The International Transfer of Technology under the TRIPS Agreement

by

Shaikhah Nasser Alhelali

Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy at

the School of Law

June, 2017

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List of Abbreviations

APCTT: the Asian and Pacific Centre for Transfer of Technology

ASTT: the Advisory Service on Transfer and Development of Technology

CCAT: climate change adaptation technologies

CCMT: the climate change mitigation technologies

CDM EB: The CDM Executive Board

CDM: the Clean Development Mechanism

CERs: certified emission reductions

COP: the Conference of Parties

CTCN: the Climate Technology Centre and Network

DOE: designated operational entity

DSU: Dispute Settlement Understanding

EGTT: the Expert Group on Technology Transfer

EIT: economies in transition

ERUs: emission reduction units

ESTs: the environmentally sound technologies

FDI: Foreign direct investment

FTA: the Free Trade Agreement

GATS: the Agreement on Trade in Services

GATT: the General Agreement on Tariffs and Trade

GEF: the global environment facility

GHG: the greenhouse gases

IMF: International Monetary Fund

INDCs: Intended Nationally Determined Contributions

IP: intellectual property

JV: Joint Venture

LDCs: least developed countries

MEAs: multilateral environmental agreements

MFN: most-favoured-nation treatment

NAPAs: National Adaptation Programmes of Actions

NDCs: Nationally Determined Contributions

NIEO : New International Economic Order

NT: national treatment

OECD: the Organization for Economic Co-Operation and Development

PDD: project design documents

R&D: research and development

TEC: the Technology Executive Committee

the Berne Convention: the Berne Convention for the Protection of Literary and Artistic Works

the Paris Convention: the Paris Convention for the Protection of Industrial Property

TLT: the Trademark Law Treaty

TM: the Technology Mechanism

TNA: Technology Needs Assessment

TOT: international transfer of technology

TRIPS: the Agreement on Trade-Related Aspects of Intellectual Property Rights

UNCTAD : United Nations Conference on Trade and Development

UNED: The United Nations Conference on Environment and Development

UNESCAP: the United Nations Economic and Social Commission for Asia and the Pacific

UNFCCC: the United Nation Framework Convention on Climate Change

UNSG : the United Nations Secretary General

VCLT: the Vienna Convention on the Law of Treaties

WIPO: World Intellectual Property Organisation

WTO: the World Trade Organisation

WW II: World War II

Dedication

To my husband

Abstract

The international transfer of technology plays a critical role to developing countries. It enhances the economic development and welfare, in addition to reducing the gaps between developing and developed countries. The promotion of the international transfer of technology increases the capabilities of developing countries and assists them to gain more independency. Therefore, the central question that this thesis tries to answer is related to whether the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) fosters international transfer of technology to developing countries or not.

Developing countries as per the TRIPS Agreement are requested to comply with minimum standards of intellectual property (IP) protection, since they are linked to international trade under the World Trade Organisation (WTO) regime. So, in order to have balanced rights and obligations, we have to evaluate whether the TRIPS Agreement is benefiting all parties and whether the transfer of technology is well-managed under the TRIPS Agreement.

The terms and conditions of the TRIPS Agreement will be analysed using the doctrinal legal method. We find that the TRIPS provisions are still far from fostering the international transfer of technology to developing countries although the preamble and its principles and objectives under Articles 7 and 8 emphasize its importance. In addition to analysing the provisions related to transfer of technology

under the United Nation Framework Convention on Climate Change (UNFCCC) through both the doctrinal legal method and empirical study on the transfer of environmental sound technologies under the Clean Development Mechanism (CDM) that was established in Kyoto Protocol adopted in 1997. We find that CDM works mainly for reducing the greenhouse gases (GHG) while the international transfer of technology is not an obligatory element of it.

We reached a number of recommendation to improve the current situation and enhance more development in the field of international transfer of technology. At the beginning we need to define the international transfer of technology in the TRIPS Agreement. Lack of definition results in challenges and obstacles in the way we are evaluating its promotion. In addition, TRIPS Agreement is required to create a new mechanism, similar to the CDM, but particularly for the promotion of international transfer of technology.

Chapter 1:

Introduction

1.1 Overview:

Technology and innovation play an increasingly essential role in the global economy and can continue to contribute to satisfying human needs and enhancing better standards of living in many fields, such as health, food, security, water and energy. The role of technology in development and economic growth has been widely recognised since World War II (WWII). No one denies the importance of international transfer of technology to developing countries, and the productivity growth that arises as a result.

And yet, further growth should also stem from the adoption of strategies to reward and incentivise innovation, since intellectual creativity plays a key role in economic development for all countries, worldwide.[1] That is why countries have sought to develop legal protections for all types of intellectual property (IP) rights, providing an IP owner a number of exclusive rights. Generally, the IP protected is all types of creations of the mind like patents for inventions, trademarks, industrial designs and

[1] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2: ICTSD Programme on Innovation, Technology and Intellectual Property. ICTSD' (2011) <http://ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf> accessed 11 January 2017.

geographical indications, literary works, films, music, artistic works, architectural design, and rights related to copyright. [2]

These exclusive rights allow the IP owner to protect his creativity and mental efforts, in addition to encouraging creativity in others. Whenever a country lacks effective legal protection for IP rights, it will be less attractive with regard to foreign investment in IP or patents.[3] Therefore, providing legal protection for IP rights first helps to spur mankind's creativity. Second, it encourages others to create or invent without the concern that their efforts will be taken easily by others. Third, such creativity is important because it develops new jobs and industries, satisfies human needs and improves the standard of living.

The international protection of IP rights passed various stages until it reached the restrictive standards of the present day. The Agreement of Trade-Related Aspects of Intellectual Property Rights (The TRIPS Agreement) is one of the most significant achievements of the Uruguay Round of the General Agreement on Tariffs (GATT). The TRIPS Agreement is annexed (C1) to the Marrakesh Agreement establishing the World Trade Organization (WTO), signed in 15 April 1994 and entered into force in 1 January 1995.[4] It established minimum standards of IP rights protection linked to trade.[5]

[2] WIPO, 'What is Intellectual Property?' (WIPO-Administered Treaties, n.d.) <http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf> accessed 12 February 2017.
[3] Daniel J Gervais, 'Intellectual Property, Trade & Development: The State of Play' [2005] 74(2) Fordham Law Review 505-535
[4] WTO, 'The multilateral trading system—past, present and future' (WTO, n.d.) .<https://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr01_e.htm> accessed 14 February 2017.
[5] TRIPS Agreement (entered into force 1 January 1995) art 1.1.

The TRIPS Agreement forms the beginning of the globalization stage of protecting IP rights. The TRIPS consolidates the idea of a globalized market in which intangible IP rights are considered jointly with goods and services.[6]

During the negotiation period of the TRIPS Agreement, both developed and developing countries started to forcefully raise the question of how to bridge the technological gap between countries with different levels of industrial capacity.[7] Developing countries raised their concerns with regard to the minimum standards of IP protection under the WTO regime. In fact, most of the patents and IP rights are owned by developed countries. Thus, it is to their benefit to have stricter standards of IP protection for all countries.[8]

So as long as developing countries are signatories to the WTO Agreement, in which the TRIPS agreement is part of under Annex (C1), they have to take necessary actions in their national legislation and otherwise adopt policies to comply with these minimum standards of IP protection. At the same time, these efforts essentially protect patents and IP rights belonging to developed countries without any direct impact or advantage to developing countries.

From this perspective, the idea of international transfer of technology appears under the TRIPS Agreement. The international transfer of technology, or (TOT) as we will refer to it in this thesis, is a tool that ensures creating balanced rights and obligations

[6] Alberto Bercovitz, 'Copyrights and Related Rights' in Carlos Correa and Abdulqawi Ayusuf (eds), *Intellectual Property and International Trade: The TRIPS Agreement* (Wolters Kluwer Law & Business 2008) 130.
[7] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2: ICTSD Programme on Innovation, Technology and Intellectual Property. ICTSD' (2011) <http://ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf> accessed 11 January 2017.
[8] Jack Mutti, Rachelle Sampson and Bernard Yeung, 'The Effects of the Uruguay Round: Empirical Evidence from US Industry' (2000) 18(1) Contemporary Economic Policy <http://www.bus.umich.edu/pdf/mitsui/nttdocs/uruguay.pdf?origin=publication_detail > accessed 12 February 2017.

under the TRIPS Agreement in a way that benefits all parties. So the TRIPS Agreement benefits developed countries by providing minimum standards of IP protection, but also benefits developing countries by promoting TOT. At the end, this was thought of as a mechanism to achieving economic development and welfare for all parties to the WTO. [9]

Now after 22 years of the adopting of the TRIPS Agreement, the question is to be answered on whether the TRIPS Agreement fosters TOT to developing countries or not, and to what extent. This is the main question this thesis tries to answer, by attempting to evaluate and explore the existing mechanism for TOT under the TRIPS Agreement.

In order to reach a conclusion in regard to this question, an empirical study will be done on the transfer of environmentally sound technologies (ESTs) to developing countries under the United Nations Framework Convention on Climate Change (UNFCCC) regime. The UNFCCC, entered into force on 21 March 1994,[10] includes some provisions related to the responsibility of developed countries to transfer or make access to ESTs and know-how to developing countries to enable them to implement the provisions of the UNFCCC.[11]

The empirical study constitutes an important part of the thesis, since it assists us to evaluate the application of all provisions and terms of TOT under both the TRIPS Agreement and the UNFCCC. We chose the ESTs because both parties, developing

[9] SY Tong, 'Foreign Direct Investment, Technology Transfer and Firm Performance' (Hong Kong 2011) < http://hiebs2.hku.hk/public/working_papers/pdf/wp1023.pdf > accessed 12 February 2017.
[10] PG Sampath and P Roffe, 'Unpacking the International Technology Transfer Debate: Fifty Years and Beyond' (2012) < https://www.files.ethz.ch/isn/152815/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf > accessed 12 February 2017.
[11] UNFCCC (adopted on 9 May 1992 and entered into force on 21 March 1994) art 4.5.

and developed countries, see a need to encourage such transfers, for a number of reasons that we will clarify in Chapter 4 and 5 of this thesis.

1.2 Research Questions:

The main research question we will try to answer in this thesis is whether the TRIPS agreement promotes or fosters TOT to developing countries. Actually, this central question must be answered via a number of sub-questions:

1.2.1 What is TOT, as per the TRIPS Agreement and the UNFCCC, its contents, objective, and its parties?

1.2.2 What is the relationship between TOT and IP protection? What is the role of IP in such transfers?

1.2.3 Does the TRIPS Agreement foster TOT to developing countries?

1.2.4 Does the UNFCCC foster the transfer of ESTs to developing countries?

1.3 The Problem Statement:

The problem this thesis seeks to investigate is how to achieve balanced rights and obligations under the TRIPS agreement in general, and in particular with regard to fostering TOT under the WTO regime and the UNFCCC regime, therefore, allowing developing countries to benefit from the TRIPS Agreement and the UNFCCC through TOT.

1.4 Methodology

The main methodology adopted in this thesis is the doctrinal legal method (or as known the black letter method). As per the doctrinal legal method, we can explore the law applicable to TOT. Also this method enables the researcher to analyse and evaluate the legal aspects as per complicated mixtures of international treaties. In this thesis, the TRIPS Agreement is one of those international treaties, along with the earlier IP conventions, like Berne and Paris Conventions, in addition to the UNFCCC and its subsequent protocols and agreements. Analysis of the UNFCCC is required because it is a specific comparative case to the TOT regime in the TRIPS Agreement, dealing with the international transfer of ESTs to mitigate and adapt to climate change.

Most of the research questions, as earlier mentioned, require legal analysis and evaluation of the terms and provisions of the TRIPS Agreement and the UNFCCC to clarify whether they support TOT or not, and to what extent. Then we explore how binding such terms and conditions in a way foster TOT to developing countries.

The doctrinal legal method provides an intricate stage for reading, analysing and linking new information to the known body of law,[12] enabling us to answer questions related to the definitions of TOT and 'developing' and 'developed' countries, and the contents of TOT agreements and ESTs. As a result, the doctrinal legal method enables reading and analysing the primary sources of legal doctrine and seeks to achieve more than simply a description of the law on the subject matter (i.e., TOT).[13] This method then enables a kind of legal research that makes room for other perspectives to be involved in the analysis and evaluation such as international

[12] Terry Hutchinson, 'Critique and Comment Developing Legal Research Skills: Expanding the Paradigm' [2008] 32(ND) Melbourne U L R <http://www.mulr.com.au/issues/32_3/32_3_9.pdf> accessed 12 February 2017.
[13] ibid.

trade, international environmental law and investment regimes. An essential role the doctrinal legal method plays herein is to take the research far from the written doctrines in TRIPS agreement or the UNFCCC to the actual application of TOT mechanisms and provisions. This application is linked also to various numbers of forms and methods of transferring technologies worldwide, such as the joint venture, foreign direct investments, technology license agreement, turn-key packages, purchase of equipment agreements, management contracts, franchising of goods and services, and the Clean Development Mechanism (CDM) under the UNFCCC. Hence, this type of methodology is known as theoretical research and helps to find a specific statement of the law and legal reasoning behind of such statements of law.[14] This is for the purpose to reach a conclusion whether these provisions promote TOT to developing countries for achieving the objectives of the TRIPS Agreement. One of these objectives is to create a balanced rights and obligations system between developed and developing countries.

Also, it is important to reflect in this research the interactions of other factors in making the operation of transferring technologies to examine whether the entire system of TOT is working effectively or not and to what extent. In this regard, barriers to such TOT can be explored through the application of the doctrinal legal method toward all these legal terms and factors. For instance, the interaction of governmental aid and the role of international organizations in promotion of TOT to developing countries. Therefore, the primary resources will not only be the TRIPS agreement itself, but also United Nations Conference on Trade and Development (UNCTAD) research and reports, and the World Intellectual Property Organisation

[14] Adilah abd Razak , 'Understanding Legal Research' [March 2009] 4 (n.d) Integration & Dissemination 19.

(WIPO) and WTO reports and papers, as well as climate change regimes like UNFCCC, the Kyoto Protocol, and the Paris Agreement.

Then, the doctrinal legal method will be supported with empirical case studies with regard to international transfer of ESTs in Kuwait, the UAE and Jordan. This will be based on a number of data resources such as reports, interviews, project documents, and UNFCCC registration documents and reports. The data collection procedures used for these empirical case studies has been reviewed by the School of Law's Research Ethics Committee and approved in principle.

The importance of the empirical method in this regard is that it overcomes the limitations of the doctrinal legal method, which only analyses and evaluates of legal principles and terms, so as to allow this research to study how these legal terms and principles apply in practice under the case studies.

1.5 Synopsis of Chapters

The research consists of nine chapters. The first is an introductory chapter. In Chapter 2, background on the development of TOT as a concept is given. Then, we address the importance of TOT in global economy and how it helps in the development of economic welfare for developing countries. Also, we track in this chapter the development of TOT as a legal concept in international IP law. We explain the historical development of TOT from its beginnings in the Industrial Revolution (1760–1840) to the present.

First, we explain how TOT took place during the industrial revolution (1760 to 1840). Second, we address the international protection of IP and its impact on TOT in the period starting from mid-19th century until World War II. Third, we examine the post-colonial era, in which we look at the role of technology on the international level during the World War II. Fourth, we discuss the period prior to the adopting of the TRIPS Agreement.

Fifth, we look at the period of the drafting and signing of the TRIPS Agreement and the provisions related to TOT. Sixth, we address the post–TRIPS Agreement period and, then eighth and last, we assess the TRIPS-Plus era and the concerns of developing countries with regard to more restrictive IP standards.

Also in this chapter, the concept of TOT and its methods will be addressed. The main objective of Chapter 2 is to come out with a definition for TOT. This definition will be the basis of the empirical case studies analysis. Lastly, the relationship between international IP rights and TOT will be addressed.

In Chapter 3 of this thesis, we focus more on the terms and conditions of the TRIPS Agreement with regard to TOT. Also, a background on the development of international IP protection is given. Then, we demonstrate the IP rights provisions under the TRIPS Agreement. First, we explore the general features of the TRIPS Agreement. This is very important in order to evaluate the approach of the TRIPS Agreement with regard to TOT and the role of developing countries in the overall Agreement: unless we have a clear understanding the TRIPS Agreement system, we are not able to make a valuable analysis and evaluation of TOT under the TRIPS Agreement. Second, we analyse all the provisions related to TOT as per the TRIPS

Agreement: the preamble, principles and objectives; the scope and nature of TRIPS; its relationship with other IP conventions; national treatment and most-favoured-nation treatment; exhaustion of rights; transition periods; technical cooperation; and international cooperation. The objective of Chapter 3 is thus to analyse and evaluate TOT provisions under the TRIPS Agreement. This is important to have a clear understanding of the legal basis as per the TRIPS Agreement for fostering or not fostering TOT to developing countries.

In Chapter 4 the legal framework for ESTs under the UNFCCC will be explored. It is important to explore the international transfer provisions under the UNFCCC and subsequent protocols and agreements in order to know the developments made in this field, prior to the specific country case studies in Chapters 5–8 We will look at the context of the transfer of ESTs under the regime governing the international response to climate change: the UNFCCC, Kyoto Protocol, Cancun Agreement, and Paris Agreement.

In Chapter 5, an outline of the case studies of Kuwait, the UAE and Jordan will be given with regard to: the objectives of the case study, their classification as developing/developed countries under both the WTO regime and the UNFCCC regime, data resources, the Clean Development Mechanism (CDM) as a tool for promoting the transfer of ESTs and finally the role of the IP and patent law in the in the international transfer of ESTs.

In Chapters 6, 7 and 8, first a background on the ESTs industry in each country is given, and the special conditions and local market and income of each country.

Second, we analyse the total number of EST projects submitted to the UNFCCC to be registered as CDM projects in each country. Third, we filter these projects as to exclude those that are unrelated to TOT at all. Then, we focus on only the projects that include, whenever applicable, some TOT provisions. We try to answer whether CDM as a tool is successful in promoting TOT. By the end of each case study chapter, we will highlight the barriers related to transfer of ESTs under the CDM in each country.

In Chapter 9 the significant findings and conclusions will be addressed and evaluated. Then, the barriers to TOT will be highlighted to suggest the most appropriate solutions or recommendation for each country, whenever applicable. This chapter also includes the conclusion of the entire thesis.

Chapter 2:

Development of International Transfer of Technology

2.1 Introduction

More than three decades ago, TOT was considered as '[o]ne of the fundamental processes that influence the economic performance of nations and firms.[15] Nevertheless, it is not easy to promote TOT for many reasons. TOT is regarded as a method that helps in making the IP law better fits the needs of developing countries.[16] Accordingly, we need to track the development of TOT in order to understand how it previously existed and how it was conceptualised.

This chapter demonstrates the concept of TOT, its definition, its forms and the means by which it has been achieved. This is a fundamental step in order to explore how to encourage TOT under the TRIPS Agreement and other related agreements that have established TOT as an objective. [17]

[15] E Mansfield, 'West Technological Transfer Issues and Problems; International Technology Transfer, Forms, Resource Requirements, and Policies' (1975) American Economic Review.
[16] Daniel J Gervais, 'Intellectual Property, Trade & Development: The State of Play' [2005] 74(2) Fordham Law Review 505-535
[17] See Chapter 3, p 76 and Chapter 4, p 150.

The establishment of an acceptable definition of TOT has had an impact on encouraging and fostering it internationally. However, reaching such a definition requires us to historically examine how TOT began. The world has passed through different relevant stages in this regard. We will address these stages with their impacts on TOT.

It is important to highlight that there were some developments in TOT field, but from different angles, i.e., international law or international environmental law. For example, intensive international efforts have taken place to mitigate and adapt to the threat of climate change, or global warming. This has prompted all countries, including developing countries, to work harder on promoting sustainable development through the adoption of ESTs. There has been international pressure to adopt this approach under the climate change regime.

In fact, these efforts cannot lead to the mitigation or adaptation of the climate change threat unless the transfer of ESTs to developing countries is fostered, as we will discuss later in this thesis.[18] Therefore, in this chapter, it is important to briefly highlight this most recent period, although further focus and analysis will be included in the case study chapters.

Lastly, we will address the relationship between the protection of IP and the fostering of TOT, including the extent to which those IP laws help to encourage TOT.

2.2 Historical development of international transfer of technology:

[18] See Chapter 4, p 150.

The term 'TOT' has only recently been used as a legal term. The general common usage of TOT was either as an economic concept for the activities of globally active enterprises or as a sociological concept with regard to the relationship between different cultures.[19] The use of TOT as a legal term or a legal obligation of a developed country towards a developing country to assist the latter in achieving economic development and welfare is, in fact, a new development in international trade law and IP law.

TOT, as a phenomenon, is not something new in international transactions. History provides many examples in which innovations and technologies have been transferred to other countries. These transferred innovations and technologies were the basis for these countries' development. Historically, each period in of TOT development has its own characteristics, benefits, challenges and effects.

2.2.1: The Industrial Revolution (1760 to 1840):

The Industrial Revolution (1760–1840) was a major turning point in the international economy. It is a transition period where key changes occurred in many countries. In fact, '[t]he eighteenth century does represent a decisive break in the history of technology and the economy'.[20] So, it had a major impact on TOT, because of the substantial opportunities for TOT at the international level without IP or patent restrictions. [21]

[19] Hoshimi Uchida, 'Technology Transfer' in *The Era of Industrialisation, A History of the Japanese Economy* (Vol 4 1990).
[20] Robert C Allen, *The British Industrial Revolution in Global Perspective: How Commerce Created The Industrial Revolution and Modern Economic Growth* (Oxford University 2006) 2.
[21] Hoshimi Uchida, 'Technology Transfer' in *The Era of Industrialisation, A History of the Japanese Economy* (Vol 4 1990).

Most of the famous industrial inventions, i.e., the spinning jenny, railways, the steam engine, coke-fired blast furnaces[22], textile production, the shift to coal and coke in the iron industry were invented in Great Britain, moved to Continental Europe, and then were adopted and used in the United States of America and Japan. Japan, which is currently one of the most developed countries, can be considered as 'the sole historical example of a successful transfer of technology from the West to a non-Western society'.[23]

The TOT process was easier and successful at this period, without any remarkable challenges. By comparing this with current TOT experiences, a huge number of challenges and obstacles exist in any step toward TOT from developed to developing countries.

TOT occurred through purchases of the new technologies and inventions from Great Britain, because, at that time, inventors were happy to market their inventions in new markets. TOT was a tool for sharing technologies across borders and for training new users on how to use them.[24] One of the factors that facilitated such successful TOT was the absence of IP barriers and linkages between trade and IP.

Therefore, the level of IP protection available in each stage has had a direct impact on TOT. At this period, there were some efforts to protect IP through national legislation. For example, England started before the industrial revolution to set up some legal protection of IP, such as the statute of monopolies of 1624 which was the

[22] Robert C Allen, *The British Industrial Revolution in Global Perspective: How Commerce Created The Industrial Revolution and Modern Economic Growth* (Oxford University 2006) 2.
[23] Hoshimi Uchida, 'Technology Transfer' in *The Era of Industrialisation, A History of the Japanese Economy* (Vol 4 1990).
[24] ibid.

first expression for patents law in England[25], and then the Statute of Anne of 1709 for copyright. [26]

Also, the first Patent Registration Act in US was issued in 1790 while in France the Copyright Act of 1791 was issued.[27] Nevertheless, these legislative actions were very simple in their nature and on the national level only. That is why this period was described as of 'national or territorial protection of IP rights'.[28]

Thus, this period lacked internationally effective IP protection. As a result, TOT took place on the international level easily. Both inventors and users were able to benefit from TOT of the new industrial inventions and technologies. Greater economic welfare and development in all fields. On the one hand, Great Britain received commercial benefits and rewards, and on the other hand, the recipient countries took their first fundamental steps toward technological development and economic growth. [29]

2.2.2: TOT under the international protection of IP from mid-19th century until World War II

In this period, bilateral agreements for IP protection started to emerge. For example, France issued a decree that allowed the grant of copyright protection to foreign IP holders, even if their countries did not offer the same protection for French IP

[25] Chris dent , 'Generally Inconvenient: The 1624 Statute of Monopolies as political compromise ' [2009] 33(Nd) Melbourne University Law Review 415-453

[26] Peter Drahos and Herchel Smith, *The Universality of Intellectual Property Rights: Origins and Development* (1998) 4; See also: Jermey Norman, 'The Statute of Anne: The First Copyright Statute (1709)' History Information (26 December 2016) <http://www.historyofinformation.com/expanded.php?id=3389> accessed 14 February 2017.

[27] Peter Drahos and Herchel Smith, *The Universality of Intellectual Property Rights: Origins and Development* (1998) 3.

[28] ibid.

[29] Nadine smith, 'Industrial Technology Transfer Between Britain and France in the Eighteenth Century' [2002] Nd(Nd) Paul Jr Independent Charter Public School <https://www1.umassd.edu/ir/papers/2002/smith.doc> accessed 29 April 2017

holders. This initiative encouraged other countries to adopt the same approach towards foreigners. England also issued two acts: the International Copyright Act in 1838 and the International Copyright Act in 1844. In fact, those two acts allowed reciprocal copyright treaties with other nations,[30] which resulted in the protection of the rights of foreigners.[31]

In this period, the US did not play a major role; development of international IP rights was left to Europe. Their efforts resulted in the issuance of two important international IP conventions: the Paris Convention for the Protection of Industrial Property in 1883, (known as the Paris Convention) [32] and the Berne Convention for the Protection of Literary and Artistic Works in 1886 (known as the Berne Convention).[33]

The international protection of IP period started with these two conventions. [34] The objective was to use international IP protection as a tool to impose some restrictions on TOT occurring without reward or compensation. This is in order to encourage innovations and inventions. This approach was the objective of all subsequent developments in this field; developed countries sought more and more restrictions on TOT in the following periods.

2.2.3: The Post-Colonial Era

[30] Philip V Allingham, *Nineteenth-Century British and American Copyright Law* (Lake Head University 2013) <http://www.victorianweb.org/authors/dickens/pva/pva74.html> accessed 23 October 2016.
[31] Peter Drahos and Herchel Smith, *The Universality of Intellectual Property Rights: Origins and Development* (1998) 5.
[32] WIPO, *Summary of the Paris Convention for the Protection of Industrial Property (1883)* <http://www.wipo.int/treaties/en/ip/paris/summary_paris.html > accessed 10 February 2017.
[33] WIPO, *Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886)* < http://www.wipo.int/treaties/en/ip/berne/summary_berne.html> accessed 10 February 2017.
[34] See Chapter 2 p 76.

Countries recognised well how important technology was during World War II (WWII). Technology played a crucial role in determining the outcome of WWII in several respects: weapons, logistical support, medicine, communication and industry.[35]

This affected the American view of the value of technology: Technology was not just a matter of improving standards of living; it also played an arguably more serious role that required more consideration. This new vision forced the American government to give more attention and care to research and development. The US government began to sign contracts with qualified companies, universities and non-profit organisations to develop technologies and inventions in all fields. Nevertheless, this initiative was general, without incorporating specific targets, strategies or requirements.[36] Also, IP policies at that time allowed IP to be licensed, most of the time through by adopting non-exclusive licensing agreements. As a result, the technology was not well-commercialised during this period. Also, TOT was not adopted as a policy on the international level.[37]

Later, in 1961, TOT was placed on the table for the first time as an international issue. Some developing countries such as Brazil submitted a request to the United Nations Secretary General (UNSG) to initiate studies to ascertain the role of international treaties in promoting IP protection in developing countries. As a consequence, the UN issued a decision requesting the UNSG to call for the United

[35] ibid.
[36] ibid.
[37] ibid.

Nations Conference on Trade and Development (UNCTAD), based on Brazil's request, to facilitate TOT to developing countries.[38]

Hence, developing countries began to think more about the technological gap between them and developed countries, particularly after most of the developing countries gained their independence in the early 1960s. After being independent, developing countries found themselves lagging behind the industrialised developed world in their infrastructure and economic development. Infrastructure related to bridges, water supply, sewers, electrical grids, telecommunications, oil and gas supply and so forth all required more effort to close the technological and economic gap.[39]

Developing countries understand the importance of TOT as a basic requirement for economic development,[40] and then, a need to have a specific framework for TOT on the international level to promote access to technologies.[41]

In fact, those international demands for TOT and technical assistance were made pursuant to a call for a New International Economic Order (NIEO), which was coupled with trade proposals through the UNCTAD in Geneva in 1964.[42] This was mainly aimed at dissolving the current colonial status of the developing countries and

[38] UN General Assembly 'The role of patents in the transfer of technology to under-developed countries', Doc.A/ks 1713, 19 December 1961 , 16th Session; See also: PG Sampath and P Roffe, 'Unpacking the International Technology Transfer Debate: Fifty Years and Beyond' (2012) < https://www.files.ethz.ch/isn/152815/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf > accessed 12 February 2017.

[39] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.

[40] ibid: 240.

[41] PG Sampath and P Roffe, 'Unpacking the International Technology Transfer Debate: Fifty Years and Beyond' (2012) < https://www.files.ethz.ch/isn/152815/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf > accessed 12 February 2017.

[42] P Van Dijik, 'Identification of the Legal Principles Most Relevant to the NIEO Concept and a Tentative Specification of Their Contents', 'Restructuring the International Economic Order: Indonesian and Dutch Perspectives' page 91:98.

promoting their interests by improving their trade position. This was also raised based on the principle of equal rights and the self-determination of people as stated in Article 1 of the UN Charter.[43] However, achieving those demands was not easy, as those international goals initially failed to materialise.

The absence of a TOT framework resulted in a sort of technological colonialism.[44] Developed countries offered developing countries assistance in the form of one-sided agreements, which were drafted solely by the developed countries. They were usually linked to the rights to build, operate and maintain manufacturing plants in developing countries without interference from the developing countries.[45] Developing countries had no choice but to accept such agreements in order to enable limited TOT.[46]

This type of TOT was widespread during this period for one reason: monopoly power over technology and innovations during this period. Nevertheless, circumstances gradually began to change in an opposite direction through the spread of infringement of IP rights in many developing countries. IP infringement was an easy way to break the wall of protection surrounding technology and inventions, which allowed developing countries to gain access to more technological developments. As a result, the developed countries suffered huge financial losses because of the lack of effective IP protection on the international level. This, as we will see in the next

[43] ibid.
[44] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[45] See p.57.
[46] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.

period was the main reason behind linking IP protections to trade as per the TRIPS Agreement.

The concept of protecting IP and initiatives to encourage TOT, was constructed via a long period of debate and negotiation between developed and developing countries.[47] This was a controversial period, that lasted over 50 years in this period. Actually, this concept is still a controversial issue among countries, but the debate stimulated the first steps toward an understanding of the two concepts.

Nevertheless, this period added a great deal to the general understanding of several aspects of the concept of TOT. First, when the developed countries began to call for stronger IP protection, the developing countries sought more TOT, but there was little understanding of what TOT was, how it could be achieved, and to what extent. The role of the IP holders at that time was vague, and the process for such transfer was complicated and unclear.[48] Thus, those demands played a role in giving more attention to TOT as a concept.

Second, the spread of IP infringement in many developing countries made IP protection a top priority issue for developed countries. In fact, private sector businesses were started to observe and investigate IP infringements in developing countries and demonstrate the financial losses to the IP holders as a result.

[47] R Falvey et al., *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.

[48] PG Sampath and P Roffe, 'Unpacking the International Technology Transfer Debate: Fifty Years and Beyond' (2012) < https://www.files.ethz.ch/isn/152815/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf > accessed 12 February 2017.

Third, this period influenced some international conventions, for example, the UN Convention on the Law of the Sea. This Convention, formally known as the Third United Nations Convention on the Law of the Sea, or the UNCLOS III, was adopted in 1982.[49]

The objective of this Convention was to 'to establish a comprehensive set of rules governing the oceans and to replace previous U.N. Conventions on the Law of the Sea, one in 1958 (UNCLOS I) and another in 1960 (UNCLOS II), that were believed to be inadequate' at that time.[50] In addition, this Convention was influenced by the NIEO, and thus, it called for TOT from developed to developing countries.[51] The Transfer of Marine Technology was added as a provision to Part XIV of the Convention, and was inspired by the Principle of No Discrimination. Pursuant to this provision, the objective was to enable 'the exploration and exploitation of the seabed and the areas for developing countries'[52] through the transfer of marine technology on fair and reasonable terms and conditions 'in order to help developing countries to access the benefits of Oceans and Seas.'[53]

Another example is the landmark Earth Summit of 1992, which was a major conference of the United Nations held in Rio de Janeiro that included multilateral environmental agreements (MEAs).[54] One of those agreements was the

[49] The United Nation Law of the Sea Treaty Information Centre, *The Law of Sea Treaty (LOST) Background* (National Center for Public Policy Research) <http://www.unlawoftheseatreaty.org/> accessed 22 Nov 2017.
[50] ibid.
[51] ibid.
[52] UNESCO, 'Intergovernmental Oceanographic Commission: Resources, Meetings, Documents, People' <http://ioc-unesco.org> accessed 25 November 2016.
[53] ibid.
[54] PG Sampath and P Roffe, 'Unpacking the International Technology Transfer Debate: Fifty Years and Beyond' (2012) < https://www.files.ethz.ch/isn/152815/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf > accessed 12 February 2017.

UNFCCC, which entered into force on 21 March 1994.[55] The UNFCCC stated[56] that the developed countries and parties included in Annex II shall take all practicable steps to promote, facilitate and finance, international transfer of ESTs.[57] Therefore, new development is included in the climate change regime.

2.2.4: The Pre-TRIPS Period:

Before the establishment of the WTO, the General Agreement on Tariffs and Trade (GATT) had been implemented. It was a multilateral agreement that regulated international trade, which was signed in 1947 and lasted until 1994, when it was replaced by the WTO. The text of the GATT is still in effect under the WTO framework, as it was taken into consideration during the modifications made in 1994. The GATT had recognised several rules related to IP, but not with regard to TOT.

The WIPO was formed on 14 July 1967. It is one of the specialised UN agencies that encourage IP protection internationally. It administers a number of IP conventions.[58] The Paris and Berne Conventions lacked rules on the international enforcement of IP protection between states. The cornerstone of IP protection under these two Conventions was the principle of national treatment, which ensured that each sovereign territory conferred on foreign nationals the same protection available to their own nationals. Nevertheless, under these Conventions, there was no harmonisation of the rights granted by the different countries, and the minimum standards of IP protection they set were subject to numerous exceptions. In other words, the IP provisions under the Paris and Berne Conventions aimed to ensure the

[55] ibid.
[56] The UNFCCC (adopted on 9 May 1992 and entered into force on 21 March 1994), art 4(5)
[57] UNFCCC (2014) *Technology* <http://unfccc.int/cooperation_and_support/technology/items/1126.php> accessed 23 Nov 2016.
[58] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 10.

similarity, rather than the uniformity, of the rules laid down by the member countries.[59]

Therefore, the member states of Paris and Berne conventions began to express dissatisfaction and request a revision to their provisions. As a result, a document was prepared in 1979 for a possible revision of the Paris Convention. The main objective of that was to give full recognition to the need for economic and social development, as well as to facilitate the development of technology in developing countries and to improve the conditions for TOT.[60]

Other efforts were made in the context of the Paris Convention at conferences held in Geneva and Nairobi between 1980 and 1982. At these conferences, the developing countries officially sought the incorporation of a provision in the Paris Convention promoting TOT. Also, the developed countries sought stricter enforcement of IP protection than was provided under the Paris Convention. Nevertheless, there was no agreement reached among the relevant parties, and as a result, the Paris Convention was not revised.[61]

However, the Paris Convention opened a channel for TOT under the umbrella of national treatment. Since it established a policy of equal patent protection without regard to an inventor's nationality, there were some opportunities for inventors and

[59] ibid.
[60] Daniel Gervais, 'TRIPS and Development' Vanderbilt University Law School Public Law and Legal Theory Working Paper (2014) 13-46.
[61] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012).

incentives to make TOT.[62] It was left to the intent of parties and how they agreed to such transfer.

In sum, we can conclude that during this period, a number of shortfalls in promoting TOT, under both the Paris and Berne Conventions and the GATT, framed the next period.[63] They raised some issues that would become key subjects for the next period of negotiations between the developed and developing countries, as will be explained further in the following section.

2.2.5: The Age of TRIPS:

Negotiations on the TRIPS Agreement started in the Uruguay Round, which began in 1986 and concluded in December 1993. It was the eighth round of multilateral trade negotiations that occurred over a period of 50 years. This round started based on the intention of the various participants to negotiate trade aspects under the WTO. [64]

In fact, the WTO was born out of the negotiations; most of the issues addressed in the WTO were born out of negotiations among all the countries.[65] The WTO negotiated based on the 'to talk' principle.[66]

[62] Irina Talis, *Do Stronger Intellectual Property Rights Encourage Technology Transfer? Evidence from Foreign Patenting in the United States* (Stanford University 2008).
[63] Susan K Sell, 'The Dynamics of International IP Policymaking' in Daniel J. Gervais (ed) *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2013) 74–85.
[64] Jack Mutti, Rachelle Sampson and Bernard Yeung, 'The Effects of the Uruguay Round: Empirical Evidence from US Industry' (2000) 18(1) Contemporary Economic Policy <http://www.bus.umich.edu/pdf/mitsui/nttdocs/uruguay.pdf?origin=publication_detail > accessed 12 February 2017.
[65] WTO, 'Understanding the WTO' <http://www.wto.org/english/thewto_e/whatis_e/tif_e/tif_e.htm> accessed 5 November 2016.
[66] ibid.

The Uruguay Round ended in Marrakesh in April 1994 with the signing of the Agreement establishing the WTO. Annex 1C of the WTO Agreement is the TRIPS Agreement,[67] which entered into force on 1 January 1995, with its main objective to link IP protection to trade rules.[68]

It is worth mentioning that TRIPS was not among the trade issues required to be negotiated in the Uruguay Round. When the Round started in 1986, it was not clear that it would cover IP as an item on the agenda. Gradually, the TRIPS Agreement's role began to change until it was considered to be a core issue of the WTO. In the end, the decision was left to the countries either to approve it or to break the Round.[69] Thus, TRIPS become an essential issue for the success of the Round. The development of the Uruguay Round's agenda will be discussed in further detail in the next chapter. [70]

As we are providing the historical background of how TOT developed in this chapter, it is important to address how TOT and technical cooperation were addressed by the WTO. During the Uruguay Round, a number of US industries claimed that they had lost tens of billions of dollars because of IP infringement. Therefore, the US argued in favour of more IP protection on the international level. As a result, the US enacted Section 301 of the Trade Act of 1974. This act authorises the US to take all appropriate actions whenever there is a foreign law, policy, or practice that violates an international trade agreement. It applies not only to foreign acts, but also whenever there are any violations under bilateral and multilateral trade agreements

[67] ibid.
[68] ibid.
[69] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012).
[70] See Chapter 3 p 76.

that deny the US's rights under those agreements. In addition, it applies to any unreasonable, unjustifiable, or discriminatory practices of foreign governments that restrict US trade.[71] (Special) Section 301 of the Trade Act of 1974 (formerly called Special 301) is the section related to remedying IP infringements that affect US commerce and trade from the acts, policies or practices of a foreign government.[72]

Pursuant to this section, the US tried to exert more pressure toward linking IP to trade, and therefore, to remedying financial losses related to IP infringements worldwide. The US has given itself the power to decide whether other countries' IP systems offer adequate protection or not, and whether there is a need to impose bilateral sanctions on them.[73] Consequently, the international fear that such sanctions would be applied and fears of being evaluated annually under Section 301 constituted a source of pressure for developing countries, which forced most of them to get involved in the negotiations and then to become parties to the Agreement.[74]

Subsequent to those actions taken by the US, the TRIPS Agreement was promoted on the international level and under the WTO umbrella. The TRIPS Agreement was the outcome, which had the support of the European Commission and the Japanese government. [75]

[71] Stewart Law, 'Brief Comparison of Section 301 and Special 301 Trade Laws' (FTAC 2004) <http://www.ftac.net/7-Special_301.pdf> accessed 29 October 2016.
[72] ibid.
[73] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 12.
[74] Daniel Gervais, 'TRIPS and Development' Vanderbilt University Law School Public Law and Legal Theory Working Paper 13-46, 3.
[75] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 12.

As a result, the TRIPS Agreement is considered to be the first and the most comprehensive global set of rules covering IP protection. It specifies minimum standards with which all countries must comply. It reflects the fact that the world is moving towards a uniform, global system of IP protection.[76] It also established IP law within an international trading system for the first time.

In fact, the TRIPS Agreement aims to create a balance between the interests of innovators (or creators) and users, and between competition and appropriation, which initially had been the main purpose of the calls for stronger IP protection.[77] Nevertheless, the TRIPS Agreement is among the more controversial international IP agreements that have entered into force, and the negotiations were highly contentious.[78]

From the perspective of the developing countries, the TRIPS Agreement would force obligations on them alone, but all the rights and interests would accrue to the inventors and creators, most of whom are from the developed countries. Eventually, they agreed to receive 'freer access to the markets of developed countries in exchange for their agreement to protect IP rights of foreign nationals under the TRIPS Agreement as a quid pro quo'.[79] That is the reason the developing countries agreed to comply with the minimum standards under the TRIPS provisions, i.e. the hope that they would, to some extent, encourage cross-border TOT.

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[76] JJ Simons, 'Cooperation and Coercion: The Protection of Intellectual Property in Developing Countries' (1999) <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1159&context=blr> accessed 15 November 2016.
[77] TT Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010).
[78] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.
[79] TT Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010).

The developing countries were encouraged to accept the TRIPS Agreement to foster TOT and technical cooperation. TOT was addressed under different provisions of the TRIPS agreement. These TOT provisions will be examined and evaluated in more detail in the next chapter. After the TRIPS Agreement entered into force, still-developing countries requested that TOT be promoted. On the other hand, the developed countries began to call for IP protection in addition to the minimum standards provided under the TRIPS Agreement. This led to calls to open the next round of multilateral trade negotiations (the Doha Round) and the need to initiate the TRIPS-Plus period, as will be further explained in the next section.

2.2.6: Beyond TRIPS:

The developing country members of the WTO expressed their dissatisfaction with the minimum standards of IP protection under the TRIPS Agreement, which obliged them to comply to developed-country standards without any incentives aimed at promoting TOT.

The developing countries requested a revision of TOT provisions under the TRIPS Agreement. They issued calls for the promotion of TOT that could lead to economic welfare and development in their countries. At the same time, the developed countries also expressed their dissatisfaction with regard to the current minimum standards of IP protection for developing countries, as they called for IP standards in addition to the minimum standards under the TRIPS Agreement. However, international institutions, with regard to both IP protection and TOT, did play a more effective role during this period.

Thus, during this period, negotiations began for additional IP protection and the revision of TOT provisions under the TRIPS; the Doha Round of multilateral trade negotiations began in 2001. Then, the term TRIPS-Plus emerged through the enactment of related TRIPS provisions allowing the developed countries to ask for higher standards of protection. Three issues that emerged during this period will be further explained as follows:

a) The Doha Round of multilateral trade negotiations in 2001

The Doha Round is the latest cycle of negotiations, which has taken place in the capital of Qatar, Doha, under the umbrella of WTO subsequent to the Uruguay Round. The Doha Round was officially launched at the WTO's Fourth Ministerial Conference in November 2001.[80]

The Doha Ministerial Declaration Mandate includes several issues concerning the implementation of the present agreements. The phrase 'issues concerning the implementation of the present agreements' is a shorthand term for the problems raised particularly by the developing countries about the implementation of the current WTO Agreement. Therefore, this term was promoted in the Doha Round as a logical reaction by the developing countries to the request of the developed countries for higher standards of IP protection than those provided in the TRIPS Agreement. The main concern of the developing countries was to avoid being pressured to enact or implement even tougher or more restrictive conditions in their IP or patent laws those legally required by the TRIPS.[81]

[80] WTO, 'The Doha Round' <http://www.wto.org/english/tratop_e/dda_e/dda_e.htm#development> accessed 1 November 2016.
[81] ibid.

Thus, the term 'implementation of current WTO agreements' became a vital part of the Doha Round. Part of the provisions were related to agriculture, services, TRIPS issues, the relationship between trade and investment, the interaction between trade and competition policy, trade and TOT, technical cooperation and capacity building, least-developed countries and many other issues.[82] All of these issues were addressed in the Doha Ministerial Declaration Mandate for negotiations by the developed and developing countries in the Doha Round.

Subsequently, a decision was made on 14 November 2001, pursuant to paragraph 12 of the Doha Ministerial Declaration Mandate, for a two-track solution: The first track provided that more than 40 items under 12 headings would be settled at or before the Doha conference, while the remaining issues, most related to the implementation of the TRIPS Agreement, would be subject to immediate negotiation.[83] Those issues of negotiation may have provided progress at different levels and for various aspects. The challenging problem therein was that most of those issues were of a controversial nature, and it might be difficult to agree on the aspects subject to negotiation.

In fact, as per the original plan for the Doha Round, the Cancun Conference was intended to 'deliver a basic deal on the modalities (framework) requiring WTO members to open their markets in implementing the Doha Development Agenda'[84]

[82] 'The Doha Declaration Explained' <http://www.wto.org/english/tratop_e/dda_e/dohaexplained_e.htm> accessed 3 November 2016.
[83] ibid.
[84] Sungjoon Cho, 'The Demise of Development in the Doha Round Negotiations' <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1338&context=bjil > accessed 1 December 2016.

by the end of 2004. However, most of the developed countries were not prepared to reform their long-standing agricultural protection policies to meet that deadline.

The collapse of the Doha Trade Talks on 29 July 2008 occurred because of the disagreement between the developed and developing countries about issues related to agriculture. This failure in the negotiations resulted in many negative effects for the developing countries. It was not only 'a bad omen for the efforts to strengthen global trade relations and collaboration, but it also does not bode well for the urgently needed measures that would enable the developing countries to accelerate growth and reduce poverty'.[85]

The foregoing summarises the negotiations that took place in the Doha Round, which culminated in failure. Nevertheless, calls for higher standards of IP protection as per the TRIPS provisions have not ceased. They have taken the shape of calls for a TRIPS-Plus agreement, as we will explain in the next section.

b) TRIPS-Plus

Despite the collapse of the Doha Round talks, many of the developing countries found themselves under more pressure to provide tougher or stricter IP protection than that required by the TRIPS Agreement. Accordingly, calls for IP protection in

[85] David Bigman, 'Beyond the Doha Round: Time to Reform the WTO' (2006) Stanford Centre for International Development Working Paper No 294 < http://engagedforums.com/discussions/WTO_Public_Forum_2006/Discussions/wtopublic2006/1?tsn=1&nav=display&tid=40 > accessed 3 November 2016.

excess of the minimum standards in the TRIPS have become known as TRIPS-Plus.[86]

According to some researchers, the term TRIPS-Plus is used to cover two different types of standards: those under Article 1.1 of the TRIPS Agreement, which 'confers on its Members the discretion to implement (more extensive protection) than is conferred by TRIPS standards',[87] or those qualifying the operation of some standards as per the TRIPS provisions for the purpose of choosing when to adopt standards, i.e., option-creating standards as per Articles 27.1 and 27.3.[88]

These are applied through bilateral agreements, and in fact, the US has developed models for such agreements. This is intended to reduce the costs of negotiations and agreements to the terms and conditions. For instance, the Free Trade Agreement (FTA) that the US negotiated with Jordan will serve as a model for the other FTAS that are being negotiated with Chile and Singapore.[89] Nevertheless, the developing countries are by no means obliged to accept TRIPS-Plus obligations as a matter of international law. Some countries, such as Brazil, China or the Central American states, have had no choice but to adopt them as part of their trade agreements with the US or the EU for several reasons, including the need for access to medicines. Some common examples of TRIPS-Plus provisions are the extension of the term of a patent for more than the 20-year minimum or limitations on the use of compulsory licences.

[86] Sisule F Musungu and Graham Dutfield, 'Multilateral agreements and a TRIPS-plus World: The World Intellectual Property Organisation (WIPO)' < https://www.iprsonline.org/ictsd/docs/WIPO_Musungu_Dutfield.pdf > accessed 10 February 2017
[87] Peter Drahos (2001), 'BITS and BIPS: Bilateralism in Intellectual Property' < https://www.anu.edu.au/fellows/pdrahos/articles/pdfs/2001bitsandbips.pdf > accessed 22 Nov 2016.
[88] ibid.
[89] ibid.

Such IP rules and practices have the effect of 'reducing the ability of developing countries to protect the public interest and may be adopted at the multilateral, plurilateral, regional and/or national level'.[90]

c) More international institutions

This period witnessed the birth a growing number of international institutions in the fields of IP protection and TOT. The first to be established was UNCTAD in 1964, which is the United Nations body responsible for dealing with development issues, particularly international trade; it is one of the main drivers for economic development. UNCTAD is governed by its 194 member states pursuant to a forum in which the representatives of all the member countries can freely engage in dialogue and discuss ways to establish a better balance in the global economy. As an international institution, UNCTAD has played an active role in promoting TOT to developing countries.[91]

UNCTAD offers direct technical assistance to developing countries and countries with economies in transition in order to help them build their capacities. It is a type of technical assistance that allows developing countries to become equitably integrated into the global economy and to improve the living standards of their population. Also, UNCTAD holds a ministerial-level meeting every four years to discuss major global economic issues and to make decisions regarding its programme of work.[92]

[90] ibid.
[91] UNCTAD, 'About UNCTAD' (UNCTAD United Nations Conference on Trade and Development 2013) < http://unctad.org/en/Pages/AboutUs.aspx > accessed 1 February 2017.
[92] ibid.

Under the umbrella of UNCTAD is the Advisory Service on Transfer and Development of Technology (ASTT). The ASTT is a division that was established in 1976 to promote TOT.[93] The basic objective of this office is to provide advice and technical assistance with regard to TOT to developing countries.[94]

Second, this period witnessed the establishment of WIPO. WIPO is one of the most important organisations encouraging TOT to developing countries. WIPO has a special programme for technical assistance that provides business systems for IP offices and for national/regional institutions in developing and least developed countries (LDCs) to enable them to participate effectively in the global IP system. This programme aims to provide efficient automated and standardised business processes for IP administration to achieve integration into regional and international systems to enable the electronic exchange of data and documents.[95]

Third, the Asian and Pacific Centre for Transfer of Technology (APCTT) was established in 1977 with the objective of promoting TOT in the Asia-Pacific region. Therefore, it is a regional institution of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) serving the Asia-Pacific region.[96] The APCTT addresses science technology and innovation, TOT and technology intelligence.[97] Pursuant to Article 4 of the Statute of the APCTT, the objective of the centre is to assist its members and the associate members of the ESCAP to

[93] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[94] ibid.
[95] WIPO, 'Technical Assistance' < http://www.wipo.int/global_ip/en/activities/technicalassistance/ > accessed 28 November 2016.
[96] APCTT, 'APCTT Asian and Pacific Centre for Transfer of Technology of the United Nations Economic and Social Commission for Asia and the Pacific' (2013) < http://www.apctt.org > accessed 1 October 2016.
[97] ibid.

strengthen their capabilities, and to develop and manage national innovation systems. The APCTT provides assistance in identifying the applicable technologies in developing countries, and it helps them to develop, transfer, adapt and apply new technology by improving the terms for TOT to them.[98]

In sum, all the above-mentioned developments regarding TOT during this period reveal how the concept of TOT was being framed on the international level. Although this historical background does not provide a definition of the TOT, which we will examine in this thesis, it is important to highlight the controversy surrounding the issue and how it has been historically framed.

Moreover, it is also important to provide a general understanding about the methods and forms for transferring technologies in the above-mentioned periods. As we noted, there are a number of experiences involving TOT throughout history; thus, the issue of the forms and methods that were used to perform such TOT is raised herein. This will be addressed further in the following section.

2.3 The concept of international transfer of technology and its methods:

In order to examine how to promote TOT to developing countries, as a primary step we will build a clear understanding of the concept of TOT. Because of the dynamic nature of the technologies themselves, a number of definitions exist,[99] and most of them incorporate many uncertainties and ambiguities.

[98] ibid.
[99] S Abdulwahab, R Che Rose and SI Wati Osman, 'Defining the Concepts of Technology and Technology Transfer' (International Business Research 2012).

First, the TRIPS Agreement, the UNFCCC and subsequent agreements dealing with TOT have not defined TOT. In fact, defining TOT is a key part of any research related to TOT. Such a definition will avoid the analysis and evaluation of situations that do not have any linkage to TOT.

In addition, there are a number of activities that are different in nature from TOT, but have been treated by developing countries as TOT. For example, we noted the misunderstanding and confusion regarding what constitutes TOT and what constitutes technological diffusion or technology generation.[100] Thus, some developing countries have considered mere imports of technology to their markets as TOT from a developed country. In other words, and from a general point of view, there are different technical levels of TOT, and unfortunately, most of them do not lead to real and successful TOT to developing countries.

In fact, mere imports of technology, and the general knowledge and application of new technologies in the developing country as a host country, are closely related to technological diffusion, not technological transfer. Technological diffusion is considered to be another benefit of bringing new technology into a host economy. Therefore, technological diffusion is related to the introduction of new technology in a host country and the creation of an awareness of this new technology and its advantages, compared to the old technology. This general knowledge and awareness of new technology may spill over into the economy of the host country as a whole, but at the same time, it does not occur with any deliberate intent.

[100] UNCTAD, 'Transfer of Technology' [2001] n.d UNCTAD Series on Issues in International Investment Agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016.

Technological diffusion occurs through the passage of time by the application of the new technology in the new market.[101]

Technological diffusion used to be construed as a (Basic Level) of transferring technology. This basic level involves the enhancement of the capability to

> use, operate and maintain the technological equipment, devices, machinery, etc., subsequent to implementation of the technology, including undertaking replacement and repair of minor components; the capability, primarily concerning the respective operators, to secure and maintain an efficient level of productivity (at best at its design levels of performance).[102]

Experts in TOT have developed three levels for TOT: The first is the Basic Level, technological diffusion, as clarified above. The Intermediate Level involves the enhancement of the capability to

> replicate and or independently undertake complete implementation, including possibly fabrication of technological components, technological subsystems or complete systems; the capacity to independently undertake incrementally minor adjustments, modifications, improvements, optimisation, etc., in relation to specific application requirements and contexts.[103]

The last level is the Advanced Level of TOT, which involves the enhancement of the capability

> to generate more substantial changes and developments of the technological

[101] ibid.
[102] Bo Wang, 'Can CDM Bring Technology Transfer to China?—An Empirical Study of Technology Transfer in China's CDM Projects' [2010] 38(ND) Energy Policy 2572–2585.
[103] ibid.

components, technological subsystems or complete systems in question; the capability to undertake reconfiguration and redesign of the basic technology outlay, and to develop new designs or elements of the system, or of the complete system, including possibly to continuously optimise system performance through engineering R&D-related activities.[104]

The linkage of these three levels with the objectives of the TRIPS Agreement with regard to developing countries will enable us to produce a different, more precise definition of what constitutes TOT. First, we must exclude all the definitions that promote technological diffusion or the Basic and Intermediate Levels of TOT. This is based on one simple reason: We are seeking a definition for TOT that meets the objectives of the TRIPS Agreement, the UNFCCC and any other protocol or agreement that encourages TOT.

In the TRIPS Agreement, Articles 7 and 8 state a set of objectives to be achieved by it: preventing any abuse of IP rights by their holders, resorting to practices which unjustifiably limit trade or are detrimental to TOT, the promotion of technological innovation, the encouragement of the transfer and dissemination of technology and the establishment of measures to protect public health and nutrition.[105] Accordingly, technological diffusion or the Basic and Intermediate Levels of TOT will not help to meet the objectives of TRIPS with regard to the developing countries.

Therefore, in any definition of TOT, three dimensions should be incorporated: the content, the parties and the outcome or objective of the transfer. These three

[104] ibid.
[105] TRIPS Council, *Special Discussion on Intellectual Property and Access to Medicines*, IP/C/M/31 (July 10, 2001) <https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=90911&CurrentCatalogueIdIndex=0&FullTextSearch=> accessed 15 November 2016.

dimensions are very important to promote the economic development and welfare of developing countries. In accordance with these dimensions, we will review the most common definitions of TOT. In other words, we will review and evaluate these definitions to determine the extent to which they can achieve the main objectives of the TRIPS and other related agreements. Thus, they will be evaluated pursuant to 'a principal economic operation and not through a joint product or by-product, contingent on other operation'.[106]

In addition to the general economic and development objectives of transferring technology, the content of TOT is essential. Any agreement related to TOT must be dealt with as a global package or a total system. Through such TOT agreements, the licensee (host developing country) is expected to obtain all information, technical assistance, IP rights, equipment…etc. and then enabling him to produce the same, either the technology itself or the products or equipment or services that have the same quality standards of the licensor with the licensor's technology.[107]

Subsequently, the contents of this global package or total system shall be left open 'until the goal is achieved'.[108] In so doing, the licensee can avoid losing his interest simply because the patent licence is expired or the know-how is no longer secret.[109]

Hence, the definition of TOT will establish a clear understanding of what the licensee (host developing country) needs and what the licensor (IP holder in developed country) offers. It ensures that TOT is a total system that includes not only the

[106] Dominique Foray, 'Technology Transfer in the TRIPS Age: The Need for New Types of Partnerships between the Least Developed and Most Advanced Economies' (ICTSD, Issue 23, 2009) vii. < https://www.iprsonline.org/New%202009/foray_may2009.pdf > accessed 5 November 2016.
[107] ICC, *ICC International Technology Transfer Contract* (ICC Publication No 674 2009) 9–10.
[108] ibid.
[109] ibid.

technology, but also contents such as 'know-how, patents, IPRs, detailed design, technical assistance, equipment or tools,…'.[110]

The contents of the TOT shall include the assignment, sale and licensing of all forms of IP and patents. In addition, it should include provisions regarding know-how and technical expertise, whenever applicable. Such know-how and expertise may take the form of 'feasibility studies, plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training, services involving technical advisory and managerial personnel, and personnel training'.[111]

There are common definitions of technology as a term and definitions of TOT. The UNCTAD's Transfer of Technology Code defines technology as the 'systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service'.[112] Hence, this excludes the mere sale or lease of goods (excluding hiring or sold goods). In other word, it is the knowledge that goes into the creation of a product or service that constitutes a technology, not the finished product or service.[113] Therefore, technology usually includes tangible and intangible assets. The intangible or physical assets includes the 'physical assets are sold and bought in the modern market according to some fixed standards that determines their market value'[114] while in addition to that is the tangible assets that added more value to the product when it is traded as an IP item.

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[110] ibid.
[111] UNCTAD, 'Transfer of Technology' [2001] n.d UNCTAD Series on Issues in International Investment Agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016.
[112] ibid.
[113] ibid.
[114] S Saleem, *Intellectual Property and their Economic Importance for Developing Countries Like Pakistan* (University of Oslo 2011) 11

Moreover, the Organization for Economic Co-Operation and Development (OECD)[115] defines technology as 'the systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service, including any integrally associated managerial and marketing techniques'.[116] Nevertheless, we should clarify that technology includes not only technical knowledge, organisational capacity, knowledge or methods that are necessary to carry on or to improve the existing products or processes but also includes entrepreneurial expertise and professional know-how.[117]

In practice, what constitutes technology, as per its dynamic nature, varies according to the culture and the level of development, because defining technology functionally adds an element of subjectivity. '[T]echnology is, in fact, the use of scientific knowledge by a given society at a given moment to resolve concrete problems facing its development'.[118]

Based on the foregoing, the definition of technology may differ depending on the product itself and the purpose of such product. In some instances, the full bundle of technology required to produce a product may constitute 'the technology', while in other instances, a product may require different types of technology, for example, a digital camera may require different types of technology for image capture, storage,

[115] The Organisation for European Economic Cooperation (OEEC) was established in 1948 to run the US-financed Marshall Plan for the reconstruction of a continent ravaged by war. Canada and the US joined OEEC members in signing the new OECD Convention on 14 December 1960. The Organisation for Economic Co-operation and Development (OECD) was officially born on 30 September 1961; see: OECD, 'History' (OECD, n.d) <http://www.oecd.org/about/history/> accessed 14 February 2017.
[116] MD Haug, 'The International Transfer of Technology: Lessons that East Europe can learn from the failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[117] UNCTAD, 'UNCTAD Series on Issues in International Investment Agreements' (2001).
[118] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.

transmission and so on.[119] Also, with respect to software, a separate application would usually constitute a distinct technology on this basis.[120]

When a corporation has a technology that can be transferred to a new market, a good understanding of the transfer process is necessary for both parties. Due to the complexity of the process of TOT to a new market in a host country, the definition of what constitutes TOT highlights the process for such transfer. Subsequently, the term TOT can be defined as 'the process of movement of technology from one entity to another, being just successful if the receiving entity can effectively utilise the technology transferred and assimilate it'.[121] Therefore, TOT is the process by which commercial technology is disseminated in some form of TOT transaction, which may or may not be covered by a legally binding contract; however, it should involve the communication of the relevant knowledge by the transferor to recipient.[122]

Furthermore, the WIPO sets forth the definition of TOT as follows:

> The process by which a technology, expertise, know-how or facilities developed by one individual, enterprise or organisation is transferred to another individual, enterprise or organisation. Effective technology transfer

[119] Steven D Anderman and John Kallaugher, *Technology Transfer and the New EU Competition rules: Intellectual Property Licensing after Modernisation* (Oxford UP 2006).
[120] ibid.
[121] K Ramanathan, 'An Overview of Technology Transfer and Technology Transfer Models' < http://webcache.googleusercontent.com/search?q=cache:8lZSmaul_5YJ:ictt.by/Library/Shri2008/Day1/1_KRamanathan%2520-%2520Presentation%2520Overview%2520of%2520TT%2520Models.ppt+&cd=2&hl=en&ct=clnk&client=safari> accessed 10 January 2017.
[122] UNCTAD, 'UNCTAD Series on Issues in International Investment Agreements' (2001) .

> results in commercialization of a new product or service or in the improvement of an existing product or process.[123]

The following definition of TOT is also mentioned in several WIPO reports:

> Transfer of new technologies from universities and research institutions to parties capable of commercialization, or in the sense of transfer of technologies across international borders, generally from developed to developing countries.[124]

TOT are classified into vertical and horizontal transfers. A vertical transfer refers to TOT from basic research to applied research, to development, and then, to production. A horizontal transfer refers to the movement of technology from one place, organisation, or context to another place, organisation, or context.[125]

In general, TOT consists of IP contents that are licenced in the form of IP, the subject of formal consulting or training agreements, communicated in workplace or research settings, and/or diffused by publication or other means.[126]

In sum, and as mentioned above, all these definitions of TOT refer mainly to the technical process of transforming IP into products and transferring research results

[123] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[124] WIPO, 'Technology Transfer & Licensing' <http://www.wipo.int/ip-development/en/strategies/technology.html> accessed 11 November 2016.
[125] E Mansfield, 'West Technological Transfer Issues and Problems; International Technology Transfer, Forms, Resource Requirements, and Policies' (1975) American Economic Review.
[126] WIPO, 'Technology Transfer & Licensing' <http://www.wipo.int/ip-development/en/strategies/technology.html> accessed 11 November 2016.

from public research organisations (PROs) to the industrial sector.[127] However, they do not clearly show the three dimensions for defining the TOT: the contents, the parties and the outcome or objective of the transfer.

The contents should clearly show that TOT is a global package or a total system that includes all the relative contents that can enable the host country to reproduce the technology independently. The parties are the licensor or transferor and the licensee or transferee. The objective has two parts: First, such a transfer must enable the host country to reuse or produce the same technology independently of the IP holder or the licensor. In addition, the objective of improving the economic development and welfare of developing countries as per the TRIPS objectives should be achieved through the TOT.

By incorporating these three dimensions in the definition of TOT, many forms of technological diffusion will be excluded; further, many unrealistic cases of TOT will be excluded. This is simply because the obligations and commitments set forth in the TRIPS Agreement should work to achieve the purpose of assisting developing countries to gain access to more technology independently.

As a result of the abovementioned concerns about the existing definitions of the TOT and because the scope of this thesis is to examine TOT through the lens of the provisions of the TRIPS Agreement and other agreements that promote TOT, such

[127] WIPO, 'Technology Transfer in Countries in Transition: Policy and Recommendations. Division for certain countries in Europe and Asia' (2012) < http://www.wipo.int/export/sites/www/dcea/en/pdf/Technology_Transfer_in_Countries_in_Transition_FINAL-21.08.2012.pdf > accessed 1 February 2017.

as the UNFCCC and its subsequent agreements and protocols, TOT is defined here as:

> A transfer of technology as a total system from the IP owner in a developed country (transferor) to a secondary user or recipient in a developing country (transferee) in a way that enables the transferee to absorb the technology and use all IP rights related to such technology independently for the purpose of achieving the TRIPS objectives.

First, this definition will help to determine the parties to the transfer agreement, i.e., developed and developing countries. Accordingly, local TOT are not the subjects of this thesis. Rather, we will examine TOT and the objective of improving the economic welfare and development of developing countries. Next, the contents are included in this definition through the explicit reference to TOT as a total system or a global package. Lastly, the objectives of such a transfer are to reproduce the same independently and to achieve the objectives of the TRIPS Agreement.

2.3.1 The forms of TOT

TOT can take different forms depending on the expertise and the nature of the technology required by the recipient party, the size of the technological gap between the two parties, the capacity and the infrastructure of the recipient party and the quantity of the technical information available in the recipient party. For this reason, many corporations that own technologies and inventions have TOT offices for the purpose of providing research studies related to the feasibility of technology with commercial value, the best way to market technology, and the proper opportunities for the exchange and transfer of such technology. Therefore, promoting TOT to

developing countries can occur through the intorduction of Research & Development or transfer offices into domestic firms to enable them to be more competitive in the marketplace.[128]

In fact, the transfer of patented technologies or the licensing of the use of a given technology or know-how takes place through different types of legal relationships between the transferor, who is the owner of the IP rights or the supplier of the know-how, and the transferee, who is the recipient party.[129] The choice of the most appropriate method for TOT depends mainly on the complexity and the level of development of the technology, the local needs and the technological capacity of the transferee, and the cost of the transfer.[130]

The role of IP protection on the international level has had an impact on the TOT market. Currently, TOT must be made using an IP licence.[131]

In this regard, TOT agreements or licences can produce different legal relationships. There are many forms and methods for TOT, but technology transfers are usually one of three general basic types. The first is transfer of machinery or intermediate goods, which applies to manufacturing, where the nature of the technology is simple and uncomplicated. The second form occurs through the use of a technical expert for

[128] SY Tong, 'Foreign Direct Investment, Technology Transfer and Firm Performance' (Hong Kong, 2011) < http://hiebs2.hku.hk/public/working_papers/pdf/wp1023.pdf > accessed 19 December 2016.
[129] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[130] ibid.
[131] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.

small- and medium-sized projects. The last form occurs through transfer of technical know-how, either patented or unpatented.[132]

In practice, this can be achieved through many kinds of legal relationships. The UNCTAD Draft Transfer of Technology Code lists several types of legal instruments that can be used to transfer technology. These types are specified according to the type of TOT used. For example, assignments, sales and licensing can be used to transfer all forms of industrial property except trademarks, service marks and trade names, if they are not a part of a TOT transaction.[133] Moreover, another form of transfer is related to the provision of know-how and technical expertise in the form of feasibility studies, plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training, services involving technical advisory and managerial personnel and personnel training.[134]

Accordingly, the forms of TOT are related to the content of TOT. In this thesis, we elaborate that what we mean by TOT is one that is dealt with as a global package or a total system. Thus, all detailed contents must be included within such a transfer in order to reach two final results. First, such a transfer must lead to the absorptive capacity of the host country as a transferee in its local market according to its local capabilities. Second, this transfer must occur as a total system or a global package in order to enable the transferee to reuse or reproduce the same technologies, independently from the transferor. In the end, this will assist the host country, as the transferee, to enhance its economic development and welfare.

[132] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[133] UNCTAD, 'Transfer of Technology: UNCTAD Series on Issues in International Investment Agreements' (2001).
[134] ibid.

As noted above, other experts regarding TOT have identified two types of TOT, i.e., horizontal and vertical TOT. In a horizontal TOT, technology is transferred from one place, organisation or context to another place, organisation, or context. In a vertical TOT, technology is transferred from basic research to applied research, from applied research to development, and from development to production.[135] These types of transfer each create challenges and obstacles for developing countries, depending on their technical capacity and the way the new technology will be absorbed into the new market.[136]

In the end, those forms of TOT are related to the technical description of the TOT process. Accordingly, they describe how technology is transferred technically. These transfers can occur through any of the common types of legal relationships. Therefore, TOT can be implemented through types of TOT which can vary, depending on the capacity of the transferee, the size of the technology, the partners in the legal relationship, the location, the complexity and many other factors, as will be explained further in the next section.

2.3.2 Types of legal relationships to carry out TOT

TOT occurs through different types of legal relationships. The type is chosen based on the special characteristics of each transaction. In addition, it is based on the mutual agreement of the parties. Nevertheless, regardless of the type of legal

[135] Edwin Mansfield, 'East- West Technological Transfer Issues and Problems: International Technology Transfer: Forms, Resource Requirements, and Policies' (May 1975) 65(2) American Economic Review 362–376.
[136] ibid.

relationship the parties agree to adopt, TOT are incorporated into such legal relationships in two ways.

The first method takes the form of inserting certain provisions in the contract itself that identify the technology as a global package and the required licences or permissions, the objective of the transfer, and the parties involved in such TOT. Therefore, the licence required might be attached to the contract. Accordingly, in this method, TOT is found within the main contract or partnership agreement. [137]

The second method is an independent TOT agreement that is attached to the main contract. It identifies the particular content of the TOT in more detail. This TOT agreement assists in dealing with TOT as a global package of information, not only as the individual IP rights. This agreement clarifies the relationship between the contract as a project and the technology, which will be transferred through licences. Thus, this agreement ensures that any expiration or invalidity of any part of the patents or know-how will not affect the validity of the licence or its consideration.[138]

The second method is much better than the first for a variety of reasons. First, it covers cases in which the technology supplier is different from the contractor or partner in the project. Second, it is appropriate for cases in which TOT is complex and requires detailed technical processes.

Third, this TOT agreement can provide more detail about the TOT process, the contents, the challenges, the parties, the outcomes and objectives, the concerned

[137] See p. 57.
[138] ICC, *ICC International Technology Transfer Contract* (ICC Publication No 674 2009) 9–10.

personnel related to each stage of the transfer, the requirements of the developing countries and the obligations of the developed country. Therefore, it eliminates any allegations or ambiguities and uncertainties with regard to the parties' intentions and obligations under the contract.

Regardless of the way TOT provisions are stated in the particular legal relationship, it is important to highlight the types of legal relationships that are commonly used for projects that include TOT. Each type has its own characteristics and features, as is explained further below:

a) Foreign Direct Investment:

Foreign direct investment (FDI) is a traditional method used for TOT, and it is the most favoured one from the viewpoint of developed countries.[139] The importance of FDI, as a type of commercial dealing, has grown dramatically as a major form of international capital transfer over the past decade.[140] In addition, it has become a major catalyst for development and an integral part of an open and effective international economic system.[141]

On the other hand, developing countries look at FDI as an essential means for adopting new technologies in their local markets. Through the direct involvement of

[139] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209. See also: KE Maskus, 'Encouraging International Technology Transfer: UNCTAD-ICTSD Project on IPRs and Sustainable Development. USA: ICTSD and UNCTAD' (2004) < https://www.iprsonline.org/resources/docs/Maskus%20-%20Encouraging%20International%20ToT-%20Blue%207.pdf > accessed 11 January 2017.
[140] KA Froot, '*Introduction to "Foreign Direct Investment*' Foreign Direct Investment (Vols 0-226-26621-4, University of Chicago Press 1993).
[141] OCED, 'Foreign Direct Investment for Development: Maximising Benefits and Minimising Costs' (2002) < https://www.oecd.org/investment/investmentfordevelopment/1959815.pdf > accessed 15 December 2016.

foreign partners, there are ample opportunities to transfer these new technologies directly to new markets.[142]

FDI, as a mechanism for transferring technology, can improve the host country's economy. In fact, it is considered to be an important source of new technology for the developing world. There some real-world examples that show how FDI has been successful; China is one of the countries that have 'established certain technological capabilities with the help of FDI'.[143]

FDI facilitates TOT, but sometimes it focuses more on technology diffusion and not on TOT itself; thus, we need to look closely at the content of the technology transferred. In addition, FDI might come with a high cost with regard to the financial capabilities of developing and least developed countries. Further, there may be a lack of positive linkages between the partners in the FDI and the local communities.[144]

Despite the benefits of FDI as a mechanism for TOT, most developing countries are not able to attract FDI flows for several reasons. Attracting FDI flows requires certain attractive strategies and policies for foreign investments in the host country.[145]

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[142] SY Tong, 'Foreign Direct Investment, Technology Transfer and Firm Performance' (Hong Kong, 2011) < http://hiebs2.hku.hk/public/working_papers/pdf/wp1023.pdf > accessed 19 December 2016.
[143] UNCTAD, 'Foreign Direct Investment, the Transfer and Diffusion of Technology, and Sustainable Development' [8 December 2010] General (ND) Trade and Development Board, UNCTAD <http://unctad.org/en/docs/ciiem2d2_en.pdf> accessed 3 November 2016.
[144] OCED, 'Foreign Direct Investment for Development: Maximising Benefits and Minimising Costs' (2002) < https://www.oecd.org/investment/investmentfordevelopment/1959815.pdf > accessed 15 December 2016.
[145] Louise Groenbech, 'Technology Transfer through Foreign Direct Investment to Developing Countries –The Role of the Home Country Measures' [2001] (ND) ECLOS <https://www.eolss.net/Sample-Chapters/C15/E1-31-03-01.pdf> accessed 3 November 2016.

In addition, the role of the developed countries is crucial to TOT through FDI. Therefore, there have been measures, incentives and efforts by developed countries to improve the quality and quantity of FDI for developing and least developed countries.[146]

b) Turn-key packages:

In the 1970s, TOT was incorporated in a package of services and supplies of equipment and machinery under turn-key contracts for developing countries. Pursuant to this kind of mechanism, the supplier provides machinery, buildings, management expertise, and production plans; all that was required from the developing country as a transferee was to come in and turn the key.[147]Turn-key packages did exist earlier than the 1970s, but these tended not to give developing countries the opportunity to select what they really needed.[148]

For example, in 1934, in Kuwait, operations related to the exploration for oil, onshore and offshore surveys, drilling of test wells and the development of producing wells were accomplished through a turn-key package that established the Kuwait Oil Company (KOC). KOC was established as a partnership between the Anglo-Persian Oil Company, which is known today as BP (British Petroleum), and the Gulf Oil Corporation, now known as Chevron.[149] Subsequently, it was presented to Kuwait as a turn-key package.

[146] ibid.
[147] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[148] ibid.
[149] KOC, 'Brief History of Kuwait Oil Company' < https://www.kockw.com/sites/EN/Pages/Profile/History/KOC-History.aspx > accessed 23 January 2017.

In turn-key packages, there are two options: either a transfer of new technologies within the entire services and equipment contract to the developing country or a mere sales-service agreement as a turn-key package not including the transfer of new technologies to the developing countries. The second option may include some technologies related to the operation of the equipment. Thus, it is only a (Basic Level) technological transfer.

c) Technology licence agreement:

The technology licence agreement is a method for the exchange of IP between two parties: the IP owner (licensor) and the recipient party (licensee). Therefore, it is a key method for exploiting IP as an asset for business.[150] This type of agreement is the purest type for the TOT, and it usually entails a limited transfer of some of the technology content, such as the know-how, patented technologies, or industrial designs, etc.[151] IP covers a wide range of items that can be subject to licensing, such as patents, copyrights, formulae, technology, know-how, trade secrets, industrial designs, trademarks, etc.[152] This method can be used separately or as part of other legal relationships such as FDI or turn-key packages.

In fact, the consideration for this licence is that the IP owner is waiving its legal right to prevent and stop any unpermitted production, use or sale of a product or service that infringes the patent, often in return for a lump-sum payment based on the

[150] WIPO, 'Successful Technology Licensing' (WIPO 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 3 November 2016.
[151] Philip J Wilson, 'The Legal Structures Governing Technology Transfers and Joint Ventures with the People's Republic of China' (1985) 3(1) Berkeley Journal of International Law <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1026&context=bjil> accessed 4 November 2016.
[152] WIPO, 'Successful Technology Licensing' (WIPO 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 3 November 2016.

technology's value or based on the estimated value of the rewards from the products of such technology. Accordingly, a licence agreement grants a person or an entity, usually an industrial organisation, a licence to use the patent.[153] Such a grant takes the form of a waiver some of the IP holder's rights as per the IP laws. Usually, the waiver is limited by geographic area, time, or level of production.[154] Nevertheless, this waiver might not be restricted, in which case a TOT as per our definition may occur. The waiver may allow the licensee to have unrestricted use of the licenced technology.[155]

Therefore, a technology licence agreement is dealt with as a process whereby the IP holder (the licensor) that possesses the IP rights over the technology allows or gives permission to another company (the licensee) to use or sell these rights in return for a financial reward (royalties).[156] Licences typically involve the purchase of production or distribution rights protected by certain IP rights and the technical information and know-how required for an effective exercise of those rights.[157]

[153] WIPO, 'Technology Transfer in Countries in Transition: Policy and Recommendations. Division for certain countries in Europe and Asia' (2012) < http://www.wipo.int/export/sites/www/dcea/en/pdf/Technology_Transfer_in_Countries_in_Transition_FINAL-21.08.2012.pdf > accessed 1 February 2017.
[154] Philip J Wilson, 'The Legal Structures Governing Technology Transfers and Joint Ventures with the People's Republic of China' (1985) 3(1) Berkeley Journal of International Law <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1026&context=bjil> accessed 4 November 2016.
[155] ibid.
[156] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.
[157] KE Maskus, 'Encouraging International Technology Transfer: UNCTAD-ICTSD Project on IPRs and Sustainable Development. USA: ICTSD and UNCTAD' (2004) < https://www.iprsonline.org/resources/docs/Maskus%20-%20Encouraging%20International%20ToT-%20Blue%207.pdf > accessed 11 January 2017.

Under the technology licence agreement, permission may be granted for the purpose of using a patent, technology and trademarks, for example.[158] It might be divided into the following types: patent licences, whereby patents are usually licenced for the particular technology used in the manufacturing process;[159] or know-how agreements, whereby a licence covers some information that cannot be transferred in way other than this type of agreement, through which the supplier either demonstrates or delivers plans for a particular technology.[160] It is possible to include provisions concerning know-how in a document that is separate from a licence contract. It is also possible to include such provisions in a licence contract[161] or in a technical assistance agreement that involves the supply of scientific and engineering assistance, training and management assistance.[162]

The licence agreement, when used independently of other types of relationships, is often appropriate for small companies in high-technology sectors. This is because a small company does not have the financial resources to export or to encourage inward FDI. In addition, in a high-technology field, the chances are that the new technology can be upgraded, leaving the company in an uncompetitive position. Therefore, it will assist them to recoup the high costs of research and development (R&D) at a low cost.[163]

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[158] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[159] ibid.
[160] ibid.
[161] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[162] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[163] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.

In fact, there some concerns related to IP licences. In order to use this method for TOT, the status of the use or resale of the technology after the expiry of the licence must be addressed.[164] In addition, to meet the objectives of TOT, the licensee must have control over the quality of the product, which includes the IP items.[165]

If those concerns are taken into consideration, TOT pursuant to this method is very attractive to host countries, because it does not require capital investment by the licensor.[166] Thus, this type of transfer will result in the avoidance of trade barriers imposed on the sale of plants and equipment, FDIs or joint ventures. Licence agreements also may be used locally, within the firm or other firms, or internationally.

d) Joint Venture (JV)

A Joint Venture is a long-term partnership relationship in which mutual interests are exchanged between the partners involving the pooling of assets and joint management, and profit and risk sharing; it usually occurs between foreign partners and local contractors in the host country.[167] It is a more complex relationship than the technology licence agreement, because it includes a package of technology, know-how, expertise, IP rights, fixed assets, capital and many other legal relationships involved in the operation of the JV project.[168] Nevertheless, it is widely recognised as

[164] ibid.
[165] ibid.
[166] Philip J Wilson, 'The Legal Structures Governing Technology Transfers and Joint Ventures with the People's Republic of China' (1985) 3(1) Berkeley Journal of International Law <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1026&context=bjil> accessed 4 November 2016.
[167] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[168] Philip J Wilson, 'The Legal Structures Governing Technology Transfers and Joint Ventures with the People's Republic of China' (1985) 3(1) Berkeley Journal of International Law <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1026&context=bjil> accessed 4 November 2016.

a vehicle for transferring technology and enhancing local expertise in the host country.[169]

This type of legal relationship can be used as a mechanism for TOT through the operation of the project's scope of work, technical liaisons, training and technical support. The partners in a JV reap rewards that cover their costs and allow them to gain more profits due to the length of the project.[170] For example, the transfer occurs when one of the JV partners may own the technology and would like to transfer it to other party through the implementation of the project's scope of work. Accordingly, the technology owner is the transferor, and the other party is the transferee. The transferee has a sufficient opportunity, due to the length of the project, to establish an optimal transfer process and the related training. Also, the transferor has an opportunity to receive continuing rewards and profits in addition to its licence fees, by sharing the profits from the construction of the project and the manufacturing and sale of the finished products.[171] Therefore, through this long legal and technical relationship, a JV is a mechanism that can lead, at the end of the day, to more independence in technological development for the host country as per the purposes of the TRIPS Agreement.

[169] Richard Lihua and David Greenwood, 'Technology Transfer in International Joint Venture Projects in China ' [2000] ND(ND) University of Northumbria <http://www.arcom.ac.uk/-docs/proceedings/ar2000-365-373_Lihua_and_Greenwood.pdf> accessed 4 November 2016.
[170] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[171] Philip J Wilson, 'The Legal Structures Governing Technology Transfers and Joint Ventures with the People's Republic of China' (1985) 3(1) Berkeley Journal of International Law <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1026&context=bjil> accessed 4 November 2016.

e) Purchase of Equipment:

This type of agreement might be called 'a machinery supply contract', wherein the technology is transferred through the supply of the equipment, and the supplier must provide the purchaser with guidance on how the technology in the particular equipment is used.[172] This is the traditional method used for TOT related to equipment to developing countries, and it is a simple one as well.

Many types of plants and equipment, hand-tools, and consumer goods supplied by multinational companies to developing countries embody technologies that the purchasers learn to use. This also includes simply designed equipment and materials.[173] It constitutes a traditional and easy way to transfer the technology through using it and through performing some maintenance and changing spare parts.

This method may not transfer the technology as a whole to the developing countries. In fact, it usually only transfers some basic technical information regarding how to use the technology. That is the reason why technology or IP owners prefer this kind of contract and have less concern and risk in this regard. First, the payment is guaranteed, and the developing country will not be provided with any of the particular details related to the product except the guide or instruction book, although they may provide some technicians to assist in case there are any defects or problems that require maintenance or technical assistance.

[172] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.
[173] ibid.

This method is considered to be a very narrow mechanism, allowing for only partial TOT. In order for a technology to be completely transferred, another method must be used along with this one. Hence, 'the success of this method of transfer depends upon the availability of other complementary know-how'.[174]

In actual commercial relations, contracts covering the sale and purchase and the import of capital goods are sometimes associated with a licence contract and/or a know-how contract. Otherwise, provisions concerning the sale and purchase and the import of capital goods may be incorporated in the licence contract or the know-how contract itself.[175]

f) Franchising of Goods and Services Agreements

A franchise or distributorship agreement is a business arrangement whereby the reputation, technical information and expertise of one party is combined with the investment of another party for the purpose of selling goods or rendering services directly to the consumer.[176]

According to some scholars, franchising is a variation of licensing, and in some ways is an improvement on mere licensing, because it is accompanied by an on-going relationship between the franchiser and the franchisee. A pure licensing arrangement includes a one-off sale of IP rights by the licensor to the licensee and

[174] ibid.
[175] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[176] ibid.

the subsequent partial loss of control by the former of the quality of the goods produced by the latter under the licence.[177]

The concept or the scope of a franchising agreement is based on a trademark or service mark or a trade name and a special design of the premises. Usually, the licence of such a mark or name by its owner is combined with the supply of know-how of the technical information, technical services, technical assistance or management services concerning production, marketing, maintenance and administration.[178]

Such an agreement for distribution may involve some of the following drawbacks:[179] government rules and regulations in the host country, some difficulties in finding suitable franchisees, the lack of host country investment, control of the franchisees and the adaption of a franchise to local needs and trademark obstacles.

g) Management Contracts

This kind of contract includes employment contracts whereby an employer, due to his need for special expertise, hires foreign experts for certain technical operations[180] or management and administrative technologies. Management contracts may take the shape of consultancy contracts whereby the recipient requests the help of an

[177] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.
[178] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[179] A Shamsavari, O Adikibi and Y Taha, 'Technology and Technology Transfer: Some Basic Issues' (UK: Kingston University) < http://eprints.kingston.ac.uk/6629/1/Shamsavari-A-6629.pdf > accessed 1 January 2017.
[180] MD Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.

individual consultant or firm of consultants that will provide advice and render services concerning the technology required.[181]

h) Clean Development Mechanism (CDM):

The CDM is a tool created as per Article 12 of the Kyoto Protocol under the climate change regime. [182] The purpose of a CDM is to assist developing countries in performing their development policies in a sustainable manner. Therefore, the main objective of a CDM under the UNFCCC is to mitigate and adapt to the climate change threat.[183] This CDM requires a developed country to perform EST projects in developing countries for the purpose of reducing greenhouse gas (GHG) emissions.[184] CDM also is used as a tool for promotion of the international transfer of ESTs and know how to developing countries.[185]

CDM is created as per Kyoto Protocol that entered into force in 2005. So, this mechanism can apply to each of the abovementioned project types. So it is not a unique form of contracting, it is instead a mechanism to be applied to all of the above projects whenever any of them promotes sustainable development and reduces GHG emissions in developing countries.

[181] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) <file:///C:/Users/User/Desktop/PDH%2013-14/references%20ITT/WIPO%20technology_transfer%20contractual%20agreements.pdf> accessed 23 February 2014.
[182] Alexander Zahar, *International Climate Change Law and State Compliance* (Routledge 2015) 136
[183] See Chapter 4 , p. 150.
[184] The Kyoto Protocol to UNFCCC, adopted on 11 December 1997 in Kyoto, and entered into force on 16 February 2005, art 12.
[185] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017

There are a number of conditions for submitting any EST project to be registered as a CDM project under the UNFCCC. First, CDM is limited to the climate change regime, so it can apply only to EST projects. Second, the parties should be a developed and a developing country as per the UNFCCC classifications of parties. Lastly, the guidelines for completing all documentations, process and specifications need to be followed in order to have an EST project registered as a CDM project.[186]

2.4 Relationship between international transfer of technology and IP rights:

Developing countries face challenges in implementing the TRIPS Agreement, especially when complying with its minimum standards of IP protection. [187] Before the TRIPS Agreement, there was not any legal obligation for countries to comply with a any particular standard of IP protection.[188] For example, under the Paris and Berne Conventions, there were no assurances regarding the level of protection of IP rights in developing countries.

Hence, it is crucial to identify the relationship between developing an effective system or standards for IP protection in a country and the promotion of TOT to that country. In this regard, one basic issue that should be tackled is whether providing stronger IP protection encourages TOT to developing countries or not, and to what extent. In other words, does the IP protection contribute toward opening channels and opportunities for more economic growth and development?

[186] See Chapter 4 , p.150.
[187] Daniel J Gervais, 'Intellectual Property, Trade & Development: The State of Play' [2005] 74(2) Fordham Law Review 505-535
[188] JJ Simons, 'Cooperation and Coercion: The Protection of Intellectual Property in Developing Countries' (1999) <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1159&context=blr> accessed 15 March 2014.

First, the role of IP protection in encouraging TOT to developing countries requires a deeper understanding of the entire process of the development of a technology. This is necessary because knowledge is generally non-exclusive in nature, and it is not possible to prevent others from copying new inventions or technologies, even without the authorisation of its creator or inventor. Thus, where a new technology is on the market and has a value, it is likely to be copied or imitated, reducing the potential profits of the original creator.[189]

IP law is an area of law that concerns the legal rights associated with creative efforts or commercial reputation and goodwill. There are several different forms of IP rights, such as copyrights, patents for inventions, trademarks, designs, etc.[190] So an IP right is a government-protected right granted to an inventor or creator that precludes others from using the technology or product in question.[191]

Accordingly, this was the starting point behind the existence of IP rights, at least in terms of the technology realm, as means of encouraging innovation by granting successful inventors temporary monopoly power over their innovations.[192] This monopoly power has the purpose of providing compensation for the high amount of research and development (R&D) investment in that type of creation or invention.

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[189] R Falvey and others, *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.

[190] DI Bainbridge, *Intellectual Property* (9th edn, Pearson 2012).

[191] Wipo, 'Fields of Intellectual Property Protection' [n.d] Chapter 2(n.d) WIPO Intellectual Property Handbook: Policy, Law and Use <http://www.wipo.int/export/sites/www/about-ip/en/iprm/pdf/ch2.pdf> accessed 15 February 2017.

[192] R Falvey and others, *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.

In contrast, TOT enhances improvements in the technological and economic growth in new developing countries. The main objective of TOT is to assist developing countries achieve more technological and economic development. From this perspective, the relationship between IP protection and TOT might be described as a relationship of mutual concessions between parties.

Furthermore, globalisation and the openness of international trade have played a role in this regard. The TRIPS Agreement clearly reflects the globalisation of IP by linking the protection of IP to trade. The TRIPS Agreement recognizes only rights that are trade-related; customary IP rights were not a dominant issue during the TRIPS negotiations.[193]

Therefore, the TRIPS Agreement incorporated TOT provisions and required all the signatory member nations to establish a minimum level or standard of protection for IP rights. The importance of the relationship between TOT and the protection of IP rights was explicitly recognised for the first time under the TRIPS Agreement. Although the TRIPS Agreement added a great deal to international aspects of both IP and TOT, the role of IP in encouraging TOT is still controversial.

The first argument is that stricter IP protection encourages TOT. This is the approach of the developed countries, because such protection creates incentives for international investment and trade in the developing countries.[194]

[193] JJ Simons, 'Cooperation and Coercion: The Protection of Intellectual Property in Developing Countries' (1999) <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1159&context=blr> accessed 15 March 2014.
[194] EH Smith, 'Worldwide Copy Right Protection Under the TRIPS Agreement' in *International Intellectual Property Law & Policy* (Vol 3, Juris Publishing 1998) 54.

This argument is based also by the idea that the marriage between trade and IP processes under the TRIPS Agreement has been and will continue to be very beneficial to both trade and IP protection, in addition to benefiting developed and developing countries as well by promoting cross-border flows of technology from the developed to the developing countries.[195]

In addition, the enforceability of IP protections in developing countries creates a sufficient incentive for transferring of technology.[196] IP owners, if they were provided assurances that their IP rights would be protected, would be encouraged to make more investments in developing countries. In contrast, where a country provides weak IP protection, IP owners may choose not to transact at all. [197] As a result this affects cross-border flows of technology, trade and investment to this country.[198]

In addition, the enhancement of IP protection helps to improve competitiveness at both the macro- and the microeconomic levels via improved access to and accumulation of knowledge capital.[199] It is a desire for international fairness aimed at

[195] Hanns ullrich, Reto M Hilty, Matthias Lamping, and Josef Drexl, *TRIPS plus 20: From Trade Rules to Market Principles* (2016) 344.
[196] CM Correa, 'Can the TRIPS Agreement Foster Technology Transfer to Developing Countries?' in KE Maskus and JH Reichman (eds), *International Public Goods and Transfer of Technology: Under a Globalized Intellectual Property Regime* (Cambridge 2005) 227.
[197] KE Maskus, 'Encouraging International Technology Transfer: UNCTAD-ICTSD Project on IPRs and Sustainable Development. USA: ICTSD and UNCTAD' (2004) < https://www.iprsonline.org/resources/docs/Maskus%20-%20Encouraging%20International%20ToT-%20Blue%207.pdf > accessed 11 January 2017.
[198] CM Correa, 'Can the TRIPS Agreement Foster Technology Transfer to Developing Countries?' in KE Maskus and JH Reichman (eds), *International Public Goods and Transfer of Technology: Under a Globalized Intellectual Property Regime* (Cambridge 2005) 227. See also: Cepeda et al., *Policy Complements to the Strengthening of IPRs in Developing Countries: OECD Trade Policy Papers* (OECD Publishing 2010) <file:///C:/Users/User/Desktop/PDH%2013-14/references%20ITT/ref%20Part%202/OECD%20IPRs%20and%20TT.pdf> accessed 10 March 2014.
[199] ibid.

the equal treatment of both domestic and foreign producers and providing them with the same levels of IP protection as their trading partners.[200]

However, developing countries have a different opinion of stricter IP protection, that it results in hindering TOT and consequently economic development. This opinion finds its justifications in the TRIPS Agreement itself. The way the TRIPS Agreement is structured has benefited developed countries more than developing countries.[201] This is supported by the fact that most of IP owners belong to developed countries. The adoption of stronger IP protection means that the developing countries are no longer allowed to use new developed-world inventions without providing compensation; developing countries are obliged to comply with the minimum standards of IP protection, regardless of their limited resources.[202]

In fact, the importance of TOT is undoubtedly a well-recognised factor in the industrialisation of both Europe and the USA in the nineteenth century and in Japan in the twentieth century.[203] Mimicking previous works and creations is an important method for the development and sharing of knowledge and the encouragement of inventory in other countries.[204]

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[200] JJ Simons, 'Cooperation and Coercion: The Protection of Intellectual Property in Developing Countries' (1999) <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1159&context=blr> accessed 15 March 2014.
[201] A Micheals, 'International Technology Transfer and TRIPS Article 66.2: Can Global Administrative Law Help Least-Developed Countries Get What They Bargained For?' (2009) Georgetown Journal of International Law <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1755643> accessed 27 February 2014.
[202] ibid.
[203] C Perez and L Soete, 'Catching up in Technology: Entry Barriers and Windows of Opportunity' <http://arno.unimaas.nl/show.cgi?fid=3536> accessed 9 January 2017.
[204] JJ Simons, 'Cooperation and Coercion: The Protection of Intellectual Property in Developing Countries' (1999) <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1159&context=blr> accessed 15 March 2014.

The case for all parties benefitting from increasing innovation and creativity through stricter IP protection then becomes weaker. More and more countries strengthening their IP regimes because the extra markets covered and the extra innovation that can be stimulated by such protection diminish.[205] Simultaneously, IP rights are considered to be 'rights to exclude', and providing stronger protection for them will definitely lead to both market expansion and market power effects.[206] Since minimum standards of IP protection results in monopoly pricing that distorts consumer choice and welfare reductions. This affect developing countries that undertake little or no research and development.[207]

In sum, these are both of the views and their argument with regard to the role of IP in encouraging TOT. In fact, it is important to agree on some basic elements when assessing the relationship between IP protection and TOT to developing countries. First, the terminology for 'stronger' IP protection should be explained and agreed upon. 'It is common in the literature to refer to "weak" and "strong" IP protection. Nevertheless, these terms frequently are interpreted as references to the content of laws and regulations'.[208]

[205] R Falvey et al., *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.
[206] TT Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010).
[207] R Falvey et al., *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.
[208] KE Maskus, 'Encouraging International Technology Transfer: UNCTAD-ICTSD Project on IPRs and Sustainable Development. USA: ICTSD and UNCTAD' (2004) < https://www.iprsonline.org/resources/docs/Maskus%20-%20Encouraging%20International%20ToT-%20Blue%207.pdf > accessed 11 January 2017.

To be more precise, a country with laws and regulations that do not comply with the minimum standards of the TRIPS Agreement may be described as weak in this regard, while another that adopts laws and regulations that are within or more than the minimum standards of the TRIPS Agreement is described as strong.[209]

Second, the effect of strong IP protection in terms of access to technology should also be taken into consideration. Stronger IP protection leads to limited access to technology, although encouraging TOT requires access to the technology. Therefore, developing countries may face challenges related to establishing and maintaining effective access to this information and devising mechanisms for deploying it effectively within an economy.[210]

Know-how about the processes to produce goods and services should be distributed effectively, and this is a basic element of the transfer. The technology, which is embedded in machinery, equipment, licensing agreements, and managerial skills, needs to be discovered by the developing countries.[211] This key component of any transfer process is affected directly by the level and kind of protection for IP protection provided in a country.

Third, the theory of learning by doing will be affected as well. According to this theory, the more the country uses a technology, the better the country learns its parameters, and the more productive it becomes. Any given technology has

[209] ibid.
[210] UNCTAD, 'Compendium of International Arrangements on Transfer of Technology: Selected Instruments: Relevant Provisions in Selected International Arrangements Pertaining to Transfer of Technology' (2001) < http://unctad.org/en/docs/psiteipcm5.en.pdf > accessed 29 November 2017.
[211] ibid.

bounded productivity, therefore, productivity can grow over the long run only if agents continue to switch to better technologies.[212]

Fourth, the state's income is taken into consideration in the decision about whether a developing country will provide stronger IP protection. This is simply because allowing stronger IP protection will result in the shifting of profits to foreign firms and the reduction of output in the domestic economy; therefore, developing countries prefer weaker IP protection, at the price of less encouragement of domestic innovative activity.[213] Providing the required strict IP protection will inhibit developing countries from following international trends in the fields of technology and innovation.

Fifth, IP piracy is one of the nightmares of IP protection. The barriers on TOT imposed by IP owners in developed countries were the basic reason for the spreading of infringement of IP in their countries.

Sixth, logically, the firms in developed countries will not offer their technologies to new markets, as they are a basic source of their income; thus, developing countries must seek such transfer. Also, developing countries suffer from the lack of information in regard to how to improve their processes and their products, and the sort of technologies they need to improve their technological capacity.

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[212] B Jovanovic and Y Nyarko, 'Learning by Doing and the Choice of Technology' (1996) 64(6) *Econometrica* 1299.

[213] R Falvey and others, *The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence* (UNIDO 2006). <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf> accessed 1 November 2016.

As a result, many firms in developing countries negotiate with technology owners in developed countries to enter into consultancy agreements, through which firms in the developed country provide advice about the technology the developing-country firm requires and the extent to which this technology will help them improve their production needs.

A good example of this lack of information and a subsequent agreement to determine the required technologies is the agreement signed by the Kuwait Oil Company[214] and Shell on 17 February 2010, i.e., 'an Enhanced Technical Service Agreement for development of the Jurassic Gas fields', according to which Shell agreed to deploy technical experts to Kuwait to support KOC in its management of the on-going development of the Jurassic Gas fields.[215] Shell's technical experts were to work with Kuwait to support KOC in managing the on-going development of these gas fields. The development of non-associated gas is a key strategic project on which KOC is dependent to meet a significant part of Kuwait's demand for clean energy.[216] This project was signed for one basic purpose: so that Shell would assist KOC technically in determining the kind and extent of the technology needed to produce the Jurassic gas in Kuwait. This agreement clearly shows that Kuwait does not have the proper knowledge and experience to determine the types of innovations needed.

[214] In 1934, the Kuwait Oil Company Ltd. was established by the Anglo-Persian Oil Wellhead Maintenance Company, now the British Petroleum Company, and Gulf Oil Corporation, now Chevron Corporation. The Company's activities were extended to include exploration operations, on-shore and off-shore surveys, drilling of test wells, and the development of producing fields in addition to crude and natural gas exploration; KOC, 'Kuwait Oil Company' (2012) <http://www.kockw.com/sites/EN/Pages/Profile/About-KOC.aspx> accessed 11 November 2017.
[215] Shell, 'Shell To Provide Technical Support In Kuwait Gas Field Development, from SHELL in Kuwait' (2010) <http://www.shell.com/kwt/aboutshell/media-centre/news-and-media-releases/archive/2010/technical-gas-field-17022010.html> accessed 11 November 2017.
[216] ibid.

2.5 Conclusion

TOT, as we have seen, has meant different things in different historical periods. Each period had its own impact on the encouragement of TOT and on the international legal framing of the methods and extent.

The historical background of TOT confirms the relationship between IP protection and TOT. This has produced many IP institutions that work in particular toward encouraging TOT between developed and developing countries. In addition, it has enabled more and more issues to be addressed in negotiations in the post-TRIPS period.

Many challenges and obstacles still require additional research and development in this field to determine the best way to resolve them. Achieving a balance between the parties, while also preserving their interests, may not be as easy as it appears. Focusing on the legal rules that cover TOT and their effectiveness will be the main issue in the next chapter, which is related to the terms and conditions of the TRIPS Agreement applicable to TOT.

Chapter 3

International Transfer of Technology

under the Terms and Conditions of the TRIPS Agreement

3.1 Introduction

Prior to the adoption of the TRIPS Agreement and before the new digital world and online environment came into being, the power of the Berne and the Paris Conventions reached its height. The Paris Convention applied to a total number of 177 member parties[217] while the Berne Convention applied to a total of 172 member parties.[218] As we are examining the international transfer of technology in this thesis, and because most of the technologies we are evaluating, in the case studies[219] are patanable technologies and know-how, then we will focus more on industrial property more than the copy rights.

Therefore, the objective of Paris convention, at that time, was to take major step in ensuring the protection of industrial property in other countries. It looked at improving international industrial property protection by remedying the deficiencies of previous treaties. The Paris Convention applies to all types of industrial property in its widest sense, including: including patents, trademarks, industrial designs, utility models,

[217] Wipo, 'Contracting Parties: Paris Convention ' (*WIPO-Administered Treaties*, n.d) <http://www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=2> accessed 19 October 2017

[218] WIPO, 'Contracting Parties > Berne Convention (Total Contracting Parties : 172)' (WIPO-Administered Treaties, n.d) <http://www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=15> accessed 11 February 2017.

[219] See chapter: 5 to 8.

service marks, trade names, geographical indications and the repression of unfair competition.[220]

The Paris and Berne Conventions allow member parties to enter into new bilateral agreements, but nevertheless a very limited number of bilateral treaties existed, and most of these were not of major importance with regard to international IP protection.[221] Over time, the Paris and Berne Conventions declined in importance although it was revised quite regularly. The Paris Convention was revised in Brussels in 1900, in Washington in 1911, in the Hague in 1925, in London in 1934, in Lisbon in 1958, in Stokholm in 1967[222] While the Berne Convention was revised in Paris in 1896, in Berlin in 1908, in Rome in 1928, in Brussels in 1948 and by the 'twin revisions' in Stockholm in 1967 and in Paris in 1971. The purpose of these revisions was to deal with new technological developments.[223]

Nevertheless, these revisions did not improve the IP regime sufficiently to cope with the new technologies that came into existence in the 1970s and 1980s, such as reprography, video technology, satellite broadcasting, computer programs, electronic databases, etc. In reaction to these new technological developments, the international copyright community followed the 'guided development' principle rather than establishing new international treaties that dealt with matters relating to the

[220] G h c bodenvasen , *A Guide to the Application of the Paris Convention For the Protection of Industrial Property: As revised as Stockholm in 1967* (WIPO Publication 2007) 21
[221] ibid 66.
[222] Wipo, 'Paris Convention for the Protection of Industrial Property' (*WIPO-Administered Treaties* , n.d) <http://www.wipo.int/treaties/en/text.jsp?file_id=288514> accessed 19 October 2017
[223] Mihaly Ficsor, *The Law of Copyright and the Internet: The 1996 WIPO Treaties, their Interpretation and Implementation* (Oxford University Press 2002) 3.

online and digital environments, and the Berne Convention remained without further revision.[224]

The global economy became more dependent on knowledge technology and innovation. Hence, IP started to take a central part in global political and economic debates and negotiations. Countries began to look at IP rights differently, and the question of how to protect IP rights at the international level started to be raised on various occasions.[225]

Countries discovered that the conventions protecting IP prior to the TRIPS era were deficient in two areas of major importance. The first was the absence of an enforcement mechanism that would give effective assurance of members' compliance with the standards of IP protection. The second was the lack of instruments for dealing with IP infringements of the new digital and online technology.[226]

In this chapter, we will examine and evaluate TOT under the TRIPS Agreement. We will first give the introductory background to the international efforts for improving the IP protection that was available under the Berne and Paris Conventions. Some international IP agreements and conventions were negotiated and adopted at the same time as the TRIPS Agreement, some were adopted before the TRIPS Agreement, and others came after the adoption of the TRIPS Agreement. It is therefore important to look at the main objectives and purposes of these agreements

[224] ibid 4.
[225] Sam Ricketson and Jane Ginsburg, 'The Berne Convention: Historical and Institutional Aspects' in Daniel Gervais (ed) *International Intellectual Property: A Handbook of Contemporary Research* (2015) 5–27.
[226] ibid.

and the extent to which they can assist in protecting IP in the new digital and online world. This will be considered under the heading of 'The Development of International IP Protection' (Section 3.2).

We will then analyse the basic approach of the TRIPS Agreement in the section headed 'Intellectual Property Rights under the TRIPS Agreement' (Section 3.3). In Section 3.4 we will address the general features of the TRIPS Agreement, and its nature and scope will be explained. We will then evaluate the provisions of the TRIPS Agreement related to TOT, particularly Articles 7, 8, 66, 67 and 69.

3.2 The Development of International IP Protection

WIPO sponsored the negotiation of some special agreements that are linked to the Berne Convention.[227] There were a number of significant IP agreements that were made to address recent developments in the online and digital fields. These agreements tried to add either procedural or substantive IP provisions to both the Paris and the Berne Conventions. They also reflected the concerns and interests of both developing and developed countries in the continuing improvement of the international IP system, and the treaties most relevant to industrial property are discussed below.

First, the Trademark Law Treaty (TLT) was adopted on 27 October 1994. This treaty contains some procedural provisions to simplify the administrative procedure for applications to register trademarks. It therefore does not include substantive terms and conditions, but aims only to standardise and streamline national and regional

[227] ibid 6.

trademark registration procedures. Hence there is no problem with its compatibility with international agreements such as the TRIPS Agreement.[228] It simplifies and harmonises some general features of common procedures. The result is that trademark applications have become easier, less complex and more predictable.[229]

Second, the Patent Law Treaty was adopted on 1 June 2000.[230] This treaty aims to harmonise and streamline the formal procedures for national and regional patent applications and patents. In order to make such procedures more flexible, it provides maximum sets of requirements that may be applied by the office of a contracting party.

Also there are a number of treaties related to copyrights like: the WIPO Copyright Treaty (WCT), adopted in Geneva in 1996, the WIPO Performance and Phonograms Treaty (WPPT), adopted in 1996, the Beijing Treaty on Audio-visual Performances, adopted in 2012, and the Marrakesh Treaty to facilitate Access to Published Works for Persons who are blind, Visually Impaired or otherwise Print Disable (The VIP Treaty) in 2013.

As noted above, most of the above-mentioned agreements deal with particular procedural problems, while others are related to particular IP rights. Although they are all related to IP in international law, their approach is completely different from that of the TRIPS Agreement under the WTO umbrella, as we will see in the next section.

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[228] Europa <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52005SC1793> accessed 12 November 2017.
[229] WIPO <http://www.wipo.int/treaties/en/ip/tlt/> accessed 11 November 2017.
[230] Daniel J. Gervais, *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2nd edn, 2014) xxxii.

3.3 Intellectual Property Rights under the TRIPS Agreement:

The TRIPS Agreement is the most comprehensive multilateral agreement on IP to date.[231] From the date it entered into force (1 January 1995), it has bound all WTO Members. Nevertheless, some Members, depending on their level of development, enjoyed transitional periods before they had to comply fully with the TRIPS standards. The Council of TRIPS administers issues related to the TRIPS Agreement and is open to all Members of the WTO. The Council reports to the WTO General Council.[232]

The TRIPS Agreement is part of one of the three annexes to the agreement establishing the WTO (which is an umbrella agreement that includes a number of multilateral trade agreements in Annexes 1, 2 and 3 and four plurilateral trade agreements in Annex 4).[233]

The TRIPS Agreement is the third part of the Annex 1 agreements, namely Annex 1C; Annex 1A is related to goods (the GATT 1994) while Annex 1B is related to services (the Agreement on Trade in Services – GATS). The TRIPS Agreement contains specific provisions relating to the following IP areas: copyright and related rights, trademarks, geographical indications, industrial designs, patents, and undisclosed information.[234]

[231] WTO, 'The WTO Multilateral Trade Agreements' (2014) <https://ecampus.wto.org/admin/files/Course_622/CourseContents/MTA-E-R3-Print.pdf> accessed 4 December 2016.
[232] ibid.
[233] ibid.
[234] ibid.

Unlike the other IP agreements discussed in Section 3.2, the TRIPS Agreement has led to important and continuing developments in international IP law. International IP law moved up the agenda of international trade negotiations after the TRIPS Agreement. In fact the TRIPS Agreement opened the channel for further development of international IP law, through both the built-in agenda for the review of the TRIPS Agreement[235] and separate multilateral treaties on related matters. Hence, the TRIPS Agreement is the starting point and is an effective method for allowing more international IP protection and enforcement worldwide.[236] This is one of the basic features of the TRIPS Agreement approach for handling IP in international law. In fact, the TRIPS Agreement is the first international treaty that deals intensively with IP enforcement.[237]

Nevertheless, some scholars believe that applying IP law in international trade negotiations is part of a 'third generation of actual and potential trade distortions, which includes intellectual property law'.[238] As a result of the deficiencies mentioned above in the pre-TRIPS Agreement conventions in relation to the general international IP system, namely the level of protection, the implementation and enforcement and, particularly, the fact that these conventions were not adequate for the new online and digital era, the negotiation of the TRIPS Agreement started under the umbrella of the WTO.[239]

[235] Carlos M. Correa, 'The TRIPS Agreement and Developing Countries' < http://link.springer.com/chapter/10.1007%2F0-387-22688-5_54 > accessed 1 December 2016.
[236] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 11.
[237] Carmen Otero García-Castrillón, 'Protection of Intellectual Property through border measures in the European Union' [2012] Annex XXI(Nd) AIDA 220-267
[238] ibid.
[239] ibid 117.

This explains why, at the beginning of the Uruguay Round, there were strong disagreements between developed and less developed countries on the scope and contents of the TRIPS Agreement. The developed countries argued that strengthened IP protection would promote innovation, foreign direct investment and TOT to developing countries;[240] better standards of protection for IP through the TRIPS Agreement could be an incentive for more research and development for inventions, and for intellectual creativity. They also argued that investment opportunities in developing countries would increase through the establishment of new international rules for the protection of IP that were linked to trade.[241]

Conversely, most developing countries believed that strengthening IP protection would neither result in the transfer of know-how and technology, nor open more investment channels.[242] In fact, no one can ignore the connection between IP and economic development. However, the strength of that connection varies from one country to another. For example, IP plays a major role in the US economy, but if one looks more deeply one sees that until 1982 the US did not have a very protective patent law, and until 1978 it had weak copyright laws. This was one of the arguments that created a fear in developing countries about the adoption of the TRIPS Agreement.[243] The fear was of creating monopoly powers under the umbrella of IP protection linked to trade.

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[240] Carlos M. Correa, 'The TRIPS Agreement and Developing Countries' < http://link.springer.com/chapter/10.1007%2F0-387-22688-5_54 > accessed 1 December 2016.
[241] Sunil Mani and Richard R. Nelson, 'Introduction' in Sunil Mani and Richard R. Nelson (eds) *TRIPS Compliance, National Patent Regimes and Innovation: Evidence and Experience from Developing Countries* (Edward Elgar Publishing Limited 2013) 1–15.
[242] ibid.
[243] Jerome H. Reichman, 'Intellectual Property in the Twenty-First Century: Will the Developing Countries Lead or Follow?' in Mario Cimoli and others (eds) *Intellectual Property Rights: Legal and Economic Challenges for Development* (Oxford University Press 2014) 111–184.

The advantages and rewards of innovation, knowledge and technology production for developed countries was a concern for developing countries, since, logically, a tough IP law would be for the benefit of developed countries and would lead to the flow of funds, under the form of patent or copyright royalties, from developing to developed countries.[244]

Additionally, developing countries believed that they were the furthest from the IP and trade negotiations. The new rules and attitudes in international trade IP law were against their interests but they were ultimately forced to accept them. This was because of the pressure exerted by the US, and its threats to use penalties under the 'Super 301' procedures. Section 301 of the US Trade Act 1974 authorises the US President to take all appropriate actions and procedures, including retaliation, to encourage the removal of any legislation or policy in any foreign country that breaches international trade law or negotiations. Developing countries argue that the US can use Section 301 under its own interpretation of what constitutes insufficient legal protection or unfair trade actions.[245]

As a result of these disagreements, developing countries began to consider the TRIPS Agreement as a sort of localised globalism and not globalised localism. Localised globalism refers to 'a situation when local authorities change and adapt to international and transnational influences. Examples include recognising increasingly international concerns about environment, and changing local attitudes to

[244] Mario Cimoli and others, 'The Role of Intellectual Property Rights in Developing Countries: Some Conclusions' in Mario Cimoli and others (eds) *Intellectual Property Rights: Legal and Economic Challenges for Development* (5th edn, Oxford University Press 2014) 503.
[245] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 16.

deforestation or use of resources.'[246] The TRIPS Agreement is an example here, with developed countries forcing the majority of the remaining nations to change their domestic laws and policies on IP to comply with the requirements of the TRIPS Agreement – this is localised globalism.[247]

There are also many ways in which granting exclusive rights to IP holders may restrict the transfer of know-how and technology. Patents, as an example, prevent others from using a technology or know-how, even if this is only temporarily. The monopolistic or oligopolistic behaviour of IP holders can therefore create many obstacles to TOT.[248]

Despite such arguments, the TRIPS Agreement was adopted as an integral part of the WTO. It forms a framework for establishing new rules and disciplines in the IP regime, as per the aims and purposes in its Preamble. The spirit of the TRIPS Agreement is the application of the basic principles of the GATT 1994 to the relevant international IP conventions. The TRIPS Agreement then looks for adequate standards and principles on the availability, scope and use of trade-related IP rules.[249]

Thus, the TRIPS Agreement looks for a way to develop an enforcement mechanism for trade-related IP rules, bearing in mind the differences in countries' IP systems.

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[246] Graham Dutfield and Uma Suthersanen, *Global Intellectual Property Law* (Edward Elgar 2008) 3.
[247] ibid.
[248] Carlos A. Primo Braga, Carsten Fink and Claudia Paz Sepulveda, 'Intellectual Property Rights and Economic Development' in Frederick Abbott, Thomas Cottier and Francis Gurry (eds) *The International Intellectual Property System: Commentary and Materials: Part 2* (Kluwer Law International 2000) 1852–1863.
[249] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.

The objective is to have an effective and expeditious procedure for dispute settlement. This was reflected in the TRIPS Preamble, with one of the important issues mentioned in the Preamble being the reduction of tensions through strengthened commitments to resolve disputes on trade-related IP issues through multilateral procedures. On the other hand, the TRIPS Agreement, as explained in its Preamble, sets out transitional arrangements and identifies the need for a multilateral framework of principles and rules that deal with the international trade in counterfeit goods.[250]

The TRIPS Agreement also addresses TOT, which was one of the main concerns of the developing countries during the negotiations. The TRIPS Agreement includes a number of provisions relating to this. One of the purposes of protecting IP at the international level is to promote innovation and TOT, and this requires the governments of developed countries to provide incentives for their companies to transfer technology to less-developed countries.[251]

It follows that the agenda of the TRIPS Agreement is to deal with all the following issues: an enforcement mechanism, minimum standards for IP protection and the TOT. Nevertheless, the TRIPS Agreement is still one of the most controversial treaties in the world, even after its provisions have been implemented. Both developed and developing countries have started expressing more demands and concerns about it.[252]

[250] ibid.
[251] WTO, 'TRIPS: Issues: Technology Transfer' <http://www.wto.org/english/tratop_e/trips_e/techtransfer_e.htm> accessed 2 January 2017.
[252] ibid.

Developed countries have started calling for IP protection in excess of what is in the TRIPS Agreement. In their view, the TRIPS Agreement was not as 'unequivocal a success for IP holders in developed countries as they would have wished'.[253] Thus there are many issues still unresolved under the TRIPS Agreement. One of those issues is IP enforcement. The enforcement mechanism under the TRIPS Agreement is set out in general terms.[254] Issues like the protection of clinical test data, parallel importation, the protection of geographical indications, and patents on plants and the genetic resources of plants still remained unresolved under the TRIPS Agreement.[255] By contrast, developing and less-developed countries have expressed dissatisfaction, on the grounds that the TRIPS Agreement is, in practice, interpreted and implemented for the sole benefit of the developed countries. They have also realised that 'the trade-off between greater market access and greater IP protection that was promised during the negotiation round was not achieved. As a result, a backlash to the TRIPS Agreement has been created.[256]

Now, more than 20 years after the signature of the TRIPS Agreement in Marrakesh on 15 April 1994, most countries and intergovernmental organisations have 'shifted their focus from simply complying with their obligations under the TRIPS Agreement and embarked instead on path towards developing local innovation potential while minimizing the welfare costs of increased levels of IP protection'.[257] Countries have

[253] Anselm Kamperman Sanders and Dalindyebo Shabalala, 'Intellectual Property Treaties and Development' in Daniel J. Gervais (ed) *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2014) 42–72.
[254] ibid.
[255] ibid.
[256] ibid.
[257] Daniel J. Gervais (ed), *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2nd edn, 2014).

renewed their historical scepticism towards claims that higher IP protection would lead to more innovation and greater TOT.

Although the developed countries are calling for TRIPS-Plus standards to be agreed on and covered by an enforcement mechanism, these countries have not been successful. This is a result of the remaining scepticism in developing countries about any IP protection that goes beyond their abilities. The developed countries have therefore stopped further negotiation of TRIPS-Plus treaties and so-called harmonisation initiatives at WIPO, like the proposed Substantive Patent Law Treaty and the WIPO Treaty on the Protection of Broadcasting Organizations. Additionally, any TRIPS-Plus provisions must be adopted through multilateral, regional and bilateral negotiations.[258]

Consequently, some developed countries have started to coordinate work on promoting TRIPS-Plus by following a different path. The idea is to launch simultaneous initiatives in various international and regional forums. Developed countries are trying to shift the battlefield to the World Customs Organization (WCO), through which they may attract the involvement of other bodies, such as the Universal Postal Union (UPU) and the International Medicinal Products Anti-Counterfeit Taskforce (IMPACT) of the World Health Organization (WHO), and address the question in the Anti-Counterfeiting Trade Agreement (ACTA) and various free trade agreements. This is regarded as the second generation of IP

[258] Anselm Kamperman Sanders and Dalindyebo Shabalala, 'Intellectual Property Treaties and Development' in Daniel J. Gervais (ed) *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2014) 42-72.

enforcement, with the TRIPS Agreement being considered as the first generation in IP enforcement linked to trade.[259]

Hence, before starting to consider TRIPS-Plus, as the second generation of the IP enforcement mechanism, we shall analyse the TRIPS provisions as they relate to the TOT. We wish to decide whether or not the TRIPS Agreement fosters TOT and, if it does, to what extent.

3.4 The General Features of the TRIPS Agreement:

The negotiations for the TRIPS Agreement began at the Ministerial Conference of the GATT in Punta del Este, Uruguay, in September 1986. Prior to that time, negotiations at the WIPO between developed and less-developed countries over the revision of the Paris Convention had become deadlocked.[260] This failure led to certain objectives and principles being set out by the GATT Contracting Parties for the Ministerial Conference, and one of these objectives was the establishment of the TRIPS Agreement.

The TRIPS Agreement reflects important and distinctive features of international IP law. First, it positively prescribes regulatory standards that must be met by WTO Members.

Second, flexibilities in the TRIPS Agreement are limited to the transitional periods. These flexibilities can sometimes apply to the basic or core obligations, which

[259] Xuan Li, 'TRIPS-Plus-Plus Initiatives on Broad Border Measures: Features and Implications' in Carlos M. Correa (ed) *Research Handbook on the Interpretation and Enforcement of Intellectual Property under the WTO Rules* (Edward Elgar Publishing Limited 2010) 24.
[260] See Chapter 2, p.30.

'however remain subject to treaty interpretation by Panels and the Appellate Body'.[261] Moreover, the way the TRIPS Agreement deals with IP rights is not the usual way for matters related to international trade or even international IP law. This is a different way of addressing trade-related issues from the practice under the original GATT 1947.[262]

The way of dealing with IP protection is somewhat comparable to human rights treaties, in that the TRIPS Agreement also sets high standards of protection and requirements.[263] But there are important differences: when dealing with a human rights treaty, the provisions are set out on the basis of a core principle (human rights shall apply to all people and under all circumstances), and there are no exceptions; when dealing with IP as a trade-related issue, exceptions exist, and it is unacceptable to say 'take it or leave it' or to work under a one-size-fits-all approach.[264]

Third, the TRIPS Agreement reflects the highly abstract nature of IP. IP can exist not only in traded products but also in any creative ideas and information in any product.[265]

Fourth, the TRIPS Agreement was the first international agreement in WTO law to address the private rights of economic operators. This is quite different to WTO

[261] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 118.
[262] ibid.
[263] ibid.
[264] ibid.
[265] ibid.

agreements such as the GATT and GATS, which affect trading entities through their home states.[266]

Fifth, the TRIPS Agreement brought together a number of normative strands in various areas of IP. This has led to the TRIPS Agreement being described as 'the middle of the international IP hourglass'.[267] Most of the norms set out in the Berne and Paris Conventions, in addition to those in the Washington Treaty and the Rome Convention, were incorporated into the TRIPS Agreement after having been filtered through the process of linking IP to trade. At the same time, the TRIPS Agreement focuses on the impact of the protection of IP on trade.[268]

As some scholars have explained, the TRIPS Agreement fully incorporates the substantive rules enshrined in other international treaties. It does not just contain links or references to other treaties, but interweaves IP with the WTO and WIPO on the one hand, and with the UN system on the other hand.[269]

Sixth, for the first time in international IP law, the TRIPS Agreement makes IP subject to effective international litigation, not just commercial arbitration, under the WTO dispute settlement system. The TRIPS Agreement deals with the main categories of IP rights by establishing minimum standards of protection for each category. Thus, WTO Members cannot agree on lesser standards outside the WTO because this would be considered a breach of the TRIPS Agreement; in contrast,

[266] ibid.
[267] Daniel J Gervais (ed), *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2nd edn, 2014) xxxiii.
[268] ibid.
[269] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 118.

WTO Members are allowed to call for TRIPS-Plus standards. We can therefore say that the TRIPS Agreement aims to support greater and greater IP protection but never less protection.[270]

Additionally, this requires the protection to be linked to the WTO dispute settlement mechanism. This is done by means of the Dispute Settlement Understanding (the 'Understanding on Rules and Procedures Governing the Settlement of Disputes') in the WTO. These rules and procedures are set for the purpose of resolving disputes between Members of the WTO concerning compliance with its standards.[271]

This was, in fact, the main concern for the developed countries, headed by the US and the EU, as they 'placed heavy emphasis in their international trade relations with developing countries on ensuring that patents, copyrights, and trademarks owned by their firms are effectively enforced'.[272]

Seventh, the TRIPS Agreement is a binding comprehensive multilateral agreement that applies to all WTO Members. It is considered one of the basic founding pillars of the WTO. It is binding on each Member of the WTO from the date the WTO Agreement becomes effective for that country. Moreover, any country that intends to join the WTO must meet the minimum requirements and standards for IP protection as set out in the TRIPS Agreement.[273]

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[270] Susy Frankel, 'The Application of GATT Jurisprudence to the Interpretation of the TRIPS Agreement' in Carlos Correa (ed) *Research Handbook on the Interpretation and Enforcement of Intellectual Property Under WTO Rules* (2010) 3–23.
[271] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012).
[272] Keith E. Maskus, *The WTO, Intellectual Property Rights and the Knowledge Economy: Critical Perspectives on the Global Trading System and the WTO* (Edward Elgar Publishing 2004) xi.
[273] ibid.

Hence, the TRIPS Agreement is part of the single undertaking resulting from the Uruguay Round negotiations.[274] The minimum standards set out in the TRIPS Agreement make this agreement unique compared with other IP conventions such as the Paris or Berne Conventions, or trade agreements such as the GATT. The Berne and Paris Conventions do not require specific actions to be taken or specific policies to be followed by any particular member. They do not allow any member affected by another member's IP violation to submit a complaint based on this right, in the way in which the TRIPS Agreement allows such enforcement under the Dispute Settlement Unit .[275] Accordingly, IP, when treated in this manner, becomes a pre-eminent aspect of global trade policy.

Eighth, the TRIPS Agreement follows the GATT tradition of adopting the multilateral disciplines of non-discrimination in the principles related to most-favoured-nation and national treatment, in addition to having a commitment to transparency.[276]

Finally, it is worth mentioning that the TRIPS Agreement consists of seven parts and seventy-three articles. In this chapter the general provisions and terms of the TRIPS Agreement will be explained for the purpose of understanding their concepts and their effect on TOT to less-developed countries. The basic provisions related to TOT will then be explained.

[274] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 8.
[275] Carlos A. Primo Braga, 'Trade-related Intellectual Property Issues: The Uruguay Round Agreement and its Economic Implications' in Keith E. Maskus (ed) *The WTO, Intellectual Property Rights and the Knowledge Economy: Critical Perspectives on the Global Trading System and the WTO* (Edward Elgar Publishing 2004) 3–41.
[276] ibid.

3.5 The TRIPS Preamble

The Preamble to the TRIPS Agreement declares the intention of the Member Parties in entering the Agreement and sets out the context for interpreting the Agreement; it does not contain binding obligations.[277]

The main message delivered by the Preamble is the linkage between international trade and international IP protection, and it demonstrates how the TRIPS Agreement forms a new framework for international rules and disciplines in IP. However, the TRIPS Preamble initially sets out somewhat opposing aims,[278] in doing so, it tries to reflect the effort that was made to balance the different political considerations of developed and less-developed countries.[279] This is done through setting out the basic provisions of the Agreement. The Preamble starts, in recital 1, by stating its desire to reduce distortions and impediments to international trade through the protection of IP rights.[280] The message is that pursuant to the TRIPS Agreement the Members will do their best not to allow IP to distort or impede international trade. The arguments and objections raised by the developing countries are therefore reflected in the Preamble.

However, the Preamble not only creates a link between IP and international trade, but also states that the purpose of the Agreement is to promote the effective and adequate protection of IP. At the same time, the Preamble ensures that the

[277] Hiroko Yamane, *Interpreting TRIPS: Globalisation of Intellectual Property Rights and Access to Medicines* (Bloomsbury Publishing 2011) 5.
[278] TRIPS Agreement (entered into force 1 January 1995) preamble.
[279] ibid 5.
[280] TRIPS Agreement (entered into force 1 January 1995) preamble.

enforcement of IP protection does not become a barrier to legitimate trade.[281] This shows that IP infringements are the real reason behind the purposes mentioned in the Preamble. The idea then morphs into using use the *protection* of IP in a way that can reduce the distortions and impediments to international trade.[282]

Moreover, starting the Preamble with a reference to the desire to reduce distortions and impediments to international trade is something new and anomalous for an IP convention. In other words, if the TRIPS Agreement was merely a convention for the protection of IP, it should start with a reference to the desire to protect IP regardless of the impact on international trade, or regardless of the economic value of IP in international trade. Instead, the TRIPS Agreement makes a link with international trade and this is why the TRIPS Agreement looks at IP as 'as the most dynamic and contested regulatory arena in the global political economy'.[283]

The Preamble therefore suggests that IP infringement is considered to be a form of distortion of trade. In contrast, IP protection should not be a barrier to legitimate trade. A reconciliation of IP law and trade law is therefore found here, with the idea that trade law can recognise types of trade that are not legitimate and can suppress them.[284]

The reinforcement of the idea that IP protection measures and rules should not constitute a barrier to legitimate trade reflects 'the contentious nature of the

[281] ibid.
[282] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 80.
[283] Susan K Sell, 'The Dynamics of International IP Policymaking' in Daniel J. Gervais (ed) *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era* (2013) 74–85.
[284] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 80.

negotiations and the differences in perspective among the negotiating WTO members'.[285] The Preamble to the TRIPS Agreement tries to take a middle position between the concerns of the developed and those of the developing countries. From the perspective of the developed countries, the TRIPS Agreement assists their objective by stopping IP infringements and ensuring they keep their rewards and profits from the production of IP. On the other hand, the TRIPS Agreement looks at the objectives of developing countries of avoiding barriers to legitimate trade.

The applicability of this in practice is absent under the Preamble, because the enforcement of IP rights might be possible, but ensuring there is trade with less-developed countries, including both developing and the least developed countries (LDCs), might be quite difficult in practice. The difficulties related to the less-developed countries are not solved in the Preamble.

The Preamble, in Recital 2, also recognises the need for new rules and disciplines on many issues. First, it addresses the applicability of the basic principles of GATT 1994 and the relevant international IP conventions. This is the new development that is made by the TRIPS Agreement in the IP field, and reflects the new era of trade-related IP protection. The Preamble shows how the TRIPS Agreement can create trade-related IP, and how the GATT principles are applicable to this kind of agreement. The GATT principles had previously been applied only to goods and not to IP, which is why the TRIPS Agreement sets out this desire in the Preamble.

[285] IPRS, <http://www.iprsonline.org/unctadictsd/docs/RB_ part1.1_corrected_update.pdf> accessed 12 November 2017.

Second, the Preamble refers to the provision of adequate standards and principles concerning the availability, scope and use of trade-related IP rights. The term 'availability' of trade-related IP is anomalous here: the Agreement is entitled 'Trade-Related Aspects of Intellectual Property Rights', so the meaning of the term 'availability' must be questioned. This provision is mentioned in the Preamble to emphasise the different political reasons for adopting the TRIPS Agreement. In fact, it answers the question of why the TRIPS Agreement was needed. It also reflects the conclusion that had been reached in the negotiations on the TRIPS Agreement that there was a need to create certain rules and principles for the availability, scope and use of trade-related IP rights. This is the main target of the TRIPS Agreement.[286]

Third, the Preamble states that the provision of effective and appropriate means for the enforcement of trade-related IP rights should consider the differences in national legal systems. This reference in the Preamble to the different national legal systems has further impacts in the context of the Agreement. It is related to how far IP can be protected at the international level. IP protection essentially depends on national legislation, through the rules and regulations of domestic law, and this is the basis for the international protection of IP. From this perspective, the IP protection system is still based on the principle of the territoriality and sovereignty of states.[287]

Fourth, enforcement is one of the features that increase the importance of the TRIPS Agreement. The TRIPS Preamble recognises the need for new rules and disciplines concerning effective and expeditious procedures for the multilateral prevention and

[286] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 80.
[287] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 123–124.

settlement of disputes between governments.[288] Hence, the TRIPS Preamble in this provision encompasses all political disagreements and disputes related to the enforcement of IP protection.[289] It sets out that the final conclusion of all the negotiations is to have an enforcement mechanism for the international protection of IP that is linked to trade law. It is also a continuous reminder of the legal and practical function of the TRIPS Agreement.[290]

Fifth, the Preamble refers to transitional arrangements that enable the fullest participation in the results of the negotiations. It has been argued that these transitional periods are the only concession that was made to developing and least-developed countries under the TRIPS Agreement.[291] This provision also reflects the interests of the developing countries and the LDCs, as they needed more time to comply with the minimum standards of IP protection in the TRIPS Agreement.

The TRIPS Agreement therefore intended to create new rules and principles for the five main issues mentioned above. In Recital 3 the Preamble recognises 'the need for a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods';[292] Recital 4 makes it clear that IP rights are private rights, and Recital 5 recognises 'the underlying public policy objectives of national systems for the protection of IP, including developmental and technological objectives'.[293]

[288] TRIPS Agreement (entered into force 1 January 1995) preamble.
[289] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 80.
[290] ibid.
[291] Paul Goldstein, *International Intellectual Property Law* (2nd edn, Foundation Press 2008) 110.
[292] TRIPS Agreement (entered into force 1 January 1995) preamble.
[293] ibid.

Recital 6 recognises '… the special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base'.[294] This is the first reference to the term 'flexibility' under the TRIPS Agreement, a term that is further explained in Article 66.1.

The term 'flexibility' indicates that the Members enjoy important room for manœuvre in the implementation of their obligations under the TRIPS Agreement. The origin of this term lies in the negotiation of the TRIPS Agreement, and the reference makes it clear that the TRIPS Agreement is intended to incorporate a great degree of built-in flexibility.[295]

The term came into widespread use by the trade negotiators in the negotiations for the Doha Declaration on TRIPS and Public Health, and, after that, became part of the glossary of the IP community. Nevertheless, the existence of 'flexibilities' should not be used as an excuse to avoid compliance with TRIPS obligations. Moreover, the flexibilities are not always a solution to problems related to compliance with minimum standards of IP protection.[296]

Recital 7 of the Preamble emphasises 'the importance of reducing tensions by reaching strengthened commitments to resolve disputes on trade-related intellectual property issues through multilateral procedures'.[297] The reference to reducing 'tensions' gives an insight into the political background to the TRIPS negotiations, as

[294] ibid.
[295] WIPO, 'Meaning of Flexibilities' <http://www.wipo.int/ip-development/en/agenda/flexibilities/meaning_of_flexibilities.html> accessed 27 November 2016.
[296] ibid.
[297] TRIPS Agreement (entered into force 1 January 1995) preamble.

it makes an explicit link between stronger multilateral rules on trade and the reduction of tensions.[298] The presence of disagreements is clearly shown here in the TRIPS Preamble, with tensions being mentioned explicitly. The TRIPS Agreement is therefore trying to say that the tensions will be resolved by reaching strengthened commitments to resolve disputes about trade-related IP.

The TRIPS Preamble states, in recital 8, the desire to establish a mutually supportive relationship between the WTO and WIPO as well as 'other relevant international organizations'.[299]

The Preamble to the TRIPS Agreement is, in fact, important. A preamble is usually drafted to establish a definitive record of the intention or purpose of the parties in entering into an agreement.[300] It can therefore be used as an interpretive tool if disputes arise between the parties. This is because, as a general principle of international law, all treaties are binding on their parties and are to be implemented in good faith.[301] When a dispute arises about any provision or term of the agreement, the intention and main issues mentioned in the preamble must be taken into consideration.

As stated in Article 16[302] of the Vienna Convention on the Law of Treaties of 23 May 1969 (VCLT), the rules and regulations of the VCLT apply to a treaty unless the treaty specifies otherwise.[303] In the TRIPS Agreement, Article 64 specifies that the

[298] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 80.
[299] TRIPS Agreement (entered into force 1 January 1995) preamble.
[300] IPRS, <http://www.iprsonline.org/unctadictsd/docs/RB_ part1.1_corrected_update.pdf> accessed 12 November 2017.
[301] The Vienna Convention on the Law of Treaties (VCLT) (adopted 23 May 1969) part III s 1, art 26.
[302] Art 16 of the VCLT states that: 'unless the treaty otherwise provides, instruments of ratification, acceptance, approval or accession establish the consent of a State to be bound by a treaty upon:
(a) Their exchange between the contracting States;
(b) Their deposit with the depositary; or
(c) Their notification to the contracting States or to the depositary, if so agreed.
[303] UN, <https://treaties.un.org/doc/Publication/UNTS/Volume 1155/volume-1155-I-18232-

WTO rules and procedures for disputes are the default rules to apply to consultations and disputes under the TRIPS Agreement unless the TRIPS Agreement specifies other particular provisions.[304]

The WTO rules and procedures can be found in Articles XXII and XXIII of the GATT 1947 and were also amended, to some extent, by the DSU, as stated in Article 64 of the TRIPS Agreement. In fact, Article 3.2 of the DSU states that the current provisions of the WTO agreements shall be interpreted in accordance with the customary rules of interpretation of public international law.[305]

The VCLT sets forth the basic rules for interpreting treaties. The central rule is set out in Article 31, and additional rules in Article 32, of the VCLT. Article 31 requires good faith to be used in interpreting any treaty, with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.[306] Therefore, the interpretation of a treaty must rely primarily on its terms in context, and the object and purpose of the treaty must inform its meaning. The phrase 'object and purpose' is an important element of treaty interpretation. It is a unitary concept, referring to the goals that the drafters of the treaty hoped to achieve.[307] The first principle for interpreting the TRIPS Agreement is that the interpretation must be 'in good faith'.[308]

English.pdf> accessed 12 November 2017.

[304] Hiroko Yamane, *Interpreting TRIPS: Globalisation of Intellectual Property Rights and Access to Medicine* (Hart Publishing 2011) 191.

[305] ibid 191.

[306] The Vienna Convention on the Law of Treaties (VCLT) (adopted 23 May 1969) part III, s 3, art 31.

[307] David S. Jonas and Thomas N. Saunders, 'The Object and Purpose of a Treaty: Three Interpretive Methods' < https://wp0.vanderbilt.edu/wp-content/uploads/sites/78/JonasSaunders-cr_v2.pdf> accessed 19 December 2016.

[308] Susy Frankel and Daniel Gervais, 'Plain Packaging and the Interpretation of the TRIPS Agreement' <http://www.vanderbilt.edu/jotl/manage/wp-content/uploads/Gervais-Final-Review.pdf> accessed 27 February 2015.

In addition, a treaty must be interpreted in the context of its object and purpose. As laid down in Article 7 of the TRIPS Agreement, the protection and enforcement of IP rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to achieve the mutual advantage of producers and users of technological knowledge, and in a manner conducive to social and economic welfare, and to achieve a balance of rights and obligations. Therefore, according to the aforesaid rule of interpretation set out in the VCLT, any obligation or provision of the TRIPS Agreement must be interpreted within the framework of the objectives mentioned in Article 7. This is quite important when analysing TOT provisions in the TRIPS Agreement.

The principles of the TRIPS Agreement are stated in Article 8. They are mainly related to the protection of public health and nutrition and the promotion of the public interest in sectors of vital importance to socio-economic and technological development, in addition to the prevention of the abuse of IP by holders, or the use of practices that unreasonably restrain trade or affect TOT. These principles must be taken into consideration whenever any provision in the TRIPS Agreement is interpreted. For instance, when interpreting the trademark provisions in the TRIPS Agreement, a good faith interpretation at least requires that the trademark provisions be interpreted in their context and in the light of the object and purpose of the TRIPS Agreement.[309] Another example relates to technical cooperation: in Article 67 of the Agreement it is stated that developed countries should provide technical cooperation to developing countries on mutually agreed terms, so the extent and limits of this obligation are to be determined from the objectives and principles of the Agreement.

[309] ibid.

In addition, any specific statements about the object and purpose, whether in the preamble to a treaty or in any other provisions, are relevant to the context of the treaty and to its interpretation. This is because the context, for the purposes of interpretation, includes not only the text of the treaty but also its preamble and annexes, as stated in Article 31(2) of the VCLT. In fact, this is an important issue to be taken into account when determining what constitutes the object and purpose of the agreement, because many practical problems may arise if states wish to release themselves from certain rules and obligations. Another problem occurs when a state has signed a treaty but has not yet ratified it, because at this stage it should comply with the treaty's object and purpose.[310] This will also affect states' rights to make reservations, as a state is not allowed to make any reservations concerning the object and purpose of the treaty during this phase.[311]

For the TRIPS Agreement, as mentioned earlier, the Preamble states some basic general objectives of the Agreement as a whole. The TRIPS Agreement, like many other agreements, includes an explicit textual expression of the term 'object and purpose' in both Article 7 and Article 8. The interpretation of a treaty focuses on the ordinary meaning, but this may not lead to satisfactory results, especially if the treaty has many provisions with constructive ambiguities, although in the Doha Declaration on TRIPS and Public Health all WTO Members emphasised the role of Articles 7 and 8 in interpreting the TRIPS Agreement. [312]

[310] David S. Jonas and Thomas N. Saunders, 'The Object and Purpose of a Treaty: Three Interpretive Methods' < https://wp0.vanderbilt.edu/wp-content/uploads/sites/78/JonasSaunders-cr_v2.pdf> accessed 19 December 2016.
[311] ibid.
[312] Simon Lester, 'The Interpretative Use of Object and Purpose in TRIPS Cases' <http://worldtradelaw.typepad.com/ielpblog/2011/10/the-interpretative-use-of-object-and-purpose-in-trips-cases.html> accessed 20 December 2016.

At the same time, it is worth mentioning that the context of an agreement, as stated by Article 31 of the VCLT, includes not only its text but also 'any agreement relating to the treaty which was made between all the parties in connection with the conclusion of the treaty as well as any instrument made by one or more parties and accepted by the other parties'.[313]

Also, when interpreting treaty language, all aspects of Article 31 of the VCLT should be applied. As a result, the ordinary meaning of an article is not only the words of 'the article in question but also that article's context and the object and purpose of the treaty'.[314]

Therefore, Article 31.1 of the VCLT should always be applied when interpreting the TRIPS Agreement, even if the WTO Panels and the Appellate Body decide to base their decisions on the ordinary meaning of the drafted words in the TRIPS Agreement. This is because the reports of the Panels and Appellate Body relating to the TRIPS Agreement are not 'precedential in the sense that they do not bind future opinions on the same matter'.[315] They provide only guidance to both governments and the DSU bodies as to how future cases may be decided.[316]

Another rule to be highlighted is that nothing in the TRIPS Agreement can prevent any state from observing any existing obligations it may have to any other state

[313] David S. Jonas and Thomas N. Saunders, 'The Object and Purpose of a Treaty: Three Interpretive Methods' < https://wp0.vanderbilt.edu/wp-content/uploads/sites/78/JonasSaunders-cr_v2.pdf> accessed 19 December 2016.
[314] Susy Frankel and Daniel Gervais, 'Plain Packaging and the Interpretation of the TRIPS Agreement' <http://www.vanderbilt.edu/jotl/manage/wp-content/uploads/Gervais-Final-Review.pdf> accessed 27 February 2015.
[315] Carlos M. Correa, 'The TRIPS Agreement and Developing Countries' < http://link.springer.com/chapter/10.1007%2F0-387-22688-5_54 > accessed 1 December 2016.
[316] ibid.

under the Paris Convention, the Berne Convention, the Rome Convention or the Treaty on Intellectual Property in Respect of Integrated Circuits, as set out in Article 2(2) of the TRIPS Agreement. Under that provision, the scope of interpretation might be very broad.[317] It means that the scope of obligations under the TRIPS Agreement may thus include provisions under the Berne or Paris Conventions or other provisions of the WTO Agreement.

The reason we refer here to the interpretation provisions of the VCLT is to highlight the importance of the TRIPS Preamble in explaining the purpose and objective of the obligations in relation to TOT. It is stated clearly in the Preamble that the Members do not intend to use IP protection to distort or impede international trade. In addition, the intention of reducing the tensions between developed and developing countries is clear under the TRIPS Agreement.

In accordance with the principles of interpretation, all TOT provisions and also the minimum standards for IP protection provisions must sit under the framework of the TRIPS Preamble and its purpose and objective. It is not logical to say that the Preamble states only general guidelines that need not be followed when interpreting each of the TRIPS Agreement provisions.

3.6 TRIPS Agreement Part I: General Provisions and Basic Principles:

Part I of the TRIPS Agreement, 'General Provisions and Basic Principles', consists of eight Articles in which different general issues are described to give a general understanding of the Agreement. The issues are the nature and scope of the

[317] T.T. Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010) 2.

obligations (Article 1), IP conventions (Article 2), national treatment (Article 3), most-favoured-nation treatment (Article 4), multilateral agreements on the acquisition or maintenance of protection (Article 5), exhaustion (Article 6), objectives (Article 7) and principles (Article 8). These issues will be explained in further detail in order to give an understanding of the framework of the TRIPS Agreement and its general application.

3.6.1 Article 1: 'Nature and Scope of Obligations'

Article 1 of the TRIPS Agreement starts with a general statement about giving effect to the obligations contained in the text.[318] The term 'giving effect' is not limited to requiring Members to make legislative changes. It means that a country that is a Member of the WTO must take all necessary legal and administrative measures to ensure the application of the Agreement.[319]

There are three provisions identifying the nature and scope of the obligations. The first provision, under Article 1.1, makes two issues clear. First, it allows any WTO Member to implement more extensive protection than the minimum standards that are required under the TRIPS Agreement. Nevertheless, this is only a 'may' provision, and is not obligatory. The more extensive protection is the basis for a TRIPS-Plus era, as we will explain later in this chapter. Article 1.1 might be viewed from an opposite direction by saying that the TRIPS Agreement starts the explanation of its nature by giving a channel for more IP protection. This is purely for the benefit of IP holders, who are mostly nationals of the developed, and not the

[318] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 173.
[319] ibid 174.

developing, countries. It may also show an intention to favour them because no balance of rights and obligations can be reached under the TRIPS Agreement.

Politically, Article 1.1 opened a channel for calls for TRIPS-Plus after the TRIPS Agreement was implemented. It means that the TRIPS Agreement tends to globalise IP protection instead of creating a uniform or deeply harmonious regime.[320] At the same time, it is important to highlight the fact that any provision of additional TRIPS protection cannot violate other TRIPS provisions, so that a country cannot apply longer protection periods only for its own nationals, as this is in clear conflict with the principle of non-discrimination.

Hence, the TRIPS Agreement allows for more IP protection than what it is required, but the flexibility given to specific countries by its terms and conditions cannot be breached.

The second issue arising from Article 1.1 is that the implementation of the TRIPS Agreement must take into consideration each country's legal system and practice. Article 1.1 states that 'Members shall be free to determine the appropriate method of implementing the provisions of this Agreement within their own legal system and practice'.[321] The first issue that we highlighted above is that applying additional IP protection is a possibility and not an obligation. The second issue is that such application of additional minimum standards of IP protection is to be carried out under the conditions of the country's own internal legal system and practices in this regard.

[320] T.T. Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010) 1.
[321] TRIPS Agreement (entered into force 1 January 1995) art 1.1.

Applying the TRIPS provisions in accordance with a Member's internal legal system and practices gives a Member some flexibility in complying with the minimum standards of IP protection. Each Member is free to determine the appropriate method of implementing the Agreement in accordance with its own legal system and practice.[322] This is useful if there is any dispute between Members after they have implemented the TRIPS Agreement. For example, the basis for deciding whether the actions taken by a particular country are appropriate for compliance with the TRIPS Agreement minimum standards is that 'Members are free to choose the appropriate methods'. Accordingly, Members cannot be obliged to choose a specific method, as long as there is compliance with the minimum standards.[323]

Leaving Members free to choose the appropriate method of implementing the TRIPS Agreement should take precedence over the United State Trade Representative (USTR) Section 301 reports. Members are obliged to comply with the minimum standards, but forcing them to follow specific procedures or to take particular actions goes against the freedom to choose the appropriate method that is set out in Article 1.1. Therefore, the USA cannot request developing countries to apply greater penalties for IP infringements. Applying penalties and requiring compensation for IP infringements must be done in accordance with a country's legal system.

The TRIPS Agreement sets out minimum standards for all IP rights in different categories:[324] copyright and related rights, trademarks, geographical indications, industrial designs, patents, layout designs of integrated circuits, undisclosed

[322] UNCTAD, 'Nature and Scope of Obligations' <http://www.iprsonline.org/unctadictsd/docs/RB_1.2_update.pdf> accessed 22 December 2016.
[323] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 175.
[324] TRIPS Agreement (entered into force 1 January 1995) art 1.2.

information, breeders' rights, utility models, databases, and community rights to traditional knowledge.[325]

Article 1.2 of the TRIPS Agreement tries to define 'IP', but in fact it does not succeed. It says that IP refers to all categories of IP that are the subject of Sections 1 to 7 of Part II, which means the IP that is to be given minimum standards of protection under the TRIPS Agreement. Accordingly, Article 1.2 does not define the concept of IP, and refers only to sections of the TRIPS Agreement that deal with the different categories.[326]

The TRIPS approach of defining IP by referring to all the categories of IP set out in certain sections of the Agreement excludes other potential categories of IP that are not the subject of those sections.[327] In addition, the meaning of a category is missing from the TRIPS Agreement. A category is defined as a set or subset of things, and this may lead to ambiguity 'because sets and subsets may be defined more broadly or narrowly depending on the intent of the creator of the set or subset.'[328]

Lastly, Article 1.3 defines the nationals of other Members who are to be given the treatment set out in the TRIPS Agreement with regard to the protection of IP. Nationals include 'persons, natural or legal, who have a close attachment to other Members without necessarily being nationals'.[329]

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[325] UNCTAD 'Training Tools on the TRIPS Agreement: The Developing Countries Perspective' (2002) < http://unctad.org/en/Docs/ditctncdmisc17_en.pdf> accessed 15 January 2017.
[326] UNCTAD, '3: Categories of Intellectual Property Embraced by TRIPS' (2004) <https://www.iprsonline.org/unctadictsd/docs/RB_Part1_Nov_1.2Update.pdf> accessed 2 December 2016.
[327] ibid.
[328] ibid.
[329] WTO, 'Notification Possibilities Provided in Articles 13 and 31 of The TRIPS Agreement' [1995] IP/C/W/5(ND) Council for Trade-Related Aspects of Intellectual Property Rights in World Trade Organization.

The TRIPS Agreement makes some major changes to the development of global IP protection, and different aspects of this are explored in Article 1, the 'nature and scope of obligations' Article. First, the TRIPS Agreement is part of a global rules-based multilateral trading system. This makes the TRIPS Agreement different from any other agreement related to IP protection.[330] Second, the TRIPS Agreement includes all types of IP rights in the categories addressed by its provisions. Third, the TRIPS Agreement links IP protection to trade. The TRIPS Agreement introduces IP protection into the international trading system because of the increase in the cross-border exchanges of goods, services, capital and knowledge in economic activity. In addition, human well-being is increasingly based on knowledge creation and innovation.[331] This linkage has the purpose of ensuring that everyone in the globally connected world has equal access to this knowledge, which is a central issue for the TRIPS Agreement.[332]

The obligations in this Article also extend to intergovernmental arrangements such as those of the European Union, which should take all reasonable measures to assure consistency between its own arrangements to harmonise IP laws and regulations under the EU umbrella and the TRIPS Agreement.[333]

The TRIPS Agreement establishes minimum standards of IP protection that are more consistent 'with the prevailing standards in the most highly industrialized

[330] T.T. Nguyen, *Competition Law. Technology Transfer and the TRIPS Agreement: Implications for Developing Countries* (Edward Elgar Publishing Limited 2010) 2.
[331] John M. Curtis, 'Intellectual Property Rights and International Trade: An Overview' (2012) < https://www.files.ethz.ch/isn/143049/no.3_0.pdf > accessed 19 January 2017.
[332] ibid.
[333] ibid.

countries' such as the USA, the EU member states and Japan.[334] This affects the objective of having balanced rights and obligations under the TRIPS Agreement. The high standards in the USA, the EU and Japan might be applied with difficulty in the internal systems and local conditions of developing countries. This problem has been solved to some extent through the transitional arrangements.

In addition, the industrial revolutions in the USA, Japan and the EU countries started in a period of weak international IP protection that enabled those countries to achieve their present levels of development.[335] Applying strong protection along with adopting the standards of the most highly industrialised countries will affect the developing countries' strategies for development and economic welfare. Going far beyond what was previously in place and having more restrictions on IP protection will make development itself difficult. Another point is that, even if we assume that the TRIPS Agreement encourages technical assistance and TOT, this assistance and transfer will still depend on offers and acceptances in the market, and investment opportunities between each pair of countries.

In other words, the TRIPS Agreement does not allow 'today's developing countries to rely on this same model of economic transformation by setting minimum standards at levels tailored for later stages of growth'.[336] In other words, when a developing country nowadays is trying to move forward with development, it has to comply fully with IP protection and the restrictions on IP in order to obtain the benefit of one or two chances for TOT.[337]

[334] UNCTAD, 'Nature and Scope of Obligations' <http://www.iprsonline.org/unctadictsd/docs/RB_1.2_update.pdf> accessed 22 December 2016.
[335] ibid.
[336] ibid.
[337] ibid.

A question might be raised in this regard. If the TRIPS Agreement is trying to provide a balanced set of rights and obligations between the parties and its purpose is to assist developing countries to start development with the assistance of developed countries, why is it only a minimum standards agreement with a maximum level of protection? In fact, some reports considered this not to be 'the optimal way to address development priorities, but it is for now the one provided by TRIPS'.[338]

3.6.2 Relationship with other Conventions on IP rights

The TRIPS Agreement does not replace the previous conventions on IP protection such as the Paris Convention, the Berne Convention, the Rome Convention and the Treaty on Intellectual Property in Respect of Integrated Circuits. Instead, it obliges all Members of the WTO to comply with Articles 1 to 12 and Article 19 of the Paris Convention. This is stated explicitly in Article 2 of the TRIPS Agreement. Moreover, the TRIPS Agreement obliges all Members to continue to perform their obligations under previous conventions.

In fact, the point of departure in the Uruguay Round negotiations was the standards of protection provided by the existing conventions such as the Berne and Paris Conventions. In regard to the regulatory approach, the TRIPS Agreement has a so-called Berne-Plus or Paris-Plus structure, or, as some other studies have called it, 'Convention Plus'.[339]

Accordingly, the negotiation of the TRIPS Agreement had taken into consideration some of those previous conventions like the Paris and the Berne Conventions, the

[338] ibid.
[339] UNCTAD 'Training Tools on the TRIPS Agreement: The Developing Countries Perspective' (2002) < http://unctad.org/en/Docs/ditctncdmisc17_en.pdf> accessed 15 January 2017.

Protection of Literary and Artistic Works (1971), and the Washington Treaty on Intellectual Property in respect of Integrated Circuits (1989), and supplemented them with some additional obligations.[340]

These conventions, as a result of the TRIPS Agreement, therefore become binding, with some exceptions, on all Members, even those that have not ratified them.[341] In other words, joining the TRIPS Agreement means that the provisions of previous conventions bind a country, even if it has not ratified those previous conventions; however, this is not the case for the Rome Convention, which is binding only on states that had previously ratified it. Also, the Washington Treaty is binding in the form as amended by the TRIPS Agreement.[342] In conclusion, the TRIPS Agreement is considered to be an integrated agreement. It does not stop the obligations of any other conventions from continuing to apply after it has been signed.

3.6.3 National Treatment and Most-Favoured-Nation Treatment (MFN) under Articles 3 and 4 of the TRIPS Agreement

One of the key principles of the multilateral trade agreements annexed to the WTO Agreement is the principle of non-discrimination applicable in all of its provisions. The WTO agreements are complex in nature. This is because they cover different kinds of areas: trade in goods, services and IP rights, agriculture, textiles and clothing, banking, telecommunications, government purchases, industrial standards and product safety, food sanitation regulations and much more.[343]

[340] ibid.
[341] ibid.
[342] ibid.
[343] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 16.

However, the implementation of all these provisions, regardless of their nature, must comply with the principle of non-discrimination, as this is one of the fundamental principles forming the basis of the multilateral trading system. Trading without discrimination can be achieved through two rules or principles: national treatment (NT) and most-favoured-nation (MFN) treatment. Under the TRIPS Agreement, these two rules are common to all categories of IP.[344] This will be explained in some detail below.

a) The Principle of National Treatment (NT) under Article 3 of the TRIPS Agreement

Under the WTO agreements, a WTO Member cannot favour its domestic products over imported products within its national territory. This is applied, with certain differences, to trade in goods (Article III of the GATT 1994), trade in services (Article XVII of the GATS) and IP protection (Article 3 of the TRIPS Agreement).[345]

The NT principle means that each Member must accord, to the nationals of other Members, treatment that is no less favourable than the treatment that it accords to its own nationals with regard to the protection of IP, subject to the exceptions already provided in the existing IP protection conventions. This is what is stated in Article 3 of the TRIPS Agreement.

[344] ibid 16.
[345] WTO, 'The WTO Multilateral Trade Agreements' (2014) <https://ecampus.wto.org/admin/files/Course_622/CourseContents/MTA-E-R3-Print.pdf> accessed 4 December 2016.

The NT principle forbids discrimination between a Member state's own nationals and the nationals of other Member states.[346] It can be described as (treating foreigners and locals equally) or treating foreigners no less favourably than nationals.[347] It applies under the TRIPS Agreement to persons and legal entities, unlike under the GATT where it applies only to goods. In this regard, it is closer to the IP protection conventions because the nature and scope of the obligations in respect of IP rights are different from the nature and scope of the obligations in the broader category of trade agreements.[348]

The NT principle imposes an obligation on all Members to treat imported and locally produced IP items, including trademarks, copyrights and patents, in the same way.[349] It is worth mentioning that NT only applies once an item of IP has entered the market.[350]

The exceptions allowed under the four pre-existing WIPO treaties (the Paris and Berne Conventions, the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (the Rome Convention) and the Treaty on Intellectual Property in Respect of Integrated Circuits) are also

[346] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 16.
[347] WTO, 'Understanding the WTO' <http://www.wto.org/english/thewto_e/whatis_e/tif_e/tif_e.htm> accessed 5 November 2016.
[348] Carlos A. Primo Braga, 'Trade-related Intellectual Property Issues: The Uruguay Round Agreement and its Economic Implications' in Keith E. Maskus (ed) *The WTO, Intellectual Property Rights and the Knowledge Economy: Critical Perspectives on the Global Trading System and the WTO* (Edward Elgar Publishing 2004) 3–41.
[349] WTO, 'Understanding the WTO' <http://www.wto.org/english/thewto_e/whatis_e/tif_e/tif_e.htm> accessed 5 November 2016.
[350] ibid.

allowed under the TRIPS Agreement.[351] This is because this is the case for all three main WTO agreements: Article III of the GATT, Article XVII of the GATS and Article 3 of the TRIPS Agreement, although each agreement handles the principle slightly differently.[352]

One of the important exceptions in this regard is the 'comparison of terms' for copyright protection that is allowed under Article 6(8) of the Berne Convention as incorporated in the TRIPS Agreement. Accordingly, when a Member has agreed with another country to provide copyright protection in excess of the minimum standards set out by the TRIPS Agreement, then the national treatment is based on the additional agreed terms that are available to foreigners on the basis of material reciprocity.[353]

b) The Most-Favoured-Nation Treatment (MFN)

MFN treatment is a central pillar of the international trading system. MFN treatment applies under the three principal WTO Agreements (the GATT 1994, GATS and the TRIPS Agreement), not just to IP protection.[354] All of the MFN provisions under these three annexed WTO agreements employ more or less the same terminology.[355]
MFN treatment ensures a level playing field for all trading partners, and promotes multilateral trade agreements. From the standpoint of the WTO, MFN treatment

[351] WTO, 'The WTO Multilateral Trade Agreements' (2014) <https://ecampus.wto.org/admin/files/Course_622/CourseContents/MTA-E-R3-Print.pdf> accessed 4 December 2016.
[352] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 16.
[353] ibid.
[354] William J. Davey, *Non-Discrimination in the World Trade Organization: The Rules and Exceptions* (Brill 2012) 66–69.
[355] Richard Senti and Patricia Conlan, *WTO: Regulation of World Trade after the Uruguay Round* (Schulthess Polygraphischer Verlag 1998) 38–42.

promotes the idea of sovereign equality because all countries are equal and have equal standing in the world.[356] This principle is a cornerstone of the trading system and of multilateral tariff reduction; it applies to all provisions of the WTO agreements including IP protection under the TRIPS Agreement (Article 4).[357]

From the political perspective, MFN treatment is used for the purpose of reducing factionalism among countries. There are countries that had tried to have favourites amongst other countries, for foreign policy or national security reasons, and this had led to the international tensions and to WWII.[358]

MFN treatment is defined by UNCTAD as 'treatment accorded by the granting State to the beneficiary State, or to persons or things in a determined relationship with that State, not less favourable than treatment extended by the granting State to a third State or to persons or things in the same relationship with that third State'. An MFN clause can also be defined as 'a treaty provision whereby a State undertakes an obligation towards another State to accord most-favoured treatment in an agreed sphere of relations'.[359]

In detail, MFN treatment obliges a country to grant to every other country with which it has signed an MFN treaty the most favourable treatment it grants to any other

[356] William J. Davey, *Non-Discrimination in the World Trade Organization: The Rules and Exceptions* (Brill 2012) 66–69.
[357] Thomas Cottier, *Trade and Intellectual Property Protection in WTO Law: Collected Essays* (Cameron May 2005) 68.
[358] Michael J. Trebilcock, *Understanding Trade Law* (Edward Elgar 2011) 36.
[359] UNCTAD, 'Most-Favoured-Nation Treatment: UNCTAD Series on Issues in International Investment Agreements II' < http://unctad.org/en/Docs/diaeia20101_en.pdf> accessed 29 January 2017.

country with respect to imports, exports and related regulations.[360] MFN treatment forbids discrimination between the nationals of other Members. The idea is that all countries should benefit from the most favourable treatment. Accordingly, if a country grants an advantage to one trading partner, equal trade advantages must be given to all other countries.[361]

It is irrelevant whether or not the country to which the favourable treatment is given is a WTO Member, and it is also irrelevant whether or not the national to whom the favourable treatment is given is a national of a WTO Member.[362] In other words, countries cannot normally discriminate between their trading partners and grant one a special favour that is not given to other WTO Members. An example of a special favour is a lower rate of customs duty for a particular product.[363] Foreign traders usually look for sufficient assurances of non-discrimination of any kind that might put them at a competitive disadvantage.[364]

One of the most important consequences of the TRIPS Agreement is the incorporation of the IP into the international trade system. Therefore, both NT and MFN treatment apply to IP matters between WTO Members and, accordingly, to the application of the DSU to IP issues. This linkage, according to some researchers, may lead to unfair results like commercial retaliation in other realms in the event of

[360] Michael Trebilcock, Robert Howse and Antonia Eliason, *The Regulation of International Trade* (4th edn, Routledge 2013) 54.
[361] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 16.
[362] Richard Senti and Patricia Conlan, *WTO: Regulation of World Trade after the Uruguay Round* (Schulthess Polygraphischer Verlag 1998) 38–42.
[363] WTO, 'Understanding the WTO' <http://www.wto.org/english/thewto_e/whatis_e/tif_e/tif_e.htm> accessed 5 November 2016.
[364] UNCTAD, 'Most-Favoured-Nation Treatment: UNCTAD Series on Issues in International Investment Agreements II' < http://unctad.org/en/Docs/diaeia20101_en.pdf> accessed 29 January 2017.

non-compliance with the TRIPS Agreement. For example, a Member may retaliate against agricultural tariffs that are of high importance to developing countries, using the argument that there is non-compliance with the minimum standards of the TRIPS Agreement.[365]

Article 4 of the TRIPS Agreement states that if any favour, advantage, privilege or immunity is granted by a Member state to the nationals of any other Member, it shall be accorded immediately and unconditionally to the nationals of all other Members.[366] Hence, MFN treatment means that every time a country lowers a trade barrier or opens up a market, it has to do so for the same goods or services from all its trading partners, whether they are rich or poor, weak or strong.[367]

The word 'immediately' has been interpreted to mean that the favour, advantage, privilege or immunity that is given by a WTO Member shall be given to all WTO Members 'at the same time and without any lapses'.[368]

MFN treatment may apply to many types of advantages. For example, an advantage may be an amendment to the customs duties or charges of various kinds that arise in relation to the import and export of goods and services. Sometimes MFN treatment may apply to the international transfer of payments for imports or exports. An advantage may be given with regard to the method of levying customs duties and

[365] Pedro Roffe, Christoph Spennemann and Johanna von Braun, 'Intellectual Property Rights in Free Trade Agreements: Moving Beyond TRIPS Minimum Standards' in Carlos Correa (ed) *Research Handbook of the Protection of Intellectual Property under WTO Rules: Intellectual Property in the WTO, Volume I* (Edward Elgar 2010) 267.
[366] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 17.
[367] WTO, 'Principles of the Trading System' <https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm> accessed 20 December 2016.
[368] Richard Senti and Patricia Conlan, *WTO: Regulation of World Trade after the Uruguay Round* (Schulthess Polygraphischer Verlag 1998) 38.

other border charges, or to the administrative procedures for the recording and control of cross-border movements in goods and services, or to the levying of direct and indirect charges on goods and services. Moreover, MFN treatment may apply to the legal rules and regulations for the trade, transport, distribution and use of imported goods and services, and to IP rights in the form of standard procedures in regard to counterfeiting copyrights and patents.[369]

There are in fact some exceptions to MFN treatment. States have the right to establish a free trade agreement or customs union within a group of countries under Article XXIV GATT 1994, provided the preferential treatment applies only to goods traded within the group and discriminates only against goods from outside. Also, states have the right to give developing countries special access to their markets or to raise barriers against products that are considered to be traded unfairly from specific countries.[370]

3.6.4 Exhaustion of Rights under Article 6 of the TRIPS Agreement

Article 6 of the TRIPS Agreement, related to the exhaustion of IP, permits any Member to admit parallel imports irrespective of the type of applicable IP rights. As a general doctrine, the exhaustion of rights in IP law imposes limitations on the rights of an IP holder or owner (of a patent, copyright or trademark), in order to control the

[369] Richard Senti and Patricia Conlan, *WTO: Regulation of World Trade after the Uruguay Round* (Schulthess Polygraphischer Verlag 1998) 39.
[370] WTO, 'Understanding the WTO' <http://www.wto.org/english/thewto_e/whatis_e/tif_e/tif_e.htm> accessed 5 November 2016.

disposition of a good after the good has been sold by or under the authority of the IP owner.[371]

This doctrine remunerates the IP owner through the reward he receives, and at the same time allows the free disposition and movement of chattels and prevents IP rights from unduly disrupting the distribution system.[372]

The concept behind Article 6 is thus that the title-holder 'exhausts' his/her rights after the sale of a protected product through which he/she obtained remuneration for the IP content of that product. The application of this principle may make it possible to acquire goods legitimately in a foreign country at prices lower than those charged domestically for the same goods, thus benefiting users and consumers.[373]

3.6.5 The Objectives and Principles of the TRIPS Agreement under Articles 7 and 8

a) The negotiations on the objectives and principles during the Uruguay Round

Most of the countries taking part in the negotiation of the TRIPS Agreement contributed to the principles and objectives in the text of the Agreement. It is therefore important to indicate the relevant submissions made by the countries in the Uruguay Round, in order to have the full background to Articles 7 and 8.

The EU pointed out during the negotiation period that the TRIPS Agreement might be criticised for limiting policy options on public health matters. The Agreement's

[371] James B Kobak Jr, 'Exhaustion of Intellectual Property Rights and International Trade' [March 2005] 5(1) Global Economy Journal.
[372] ibid.
[373] UNCTAD 'Training Tools on the TRIPS Agreement: The Developing Countries Perspective' (2002) < http://unctad.org/en/Docs/ditctncdmisc17_en.pdf> accessed 15 January 2017.

objectives and principles, as set out in Articles 7 and 8, give Members a sufficiently wide margin of discretion as to how the Agreement is implemented. For example, the flexibility provisions, like the transitional arrangements, allow countries to have an IP regime that fits with their policy concerns and that is capable of responding to public health concerns, while at the same time preserving an adequate level of IP protection.[374]

The EU raised some concerns in this regard. Article 7 refers to 'social and economic welfare' as an objective of the TRIPS Agreement, while Article 8 allows Members to take measures necessary to protect public health, provided such measures are consistent with the provisions of the Agreement. Articles 7 and 8 were 'clearly not drafted as general exception clauses but they are important for interpreting other provisions of the Agreement, including where measures, such as compulsory licences, are taken by Members to meet public health objectives'.[375]

Argentina argued at the TRIPS Council that implementing the TRIPS provisions in an unbalanced manner might lead to the prioritising of one party's interests and rights, with other parties' interests and rights being ignored. This 'will lead others to react in a way that could jeopardize the global system of rules as a whole'.[376] Argentina also advised that it 'should be made clear before it is too late that excessive demands are

[374] TRIPS Council, 'Special Discussion on Intellectual Property and Access to Medicines, IP/C/M/31' (2001) <https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=90911&CurrentCatalogueIdIndex=0&FullTextSearch=> accessed 15 January 2017.
[375] ibid.
[376] ibid.

not sustainable and that the destruction of the global system of rules is in no one's interest'.[377]

Argentina stated that Articles 7 and 8 recognise that 'a private right cannot be made to prevail over a social benefit such as health'. Then Articles 7 and 8 contain a set of objectives, including the prevention of any abuse of IP rights by their holders, the avoidance of the resort to practices that unjustifiably limit trade or are detrimental to TOT, the promotion of technological innovation, the encouragement of the transfer and dissemination of technology and the establishment of measures to protect public health and nutrition.[378]

India played a major role in the Uruguay Round negotiations. India noted that the protection of public health and nutrition is a fundamental principle of the TRIPS Agreement, as mentioned in Article 8.[379] India criticised this formulation, considering it to be curious, and raised an important question of why such a provision was included without every party agreeing to its contents. India highlighted that the TRIPS Agreement 'appears to suggest that Members can protect public health only if the measures taken by them are consistent with the TRIPS Agreement. The implication is that, if by any chance the measures taken by a Member are deemed inconsistent with the TRIPS Agreement, then it would not be possible for that Member to have resort to those measures to protect public health.' India believed that '[b]oth protection of the rights of the right holders and protection of public health

[377] ibid.
[378] ibid.
[379] ibid.

are important objectives in themselves and one cannot be espoused at the expense of the other'.[380]

In addition, India confirmed that 'a principle which, inter alia, incorporates an element of exception as well, cannot be tested against the yardstick of consistency with other provisions of the Agreement'.[381] India also drew a comparison with how the TRIPS Agreement dealt with other issues such as the protection of the environment, stating that 'in areas like protection of environment (protection of plant and animal life), Article XX of the GATT gives Members the right to deviate from fundamental principles such as MFN and national treatment, provided the requirements in the Chapeau of Article XX which relate to avoidance of arbitrary or unjustifiable discrimination or disguised restriction on international trade are met by the Member'.[382]

India emphasised the importance of Articles 7 and 8 as aids for interpretation, as set out in the VCLT. In addition, it said that the TRIPS Agreement should be examined on the basis that promoting the protection of IP is not to be seen as the sole objective of the Agreement. India believed that there are many other aspects that should be taken into consideration, like 'whether or not public policy objectives based on Articles 7 and 8 have been adequately met or not'.[383]

India raised the issue of the possible misinterpretation of Articles 7 and 8, stating that '[t]he real concern both in the international civil society and in national jurisdictions is

[380] ibid.
[381] ibid.
[382] ibid.
[383] ibid.

that the TRIPS Agreement in its current form may be misinterpreted by some as promoting one at the expense of the other. This concern must be taken seriously by the TRIPS Council.' [384]

Among the countries of the Middle East, Egypt submitted that Articles 7 and 8 allow governments to adopt measures necessary to protect public health and nutrition and to prevent the abuse of IP rights including the resort to anti-competitive practices. Nevertheless, steps to protect IP under the TRIPS Agreement are restricted '– but not totally neutralized – by the requirements that they must be consistent with the provisions of the Agreement'.[385]

On behalf of the LDCs, Tanzania raised some important issues with regard to Articles 7 and 8. Regardless of how fundamental Article 7 is, 'it encapsulates the need for a judicious balance between the need to provide an incentive for invention and research on the one hand and the overriding need to apply the knowledge and technology for the social economic welfare'. Nevertheless, Tanzania emphasised, as did Egypt, the importance of good interpretation for the purpose of protecting human life and decent human values. In its view, IP protection should not result in threatening human life.[386]

Tanzania believed that Article 8 was intended to give least developed countries the maximum flexibility in order to adopt measures to meet the challenges of killer diseases. This should be permitted without restriction and without reference to the

[384] ibid.
[385] ibid.
[386] ibid.

statement that such measures must be consistent with the provisions of the Agreement.[387]

In contrast to the above concerns, the USA believed that the TRIPS Agreement had struck a proper balance between offering incentives for innovation and ensuring that there was access to necessary medicines.[388] The USA stated that, in some areas, the TRIPS Council discussions report that a strong patent regime can produce other benefits for countries, regardless of whether the countries are developed or developing. An example of these benefits is attracting investments and market entry by innovative companies through providing the required patent protection.[389]

The USA clarified during the negotiation of these Articles that patents usually provide greater capacity for the innovator to compete based on the innovation. Therefore, if the innovator cannot use the innovation to provide a market advantage, there is a disincentive to enter the market, especially when others charge lower prices.[390]

The USA also explained how patents systems should not impede research and development activities. Under a strong patent protection system, an innovator must disclose all the technical details of the invention in order to obtain a patent, and this requirement is embodied in Article 29 of the TRIPS Agreement. ‘This disclosure stimulates a significant flow of information to the public, including competing

[387] ibid.
[388] ibid.
[389] ibid.
[390] ibid.

manufacturers'. [391] As a result, patent protection encourages more innovation and creativity.[392]

All these political, legal and economic concerns with regard to the wording of Articles 7 and 8 show the importance of these principles and objectives for the interpretation of the TRIPS provisions, as will be further explained in the next point.

b) The importance of the objectives and principles

The TRIPS Agreement sets minimum standards for IP protection. Today, there are 164 Members of the WTO and therefore 164 parties to the TRIPS Agreement.[393] The effect of this Agreement is to create international patent laws within certain agreed standards to benefit all countries, which has been described as patent harmonisation. One of those standards, as an example, is that 'patents be given for a minimum of 20 years, for products and processes; and that pharmaceutical test data be protected against "unfair commercial use"'.[394]

This harmonisation of IP law has been described as a 'one-size-fits-all' approach. As it moves forward it seeks to apply higher standards than the TRIPS standards, through a combination of multilateral discussions on a substantive patent law treaty and bilateral treaties and negotiations. Whether or not this approach is beneficial to

[391] ibid.
[392] ibid.
[393] WTO, 'Members and Observers' (WTO, n.d.) <https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm> accessed 11 February 2017.
[394] Rohan K. George, 'Does One Size Fit All? A Comparative Study to Determine an Alternative to International Patent Harmonization' [2009] Paper 28(Nd) Cornell Law School Inter-University Graduate Student Conference Papers.

all countries is an important question that needs to be answered on the basis of an analysis of the basic TRIPS provisions and their effect on developing countries.[395]

It is inappropriate that an international agreement adopts one-size-fits-all approach since, in order to succeed, it has to 'be flexible enough to accommodate the world's cultural and jurisprudential diversity'.[396]

The one-size-fits-all approach is highly problematic. It imposes the same obligations on different countries with different levels of development. This was, in fact, the reason behind the incorporation of a number of flexibilities in the TRIPS Agreement that facilitate development and protect the public interest.[397]

Articles 7 and 8 of the TRIPS Agreement are promising provisions for developing countries. Developing countries disagreed with IP protection being included in the WTO regime. Brazil and some other developing countries spent the first years of the Uruguay Round objecting to the incorporation of IP rights in the GATT environment.[398] The textual balancing of interests in the two Articles is directed towards the technological aspects of IP, as the result of promises that were made to encourage developing countries to become parties to the WTO Agreement.

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[395] ibid.

[396] Graham Dutfield, ' Protecting Traditional Knowledge: Pathways to the Future' [April 2006] (n.d) International Centre for Trade and Sustainable Development (ICTSD) <http://www.ictsd.org/downloads/2008/12/protecting-traditional-knowledge_pathways-to-the-future.pdf> accessed 21 May 2017

[397] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.

[398] Denis Borges Barbosa 'TRIPS Art. 7 and 8, FTAs and Trademarks' (2006) < https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=889107 > accessed 30 January 2017.

Accordingly, both Articles reflect the tensions inherent in the negotiations between developed and developing countries. The concern of the developing countries was that only one side of the TRIPS objectives, the protection of technological assets, would be pursued by the developed Member countries, while TOT and the active promotion of developmental interests were 'relegated to a secondary, and perhaps even illusory, status'.[399]

The TRIPS Agreement sets out a number of objectives in Article 7. The enforcement of IP protection should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare and to the balance of rights and obligations.[400]

Accordingly, technological innovation, the transfer and dissemination of technology, and the production and use of technological knowledge are the first three objectives, and their main focus is technological development. At the same time, these objectives may not affect all types of IP rights.[401] The two objectives related to social and economic welfare and the balancing of rights and obligations apply to all types of IP rights, as they have a broader context.[402]

The principles of the TRIPS Agreement are set out in Article 8, which is entitled 'Principles'. The principles are mentioned in two provisions of Article 8. Article 8.1

[399] UNCTAD Recourse Book, 'Objectives and Principles' (2004) <http://www.iprsonline.org/unctadictsd/docs/RB_Part1_Nov_1.5_update.pdf> accessed 22 March 2015.
[400] TRIPS Agreement (entered into force 1 January 1995) art 7.
[401] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.
[402] ibid.

empowers Members of the WTO to adopt measures in the interests of the protection of public health and nutrition, and the promotion of the public interest in certain sectors of vital importance to their socio-economic and technological development. The measures that are adopted must be consistent with the provisions of the TRIPS Agreement.[403]

Article 8.2 states that appropriate measures, as long as they are consistent with the provisions of the TRIPS Agreement, may be needed for the prevention of the abuse of IP rights by right holders or the resort to practices that unreasonably restrain trade or adversely affect TOT.[404] It is important to note that the condition that any measures must be consistent with the provisions of the TRIPS Agreement exists only in the TRIPS Agreement: neither the Paris Convention nor the Berne Convention contains comparable statements.[405]

The objectives and principles of the TRIPS Agreement are of great importance as they reflect various issues that are important to developing countries. First, the objectives and principles actually include an express recognition of the policy objectives that are fundamental to the new international IP law established by the TRIPS Agreement. Moreover, the objectives and principles of the TRIPS Agreement address the wider public interest agenda, and are not just peripheral objectives and principles.[406]

[403] TRIPS Agreement (entered into force 1 January 1995) art 8.1.
[404] TRIPS Agreement (entered into force 1 January 1995) art 8.2.
[405] World Intellectual Property Organization (WIPO), 'Implication of the TRIPS Agreement on Treaties Administered by WIPO' [2012] ND(ND) WIPO Publication No. 464 E 1-83.
[406] Alison Slade, '*Articles 7 and 8 of the TRIPS Agreement: A Force for Convergence within the International IP System*' (2011) The Journal of World Intellectual Property Vol. 14, No. 6 413–440.

Second, the objectives and principles of the TRIPS Agreement encourage the convergence of policy objectives, which facilitates greater coherency within the international system.[407] In other words, the TRIPS Agreement establishes, with its objectives and principles, a link between the IP side and other areas of trade and issues of socio-economic importance. Thus, these two Articles work as a foundation for the new international IP law.

Third, Article 7 requires that IP protection and enforcement should contribute to the promotion of social and economic welfare and the transfer and dissemination of technology. IP protection and enforcement should also achieve a balance between rights and obligations and should be advantageous to both producers and users of technological knowledge. Article 7 and Article 8 can be considered as 'important tools for restoring the balance of the international intellectual property system'.[408]

These objectives are linked with Article 8.1, which acknowledges that Members may need to adopt measures that are 'necessary to protect public health and nutrition and to promote the public interest in sectors of vital importance to their socio-economic and technological development'.[409] Therefore, Articles 7 and 8 were intended to import a normative and balanced approach to international IP law in the TRIPS era.[410]

[407] ibid.
[408] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.
[409] ibid.
[410] ibid.

In sum, the influence of Articles 7 and 8 now extends beyond the confines of the TRIPS Agreement. Their ultimate effect is to elevate both the legal and the political relevance of these provisions within the international IP system more generally.[411]

c) The Context of the Objectives under Article 7 of the TRIPS Agreement

Although the comments and points of the developing and least-developed countries were not taken up in the final text of Article 7, there are still some benefits that can be achieved for both types of country in the current text of this Article.

Article 7 provides that IP protection should contribute: to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

TOT refers, in general, to the transmission of technology in different forms and methods; dissemination is similar to the diffusion of innovation, which is explained in the previous chapter.[412] In fact, IP protection can be reduced to the diffusion of innovations, because it allows an IP holder to charge for the advantage of the exclusive rights.[413]

[411] ibid.
[412] See Chapter 2 , p. 42.
[413] UNCTAD Recourse Book, 'Objectives and Principles' (2004) < https://www.iprsonline.org/unctadictsd/docs/UNCTAD_frontmatter.pdf> accessed 22 January 2017.

Article 7 is intended to benefit all countries by providing incentives to introduce new inventions and creations.[414] It is obvious that this Article reflects the requirement for a balanced approach to IP protection that takes into account the interests of both producers and users.[415] Accordingly, IP protection has two aims: the first is to contribute to the promotion of technological innovation, while the second is to encourage the transfer and dissemination of technology. These two aims should achieve a mutual advantage and benefits for producers and users.

The most important point here is that Article 7 recognises that the protection and enforcement of IP rights should contribute to the transfer and dissemination of technology.[416] Thus, Article 7 shows explicitly that IP protection and enforcement 'are not an end in themselves'.[417] Members are to achieve the objectives through the protection and enforcement of IP rights. Therefore protection is just a tool for the objectives and should encourage innovation and creation. The wording of Article 7 illustrates this: 'The protection . . . should contribute . . . ' means that protection of this nature does not automatically lead to innovation and technology, but that countries should strive for those objectives using this tool.[418]

The problems of the lack of scientific and technological capability or the lack of financing for innovative activities are clearly identified in this Article.[419] This leads to the concept of the 'mutual advantage of producers and users of technological

[414] ibid.
[415] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 13.
[416] ibid 24.
[417] UNCTAD Recourse Book, 'Objectives and Principles' (2004) < https://www.iprsonline.org/unctadictsd/docs/UNCTAD_frontmatter.pdf> accessed 22 January 2017.
[418] ibid.
[419] ibid.

knowledge' having a particular importance, in particular when looking at the status of developing countries, as they are only usually the users of technologies that have already been produced in developed countries.

Neither the TRIPS Council, the WTO Panels nor the WTO Appellate Body has defined the objectives mentioned under this Article. However, on 19 December 1997, the European Community (EC) (now the European Union) requested consultations with Canada in respect of the alleged lack of protection for inventions in the area of pharmaceuticals granted by Canada under the relevant provisions of the Canadian implementing legislation, in particular the Patent Act. The EC alleged that Canada's legislation was not compatible with its obligations under the TRIPS Agreement, because it did not give full protection to patented pharmaceutical inventions for the entire duration of the term of protection envisaged by Articles 27.1, 28 and 33 of the TRIPS Agreement.[420]

This case is known as '*Canada – Patent Protection of Pharmaceutical Products'*, and the Panel issued its report on the case on 17 March 2000.[421] In the report, the contents of Articles 7 and 8 were explored to some extent. Although the EC did not dispute the stated goal of achieving a balance within the IP system between important national policies, it took a very different interpretation of Articles 7 and 8.[422] The Panel contended that Articles 7 and 8 are statements that reflect the objective of balancing the TRIPS goals, as laid out in the negotiations that took place before the

[420] WTO, 'Dispute Settlement: Dispute DS114: Canada – Patent Protection of Pharmaceutical Products' <http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds114_e.htm> accessed 29 December 2014.
[421] ibid.
[422] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.

adoption of the TRIPS Agreement.[423] The Panel stated that: '[a]ccording to the EC, to view Article 30 as an authorization for governments to "renegotiate" the overall balance of the Agreement would involve a double counting of such socio-economic policies'.[424]

Consequently, the Panel reached the result that 'the last phrase of Article 8.1 requiring that government measures to protect important socio-economic policies' must 'be consistent with the obligations of the TRIPS Agreement'.[425] The EC had referred to the Preamble to the TRIPS Agreement, in particular the wording in Article 1.1 that demonstrates the basic purpose of the TRIPS Agreement. The Panel's opinion was that this basic purpose was to 'lay down minimum requirements for the protection and enforcement of intellectual property rights'.[426] Moreover, the Panel found that '[b]oth the goals and the limitations stated in Articles 7 and 8.1 must obviously be borne in mind when doing so as well as those of other provisions of the TRIPS Agreement which indicate its object and purposes'.[427]

On one view, the key findings of the Panel were disappointing because they perpetuate the unfairness of the TRIPS Agreement and take away the discretion needed by the Members to develop their public policies.[428] As shown in the Panel report, the Panel did not explain, nor did it add any definitive interpretation of, Articles 7 and 8.

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[423] WTO, 'The Panel Report' <https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=29169&CurrentCatalogueIdIndex=0&FullTextSearch=> accessed 25 December 2016.
[424] ibid.
[425] ibid.
[426] ibid.
[427] ibid.
[428] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.

Promoting technological innovation and the transfer and dissemination of technology are objectives of the TRIPS Agreement. The WTO Members, the TRIPS Council, the Panel and Appellate Body must carry out those objectives by means of proper implementation. This shall be done in a way to enable these objectives to be implemented in practice either through building a relationship between developed and developing countries, or by setting clear rules and procedures for how to achieve the objectives throughout the terms and conditions of the TRIPS Agreement. Those clear rules and procedures should include guidelines for how the TRIPS Council and the Appellate Body should ensure they are applied. TOT will not be achieved through the general concepts described in these objectives. These objectives must be implemented in practice through strategies for implementation that are under the WTO's control.

In fact, the use of the word 'should' and the references to 'social and economic welfare' and 'a balance of rights and obligations' in Article 7 provide a reminder of many obligations under the TRIPS Agreement that are linked to these objectives and principles, and compliance with other TRIPS obligations should always be connected to these two Articles. Accordingly, the word used is not 'shall': the obligation is a soft obligation because of the use of the word 'should'. In other IP matters, the word 'shall' or 'must' is used.

d) The Principles in Article 8 of the TRIPS Agreement

Article 8 of the TRIPS Agreement must be read together with the Preamble. However, the text of this Article differs from that of Article 7, as it allows the WTO

Members to take specific actions for the purpose of protecting public health or adopting measures against any abuse of IP rights.[429]

Accordingly, this Article can be a basis for more exceptions, but it must be borne in mind that these exceptions are limited by the use of the phrase 'consistent with the provisions of this Agreement' in both paragraphs of Article 8.[430] This statement was added in the last stages of the Uruguay Round negotiations. Article 8.1 gives WTO Members discretion with regard to adopting internal measures that they consider being necessary to protect public health and nutrition and to promote the public interest in sectors of vital importance to their socio-economic and technological development.[431]

It is worth clarifying that any such measures must not violate the terms of the Agreement. In other words, they are presumed to be consistent with the TRIPS Agreement. Hence, any Member that wishes to challenge another Member's measures bears the burden of proving inconsistency. The phrase 'promoting the public interest in sectors of vital importance to their socio-economic and technological development' gives WTO Members substantial discretion in relation to the kind of measure that may be adopted and the subject matter of such measures.[432]

[429] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 237.
[430] ibid 238.
[431] UNCTAD Recourse Book, 'Objectives and Principles' (2004) < https://www.iprsonline.org/unctadictsd/docs/UNCTAD_frontmatter.pdf> accessed 22 January 2017.
[432] Ibid.

Under Article 8.2, any appropriate measures may be taken that are consistent with the provisions of the Agreement and that are needed to prevent the abuse of IP protection by right holders or the resort to practices that unreasonably restrain trade or adversely affect TOT. This Article reflects the demands presented by most of the developing countries during the Uruguay Round negotiations. Nevertheless, it is still limited by the use of the phrase 'consistent with the provisions of this Agreement.'[433]

e) New Developments during the Doha Conference

The WTO Members issued two important decisions during the Doha Conference: the first is the Doha Ministerial Declaration (the 'Ministerial Declaration') and the second is the Declaration on the TRIPS Agreement and Public Health (the 'Doha Declaration').[434] These two decisions concern the objectives and principles set out in Articles 7 and 8. The Doha Declaration was adopted in 2001 by the Doha Ministerial Conference in response to growing concerns about the implications of the TRIPS Agreement for access to medicines.

In fact, lack of access to medicines is an important concern for developing countries.[435] In 2003, the World Health Organization (WHO) estimated that, in 1999, 30 percent of the world's population lacked access to essential medicines. In addition, the United Nations reported that essential medicines were available for only

[433] Susy Frankel and Daniel Gervais, 'Plain Packaging and the Interpretation of the TRIPS Agreement' <http://www.vanderbilt.edu/jotl/manage/wp-content/uploads/Gervais-Final-Review.pdf> accessed 27 February 2015.
[434] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.
[435] Carmen Otero García-Castrillón, 'An Approach to The WTO Ministerial Declaration on the TRIPS Agreement and Public Health' [2002] 35(1) Journal of International Economic Law 212-219

34.9 percent of public health services in 27 developing countries.[436] It was stated clearly in the Doha Declaration that the WTO Members had reached an agreement that the TRIPS Agreement could not prevent a party from protecting public health through adopting appropriate measures. The Doha Declaration also stated that:

> while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO members' right to protect public health and, in particular, to promote access to medicines for all.[437]

The Doha Declaration stated that WTO Members could use the flexibilities in the TRIPS Agreement, including compulsory licensing, to cope with public health problems.[438] The Ministerial Declaration stated that 'in undertaking the work outlined in this paragraph, the TRIPS Council shall be guided by the objectives and principles set out in Articles 7 and 8 of the TRIPS Agreement and shall take fully into account the development dimension'.[439]

f) General Analysis of Articles 7 and 8 of the TRIPS Agreement

Generally speaking, Articles 7 and 8 are set out in a way that is far from working to enforce the international transfer of technology to developing countries or to LDCs. Accordingly, we can say that the current language may not foster any TOT from developed countries to developing countries.

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[436] Hiroko Yamane, *Interpreting TRIPS: Globalisation of Intellectual Property Rights and Access to Medicines* (Hart Publishing 2011) 3.
[437] WTO < https://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm > accessed 12 November 2016.
[438] Hiroko Yamane, *Interpreting TRIPS: Globalisation of Intellectual Property Rights and Access to Medicines* (Hart Publishing 2011) 304.
[439] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.

Interpretation plays an essential role in this regard. In order to have balanced rights and obligations in the TRIPS Agreement, Articles 7 and 8 should always be complied with when a country is implementing any of the TRIPS Agreement obligations. Accordingly, we might say that there are still a number of ways to use these two Articles to promote TOT and for social and economic welfare and to preserve the balance of the IP system.[440]

First of all, Articles 7 and 8 are a starting point and a guideline for any interpretation made by the Panel or the Appellate Body in relation to any of the TRIPS Agreement provisions. When we talk about the principles and objectives of a treaty, this is meant in general terms. This generality means that the objectives and principles apply to the whole treaty, and that whenever there is room for interpretation they shall always be taken into consideration.

Second, these two Articles might be used to strengthen some obligations in the TRIPS Agreement in order to challenge any lack of balance between the rights and the obligations.[441]

Third, these Articles may become more effective if the WTO bodies, other international organisations and developing countries always tried to refer to them in

[440] PK Yu, 'The Objectives and Principles of the TRIPS Agreement' (2013) < http://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1456&context=facscholar > accessed 2 January 2016.
[441] ibid.

order to confirm that the TRIPS Agreement fulfils the objective of contributing to the dissemination and TOT.[442]

3.6.6 Article 66

Article 66.1 is related to the transition period of ten years, which applied to all obligations except those arising under Articles 3, 4, and 5. The TRIPS Agreement gave certain WTO Members a transition period for implementing the Agreement and complying with its terms and conditions. The period depended on the level of development of the country, as stated in Articles 65 and 66.[443]

Article 65.1 states that developed country Members had to comply with the TRIPS provisions from the date of entry into force of the Agreement, which was 1 January 1995. Article 65.2 gave developing countries a general transition period of five years, which ended on 1 January 2000, for transposing the terms and conditions of the TRIPS Agreement into their legal and administrative systems.

In addition, another transition period, ending on 1 January 2005, was given under Article 65.4 in special circumstances to a developing country Member if that Member required a delay in the application of the TRIPS Agreement obligations related to product patents in the field of pharmaceutical and agricultural chemical inventions.[444] The TRIPS Agreement contains a number of flexible terms and conditions for the least developed countries. In order to determine whether a country is classified as a

[442] ibid.
[443] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* 21.
[444] ibid 21.

developing or least developed country (LDC), the WTO uses the United Nations List of LDCs.[445]

Article 66.1 granted a transition period to LDC WTO Members of ten years, until 1 January 2006, for complying with the terms and conditions of the TRIPS Agreement.[446]

Article 66 states the reasons behind these extensions of time, which are mainly the special needs and requirements of LDCs as they suffer from economic, financial and administrative constraints. The Article also explicitly mentions that the transitional periods were given for the purpose of granting these countries some flexibility to create a viable technological base.

There was flexibility for requesting further extensions, and further extensions were granted, as follows:

1- On 29 November 2005, the TRIPS Council extended the transitional period for LDCs to 1 July 2013 or such date as the country ceased to be an LDC, whichever date was earlier.
2- More recently, as set out in the Doha Declaration, the TRIPS Council decided to extend the transition period for LDCs to 2002 for certain obligations with respect to pharmaceutical products until 1 January 2016.[447]

[445] ibid 22.
[446] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 690.
[447] Antony Taubman, Hannu Wager and Jayashree Watal (eds) *A Handbook on the WTO TRIPS Agreement* (Cambridge University Press 2012) 22.

3- On 11 June 2013 the TRIPS Council extended the transitional period for LDCs that was ended in 1 July 2013 to 1 July 2021, or when a particular country of the LDCs ceases to be in an a LDC before 2021, whichever date is earlier. [448]

Article 66.2 establishes a mandatory, binding, and positive legal obligation on developed-country members of the WTO. Developed-country members agree to provide incentives, financial or non-financial, to enterprises and institutions in their territories for the purpose of promoting and encouraging TOT to LDC members. This is for the purpose of assisting these members to create a sound and viable technological base.

This Article means that developed-country members are not obliged to carry out TOT themselves. This is shown clearly in Article 66.2. In fact, their obligation is satisfied if they provide incentives to their enterprises and institutions to encourage technology flows to LDC Members.[449] Accordingly, TOT is not obligatory for them, as long as they satisfy their obligations to provide incentives to their technology holders.

In addition, this obligation is limited to transfer to LDCs, and there is no such provision for developing countries, even though the developing countries may benefit more from such incentives in the international market. They can benefit more

[448] WTO, Extension of the Transition Period Under Article 66.1 for Least Developed Countries Members, adopted in 11 June 2013, Art 1
DECISION OF THE COUNCIL FOR TRIPS OF 11 JUNE 2013
See also: Wto, 'Responding to least developed countries' special needs in intellectual property' (*INTELLECTUAL PROPERTY: LEAST DEVELOPED COUNTRIES*, n.d)<https://www.wto.org/english/tratop_e/trips_e/ldc_e.htm> accessed 28 October 2017

[449] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2' (ICTSD Programme on Innovation, Technology and Intellectual Property) (2011) < http://www.ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf > accessed 24 December 2016.

because their level of development is higher than that of LDCs, and therefore it is easier for them to improve. Thus, the text does not meet the calls made by developing countries during the Uruguay Round negotiations, when they accepted the protection of IP as part of the bargain. In fact, the developing countries were convinced to sign the TRIPS Agreement by the promise that IP protection would 'stimulate local innovation in the developing world, and lead to increased investment and TOT from the developed to the developing world'.[450] Therefore, it is clear that the objectives mentioned in Article 7 did not run throughout the TRIPS Agreement. The obligation here is only an obligation with respect to the LDCs, as noted earlier.[451]

It could be said that the way in which this obligation is drafted is questionable. This Article does not include executive rules and regulations that must be observed. Moreover, it has been argued that Article 66.2 obliges developed countries not only to provide incentives for TOT but also to ensure the effective functioning of such incentives.[452] This is why it is crucial to understand the impact of such incentives and 'how well the incentives are functioning, how they can be improved, and how Article 66.2 can be made into a more effective instrument for technology transfer'.[453]

The issue also relates to the definitions in the TRIPS Agreement: the terms 'developed', 'developing' and 'least-developed' country are not defined at all under

[450] Andrew Michaels, 'International Technology Transfer and TRIPS Article 66.2: Can Global Administrative Law Help Least-Developed Countries Get What They Bargained For?' (2009) Georgetown Journal of International Law 41 223.
[451] Sisule F. Musungu, 'The TRIPS Agreement and Public Health' in Carlos Correa and Abdulqawi A. Yusuf (eds) *Intellectual Property and International Trade* (2nd edn, Wolters Kluwer 2008) 445.
[452] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2' (ICTSD Programme on Innovation, Technology and Intellectual Property) (2011) <http://ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf> accessed 24 December 2014.
[453] ibid.

the TRIPS Agreement. The WTO defines LDCs as those countries specified as such by the UN, while the WTO has no definition at all for 'developed' or 'developing' country. In any agreement that imposes an obligation, it must be made clear who has to perform that obligation. According to some scholars, it can be concluded that the TRIPS Agreement suffers from a lack of clarity regarding which particular Members are actually obliged to encourage TOT under Article 66.2, and this affects the effective implementation of the Article.[454]

At the TRIPS Council in 1998, Haiti requested further information from other WTO Members regarding their implementation of Article 66.2. The Members began to submit regular reports after the 2001 Ministerial Conference in Doha mandated that the TRIPS Council put in place a monitoring mechanism for Article 66.2. Subsequently, the TRIPS Council decided, in February 2003, that developed country Members must submit full reports on the activities and actions they had undertaken to meet their obligations, every three years starting from 2003.[455] These reports must explain, in detail, how the incentives given by the Member are functioning in practice.[456]

When evaluating the annual reports submitted by developed countries, it can be seen that the developed countries have adopted a broad definition of 'TOT'; for example, in New Zealand's submissions to the TRIPS Council, it was stated that:

[454] Suerie Moon, 'Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs? An Analysis of Country Submissions to the TRIPS Council (1999–2007)' (ICTSD Programme on Innovation, Technology and Intellectual Property) (2008).
[455] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2' (ICTSD Programme on Innovation, Technology and Intellectual Property) (2011) < http://www.ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf > accessed 24 December 2016.
[456] WTO, 'TRIPS: Issues: Technology Transfer' <http://www.wto.org/english/tratop_e/trips_e/techtransfer_e.htm> accessed 2 January 2017.

> Technology transfer is interpreted in this report broadly to include training, education and know-how, along with any capital component. Using the United Nations definition, New Zealand sees four key modes of technology transfer: (i) physical objects or equipment; (ii) skills and human aspects of technology management and learning; (iii) designs and blueprints which constitute the document-embodied knowledge on information and technology; and (iv) production arrangement linkages within which technology is operated.[457]

Another example is given by some researchers of how Article 66.2 is a soft legal obligation, and cannot be enforced by developing countries. In recent years, it has been noticed that some developed countries are taking the initiative to pursue free trade agreements with selected developing countries. They assert that this is for the purpose of intensifying and deepening the WTO agreements, as those FTAs can be characterised as TRIPS-Plus agreements. In contrast to the main purpose of other FTAs, which is to increase market access, the aim of these particular FTAs is to increase the IP protection beyond the minimums given in the TRIPS Agreement. This means that the same mechanism is used here to negotiate more and more IP protection, and that trade issues and investment are offered in exchange for the additional IP protection in a single agreement.[458]

To have a real TOT, many issues need to be carefully studied and clarified in the development agenda for the TRIPS Agreement, as discussed below.

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[457] Suerie Moon, 'Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2: ICTSD Programme on Innovation, Technology and Intellectual Property. ICTSD' (2011) <http://ictsd.org/downloads/2011/05/technology-transfer-to-the-ldcs.pdf> accessed 11 January 2017.

[458] Pedro Roffe, Christoph Spennemann and Johanna von Braun, 'Intellectual Property Rights i Free Trade Agreements: Moving Beyond TRIPS Minimum Standards' in Carlos Correa (ed) *Research Handbook of the Protection of Intellectual Property under WTO Rules: Intellectual Property in the WTO, Volume I* (Edward Elgar 2010) 273.

First, the basis for encouraging TOT needs to be clarified, since each developing country has unique needs for technologies, and these should be taken into consideration in evaluating whether or not the developed world can facilitate TOT. For example, an oil-producing developing country such as Kuwait or Saudi Arabia may require a special kind of technology that increases oil and gas production, while technologies related to agriculture and industry would not provide the same benefit.

Second, the provision of incentives for TOT should be obligatory for developing countries as well as LDCs.

Third, the obligation to open channels for TOT should be clearly linked to the level of IP protection in the developing country. Any country that shows an improvement in IP protection should have more channels for TOT. According to some researchers, the TRIPS Agreement has nothing to do with market access, and will never allow market access unless it is recognised that innovation is a key aspect here.[459]

Fourth, enforcement is quite important if there is to be a serious TOT. Developing countries should be able to complain through the DSU about any developed country that is not meeting its obligation to facilitate TOT.

3.6.7 Article 67: Technical Cooperation

Article 67 of the TRIPS Agreement requires developed-country members to provide, on request and on mutually agreed terms and conditions, technical and financial cooperation in favour of developing and least-developed country members. It also refers to 'cooperation for development'. A number of decisions have been issued in

[459] Antony Taubman, *A Practical Guide to Working with TRIPS* (Oxford University Press 2011) 73.

regard to Article 67.[460]

Technical cooperation, or cooperation for development, takes place at the stage of the preparation of laws and regulations for compliance with TRIPS Agreement requirements. For example, support and expertise related to national offices for patents, copyrights and trademarks, and the training of personnel, may be given. [461]

Developed-country members have agreed to notify contact points in their administrations for such TRIPS-related technical cooperation. A number of members have also notified contact points specifically for technical assistance on TRIPS notifications.[462]

The information and the training required under the umbrella of technical cooperation must be effective and functioning. In other words, technical cooperation must be readily accessible. To facilitate the monitoring of compliance with Article 67, the developed-country members have agreed to present descriptions of their relevant technical and financial cooperation programmes and to update this information annually.[463]

This is not just a requirement for developed countries: intergovernmental organisations are also involved. Information from developed-country members, intergovernmental organisations and the WTO Secretariat about their technical cooperation activities in TRIPS is circulated in documents in the IP/C/W/ series.[464]

Cooperation with regard to technical assistance takes place between the WIPO and

[460] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 698.
[461] WTO, 'TRIPS: Technical Cooperation in the TRIPS Area', <http://www.wto.org/english/tratop_e/trips_e/intel9_e.htm> accessed 26 January 2017.
[462] ibid.
[463] ibid.
[464] ibid.

the WTO through seminars, workshops and conferences. In addition, they have entered into two important joint initiatives. The first joint initiative was in 1998, and was for the purpose of assisting developing countries to meet the deadline for implementing the TRIPS Agreement. The second joint initiative was in 2001 and was to assist LDCs.

The TRIPS Agreement does not provide a definition of technical assistance activities. However, the TRIPS Council provided some guidance on what IP-related technical assistance might involve on 26 April 1996, when it summarised the information on technical cooperation activities that had been presented by WTO members during the first year that the TRIPS Agreement had been in force.[465]

The TRIPS Council categorised technical assistance as: general assistance in the development of human resources, assistance in the preparation of laws and regulations on the protection and enforcement of intellectual property rights as well as on the prevention of their abuse, support regarding the establishment or reinforcement of relevant domestic offices and agencies, and other types of assistance, specifically the promotion of public awareness of IP and the exploitation of IP rights.[466]

Since there is 'no best-practice or internationally-shared guidelines in this regard, developed countries are free to decide which activities to prioritise financing for, and how best to design and deliver IP related technical assistance'. [467] The lack of definition of what activities are required, along with the absence of best practice

[465] Duncan Matthews and Viviana Munoz-Tellez, 'Bilateral Technical Assistance and the TRIPS Agreement: The United States, Japan and the European Communities in Comparative Perspective' (2006).
[466] ibid.
[467] ibid.

advice means that there is 'duplication of efforts or, at worst, conflicting advice'. [468]

In addition, by requiring developing countries to request assistance from developed country WTO Members, and by requiring the providers and recipients of technical assistance to mutually agree terms and conditions, there is a risk that Article 67 perpetuates a dependency culture. IP-related technical assistance subsequently provided by developed countries may be inappropriate for the specific conditions of a country.[469]

3.6.8 Article 69: International Cooperation

This Article requires WTO members to cooperate with each other for the purpose of eliminating the international trade in goods that infringe IP rights. For this purpose, the TRIPS Council agreed, on 21 September 1995, to adopt a common procedure for the notification of the contact points established by the Members for the purposes of Article 69. [470] This Article is intended to promote the exchange of information and cooperation between customs authorities with regard to IP piracy.[471]

3.7 Conclusion

International IP law is changing, and the regulations related to TOT are undergoing a corresponding change. Some special features of IP protection already existed in the era of the Paris and Berne Conventions. The world then shifted to the New International Economic Order (NIEO) in the 1970s, and, after a while, in the late 1980s and early 1990s, the WTO TRIPS Agreement began to be negotiated and the

[468] ibid.
[469] ibid.
[470] WTO, 'TRIPS: Technical Cooperation in the TRIPS Area' <http://www.wto.org/english/tratop_e/trips_e/intel9_e.htm> accessed 26 December 2016.
[471] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* (4th edn, Sweet & Maxwell 2012) 706.

Agreement was later issued. IP law is still evolving, and more improvements are needed to avoid having one-size-fits-all regulations.

TOT is a concept that requires more effort at the international level. The TRIPS Agreement did not achieve some of what the developing countries requested. As explained, the provisions related to TOT neither have any real effect on the process of TOT to developing countries nor push for such an effect. The provisions that are related to TOT are soft ones and are not a basis for obliging the developed world to assist in TOT.

The analysis of the TRIPS TOT provisions indicates that the new international rules and regulations for TOT, in particular, and for IP protection, in general, 'are bringing greater uniformity but not necessarily full harmonisation of national legislation and practices on the matter'.[472]

In addition, the enforcement procedure under the TRIPS Agreement is quite anomalous when considered from the point of view of developing countries. When a developing country has not met the minimum standards of IP protection, a developed country can make a complaint and force it to comply with the TRIPS Agreement through the DSU. Trade will also be affected if a developing country has not complied with the TRIPS Agreement. On the other hand, there can be no enforcement of the TRIPS Agreement against developed countries because there are no obligatory terms and conditions that would force them to transfer technology

[472] Carlos M. Correa, 'Pro-competitive Measures Under the TRIPS to promote Technology Diffusion in Developing Countries' in Peter Drahos and Ruth Mayne (eds), *Global Intellectual Property Rights: Knowledge, Access and Development* (OXFAM 2002) 54.

to developing countries. In fact, the interpretation of the Panels and the Appellate Body is a key element in this regard, and because the TRIPS Agreement has many gaps and ambiguities, the members have left many issues open to interpretation.[473]

When studying TOT, one must first look at the regulatory aspects, which we have tried to analyse in this chapter. The purpose of this chapter is to examine whether or not the current provisions of the TRIPS Agreement are good regulatory provisions that have made some improvements in TOT to developing countries. The second part of the study is to look at how TOT can be achieved in practice, using a case study or empirical approach, and this will be the subject of the next chapter.

[473] ibid.

Chapter 4

The legal framework for international transfer of ESTs

4.1 Introduction:

Despite the advantages of the industrial revolution, its effects on the environment are a real concern. The massive use of fossil fuels and the increasing amounts of GHG emissions by developed countries has resulted in environmental pollution and global warming.[474]

Scientifically this phenomenon is called climate change. Since the pre-industrial era in the 1850s, temperature measurements show a decrease in cold days and nights and an increase in warm days and nights over the last 50 years. Globally the temperature has become warmer by 8 degrees Celsius over this period, and may result in further 6 degrees Celsius rise in average temperatures by the end of this century, accompanied by more heat waves, floods and storms.[475]

So climate change is a serious global threat to sustainable development as a result of industrial activities in most developed countries. It requires immediate actions at the national level in each country to mitigate it effectively by all available means.[476]

[474] NAS, 'Climate Change Evidence & Causes' (NAS, N.D) <http://dels.nas.edu/resources/static-assets/exec-office-other/climate-change-full.pdf> accessed 23 March 2017
[475] B.Metz, 'Controlling climate change' (Controlling Climate Change , 26 October 2009) <http://controllingclimatechange.net/pubs/ControllingClimateChange_Study_Questions.pdf> accessed 10 April 2017
[476] Mohammad Dastbaz et al., Green Information Technology (Elsevier 2015); See also: Jean-François Masson, Climate Change Litigation and Law: Climate Change and its Causes, Effects and Prediction (Nova Science Publishers 2010)

Developing countries should participate in these actions while promoting more economic development.[477]

We noted in the previous chapter that the TRIPS Agreement incorporates provisions of TOT and IP protection to ensure balance between advantages for developed and developing countries. Nevertheless, we revealed that TOT provisions are soft and do not assist further activation.

Therefore, we have to examine how the UNFCCC addresses the international transfer of ESTs to developing countries in this chapter. In the following chapters, we will examine as case studies the international transfer of ESTs in a number of developing countries as per the UNFCCC classifications: Kuwait, the UAE and Jordan after providing an outline of the case studies in Chapter 5.

4.2 Sustainable Development as an international objective:

The climate has changed and will continue to change,[478] as long as energy use, deforestation, agriculture and industrial production continue to increase. All of these activities will result in increasing the GHG emissions in the atmosphere in most of the developed countries as it has already resulted in a hole in the ozone layer.[479]

Hence, the international community started to look for solutions to climate change. The idea of providing alternative sources of energy, like new renewable energy, such

[477] UNFCCC, 'Climate Change: Impacts, Vulnerabilities and adaptation in developing countries' (UNFCCC, N.D) <https://unfccc.int/resource/docs/publications/impacts.pdf> accessed 23 March 2017
[478] NOAA.gov, (Climate Change) http://www.nws.noaa.gov/om/brochures/climate/Climatechange.pdf, accessed 30 November 2015.
[479] Brunnee, J. *ACID Rain and Ozone Layer Depletion: International Law and Regulation*, Transnational Publishers, (1988) 35.

as solar, wind, hydro, rain, tides, waves and sunlight energy that work in a sustainable manner, began to gain more favour.[480]

Then, 'sustainable development' started to become a common objective in international law. The World Commission on Environment and Development defined sustainable development in 1987 as, 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. [481]

Achieving sustainable development on a global scale requires essential changes to be made to substantial technologies as a first step to move towards more efficient and cleaner technologies. The second step is improving the patterns and models used in both developed and developing countries.[482] Hence, the role of international transfer of ESTs becomes important in achieving more sustainable development.

4.3 The development of international transfer of ESTs in the climate change regime:

Both developed and developing countries share mutual interests in promoting TOT as they can benefit on the same level and in several ways. Nevertheless, it is important to highlight the objectives of such a transfer as per developed countries' view. Developed countries are the exporters of ESTs and consequently, if they only target to meet their international obligations for mitigating and adapting climate change, the transfer of EST technology will not work successfully. So, developed

[480] Wilkins, G. *Technology Transfer for Renewable Energy: Overcoming Barriers in Developing Countries*, The Royal Institution of International Affairs, (2002) 47.
[481] Cooke, R. 'Urban and Architectural Sustainability in the Gulf'. In G. Katodrytis and K. Mitchel (eds.), *UAE and The Gulf: Architecture and Urbanism Now*, Architectural Design, (2015) 106–113.
[482] Wilkins, G. (2002) *Technology Transfer for Renewable Energy: Overcoming Barriers in Developing Countries* (The Royal Institution of International Affairs) 48.

countries must have a real concern for assisting developing countries to achieve more independence in international trade and in their economy through the promotion of international transfer of ESTs, and not only mitigating climate change in general.

One of the main problems in the international transfer of ESTs under the UNFCCC, as we will see later, is that this international transfer is addressed as a tool for mitigating or adapting climate change only. In other words, UNFCCC and the Kyoto Protocol addressed the international transfer of ESTs in isolation from their IP role and international trade, and was purely based on environmental reasons. Whereas if they worked within the objectives and principles of the TRIPS Agreement, more progress might be achieved with regard to fostering international transfer of ESTs to developing countries.

In my opinion, any TOT should target achieving economic development and welfare in developing countries as a priority; then, other objectives may come into play. The framework herein in the international transfer of ESTs is quite anomalous since it comes to the international community without any linkage or reference to TRIPS and IP, as will see in this chapter.

Anyway, the international transfer of ESTs under the climate change regime is the foundation for calls for mitigating or adapting climate change and achieving sustainable economic development in the world. [483] A distinction is to be made between two types of technologies when identifying the technologies related to

[483] Littleton, M. (2008) 'The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries', *DESA Working Paper No 71 Economic and Social Affairs*, http://www.un.org/esa/desa/papers/2008/wp71_2008.pdf, accessed 29 February 2016.

climate change. First, there are the climate change mitigation technologies (CCMT), which are technologies that use renewable energies, make older equipment more energy efficient, or change management practices or consumer behaviour in a sustainable manner.[484] Mitigation technologies may cover several sectors: energy supply, transport, buildings, industry, agriculture, forestry, and waste management. The IPCC also defines CCMT as 'technological change and substitution that reduce resource inputs and emissions per unit of output'.[485] In brief, mitigation is related to implementing policies to reduce GHG emissions.

Second, climate change adaptation technologies (CCAT), are those types of technologies that adjust 'natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities.'[486] Adaptation technologies can best be used in sectors like agriculture, coastal zone, infrastructure, water resources and hydrology, tourism, finance, biodiversity and health.[487]

GHG emissions are produced usually through certain kinds of technologies and various kinds of industrial activities in different sectors. Thus, any calls for reducing GHG emissions should consider the need to replace the current technologies with

[484] UNEP, 'Climate Change Mitigation' (UNEP, n.d), http://www.unep.org/climatechange/mitigation/Home/tabid/104335/Default.aspx, accessed 10 March 2016.
[485] De Meeûs, J. and Strowel, A. (2012) 'Climate change and the debate around green technology transfer and patent rules: History, prospect and unresolved issues', *The WIPO Journal*, 1–19.
[486] ibid.
[487] ibid.

new, cleaner ESTs.[488] Non-environmental technologies will be unable to meet such mitigation objectives.

As a result, in the climate change negotiations, the international transfer of ESTs has caused heated debate between developed and developing countries, similar to the negotiations of the TRIPS Agreement. Under TRIPS, it was difficult to adopt the minimum standards of IP protection without incorporating the provisions of TOT. [489] So the same occurred in the climate change negotiations.

The UNFCCC and its subsequent agreements and protocols tried to set out legally binding obligations for all countries with respect to mitigating or adapting climate change.[490] Nevertheless, developing countries would not accept participating in a problem that is the result of the massive industrial activities in the developed world without any sort of compensation or balancing, in particular.

Hence the international transfer of ESTs existed as an incentive to involve all parties in sharing responsibility for climate change. The UNFCCC preamble noted the historically the largest share of GHG emissions has originated in developed countries, while the levels in developing countries are still low but will grow to meet their social and development needs.[491]

[488] Thegef.org, (Technology Transfer for Climate Change), <https://www.thegef.org/gef/Technology_Transfer> accessed 23 November 2015.
[489] See Chapter 3 p.82.
[490] Thegef.org, (Technology Transfer for Climate Change), <https://www.thegef.org/gef/Technology_Transfer> accessed 23 November 2015.
[491] The UNFCCC (The United Nations Framework Convention on Climate Change (adopted on 9 May 1992 and entered into force on 21 March 1994), preamble.

The United Nations Conference on Environment and Development (UNED) held in Rio de Janeiro from 3–14 June 1992, informally called 'the Rio Conference' or 'the Earth Summit' focused on the interaction between developments and environmental concerns worldwide.[492] The international community as per this summit supported, as an initial step, the political endorsement of sustainable development as an international objective.[493]

The Earth Summit produced a number of important documents in this field. Three documents are non-binding and three are legally binding. With regard to the non-binding documents, firstly, Agenda 21 was adopted as a comprehensive program of action for promoting global actions in all areas of sustainable development, including Chapter 34 that goes into more detail to explain the meaning of ESTs.[494]

Second, the Rio Declaration on Environment and Development, which is a series of principles defining the rights and responsibilities of states, was adopted. It is a soft law document that consists of 27 principles of a non-binding nature. Third, the Statement of Forest Principles, which is a set of principles to underline the sustainable management of forests worldwide[495], was adopted. Next adopted were the UNFCCC and the Convention on Biological Diversity (CBD), which are binding.[496]

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[492] French, D. [2005] *International Law and Policy of Sustainable Development*, Manchester University Press, 17–18.
[493] ibid.
[494] French, D. [2005] *International Law and Policy of Sustainable Development*, Manchester University Press, 17–18.
[495] UNFCCC, 'UNCED Conference on Environment and Development 1992' (Earth Summit, n.d), http://www.un.org/geninfo/bp/enviro.html, accessed 29 February 2016. And see: Taylor, P. [1998] *An Ecological Approach to International Law: Responding to Challenges of Climate Change*, Routledge, p. 325.
[496] UNFCCC, 'UNCED Conference on Environment and Development 1992' (Earth Summit, n.d), http://www.un.org/geninfo/bp/enviro.html, accessed 29 February 2016.

4.4 The context of international transfer of ESTs:

Neither the UNFCCC, nor any of its consequent protocols and agreements has clearly defined what is meant by the international transfer of ESTs.[497] The only general definition and outline of what the international transfer of ESTs is under Chapter 34 of Agenda 21, which, as we described earlier, is a non-binding document.

Primarily we have to understand clearly what the international transfer of ESTs is, because it is a complex dynamic[498] and a multi-stage process.[499] Any international transfer of ESTs should avoid creating a dependency between transferee and the transferor.[500] This is the core spirit of TOT, whether it is as per the rules and regulations of the TRIPS Agreement or under the climate change regime. Moreover, under the climate change regime such a transfer should also improve environmental performance by reducing GHG emissions, and work in a sustainable manner.[501]

The non-agreement of what international transfer of ESTs is, under the UNFCCC regime, causes various legal interpretations and technical difficulties for the parties to TOT processes.[502] The IPCC defines the international transfer of ESTs as 'a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting climate change amongst different stakeholders such as

[497] De Meeûs, J. & Strowel, A. [2012] 'Climate change and the debate around green technology transfer and patent rules: History, prospect and unresolved issues', *The WIPO Journal*, 1–19.
[498] UNFCCC, 'Benefits of the Clean Development Mechanism 2011' (UNFCCC, 2011), http://www.slideshare.net/iraktobing/benefits-of-clean-development-mechanism-2011, accessed 8 March 2016.
[499] Coninck and others, 'Technology transfer in the Clean Development Mechanism' [2007] Energy Research Centre of the Netherlands.
[500] UNEP [2003] 'Technology Transfer: The Seven "C"s for the Successful Transfer and Uptake of Environmentally Sound Technologies', International Environmental Technology Centre United Nations Environment Programme, http://www.unep.or.jp/ietc/techTran/focus/Technology_Transfer_v6.pdf, accessed 22 January 2016.
[501] ibid.
[502] Coninck et al. [2007] 'Technology Transfer in the Clean Development Mechanism', Energy Research Centre of the Netherlands.

governments, private sector entities, financial institutions, NGOs and research/education institutions.'[503] Also the ICTSD defines it as 'the process of development, transfer, adaptation, and deployment of technologies to facilitate a climate-compatible technology transition.' [504]

The IPCC definition is a good one because it adopts a wider concept that includes know-how, experience, and equipment. So, every relevant flow of hardware, software, information and knowledge, from developed to developing countries or vice versa, falls within this definition 'whether on purely commercial terms or on a preferential basis'. Also the IPCC definition touches on the nature of technology, as it deals with technology being unique in its nature as an IP item. Technology may not always be codified, or sold in embodied forms because it contains tacit elements that make it different from other ordinary goods and services.[505]

Nevertheless, the definitions set out by the IPCC and ICTSD lack one element, which is important to us. They have not indicated the core objective of any TOT, instead they set only the objective of combating climate change. The objective of any TOT should function to make developing countries less dependent and put them back on the technological track. In this regard, we recall here the definition that we set out in the previous chapter for TOT.[506] This definition should be applied to any kind of technology, including ESTs.

[503] ibid.
[504] Coninck, H. & Sagar, A. [2015] 'Technology in the 2015 Paris Climate Agreement and beyond' (42) ICTSD, < http://www.ictsd.org/themes/innovation-and-ip/research/technology-in-the-2015-paris-climate-agreement-and-beyond> accessed 13 January 2016.
[505] Coninck et al. [2007] 'Technology Transfer in the Clean Development Mechanism', Energy Research Centre of the Netherlands.
[506] See Chapter 2, p. 50.

Chapter 34 of Agenda 21 sets out some general characteristics that can give a general understanding of the context of ESTs. ESTs are technologies that usually can protect the environment, or harm the environment less, as they are less polluting. They may use resources in a sustainable manner or recycle more of their waste products. Or, they may handle all residual waste via more environmentally methods as substitutes.[507]

ESTs are described, as 'process and product' technologies by which little or no waste at all is generated for the purpose of preventing pollution. At the same time, they should cover 'end of the pipe' technologies that usually treat pollution after it has been generated.[508]

Chapter 34 deals with ESTs as total systems, and includes 'know-how, procedures, goods and services, and equipment as well as organisational and managerial procedures' and not just individual technologies that should be transferred separately from other closely related sources or factors.[509] In fact, dealing with the international transfer of ESTs as total systems is a central challenge in the promotion of TOT to developing countries.[510] As we will see in most of the CDMs projects, developing countries face the difficulty of recognising how this technology can be totally

[507] United Nations Conference on Environment and Development (UNED), held in 1992 in Rio de Janeiro, Brazil, Agenda 21, ch 34.
[508] United Nations Conference on Environment and Development (UNED), held in 1992 in Rio de Janeiro, Brazil, Agenda 21, ch 34, art 3.
[509] United Nations Conference on Environment and Development (UNED), held in 1992 in Rio de Janeiro, Brazil, Agenda 21, ch 34, art 3.
[510] The Stakeholder Forum for a Sustainable Future [2012] 'Review of implementation of Agenda 21: Detailed review of implementation of Agenda 21', Sustainable development in the 21st century (SD21) 232.

transferred to them.

Total system means to set out not only a theoretical definition, but also an operational definition[511] that assists developing countries in practice in knowing when and how the technology is transferred to them. It means that the process of transferring ESTs internationally shall include the technology, the know-how, its procedures of implementation, related goods and services, and the applicable equipment, in addition to any other organisational and managerial procedures that are necessary for this technology to be operated successfully in the developing country.[512] This might include any specialised human resources development and local capacity-building aspects of technology choices.[513] It is to adopt a process of transferring 'tacit and explicit knowledge and skills rather than mere technical assistance'.[514] Also this process shall not work in isolation from other economic, cultural and social aspects and priorities.[515]

ESTs had to be incorporated along with the sustainable development objectives of the host country in order to achieve the objectives of Chapter 34. It is impossible to deal with general types of ESTs as an all-purpose recipe that is appropriate to all

[511] Coninck et al. [2007] 'Technology Transfer in the Clean Development Mechanism', Energy Research Centre of the Netherlands.
[512] United Nations Conference on Environment and Development (UNED), held in1 992 in Rio de Janeiro, Brazil, Agenda 21, ch 34, art 3.
[513] ibid.
[514] Coninck, H. & Sagar, A. [2015] 'Technology in the 2015 Paris Climate Agreement and beyond' (42) ICTSD, http://www.ictsd.org/themes/innovation-and-ip/research/technology-in-the-2015-paris-climate-agreement-and-beyond, accessed 13 January 2016.
[515] United Nations Conference on Environment and Development (UNED), held in 1992 in Rio de Janeiro, Brazil, Agenda 21, ch 34, art 3.

national contexts.[516] That's why the Technology Needs Assessment (TNA)[517] was established later by the UNFCCC, as it is a vital process to identify the technological capacity and the most appropriate types of technologies as per the environmental, economic, technical conditions of the host country. TNAs are crucial to enabling a set of choices and for ensuring 'the long-term effectiveness of technology transfer'.[518]

Then, Chapter 34 addresses the importance of promoting technology cooperation with developing countries. This should be done in a way that enables TOT, not only for the efficient use of the technology, but also for any further development of transferred technology. Technology cooperation shall involve the joint efforts of all parties concerned, including long-term partnerships to provide any systematic training or capacity building required. This is in order to achieve improvement in the technologies currently in use and look forward to full replacement.[519]

The Earth Summit goes into some useful detail in explaining the shape of ESTs.

[516] The Stakeholder Forum for a Sustainable Future, 'Review of implementation of Agenda 21: Sustainable development in the 21st century (SD21), Detailed review of implementation of Agenda 21' (Sustainable Development, Jan 2012), https://sustainabledevelopment.un.org/content/documents/1126SD21%20Agenda21_new.pdf accessed 2 March 2016.
[517] United nations development programme (undp) and Unfccc, 'Handbook for concluding Technology Needs Assessment for Climate Change' [November 2010] Nd(Nd) UNFCCC Reports: Expert Group on Technology Transfer <https://portals.iucn.org/library/sites/library/files/documents/Tech-010.pdf> accessed 12 May 2017
[518] The Stakeholder Forum for a Sustainable Future, 'Review of implementation of Agenda 21: Sustainable development in the 21st century (SD21), Detailed review of implementation of Agenda 21' (Sustainable Development, Jan 2012), < https://sustainabledevelopment.un.org/content/documents/1126SD21%20Agenda21_new.pdf> accessed 2 March 2016.
[519] United Nations Conference on Environment and Development (UNED), held in 1992 in Rio de Janeiro, Brazil, Agenda 21, ch 34, art 5.

Chapter 34 of Agenda 21 gives some general, common descriptions of what ESTs are.[520] According to some scholars, the real difference between soft and hard laws 'lies in the processes by which the rule is articulated and the consequences of its breach.'[521] Based on that, this soft law 'may be the harbinger of future "hard" law'[522] and that is why, in some implementation review studies, it was stated that the successful implementation of Chapter 34 of Agenda 21 'is likely to be contingent upon the effectiveness of the associated institutional framework.'[523]

The role of the international institutions is vital,[524] because sometimes the international community works on a step-by-step basis until gradually reaching international binding legal obligations and not only political commitments. [525]

The UNFCCC lacks a definition of the international transfer of ESTs or ESTs. It is logically accepted that the UNFCCC could not incorporate Chapter 34 of Agenda 21 as it was adopted at the same time as the UNFCCC. The plan was that each document would work toward its own purposes and objectives. The Kyoto Protocol to

[520] Maskus, K. [2010] 'Differentiated Intellectual Property Regimes for Environmental and Climate Technologies', *OECD Environment Working Papers,* 17(N. D.), 1–35.
[521] Lowe, V. [2005] 'Sustainable Development and Unsustainable Arguments'. In A. Boyle and D, Freestone (eds.), International Law and Sustainable Development: Post Achievements and Future Challenges (Oxford University Press) 19–37.
[522] Taylor, P. [1998] *An Ecological Approach to International Law: Responding to Challenges of Climate Change* (Routledge) 325.
[523] The Stakeholder Forum for a Sustainable Future, 'Review of implementation of Agenda 21: Sustainable development in the 21st century (SD21), Detailed review of implementation of Agenda 21' (Sustainable Development, Jan 2012), <https://sustainabledevelopment.un.org/content/documents/1126SD21%20Agenda21_new.pdf> accessed 2 March 2016.
[524] Footer, M. [2010] 'The (RE)turn to "soft law" in reconciling the antinomies in WTO Law', *Melbourne Journal of International Law*, 11(2), 241–276.
[525] French, D. [2005] *International Law and Policy of Sustainable Development*, Manchester University Press, 17–18.

the UNFCCC, which was adopted in 1997, lacks the required definition for international transfer of ESTs and so has not referred to Chapter 34 of Agenda 21.[526]

The Bali Climate Change Conference was held in the 13th session of the Conference of Parties to the UNFCCC in December 2007. This conference set out the Bali Map, including the Bali Action Plan as per decision 1/COP 13. The Bali Action Plan, as per Article 1(C), enhances action on technology development and transfer to support action mitigation and adaptation to climate change. The only reference to ESTs was made in the sub-paragraphs of the same Article so as to produce effective mechanisms that promote access to affordable ESTs.[527]

4.5 International transfer of ESTs under UNFCCC:

The UNFCCC is a convention adopted at the UN Headquarters, New York on 9 May 1992 and was opened for signatures at Rio de Janeiro from 4–14 June 1992, and thereafter at the UN Headquarters, New York, from 20 June 1992 to 19 June 1993. By that date, the convention had received 166 signatures and it entered into force on 21 March 1994.[528] The UNFCCC has nearly a universal membership[529] of 196

[526] The Kyoto Protocol recalled the UNFCCC, and particularly Articles 2 and 3. In addition to the Berlin Mandate adopted by decision 1/CP.1 of the Conference of the Parties to the UNFCCC at its first session, see: Kyoto Protocol (adopted in Kyoto, Japan in December 1997 and entered into force on 16 February 2005), preamble.
[527] UNFCCC, 'Conference of Parties: Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007 Addendum Part Two: Action taken by the Conference of the Parties at its thirteenth session' (UNFCCC, 14 March 2008) <https://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf> accessed 12 May 2017
[528] United Nations Framework Convention on Climate Change, (Status of Ratification of the Convention) <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php> accessed 30 November 2015.
[529] United Nations Framework Convention on Climate Change, (Annex I Greenhouse Gas Inventories) <http://unfccc.int/national_reports/annex_i_ghg_inventories/items/2715.php> accessed 23 November 2015.

Parties.[530] Countries that have ratified the convention are called 'Parties to the Convention'.[531]

Parties usually meet every year at the Conference of Parties (COP) unless otherwise decided. The COP is the supreme decision-making body, in which each party is represented. The objective of the COP is to review national communications, emission inventories records, legal requirements, decisions, implementation, and institutional and administrative arrangements. [532]

Hence, the UNFCCC focuses on international efforts for stabilising GHG emissions into the atmosphere in order to prevent or reduce dangerous human activities.[533] The UNFCCC is the first treaty that imposes emission reduction obligations on states although it does not include binding reduction limits.[534]

The UNFCCC adopts an approach to assist flows of ESTs to developing countries through facilitating international collaborative research and development (R&D) and collaborations in technological innovation between institutions (private or public) in different countries.

[530] United Nations Framework Convention on Climate Change, (Status of Ratification of the Convention), <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php> accessed 30 November 2015.
[531] UNFCCC, 'First steps to a safer future: Introducing The United Nations Framework Convention on Climate Change' (UNFCCC, n.d), <http://unfccc.int/essential_background/convention/items/6036.php> accessed 9 February 2016.
[532] UNFCCC, 'Conference of the Parties (COP)' (UNFCCC, n.d), <http://unfccc.int/bodies/body/6383.php> accessed 22 February 2016.
[533] United Nations Framework Convention on Climate Change, (Annex I Greenhouse Gas Inventories) <http://unfccc.int/national_reports/annex_i_ghg_inventories/items/2715.php> accessed 23 November 2015.
[534] Zahar, A. [2015] *International Climate Change Law and State Compliance* (Routledge) 86–87.

As a result, the UNFCCC imposes different categories of commitments on parties. Technically, the UNFCCC sets out some commitments for mitigating or adapting climate change. General commitments for all Parties are set out as per Article 4.1 and particular commitments for developed countries Annex I Parties under Article 4.2 and other commitments for Annex II Parties pursuant to Articles 4.3, 4.4 and 4.5.[535]

Annex I Parties includes industrialised countries that were members of the Organisation for Economic Co-operation and Development (OECD) in 1992, in addition to countries with economies in transition (EIT) including the Russian Federation, the Baltic States, and several central and eastern European states. The Annex II Parties take in the OECD members of Annex I, but not the Parties with economies in transition (EIT). Lastly, the non-Annex Parties include most of the developing countries.[536]

This was stated in the UNFCCC in different provisions. The Preamble affirms that developed countries have the largest share of historical and current global emissions of GHGs, on account of more than 150 years of industrial activity,[537] so no one denies their responsibility to mitigate and adapt to climate change. Then the Preamble encourages the widest possible cooperation by all countries, whether developed or developing countries, stating clearly that although developing countries have low GHG emissions, they might grow to meet their social and developmental

[535] IKLIM, 'United Nations Framework Convention on Climate Change (UNFCCC)' (IKLIM, n.d), <http://iklim.cob.gov.tr/iklim/AnaSayfa/BMIDCS.aspx?sflang=en> accessed 21 February 2016.

[536] Parliament of Australia, 'United Nations Framework Convention on Climate Change (UNFCCC)' (Parliament of Australia, 22 October 2010), <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChange/Governance/International/unfcc> accessed 21 February 2016.

[537] United Nations Framework Convention on Climate Change, 'Kyoto Protocol' (UNFCCCINT, n.d), <http://unfccc.int/kyoto_protocol/items/2830.php> accessed 11 April 2016.

needs.[538]

In addition, Article 3 (1) of the UNFCCC ensures that the implementation of the convention shall be based on the equity among Parties taking into consideration their common and differentiated responsibilities and respective capabilities, accordingly, highlighting the responsibility of the developed countries Parties to take the lead in combating climate change as per the convention.[539]

The international transfer of ESTs supposed to be a key element in the UNFCCC.[540] The Preamble of the UNFCCC affirms the importance of TOT, but not explicitly. It addresses developing countries' need to access the resources that are required for sustainable social and economic development. It suggested that this can implemented through the '…application of new technologies on terms which make such an application economically and socially beneficial'.[541]

The international transfer of ESTs, although Parties call it a key element in climate change, was not addressed in that way in the Preamble as a beginning point. Access to resources might be implemented in various different ways and most of the time is far away from a real TOT.

Moreover, what is meant by 'access to resources' here is vague. Access to

[538] UNFCCC (adopted The United Nations Framework Convention on Climate Change on 9 May 1992 and entered into force on 21 March 1994), preamble.
[539] ibid, art 3(1).
[540] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017
[541] UNFCCC (adopted The United Nations Framework Convention on Climate Change on 9 May 1992 and entered into force on 21 March 1994), preamble.

resources is a part of a series of processes and actions that result in the end in a real TOT. As we have mentioned, access to a source or resources is a part of the total system of TOT as per chapter 34 of Agenda 21. The total system requires in addition to the access to technologies or sources, the know-how, processes, etc.

In my opinion access to resources should be linked to the objectives of TRIPS as this will help in achieving a dual advantage: it will work within the TRIPS objectives. In particular, this linkage will support the basic role of developed countries in reducing the technological and economic gaps between them and developing countries by which they will promote TOT as an incentive to calling for additional IP protection as per the provisions of the TRIPS Agreement. Then the second advantage this linkage will make is a general goal of achieving sustainable social and economic development, which is particularly related to ESTs under the climate change regime.

The UNFCCC Preamble recognised also the importance of the diffusion of EST technologies or low/zero carbon technologies to developing countries for mitigating and adapting climate change, in addition to recognising the importance of the removal of barriers to allow existing ESTs to compete in the market.[542] Diffusion of technology is different than TOT, as we previously mentioned.[543]

The international transfer of ESTs is not defined precisely under the UNFCCC. Nevertheless, the UNFCCC has addressed different provisions that may, to some

[542] Yamin, F. & Depledge, J. [2004] *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge University Press) 304.
[543] Chapter 2 , p.42.

extent, promote their international transfer, specifically Articles 4.1 (c), 4.3, 4.5 and 4.7.[544]

All Parties of the UNFCCC are required to 'promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes…' in order to either control, reduce or prevent GHG emissions in all relevant sectors'.[545]

The promotion of international transfer of ESTs shall take into consideration the Parties' common but differentiated responsibilities and development priorities, objectives and circumstances. Developing countries can benefit from this consideration as their responsibility and role is much less than developed countries. Therefore, this will affect their legal commitments related to mitigating or adapting climate change because the greater responsibility lies with the developed countries.

In this regard we have to clarify that promoting the international transfer of ESTs shall be set out independently without such a consideration due to the urgency of climate change. The UNFCCC lacks precise, clear and unconditional definition of international transfer of ESTs. Otherwise, this will follow the same manner of the TRIPS Agreement. This is also because the number of ESTs required for mitigating

[544] Article 4.1 (c) states that all Parties shall 'promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors.' See: UNFCCC, adopted on 9 May 1992, opened for signature and entered into force on 21 March 1994, art 4.1(c).
[545] ibid, art 4.1(c).

or adapting to climate change is too high and ESTs are needed on a short timescale.[546]

Article 4.1 (C) also includes promotion and cooperation in the transfer of practices and process in addition to technologies. So it gives greater prominence to practices and processes like changes in lifestyle and behaviour.[547] Therefore, this Article indicates dealing with the transfer of technologies as a total system, to some extent. This is also why some scholars have pointed out that the language of the UNFCCC tends to define transfer of ESTs widely, because its various parts include references to access to technology, processes, know-how and best practices.[548]

In fact, it is good to have a legal commitment from all parties to promote TOT and to deal with it as a total system. However, this was not as clear and precise as it should have been. The most important issue is to show that this total system of transfer results in enabling developing countries to reuse, reproduce, and resell the same ESTs independently from a developed country. This is missing under the UNFCCC, but is quite important, because this is the only way to assist developing countries to achieve more technological development and economic welfare and also mitigate and adapt to climate change.

In practice, the term international transfer of ESTs may cover different situations, ‘ranging from patent and/or know-how licenses to more complex dealings involving

[546] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017.
[547] Yamin, F. & Depledge, J. [2004] *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge University Press) 305.
[548] Maskus, K. [2010] 'Differentiated Intellectual Property Regimes for Environmental and Climate Technologies', *OECD Environment Working Papers* 17(n.d) 1–35.

the supply of technical assistance, equipment, etc.',[549] So we wonder how to use such a term to achieve the objectives of the TRIPS Agreement and UNFCCC, if this was not clearly agreed upon under UNFCCC.

For example, promotion of the transfer of ESTs can be achieved only if it covers 'the situation where a company (licensor), which itself manufactures certain products, licenses to another company (licensee) a global package of information and IP rights in order to put the licensee in the condition to manufacture the product using the technology of the licensor'.[550]

This is basically what is supposed to be required when a convention promotes TOT. This way would avoid cases in which the licensee may lose interest in the transaction or international transfer agreement simply because 'a certain patent expires or part of the licensor's know-how is no longer secret'.[551]

Article 4.3 mandates that the developed Annex I Parties must provide new and additional financial resources to developing countries in order to meet the agreed full incremental costs of implementing measures for reducing GHG emissions, as per Article 12, paragraph 1. This includes the costs of transfer of ESTs for that purpose as stated in Article 4.3. This obligation later gave rise to the Global Environmental

[549] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009), 9.
[550] ibid.
[551] ibid.

Facility (GEF), which was founded in 1991.[552] GEF provides financing for specific climate change projects through the World Bank.[553]

Article 4.5 of the UNFCCC is the first core basis of the international transfer of ESTs' commitment to the climate change regime. Developed Annex II Parties are required also as per this Article to take all practicable steps for promoting, facilitating and financing the transfer or access to ESTs and know-how, as appropriate, to other Parties.[554] This is because developing countries' implementation of their commitments to climate change is subject to or conditional upon financial and technical support for TOT issues.[555]

In this process, the developed-country Parties shall support the development and enhancement of endogenous capacities and technologies of developing-country Parties. Other Parties and organisations in a position to do so may also assist in facilitating the transfer of such technologies.'[556]

[552] GEF, 'GEF:Investing our Planet ' (The Global Environmental Facility (GEF), N.D) <https://www.thegef.org > accessed 10 April 2017
[553] Maskus, K. [2010] 'Differentiated Intellectual Property Regimes for Environmental and Climate Technologies', *OECD Environment Working Papers*, 17(n.d) 1–35.
[554] UNFCCC, adopted on 9 May 1992, opened for signature and entered into force on 21 March 1994, Article 4.5. See also: CTI, 'Methods for Climate Change Technology Transfer Needs Assessments and Implementing Activities Developing and Transition Country Approaches and Experiences' (CTI, March 2002) < http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNA_HAB_infobox_3/74504a75eb474215a5216bd319737e78/0d8134cd09604f6a9492ccf0cb6b92e8.pdf> accessed 10 February 2016.
[555] UNFCCC, 'Technology Transfer and Assessment of Technology Need: Enabling the Kingdom of Thailand to its First National Communication in Response to its Commitment to the UNFCCC (Phase II) (UNFCCC, n.d), <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/bf9c1057f7e348a29f68ae1d466ce1ff.pdf> accessed 10 February 2016.
[556] UNFCCC, adopted on 9 May 1992, opened for signature and entered into force on 21 March 1994, art 4.5.

Article 4.5 indicates how the UNFCCC treats climate change as urgent matter that requires immediate actions by all countries. Nevertheless, there are a number of concerns that need to be noted:

First, the text has not treated the problem of the lack of information in the developing country,[557] even though this has been the focus of a huge part of research by experts on TOT and the concerned international institutions. Many developing countries do not know well what kinds of ESTs are most appropriate for them to host in TOT agreement.

Although later, under the objective of promoting the development and transfer of technologies, the UNFCCC made some effort to overcome the problem of information, most of them are still not on a practical level, as we will see later in further detail in this chapter. For example, the Expert Group on Technology Transfer (EGTT) was established in 2001 in the seventh session of the COP in 2001, to promote the implementation of a TOT framework. The EGTT aims to advance TOT activities under the UNFCCC. The EGTT worked for five years and concluded with a number of findings and recommendations.[558]

The EGTT highlighted that what had been reached in the UNFCCC was considered a solid basis for more development in the future to '…a more practical and results-oriented level by promoting actions in specific sectors and regions.'[559]

The UNFCCC commissioned TT:CLEAR to solve the problem of lack of information, related mainly to ESTs, in developing countries. TT:CLEAR is a web-based TOT

[557] ibid.
[558] UNFCCC [2007] 'Expert Group On Technology Transfer: Five Years of Work', Climate Change Secretariat.
[559] UNFCCC [2007] 'Expert Group On Technology Transfer: Five Years of Work', Climate Change Secretariat.

information system or clearing house called established by the UNFCCC Secretariat. It aims to improve the flow of, access to, and quality of information relating to the development and transfer of ESTs under the Article 4.5 of UNFCCC.[560]

TT:CLEAR includes an inventory of EST projects as well as a technology web page. It provides access to national TNA reports, National Adaptation Programmes of Actions (NAPAs), and national communications to the UNFCCC. It enables users to have relevant information on TOT projects in addition to some case studies of successful TOT, as well as some general information related to types of ESTs and know-how, concerned international institutions and organisations, methods, models and tools of assessment.[561]

Again, it works in the same manner it is only a data website for general information related to TOT for those who are interested in taking an additional look and overview.

Therefore, a question is raised that all these initiatives under the UNFCCC have not come up with a solution for solving the critical problem of the lack of information about TOT in developing countries. We also shall bear in mind that those findings are under the umbrella of the UNFCCC; in other words the UNFCCC, through the establishment of EGTT and TT:CLEAR, is telling the world that still we do not provide real cooperation and enhancement for the international transfer of ESTs to

[560] Vladu, L. [2007] 'Overview of the UNFCCC technology information clearing house (TT:Clear) and the work done on networking', Adaptation, Technology and Science Technology Sub-programme: Germany.
[561] The United Nation's inter-agency Mechanism on Energy, 'TT:CLEAR technology information system/ technology transfer clearing house' (UN-Energy, n.d) <http://www.un-energy.org/activities/193-ttclear-technology-infomration-system-technology-transfer-clearing-house> accessed 4 April 2016.

developing countries. All that is available are high-level general commitments that do not promote real TOT.

A second objection to Article 4.5 is that this text does not reflect any terms related to the absorptive capacity of the developing country as part of the transfer agreement.[562] In fact, the absorptive capacity is a challenge that is not new. Most IP and TOT experts highlight it as a barrier or a challenge to a real TOT.[563]

Third, the treatment of the international transfer of ESTs should be linked to policymakers in developing countries. This should include the pathway used in the TOT regime, whether governmental bodies drive it only, or the private sector, or the community. The more cooperation is enhanced the more long-term benefits will be achieved.[564]

In addition, Article 4.7 linked the obligations required from developing countries to those required by developed countries. It states that implementing the obligations required for developing countries depends mainly on how effective the implementation of the developed-country Parties' commitments under the UNFCCC are.[565]

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[562] The Stakeholder Forum for a Sustainable Future [2012] 'Review of implementation of Agenda 21: Detailed review of implementation of Agenda 21', Sustainable development in the 21st century (SD21) 232.

[563] Jørgen boldt and others, 'Overcoming Barriers to the Transfer and Diffusion of Climate Technologies' [January 2012] n.d UNEP Risø Centre on Energy, Climate and Sustainable Development <http://webcache.googleusercontent.com/search?q=cache:HHIi0tpuKWMJ:www.tech-action.org/-/media/Sites/TNA_project/TNA%2520Guidebooks/TNA_Guidebook_OvercomingBarriersTechTransfer_10.ashx%3Fla%3Dda+&cd=2&hl=en&ct=clnk&client=safari> accessed 12 May 2017

[564] The Stakeholder Forum for a Sustainable Future, 'Review of implementation of Agenda 21: Detailed review of implementation of Agenda 21' [2012] Sustainable development in the 21st century (SD21) 232.

[565] UNFCCC, adopted on 9 May 1992, opened for signature and entered into force on 21 March 1994, art 4.7.

As part of the Marrakesh Accords, the Parties agreed at COP 7 upon a framework for meaningful and effective actions in order to enhance the implementation of Article 4.5 of the UNFCCC. This framework was annexed to decision 4/CP.7.[566] The framework set out in this decision ensures that any successful development and transfer of ESTs and know-how requires 'a country-driven, integrated approach, at a national and sectoral level. This should involve cooperation among various stakeholders (the private sector, governments, the donor community, bilateral and multilateral institutions, non-governmental organisations and academic and research institutions) ….' [567]

Also the framework set out in this decision included five key themes pursuant to Chapter 34 of Agenda 21 by the UN General Assembly[568] and to the related technology provisions in the UNFCCC.[569] The first theme is technology needs assessments. It is 'a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of Parties other than developed country Parties, and other developed Parties not included in Annex II to the Convention, particularly developing country Parties.' [570].

[566] Alam, M. 'Climate Change: Technology Transfer under UNFCCC. Training programme on energy efficient technologies for climate change mitigation in Southeast Asia' (Southeast Asia network of climate change focal points) UNEP TNA Guidebook Series, http://www.unep.org/climatechange/Portals/5/documents/RoapFocalPoints/001%20Climate%20Change%20%20A%20Perspective%20post%20COP%2015.pdf, accessed 10 February 2016.
[567] UNFCCC Annex to decision 4/CP7 'Framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention, adopted on 10 November 2001.
[568] See: p.156.
[569] UNFCCC decision 4/CP7, adopted on 10 November 2001.
[570] UNFCCC, 'Recommendations of the Expert Group on Technology Transfer for enhancing the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention Note by the Chair of the Expert Group on Technology Transfer' (Subsidiary Body for Scientific and Technological Advice, 18–26 May 2006), <http://unfccc.int/resource/docs/2006/sbsta/eng/inf04.pdf> accessed 10 February 2016.

The second theme is technology information that defines different means, like hardware, software and networking in order to facilitate the flow of information between different stakeholders in a developing country. The remaining themes are enabling environmental and capacity building.[571]

In fact, this addresses how minimising adverse economic, social and environmental impacts on developing countries when responding to climate change is a priority of the UNFCCC, as the Parties have agreed that any implementation of any agreement should 'give special attention to the concerns of vulnerable economies'. [572]

In addition, Article 4.8 states that Parties shall give full consideration to what actions are necessary to meet developing countries' specific needs and concerns of developing country that are arising from adverse effects of climate change.[573]

Also Article 4.9 of the UNFCCC requires Parties to give special consideration to the specific needs and special situations of the LDCs. This is with regard to challenges related to TOT and funding. Article 11.1 of the UNFCCC ensures that financial resources shall be provided for TOT on a grant or concessional basis. [574]

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[571] UNFCCC, 'Recommendations of the Expert Group on Technology Transfer for enhancing the implementation of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention Note by the Chair of the Expert Group on Technology Transfer' (Subsidiary Body for Scientific and Technological Advice, 18–26 May 2006), <http://unfccc.int/resource/docs/2006/sbsta/eng/inf04.pdf> accessed 10 February 2016.

[572] Babiker, M. et al. [1999] 'The Kyoto Protocol and Developing Countries' Report No 56(ND) Global Change Science Policy <http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt56.pdf> accessed 15 February 2016.

[573] UNFCCC (The United Nations Framework Convention on Climate Change adopted on 9 May 1992 and entered into force on 21 March 1994), art 4.8.

[574] UNFCCC (The United Nations Framework Convention on Climate Change (adopted on 9 May 1992 and entered into force on 21 March 1994), arts 4.9 & 11.1

In conclusion, with respect to UNFCCC's role in promoting the international transfer of ESTs, undoubtedly TOT is one of the key objectives, as stated in particular in Articles 4.1, 4.3, 4.5 and 4.7. This is because the UNFCCC works under a principle that developed countries are developers and suppliers of technology, while developing countries are only recipients of technologies.[575]

Nevertheless, all the UNFCCC reports, studies, workshops and group works address the same concerns in regard to promoting the international transfer of ESTs. In many studies the way forward has been reviewed, and in each action, the importance of having solutions on a practical level in order to promote a real TOT has been repeated. That is why it is important to explore the practical application of this huge number of initiatives and mechanisms under the UNFCCC to support TOT. This will be the objective of the case studies in the thesis.[576]

4.6 The international transfer of ESTs as per the Kyoto Protocol 1997

The Kyoto Protocol was adopted in Kyoto, Japan on 11 December 1997 and entered into force on 16 February 2005. It is an international agreement linked to the UNFCCC and extends the UNFCCC. In fact, the UNFCCC is the parent convention of the Kyoto Protocol, which was ratified by 192 of the UNFCCC Parties.[577] So the Kyoto Protocol works toward the same objectives. [578] The detailed rules of

[575] Srinivas, K. [2013] 'Climate Change, Technology transfer and intellectual property rights: a modest exercise in thinking outside the Box' in A. Brown (ed.), *Environmental Technologies, Intellectual Property and Climate Change: Accessing, Obtaining and Protecting* (Edward Elgar Publishing Limited) 152–180.
[576] See chapters 6, 7 and 8, in addition to case studies findings in chapter 9.
[577] UNFCCC, ' Kyoto Protocol' (UNFCCC , n.d) <http://unfccc.int/kyoto_protocol/items/2830.php> accessed 12 May 2017
[578] Zahar, A. [2015] *International Climate Change Law and State Compliance* (Routledge) 86–87.

implementing the protocol were adopted in the COP 7 in Marrakesh, Morocco in 2001, referred to as the 'Marrakesh Accords'. [579]

The Kyoto Protocol commits its Parties to internationally legally binding emission reduction targets, unlike the UNFCCC. [580] It is a compulsory binding document, described as a compliance instrument that gives the right to impose penalties through its enforcement nature.[581]

The Kyoto Protocol sets mechanisms to support its implementation. First, the emission trading (ET) as per Article 17 of the Kyoto Protocol, then second the CDM as per Article 12 and lastly, the Joint Implementation (JI) as per Article 6. They are market-based mechanisms or carbon-trading mechanisms.

The main purpose of these mechanisms is, first, to stimulate sustainable development through TOT and investment, thereby helping countries with their Kyoto commitments; second, to help countries meeting their reduction targets in a cost-effective way; and third, to encourage private sector and developing countries to contribute in reduction efforts.[582]

Therefore, the Kyoto Protocol through these mechanisms promotes the international transfer of ESTs to developing countries more effectively. Actually, most of the

[579] United Nations Framework Convention on Climate Change, 'Kyoto Protocol', <http://unfccc.int/kyoto_protocol/items/2830.php> accessed 30 November 2015.
[580] As previously mentioned, the UNFCCC does not come out with legally binding reductions for levels or amounts of GHG emissions. See also: UNFCCC, 'Kyoto Protocol' (UNFCCC, n.d.), http://unfccc.int/kyoto_protocol/items/2830.php, accessed 11 February 2016>; See also: Cameron, P. [2001] 'The Kyoto Process: Past, Present and Future' in P. Cameron & D. Zillman (eds.), *Kyoto: From Principles to Practice* (Kluwer Law) 3–23.
[581] Zahar, A. [2015] *International Climate Change Law and State Compliance* (Routledge) 63.
[582] United Nations Framework Convention on Climate Change, (UNFCCCINT), <http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php> accessed 18 November 2015.

previously mentioned international legal institutions for the international transfer of ESTs had existed prior to the conclusion of the Kyoto Protocol. At that time, those institutions were working under the general provision of the UNFCCC, as we discussed earlier, so '…they were too ''soft'' and the related provisions were ambiguous, and they had not worked as well as they might to realise the objective of reducing GHG emissions.'[583]

For instant, the EGTT, TT:CLEAR and Technology Mechanisms were conceptual and did not contain precise guidelines or solutions for developing countries on a practical level. In addition, they repeated similar recommendations in each study, workshop or report, without providing some concrete solutions.

Instead, the Kyoto Protocol created the CDM, which would be used as a tool to transfer ESTs to developing countries. Under Article 10 (c), Parties shall cooperate to promote effective modalities 'for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to…' ESTs. In fact, this Article mentions not only ESTs, but also know-how, practices and processes that relevant to climate change. Also it mentions that the same commitment applies to formulating policies and programs for promoting an effective transfer of ESTs to developing countries. Nevertheless, the Article limited such commitment to ESTs that are publicly owned or in the public domain. So we are talking mainly about ESTs that had fallen into the public domain.

In addition, the statement shall 'cooperate in' contradicts the general commitment

[583] Fa Ma, Z. [2012] 'The effectiveness of Kyoto Protocol and the legal institution for international technology transfer' 37 *Journal of Technology Transfer* 57–79.

under the UNFCCC that developed countries shall take all practical steps[584] as to their responsibility, mainly in regard to climate change.

Also it is useful to adopt a wider definition of understanding regarding what is meant by the international transfer of ESTs in the Protocol '…*environmentally sound technologies, know-how, practices and processes pertinent to climate change…*'; nevertheless, this is meaningless as long as it is not supported or linked to precise legal obligations or mechanisms and an objective of enabling the transferee to reuse, resell and reproduce the same technology.

Another point related to using the word 'effective' in law. It is really vague and complicated, especially if the obligation is not specified with certain results to be achieved. For example, the Kyoto Protocol does not link or make explicit reference to the three Kyoto mechanisms and the international transfer of ESTs. CDM might work as an 'effective tool' in TOT if that was supported through the Kyoto Protocol.[585] Instead, the Kyoto Protocol left the international transfer of ESTs out of the realm of the three mechanisms, and kept it with some general soft commitments, as we see in the language of Article 10(c). Then, Article 11.2 of the Protocol repeats that developed countries shall provide financial resources for TOT.[586]

[584] UNFCCC (The United Nations Framework Convention on Climate Change adopted on 9 May 1992 and entered into force on 21 March 1994), art 4.5; see also: Grubb, M. et al. [1999] *The Kyoto Protocol: A Guide and Assessment* (Royal Institute of International Affairs) 139.
[585] Grubb, M. et al. [1999] *The Kyoto Protocol: A Guide and Assessment* (Royal Institute of International Affairs) 139.
[586] Kyoto Protocol (adopted in Kyoto, Japan in December 1997 and entered into force on 16 February 2005), Article 10(c) and 11.2. See also: Seres, S. & Haites, E. [2008] 'Analysis of Technology Transfer in CDM Projects', The UNFCCC Registration & Issuance Unit CDM/SDM.

Accordingly, if we analyse the three Kyoto mechanisms, they actually share a common root in the definition of the commitments as per Article 3.10 to 3.12.[587] Under Article 3.10, 'Any emission reduction units, or any part of an assigned amount, which a Party acquires from another Party in accordance with the provisions of Article 6 or of Article 17 shall be added to the assigned amount for the acquiring Party.'[588]

Then, Article 3.11 states that 'Any emission reduction units, or any part of an assigned amount, which a Party transfers to another Party in accordance with the provisions of Article 6 or of Article 17 shall be subtracted from the assigned amount for the transferring Party.'[589] Lastly, Article 3.12 states that 'Any certified emission reductions which a Party acquires from another Party in accordance with the provisions of Article 12 shall be added to the assigned amount for the acquiring Party.'[590]

The most important mechanism to this thesis is the CDM. Under the ET, Parties are allowed to participate in ET for the purpose of fulfilling their commitments. It gives any Party the opportunity to purchase GHG credits or allowances from another Party that has emissions below its targets,[591] as set out in the protocol's target-based credits.[592] So the ET enables any two entities obliged to adhere to emission controls as per Kyoto Protocol to exchange part of their emission allowances between them

[587] Grubb, M. et al. [1999] *The Kyoto Protocol: A Guide and Assessment*, Royal Institute of International Affairs, p. 194.
[588] Kyoto Protocol (adopted in Kyoto, Japan in December 1997 and entered into force on 16 February 2005), Article 3.10.
[589] ibid, art 3.11.
[590] ibid, art 3.12.
[591] Michael Grubb et al. [1999] *The Kyoto Protocol: A Guide and Assessment* (Royal Institute of International Affairs) 128.
[592] Cameron, P. [2001] 'The Kyoto Process: Past, Present and Future' in P. Cameron & D. Zillman (eds.), *Kyoto: From Principles to Practice* (Kluwer Law) 3–23.

at any time. [593]

The JI refers to the Parties' right of trading among themselves through emission reduction units (ERUs) in projects that aim to reduce anthropogenic emissions by sources or enhance anthropogenic removals by sinks of GHG in any sector of the economy of any other Party. [594]

The purpose of JI is to encourage efforts for mitigation climate change in two paths. The first path is through the implementation of efficient activities, technologies and techniques that reduce the emissions of GHGs in developed countries. The second path is the possibility given to developed countries to make additional emissions at reduced economic cost. Thus, the advantages of the JI are threefold: an environmental advantage, a development advantage and an economic advantage.[595]

JI shares with CDM the fact that they provide credits to the country that invests in another country for the purpose of reducing GHG emissions. Therefore, both parties involved in JI are countries with emission caps; each ERU generated by a JI project has to be converted from one Annex I host country. Through this, the overall Kyoto emissions cap will be maintained at the same level.[596]

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[593] Grubb, M. et al. [1999] *The Kyoto Protocol: A Guide and Assessment* (Royal Institute of International Affairs)131.
[594] Cameron, P. [2001] 'The Kyoto Process: Past, Present and Future' in P. Cameron & D. Zillman (eds.), *Kyoto: From Principles to Practice* (Kluwer Law) 3–23.
[595] FFEMFR, Climate Change: Guide to the Kyoto Protocol Project Mechanisms: The Joint Implementation Mechanism (JI), <http://www.ffem.fr/jahia/webdav/site/ffem/shared/ELEMENTS_COMMUNS/U_ADMINISTRATEUR/5-PUBLICATIONS/Changement_climatique/GuideC_projets_Kyoto_angl.pdf> accessed 30 November 2015.
[596] Shishlov, I. et al. [2012] 'Joint Implementation: A Frontier Mechanism within the Borders of an Emission Cap', Climate Report: Research on the Economics of Climate Change, 33(1), http://www.lawteacher.net/oscola-referencing/journal-article.php, accessed 30 November 2015.

The CDM is a baseline credit mechanism that mitigates climate change by Annex I Parties in order to comply with their reduction targets commitments.[597] Under the CDM, projects will be registered if they reduce GHG emissions and then obtain the certified emission reductions (CERs) that 'are tradable on the carbon markets and countable against emissions targets instituted at both company level under national legislation and country level'.[598] So CERs can be traded and sold, and used by developed countries.[599]

The CDM proposes to provide support and assistance in obtaining sustainable development for developing countries.[600] It is important to note that there are various benefits in investing in CDM projects in developing countries but 'not least of which is the transfer of technology and know-how not already available in the host countries'.[601] CDM does not have 'an explicit TOT mandate and is not identified as a means of fulfilling the transfer of technology objectives of the Protocol'.[602]

Nevertheless, it may contribute to the international transfer of ESTs through financing emission reduction projects that use more ESTs that are not being used or

[597] The Kyoto Protocol to UNFCCC, adopted on 11 December 1997 in Kyoto, and entered into force on 16 February 2005, art 12.
[598] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017; and see: Zahar, A. [2015] *International Climate Change Law and State Compliance* (Routledge) 136.
[599] United Nations Framework Convention on Climate Change, (UNFCCCINT), <http://cdm.unfccc.int/about/index.html> accessed 18 November 2015.
[600] Zahar, A. [2015] *International Climate Change Law and State Compliance* (Routledge) 136.
[601] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017.
[602] Seres, S. & Haites, E. [2008] 'Analysis of Technology Transfer in CDM Projects', The UNFCCC Registration & Issuance Unit CDM/SDM.

recognised in developing countries as host countries.[603] For instance, if one of the Annex I Parties makes an agreement with any developing countries for the purpose of hosting a GHG reduction project, this will allow this Annex I Party to emit GHGs above the assigned amount allowed under the Protocol, through CERs.[604] This means Article 12 provides an incentive to Annex I Parties if they share with and transfer to developing countries' ESTs. [605]

It is good progress that the Kyoto Protocol came out with a new method for transferring technologies to developing countries. Nevertheless, CDM may take the shape of a BOT contract, joint venture or consortium, or as any regular sale of equipment and supply of services agreement. Actually this is one of the most important points that needs to be highlighted here; when the Kyoto Protocol set out this mechanism, it did not set out a model agreement or model terms and conditions that developing countries could use for their CDM projects. As a result, each developed country drafts its own terms and conditions which, as we shall see, may not include any TOT.

4.7 Technology Transfer Mechanisms under the Cancun Agreements in 2010

The Cancun Agreements are a set of significant agreements under the UNFCCC reached on 11 December 2010 in Cancun, Mexico at the COP 16. Those agreements or decisions work as key steps in reducing GHG emissions and in achieving sustainable development in developing countries. The Cancun

[603] ibid.
[604] ibid.
[605] Wang, B. [2010] 'Can CDM bring technology transfer to China?—An empirical study of technology transfer in China's CDM projects' 38(5) *Energy Policy*. DOI: 10.1016/j.enpol.2009.12.052, accessed 25 November 2015.

Agreements address 'the long-term challenge of climate change collectively and comprehensively over time and take concrete action now to speed up the global response.'[606]

The Cancun Agreements made some progress with regard to developing countries' calls for promoting the international transfer of ESTs through institutional, well-managed criteria. As a result, a new mechanism was created, 'the Technology Mechanism' (TM) that aims to enhance actions surrounding technology diffusion and transfer for the purpose of mitigating or adapting to climate change. In addition to having concrete steps and measures effectively operationalises the international transfer of ESTs provisions under the UNFCCC regime. This mechanism was established in the Copenhagen Accord in 2009. [607] Nevertheless, the decision concerning the details, function, and structure of this new mechanism was undertaken later in the Cancun Agreements.

Thus, when reaching Cancun, the Parties started to flesh out ideas and the details of TM. Thus, the decision to establish the TM at the Cancun Conference represents a potentially positive development in view of the long-standing demands by developing

[606] UNFCCC, 'The Cancun Agreements, an assessment by the Executive Secretary of the United Nations Framework Convention on Climate Change: Key Steps of the United Nations Climate Change Conference' (UNFCCC, n.d), <http://cancun.unfccc.int/cancun-agreements/significance-of-the-key-agreements-reached-at-cancun/#c45> accessed 16 February 2016.

[607] Coninck, H. & Sagar, A. [2015] 'Technology in the 2015 Paris Climate Agreement and beyond' (42) (ICTSD) <http://www.ictsd.org/themes/innovation-and-ip/research/technology-in-the-2015-paris-climate-agreement-and-beyond> accessed 13 January 2016. See also: ICTSD [28 Nov 2011] 'The Climate Technology Mechanism: Issues and challenges' ICTSD BIORES 5(4), <http://www.ictsd.org/bridges-news/biores/news/the-climate-technology-mechanism-issues-and-challenges> accessed 12 April 2016.

countries for the institutional strengthening of the TOT 'pillar' under the UNFCCC.[608]

The TM shall support countries' efforts for mitigation and adaptation of climate change and for promotion the transfer and diffusion of ESTs.[609] TM, when established, was supported by two main bodies: a policy arm, the Technology Executive Committee (TEC)[610], and an implementing institution, the Climate Technology Centre and Network (CTCN).[611] In addition to the agendas for those two bodies, later in 2015 the Paris conference imposed on Parties the requirement to submit Intended Nationally Determined Contributions (INDCs).

In fact, TM is not a TOT mechanism; it is a 'Technology Mechanism' and as such, it is clear that there is a big difference in the two terms. In addition, the TM faces many challenges and IP protection is one of those challenges. Developing countries call and demand repeatedly for the consideration of IP protection as one of the possible barriers to TOT but unfortunately this has not been addressed in any way in the TM

[608] ICTSD [28 Nov 2011] 'The Climate Technology Mechanism: Issues and challenges' 5(4) ICTSD BIORES <http://www.ictsd.org/bridges-news/biores/news/the-climate-technology-mechanism-issues-and-challenges> accessed 12 April 2016.
[609] UNFCCC, 'Technology Mechanism: Enhancing climate technology development and transfer' (UNFCCC, 2015), <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf> accessed 16 February 2016.
[610] The TEC is the policy component of the Technology Mechanism. It was established in 2010 to facilitate enhanced action on climate technology development and transfer. See: <http://unfccc.int/ttclear/pages/tec_home.html>
[611] The CTCN was established by COP 16 for the purpose of facilitating the transfer of technologies through three core services: first, through providing technical assistance at the request of developing countries to accelerate the transfer of climate technologies; second, by creating access to information and knowledge on climate technologies; and third, by fostering collaboration among climate technology stakeholders via the Centre's network of regional and sectoral experts from academia, the private sector, and public and research institutions. See: Unfccc, 'Technology Mechanism ' (TT-Clear, n.d) <http://unfccc.int/ttclear/support/technology-mechanism.html> accessed 20 May 2017

or in any of the Cancun Agreements.[612]

TM does not contain direct straightforward obligations on the part of developed countries. So the TM is still not working on a practical supportive level and needs 'to be endowed with sufficient resources if it is to play any meaningful role and make a "real" difference.'[613]

4.8 International transfer of ESTs under the Paris Agreement 2015

The Paris Agreement under the UNFCCC was adopted on 12 December 2015 by consensus in the COP 21 in Paris as per decision No. 1/CP.21.[614] It was opened for signature from 22 April 2016 to 21 April 2017.[615] The Agreement entered into force in 4 November 2016. It sets legally binding provisions on all countries, whether developed or developing, to make significant commitments to mitigate and adapt to climate change on a national level.[616]

Developed Parties that are basically responsible for most of the global GHG emissions have already pledged their Nationally Determined Contributions (NDCs). Developing Parties shall revisit their current pledges by 2020 and, subsequent to that, strengthen their GHG emission reduction targets for 2030.[617]

[612] ICTSD [28 Nov 2011] 'The Climate Technology Mechanism: Issues and challenges' 5(4) ICTSD BIORES <http://www.ictsd.org/bridges-news/biores/news/the-climate-technology-mechanism-issues-and-challenge> accessed 12 April 2016.
[613] ibid.
[614] UNFCCC, 'The Paris Agreement: Next steps' (UNFCCC, 3 February 2016), https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_next_steps_post_adoption.pdf> accessed 15 February 2016.
[615] Paris Agreement under the UNFCCC, adopted on 12 December 2015, will be entered into force on 22 April 2016 to 21 April 2017, art 21, p 1.
[616] NRDC, 'The Paris agreement on Climate Change: Issue Brief' (NRDC, December 2015), <https://www.nrdc.org/sites/default/files/paris-climate-agreement-IB.pdf> accessed 14 April 2016.
[617] Ibid.

All countries have to report their GHG inventories and progress towards emission reduction targets every two years through the Intended Nationally Determined Contributions (INDCs)[618] or, more precisely, the Nationally Determined Contributions (NDCs) after ratification.[619] Accordingly, this agreement includes a more transparent and accountable system than any prior climate change agreement, since it holds countries accountable for their commitments as per the Agreement. [620]

The Agreement's approach is a type of one-size-fits-all obligation. It is far from the principle of common but differentiated responsibilities and respective capabilities of the UNFCCC.[621] The Agreement has only allowed developing countries the opportunity to communicate their contribution in the first quarter of 2015.[622] Nevertheless, the Agreement recognises 'the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change...'[623] Also, the agreement takes full account of LDC needs with regard to TOT.[624]

[618] NRDC, 'Issue Brief: The Paris agreement on Climate Change' (NRDC, December 2015), <http://www.nrdc.org/globalwarming/files/paris-climate-agreement-IB.pdf> accessed 15 February 2016.
[619] International Centre for Climate Governance, 'INDC' (Climate Policy Observer: Monitoring Climate Policies, n.d) <http://climateobserver.org/open-and-shut/indc/> accessed 14 April 2016.
[620] NRDC, 'Issue Brief: The Paris agreement on Climate Change' (NRDC, December 2015), <http://www.nrdc.org/globalwarming/files/paris-climate-agreement-IB.pdf> accessed 15 February 2016.
[621] Centre for Climate Change Solutions, 'Essential Elements of a Paris Climate Agreement' (C2ES, December 2015) <http://www.c2es.org/docUploads/essential-elements-of-a-paris-climate-agreement.pdf> accessed 14 April 2016.
[622] International Centre for Climate Governance, 'INDC' (Climate Policy Observer: Monitoring Climate Policies, n.d) <http://climateobserver.org/open-and-shut/indc/> accessed 14 April 2016.
[623] UNFCCC (The United Nations Framework Convention on Climate Change adopted on 9 May 1992 and entered into force on 21 March 1994), preamble.
[624] NRDC, 'Issue Brief: The Paris agreement on Climate Change' (NRDC, December 2015), <http://www.nrdc.org/globalwarming/files/paris-climate-agreement-IB.pdf> accessed 15 February 2016.

We have to note that the Agreement, although it sets out minimum obligations and implements mechanisms for the purpose of ensuring additional actions, mainly taken in developing countries, nevertheless has not addressed similar binding obligations for the international transfer of ESTs to developing countries.[625] Although as we saw in most of the UNFCCC reports and studies, the international transfer of ESTs is a key factor in mitigation and adaptation of climate change. However, still no binding obligations exist even in this recent agreement.

On conceptual basis, the preamble of the Agreement recognises the importance of EST transfer as all other UNFCCC agreements do. Parties, in the COP 21, agreed on strengthening the TM and also requested that the TEC and the CTCN support the implementation of the Paris Agreement in regard to technology research, development and demonstration, and the development and enhancement of endogenous capacities and technologies.[626]

While in the text of the Agreement there is no new progress or obligations for the international transfer of ESTs, there are some general provisions mentioned for supporting developing Parties to allow for higher ambition in their action as per

[625] ibid.

[626] The UNFCCC, COP 21, Paris, 30 November to 11 December 2015, para 66–68. See: <https://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf>

Article 4.5 of the Paris Agreement, in addition to taking into consideration developing countries' economic concerns, but again, how and to what extent is not shown.[627]

Developed Parties shall provide financial resources to assist developing countries in their strategies and actions to mitigate and adapt to climate change, as per Article 9 of the Paris Agreement. Nevertheless, there is nothing there on how to assist developing countries with regard to the international transfer of ESTs.

Some general commitments can be found in the Paris Agreement, in particular in Article 10, with regard to promoting the international transfer of ESTs, as Parties should share a long-term vision concerning the importance of TOT for reducing GHG emissions.[628] Also, without practical mechanisms or executive rules of how to put that in practice, Parties should also strengthen cooperative action on technology development and transfer.[629]

The Agreement ensures that 'accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development…'.[630] Then efforts in this regard, as appropriate, shall support and facilitate access to technology, in particular for early stages of the technology cycle, to developing-country Parties. Nevertheless, this shall be through the TM and the Financial Mechanism, which as we have mentioned, do not work to promote TOT on a practical level.[631]

[627] UNFCCC (The United Nations Framework Convention on Climate Change adopted on 9 May 1992 and entered into force on 21 March 1994), art 4.5
[628] Paris Agreement, adopted on 12 December 2015 in Paris, France, opened for signature from 22 April 2016 to 21 April 2017, Article 10.1.
[629] ibid, art 10.2.
[630] ibid, art 10.5.
[631] ibid.

In sum, even though it is mentioned in some of Article 10's provisions, the scope given TOT is still too wide and useless. It is not supported with a time limit or certain criteria or mechanisms that measure how developed countries are complying with them and to what extent there is support for developing countries. The Agreement deals with NDCs in a different way; it is very productive and precise in NDCs' provisions while it is soft and wide in the provisions for international transfer of ESTs.

4.9 Conclusion:

The absence of a role for IP role in TOT under the UNFCCC regime is clearly noted. Any TOT is closely linked to IP rights in different aspects. IP is used as a catalyst or an incentive for greater investment in ESTs projects in developing countries. Ignoring the IP part when dealing with TOT will misdirect the objectives of the TRIPS Agreement and will open the path to further examples of commercial dealings that do not include real or a successful TOT.

The definition we set out for the transfer of technologies or ESTs focused on the objective of such transfers as being using the IP rights of the transferor by the transferee independently for the purpose of achieving the TRIPS objectives. This takes the shape of selling, reusing, or reproducing the same technology.

The TRIPS Agreement includes several crucial principles that can be a basis for more development in TOT. Those principles can work as potential motivators to promote the international transfer of ESTs under the climate change regime.[632] The

[632] Littleton, M. [2008] 'The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries', *DESA Working Paper No 71 Economic and Social Affairs*, <http://www.un.org/esa/desa/papers/2008/wp71_2008.pdf> accessed 29 February 2016.

Doha Declarations have emphasised in different ways how important the TRIPS principles are, as we saw in the previous chapter.

As an IP system, as per the TRIPS Agreement, works for the purpose of promoting development goals, then the international transfer of ESTs should also work for such objectives as a primary logical objective. Then it should work towards other objectives, such as protecting public health and humankind, in addition to protecting the earth against the threat of climate change.

The TRIPS Agreement explicitly set out terms and provisions that promote environmental protection, public health, and development and economic welfare for developing countries. Hence, climate change is also closely related to public health and economic development. So all these objectives can be used to encourage the international transfer of ESTs and link them to IP at the same time.

In addition, the TRIPS Agreement supports its Members by giving them some discretion 'to determine when those goals should override the normal TRIPS restrictions.'[633] The world has experienced a good example in this regard, when it had to promote affordable essential medicine to combat the threat of AIDS in the developing world. So if we consider climate change a real danger and a threat that requires immediate action by all countries, then allowing the compulsory license might be a good solution in this regard. This will be subject to further analysis in the following chapter.

[633] Littleton, M. [2008] 'The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries', *DESA Working Paper No 71 Economic and Social Affairs*, <http://www.un.org/esa/desa/papers/2008/wp71_2008.pdf> accessed 29 February 2016.

In conclusion, we have noted that there is some progress in promoting the international transfer of ESTs under the climate change regime. It is at a better position than the point at which TRIPS stopped. Nevertheless, understanding how such transfers will work in practice is based on countries' experiences in this regard, and in particular, developing countries' prior experiences in transferring ESTs. Case studies dealing with some developing countries like Kuwait, UAE and Jordan will add more practical comments and analysis to the whole picture. These will be the subject of the following chapters.

Chapter 5

Outline of the International Transfer of Technology Case Studies

5.1 Introduction

We noted that in order to comply with the UNFCCC and its subsequent agreements and protocols, GHG emissions should be reduced through a number of EST projects. Technical cooperation between Annex I industrially developed countries and non-Annex I developing countries in this regard is crucial. Developed countries own most of the ESTs. Thus in order to allow developing countries to catch up, there are two main channels to follow: either to develop new types of EST by internal means, or to acquire such new technologies from developed countries through the TOT.

The UNFCCC and the Kyoto Protocol have developed out of the CDM. It is a tool for achieving two key objectives. First, it will work by reducing GHG emissions in developing countries through EST projects. Second, CDM is a tool that will encourage or even foster transferring technologies to developing countries.[634]

The objective to reduce GHG emissions under the Kyoto Protocol is the main concern of the UNFCCC and Kyoto parties. If any EST project is registered as a CDM project, the developed-country Party will earn CERs. CERs are a type of emissions unit, known as carbon credits, issued by the CDM Executive Board for

[634] Antoine Dechezleprêtre et al., 'Technology Transfer by CDM Projects: A Comparison of Brazil, China, India and Mexico' [2009] 37(ND) Energy Policy 703–711.

emission reduction as a result of registered CDM projects and verified by a designated operational entity (DOE) as per the Kyoto Protocol.[635]

The CDM Executive Board (CDM EB) supervises CDM as per the Kyoto Protocol under the authority and guidance of the Conference of the Parties (COP), serving as the meeting of the parties to the Kyoto Protocol (CMP).[636] Therefore, the CDM Executive Board (EB) is fully accountable to the CMP. CERs must, then, be verified by a DOE, an independent auditor accredited by the CDM Executive Board to validate project ESTs proposals.[637]

CERs encourage the Annex I parties to work on developing more EST projects that meet the requirements of CDM and follow its criteria. In contrast, the second objective of the CDM is to be used as a tool to encourage or even foster the international transfer of ESTs to non-Annex I developing-country Parties. Achieving this objective is still complicated and includes many uncertainties in respect of its requirements and criteria. That is why we need to have more examination, analysis and evaluation of such tools as the CDM, through an empirical basis. For this purpose, then, we chose case studies from a number of developing countries that submitted ESTs to be registered as CDM projects under the UNFCCC.[638]

This chapter outlines the case studies that will be the subject of the following three chapters. We believe it is important in this chapter to elaborate the objectives of the

[635] UNFCCC, 'The Kyoto Protocol Mechanism: International Emissions Trading, Clean Development Mechanism, Joint Implementation' [2007] ND (ND) Paper from sustainably managed forests (FSC) <http://unfccc.int/resource/docs/publications/mechanisms.pdf> accessed 27 January 2017.
[636] UNFCCC, 'EB Meetings' (UNFCCC: Executive Board, n.d) <http://cdm.unfccc.int/EB/ index.html> accessed 27 January 2017.
[637] UNFCCC, 'Designated Operational Entities' (UNFCCC: Validators and Verifiers, n.d) <https:// cdm.unfccc.int/DOE/index.html> accessed 27 January 2017.
[638] Antoine Dechezleprêtre et al., 'Technology Transfer by CDM Projects: A Comparison of Brazil, China, India and Mexico' [2009] 37(ND) Energy Policy 703–711.

case studies, the criteria for evaluation and data resources, in addition to an evaluation of the role of the CDM as the tool for TOT.

In addition, we will look to two main issues in this chapter to avoid repetitions between each case study. First, we will look at the IP role in the CDM projects, in which we will clarify how TOT will be as per the IP and patent tools as per the TRIPS agreement and international IP law. Second, we will clarify the reasons behind choosing the countries of Kuwait, the United Arab Emirates and Jordan as developing countries in the case studies.

5.2 Criteria for evaluation under the case studies

A number of elements were considered in the criteria for evaluating TOT in EST projects that are or were submitted to be registered as CDM projects under the UNFCCC. Certain elements had to be examined before reaching a conclusion as to whether or not such TOT has been successful in each EST project in a developing country.

(1) First, one of the important characteristics requiring analysis is how ready the local market is to actually absorb such new technologies. In fact, this is the main objective for becoming involved in such a project on the part of the developing country. It is important to enable the developing countries to choose the appropriate ESTs that fit their internal conditions and local market needs. Otherwise, they may pay the costs of such projects without a real difference in sustainable development.

Sustainable development is defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own

needs.'[639] This means that there are two basic concepts of sustainable development: first, the concept of needs as to the '…the essential needs of the world's poor, to which overriding priority should be given',[640] and second, the concept of limitations that are 'imposed by the state of technology and social organization on the environment's ability to meet present and future needs.'[641]

The Paris Agreement resulted in the adoption of the 'Transforming our World: The 2030 Agenda for Sustainable Development' on 25 September 2015.[642] This agenda features 17 new sustainable development goals (SDGs) that are targeted by 2030 to 'eradicate extreme poverty, promote prosperity and people's well-being, while protecting the environment'.[643]

Goal 17 of the agenda is to 'Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development' in many respects, including finance, technology, capacity building, trade and systemic issues.[644] Under the technology aspect in Article 17.7, parties of the Paris Agreement shall work on promoting 'development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed'.[645] Accordingly, the Paris

[639] United Nations, 'Report of the World Commission on Environment and Development: Our Common Future' (UN Documents, n.d) <http://www.un-documents.net/our-common-future.pdf> accessed 27 January 2017.
[640] ibid.
[641] ibid.

[642] Transforming our World: The 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015.

[643] United Nations, 'UN Member States Agree Sustainable Development Goals Momentum for COP21' (UN Climate Change Newsroom, 3 Aug 2015) <http://newsroom.unfccc.int/unfccc-newsroom/un-member-states-agree-sustainable-development-goals/> accessed 27 January 2017.
[644] Transforming our World: The 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015, Goal 17.
[645] ibid, art 17.7.

Agreement identified that the current system is not fostering TOT to developing countries: hence this resolution.

In fact, in promoting TOT, certain prerequisites for achieving a successful TOT shall be achieved in a developing country. These prerequisites are important to address whenever applicable in each case study country. For instance:

a) The technology must be appropriate for the needs of the host country.
b) The technology must be appropriate for the proposed method or transaction or application.
c) The technology must be at a level of maturity.
d) The recipient must be at an appropriate level to apply the technology.
e) The technology must be economically viable.[646]

These factors will be addressed against the background given in each case study with regard to the EST industry in the host country as a developing country. This will be addressed through the host country's policies, related laws and regulations, and the technical needs assessment that is done in the host country with regard to the EST industry.

(2) Second, it is important that both parties, developed and developing country, in each EST project know exactly what is meant by TOT and how can it be achieved.

[646] Committee to Evaluate Transfer of Pollution Prevention Technology for the US Army, Board of Manufacturing and Engineering Design, Division of Engineering and Physical Sciences. Transfer of Pollution Prevention Technologies (National Academies Press 2002) 13.

We already had defined the TOT but it is important to remind the reader with the definition here in the case studies outline.[647] We define TOT as:

> A transfer of the technology as a total system from the IP owner in a developed country (transferor) to a secondary user or recipient in a developing country (transferee) in a way that enables the transferee to absorb the technology and use all IP and patents rights related to such technology independently for the purpose of achieving the TRIPS objectives.

In fact, there is confusion and misunderstanding between TOT and technology diffusion. The definition set out here stands on three main issues. First, the transfer shall be dealt with as a total system, so the content of the technology is important. Second, the two main parties shall make this transfer: the developed and the developing country. Third, the objective of such a transfer is to build absorbing capacity through enabling the transferee to use all IP and patent rights, including the right to reuse, resell, and reproduce the same transferred technology in the future independently by the developing country.

This is different from technology diffusion. Technology diffusion helps in providing general knowledge about the new technologies. Nevertheless, it does not transfer the technology to the transferee. TOT will achieve an important result: the absorbance capacity. The transferee will be able to reproduce or reuse the same technology in the future independently from the transferor.[648] In fact, technology diffusion can be seen as an additional benefit that the application of this new

[647] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017
[648] UNCTAD, 'Transfer of Technology' [2001] ND UNCTAD Series on issues in international investment agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016.

technology and not the transfer of it can achieve in the host country. Nevertheless, as previously mentioned, it is related to the general adoption and general awareness of the use of new technologies.[649]

Hence, technology diffusion introduces new technology and creates an awareness of that technology, which may spill over into the economic development of the host country in general. This will be achieved whenever new technologies are applied, and this diffusion is quite far from the objectives of TOT. Normally, technology diffusion is achieved through the passage of time and training of personnel.[650]

It might be easier to classify the levels of TOT technically. TOT can be classified according to three levels of transfer: the basic level, the intermediate level, and the advanced or innovative level, as explained in chapter 2.[651]

(3) Finally, the challenges facing the host country in TOT under CDM will be explored in the case study chapters. We will focus on the barriers and challenges related directly to TOT deal under CDM.

5.3 The objectives of the case studies

The objective of the case studies is to examine, analyse and evaluate TOT in the EST projects that are submitted to registration under the UNFCCC as CDM projects in three developing countries: Kuwait, the United Arab Emirates (UAE) and Jordan.

Accordingly, it will be useful to explore how each of those developing countries, with different capabilities, dealt with its own challenges and how the CDM benefited (or

[649] ibid.
[650] ibid.
[651] See p.104 Chapter 2.

not) each of them. Therefore, at the end of these case studies, we can reach a conclusion as to whether the CDM has added something new in fostering TOT than is provided for in the TRIPS agreement.

In fact, the literature related to international transfer of ESTs through CDM as a tool is still limited, which is why this area of research was chosen as a case study. In addition, CDM in the field of TOT is more recent than other types of international TOT. Therefore, the focus of the case studies will be on how the CDM as a tool contributes to encouraging and promoting TOT.

Additionally, some science, technology and innovation policies will be reviewed in each country to see whether they have a direct effect on promoting TOT. We will also examine the capability of developing countries to absorb such a new technology into their internal local systems through the ability to access, adapt and reuse technological knowledge that has been generated abroad.[652]

There are many factors that influence TOT, including government strategy and policy-making in a developing country, in addition to 'the geographical position of origin and destination markets, market size and competitiveness, commercial prospects, the level of development of human capacities and skills, governance, and infrastructure.' [653] Therefore, those issues will not be examined in detail unless they have a direct impact on TOT.

Issues like the developing country's development agenda will be addressed only when there is a direct impact on promoting TOT. Instead, we are concerned more

[652] UNCTAD, 'Transfer of Technology and Knowledge Sharing for Development Science, Technology and Innovation Issues for Developing Countries' [2014] 8(ND) UNCTAD Current Studies on Science, Technology and Innovation <http://unctad.org/en/PublicationsLibrary/dtlstict 2013d8_en.pdf> accessed 9 July 2016.
[653] ibid.

with how TOT may be effective, as per the current legal system. Each case study will focus only on how a CDM project can best assist TOT and how can it be addressed within the terms and conditions of the method or form used for such a transfer. The objective is to arrive at a legal analysis and conclusions as to how TOT is supported as a mechanism for improving development and economic welfare in developing countries.

We can summarize the objectives of the case studies as follows:

a) To review TOT provisions in each EST project that is submitted to be registered as a CDM project.
b) To examine how successful TOT is under these EST projects.
c) To explore the current barriers to CDM as a tool for TOT.
d) To identify lessons learned or recommendations to solve the barriers explored and opportunities for improvement.

5.4 Parties of EST projects – developing countries: Kuwait, the UAE and Jordan

We chose Kuwait, the UAE and Jordan as representative developing countries. Developing countries represent the majority of WTO Members. Around two thirds of the 150 WTO members are developing countries.[654]

The WTO agreement identifies three groups of countries: developed, developing and least developed countries (LDCs). Nevertheless, the WTO has not defined these three groups. WTO members self-define themselves as either developed, developing

[654] WTO, 'Understanding the WTO: Developing Countries: Overview' (WTO: Overview, n.d) <https://www.wto.org/english/thewto_e/whatis_e/tif_e/dev1_e.htm> accessed 28 January 2017.

or LDC, but any other member can challenge this definition.[655] Being a developing country as per the WTO terms and conditions enables a developing country to benefit from flexibilities like longer transition periods.[656]

The United Nations has a list of LDCs but has no international list or convention for developing countries. It identifies developing regions and developed regions or areas. Therefore, and in common practice, 'Japan in Asia, Canada and the United States in northern America, Australia and New Zealand in Oceania, and Europe are considered "developed" regions or areas'.[657] In contrast, countries emerging from the former Yugoslavia are treated as developing countries, while countries of Central Europe and of the Commonwealth of Independent States in Europe are not included under developed or developing regions.[658] Kuwait, Jordan and the UAE declared themselves developing countries under the WTO.[659]

The International Monetary Fund (IMF) has a flexible system for country classifications according to development. There are three main factors: (1) per capita income level; (2) export diversification; and (3) degree of integration into the global financial system. [660]

The World Bank provides another classification. It classifies countries into four

[655] WTO, 'Development: Definition. Who are the Developing Countries in the WTO?' (WTO: Development, n.d) <https://www.wto.org/english/tratop_e/devel_e/d1who_e.htm> accessed 28 January 2017.
[656] ibid.
[657] UN, 'Composition of Macro Geographical (Continental) Regions, Geographical Sub-regions, and Selected Economic and Other Groupings' (UN, 26 September 2016) <http://unstats.un.org/unsd/methods/m49/m49regin.htm#developed> accessed 28 January 2017.
[658] UN Statistic Division , 'Composition of Macro Geographical (Continental) Regions, Geographical Sub-regions, and Selected Economic and Other Groupings' (UN Statistic Division , n.d) <http://unstats.un.org/unsd/methods/m49/m49regin.htm#developed> accessed 25 December 2016.
[659] WTO, '6 Ways the WTO can Help Countries Develop' (WTO: Help Countries Develop, 26 September 2016) <https://www.wto.org/english/thewto_e/whatis_e/10thi_e/10thi06_e.htm> accessed 28 January 2017.
[660] Lynge Nielsen, 'Classifications of Countries based on their Level of Development: How it is done and How it could be done' [February 2011] WP/11/31(n.d) IMF Working Paper <http://www.imf.org/external/pubs/ft/wp/2011/wp1131.pdf> accessed 25 December 2016.

income groups that are set out each year on July 1. Economies were divided according to 2016 GNI per capita using four ranges of income: low income countries had GNI per capita of US $1,025 or less; lower middle income countries had GNI per capita of between $1,026 and $4,035; upper middle income countries had GNI per capita of between $4,036 and $12,475; and high income countries had GNI per capita of above $12,476.[661]

As we analyse the international transfer of ESTs to developing countries, we will base that mainly on Party classifications as per the UNFCCC. Parties under the UNFCCC are classified into these categories:

1. Annex I. Around 43 countries are in the UNFCCC Annex I list. Those countries are all the developed industrialized countries, including the European Union (EU), the relatively wealthy countries that were members of the Organization for Economic Cooperation and Development (OECD) in 1992 and Economies in Transition (EITs). EITs are the former centrally planned (Soviet) economies of Russia and Eastern Europe. Also, developing countries have the option to volunteer and become one of the Annex I parties if it sees itself as sufficiently developed to comply with Annex I commitments.[662]

Historically, the Annex I parties like the USA, Belgium, France, Germany, Greece, the UK, the Russian Federation, Italy, Japan, Australia, Denmark, Canada, etc. are the industrialized countries who have contributed the most to climate change.[663]

[661] ibid.
[662] UNFCCC, 'Parties & Observers' (UNFCCC, n.d) <http://unfccc.int/parties_and_observers/items/2704.php> accessed 20 December 2016.
[663] UNFCCC, 'Guide to the Climate Change Negotiation Process' (UNFCCC, n.d) <http://unfccc.int/not_assigned/b/items/2555.php> accessed 25 December 2016.

In fact, the per capita GHG emissions of Annex I parties are higher than those of most developing countries. The reason for that is the industrial capability of Annex I parties. The developed industrialized countries in Annex I parties also enjoy greater financial and institutional capacity to address climate change than developing countries.[664]

Annex I parties, as per the principles of equity and common but differentiated responsibilities under the UNFCCC, are obliged to take the lead and modify the longer-term trends in global GHG emissions. Hence, Annex I parties are committed to take certain actions in adopting national policies and measures and to comply with the non-legally binding aim under the UNFCCC of returning GHG emissions level to 1990 levels.[665]

In order to give assurances of such compliance, Annex I parties must submit national communications (NCs) as per Articles 4.1 and 12 of the UNFCCC. National communications are regular reports in which each Annex I country is obliged to set up the details of its climate change policies and measures.[666] Most Annex I parties submitted their first NC in 1994 or 1995, the second in 1997–1998 and the third after 30 November 2001. The fourth NC was due on 1 January 2006[667], the fifth NC on 1 January 2010 and the sixth on 1 January 2014. Decision 9/CP.16 calls for submission of the seventh NC on 1 January 2018.[668]

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[664] ibid.
[665] ibid.
[666] ibid.
[667] UNFCCC, ' Annex I National Communications and Reports Demonstrating Progress under the Kyoto Protocol' (UNFCCC, n.d) <http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/3625.php> accessed 11 February 2017
[668] UNFCCC, 'National Communications Annex I' (UNFCCC, n.d) <http://unfccc.int/national_reports/annex_i_natcom_/items/1095.php> accessed 25 December 2016.

Annex II. Around 24 countries that are parties from Annex I, are also listed as Annex II parties. This list is therefore composed of EU and OECD members. In fact, Annex II parties are required to provide financial and technical support to both developing countries and the EITs. This support will assist them in reducing their GHG emissions through climate change mitigation actions and manage the impacts of climate change through climate change adaptation actions.[669] Annex II parties have a special obligation to provide new and additional financial resources toward non-Annex I developing countries to help with mitigating and adapting the climate change threat. This includes a commitment to facilitate the transfer of EST technologies to both developing countries and EITs.[670]

2. Non-Annex I. All remaining countries are listed as non-Annex I parties. Those are parties to the UNFCCC that are not listed in Annex I of the Convention. Most of those countries are either developing or low-income countries.[671]

Non-Annex I parties must report in more general terms on their actions to mitigate the climate change threat and adapt to its effects. The timeframe for the submission of NCs is less tight for these parties than for Annex I countries. Also, submission of NCs depends on the funding facility by Annex II parties as operated by the global environment facility (GEF). Over 50 non-Annex I parties have now submitted their NCs, but later than Annex I parties. [672]

The UNFCCC recognizes the importance of providing financial assistance and the transfer of EST technologies to non-Annex I parties. This is for the purpose of

[669] UNFCCC, 'Parties & Observers' (UNFCCC, n.d) <http://unfccc.int/parties_and_observers/items/2704.php> accessed 20 December 2016.
[670] UNFCCC, 'Guide to the Climate Change Negotiation Process' (UNFCCC, n.d) <http://unfccc.int/not_assigned/b/items/2555.php> accessed 25 December 2016.
[671] ibid.
[672] ibid.

enabling them to address mitigation and adaptation measures and actions in the context of their sustainable development. [673]

Then there is a list for least-developed countries (LDCs). About 49 parties are LDCs. They are given a special position under the UNFCCC because of their limited capabilities in mitigating or adapting the climate change threat.[674]

Kuwait, the UAE and Jordan are non-Annex I parties and so, as per the requirements of the UNFCCC, they are considered developing countries.[675]

Developed Annex I industrialized countries that ratified the Kyoto Protocol agreed to legally binding GHG emissions reduction targets during the first commitment period (2008–2012). During a second commitment period, new targets are to be set for industrialized countries.[676] The UNFCCC does not set any immediate restrictions on non-Annex I parties for three reasons. First, it avoids setting restrictions on the development of non-Annex I parties because reducing GHG emissions is linked strongly to industrial capacity. Non-Annex I parties are either developing counties or countries that face low-income difficulties. [677] Second, non-Annex I parties can sell emissions credits to Annex I parties when their operators have difficulty meeting their emissions targets.[678] Third, non-Annex I parties have the opportunity to receive

[673] Climate Change Connection, 'UNFCCC' (Climate Change Connection: Connecting Manitobans to climate change facts and solutions, n.d) <http://climatechangeconnection. org/solutions/international-solutions/unfccc/> accessed 20 December 2016.
[674] UNFCCC, 'Parties & Observers' (UNFCCC, n.d) <http://unfccc.int/parties_and_ observers/items/2704.php> accessed 20 December 2016.
[675] UNFCCC, 'List of Non-Annex I Parties to the Convention' (UNFCCC, n.d) <http://unfccc.int /parties_and_observers/parties/non_annex_i/items/2833.php> accessed 20 December 2016.
[676] New Zealand Parliament, 'The UN Climate Change Conference: Where to now for the Kyoto Protocol?' (New Zealand Parliament, 16 Mar 2010) <https://www.parliament.nz/en/pb/research-papers/document/00PLEcoRP09081/the-un-climate-change-conference-where-to-now-for-the> accessed 24 December 2016.
[677] Climate Change Connection, 'UNFCCC' (Climate Change Connection: Connecting Manitobans to climate change facts and solutions, n.d) <http://climatechangeconnection. org/solutions/international-solutions/unfccc/> accessed 20 December 2016.
[678] ibid.

rewards and technologies from the investments in EST projects from Annex I parties.[679]

Accordingly, developing countries are asked by developed industrialized countries to limit the growth of their GHG emissions through EST projects and sustainable development. This will be done based on financial support and TOT by the developed industrialized countries.[680]

The UNFCCC has pushed only a small number of Annex I parties to make appreciable progress towards achieving their non-binding targets. Accordingly, it was noted that the UNFCCC was not sufficient to achieve such targets so as to ensure that GHG emissions are reduced to a safe level.[681]

The urgent need for new, more effective actions to achieve this target was a must. That is why the Kyoto Protocol was adopted in Kyoto, Japan, in December 1997 and entered into force on 16 February 2005. The commitments under the Kyoto Protocol are set out in the form of decisions called the Marrakesh Accords. The Marrakesh Accords were formally adopted in Montreal, Canada, in December 2005.[682]

The Kyoto Protocol obliged the Annex I parties to reduce GHG emissions as per the targets listed in Annex B of the Protocol to an average of five percent below 1990 levels over the first commitment period of the Protocol from 2008 to 2012.[683]

Certain measures to be taken by Annex I parties to meet this target take two forms:

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[679] ibid.
[680] New Zealand Parliament, 'The UN Climate Change Conference: Where to now for the Kyoto Protocol?' (New Zealand Parliament, 16 Mar 2010) <https://www.parliament.nz/en/pb/research-papers/document/00PLEcoRP09081/the-un-climate-change-conference-where-to-now-for-the> accessed 24 December 2016.
[681] ibid.
[682] ibid.
[683] ibid.

first, reducing the quantity of GHGs that are being emitted through ESTs projects, and second, removing the carbon dioxide presently in the atmosphere using carbon sinks—for example, trees. There is an additional means of meeting these targets under the Kyoto Protocol in the form of market-based mechanisms, thereby creating the carbon market.[684]

Financing these measures has always been one of the key issues under the UNFCCC. As per the principle of common but differentiated responsibilities and fairness, Annex II parties have to provide new and additional financial resources to parties from developing countries who are non-Annex I parties. This is to ensure the full support for incremental costs occurred during UNFCCC implementation by non-Annex I parties. [685]

Recently, at COP21 held in Paris at the end of 2015, 196 parties to the UNFCCC adopted the Paris Agreement. The Paris Agreement set out a framework arrangement for the required global action for mitigating and adapting to the climate change threat after 2020. Parties to the Paris Agreement shall submit their intended nationally determined contribution.[686] Therefore parties have to advance the construction of global climate governance. It is a bottom-up model that attracts all parties to the Paris Agreement to effectively participate in mitigating and adapting to climate change in a balanced and equal way. [687]

In sum, we have chosen Kuwait, the UAE and Jordan as developing countries because they are different levels of non-Annex I parties. As a result, we will explore

[684] ibid.
[685] Zhang Wen and Pan Xun, 'Study on the Demand of Climate Finance for Developing Countries based on Submitted INDC' [2016] 7(n.d) Advances in Climate Change Research 99–104.
[686] ibid.
[687] ibid.

the different types of barriers that developing countries face in promoting TOT. We need to have developing countries that enjoy different capabilities so that we can find out as much as possible about the challenges related to TOT. For example, it is obvious that Kuwait and the UAE may not face the same financial and cost challenges as Jordan, while challenges related to lack of information and technical expertise can also differ in these three countries.

5.5 Data sources

Data related to the project cycle and its status in the process of approving it as a CDM project was collected from the UNFCCC lists of CDM projects. Data and information related to whether this type of project is within the country's needs or not were collected from the TNAs, along with other reports and analyses used in some countries to assess the country's needs. As the TNA is a vital process that was established by the UNFCCC to identify the technological capacity in the host country and to assist it in choosing the most appropriate types of technology as per its environmental, economic and technical conditions,[688] the TNA plays a central role in creating the basis for a successful TOT.

Data and statistics related to GHG emissions in each developing country and their strategies and policies for reducing GHG emissions were obtained from each country's declared and endorsed policy through the Intended Nationally Determined Contributions (INDCs) as per the INDC submissions by UNFCCC parties.[689]

[688] The Stakeholder Forum for a Sustainable Future, 'Review of Implementation of Agenda 21: Sustainable Development in the 21st Century (SD21). Detailed Review of Implementation of Agenda 21'. (Sustainable Development, January 2012) <https://sustainabledevelopment.un.org/content/documents/1126SD21%20Agenda21_new.pdf> accessed 2 March 2016.
[689] INDC, 'INDCs as Communicated by Parties' (INDC, n.d) <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx> accessed 12 July 2016.

The term INDC, as previously explained in Chapter 4,[690] is used by the UNFCCC to address the reduction of GHG emissions. The Paris Agreement, adopted in December 2015, stated that the INDC will be the first Nationally Determined Contribution when a country ratifies the agreement, unless a country decides to submit a new NDC after ratification. Therefore, following ratification of the Paris Agreement, we will have the first GHG reduction targets.[691]

Data related to general information about each EST project – such as the form of the project, the method of implementation, the IP content, TOT provisions – were collected via personal interviews with concerned officials working on the project in each of the three countries.

Information and data particularly related to TOT provisions in each EST project were collected from the individual project design documents (PDD) of each project under the CDM in the UNFCCC. Section A.4.3 of the PDD is related to 'technology to be employed by the project activity' and the project participants are requested to 'include a description of how environmentally safe and sound technology and know-how to be used is transferred to the host Party(ies).'[692] Under this section, the partners explicitly state that the project involves or does not involve TOT, or, in some cases, the PDD is silent with regard to TOT.[693]

In addition to the PDD, the validation report and the monitoring reports, under the UNFCCC for each EST project submitted to be registered as a CDM project, was

[690] See Chapter 4, p.187.
[691] NRDC, 'Issue Brief: The Paris Agreement on Climate Change' (NRDC, December 2015) <http://www.nrdc.org/globalwarming/files/paris-climate-agreement-IB.pdf> accessed 15 February 2016.
[692] Bo Wang, 'Can CDM bring Technology Transfer to China? An Empirical Study of Technology Transfer in China's CDM Projects' [2010] 38(n.d) Energy Policy 2572–2585.
[693] Stephen Seres and Erick Haites, 'Analysis of Technology Transfer in CDM Projects' [2008] The UNFCCC Registration & Issuance Unit CDM/SDM.

another resource for the case studies. They provided information and data with regard to each ESTs project.

In case of particular projects where the type of transfer was not stated, or if there were general, unclear statements as to what is meant, we referred to the interviews with concerned officials or conference calls in each country. In addition, we referred to the main documents of the contract terms and conditions, technical specifications, etc.

In case there was a direct reference to TOT or an explicit provision that a project includes TOT, then the nature of TOT activity was studied to determine whether it was imported purely through equipment, or through training local staff, etc. This was examined in such a way as to determine whether the CDM has resulted in a successful TOT, as per the definition we set and the objectives of the TRIPS agreement and the climate change regime.

5.6 The CDM as a tool for promoting international transfer of ESTs

As mentioned above, the purpose of this thesis is to focus only on the process of transferring technologies to developing countries' EST projects. There is a great deal of literature related to how TOT is addressed in the TRIPS agreement and how it is working in practice. In contrast, there is less literature related to recent developments under the climate change regime and how to link it to the TRIPS agreement while, at the same time, trying to create a more productive system for TOT.

The purposes or objectives set out in the CDM are to 'reduce compliance costs for industrialized countries while encouraging sustainable development in poorer nations

through the introduction of more environmentally friendly technologies to developing countries'.[694] Accordingly, TOT is supposed to be a crucial component of sustainable development and ESTs in developing countries.

Nevertheless, the CDM does not make TOT a compulsory condition for project eligibility. Therefore, such a mechanism shall be examined to evaluate how best it can serve to encourage TOT. [695]

The process of the CDM cycle is divided into many stages. The first stage in the CDM cycle is project development. This involves the process of evaluating the feasibility of, and obtaining permits for, the project. As mentioned in the previous chapter, a CER cannot exist without a project that aims to reduce its GHG emissions compared to the baseline. Each CER shall be labelled with a project identifier linking it to the project that reduces GHG emissions.[696]

The second stage is the methodology approval. If the project includes a special methodology for calculating the baselines and monitoring the GHG emission reductions, it shall be submitted for approval.[697]

The third stage is the validation process. The PDD is a key document for the stages of validation and then registering the project as a CDM project. Validation requires the approval of the host non-Annex I country and Annex I country for validation of the

[694] Bo Wang, 'Can CDM bring Technology Transfer to China? An Empirical Study of Technology Transfer in China's CDM Projects' [2010] 38(n.d) Energy Policy 2572–2585.
[695] ibid.
[696] UNFCCC, 'Issuance of CERs' (UNFCCC, n.d) <https://cdm.unfccc.int/Issuance/index.html> accessed 11 August 2016.
[697] UNFCCC, 'CDM Methodologies' (UNFCCC, n.d) <https://cdm.unfccc.int/methodologies/index.html> accessed 11 August 2016.

project design by an internationally accredited auditor.[698] Validation is 'the process of independent evaluation of a project activity by a designated operational entity against the requirements of the CDM'.[699]

There must also be evidence of Annex I parties' participation in the project, such as any authorization or approval from an Annex I party. During the validation process, there must be an independent environmental auditor to validate the project design, as mentioned in the PDD.[700]

The fourth stage is registration. Registration is 'the formal acceptance by the Executive Board of a validated project as a CDM project activity'.[701] Once the project is validated the design operational entity (DOE), it will be submitted to the CDM Executive Board for registration. By this means, the project will formally be considered a CDM project.

The fifth stage is generation of CERs. An operating CDM project will calculate and monitor the GHG reductions generated. The sixth stage is verification. At this stage, an independent auditor will verify the GHG reductions of the project.[702] The seventh and final stage is issuance of CERs. If the verification and certification reports are in

[698] Charlotte Streck and Jolene Lin, 'Making Market Work: A Review of CDM Performance and the Need for Reform' in Kheng-lian et al. (eds.) *Crucial Issues in Climate Change and the Kyoto Protocol: Asia and the World* (World Scientific Publishing 2010) 190.
[699] Decision 3/CMP.1 (Modalities and Procedures for a Clean Development Mechanism as defined in Article 12 of the Kyoto Protocol), adopted in 30 March 2006, para 35.
[700] Charlotte Streck and Jolene Lin, 'Making Market Work: A Review of CDM Performance and the Need for Reform' in Kheng-lian et al. (eds.) *Crucial Issues in Climate Change and the Kyoto Protocol: Asia and the World* (World Scientific Publishing 2010) 190.

[701] Decision 3/CMP.1 (Modalities and Procedures for a Clean Development Mechanism as defined in Article 12 of the Kyoto Protocol), adopted in 30 March 2006, para 36.

[702] Charlotte Streck and Jolene Lin, 'Making Market Work: A Review of CDM Performance and the Need for Reform', in Kheng-lian et al. (eds.), *Crucial Issues in Climate Change and the Kyoto Protocol: Asia and the World* (World Scientific Publishing 2010) 189.

line, then the CDM Executive Board will issue CERs. Those CERs can be distributed to the project participants.[703]

An important element in any project, which is submitted for registration as a CDM project, is that such a project contributes to sustainable development through reducing GHG emissions. Therefore, there must be scientific evidence in the project documents that the project will actually reduce emissions.[704]

This approach has a direct impact on developing countries as, according to their international commitments, they start setting out their strategies to mitigate or adapt to climate change. Logically, TOT plays a huge role in moving the trend from sell and buy transactions that accrue to the benefit of the developed world only towards a more effective TOT that assists all countries to start mitigating or adapting to climate change. This is one of the main reasons why EST projects have been chosen for the case studies.

We also note, according to the obligations under the climate change regime, that developing countries need to leapfrog a technological generation in order to stabilize the concentrations of GHG emissions. A challenge that they face is developing their economic and social development plans and strategies, since these plans will increase local demands for energy services. At the same time, 'developing countries' infrastructures and economies are not as dependent on fossil fuels as the

[703] "The CDM Executive Board (CDM EB) supervises the Kyoto Protocol's clean development mechanism under the authority and guidance of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP). The CDM EB is fully accountable to the CMP. The CDM EB will be the ultimate point of contact for CDM Project Participants for the registration of projects and the issuance of CERs. See: United Nations Framework Convention on Climate Change" (EB Meeting) <http://cdm.unfccc.int/EB/index.html> accessed 24 November 2015.
[704] UNEP, 'Technology without Borders: Case Studies of Successful Technology Transfer' [2001] (n.d) The International Energy Agency (IEA).

industrialized countries are'.[705] As a result, it is much easier to start with developing countries in adopting ESTs than with the developed world.

In addition to that, EST projects are needed urgently for both developing and developed companies. The situation is different to that under the TRIPS agreement. Under the climate change regime, developed and developing countries need to cooperate so that both will benefit. Developed countries will benefit more if an EST project is registered as a CDM project in the UNFCCC because they will receive incentives, the CERs. At the same time, developing countries will benefit from such a mechanism through promoting the TOT.

In other words, the urgency of the subject for developed countries creates a pressure for developed countries to cooperate and take necessary actions to enhance the TOT for the purpose of mitigating and adapting to climate change. Therefore, if, under these circumstances, there are still no successful TOT to developing countries, it might be more difficult to achieve a transfer of other types of technologies to developing countries under the TRIPS Agreement.

We will start the case study for each country by giving background information about each developing country, after which the total EST projects submitted for registration as CDM projects are studied. The focus then shifts to two or more projects to examine and evaluate TOT. The main barriers and challenges to TOT will be explored and, finally, appropriate solutions and conclusions will be proposed.

The documents that can help in recognizing whether a project does or does not include TOT are the CDM PDDs, the validation report, the monitoring report, the contract or agreement between parties, and TOT licence or TOT agreement,

[705] ibid.

whichever is applicable. These will determine TOT occurrence and what type of technology the project tries to enhance and promote. For example, is it only for equipment or know-how transfer, or are there more elements? Also, who supplied the technology – the contractual partner, the service provider or the contractor? Or do they only operate the technology and it is supplied to them through a licence from the IP or patent owner? We will also consider the justifications for adopting such foreign technology in the host country.[706]

5.7 The role of IP in the international transfer of ESTs

Industries usually depend on various types of technology. Some technologies are simply embodied in the equipment and machinery that can be found in the open market for purchase. On other occasions, some technologies are not available in the public domain and are still patented. Therefore, in order to use, modify or resell such technologies, a technology licence agreement is required. There are three options to get access to these technologies: first, through the technology licence agreement; second, through TOT agreement; and, third, through compulsory licence.[707]

Patents are to a large degree the strongest form of IP rights.[708] Patents are also crucial for the ESTs industry. Such ESTs help in promoting sustainable development. In fact, the TRIPS Agreement does not deal directly with national environmental laws, it deals instead with the minimum standards of IP protection linked to trade.

[706] Bo Wang, 'Can CDM bring Technology Transfer to China?—An Empirical Study of Technology Transfer in China's CDM Projects' [2010] 38(n.d) Energy Policy 2572–2585.
[707] Douglas L. Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.
[708] Giancarlo Moschini, 'Intellectual Property Rights and the World Trade Organization: Retrospect and Prospects ' (CARD, 2003). <https://www.card.iastate.edu/faculty/profiles/giancarlo_moschini/Moschini-TRIPs-preprint-Oct-04.pdf> accessed 6 February 2017.

A patent is 'the title given to the intellectual property right that is granted to protect inventions. It gives inventors an exclusive right to prevent others from exploiting the patented invention, during a limited period of time'. [709] So the patent is a bundle of legal rights to exclude others awarded in exchange for disclosure of the invention as a per a document, issued, upon application, by a government office which states who is the right holder and what is his invention. This document describes an invention and creates a legal situation for the exploitation of such invention like: manufacturing, using, selling, importing …etc with the authorization of the owner of the patent. [710]

The TRIPS agreement has not defined the patent but instead it states the patentable subject matter (Article 27), then rights conferred (Article 28), conditions on patent applicants (Article 29), exceptions to rights conferred (Article 30), other Use Without Authorization of the Right Holder (Article 31), Revocation/Forfeiture (Article 32), term of protection (Article 33), and Process Patents: Burden of Proof (Article 34).[711]

Although the TRIPS is not concerned about environmental management, it has extended, from an IP perspective, the principle of patentability to all fields of technology. Patents as per Article 27.1 of the TRIPS Agreement, shall be available for any type of invention, whether products or processes, and in all fields of technology, 'provided that they are new, involve an inventive step and are capable of industrial application'.[712] So any invention related to environmentally sound

[709] WTO, 'Chapter 24: Trade-Related Aspects of Intellectual Property Rights' (WTO, 2008) <https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/8_bgd_trips_89_e.pdf> accessed 6 February 2017.
[710] WIPO, 'Chapter 2 Fields of Intellectual Property Protection' (WIPO, n.d) <http://www.wipo.int/export/sites/www/about-ip/en/iprm/pdf/ch2.pdf> accessed 7 February 2017.
[711] WTO, 'Uruguay Round Agreement: TRIPS Part II — Standards concerning the availability, scope and use of Intellectual Property Rights' (WTO, n.d) <https://www.wto.org/english/docs_e/legal_e/27-trips_04c_e.htm> accessed 6 February 2017.
[712] The TRIPS Agreement (entered into force on January 1, 1995), Article 27.1.

technologies is capable to be patented as long as fulfils the basic TRIPS requirements for patentablilty.

Patents usually are territorial in their protection. A patent granted in one country has no legal effect in another. As long as there is not any patent applied or registered in a specific country or in specific jurisdiction, there are no restrictions on making, using or selling this patented technology in that jurisdiction.[713]

There are three permissible exclusions allowed to the basic rule on patentability under the TRIPS Agreement, under Article 27. The first permissible exclusion (in order of our discussion) is that Members may exclude from patentability diagnostic, therapeutic and surgical methods for the treatment of humans or animals.[714] The second permissible exclusion is stated under Article 27.3(b). Members have the right to exclude plants and animals other than micro-organisms and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. Nevertheless, a country that excludes plant varieties from patent protection shall provide an effective sui generis system of protection. They may also opt for a combination of patents and sui generis protection.[715]

The last permissible exclusion is for inventions contrary to public order or morality, so Members are allowed to refuse to patent inventions that are dangerous to human, animal or plant life or health or seriously prejudicial to the environment.[716]

[713] WTO, 'The WTO TRIPS Agreement : A Practical Overview for Climate Change Policymakers' [2010] 13xii(n.d) WTO <https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/8_3_overviewclimatechange_e.pdf> accessed 3 February 2017.
[714] The TRIPS Agreement (entered into force on January 1, 1995), Article 27.3 (a).
[715] WTO, 'Chapter 24: Trade-Related Aspects of Intellectual Property Rights' (WTO, 2008) <https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/8_bgd_trips_89_e.pdf> accessed 6 February 2017.
[716] The TRIPS Agreement (entered into force on January 1, 1995), art 27.2

Nevertheless to apply this exclusion, the commercial exploitation of the invention must be prevented and such prevention must be necessary for the protection of the public order or morality.[717]

As we are concerned with the international transfer of ESTs, this last exclusion, in Article 27.2 of the TRIPS Agreement is important to our discussion. In fact, Article 27.2 deals with three issues at the same time, patent, trade and environment.[718] It is the only provision under the TRIPS Agreement that makes an explicit reference to the environment.[719]

Thus, if it is necessary to ban the commercial exploitation of any invention for the purpose of avoiding serious prejudice to the environment, a WTO Member has the right to refuse a patent for this invention.[720] Although this Article provides that a country can refuse to grant a patent to risky environmental invention, no positive provision is provided for encouraging the transfer of ESTs other than the general provision related to TOT.[721]

Therefore, the TRIPS Agreement does not provide a special mechanism for enforcing the transfer of ESTs. The UNFCCC takes this role through the

[717] WTO, 'Chapter 24: Trade-Related Aspects of Intellectual Property Rights' (WTO, 2008) <https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/8_bgd_trips_89_e.pdf> accessed 6 February 2017.
[718] M Bruce Harper, 'TRIPS Article 272: An Argument for Caution ' [1997] 21(2) William & Mary Environmental Law and Policy Review <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1298&context=wmelpr> accessed 4 February 2017.
[719] The TRIPS Agreement (entered into force on January 1, 1995), art 27.2.
[720] WTO, 'Environment and the TRIPS' [8 June 1995] WT/CTE/W/8(n.d) Committee on Trade and Environment <https://www.mtholyoke.edu/acad/intrel/tradenv.html> accessed 4 February 2017.
[721] See Chapter 3 p.106

development of the CDM as a tool for promotion of the transfer of ESTs to developing countries and LDCs.

As per the TRIPS Agreement, patents provide the patent owner with the right to prevent third parties without the owner's consent from making, using, offering for sale, selling or importing the product or the process that is subject matter of the patent.[722] At the same time, the TRIPS Agreement allows the patent owner to assign, or transfer by succession, the patent and to conclude licensing contracts.[723] Those rights are the main objectives for any TOT. Any TOT that does not lead to allowing the transferee to make, use, offer for sale, sell or import the product or the process, will not considered a TOT. That is one reason why the TRIPS Agreement under this Article confirmed after mentioning the exclusive rights of patent owner that such rights in the patent can be assigned or transferred by the patent owner.

As we mentioned earlier, there are three basic tools for transferring ESTs, as follows:

5.7.1 The technology licence agreement

Generally speaking, licensing is a legal method for exploiting technologies. The party that has developed the technology and owns it is called the licensor. The party that wants to use this technology is the licensee. Through the licence, the licensor can leverage its return on its technology.[724]

It is difficult to have one definition of the technology licence agreement. This is because the definition is based on the licence scope and limitations – in other words,

[722] The TRIPS Agreement (entered into force on January 1, 1995), Article 28.1 (a) and (b).
[723] ibid, art 28.2.
[724] Douglas L. Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.

what does the licence include and what does it exclude? That is what makes the licence agreement complex, because there are more key issues in such agreements than in other types of agreement.[725]

In general, the licence is an agreement between the licensor and the licensee. The main purpose is to permit the licensee to use the licensor technology that otherwise it could not legally use.[726] A technology licence agreement takes place only when one of the parties owns (or otherwise controls, as in a licensee–sub-licensee relationship) the IP. Ownership of the IP bestows a legal right to prevent third parties from using it. That is why the licence is needed to indicate consent by the owner to allow the licensee to use the IP in exchange for fees paid. A technology licence agreement does not occur when there is no IP.[727]

Both parties in the technology licence agreement seek to achieve a number of objectives. Parties seek to enable the licensee to make, use and sell the licensed technology. Also, parties look to allocate income from the technology success. The technology licence agreement also provides strong IP protection and stops IP infringements. [728]

Accordingly, one of the important elements of the licence agreement is the scope of the grant. In order to define the licence, we should be able to recognize the exact scope and subject matter of the licence. This must be clearly agreed upon between

[725] Francis Gurry, 'Successful Technology Licensing' (WIPO, 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 5 January 2017.
[726] Douglas L Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.
[727] Francis Gurry, 'Successful Technology Licensing' (WIPO, 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 5 January 2017.
[728] Williams, Mullen and the University of Virginia Patent Foundation, 'Technology Licensing Guidebook: A Look at Licensing Intellectual Property from both Sides of the Table' (Williams Mullen, 2007) <https://www.umass.edu/tto/sites/default/files/Technology%20Licensing%20 Guidebook.pdf> accessed 5 January 2017.

parties. Key provisions ought to be mentioned explicitly in the licence agreement, such as restrictions on the geographic scope, rights of use and rights of modifying or improving the technology, permissible channels of trade, and sublicensing or assignability to a third party.[729]

As per the scope of the licence, we can find different types of technology licence. Some licences are for specific IP rights, such as using a specific patent, or copying and distributing a certain copyright of work of authorship; other licences can be for all IP rights of any kind, 'to reproduce, make, use, market, and sell products based on a type of technology'.[730]

That is why the granting clause in any technology licence agreement is important. It is the heart of the licence. It describes the rights granted to the licensee and the scope of those rights, as mentioned earlier. An example of that is a typical patent licence for a product manufacturer. The granting clause will grant 'an exclusive, royalty-bearing license, with the right to sublicense during the term of exclusivity, under the Licensed Patents and Technical Information, to import, make, have made, use, sell, offer for sale and have sold Licensed Products and Combination Products in the Territory in the applicable Field of Use'.[731] Therefore, according to the type of technology used, the granting clause will be drafted. Restrictions and limits are to be mentioned.

It is essential to highlight that a technology licence agreement is mostly adopted as part of a broader business transaction or deal. As explained in Chapter 2 (i.e.,

[729] Andrew J Sherman, 'Technology Licensing II: Key Elements of an Agreement' (Entrepreneur's Resource, 2006) <http:// entrepreneurship.org/resource-center/technology-licensing-ii-key-elements-of-an-agreement.aspx> accessed 8 January 2017.
[730] Francis Gurry, 'Successful Technology Licensing' (WIPO, 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 5 January 2017.
[731] Douglas L Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.

Section 2.3.2., 'Types of legal relationships to carry out TOT'),[732] there are different commercial relationships that TOT can be categorized into. The technology licence agreement can be signed separately, but most of the time it occurs in the context of a business relationship in which other agreements – foreign direct investment, sales agreement, turnkey packages, BOT, joint ventures, etc.[733] – are often important.

Actually, the licensee may need some technologies to improve his industry even though he has more capital and broader industry expertise than the licensor. The licensee might be in a better position to put that technology to use more quickly. The licensee can benefit more from such technology. He can avoid the delays, risks and costs inherently related to in-house technology development. At the same time, the licensor seeks to maintain his control over this technology so as to keep receiving benefits from such licences.[734]

In fact, the licence is the best solution for the licensee for solving timing problems and achieving strategic objectives. 'A "develop or license" analysis is much like a "build or buy" analysis—in many cases it will be an easy decision to acquire a license'.[735] Mostly, the licensee has no choice except the licence. This is particularly so when such technology is protected through patents.[736]

The important issue is that the licence does not lead to a transfer of ownership of the technology to the licensee: usually, licences impose conditions and limits on the

[732] See Chapter 2, p.54.
[733] Francis Gurry, 'Successful Technology Licensing' (WIPO, 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 5 January 2017.
[734] Douglas L Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.
[735] ibid.
[736] ibid.

licensee's use of the technology.[737]

As a result of the fact that the technology licence does not transfer ownership of the technology to the licensee, the licensee may have to protect certain IP rights. This is as a result of the confidential nature of such technologies. The licence will therefore determine the extent of such an obligation to protect the IP rights and the parties that are to comply – for example, the licensee, its agents and employees.[738]

Technology licensing can be applied to patents, copyrights, trade secrets and trademarks. A patent permits the patent owner to exclude others from using the patented technology. Therefore, the use of patented technology by others is illegal without the patent owner's permission under the licence. The use of such technology thus depends on the rights owned by others. Patents only apply to the country that issues such a patent: if it is applied in the UK, it is protected only in the UK, and if it is applied in China it is only protected in China.[739]

Actually, information related to the technology that is to be licensed is important. The licensee must be aware of what constitutes the technology that needs to be licensed to avoid disputes, including such content as products, formulas, technical specifications, protocols, software programs, etc. The licensor usually has an interest in narrowing the definition of the technology that is subject to licensing; in contrast, the licensee looks for a broad definition of the technology. Lack of information and

[737] ibid.
[738] Andrew J Sherman, 'Technology Licensing II: Key Elements of an Agreement' (Entrepreneur's Resource, 2006) <http:// entrepreneurship.org/resource-center/technology-licensing-ii-key-elements-of-an-agreement.aspx> accessed 8 January 2017.
[739] Douglas L. Batey, 'Law of Biofuels: Technology Licensing' (AGMRC, 2006) <http://www.agmrc.org/media/cms/TechnologyLicensing_AD86BFCA469D6.pdf> accessed 8 January 2017.

clarity is a challenge to successful technology licence agreements.[740]

The licence will determine whether it is an exclusive or a non-exclusive licence. The exclusive licence is without the right to sublicense such rights to others. The field of use is one of the important elements of the licence. It may limit the use of the licence or the scope of the grant to a particular market, or a particular type of project or plant, or a specified territory. [741]

Furthermore, the licence sets the improvements provision – that is, whether or not the licensee has the right to improve the technology during the life of the licence. Usually this is allowed if it is a non-exclusive licence. In case of an exclusive license, the Licensor sometimes insists on granting back to it for any improvements, so here the licensee will face a problem if he wishes to modify and improve the licence independently in order to adequately commercialize such technology.[742]

The commencement date of the licence and its duration is also important, along with the right to renewals and extensions and whether or not there are particular conditions for such renewals.[743]

In order to use the technology licence agreement as a method to transfer technology, certain issues need to be taken into consideration.

First, a special form of a technology licence agreement shall be drafted in a way such as to allow TOT. We will call it a TOT agreement. It is a legal method that

[740] Francis Gurry, 'Successful Technology Licensing' (WIPO, 2015) <http://www.wipo.int/edocs/pubdocs/en/licensing/903/wipo_pub_903.pdf> accessed 5 January 2017.
[741] ibid.
[742] ibid.
[743] Andrew J Sherman, Partner, Dickstein Shapiro Morin and Oshinsky LLP, 'Technology Licensing II: Key Elements of an Agreement' (Entrepreneur's Resource, 2006) <http://entrepreneurship.org/resource-center/technology-licensing-ii-key-elements-of-an-agreement.aspx> accessed 8 January 2017.

permits the owner of a patented technology (transferor or licensor) to another person or legal entity (transferee or licensee) to 'perform, in the country and for the duration of the patent rights, one or more of the "acts" which are covered by the exclusive rights to the patented invention in that country'.[744]

Second, the granting clause shall determine how the scope of the licence reflects the technology and TOT, as follows:

a) The technology shall be defined precisely as per its contents. By this TOT licence, the transferee or the licensee is expected to obtain all information and data related to such technology. It shall be defined as a global package or a total system that leads at the end of the day to absorbing such technology in the transferee's internal system. Technology shall include data, information, technical assistance, IP rights, equipment, detailed design, technical assistance – sometimes also the use of the trademarks, buyback options, etc.[745]

In addition, the provision shall precisely include know-how and technical expertise in a form of 'feasibility studies, plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training'.[746] It shall include as well the types of service that the transferee shall perform by the effect of this TOT licence. This shall include technical advisory and personnel training for the purpose of installation and operation of the main or basic project that

[744] WIPO, 'Overview of Contractual Agreements for the Transfer of Technology' (2013) < http://www.wipo.int/export/sites/www/sme/en/documents/pdf/technology_transfer.pdf > accessed 23 February 2017.
[745] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009) 9–10.
[746] UNCTAD, 'Transfer of Technology' [2001] n.d UNCTAD Series on issues in international investment agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016.

TOT licence is a part of[747] and whether is a joint venture (JV) project, BOT, turnkey contract, etc., as previously explained in Chapter 2,[748] along with the provision of technological knowledge necessary for the installation, operation and functioning of plant and equipment, and turnkey projects.[749]

b) The TOT objective

TOT licence shall be dealt with as a package of information and not only individual IP rights. It shall therefore be modified to achieve the objective of TOT.[750]

It shall enable the transferee to produce itself the same technology, or the products or equipment or services related to this technology, at the same quality standards as the transferor or the licensor. Accordingly, a TOT licence is considered here as a package of rights and not an individual exclusive right.[751]

In order to achieve this objective, the elements of this package shall be left open until the objective is achieved – in other words, the elements shall be left open until a TOT is made in practice. The transferee shall not 'lose interest in the deal simply because a certain patent is expired or part of the know-how is no longer secret, provided that this does not prevent the licensee from the manufacture of the products with the licensor's technology'.[752]

The transferee shall therefore not be affected by the invalidity of any part of the patent or know-how. Also, the transferee shall not be affected by the expiry of TOT licence. This is an essential reason that this is not a mere technology licence

[747] ibid.
[748] See Chapter 2, p.58.
[749] UNCTAD, 'Transfer of Technology' [2001] n.d UNCTAD Series on issues in international investment agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016.
[750] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009) 9–10.
[751] ibid.
[752] ibid.

agreement but, as already explained, is a TOT licence. [753]

In sum, a technology licence agreement, as per its main framework, may not be or lead to TOT unless the above-mentioned points are taken into consideration. Therefore, in order to have technology transferred using this tool, it should be modified and adjusted until it achieves this objective.

5.7.2 The TOT agreement

A TOT agreement refers 'to contracts or agreements, including renewals thereof, involving the transfer of systematic knowledge for the manufacture of a product, the application of a process, or rendering of a service including management contracts'.[754] It also includes the tools of such transfer, which mainly pertain to the assignment or licensing of all forms of IP and patent rights related to the technology. This even includes software programs, data, designs, processes, etc., as previously explained, except computer software that is developed for a mass market.[755]

In this regard, it is important to have a central TOT registration system. A TOT agreement enables the transferee to use, sell and grant technology licences to a third party. Also, a TOT agreement allows the transferor to register this patented technology.[756]

Some developing countries have worked on this through different legal systems. For example, Nigeria established a National Office for Technology Acquisition and

[753] ibid.
[754] IPPHL, 'About Technology Transfer Arrangement' (IPPHL, n.d) <http://www.ipophil.gov.ph/services/ip-business2/technology-transfer-arrangement> accessed 16 December 2016.
[755] ibid.
[756] Eusme Centre, 'Guideline: Technology Transfer Agreements with China' (CAASET-NET Science, Technology and Innovation Cooperation between Sub-Saharan Africa and Europe, n.d) <http://www.ccilc.pt/sites/default/files/eu_sme_centre_guideline_technology_transfer_agreements_with_china.pdf> accessed 5 January 2017.

Promotion (NOTAP). It was established by Decree No. 70 of 1979 and amended by Decree No. 82 of 1992, now referred to as NOTAP Act Cap 268 LFN 1994. It is an agency of the Federal Ministry of Science and Technology (FMST) in Nigeria.[757]

The most important task that NOTAP works on is evaluating and registering TOT agreements, though it also works on a number of other objectives – for example, it seeks to facilitate the emergence of a strong IP and TOT in order to have a stronger economy based on science and technology. Also, NOTAP tracks the inflow of technologies into Nigeria and works on adopting initiatives for creating more opportunities for TOT. [758]

Also, in the Philippines, the Republic Act 8293 was enacted on 6 June 1997. It is known as the IP code. This act basically sets out certain regulations for TOT registration arrangement, including rules related to the rate of fees or royalties and how to strengthen the protection of IP rights in the Philippines.[759]

In sum, TOT agreements should work to ensure the absorptive capacity of the transferee with regard to the technology. The transferee should absorb the technology in its internal system and the conditions of the local market. Therefore, some provisions should be incorporated in the agreement – for example, the transferor should be responsible for making certain improvements and modifications to the technology or any part of it to make it fit for implementation by the transferee. In fact, the same points that we had mentioned as necessary modifications to be made to the transfer of a technology licence should be incorporated into a TOT

[757] Caaset-net, 'NOTAP: National Office for Technology Acquisition and Promotion' (CAASET-NET Science, Technology and Innovation Cooperation between Sub-Saharan Africa and Europe, n.d) <https://caast-net-plus.org/partner/16> accessed 5 January 2017.
[758] ibid.
[759] IPPHL, 'About Technology Transfer Arrangement' (IPPHL, n.d) <http://www.ipophil.gov.ph/services/ip-business2/technology-transfer-arrangement> accessed 16 December 2016.

agreement. This is to allow the main objective for transferring technology to be achieved.

5.7.3 Compulsory licence

A compulsory licence (CL) is an important feature in IP law. It is a statutorily created licence to enable the licensee to use the patent technology without the permission of the licensor. It includes a governmental authorization to use the patented technology without the permission of the patent holder.[760] Without a CL, such an act will be illegal[761] and the IP or patent owner would be entitled to compensation.[762]

A CL allows greater competition in the market and makes relevant goods and services cheaper. The CL usually takes place when the IP owner has abused his dominant position; resorting to a compulsory licence is rare, since it is subject to legal, political and operational problems.[763] Accordingly, resorting to the CL shall be done when there is no possibility of gaining a voluntary licence from the IP or patent holder. Possibilities to obtain a voluntary licence must therefore be exhausted before resorting to the CL.[764]

CLs are not specifically mentioned in the TRIPS agreement. They can be inferred through exceptions to the rights of the IP holder to prevent abuse on the part of the IP holder, or resorting in practices that lead to restraining trade unreasonably or affecting TOT. CLs will provide a solution according to the flexibilities provided by the

[760] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.
[761] ibid.
[762] Charles R. McManis and Jorge I Contreras, 'Compulsory Licensing of Intellectual Property: A Viable Policy Lever for Promoting Access to Critical Technologies?' [2014] TRIPS and Developing Countries: Towards a New World Order 109–132.
[763] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.
[764] ibid.

TRIPS agreement as per Article 8. In addition, resorting to the CL can be seen as allowed as per the provisions of Article 31(C), such that a government can resort to a CL when there is an abuse of the dominant position as an anti-competitive process. The CL will be considered in this case as a measure to 'remedy a practice determined after judicial or administrative process to be anti-competitive'.[765]

As per the Decision of TRIPS Council on 6 December 2005, the TRIPS Agreement is amended by inserting Article No.31bis after Article 31. This amendment entered into force on 23 January 2017. The amendment incorporates three issues within the text of the TRIPS Agreement. First, the addition of Article 31bis after Article 31. Second, addition of a new Annex to TRIPS for the implementation of this new Article. Third, addition of Appendix to the Annex to the TRIPS Agreement.[766]

Article 31bis incorporates that pharmaceutical products made under compulsory licences granted under the terms of the amendment to be exported to countries lacking production capacity. Also it dealt with avoiding double remuneration to the patent-owner, regional trade agreements involving LDCs, the non-violation and maintaining all existing flexibilities under the TRIPS Agreement. [767]

In addition, Article 40 of the TRIPS agreement deals with control of anti-competition practices in contractual licences. It states that whenever there is a contractual licence that has adverse effects on trade and may impede the transfer and dissemination of technology, the TRIPS agreement will not prevent the government from 'specifying in their legislation licensing practices or conditions that may in

[765] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.
[766] WTO, Amendment of the TRIPS Agreement, adopted 6 December 2005: entered into force 23 January 2017.

[767] WTO, Amendment of the TRIPS Agreement, adopted 6 December 2005: entered into force 23 January 2017.

particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market'.[768]

Therefore, as per Article 40, any member country can adopt appropriate measures to prevent or control such practices, including measures such as exclusive grant-back conditions in licenses, or 'conditions preventing challenges to validity and coercive package licensing, in the light of the relevant laws and regulations of that Member'.[769]

In addition, the Declaration on the TRIPS Agreement and Public Health, adopted in 14 November 2001, confirms that the flexibilities could be used to achieve different goals, including compulsory licensing.[770] In addition, the right to resort to a CL for the purpose of public health is recognized in the Doha Declaration for Public Health and the August 2003 Decision made by the WTO members.[771]

As per this amendment, CLs can be resorted to in a case of national emergency, abuse of patent rights, public non-commercial use and technical advance of considerable economic significance over the existing patent.[772]

As a result of that, Thailand issued CLs between November 2006 and January 2007 for two AIDS drugs (efavirenz and the combination of lopinavir and ritonavir) and one

[768] The TRIPS Agreement (entered into force on January 1, 1995), art 40.1.
[769] The TRIPS Agreement (entered into force on January 1, 1995), art 40.2.
[770] Charles R. McManis and Jorge I Contreras, 'Compulsory Licensing of Intellectual Property: A Viable Policy Lever for Promoting Access to Critical Technologies?' [2014] TRIPS and Developing Countries: Towards a New World Order 109–132.
[771] WTO, 'Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health Decision of the General Council of 30 August 2003*' (General Council, n.d) <https://www.wto.org/english/tratop_e/trips_e/implem_para6_e.htm> accessed 28 January 2017.
[772] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.

antihypertension drug (clopidegrel).[773] Also, Brazil issued a CL in 2007 for generic versions of efavirenz, after the drug's patent holder, Merck & Co, failed to match the 60 percent price reduction requested.[774]

Promoting CLs on ESTs needs to be examined in the context of the flexibility provided by the TRIPS agreement. The TRIPS agreement provides countries with the freedom and discretion to conclude what constitutes a national emergency. Nevertheless, resorting to a CL lacks specification or directives in this regard, and this may result in conflicts from different aspects. First, the majority of ESTs must be considered as public goods; therefore, there must be specifications and guidelines to help each member country to determine whether or not a particular EST is considered a public good.[775]

Second, promoting CL for ESTs was not included under the Doha negotiations agenda and is not included under the WTO Trade and Investment Agenda. It was raised in the WTO Committee of Trade and Environment by Cuba, but the IP rights were not included explicitly in the Doha Agenda on Trade and Environment. It is therefore difficult to make progress on this issue.[776]

Developing countries under the WIPO Development Agenda raised the issue of CLs on some technologies. Nevertheless, the US and the EU argued that not including CL provisions will encourage innovation and IP rights and investments.[777] In this

[773] Knowledge Ecology International, 'Thailand's Compulsory Licensing Controversy' (Knowledge Ecology International, 19 June 2007) <http://www.keionline.org/content/view/90/1> accessed 12 January 2017.
[774] Keith Alcorn, 'HIV Treatment: Brazil Issues Compulsory License on Efavirenz' (Nam AIDSMap, 7 May 2007) <http://www.aidsmap.com/Brazil-issues-compulsory-license-on-efavirenz/page/1427206/> accessed 12 January 2017.
[775] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.
[776] ibid.
[777] ibid.

regard, however, the North American Free Trade Agreement (NAFTA), which entered into force on 1 January 1994, reduced the issuance of CL in each of its parties, Canada, Mexico and the US. It created a trilateral trade bloc in North America.[778] NAFTA provides detailed conditions for the issuance of CLs between parties.[779]

Most of the ESTs are owned by patent and IP holders in the US, EU countries (particularly Germany) and Japan. US entities own more than 33 per cent of ESTs in the international market. It is therefore ironic that in the US, statutory provisions (e.g., 29 USC s 1498) gives the US government the right to issue a CL for any patents owned by its citizens.[780] The US provides itself with an opportunity to use the patent without the permission of the patent holder, albeit with reasonable and entire compensation to the holder, however. At the same time, it is against giving such an opportunity to developing countries.

In the EU, the IMS health case set out certain conditions for allowing CLs. For example, the IP rights shall constitute an upstream factor indispensable to the downstream supply of the product. Furthermore, the objective of this CL shall lead to producing new products and goods from the patented technologies or inventions.[781]

Japan set certain conditions for CLs under Law No. 121 in April 1959, amended by aw No. 30 of 1990. First, the patent granted shall have a period of three years of non-working; second, a request by the applicant must be submitted to the patent holder for license negotiations. Third, if the talks fail, the applicant can approach the

[778] Global Affairs Canada, 'North American Free Trade Agreement (NAFTA)' (Global Affairs Canada, n.d) <http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/nafta-alena/index.aspx?lang=eng> accessed 28 January 2017.
[779] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.
[780] ibid.
[781] ibid.

Patents Office to initiate arbitration proceedings.[782] Therefore, it is not easy to obtain a CL under the law in Japan.[783]

In practice, providing a CL to developing countries requires the building of domestic manufacturer capabilities in order to succeed. Most developing countries do not have production capacities for the EST industry. This is for a basic reason: as long as developing countries do not have access to EST technologies, they cannot improve their production capacities.

Article 31(f) of the TRIPS Agreement states that 'any such use [of a CL] shall be authorized predominantly for the supply of the domestic market of the Member authorizing such use'.[784] Accordingly, the issuance of a CL shall lead to supply of the domestic market. This is difficult to achieve before allowing the patent to be provided to the licensee.[785] A question is raised with regard to how to build production capacity before having access to the related technologies.

In sum, this option for transferring technology should be looked at by the international community with regard to ESTs in particular. All UNFCCC member countries acknowledge how critical the climate change threat is and the immediate need to mitigate and adapt its effects on all countries. At the same time, no efforts have been made to allow access to such technologies through promoting CLs.

The following three chapters will examine the transfer of ESTs in Kuwait, the UAE and Jordan. Then, in Chapter 9 we will summarize our findings on these three case studies.

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[782] ibid.
[783] ibid.
[784] The TRIPS Agreement (entered into force on January 1, 1995), Article 31 (f).
[785] Nitya Nanda, 'Diffusion of Climate Friendly Technologies: Can Compulsory License Help?' [May 2014] 14(n.d) Journal of Intellectual Property Rights 241–246.

Chapter 6

Case Study on the International Transfer of ESTs in Kuwait

Kuwait is obliged under the current climate change regime, i.e., the UNFCCC and all subsequent protocols and agreements under the recently concluded Paris Agreement, to uphold and promote regional and international cooperation in order to mobilise stronger and more ambitious climate action.[786] Kuwait is classified as a developing country under Non-Annex I Parties under the UNFCCC Classification of Parties, as we explained in Chapter 5,[787] which has set out policies seeking more economic development in all fields.

Therefore, we will examine how the CDM works in renewable energy projects in Kuwait and whether this mechanism encourages the transfer of ESTs or not. In other words, does this mechanism add more positive development in the field of TOT than the TRIPS Agreement and the developing agenda or not, and if so, to what extent? We will determine, whenever applicable, the pitfalls of this mechanism and its application in developing countries and try to propose methods and solutions for improving it in order to have a truly effective mechanism that more strongly promotes TOT to Kuwait, as well as the rest of the developing world.

[786] Paris Agreement under the UNFCCC, adopted on 12 December 2015, will enter into force from 22 April 2016 to 21 April 2017, preamble; see also: UNFCCC, 'The Paris Agreement on Climate Change: Issue Brief' (UNFCCC, n.d) <http://unfccc.int/paris_agreement/items/9485.php> accessed 25 December 2016.
[787] See Chapter 5 p.220

Thus, we will evaluate international foreign TOT to Kuwait and analyse them in a way that also considers Kuwaiti government policies. We will look at the special characteristics of Kuwait as a developing country, on the one hand, and as a significant oil-producing country, on the other hand.

As we clarified in the previous chapter, the purpose is not to undertake research regarding climate change as an environmental phenomenon, but rather to examine the transfer of ESTs, as a field of development that incorporates transactions between developed and developing countries in which they have a mutual interest.

6.1 Background about Kuwait, particularly the EST industry in Kuwait

In order to examine and evaluate the international transfer of some patented technologies and know-how in ESTs projects in Kuwait that are submitted to be registered as CDM project in the UNFCCC, we have first to look at the patent system in Kuwait. Kuwait issued a number of laws that regulate the protection of the industrial property, as follows:

A. Law No.71 for the year 2013 related to patents system in Gulf Cooperation Council countries.
B. Law No.4 of 1962 relating to Patents, Designs and Industrial Models as amended by Law No.3 of 2001.
C. The Industry Law No.56 of 1996.

So Kuwait protect the inventions and technologies through a number of laws that provide the requirements, ways of protection, process for registration the patents, and the penalties for any infringement of the industrial property protection. These are

stated under Law No.4 of 1962 as it is the industrial property protection law. While the Law No.71 of 2013 is for establishing a patent system in the Gulf Cooperation Countries. Then the Industry Law No.56 of 1996 is related to industrial licences for companies and corporation that intend to perform industrial activities within the country.

Therefore, there are two patents registration system in Kuwait. The first is under the Ministry of Commerce and Industry as per the Law No.4 of 1962 amended by Law No.3 of 2001. While the second is under the GCC regional patent office under the Gulf Cooperation Council as per the Law No.71 of 2013.

Kuwait ratified the UNFCCC on 28 December 1994,[788] the Kyoto Protocol on 11 March 2005,[789] and signed the Paris Agreement on 22 April 2016.[790] Thus, Kuwait has international obligations regarding climate change and GHG emissions. Kuwait is an oil producer that is totally dependent on oil exports.[791]

In general, Kuwait recognises the impact of climate change on the whole world and on oil and gas producers, in particular. Thus, it is vulnerable to the physical impact of global warming and climate change in various areas, such as its ecology, natural resources and human systems. Such impacts require the utmost cooperation of all

[788] UNFCCC, 'Kuwait' (UNFCCC, n.d) <http://unfccc.int/tools_xml/country_KW.html> accessed 12 July 2016.
[789] UNFCCC, 'Status of Ratification of the Kyoto Protocol' (UNFCCC, n.d) <http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php> accessed 12 July 2016
[790] United Nation Treaty Collection, 'Status of Treaties: Paris Agreement' (United Nation Treaty Collection (UNTC), n.d). <https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&lang=en> accessed 12 July 2016.
[791] Environment Public Authority, 'Kuwait's Initial National Communications under the United Nations Framework Convention on Climate Change' [November 2012] (n.d) Initial National Communication (INC) under the United Nations Framework Convention on Climate Change (UNFCCC) <https://unfccc.int/resource/docs/natc/kwtnc1.pdf> accessed 9 July 2016.

countries, whether developed or developing countries, in response to such a critical challenge.[792]

Kuwait, as a member of the Organization of Oil Exporting Countries (OPEC), represents the world's fifth largest reserves of crude oil. In addition, it is one of the ten largest global exporters of crude oil and oil products.[793] Kuwait 'is entirely dependent on fossil fuels for energy production with 83.5% of liquid oil and 16.5% of natural gas'.[794] Hence, any fluctuation in oil prices, either in supply or demand, affects Kuwait directly. Thus, there is a need for the country to explore alternative sources of energy.[795]

The estimate of Kuwait's proven oil reserves at 101.5 billion barrels (bbl) equals approximately 7% of the total world reserves; there are an additional 5 bbl in the divided zone between Kuwait and Saudi Arabia. The daily oil and gas production has been between 2.7 to 2.9, and sometimes, 3 million barrels per day in the years from 2011 to the present.[796]

In Kuwait, the petroleum industry currently reflects the largest share of its domestic products, as well as export revenues, and is therefore the main source of the government's income. Oil industry operations in Kuwait have increased as a share of its Gross Domestic Product (GDP), reaching 51% of the economy in 2010.[797]

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[792] ibid.
[793] KOC Annual Report for Production Operation, 2015.
[794] INDC, 'INDC Submitted by the State of Kuwait' (UNFCCC, Nov 2015) <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Kuwait/1/Kuwait_INDCs_English_Version.pdf> accessed 12 July 2016.
[795] ibid.
[796] KOC Annual Report for Production Operation, 2015.
[797] Environment Public Authority, 'Kuwait's Initial National Communications under the United Nations Framework Convention on Climate Change' [November 2012] (n.d) Initial National Communication (INC) under the United Nations Framework Convention on Climate Change (UNFCCC) <https://unfccc.int/resource/docs/natc/kwtnc1.pdf> accessed 9 July 2016.

Kuwait's combustion of fossil fuels accounts for around 95.3% of its GHG emissions, which are associated with the release of fugitive emissions from oil and gas operations. In contrast, waste management accounts for around 2.4% of all GHG emissions in Kuwait. This is followed by industrial process emissions, which account for around 2.1%. Lastly, the agricultural sector accounts for around 0.2%, while managed tree plantations throughout Kuwait account for less than 0.1% of GHG emissions.[798]

For Kuwait, as an oil-producing country, being highly dependent on oil exports represents an added challenge in mitigating the climate change threat. As a result, in recent years, Kuwait has been re-thinking its dependency on oil and gas production. This is occurring through devoting more attention to the EST industry. Kuwait, as per its recent policies, is giving priority to diversifying the sources of energy production in the country. This is aimed at avoiding an increase in GHG emissions in the country and also providing an alternative source of sustainable energy.[799]

As per Article 4.8 paragraph H of the UNFCCC, Kuwait is considered one of those 'countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products'.[800] Accordingly, Kuwait will be given general consideration under the climate change regime, as per Article 4.8, Paragraph (H). Kuwait is in need of the support of developed countries regarding TOT. This will allow Kuwait to diversify its income more quickly and easily.

[798] ibid.
[799] INDC, 'INDC Submitted by the State of Kuwait' (UNFCCC, Nov 2015) <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Kuwait/1/Kuwait_INDCs_English_Version.pdf> accessed 12 July 2016.
[800] The UNFCCC (adopted on 9 May 1992 and entered into force on 21 March 1994), art 4.8(H)

Kuwait has set out a strategic vision for reducing its GHG emissions to 15% by 2030.[801] Thus, moving to a low carbon-equivalent economy by avoiding any increases in GHG emissions will essentially be based on developing and implementing the required projects in the country, and by enacting laws and regulations. Both tasks are subject to a country's special conditions and the availability of financial, technical and technological support in this regard. In fact, Kuwait highlighted the need for technological and technical support for those projects in the latest INDC report, which was submitted in November 2015. Kuwait is certain that through the mechanism of the UNFCCC, this can be achieved.[802]

Therefore, Kuwait started to implement its strategic vision to reduce GHG emissions in the oil and gas sector in the country under the umbrella of the Kuwait Petroleum Cooperation (KPC). Thus, the Kuwaiti government, as per its strategic vision, sent a direction to all oil and gas companies in the country to give priority to initiating the necessary actions to mitigate climate change in order to achieve the target of 15%.[803]

Therefore, a number of EST projects began to be implemented in the oil and gas sector in the country. Kuwait launched a new refinery project that meets the environmental standards and produces fewer GHG emissions than the refineries that are currently available. In addition, Kuwait initiated some projects for energy

[801] UNFCCC, 'Speech of His Highness Alsheikh Sabah Al-ahmad Al-Jaber Alsabah, The Amir of Kuwait, in the opening ceremonies of the UN 18 Conference of Climate Change' (UNFCCC, 4 December 2012). <https://unfccc.int/files/meetings/doha_nov_2012/statements/application/pdf/04122012_cop18_hls_emir_of_kuwait_english.pdf> accessed 25 December 2016; also: Interview with Mr. Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company on 25 May 2016.

[802] INDC, 'INDC Submitted by the State of Kuwait' (UNFCCC, November 2015) <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Kuwait/1/Kuwait_INDCs_English_Version.pdf> accessed 12 July 2016.

[803] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company on 25 May 2016.

production from municipal solid waste. There are also projects to produce renewable resources such as photovoltaic energy, solar thermal energy and wind energy.[804] Kuwait began a mass transit system project (metro system), as well as a railway project that links the different ports in Kuwait with each other and with ports abroad.[805]

In fact, technical support and TOT are essential for developing countries under the CDM mechanism. Two main parties are involved, as there is also a commitment by the developed countries under the UNFCCC mechanisms and related institutions. The institutions and tools established by the UNFCCC Technology Mechanism include the Technology Executive Committee (TEC) and the Climate Technology Centre & Network (CTCN), as well as the Green Climate Fund (GCF).[806] The role of these three institutions or mechanisms is essential in fostering the transfer of ESTs to developing countries. Each of these institutions plays a specific role in the UNFCCC Technology Mechanism, as previously explained in Chapter 4.[807]

First, the Technology Executive Committee, which was established in 2010, is the policy arm of the UNFCCC Technology Mechanism, as explained in Chapter 4.[808] The main objective of this Committee is to focus on 'identifying policies that can accelerate the development and transfer of low-emission and climate resilient technologies'.[809]

[804] INDC, 'INDC Submitted by the State of Kuwait' (UNFCCC, November 2015) <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Kuwait/1/Kuwait_INDCs_English_Version.pdf> accessed 12 July 2016.
[805] ibid.
[806] ibid.
[807] See Chapter 4 p.185.
[808] See Chapter 4 p.186.
[809] UNFCCC, 'Technology Executive Committee: Strengthening Climate Technology Policies' (UNFCCC, n.d) <http://unfccc.int/ttclear/tec> accessed 25 December 2016.

Second, the Climate Technology Centre & Network (CTCN), as explained in Chapter 4[810], is the operational arm of the UNFCCC Technology Mechanism. The main objective of this centre is to promote the accelerated transfer of EST projects at the request of developing countries. Accordingly, the CTCN shall provide 'technology solutions, capacity building and advice on policy, legal and regulatory frameworks tailored to the needs of individual countries'.[811]

Third, the Green Climate Fund (GCF) is a fund founded as an initiative to assist developing countries in their response to the climate change threat by investing in low-emission and climate-resilient development within the framework of the UNFCCC. The GCF was established by 194 governments to limit or reduce GHG emissions in developing countries. The GCF is mandated to make an ambitious contribution to mitigating and adapting to the climate change threat.[812]

In addition, the CDM creates opportunities for the promotion of TOT, although the inclusion of TOT is not obligatory in the CDM. As a result, we conducted an analysis of all the CDM projects in Kuwait, although most of them are under the validation process.

We studied these projects in general, and then, went into more detail on one or two of these projects to ascertain how they are dealing with TOT. First, we determine whether TOT that are available meet the definition that we have set out in this thesis.

[810] See Chapter 4 p.185
[811] UNFCCC, 'Technology Mechanism' (TT:CLEAR: Support for Implementing Climate Technology Activities, n.d) <http://unfccc.int/ttclear/support/technology-mechanism.html> accessed 25 December 2016.
[812] The Green Climate Fund (GCF), '2016 – GCF Expands Role in Global Climate Response' (The Green Climate Fund (GCF), n.d) <https://www.greenclimate.fund/home> accessed 20 December 2016.

As per our definition of TOT in this thesis[813], regardless of the name given to TOT and the method used, a successful TOT does not occur unless such a project or transaction leads to a full TOT, i.e. a total system, and results in the developing country having the ability to truly absorb it into its own economy.

Second, we highlight the challenges and obstacles to such transfer at each stage of implementation and try to propose some recommendations for improving the current mechanism for transferring technology.

6.2 An Overview of CDM Projects in Kuwait

The Kuwait Petroleum Cooperation (KPC) issued a direction to all its subsidiary companies to enhance EST projects in the oil and gas sector. This is aimed at complying with Kuwait's strategic vision of producing around 15% of its energy from renewable resources by 2030.

Currently, there are four projects that have been submitted to the UNFCCC to be registered as CDM projects. The first project is a small-scale CDM project for the construction of a 'Flare gas recovery unit 105" project in MAA refinery' by Kuwait National Petroleum Company (KNPC), one of the KPC's subsidiaries. KNPC is the national oil refining company of Kuwait and was established in October 1960. This project is related to the recovery and utilisation of waste gas in refinery facilities. The project's activities will lead to GHG emission reductions estimated at 54,419 tonnes of CO_2 equivalent (tCO_2e) per annum once the project is fully operational.[814]

[813] See Chapter 2 , p.50; and Chapter 5, p.198.
[814] UNFCCC, 'Project Design Document for Small-Scale CDM Project Activities (F-CDM-SSC-PDD)' (UNFCCC, 20 June 2012)

This project does not include any provisions related to TOT. Neither the PDD nor any other project document mentions any criteria related to TOT to the host country.[815]

The second project is a waste gas recovery project, also constructed by KNPC, related to 'Flare Gas Recovery Facilities Project in Unit 49 of MAB Refinery'. As per the scope of activities under this project, it seeks to recover the gases that are currently flared at the expansion units of Mina Abdullah (MAB) Refinery, which is one of the three refineries operated by KNPC. Accordingly, the project will install a Flare Gas Recovery System (FGRS) that would recover gases that are currently being flared from the refinery expansion units to the flare system. Therefore, upon the completion of this project, the reduction of an estimated 89,472 tonnes of CO_2 equivalent (tCO_2e) per annum is assumed.[816]

This project also does not include any provisions related to TOT. Neither the PDD nor any other project document mentions any criteria related to TOT to the host country.[817]

The third project is in the Wafra Joint Operation area between Kuwait and Saudi Arabia. The project is related to the 'Central Gas Utilization Project (CGUP) in the Wafra Joint Operation'. The Wafra Joint Operation is called 'the divided zone (DZ)' between Kuwait and Saudi Arabia because of the 50/50 shared joint venture ownership. It is operated in Kuwait by the Kuwait Gulf Oil Company (KGOC), which handles the administration of the Wafra Joint Operation area (or the DZ). Again, KGOC is one of KPC's subsidiaries. The project seeks 'the collection, treatment,

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<https://cdm.unfccc.int/filestorage/g/7/XO9HPV4GUZS8FLT6710RWCJIA5MYBQ.pdf/KNPC%20MAA%20PDD_200612x.pdf?t=VUZ8b2FtNGd2fDB0GtFwJQIdSEpcXDGVGoXp> accessed 12 July 2016.
[815] ibid.
[816] ibid.
[817] ibid.

transport and utilisation of excess associated gas that otherwise would have been flared originating from the Wafra Joint Operation (WJO).[818]

After the completion and operation of this project, it is estimated that there will be a reduction in GHG emissions by approximately 111,630 Nm3/h (approx. 100 MMscfd (Million standard cubic feet per day), mainly from carbon dioxide (CO_2e), as the associated gas production from the field, at about 55–60%, is currently flared. The remaining percentage of associated gas will be utilised for operational processes in the Wafra Joint Operation area.[819]

The fourth project is the 'KOC Solar Photovoltaic Project in West Kuwait' by the Kuwait Oil Company (KOC), one of KPC's subsidiaries. KOC is involved in the exploration, drilling and production of oil and gas within the State of Kuwait. KOC proposed, through the Solar Photovoltaic Project in West Kuwait, to invest in a solar photovoltaic project of an approximate capacity of 10 MWP. The project seeks to utilise ESTs to produce renewable solar energy in order to generate electricity to partially meet the electricity demand at 29 oil wells and their related infrastructure in West Kuwait.[820] The project includes some indirect provisions for TOT in the contract specifications and technical specifications.

The last two projects do include TOT provisions. Therefore, we will evaluate TOT in these two projects in more detail in the following sections.

[818] ibid.
[819] ibid.
[820] ibid.

6.3 Projects in focus

As mentioned above, there are two Kuwaiti projects that have been submitted for registration as CDM projects pursuant to the UNFCCC, which can be a basis for evaluating TOT under the CDM. We evaluated and analysed them to examine how the CDM, as a form for transferring technology, is working, and whether it fosters TOT to developing countries or not.

6.3.1: Central Gas Utilization Project (CGUP) in the Wafra Joint Operation

a) Project objective and description

This project represents one of the measures taken by Kuwait as per its national strategies for sustainable development, including the adoption of zero emissions and zero-flaring policies for all of its oil installations in the oil and gas sector under the umbrella of KPC.[821] The CGUP reduces GHG emissions and contributes to the reduction of local air pollution. In addition, it contributes to the sustainable development of Kuwait in several respects, providing economic, social and environmental benefits.[822]

This project is for enhanced gas management in the Wafra Joint Operation (WJO). The CGUP seeks to collect all associated gas produced in the WJO at a central location, and then, as a second step, to process this gas and make it available for utilisation in heaters and/or boilers. Utilisation can be for steam generation, gas

[821] Jasem Ebrahim Alnajem, 'Statement of the Permanent Delegation of The State of Kuwait to the United Nation Thematic Discussion Concerning Climate Change' (UN, August 2007) <http://www.un.org/ga/president/61/follow-up/climatechange/statements/statementKuwait.pdf> accessed 25 December 2016.

[822] UNFCCC, 'Project Design Document Form for CDM Project (F-CDM-PDD) for Central Gas Utilization Project (CGUP) in Wafra Joint Operation, Kuwait' (UNFCCC, 5 September 2012) <https://cdm.unfccc.int/filestorage/k/4/UQ6K2541TIFBSP8YOWJ3XDL0REGNCA.pdf/PDD_Central%20Gas%20CGUP.pdf?t=WUN8b2FtN3J3fDDFnAzE9jR-NQ2W80NnLIgZ> accessed 12 July 2016.

turbines for electricity generation, and crude oil heaters for the extraction of salt, gas and water.[823] This associated gas is currently flared; the project will reduce such emissions, which are harmful to the environment.

Accordingly, by the completion of this project, around 61,400–67,000 Nm3/h (approx. 55-60 MMscfd) will be utilised as an alternative energy source. In particular, it will be used as a heat source to produce steam in the Full-Field Steam Flooding (FFSF) Project. At present, the FFSF Project uses heavy fuel oil (HFO) as a source of heat energy.[824]

This project is expected to produce some sustainable development benefits to reduce GHG emissions, in particular, CO_2, in addition to reducing SO_2 and a small amount of emissions from fossil fuel burning. Thus, the objectives of the project fall within the environmental objectives of the CDM projects in the UNFCCC.[825]

The project is constituted of five phases in the contract life cycle. The first phase is the conception stage. In this phase, a general understanding of the project's documentations and requirements, and the types of approvals that are needed is agreed on as per the Delegation of Authorities Policy in the KGOC.[826]

The second phase is the feasibility stage. In this phase, the economic and environmental benefits of the project are prepared. In addition, the selection of options regarding the best contractual methods to be adopted for the implementation

[823] ibid.
[824] ibid.
[825] ibid.
[826] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.

of the scope of work occurs.[827]

The third phase encompasses the Front End Engineering Design (FEED). In this phase, the details of the design and technical specifications are provided to the foreign partner. Also, under the FEED, the requirements of the Kuwait Environment Public Authority (KEPA) are met, as well as the requirements and standards of the KGOC. The FEED is usually addressed in an independent consultancy agreement. The consultant for the FEED in the CGUP is Worley Parsons Limited.[828]

The fourth phase is execution, wherein the foreign partner implements the scope of work as per the FEED. The fifth and last phase is the handover and local operation of the plant.[829]

The CGUP is currently in the fourth phase, as the FEED has been agreed on and provided to the foreign partner to prepare the execution plan for the inception of phase four. The FEED under the CGUP was revalidated for a second review period to reduce the costs of the project.[830]

b) Type of technology used under the CGUP:

The main objective of this project is to reduce the effects of gas flaring in the atmosphere of Kuwait, in particular by the oil and gas sector. The technology used in the CGUP is a type of climate change mitigation technology (CCMT),[831] a patented technology for gathering and collecting the gas, and then, processing the gas in a system to make the whole gas usable. It also removes hydrogen sulphide (H_2S), which is one of the harmful gases produced by the petroleum industry, which makes

[827] ibid.
[828] ibid.
[829] ibid.
[830] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.
[831] ibid.

it suitable for different activities.[832]

The CGUP tries to eliminate continuous routine flaring and to provide sweet, dry fuel gas for the Joint Operations' users; in addition, it reduces sulphur oxide (SOx) emissions and disposes of waste streams in an environmentally acceptable manner.[833] The Annex I Party is not funding this project.[834]

The technology used in this project is under methodology AM0009, which reduces emissions by recovering associated gas and/or gas-lift gas and utilising the recovered gas. Accordingly, the utilisation of the recovered gas shall displace the use of other fossil fuel sources. To provide further detail, the recovered gas will be used in a processing plant to displace the use of non-associated gas in the same processing plant.[835] Also, the recovered gas can be compressed into a natural gas pipeline, and accordingly, can displace the processing of non-associated gas in a gas processing plant at another site.[836]

c) Parties

The KGOC is representing the developing host country. For the execution phase, the CGUP tendering process will invite the international contractors that own the

[832] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.
[833] Kuwait Gulf Oil Company (KGOC), 'List of HSE Projects (2013-2018)' (WJO Projects, n.d) <http://www.kgoc.com/Pages/HSSEWJOProjects.aspx> accessed 23 December 2016.
[834] UNFCCC, 'Project Design Document Form for CDM Project (F-CDM-PDD) for Central Gas Utilization Project (CGUP) in Wafra Joint Operation, Kuwait' (UNFCCC, 5 September 2012) <https://cdm.unfccc.int/filestorage/k/4/UQ6K2541TIFBSP8YOWJ3XDL0REGNCA.pdf/PDD_Central%20Gas%20CGUP.pdf?t=WUN8b2FtN3J3fDDFnAzE9jR-NQ2W80NnLIgZ> accessed 12 July 2016.
[835] ibid.
[836] ibid.

patented technologies for processing the gas.[837] The FEED, as previously mentioned, was prepared by the consultant Worley Parsons Limited.

d) TOT and IP in the project

The scope of the project is fugitive emissions from fuels (solid, oil and gas). The methodology used is classified in the UNFCCC under AM0009 (Recovery and utilisation of gas from oil wells that would otherwise be flared or vented), version 06.0.0.[838]

The PDD of the CGUP stated that the project should transfer technical knowledge to the KGOC pursuant to a 'Technical knowledge transfer' provision. This transfer shall occur along with related training for KGOC personnel.[839]

The PDD of this project did not explain how technical knowledge can be transferred to the host country or what it includes and excludes. The provision related to the transfer of technical knowledge is written in a broad statement, without clarifying what is meant by it and exactly what it includes.[840] The installed technology under the CGUP is new to the KGOC. In particular, gas processing with acid gas treatment and/or sulphur recovery is a new technology for Kuwait.[841]

[837] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.
[838] UNFCCC, 'Project Design Document Form for CDM Project (F-CDM-PDD) for Central Gas Utilization Project (CGUP) in Wafra Joint Operation, Kuwait' (UNFCCC, 5 September 2012) <https://cdm.unfccc.int/filestorage/k/4/UQ6K2541TIFBSP8YOWJ3XDL0REGNCA.pdf/PDD_Central%20Gas%20CGUP.pdf?t=WUN8b2FtN3J3fDDFnAzE9jR-NQ2W80NnLIgZ> accessed 12 July 2016.
[839] ibid.
[840] ibid.
[841] ibid.

The project lacks a specific TOT agreement because the project includes a general technical knowledge transfer that is limited to training KGOC's personnel in the host country on how best to use the technology and operate it as a part of the plant.[842]

This is far from a real and successful TOT. There should be a specific agreement for TOT or a patent license that includes provisions addressing how a technology can be transferred to the host country, as a package of information and as a total system. This agreement shall license to the host country (transferee) a global package of information and IP rights in order for the transferee or licensee to be in a position that allows it to manufacture, create or provide the same products, services and operations using the same technology of the licensor in the future, independently of the patent provider.[843] In fact, none of the project documents include such a license or agreement, or even a provision within the contract that includes such treatment.

In fact, we noted that among the personnel working on the CDM projects, there is a widespread lack of information regarding how TOT could take place and what its requirements are. They believed that training and technical support were the only legal ways they could benefit from a CDM project.

The project is basically related to technology diffusion, not TOT. As noted in Chapter 5, technology diffusion is construed by some scholars as having a narrower meaning and application than an international transfer of ESTs.[844]

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[842] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.
[843] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009) 9–10
[844] ICTSD, 'The Climate Technology Mechanism: Issues and Challenges' [28 November 2011] 5(4) ICTSD BIORES <http://www.ictsd.org/bridges-news/biores/news/the-climate-technology-mechanism-issues-and-challenges> accessed 12 April 2016.

The transfer of technical knowledge is limited to operational objectives. Such a transfer is accomplished only through training the key personnel in the KGOC to operate the plant. That is the only commitment required from the patent provider or the contractor. Thus, this project does not transfer the technology as a total system to the KGOC. It does not result in the improvement of the ability of the KGOC to re-collect, gather and process the gas to make it usable independently from the patent provider.[845]

Accordingly, the project does not transfer technology to the host country, as per the definition we set out above, for the following reasons:

1- There is no patent license or TOT agreement for the patented technology for gas processing.
2- The host country will not absorb this patented technology; rather, the objective is to train the personnel of the KGOC to operate the plant.
3- The project will not enable the host country, represented by the KGOC, to reproduce or reuse the gas processing system independently, with no interference by the patented technology provider.

6.3.2: KOC Solar Photovoltaic Project in West Kuwait (Sedra-500)

a) Project objective and description

The KOC Solar Photovoltaic Project in West Kuwait is called Sedra-500, and it is a small-scale CDM project. It is validated as a CDM project in the UNFCCC because it contributes to sustainable development in several respects. First, it generates

[845] Interview with Mohammad Alhamdan, Manager Assets Managements (Khafji) in Kuwait Gulf Operation Company (KGOC) 22 December 2016.

electric power and contributes to the national energy supply. Second, the project applies new technologies in the country. Accordingly, it encourages other companies in the oil and gas sector and other sectors in the region to utilise more ESTs to generate power and energy.[846] Third, Sedra-500 helps to conserve non-renewable natural resources by reducing fossil fuel consumption for grid electricity generation. Fourth, the PV solar panels will not emit GHGs and other emissions, such as SOx, nitrous oxides (NOx) and particulates, etc., and subsequently, will lead to better environmental and living conditions.[847]

Technically, the plant provides a minimum of 5 MW during the peak hours of the summer months under typical weather conditions at the site in Umm-Gudair in West Kuwait.[848] The plant has a peak capacity of 10 MW.[849] The plant reduces GHG emissions through converting sunlight directly into electricity.[850]

Therefore, Sedra-500 utilises a clean technology or EST that harnesses renewable solar energy to generate electricity, and thereby, uses such electricity to meet the demands of 29 electric submersible pumps (ESPs).[851]

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[846] UNFCCC, 'Project Design Document Form for Small-scale CDM Project Activities: KOC Solar Photovoltaic Project in West Kuwait' (Project Design Documents (PDD), 9 November 2015) <https://cdm.unfccc.int/filestorage/H/Y/6/HY6XK8QEL9WFJOPT1ADRIG7ZC4SNB2/PDD%20.pdf?t=b2x8b2E3ZmFlfDAjeWK82OjJX0G-883IXUwZ> accessed 12 July 2016.
[847] ibid.
[848] Interview with Mr. Saeed Alshaheen, Manager of Well Surveillance Group in Kuwait Oil Company (ArabianIndustry.com: 5 May 2015) <http://www.arabianindustry.com/oil-gas/news/2015/may/5/kuwait-oil-company-unveils-solar-project-5029388/> accessed 12 July 2016
[849] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company in 25 May 2016. See also United Nations Framework Convention on Climate Change, 'KOC Solar Photovoltaic Project in West Kuwait' (UNFCCC.int, n.d) <https://cdm.unfccc.int/Projects/Validation/DB/YGD30WK5N734RZR4K3BFIXHTRYC8K3/view.html> accessed 12 July 2016.
[850] UNFCCC, 'Project Design Document Form for Small-scale CDM Project Activities: KOC Solar Photovoltaic Project in West Kuwait' (Project Design Documents (PDD), 9 November 2015) <https://cdm.unfccc.int/filestorage/H/Y/6/HY6XK8QEL9WFJOPT1ADRIG7ZC4SNB2/PDD%20.pdf?t=b2x8b2E3ZmFlfDAjeWK82OjJX0G-883IXUwZ> accessed 12 July 2016.
[851] ibid.

Sedra-500 is now complete and is operating. The plant was launched on 26 October 2016,[852] although the project was expected to be completed by August 2015.[853] Before the operation of this project, the method of producing electricity for these pumps emitted GHGs. This is because the electrical load of the oil wells and the related infrastructure was being met by electricity drawn from the Kuwaiti national grid via substation F-193.[854]

The national grid of Kuwait consists of fossil fuel oil and/or gas-fired power plants. The grid-connected plants release GHGs in the process of generating electricity. In the absence of the project's activities, the 29 oil wells would have continued to draw electricity from the national grid, and accordingly, would have continued to contribute to GHG emissions by grid-connected fossil fuel-based power plants.[855]

Sedra-500 took the form of a turn-key contract with a lease or purchase option. In fact, it involved a new form of turn-key contract. On the one hand, it follows criteria similar to a Build, Own and Transfer (BOT) contract,[856] whereby the foreign partner fully finances the project during the project implementation period, while retaining ownership during this period.[857]

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[852] Kuwait Times, 'Kuwait starts up its first solar power plant' (Kuwait Times, 28 October 2016) <http://news.kuwaittimes.net/pdf/2016/oct/28/p09.pdf> accessed 20 December 2016.
[853] UNFCCC, 'Project Design Document Form for Small-scale CDM Project Activities: KOC Solar Photovoltaic Project in West Kuwait' (Project Design Documents (PDD), 9 November 2015) <https://cdm.unfccc.int/filestorage/H/Y/6/HY6XK8QEL9WFJOPT1ADRIG7ZC4SNB2/PDD%20.pdf?t=b2x8b2E3ZmFlfDAjeWK82OjJX0G-883IXUwZ> accessed 12 July 2016.
[854] ibid.
[855] ibid.
[856] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company in 25 May 2016. Also see: United Nations Framework Convention on Climate Change, 'KOC Solar Photovoltaic Project in West Kuwait' (UNFCCC.int, n.d) <https://cdm.unfccc.int/Projects/Validation/DB/YGD30WK5N734RZR4K3BFIXHTRYC8K3/view.html> accessed 12 July 2016.
[857] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company on 25 May 2016.

Thus, once the operation of the project has begun, the KOC has the option, as per the terms and conditions of the contract, to purchase the full 5MWe Solar Photovoltaic Plant and to obtain a transfer of ownership. This shall occur by paying the contractor an additional 10% of the full value of the equipment, materials and services.[858]

b) Type of technology used under Sedra-500:

The technology that is adopted in the plant includes PV arrays, inverters, cables, switchgears, tracker transformers and junction boxes. The PV arrays are made up of polycrystalline Si, which is a single PV technology. The PV arrays have an average life of approximately 20 years.[859]

The technology used in the project activity is a patented clean, renewable energy technology that uses solar photovoltaic (PV) panels to generate electricity entirely from solar energy. The technology involved in the proposed project activity is considered environmentally safe and sound.[860]

c) Parties

The project was awarded to Gestamp Solar through a competitive tendering process. Gestamp Solar is a Spanish company that specialises in providing optimal solutions for solar photovoltaic plants.[861] Gestamp Solar is part of a European multinational

[858] 5MWE PV PROJECT, (Signed on 7 August 2014 and to be completed between Kuwait Oil Company (KOC) and Gestamp Solar) Contract Specification Article 8.3.
[859] UNFCCC, 'Project Design Document Form for Small-scale CDM Project Activities: KOC Solar Photovoltaic Project in West Kuwait' (Project Design Documents (PDD), 9th November 2015) <https://cdm.unfccc.int/filestorage/H/Y/6/HY6XK8QEL9WFJOPT1ADRIG7ZC4SNB2/PDD%20.pdf?t=b2x8b2E3ZmFlfDAjeWK82OjJX0G-883IXUwZ> accessed 12 July 2016.
[860] ibid.
[861] ibid.

leader in steel services, automotive components, and renewable clean energy. It is the owner of the solar PV technology.[862]

The type of technology used under this project is related to renewable electricity generation for captive use and mini-grids. The methodology used is the energy industries (renewable/non-renewable) AMS I.F.[863]

d) TOT and IP in Sedra-500:

It is not clear whether this project does or does not include TOT provisions, as there are two different treatments for TOT in the PDD and the project document.

As per the PDD, Sedra-500 does not involve TOT to the host country. Section A.4.3 of the PDD is related to technology that will be employed in the project activities.[864] In this section, the project participants are requested to include a description of how environmentally safe and sound technology and know-how is transferred to the host country,[865] but for this project, nothing is mentioned. Section A.3 of the PDD states: '[T]he project does not involve any TOT to the Host Party (State of Kuwait) for application in the project activity.'[866]

In contrast, pursuant to the terms and the conditions of the contract, TOT is part of the contract, but not in its ideal form. The contract mentions that TOT shall be done through training and special on-the-job coaching for KOC's personal. The training is

[862] X-ELIO, 'Corporacion Gestamp, the Strength of an Industrial Group' (X-ELIO, n.d) <http://www.x-elio.com/en/corporation> accessed 23 December 2016.
[863] UNFCCC, 'Project Design Document Form for Small-scale CDM Project Activities: KOC Solar Photovoltaic Project in West Kuwait' (Project Design Documents (PDD), 9 November 2015) <https://cdm.unfccc.int/filestorage/H/Y/6/HY6XK8QEL9WFJOPT1ADRIG7ZC4SNB2/PDD%20.pdf?t=b2x8b2E3ZmFlfDAjeWK82OjJX0G-883IXUwZ> accessed 12 July 2016.
[864] ibid.
[865] Bo Wang, 'Can CDM Bring Technology Transfer to China?—An Empirical Study of Technology Transfer in China's CDM Projects' [2010] 38(n.d) Energy Policy 2572–2585.
[866] ibid.

aimed at improving the operational capabilities of KOC's personnel. This shall be done during the installation and operation of the project activities.[867]

In fact, the contract lacks any provision incorporating an explicit agreement between KOC and the foreign partner to transfer any technology to KOC.[868] In other words, TOT through training for operational purposes is mentioned in the contract under the training clause. However, the project does not include a patent license to use the technology. Thus, there is no TOT agreement or patent license.[869]

This project is the first implemented according to the criteria of a CDM project in the KOC. Therefore, there was a lack of technical and legal expertise in the incorporation of TOT provisions in the PDD. It was awarded through regular competitive bidding by the KOC, according to its regular policies and regulations for contracts and tender procedures, but it did not consider the requirements of the CDM in the UNFCCC.[870]

After it was awarded to the foreign partner, and at the stage of gaining the final institutional approvals, a decision was made to submit it for registration as a CDM project. The KOC's personnel who were involved in the preparation of the project documents were rushed to submit the project as a CDM project at a later stage, during the final stages of approval. This is why the KOC incorporated only the

[867] 5MWE PV PROJECT, (Signed on 7 August 2014 and to be completed between Kuwait Oil Company (KOC) and Gestamp Solar) Contract Specification.
[868] Interview with Mr. Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company on 25 May 2016.
[869] 5MWE PV PROJECT, (Signed on 7 August 2014 and to be completed between Kuwait Oil Company (KOC) and Gestamp Solar) Contract Specification.
[870] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company in 25 May 2016.

environmental provisions and GHG reduction calculations in the PDD, and did not consider TOT provisions.[871]

The general understanding reflected in the terms and conditions of the contract was that the technology would be transferred to KOC's personnel through training during the installation and operation of the project. For example, the contractor is responsible 'for training the Company personnel, as Company makes them available, so that they can assume Operation and Maintenance of the Plant after the Contract.'[872]

In addition, Article 1.2.8 of the Technical Specification of the Contract states that the Contractor is responsible for training KOC's staff regarding operation and maintenance procedures, plant monitoring / trouble shooting, etc.[873]

Nevertheless, even if the contract does provide for TOT, after evaluating the above-mentioned provisions for TOT, it is clear that this sort of transfer is different and far from a real, successful TOT.[874] It is only a technology diffusion or a basic level of TOT that focuses on the mere adoption of new technologies in the host country. It does not provide it with the opportunity to reuse the technology independently and does not consider the invalidity or the expiry of the contract and the IP or patent license.[875]

[871] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company in 25 May 2016.
[872] 5MWE PV PROJECT, (Signed on 7 August 2014 and to be completed between Kuwait Oil Company (KOC) and Gestamp Solar) Technical Specification Article 1.10.
[873] ibid, art 1.2.8.
[874] Interview with Abdulaziz Najaf, Senior Engineer in Well Surveillance Group, Kuwait Oil Company on 25 May 2016.
[875] Bo Wang, 'Can CDM bring technology transfer to China?—An empirical study of technology transfer in China's CDM projects' [2010] 38 (n.d) Energy Policy 2572–2585.

While discussed further in the conclusion of this thesis, in Chapter 9, we note here that the way the PDD is written reflects how it was driven by the UNFCCC's approach toward addressing TOT. The CDM does not make it obligatory to include TOT in the PDD; instead, it is left uncertain and to be determined. By contrast, the PDD requires specific and precise calculations of GHG emissions reductions. If they are not clearly calculated and identified, the project may not be registered as a CDM project.

The failure in the CDM to require the same precise details for TOT represents a key barrier to TOT. This is not in the interests of developing countries. At the same time, developed countries do benefit from such EST projects, as they gain certified emission reductions (CERs) from the UNFCCC. CERs 'are tradable on the carbon markets and countable against emissions targets instituted at both company level under national legislation and country level'.[876]

Thus, CERs can be traded and sold, and used by industrialised developed countries to meet a part of their emission reduction targets under the Kyoto Protocol.[877] This is an important benefit that developed countries gain through any EST projects that are submitted to be registered as CDM projects pursuant to the UNFCCC.

The PDD, as a project document, enforces this aspect for the benefit of developed countries. A key element in the registration of a CDM project is the clear

[876] UNFCCC, 'The Contribution of the Clean Development Mechanism under Kyoto Protocol to Technology Transfer' (UNFCCC , November 2010) <https://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf> accessed 12 May 2017;, and see: Alexander Zahar, *International Climate Change Law and State Compliance* (Routledge 2015) 136.
[877] United Nations Framework Convention on Climate Change (UNFCCC.int) <http://cdm.unfccc.int/about/index.html> accessed 18 November 2015.

understanding, calculations, and measures of how the project will reduce GHG emissions. On the other hand, TOT is not an obligatory element of a CDM project. Even in the PDD, TOT provisions must be completed only if the project itself includes TOT provision. The absence of TOT provisions in the PDD are not an obstacle to registering the project as a CDM. The is true although the UNFCCC and subsequent protocols and agreements repeatedly state that the threat of climate change and the responsibility to mitigate it or adapt to it is mainly borne by developed countries.

It is important to recall our definition of TOT. TOT must enable the transferee to absorb the technology. Also, it must lead to the use of all IP or patents rights related to such technology by the transferee independently for the purpose of achieving the TRIPS objectives.

Training is one component of a total system of TOT. If TOT is sought, it should be addressed in a separate TOT agreement or patent license. While this project lacked a TOT agreement that is separate from the main contract, there are different models of such agreements, and the components of the technology will differ according to each project and the requirements of the host country.

In this regard, the role of the UNFCCC is important. The CDM does not support developing countries with such an agreement or even provide guidance for them in the CDM registration process. Kuwait, as a host country, can incorporate TOT requirements into its criteria for registering the projects as CDM projects.[878]

[878] Stephen Seres and Erick Haites, 'Analysis of Technology Transfer in CDM Projects' [2008] The UNFCCC Registration & Issuance Unit CDM/SDM.

Nevertheless, unless this is fostered in practice by the UNFCCC, the EGTT and the Technology Mechanism, the patented technology owners will be reluctant to do it.

It is well known that these transfers of technology are in the interest of the IP or patent holder in the developed countries, as they will gain the CERs for each EST project, although they cannot occur if it is left solely to an agreement between the parties. The CDM encourages developed countries to gain the CERs. In contrast, it does not encourage TOT to developing countries. There should be a special mechanism, similar to the CDM, adopted particularly for the review of TOT provisions. Such a mechanism would ensure balanced rights and obligations between both types of countries.

6.4 Main Barriers in the Transfer of ESTs to Kuwait under the CDM

6.4.1: The definition of TOT

It is obvious, as shown above, that there is a lack of understanding as to what is meant by TOT, its contents and its components. Its contents include technology, know-how, patents, IP rights, detailed design, technical assistance, equipment or tools, and sometimes also the use of the trademarks (buy-back option).[879] These aspects were not clearly addressed in the projects under review.

6.4.2: The absence of TOT agreements in the projects under review

The difference between TOT and technology diffusion is not clear to Kuwait as a developing country. Since TOT agreement is a global package transferring information to the developing country, the types of licenses and TOT agreements

[879] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009) 9–10.

needed were not well defined in the projects under review.

Instead, they only addressed technology diffusion or a basic level of TOT, which is more related to a general awareness of the technology, not an actual transfer of the technology.

6.4.3 Institutional barriers

There are no legal and regulatory frameworks for TOT in Kuwait. Kuwait's Copyright Act No. 22 for the Year 2016 did not set forth any terms or conditions for TOT. Also, there are no policies or regulations for how TOT can be implemented in contracts with developed countries. This constitutes a substantial part of the problem.

The establishment of a clear policy for TOT in developing countries can help improve their awareness of what TOT is and how institutions and companies should work toward incorporating them within EST projects. Also, there are no technical institutions that provide technical assistance and expertise for TOT.

6.4.4 The absence of Technical Needs Assessments (TNAs):

One of the important components of TOT framework under the UNFCCC is 'Technology needs and needs assessments'.[880] Unfortunately, Kuwait, as a developing country, has not started conducting technology needs assessments (TNAs) to identify their needs as per the local market and conditions in Kuwait. It will be helpful for Kuwait to be clear about the technical barriers before promoting any new TOT.[881]

[880] EGTT, 'Expert Group on Technology Transfer: Five Years of Work' [2007] UNFCCC.
[881] ibid.

6.5 General findings related to TOT under the CDM in Kuwait

First of all, the CDM followed the same approach and manner as those adopted by the UNFCCC and the Kyoto Protocol. The CDM targets the basic reduction of GHG emissions. The UNFCCC's main concern is to focus on reducing the GHG emissions in the host country, with many detailed requirements and data to be inserted and completed in all documentation in order to submit a project for registration as a CDM project. By contrast, there is no such requirement for TOT; instead, this is left to parties without the interference or supervision of the UNFCCC. Therefore, the projects did not deal with TOT and cooperation as guided by the TRIPS Agreement's objectives and its TOT provisions. Thus, it was isolated from the role of engaging IP because of the means by which it was addressed in the required licenses. As previously mentioned, promoting adequate IP tools to license TOT is essential for such TOT to occur in practice.[882]

The purpose of the UNFCCC is to fulfil country obligations under the climate change regime. Again, the balance of obligations and rights has shifted. As noted above, Developing countries are required to reduce GHG emissions and bear the financial costs through such projects, although the UNFCCC clearly mentions in different provisions that the developed countries are the main parties responsible for global warming. At the same time, when it comes to the role of developed countries, it is not obligatory for them to transfer technology through the CDM to developing countries. In addition, no specific measures are provided to promote such transfer.

[882] See Chapter 5, p.217.

The CDM, through the process of consideration, validation, and registration, does not consider TOT. These are left to the interests of the parties: They can incorporate them according to their needs, and they can take whatever form the parties choose. All these stages were included to ensure that such a project will reduce GHG emissions, not to ascertain whether the project will actually enhance TOT.

Second, we noticed that the CDM, as a tool for TOT, has not addressed the EGTT-identified challenges and recommendations for achieving real TOT. Moreover, the CDM is still far from fulfilling all the UNFCCC's reports and analysis aimed at encouraging TOT. Instead, the same barriers to TOT persist, and the CDM has not solved them.

Third, there are some important prerequisites for TOT that need to be available in the host country before they can register any project as a CDM project.[883] One of those important prerequisites is the 'Technology needs and needs assessments', as mentioned previously.[884] This assessment is a set of country-driven activities that basically work to identify and determine the mitigation and adaptation technologies needed as priorities for any developing country party. Parties are encouraged, but not obliged, to conduct technology needs assessments (TNAs) for this purpose.[885]
Fourth, the lack of information and technical expertise is shown in each stage of the TOT process, as well in EST projects. There is also a lack of information about how

[883] Committee to Evaluate Transfer of Pollution Prevention Technology for the US Army Board on Manufacturing and Engineering Design, Division on Engineering and Physical Sciences, *Transfer of Pollution Prevention Technologies* (National Academies Press 2002) 13
[884] EGTT, 'Expert Group on Technology Transfer: Five Years of Work' [2007] UNFCCC.
[885] ibid.

to gain access to technology,[886] which is an important element for the success of any transfer deal. Special regional workshops for this objective might be a good idea.

We noticed in most of the CDM projects in Kuwait that the concerned entities embarking on such projects lack sufficient information about what, how and why. What is TOT and its concept and definition? How will technology be transferred to them? What sort of provisions shall be implemented, and what kind of TOT agreement will be used? Also, why is the host country's request for TOT left without certain conditions that would require such a provision to be reviewed by both parties and negotiated? The general understanding is that merely having a new technology in a country without allowing its reuse in the future and without the assistance of the developed country does not work. That is the reason we noted that for operational purposes, more focus is needed on the training for a specific project.

The UNFCCC recognised the importance of 'Technology Information' and set it as a central component of the Technology Transfer Framework under the UNFCCC. Nevertheless, as a key component, it needs to be improved by means of practical straightforward guidelines for developing countries in order to avoid the problem of a lack of information in the host country. What is needed is information related to 'hardware, software and networking, to facilitate the flow of information between the different stakeholders to enhance the development and transfer of technologies.'[887]
TT-CLEAR is the UNFCCC's Technology Information Clearinghouse, which is aimed

[886] UNEP, 'Technology without Border: Case Studies of Successful Technology Transfer' [2001] (n.d) The International Energy Agency (IEA).
[887] EGTT, 'Expert Group on Technology Transfer: Five Years of Work' [2007] UNFCCC.

at enhancing technology cooperation for action on climate change in particular.[888] Having TT:CLEAR act as a gateway might be helpful in this regard. However, what is needed is regional workshops that cover each CDM project and concentrate more on encouraging the parties to overcome this problem; they should also clarify the relevant issues for both the developing and developed countries, particularly with regard to TOT.[889] The general recommendations in the Technology Transfer Framework and the TT:CLEAR will be useless if they are not implemented from top to bottom.[890]

In conclusion, we find that the CDM has not been successful in bringing TOT to Kuwait as a developing country party of the UNFCCC. As identified in this chapter, there are various reasons and barriers that have led to this failure. A good plan for TOT is needed to act as a practical solution until a proper mechanism for enhancing TOT can be achieved either through the UNFCCC or TRIPS regime. A plan that is set out by the host country before starting negotiations for an EST project is needed. Such a plan should identify specific regulatory, organisational and technical barriers from the beginning of the process. Also, the programme plan can indicate milestones for TOT and ensure its visibility across a broader array of potential users than the established government–industry implementation teams.[891]

[888] UNFCCC, 'About TT-CLEAR' (UNFCCC, n.d) <http://unfccc.int/ttclear/templates/render_cms_page?NAD_home> accessed 17 September 2016.
[889] ibid.
[890] ibid.
[891] Committee to Evaluate Transfer of Pollution Prevention Technology for the US Army Board on Manufacturing and Engineering Design, Division on Engineering and Physical Sciences, *Transfer of Pollution Prevention Technologies* (National Academies Press 2002) 2.

Chapter 7

Case Study on International Transfer of ESTs in the United Arab Emirates

The United Arab Emirates (UAE) is obliged under the UNFCCC and all subsequent protocols and agreements to take the necessary actions for mitigating and adapting to the climate change threat. The UAE is classified as a developing country under Non-Annex I Parties under the UNFCCC classification of Parties, as we explained in Chapter 5.[892] The UAE has set out its plans and policies for more economic development and welfare by enhancing the recent environmental standards under UAE Vision 2021.[893]

7.1 Background about the UAE, in particular the EST industry

The UAE issued a federal law related to the protection of industrial protection. It is the Federal Law No. 31 of 2006 Pertaining to the Industrial Regulation and Protection of Patents, Industrial Drawings, and Designs. This law states the requirements for protection of inventions, utilities certificates, patents registration process and requirements, penalties related to any violations to this law. [894]

UAE operates two patents system, similar to Kuwait. The First is within the UAE as per the Federal Law No.31 of 2006. The second is the regional patent system within

[892] See Chapter 5 p.220.
[893] Vision 2021, 'Sustainable Environmental and Infrastructure' (Vision 2021, n.d) <https://www.vision2021.ae/en/national-priority-areas/sustainable-environment-and-infrastructure> accessed 12 January 2017.
[894] Wipo , 'UAE Laws' (*WIPO Lex*, n.d) <http://www.wipo.int/wipolex/en/profile.jsp?code=AE> accessed 31 October 2017

the Gulf Cooperation Council for all Gulf Cooperation countries. [895]

The UAE ratified the UNFCCC on 29 December 1995,[896] the Kyoto Protocol on 26 January 2005[897] and signed the Paris Agreement on 22 April 2016.[898] So the UAE has international obligations with regard to climate change and GHG emissions.

The UAE has a federation governance system that consists of seven emirates: Abu Dhabi, Dubai, Sharjah, Umm al-Quwain, Ajman, Ras Al Khaimah and, Fujairah.[899] Currently, Abu Dhabi has the largest oil fields and enjoys the biggest oil production in the UAE. Oil exploration in the UAE started in the late 1950s and early 1960s.[900]

During the past 45 years, the country has undergone significant societal and economic transformation.[901] The UAE has made a shift from tourism to broader economic welfare in the last 10 to 20 years. Collectively, the UAE is a developing country that has experienced a rapid transformation to improve its infrastructure capabilities and gross domestic income.[902]

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[895] Wipo , 'UAE Laws' (*WIPO Lex*, n.d) <http://www.wipo.int/wipolex/en/profile.jsp?code=AE> accessed 31 October 2017

[896] UNFCCC, 'United Arab Emirates' (UNFCCC, n.d) <http://unfccc.int/tools_xml/country_AE.html> accessed 12 July 2016.
[897] UNFCCC, 'Status of Ratification of the Kyoto Protocol' (UNFCCC, n.d) <http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php> accessed 12 July 2016.
[898] United Nation Treaty Collection, 'Status of Treaties: Paris Agreement' (United Nation Treaty Collection (UNTC), n.d) <https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&lang=en> accessed 12 July 2016.
[899] UNFCCC, 'The United Arab Emirates Initial National Communication to the United Nations Framework Convention on Climate Change' (INC, April 2016) <http://unfccc.int/resource/docs/natc/arenc1.pdf> accessed 26 July 2016.
[900] Gerald Butt, 'Oil and Gas in the UAE' [2011] n.d (n.d) United Arab Emirates: A New Perspective <https://www.uaeinteract.com/uaeint_misc/pdf/perspectives/11.pdf > accessed 9 July 2016
[901] UNFCCC, 'Summary Submission by the United Arab Emirates ' (UNFCCC , 22 October 2015). <http://www4.unfccc.int/submissions/INDC/Published%20Documents/United%20Arab%20Emirates/1/UAE%20INDC%20-%2022%20October.pdf> accessed 26 July 2016.
[902] Gerald Butt, 'Oil and Gas in the UAE' [2011] n.d (n.d) United Arab Emirates: A New Perspective <https://www.uaeinteract.com/uaeint_misc/pdf/perspectives/11.pdf > accessed 9 July 2016.

Regardless of the fact that oil is a driving force in the UAE's economy, great efforts were made by the UAE to support diversification of income. This has been done through government strategy since the mid-1980s that led to the development of a number of new sectors other than oil production. Dubai is a good example of how this took place. Dubai has emerged 'as an active international trading centre, combined with a large tourism sector and dynamic real estate markets'.[903]

The UAE has worked diligently to improve its capabilities, so it is good to have an example of a developing country with fewer challenges than others and to examine how TOT are working in its favour. In fact, the UAE has achieved major steps in sustainable development during the last three decades of the twentieth century. One of these achievements is the establishment of a federal environmental agency. Another is the formulation of a comprehensive national environmental strategy and the adoption of national legislation, in addition to adopting related multilateral environmental agreements.[904]

In the UAE, the net carbon dioxide-equivalent emissions for 1994 amounted to 74,436 Gg. The main gas emitted is CO_2 (60,246 Gg), which constitutes more than 81% of net CO_2-equivalent emissions in the country. Still, energy-related CO_2 emissions from fossil fuel production and combustion are huge, constituting about 60,246 Gg, or approximately 95% of the CO_2 emission total. Industrial processes account for approximately 4% of CO_2-equivalent emissions, and the remaining forms

[903] UNFCCC, 'The United Arab Emirates Initial National Communication to the United Nations Framework Convention on Climate Change' (INC, April 2016) <http://unfccc.int/resource/docs/natc/arenc1.pdf> accessed 26 July 2016.
[904] UNFCCC, 'The United Arab Emirates Initial National Communication to the United Nations Framework Convention on Climate Change' (INC, April 2016) <http://unfccc.int/resource/docs/natc/arenc1.pdf> accessed 26 July 2016.

of methane, arising from agricultural production, account for about 2% of overall CO_2-equivalent emissions in the UAE.[905]

Thus, the UAE recognizes the importance of the climate change threat. The UAE, as per its geographical location and its role as an oil producer, is in fact vulnerable to the physical impacts of global warming or climate change in different ways on its ecology, natural resources and human systems. That is why the UAE has put reducing GHG emissions in its economic strategy.[906]

As a result, the UAE has already started taking some steps with regard to its environmental policy. The UAE has promoted investments and diversified the sources of its national income to reduce its economy's dependency on oil and has promoted environmentally friendly industrial growth. First, the UAE established an Environmental Agency at the federal level in 1993. Then it established the Ministry of Environment and Water in 2006. Later, in 2016, climate change was added to the activities handled by the Ministry of Environment and Water so it was renamed to the Ministry of Climate Change and Environment. This ministry manages all aspects related to international and domestic climate change affairs, addressing 'the issue of climate change, through the implementation of comprehensive policies and initiatives to mitigate and adapt to climate change and protect our unique environmental systems'. [907] In addition, the UAE established a number of environmental institutions at the emirate level.[908]

[905] ibid.
[906] ibid.
[907] UAE Ministry of Climate Change and Environment, 'About the Ministry' (UAE Ministry of Climate Change and Environment, n.d) <http://www.moccae.gov.ae/en/about-ministry/about-the-ministry.aspx> accessed 16 January 2017.
[908] ibid.

Second, the UAE has set out the 'National Environmental Education & Awareness Strategy 2015–2021'.[909] This strategy rests on six pillars. The first pillar is to educate youth to drive the UAE towards a sustainable future. The second is to improve the community's commitment to sustainability and environmental protection. The third is to encourage the active involvement of businesses and industries in moving towards environmental sustainability. The fourth is to engage key government stakeholders to support environmental sustainability. The fifth is to ensure alignment and effectiveness of environmental education and awareness efforts in the UAE. Finally, the sixth pillar is to build adequate capabilities in the UAE with regard to personnel and education.[910]

This strategy reflects how important environment protection is to UAE, and most of its objectives are linked to students through cooperation with the Ministry of Education. Some objectives under the second pillar related to how to engage and build partnerships for achieving more sustainable development in the UAE. This is mainly related to environmental awareness, the threat of climate change, and educational objectives for educating new generations about the importance of protecting the environment.[911]

Unfortunately, nothing was mentioned with regard to building technical capacity and TOT in EST projects. This reflects actually how the UAE as a developing country was directed by the UNFCCC approach in mitigating and adapting to climate change. The role of the UAE is to put more effort into mitigating and adapt to climate

[909] ibid.
[910] ibid.
[911] ibid.

change through educational programs, training programs, campaigns, and best practices, among other ways. However, TOT and building national capabilities for more sustainable development is missing in this strategy.

In sum, sustainable energy in the UAE today has become a key factor in the country's strategy for promoting economic, environmental, and social and environmental development.[912] In contrast, TOT and how to promote it is not appropriately considered in the Ministry of Climate Change and Environment or in the National Environmental Education & Awareness Strategy 2015–2021.

7.2 An overview of CDM projects in the UAE

The UAE originally submitted 31 projects related to the EST industry to be registered as CDM projects at the UNFCCC; two of them completed the registration cycle and were officially registered as such.[913] Accordingly, we focussed only on those projects that include some provisions related to TOT from the list of 31 projects that were submitted for registration as CDM projects. These projects will be analysed and evaluated as projects on focus.

7.3 Projects in focus

7.3.1 DEWA Chiller Station L

e) Project objective and description

The project scope of work is related to renewable energy industries and the methodology used is supply-side energy efficiency improvements in generation. The

[912] Dubai Carbon, 'State of Energy Report: Dubai 2014' (Dubai Carbon, 2014) <http://www.undp.org/content/dam/rbas/doc/Energy%20and%20Environment/The%20State%20of%20Dubai's%20Energy%20and%20Its%20Path%20to%20Green%20Economy.pdf> accessed 2 Aug 2016.

[913] UNFCCC, 'Validation projects' (UNFCCC, n.d) <http://cdm.unfccc.int/Projects/ Validation/index.html > accessed 26 July 2016.

project is in the Jebel Ali area in Jumeirah, south-west of Dubai. There is no public funding from Annex I Parties for this project.[914]

The project is to generate electrical energy with less fossil fuel consumption and is intended to reduce GHG emissions and contribute to sustainable development by adopting new technology to the needs of the UAE.[915] It is a small-scale activity project[916] that works mainly for improving the efficiency of the three gas turbines (GTs) L 71 – L 73 installed at Station L Phase 1 of the Dubai Electricity and Water Authority (DEWA). The project will use a Thermal Energy Storage and Turbine Inlet Air Cooling (TESTIAC), which is an inlet air chilling system.[917]

Then the project shall 'increase the efficiency of the gas turbine by increasing the density of inlet air',[918] which is intended to lead to an increase in average historic efficiencies of the gas turbines by approximately 2%.[919] Subsequently, the project activity will reduce GHG emissions because less fossil fuel input is required to

[914] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD) , n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 12 Jan 2017.
[915] ibid.
[916] UNFCCC, 'CDM Project Activity Issuance Request Form' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/7/Q/K/7QKS1PZWUOCJBNVLIT346GM9HFA82E/7260%201%20F-CDM-ISS.PDF?t=Vnp8b2I5ejhnfDDneKRTMPd4JI2SsjJGaxNA> accessed 26 July 2016.
[917] UNFCCC, 'Monitoring Report: DEWA Chiller Station L' (UNFCCC, 1 October 2015) <https://cdm.unfccc.int/filestorage/K/9/W/K9WS1ERBX4G62IQDNHF5LAM03ZYJUO/PA7260_Monitoring%20report%20ver%201.pdf?t=VVN8b2I4NGZnfDBjcljiElpc5sSgtmmE038A> accessed 1 Aug 2016; and see: UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 26 July 2016.
[918] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 26 July 2016.
[919] UNFCCC, 'Validation Report: DEWA Chiller Station L' (UNFCCC, 14 November 2012) <https://cdm.unfccc.int/filestorage/1/f/4N1I7KTCW9QO3MJHLP0DA2UBZ8RSEY.pdf/VAL_REP_DEWA%20Chillers_v3.pdf?t=OUt8b2I4MnEwfDB3GJCndhX21z3gpvUiMVZW> accessed 26 July 2016

generate the same output of electricity during operation of the TESTIAC system.[920] The operational time shall be continuous for 8 hours a day, 7 days a week, between the months of April and October.[921]

f) Type of technology used under the project

The TESTIAC system represents state of the art technology that is new and is being used for the first time in the UAE. The ESTs used and the know-how in the TESTIAC system is a new type of patented technology owned by Energy Changes Company and will be used in the project activity through the TESTIAC system to reduce GHG emissions in the host country.[922]

From the chilling used in the TESTIAC, the ambient air surrounding the plant will be cooled after the process of filter section by the cooling coils. So this will produce 'indirect cooling of the air going to the turbine compressor, by means of cold water. These coils will use cooling water coming from the Thermal Storage Tank. The water is cooled in an ammonia-based refrigeration plant.'[923]

Comparing this to the situation before the TESTIAC chilling system, the ambient air is passing through the filter section, then to the gas turbine and later to the exhaust stack. As a result, the temperature of the ambient air is equal to the temperature of

[920] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2l0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 26 July 2016.
[921] Dubai Carbon Centre of Excellence Portfolio, 'DEWA CHILLER STATION L' (Dubai Carbon, 2015) <http://dcce.ae/wp-content/uploads/2015/05/DEWA_DCCE_carbonPortfolio_5_round3.pdf> accessed 26 July 2016.
[922] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2l0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 12 January 2017.
[923] ibid.

the inlet air, the heat of which makes the turbines run less efficiently, and is thus considered harmful to the environment.[924]

g) Parties

The parties working on this project representing the host country are the Dubai Carbon Centre of Excellence and DEWA. The project was awarded to the Energy Changes Company, established in 2006, which had developed and registered a number of EST projects under the UNFCCC in addition to developing energy policies and strategies in many countries, including smart cities concepts, EST projects, consultants and advisory studies for CDM documentations.[925]

h) The form of the project

The project is being validated as a CDM project and is still undergoing the registration process[926] Generally, a validated project means the UNFCCC Secretariat has confirmed that it meets the necessary requirements of the CDM criteria and followed the approved methodology. Also, the validation decision means that the proposals presented in the PDD will lead to a realistic determination of the emission reductions.[927]

The Energy Changes Company will provide consultant services in addition to the construction of the TESTIAC chilling system. Therefore, the CDM registration process will be prepared and handled by them. Nevertheless, the registration

[924] ibid.
[925] Energy Changes, 'Company' (Energy Changes, n.d) <http://en.energy-changes.com/unternehmen> accessed 12 January 2017.
[926] Dubai Carbon Centre of Excellence Portfolio, 'DEWA CHILLER STATION L' (Dubai Carbon, 2015) <http://dcce.ae/wp-content/uploads/2015/05/DEWA_DCCE_carbonPortfolio_5_round3.pdf> accessed 26 July 2016.
[927] UNFCCC, 'Validation Report: DEWA Chiller Station L' (UNFCCC, 14 November 2012) <https://cdm.unfccc.int/filestorage/1/f/4N1I7KTCW9QO3MJHLP0DA2UBZ8RSEY.pdf/VAL_REP_DEWA%20Chillers_v3.pdf?t=OUt8b2I4MnEwfDB3GJCndhX21z3gpvUiMVZW> accessed 26 July 2016.

process for a CDM project does not give any assurances about TOT in each project, since it works basically to ensure the proper calculation of the reduction of GHG emissions is realistic in the project. The examination role carried out by an independent third party during the validation process is responsible for assessing the project design, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant policies and regulations of both the UNFCCC and the host country.[928]

i) TOT and IP in the project

Section A.4.3 of the PDD is mainly set up for the purpose of TOT provisions, whenever applicable in the project. Section A.4.3 is not used under this PDD; only Section A.4 is filled with some information related to parties and project, but there is not any sub-section of Section A.4, as is optionally provided in the PDD form.[929]

The PDD for this project includes some broad statements for TOT within the general objectives of the project.[930] The PDD, under Section A.3 (Technologies and/or measures), states that the EST technology and the know-how used in this project would be new and will be applied for the first time in the host country.[931]

After we examined all the provisions related to TOT under the PDD, we learned that the project does include new EST technology and know-how to be applied in the host country. Nevertheless, we noted that the EST firstly applied in this project is part of a machinery supply technology. Therefore, it is purchased as part of the TESTIAC

[928] ibid.
[929] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 26 July 2016.
[930] ibid.
[931] ibid.

chilling system. So it is a simple type of TOT as per a sale of equipment and machinery agreement.[932] The contract includes some training provisions for the operation and maintenance of the plant only with regard to the EST applied.[933]

Then, the project includes know-how expertise to be transferred to the host country. Nevertheless, this was given in general statements without clarifying what it does and does not include. Accordingly, the application of the know-how in the host country creates some ambiguities and uncertainties, mostly with regard to how such know-how will be transferred.[934]

As per the officials' view, the contract includes some know-how expertise regarding how to operate the plant as a cooling unit. Nevertheless, we discovered that the objective of transferring this know-how to the host country is only for the operation of the plant and maintenance after the completion of the project. So the know-how application in the host country, since the transfer as a term was not mentioned in the PDD,[935] is only for the purpose of operating the plant and keep it maintained.

The conclusion is that TOT is dealt with in this project under the basic level of transfer, as explained in Chapter 5, so we can say it is a form of technology diffusion rather than TOT as a global package to the recipient.[936]

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[932] See Chapter 2, p.62.
[933] Dubai Carbon, 'State of Energy Report: Dubai 2014' (Dubai Carbon, 2014) <http://www.undp.org/content/dam/rbas/doc/Energy%20and%20Environment/The%20State%20of%20Dubai's%20Energy%20and%20Its%20Path%20to%20Green%20Economy.pdf> accessed 2 Aug 2016.
[934] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 12 January 2017.
[935] UNFCCC, 'Clean Development Mechanism Project Design Document Form for DEWA Chiller Station L' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/C/S/1/CS1EQDU0RZALFHBMYVI8XJK374OGNP/PDD_DEWAChillerSTL_Ver1.pdf?t=cHp8b2I0czRkfDCqd4SZA0d2i89-9ZAmYBXY> accessed 12 Jan 2017.
[936] See Chapter 5, p.199

In order to have such TOT, this should first be stated clearly in the PDD with all its requirements. Second, the contract shall clearly administrate the objective of the transfer as to allow the transferee to reuse, resell and reproduce the same technology independently of the transferor.[937]

Third, to have a successful transfer of know-how, it is important to provide a list of the know-how elements, such as 'plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training, services involving technical advisory and managerial personnel, and personnel training'[938] This assists the developing country in knowing exactly what is included in the know-how and how shall it be transferred.

Fourth, the IP and patents tools for such transfer shall be clearly agreed upon and signed between parties as per terms and conditions of the main contract. This was not included in the contract related to this project. The type of license required is not mentioned, and therefore the IP tool for such a transfer of know-how is not shown. [939]

Fifth, the project does not show the key objective of such TOT or know-how for the host country. Any TOT shall lead at the end to enable the transferee to absorb such new technology into its own system, and as per its conditions, be able to reuse, resell and reproduce the same technology independently from the transferor after the expiration of the contract.[940]

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[937] See Chapter 2 , p.50; and Chapter 5, p.198.
[938] UNCTAD, 'Transfer of Technology' [2001] n.d UNCTAD Series on issues in international investment agreements <http://unctad.org/en/docs/psiteiitd28.en.pdf> accessed 9 September 2016
[939] Dubai Carbon, 'State of Energy Report: Dubai 2014' (Dubai Carbon, 2014) <http://www.undp.org/content/dam/rbas/doc/Energy%20and%20Environment/The%20State%20of%20Dubai's%20Energy%20and%20Its%20Path%20to%20Green%20Economy.pdf> accessed 2 Aug 2016.
[940] See the definition for TOT in Chapter 2 , p.50; and Chapter 5, p.198.

In sum, this project includes a technology purchase as per the simple type of TOT under a machinery supply agreement in addition to the application of know-how expertise in the host country. The first part is a simple and traditional type of TOT in equipment and machines. The second part is important but it was left without detail and without specifying how such transfer of know-how will be done. The PDD and contract include only the application of know-how in the host country. So it is still merely knowledge of how the plant can be operated and what shall be done by the host country to maintain the plant, not a complete TOT.[941]

7.3.2 Single to combined cycle conversion at Al Ghail & Al Hamra power plants, Ras Al Khaimah

a) Project objective and description

This project is to be implemented in the existing current single cycle power plants at Al Ghail and Al Hamra by E.ON Masdar Integrated Carbon Ltd (EMIC). These two power plants are owned by the Ras Al Khaimah investment authority (RAKIA).[942]

This project depends mainly on utilizing the waste flue gases from gas turbine exhaust by installing waste heat recovery boilers. Then the steam generated from the boiler will be utilized in the steam turbine for additional power generation. Thus, such installation of both waste heat recovery boilers and turbine will convert the power plant from single cycle to a combined cycle.[943]

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[941] Dubai Carbon, 'State of Energy Report: Dubai 2014' (Dubai Carbon, 2014) <http://www.undp.org/content/dam/rbas/doc/Energy%20and%20Environment/The%20State%20of%20Dubai's%20Energy%20and%20Its%20Path%20to%20Green%20Economy.pdf> accessed 2 Aug 2016.

[942] UNFCCC, 'Clean Development Mechanism Project Design Document Form for Single to Combined Cycle Conversion at Al Ghail & Al Hamra Power Plants, Ras Al Khaimah' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/O/F/P/OFPDNI24Z3LRHXC9BMSYKJ58UTW1Q0/PDD.pdf?t=ZmN8b2I0dGlnfDCWPfJG6yPBdhvXga-hlQZr> accessed 15 Jan 2017.

[943] ibid.

The project will be implemented in two plants, as shown in the project title at Al-Ghail and Al Hamra. At the Al Ghail Plant, the project shall convert two open-cycle gas turbines of 42.1 MW each into a combined-cycle facility that adds approximately 392 MW gross additional power generation by utilizing waste heat available from the existing turbines.[944]

The same will be done at the Al Hamra Plant, as the project activity shall convert two open-cycle gas turbines of 22.5 MW each into a combined-cycle facility that adds approximately 17.543 MW gross additional power generation by utilizing waste heat available from the existing turbines.[945]

In the absence of the project activity, the electricity is generated in single-cycle mode by using natural gas as fuel. The exhaust from the gas turbines goes into the atmosphere. Consequently, this project contributes to sustainable development through the displacement of fossil fuel–generated grid-based electricity. [946]

The project will, therefore, reduce the use of natural gas in power generation and consumption, as well as carbon dioxide, a potent greenhouse gas. The project activity will reduce 1,517,830 tCO_2 in the crediting period of 10 years. So as per the CDM criteria, the project contributes to sustainable development. Nevertheless, the project is still under the validation process in the UNFCCC.[947]

b) Type of technology used under the project

The technology employed under this project is related to providing technology and know-how based on technical design calculations in order to extend the existing

[944] ibid.
[945] ibid.
[946] ibid.
[947] ibid.

plant in AL Ghail and create an additional power capacity of 39 MWel net. At the Al Hamra plant, the same will be done in order to extend the existing plant and create an additional power capacity of 16.7 MWel net.[948]

The German company E.ON is the partner obliged to provide suppliers for these patented technologies and know-how expertise to the host country as per the terms and conditions of the incorporated joint venture. In fact, through the long-term relationship, all of the technologies employed for the implementation of the project shall be fully transferred to the host country.[949]

c) Parties

The project establishes a new Carbon Project Development Joint Venture.[950] Thus, the project takes the form of an incorporated joint venture between the two partners. The first partner is Masdar, known as the Abu Dhabi Future Energy Company. It is a wholly owned subsidiary of Mubadala Development Company that focuses basically on renewable energy and sustainability.[951]

The second partner is the aforementioned E.ON, a company formed in June 2000 'from the merger of two of Germany's largest industrial groups VEBA and VIAG each with an impressive history in its own right'.[952] E.ON is an international, privately

[948] ibid.
[949] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company on 23 November 2016.
[950] E.ON, 'Masdar and E.ON Climate & Renewables Establish New Carbon Project Development Joint Venture: EMIC' (E.ON, n.d) <http://www.eon.com/en/media/news/press-releases/2010/1/19/masdar-and-e-dot-on-climate-and-renewables-establish-new-carbon-project-development-joint-venture-emic.html> accessed 19 Jan 2010.
[951] ibid.
[952] E.ON, 'E.ON History' (EON, n.d) <http://www.eon.com/en/about-us/profile/history.html> accessed 15 Jan 2010.

owned energy supplier focusing 'on renewables, energy networks and customer solutions, which are the building blocks of the new energy world'.[953]

As a result, the project will be implemented by the incorporated joint venture, E.ON Masdar Integrated Carbon Ltd (EMIC), split 50–50 between the partners.[954]

d) Form of the project

EMIC is headquartered in Abu Dhabi's Masdar City and is a 50–50% joint venture, as mentioned earlier.[955] The joint venture, as we explained in Chapter 2,[956] is a long-term partnership relationship where mutual interests are exchanged between partners involving pooling of assets, joint management, profit and risk sharing, which usually occurs between foreign partners and local contractors in the host country.[957] Hence, EMIC will work on implementing the project activity, including all permitting, licensing and consent requirements, project financing documentation, BOT Agreements, land lease agreements, power purchase agreements, and all related agreements for the purpose of implementing the project activity.[958]

e) TOT and IP in the project

Section A.4.3 of the PDD of this project includes some details about relevant transfer of ESTs used in both the Al-Ghail and Al-Hamra plants. Section A.4.3 is designated for the purpose of mentioning provisions related to TOT only, as per the guidelines

[953] E.ON, 'E.ON Facts and Figures' (E.ON, n.d) <http://www.eon.com/en/about-us/profile/facts-and-figures.html> accessed 15 Jan 2010.
[954] E.ON, 'Masdar and EON Climate & Renewables Establish New Carbon Project Development Joint Venture: EMIC' (EON, n.d) <http://www.eon.com/en/media/news/press-releases/2010/1/19/masdar-and-e-dot-on-climate-and-renewables-establish-new-carbon-project-development-joint-venture-emic.html> accessed 19 Jan 2010.
[955] ibid.
[956] See Chapter 2, p.60.
[957] M.D. Haug, 'The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience' (1992) Harvard Journal of Law & Technology 209.
[958] CMS, 'Infrastructure & Projects, UAE' (CMS, n.d) <https://cms.law/en/content/download/.../1/.../Infrastructure%20%26%20Projects.pdf> accessed 12 January 2017.

set out by the UNFCCC for completing the PDD. Thus, this section should include a description of how ESTs shall be transferred to the host country by explaining the project activity as well as a description of how the project will implement such technology, as explained in Section A.2 'Description of the Project Activity' in the PDD.[959]

We should make it clear here that any additional information related to technology in this section should be for the purpose of elaborating TOT. Therefore, it should not include general calculations and data related to how technology will result in the reduction of GHG emissions.[960]

Nevertheless, the PDD of this project filled in this section in a way similar to Section A.2. This is a mere description of technology, data and calculations of how to implement such technology, and the requirements for such implementation such as the required number of heat recovery steam generators, condensing steam turbines, plants, air cooler condensers, water plants, electrical and controlling systems, and buildings.[961]

Also, Section A.2 shows the 'Sustainable Development Indicators' and their impacts on the project. One of these indicators is 'Technology transfer & know how'. EMIC promised to work on enhancing the capacity and utilization of local technology in the host country. It would also work on enhancing the capacity and utilization of local resources, in addition to avoiding using experimental or obsolete technologies.

[959] UNFCCC, 'Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM)' (UNFCCC, n.d) <https://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04.pdf> accessed 23 September 2016.
[960] Ibid.
[961] UNFCCC, 'Clean Development Mechanism Project Design Document Form for Single to Combined Cycle Conversion at Al Ghail & Al Hamra Power Plants, Ras Al Khaimah' (Project Design Documents (PDD), n.d) <https://cdm.unfccc.int/filestorage/O/F/P/OFPDNI24Z3LRHXC9BMSYKJ58UTW1Q0/PDD.pdf?t=ZmN8b2l0dGlnfDCWPfJG6yPBdhvXga-hlQZr> accessed 26 July 2016.

Nevertheless, the project will not guarantee enabling the host country to be independent in using such technology in the future. As such the project will not lead to '… causing dependencies on foreign parties in knowledge and appliance operation (know-how transfer)'.[962]

As a result, this means that personnel in the UAE, as a host country, will lack the required technical expertise in promoting TOT under the CDM. Section A.4.3 is required to include exactly what sort of technology will be transferred to the host country, how it will be transferred and why this type of technology should be transferred to the host country. The guidelines of how to complete this section are mentioned under 'Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies'.[963]

Thus, the process of completing this section, which is highly important to developing countries, is seemingly not well supervised or reviewed by the UNFCCC. For its part, the UNFCCC contributed to building this lack of understanding as to what is required under Section A.4.3. Although the guidelines state that the main purpose of this section is TOT provision, they need to mention the baseline scenario of the project prior to and after its implementation. However, it is not stated clearly how this new baseline scenario will be transferred and what assurances are needed to make the transfer feasible.[964]

This is why a misunderstanding has occurred since the host country will usually fill in general information related to technology without any reference to TOT. The UAE, as

[962] ibid.
[963] UNFCCC, 'Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM)' (UNFCCC, n.d) <https://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04.pdf> accessed 23 September 2016.
[964] ibid.

a host country, focused only on listing equipment and systems to be used for such technologies employed throughout this project, in addition to activities and measures installed or modified in the project activities.[965]

Hence, the project will likely not result in the host country absorbing the technology. It will not lead to enabling the transferee to reuse, resell and reproduce the same technology independently of the transferor in the future. Nevertheless, in contradiction of this, the PDD mentioned in other sections that without registering this project as a CDM project under the UNFCCC, EMIC would not be able to transfer technology to the host country.[966]

This was mentioned under Section B.5 related to how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity [assessment and demonstration of additionality]. It states that

> Furthermore, EMIC, the project sponsor has identified the CDM as a critical issue, and therefore without the CDM incentive EMIC would not be implementing the project, and technology and skills transfer to UAE would be unlikely to occur and the project would not happen…'[967]

As per the text of this provision, TOT might be construed as technology diffusion or a basic level of transferring technology. As was explained in the Kuwait case study in the previous chapter, a basic level of transferring technology focuses only on the

[965] ibid.
[966] UNFCCC, 'Clean Development Mechanism Project Design Document Form for Single to Combined Cycle Conversion at Al Ghail & Al Hamra Power Plants, Ras Al Khaimah' (Project Design Documents (PDD) , n.d) <https://cdm.unfccc.int/filestorage/O/F/P/OFPDNI24Z3LRHXC9BMSYKJ58UTW1Q0/PDD.pdf?t=ZmN8b2I0dGlnfDCWPfJG6yPBdhvXga-hlQZr> accessed 15 Jan 2017.
[967] ibid.

adoption of new technologies in the host country, without giving the host country the opportunity to reuse, resell and reproduce the technology independently and without considering the invalidity or the expiry of the patented technology license agreement.[968]

Such a general description of technology and how it shall be employed in the project may fall under the general usage of the new technology in the host country without a real transfer of the technology as a total system. Any TOT that does not lead to making the host country fully able to absorb such new technology will not be considered a TOT.

In sum, the project lacks TOT agreement but it does mention, within the provisions of the contract itself, that the technology shall be transferred to the host country and the partner is responsible for providing the technical support and training to national personnel for the operation of the project after the expiry of the contract.[969] Once again, the point here is that it is only technology diffusion or a base-level TOT. It is far from our definition, far from the objectives of TRIPS and from the objectives of the CDM as a tool that encourages the transfer of ESTs.

7.3.3 10-MW photovoltaic plant in Dubai, UAE

a) Project objective and description

The project is to develop a 10-MW output capacity photovoltaic (PV) power plant in Dubai.[970] It is a small-scale activity project whose life expectancy is estimated to be

[968] Bo Wang, 'Can CDM bring technology transfer to China?—An empirical study of technology transfer in China's CDM projects' [2010] 38(n.d) Energy Policy 2572–2585.
[969] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company, on 3 June 2016.
[970] UNFCCC, 'Clean Development Mechanism Project Design Document Form for 10MW Photovoltaic Plant in Dubai, United Arabic Emirates' (Project Design Documents (PDD) , n.d) <https://cdm.unfccc.int/filestorage/N/D/U/NDUSMQAXR647J8T5BLHG3V1KIFW0CO/Photovoltaic%2

25 years. The project includes an independent consultant's study for evaluating and assessing the location of the project activity with regard to 'the climate, weather, geomorphology, topography and existing or planned use of the sites around Dubai'.[971]

The consultant recommended that a suitable technology for solar energy generation be used in the project location and as per the requirements of the UAE for power generation. The project shall contribute to sustainable development through reducing GHG emissions. The project shall displace fossil fuel–based electricity from the grid through electricity generation by a solar radiation. Hence, the project seeks to reduce fossil fuel consumption.[972]

Until the complete implementation and the full operation of the project, the equivalent amount of annual power output of the plant will be generated depending on fossil fuels that are supplied by DEWA grid. So, it will contribute to annual GHG emission reductions estimated at 12,765 tCO_2e.[973] On this basis, the project was validated as a CDM project on 8 October 2012, because it meets the requirements of the CMD.[974]

That is the basis of the evaluation, and TOT is not an element for such validation, as per the validation report on 8 October 2012.[975] In other words, the UNFCCC has not

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0plant%20Dubai%20PDD.pdf?t=SGd8b2I0cmI2fDCy9r4lK1zqMRtDr8wRtVy_> accessed 16 Jan 2017.

[971] ibid.

[972] ibid.

[973] ibid.

[974] UNFCCC, 'CDM Validation Report Dubai Electricity and Water Authority Dubai Carbon Centre of Excellence Validation of the Project Activity: 10MW Photovoltaic Plant in Dubai, UAE AENOR Reference: 2011/064/CDM/57 VERSION: 02' (UNFCCC Validation, 8 Oct 2012). <https://cdm.unfccc.int/filestorage/b/e/QXIBFV901MWP7Z4YGOSET52NDRH3A6.pdf/VAL_REP_10MW_PVv2.pdf?t=VHN8b2p3eDdpfDDS8SlJPoBWpeOoT1ewkdX8> accessed 16 January 2017

[975] The validation report on 8 Oct 2012 states that 'The conclusions can be summarised in detail as follows:

- The project is in line with all relevant host country criteria, the DNA of UAE and all relevant UNFCCC requirements for the CDM. The LoA from UAE is dated 1 November 2011.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.

reviewed whether the project transfers or does not transfer the patented technology employed under the validation process. The UNFCCC basically checks and evaluates how GHG emission reductions are calculated under the project and whether the project will result in sustainable development on that basis.

b) Type of technology used under the project

As per the consultant recommendations, a suitable technology shall be used for generating power from solar energy. The technology used in this project will consist of machinery and know-how expertise in the photovoltaic power plant that will be composed of 13 thin films, and PV modules with a total output capacity of 10 MW. Also, it will have an installed capacity of 13 MW peaks to generate 24,778 MWh annually.[976] It is a patented technology owned by First Solar.[977]

c) Parties

DEWA, the Dubai government-run company, represents UAE as a host country in this project. In general, DEWA is responsible for power generation, water production, and the transmission and distribution of power and water in the Emirate of Dubai. DEWA operates eight power plants with a total installed capacity of 7,361 MW and 7

- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so the project activity is likely to achieve the average estimated amount of emission reductions of 12,765 tCO2e per year.' See: UNFCCC, 'CDM VALIDATION REPORT Dubai Electricity and Water Authority Dubai Carbon Centre of Excellence VALIDATION OF THE PROJECT ACTIVITY: 10MW Photovoltaic Plant in Dubai, UAE AENOR REFERENCE: 2011/064/CDM/57 VERSION: 02' (UNFCCC Validation, 8 Oct 2012). <https://cdm.unfccc.int/filestorage/b/e/QXIBFV901MWP7Z4YGOSET52NDRH3A6.pdf/VAL_REP_10MW_PVv2.pdf?t=VHN8b2p3eDdpfDDS8SlJPoBWpeOoT1ewkdX8> accessed 16 January 2017.

[976] UNFCCC, 'CDM Project Design Document Form for 10MW Photovoltaic Plant in Dubai, United Arabic Emirates' (Project Design Documents (PDD) , n.d) <https://cdm.unfccc.int/filestorage/N/D/U/NDUSMQAXR647J8T5BLHG3V1KIFW0CO/Photovoltaic%20plant%20Dubai%20PDD.pdf?t=SGd8b2I0cmI2fDCy9r4lK1zqMRtDr8wRtVy_> accessed 16 Jan 2017.

[977] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company on 23 November 2016. See also: First solar, 'DEWA 13 Solar Plant' (First Solar, n.d) <http://www.firstsolar.com/en/About-Us/Projects/DEWA-13-Solar-Plant> accessed 16 January 2017.

desalination plants with an installed capacity of 1.5 million cubic metres of water per day.[978]

First Solar is the EPC Contractor and the developer of this project.[979] It is also the owner of patented technology for the solar power plant. It is a leading American provider of comprehensive photovoltaic solar energy solutions worldwide and a PV manufacturer of rigid thin film modules, solar panels and PV power plants.[980]

d) TOT and IP in the project

In this project, there are two different versions of the PDD: the first one submitted on 22 September 2011 and the second submitted on 3 August 2012. This is because the first validation report did not validate the project as a CDM project because the information provided did not meet the criteria. So it was re-validated later after making the necessary corrections and providing the required information, data and GHG emission reductions.[981]

The first PDD included provisions related to TOT under Section A.4.2 'Type and category(ies) and technology/measure of the small-scale project activity'. However, this section is not the section that addresses what shall be used for TOT provisions. This should be under Section A.4.3. The first version of the PDD explicitly stated that the project transfers the ESTs to the host country by 'installing a photovoltaic power

[978] UNFCCC, 'Clean Development Mechanism Project Design Document Form for 10MW Photovoltaic Plant in Dubai, United Arabic Emirates' (Project Design Documents (PDD) , n.d) <https://cdm.unfccc.int/filestorage/N/D/U/NDUSMQAXR647J8T5BLHG3V1KIFW0CO/Photovoltaic%20plant%20Dubai%20PDD.pdf?t=SGd8b2I0cmI2fDCy9r4lK1zqMRtDr8wRtVy_> accessed 16 Jan 2017.

[979] First Solar, 'Project Data Sheet for DEWA 13 Solar Plant' (First Solar, 2013) <http://www.firstsolar.com/-/media/Downloads/First-Solar-DEWA-FactSheet-English.ashx> accessed 16 January 2017.

[980] ibid.

[981] UNFCCC, 'CDM VALIDATION REPORT Dubai Electricity and Water Authority Dubai Carbon Centre of Excellence VALIDATION OF THE PROJECT ACTIVITY: 10MW Photovoltaic Plant in Dubai, UAE AENOR REFERENCE: 2011/064/CDM/57 VERSION: 02' (UNFCCC Validation, 8 Oct 2012).

plant' such 'state-of-the-art environmentally sustainable technology is being applied by the project in the host country'.[982] Then the PDD states that the '[k]now-how transfer is provided by training local personnel to operate and maintain the plant.'[983]

This provision was later deleted in the second, revised version of the PDD dated 3 August 2012. Nevertheless, even if not deleted, this provision is far from the type of TOT that the TRIPS tries to address, as well as from the CDM as a tool for encouraging TOT, for various reasons.

First, this project addresses the transfer of know-how to local personnel through the training of such personnel to operate and maintain the plant after the completion of the contract. So we are referring here to the basic level of transferring technology or technology diffusion.[984]

Second, the project refers to know-how transfer and not TOT. As we are well aware, know-how transfer is only one element of a TOT. Know-how transfer is a broader term than TOT. Also, know-how is related only to how to operate and maintain the plant by the personnel of the host country.[985] A TOT agreement should be addressed as a global package of all elements of technology that need to be transferred to the transferee in order to enable the transferee to reuse, resell and reproduce the same in the future, independently of the transferor.[986]

In the second, revised version of the PDD, this provision was entirely deleted. Therefore, nothing related to TOT was mentioned. In addition, Section A.4.3 was not

[982] ibid.
[983] ibid.
[984] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company on 23 November 2016.
[985] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company on 23 November 2016.
[986] ICC, ICC International Technology Transfer Contract (ICC Publication No.674 2009) 9–10

filled in, as per the Guidelines of Completing the Project Designed Document. The title of this section shall be 'Technology that shall be employed by this project' but instead Section A.4.3 is titled 'Estimated amount of emission reductions over the chosen crediting period' in the second version of the PDD.[987] Hence, this section concerns the data and calculations used to determine the GHG reductions in order to make sure that such calculations and provided data are realistic. A table with regard to the annual estimates of GHG emission reductions during the crediting period, which is for seven years, was mentioned under this section.[988]

This shows how the PDD is not an important document for fostering TOT and how it is managed under the UNFCCC. The UNFCCC approach is to ensure that the PDD, validation and monitoring reports clearly address how the GHG emission reduction is calculated and to ensure that it is realistic and feasible. In contrast, no such assurances are available for TOT. So, ultimately, the climate change regime under the UNFCCC and subsequent agreements and protocols do not create anything more than what the TRIPS provides. The same criticism is repeated here that the provisions related to TOT is still very soft and wide open. There is still no agreement on what constitutes TOT and what the transfer we are seeking to foster actually is.

In addition, the officials working on this project confirmed during interviews that the project would not result in independence: when the UAE requires another solar plant,

[987] UNFCCC/CCNUCC, 'Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM)' (UNFCCC, n.d) <https://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04.pdf> accessed 23 September 2016.
[988] UNFCCC, 'Clean Development Mechanism for Project Design Document Form (CDM-SSC-PDD) for 10MW Photovoltaic Plant in Dubai, UAE' (UNFCCC, 03/08/2012) <https://cdm.unfccc.int/filestorage/p/c/825SEGKICOX9BVMYQ7NAD6PFR1L0J3.pdf/PDD-10MW%20Photovoltaic%20Solar%20Plant.pdf?t=ZDB8b2UwcGR0fDAa6Z853VCaDhBNJfch6zda> accessed 23 September 2016.

it will depend on technology providers. So they will not be able to reuse, resell and reproduce solar plant technology independently.[989]

7.4 Main barriers in transfer of ESTs to UAE under the CDM

There are some basic barriers to TOT under the CDM mechanism, as noted in the UAE projects that have been submitted for registration as CDM projects. Barriers that are particularly related to TOT provisions in each of those projects are as follows:

7.4.1 Lack of legal and technical expertise

As noted by the total number of projects that have been submitted for registration as CDM projects, the UAE, as a host country, submitted a large number of EST projects. This reflects the importance given to these types of environmentally friendly projects for the future of the UAE as a developing country that seeks more economic and social development.

Nevertheless, relatively few of those projects addressed TOT. A first impression is that the UAE is not considering TOT in its policies and strategies, as mentioned above. The basic reason for this is the lack of technical and legal expertise in the field of TOT. The main concern is with the adoption of new technologies depending on foreign expertise through a sale agreement of technologies.[990]

Therefore, more effort should be made to develop contractual provisions that address how TOT can be promoted in practice, what type of license is needed, and how the TOT agreement shall be drafted and agreed upon with the supplier. More

[989] Interview with Benjamin Thompson, Head of Corporate Communication, Masdar: Amubadala Company on 23 November 2016.
[990] See Chapter 2 p.62.

work needs to be done on creating general understanding about how to address the TOT in each individual project. There needs to be a move from the general rigid rules and recommendations of TOT in the TRIPS and UNFCCC and the latter subsequent agreements and protocols to the development of assurances for the promotion of TOT to the host country.

This requires working on the developing technical and legal skills of the developing country's local personnel that work in the field of TOT. This will help take advantage of the opportunity to transfer ESTs to a developing country.

7.4.2 Defining TOT

There is a lack of understanding about the concept of TOT. The general trend is that it is technology diffusion or a basic level of transfer. We repeat here that any transfer that does not lead to the absorption of technology in the host country's internal systems and conditions in a way that allows this country to reuse, resell and reproduce the same technology independently from the supplier will not be considered to be TOT.

7.4.3 Absence of TOT agreements or TOT license agreements

We noted in all the projects that include some provisions related to TOT that those provisions are mentioned within the entire contract terms and conditions. This has added to the level of uncertainty with regard to what type of TOT is meant. As we are well aware, dealing with TOT as a global package or a total system requires an independent agreement regarding the license type, contents of TOT in more detail and the outcome of such transfer.

Due to the complexity of TOT, an independent TOT agreement attached to the main contract, with the partner, is very important. As a result, this agreement will avoid any ambiguity and misunderstanding because under such TOT agreement, the transferee will have a clear, straightforward understanding of what shall be obtained from the transferor as well as the limits and the objective of such a transfer.[991]

7.4.4 Contents of TOT

In order to differentiate TOT from technology diffusion, the contents of TOT need to be clear and well known to all technical and legal experts in the field of TOT in each project. We noted that there is confusion between TOT and technology diffusion. When talking about TOT, it is often technology diffusion that is addressed, which is far from what we are evaluating in these case study chapters.

7.4.5 Absence of technical needs assessment (TNA)

One of the important components of TOT framework under the UNFCCC is 'Technology needs and needs assessments'.[992] Unfortunately, the UAE, similar to Kuwait, did not start conducting technology needs assessments (TNAs) to identify the technology needs in the UAE, according to the local market and local conditions of the country. However, such a TNA would assist the UAE, as a host country, in understanding what sorts of technical barriers it may face when making any transfer of new technologies to its internal market.[993]

[991] ICC, ICC International Technology Transfer Contract (ICC Publication No.674 2009) 9–10
[992] EGTT, 'Expert Group on Technology Transfer: Five Years of Work' [2007] UNFCCC.
[993] ibid.

7.5 General findings related to transferring technology under the CDM in the UAE

First, the UAE does not have TOT as an objective in its strategies and policies, as we clarified above. All plans and strategies are related to climate change, environment protection and sustainable development.

Second, the CDM as a tool for reducing GHG emissions does not foster any TOT. It is left entirely to the sole agreement between IP holder and host country. As we noted in some of the projects under review in the UAE, there was no supervision from the UNFCCC with regard to completing Section A.4.3 of the PDD. Section A.4.3 is the main part for incorporating TOT provisions. Instead, most of the time, irrelevant information regarding the GHG emissions reduction was given. We repeat the need for another tool that really supervises and provides the proper guidelines and advice for TOT.

Third, the CDM does not provide proper guidelines to host countries with regard to how to draft TOT provisions in the PDD. This is why the UNFCCC contributed indirectly to this lack of TOT information in the PDD, which acts as a barrier to implementation. In particular, personnel in the host country who work on completing the CDM process lack sufficient information about this new mechanism, its objectives and its relation to TOT.

Lack of information should be solved through improving the understanding in developing countries of how to facilitate the flow of information between the different stakeholders,[994] thereby facilitating TOT to the developing country as a total system or a global package.

[994] ibid.

In conclusion, because of the above-mentioned barriers and findings, we find that the CDM was not successful in bringing TOT to the UAE as a developing country and a party to the UNFCCC. We will summarize these findings in Chapter 9.

Chapter 8

Case Study on International Transfer of ESTs in Jordan

Jordan is a developing country cited in the list of Non-Annex I Parties of the UNFCCC, as clarified in Chapter 5.[995] Jordan is obliged to mitigate and adapt to the threat of climate change as per the UNFCCC and all subsequent protocols and agreements. The country faces financial difficulties; however, it has set out strategies for more economic development in all fields. Jordan lacks oil and gas resources, so developing the industry of renewable technology is the most appropriate alternative solution for energy.[996] Therefore, Jordan is in need of technical expertise, technology and know-how from developed countries to enhance EST projects.[997]

8.1 Background about Jordan, in Particular the EST Industry in Jordan

Jordan protects the industrial property through a number of laws and regulations. First, the basic law that provides the protection, requirement and process for inventions and patents is Law No.32 of 1999 on Patents. This law was amended in order to comply with the international treaties and conventions, the amendments are as follow:[998]

A. Temporary Law No.71 of 2001 Amending the Patent Law.

B. Law No.28 of 2007 Amending the Patents Law.

Second, the protection of geographical indications is regulated by Law No.8 of 2000 on Geographical Indications. Third, the protection of layout-designs of integrated circuits is regulated by Law No.10 of 2000 on the Protection of Layout-

[995] See Chapter 5 p.220.
[996] PWC, 'Developing renewable energy projects: A guide to achieving success in the Middle East' [January 2016] Third Edition(n.d) Eversheds <https://www.pwc.com/m1/en/publications/documents/eversheds-pwc-developing-renewable-energy-projects.pdf> accessed 7 August 2016.
[997] Richard Probst, 'A Guide to Energy in Egypt and Jordan: Current Situation and Future Potentials' [2016] n.d (n.d) FriedrichEbertStiftung Jordan & Iraq <http://library.fes.de/pdf-files/bueros/amman/12534.pdf> accessed 9 August 2016.
[998] Wipo, 'Jordan: IP Laws and Treaties' (*WIPO Lex*, n.d) <http://www.wipo.int/wipolex/en/profile.jsp?code=JO> accessed 27 October 2017

Designs of Integrated Circuits. Fourth, the protection of industrial designs is regulated by Law No.14 of 2000 on Industrial Designs and Models. [999]

Jordan signed the UNFCCC on 11 June 1992, ratified the UNFCCC on 12 November 1993[1000] and the Kyoto Protocol on 17 January 2003,[1001] and signed the recent Paris Agreement on 22 April 2016.[1002] Accordingly, Jordan should comply with its international obligations to reduce GHG emissions and to mitigate climate change, and thereby contribute to sustainable development.

In fact, it is important to highlight that Jordan adopted a huge number of international treaties, and conventions related to IP protection in comparison with the adopted by Kuwait and UAE. For instance; Jordan signed with USA the Free Trade Agreement with USA on 24th October 2000 and the Free Trade Area between USA and Jordan on 17th December 2001.[1003]

Therefore, Jordan started effectively to fulfil and comply with its international commitments. In order to achieve its commitments under the climate change regime, it has worked harder on improving its human, organizational, institutional and financial resources to develop the required EST projects. It has also focused on how

[999] Wipo, 'Jordan: IP Laws and Treaties' (*WIPO Lex*, n.d) <http://www.wipo.int/wipolex/en/profile.jsp?code=JO> accessed 27 October 2017

[1000] UNFCCC, 'Jordan' (UNFCCC, n.d) <http://unfccc.int/tools_xml/country_JO.html> accessed 12 July 2016.

[1001] UNFCCC, 'Status of Ratification of the Kyoto Protocol' (UNFCCC, n.d) <http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php> accessed 12 July 2016.

[1002] United Nations Treaty Collection, 'Status of Treaties: Paris Agreement' (United Nations Treaty Collection (UNTC), n.d) <https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&lang=en> accessed 12 July 2016.

[1003] The Agreement between USA and Jordan on the Establishment of Free Trade Area, adopted on 24th October 2001. See also: Ustr, 'Jordan FTA' (*USTR*, n.d) <https://ustr.gov/trade-agreements/free-trade-agreements/jordan-fta/final-text> accessed 27 October 2017

to implement the required actions on a permanent basis that will lead in the end to a real sustainable development.[1004]

At the beginning, it is important to highlight that Jordan's position with regard to EST differs from that of Kuwait and the UAE because of its economy and GDP. Jordan depends heavily on imports of crude oil and natural gas from neighbouring Gulf Cooperation Council (GCC) countries. Therefore, it needs to improve energy sources through ESTs. Jordan is considered a low- to middle-income country, and had an approximate average income of 448 JD per month in 2012.[1005]

Jordan suffers from a lack of oil and gas resources and also a lack of natural resources including water, fossil fuels and other commercial minerals. In addition, economic growth has accelerated in Jordan in recent years, and this has resulted in an increase in energy demand in the country in all its forms.[1006]

All of these factors affect the Jordanian economy and put Jordan under pressure to promote more EST industry due to the urgency of the need for alternative sources of energy.

8.1.1 Context and Key Drivers in Jordan

Basically, Jordan relies on imports to satisfy more than 96% of its energy needs because it does not have an oil and gas industry of its own. As of 2015, Jordan had a power generation capacity of 4,300 MW. This also runs at full load during both the

[1004] Government of Jordan, 'National Environmental and Economic Development Study for Climate Change: Submitted to the United Nations Framework Convention on Climate Change' [May 2012] n.d (n.d) Jordan National Report <https://unfccc.int/files/adaptation/application/pdf/jordanneeds.pdf > accessed 15 August 2016.
[1005] Richard Probst, 'A Guide to Energy in Egypt and Jordan: Current Situation and Future Potentials' [2016] n.d (n.d) FriedrichEbertStiftung Jordan & Iraq <http://library.fes.de/pdf-files/bueros/amman/12534.pdf> accessed 9 August 2016.
[1006] ibid.

summer months and in winter peaks. A growth of 7% in peak power has been registered over the past five years, although some spikes of around 15% were registered in some years.[1007] In addition, the current global depression in oil prices has impacted Jordan.

This is the reason why Jordan is working heavily on the renewable energy sector in order to strengthen alternative sources of energy to meet local needs in a sustainable manner. Accordingly, Jordan has the greatest incentive in the Middle East region to work on developing renewable energy sources, especially after the political and security unrest in the Middle Eastern region in general and its neighbouring countries' political situation in particular.[1008]

Consequently, Jordan has set out a strategy aimed at reducing its fuel imports and generating around 30% of its electricity production from renewable resources by 2020.[1009]

8.1.2 Market Readiness of Jordan

Jordan has started taking serious steps to develop its renewable energy industry. First, it has enacted laws and regulations that encourage the promotion of the EST industry in the country. Second, it has sought external funding because of its financial situation.[1010]

[1007] PWC, 'Developing renewable energy projects: A guide to achieving success in the Middle East' [January 2016] Third Edition(n.d) Eversheds <https://www.pwc.com/m1/en/publications/documents/eversheds-pwc-developing-renewable-energy-projects.pdf> accessed 7 August 2016.
[1008] ibid.
[1009] ibid.
[1010] ibid.

With regard to the first step, Jordan started drawing up a legal framework for the EST industry in the country. It enacted the Renewable Energy and Efficiency Law (REEL) in April 2012. REEL proposes a regime for private companies to negotiate directly with the Ministry of Energy and Mineral Resources (MEMR) for the award of EST projects. In addition, it exempted all EST projects from customs duties and sales tax, which is a primary step in creating an attractive environment for foreign investment.[1011]

REEL imposes on the National Electric Power Company (NEPCO) and on the regional distribution companies an obligation to start purchasing the electricity generated by EST projects and to pay for the grid connection. This is obligatory by law. It is an effective method to ensure that the country hosting ESTs can absorb such technology, and then create a market for such new projects. This also reflects how the government can support sustainable development.[1012]

In addition, in December 2012 Jordan launched the first 'Feed-in tariffs' system in the Middle East, undertaken by the Energy and Minerals Regulatory Commission (EMRC) for net metering to reduce energy demand and allow for the sale of surplus energy generated back to the national grid.[1013] Moreover, Jordan has submitted its Programme of Activities (PoA) to the UNFCCC, which will, if registered, assist the future of the EST industry in Jordan, as we will explain later.

Thus, we note that Jordan has worked on establishing most of the prerequisites that will ensure the success of TOT. One of those prerequisites that provide assurances for a successful TOT is to ensure that the market can absorb such new

[1011] ibid.
[1012] ibid.
[1013] ibid.

technology.[1014] In addition, Jordan created a legal framework for this new type of industry and has set out its strategy for ESTs.

Jordan carried out a clear assessment of its capabilities, identified the challenges that it may face in its objective to promote a renewable energy industry, and has also identified the measures needed to deal with these challenges. Then, Jordan found out that it stands at a critical juncture. On the one hand, it has accumulated a wealth of knowledge and expertise in the climate regime, so it may not face problems related to the lack of information and the lack of personnel expertise. On the other hand, the implementation of its strategies and achievement of its objectives has been slow partially because of challenges related to the lack of financial resources and technical capacity.[1015]

A lack of financial resources is one of the main barriers in Jordan. In this regard, Jordan may benefit from the Renewable and Energy Efficiency Fund. This was launched in 2010 by the Ministry of Energy and Mineral Resources to ensure financing for Jordan from the Gulf Cooperation Council (GCC)'s donation for EST projects. In addition, Jordan can benefit from the EU-funded renewable energy and energy efficiency demonstration projects that were launched in 2015, and are worth €6 million. So it is an opportunity also for Jordan to utilize such funding in EST projects.[1016]

[1014] Committee to evaluate transfer of pollution prevention technology for the US army board on manufacturing and engineering design, division on engineering and physical sciences, Transfer of Pollution Prevention Technologies (National Academies Press 2002) 13.
[1015] Government of Jordan, 'National Environmental and Economic Development Study for Climate Change: Submitted to the United Nations Framework Convention on Climate Change' [May 2012] n.d (n.d) Jordan National Report <https://unfccc.int/files/adaptation/application/pdf/jordanneeds.pdf > accessed 15 August 2016.
[1016] PWC, 'Developing renewable energy projects: A guide to achieving success in the Middle East' [January 2016] Third Edition(n.d) Eversheds

Also Jordan, with the financial support of the UNFCCC, has initiated 'A National Economic and Environmental Development Study (NEEDS)' for mitigating and adapting to the threat of climate change. So, as a developing country, Jordan has clearly identified through NEEDS its problems and challenges and works for the most appropriate solutions.[1017]

We did not find such assessments in the previous two case studies. In fact, both Kuwait and the UAE depended on their income to initiate their EST industry. So their main objective is to comply with the international commitments as per the recent Paris agreement. They set out strategies to generate around 15% of energy from renewable resources by 2030. They take the commitments as they are without looking at how to best benefit from CDM projects in the technology field.[1018] That is why we concluded in both the case studies of Kuwait and the UAE that there was a lack of informational and personnel expertise in TOT field in both countries. [1019]

NEEDS, which has been adopted in Jordan, has assisted the country in the following ways:

1. by selecting which key sectors require mitigation and adaptation measures, in addition to prioritizing them as per the national communications and development plans;

2. by making a clear straightforward assessment of financial costs for the implementation of mitigation and adaptation measures in key sectors, in addition to

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<https://www.pwc.com/m1/en/publications/documents/eversheds-pwc-developing-renewable-energy-projects.pdf> accessed 7 August 2016.

[1017] Government of Jordan, 'National Environmental and Economic Development Study for Climate Change: Submitted to the United Nations Framework Convention on Climate Change' [May 2012] n.d (n.d) Jordan National Report <https://unfccc.int/files/adaptation/application/pdf/jordanneeds.pdf > accessed 15 August 2016.

[1018] See Chapter 6, p.266 and Chapter 7, p.299.

[1019] See Chapter 6, p.266 and Chapter 7, p.299.

identifying appropriate financial and regulatory instruments to support these measures; and

3. by improving national awareness among governmental agencies in order to facilitate the policy actions required to mobilize finance and investment in mitigation and adaptation measures.[1020]

In sum, there are a number of solutions that can benefit Jordan and help it to solve its financial difficulties. Nevertheless, in this case study we will not focus on those financial difficulties when analysing the EST projects submitted for registration as CDM projects. Our main concern is to explore challenges related to CDM as a tool for improving the technical capacity in the host country under TOT.

8.1.3 Technical Assessment Analysis and Studies in Jordan

Jordan established, as a first step, the National Energy Research Centre (NERC) in 1998, as a part of the Royal Scientific Society (RSS). NERC aims to undertake scientific research and development activities that work mainly for promoting the international transfer of new and renewable energy technologies, and then encourage the rational use of energy. NERC also deals with international, regional and local institutions in the EST field.[1021]

In addition, NERC established a national information database to provide the necessary information for decision-makers and researchers.[1022] NERC works towards managing and operating laboratories, units, and research and experimental

[1020] Government of Jordan, 'National Environmental and Economic Development Study for Climate Change: Submitted to the United Nations Framework Convention on Climate Change' [May 2012] n.d (n.d) Jordan National Report <https://unfccc.int/files/adaptation/application/pdf/jordanneeds.pdf > accessed 15 August 2016.

[1021] ibid.

[1022] NERC, 'About National Energy Research Center' (National Energy Research Centre (NERC), n.d) <http://www.nerc.gov.jo> accessed 11 August 2016.

stations for developing new technologies and carries out training courses, workshops and seminars.[1023]

As a second step, Jordan has adopted four Technical Needs Assessments (TNAs) in the first round of TNAs. The TNA projects have helped Jordan, as a developing country, to determine its technology priorities for the mitigation or adaptation of GHG emission measures. The TNAs are implemented by the United Nations Environment Programme (UNEP) and the UNEP DTU Partnership on behalf of the Global Environment Facility.[1024]

In sum, Jordan has taken important steps toward overcoming most of the common challenges in transferring technology through the CDM. All these studies and assessments will help the move forward towards more effective implementation. This will be reviewed in more detail through studying some of the EST projects in Jordan that have been submitted for registration as CDM projects.

8.2 An overview of CDM Projects in Jordan

There have been five projects submitted by the Government of Jordan for registration as CDM projects under the UNFCCC. In addition to two submitted Programme of Activities (PoA), which will be explained in more detail in this section, it includes a number of EST projects as well.

The first project is the 'Fuel Switching Project of the Aqaba Thermal Power Station (ATPS)', which is a thermal-type power station with a total capacity of 650 MW consisting of 5,130 MW discrete units, each with a capacity of five 130 MW units.

[1023] ibid.

[1024] Technology executive mechanism (tec), 'Good Practices of Technology Needs Assessments' (UNFCCC , 6 October 2015) <http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/ff2506265909481299786ef1e703bb99/01e45b9f64524bdda2185b65b04542fb.pdf> accessed 18 January 2017.

ATPS is the largest power plant in Jordan. The project will reduce GHG emissions by reducing CO_2 emissions through the process of switching from a more carbon-intensive baseline fuel (HFO) to a less carbon-intensive project fuel (NG). The project is estimated to reduce an average annual amount of 397,163 tonnes of carbon dioxide equivalent (tCO_2e) per year over a 10-year crediting period.[1025] The project does not include any TOT provisions. Nevertheless, training employees in the operation and maintenance of the plant is covered.[1026]

The second project is the 'Reduction of Methane Emissions from Ruseifeh Landfill'. This project seeks to maintain, expand and improve the landfill gas collection systems and electricity generation facilities that are operated by the Jordan Biogas Company (JBC) at Ruseifeh landfill, near Amman in Jordan. This project includes well-structured provisions for TOT. Therefore, this will be one of the projects that we will focus on in a more detailed analysis. In addition, the project is considered a key one with regard to the deployment of ESTs for the purpose of promoting sustainable development in the region.[1027]

The third project is the 'Samra 300 MW Combined Cycle Project'. It is a combined cycle power plant that has a total installed capacity of 300 MW. This project is

[1025] The crediting period for a CDM project activity means: 'the period for which reductions from the baseline are verified and certified by a designated operational entity for the purpose of issuance of CERs , see:, CDM rule book, 'Crediting Period (P)' (CDM RuleBook: Clean Development Mechanism Rules, Practice and Procedures, n.d) <http://www.cdmrulebook.org/310.html> accessed 18 January 2017; see also: UNFCCC, 'Clean Development Mechanism Project Design Form (CDM-PDD) for the Fuel Switching Project of the Aqaba Thermal Power Station (ATPS)' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/8/S/D/8SDN69EO2HMG4LRCPTA7UYXV150WIK/Revised%20PDD%20version%206.pdf?t=SjV8b2JxbXhqfDCGd9LQfEytDLu_ysB8Kyvg> accessed 11 August 2016.

[1026] UNFCCC, 'Validation Report for Fuel Switching Project of the Aqaba Thermal Power Station (ATPS)' [2008] 1005 IN01(3) EcoSecurities Group Plc (SGS) 1–52.

[1027] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/1/A/H/1AHIME9FCT0SLQ43O5VNYUGXK26PJ8/PDD.pdf?t=c1l8b2MzaDNhfDBqEnzmcgKxpfHHfdbYWxB8> accessed 9 August 2016.

basically aimed at facing the increasing demand for power and energy since it is estimated that there will be a 6% annual increase in the power demand in Jordan. This project includes TOT to Jordan as a host country.[1028] So we will focus on this project as well.

The fourth project is the 'Amman Ghabawi Landfill Gas to Energy Project'. This project will reduce GHG emissions from Ghabawi landfill through the extraction of landfill gas and the utilization of the methane for energy supply purposes. In addition, using landfill gas will displace electricity from the national grid, which depends on fossil-fuel power plants. This project does not include any provision related to TOT.[1029]

The fifth project is the 'Amman East 386.96 MW Combined Cycle Power Plant' in Al-Manakher Village in Amman in Jordan. It is promoted by the National Electric Power Company (NEPCO) and was awarded through a competitive tender to AES Jordan, which is a joint venture of AES and Mitsui to construct, operate and own a new natural gas-fired grid-connected power plant (this is a so-called 'BOT' contract).[1030]

Until now, only two out of all the EST projects that Jordan registered as CDM projects have fulfilled the registration process. These are the Fuel Switching Project

[1028] ibid.
[1029] UNFCCC, 'Clean Development Mechanism: Project Design Document Form (CDM-PDD) for Amman Ghabawi Landfill Gas to Energy Project' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/Z/2/A/Z2AOG0I65SB71VNPEQRJW934CTX8HM/PDD.pdf?t=YlV8b2M0aGN1fDCjVl67vYBR-CS5t_U4BPZM> accessed 6 August 2016.
[1030] UNFCCC, 'Clean Development Mechanism: Project Design Document Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=dkd8b2M0aHZifDAQB4HfRXgggiBHvNmV6kr7> accessed 7 August 2016.

of the Aqaba Thermal Power Station and the Reduction of Methane Emissions from Ruseifeh Landfill. The remaining projects are still under validation.[1031]

So far, this concerns the projects submitted for registration as CDM projects under the UNFCCC. On the other hand, Jordan submitted two Programmes of Activities (PoA) for registration under the UNFCCC. The first PoA is the Demand-Side Energy Efficiency for Water Pumping Stations, while the second is the CDM City-Wide Programme of Activities of the Greater Amman Municipality including energy, transportation, waste and urban forestry. Later, registering those PoAs will save time and effort by following the same process for each CDM project registration cycle as per the UNFCCC procedures and this surely will be beneficial for Jordan.[1032]

The PoA is a method for validating and registering a policy, measure or goal that leads to the reduction of GHG emissions in Jordan. It is a total programme that includes a number of EST projects under its framework.[1033] The benefit of the PoA is to make the registration process for each EST project easier, since after registering a PoA, an unlimited number of component project activities (CPAs) can be added without undergoing the complete CDM project cycle.[1034] Therefore, the PoA acts like a prior registration process taken as a whole instead of starting the registration process for each EST project individually.[1035]

[1031] RCREEE, 'Regional Centre for Regional Energy and Energy Efficiency (RCREEE)' [February 2012] n.d (n.d) CDM in RCREEE Member States: Experience and Achievements <http://www.rcreee.org/sites/default/files/rcreee_rs_cdminrcreeememberstates_12_en_0.pdf> accessed 2 August 2016.
[1032] UNFCCC, 'CDM Programmes of Activities' (UNFCCC, n.d) <https://cdm.unfccc.int/ProgrammeOfActivities/index.html> accessed 11 August 2016.
[1033] ibid.
[1034] UNFCCC, 'Programme of Activities (PoA)' (CDM Training Workshop , Liberia, 23-24 September 2013) <https://cdm.unfccc.int/stakeholder/rcc/workshops/lome/04.pdf> accessed 18 January 2017.
[1035] UNFCCC, 'CDM Programmes of Activities' (UNFCCC, n.d) <https://cdm.unfccc.int/ProgrammeOfActivities/index.html> accessed 11 August 2016.

In fact, this programmatic approach in Jordan will lead to many benefits and will reduce transaction costs and investment risks. In addition, it will remove some uncertainties for individual CPA participants. Also, the PoA will speed up the approval process, as mentioned earlier.[1036] If a PoA is registered it will not be required to request direct engagement of individual project developers in the CDM process, so the cycle will take less time and process will be shorter. Also, the emission reductions can be continuously scaled up without requiring more stages to be taken.[1037]

The PoA assists the developing country in achieving the co-benefits approach under the UNFCCC. It is 'a win-win strategy aimed at capturing both development and climate benefits in a single policy or measure'.[1038] In fact, the climate co-benefits term refers to the benefits of the global climate change for development plans and sectoral policies and measures along with mitigating and adapting to the climate change threat. So it is a response to developing countries' belief that CDM will work by benefiting the developed countries only. Hence, the co-benefits approach focuses on both development and mitigating and adapting to climate change as well.[1039]

Accordingly, many types of technologies with high co-benefits are supported by the PoA process. Also, no registration fee is required for any CPA included after registration. Registration fees are based on the expected average emission reductions of the 'actual case' CPAs submitted at the PoA registration.[1040]

[1036] ibid.
[1037] ibid.
[1038] Akiko Miyatsuka and Eric Zusman, 'What are Co-benefits?' [n.d] 1(1) Asian Co-Benefit Partnership (ACP) Fact Sheet <https://pub.iges.or.jp/system/files/publication_documents/pub/nonpeer/2393/acp_factsheet_1_what_co-benefits.pdf> accessed 18 January 2017.
[1039] ibid.
[1040] UNFCCC, 'CDM Programmes of Activities' (UNFCCC, n.d) <https://cdm.unfccc.int/ProgrammeOfActivities/index.html> accessed 11 August 2016.

8.3 Projects in Focus

8.3.1 Reduction of Methane Emissions from Ruseifeh Landfill

j) Project objective and description

This project was registered on 11 December 2009 as CDM Project No. 2487, titled 'Reduction of Methane Emissions from Ruseifeh Landfill'.[1041] It is a large-scale project that falls under the scope of waste handling and disposal. The methodology used for this project is a consolidated baseline and monitoring methodology for landfill gas project activities.[1042]

The project relates to maintaining, expanding and improving the landfill gas collection systems and electricity generation facilities operated by the Jordan Biogas Company (JBC) at Ruseifeh landfill in Jordan. The Ruseifeh landfill was opened in 1989 and closed in 2003 because of the impacts of GHG emissions on people. [1043]
The Ruseifeh landfill is a landmark in the deployment of ESTs and in promoting sustainable development. It was the first landfill in Jordan where landfill gas technology was piloted and the first one to be developed as a CDM. The project activity reduces GHG emissions by 'enabling the continued and improved collection and destruction of methane by an additional 84 wells which would otherwise be released into the atmosphere'.[1044]

[1041] UNFCCC, 'Project 2487: Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, n.d) <https://cdm.unfccc.int/Projects/DB/TUEV-SUED1239267670.4/view> accessed 20 January 2017.
[1042] ibid.
[1043] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/1/A/H/1AHIME9FCT0SLQ43O5VNYUGXK26PJ8/PDD.pdf?t=c1l8b2MzaDNhfDBqEnzmcgKxpfHHfdbYWxB8> accessed 9 August 2016.
[1044] ibid.

Also, it improves the supply of electricity generated from renewable sources to the power grid of Jordan as it displaces fossil fuel–based generation. It was estimated, as per the project summary, to reduce emissions of GHGs by approximately 36, 911 tonnes of carbon dioxide equivalents (tCO_2e) per year on average between 2009 and 2012. Prior to the implementation of the project, the methane used to be released into the atmosphere.[1045]

k) Type of technology employed under the project

The technology employed in this project is related to maintenance, expansion by 84 wells, in addition to the improvement of landfill gas collection systems and electricity generation facilities at the Ruseifeh landfill. It is a patented technology that is owned by Finland, as represented by its Ministry of Foreign Affairs. [1046]

The technology employed in this project is considered environmentally safe (EST) as per the validation report on 25 September 2009. The environmental impacts of landfill gas capture and utilization activities were considered at the beginning of the demonstration phase under the feasibility study by the UNDP. The Government of Jordan had accepted the feasibility study done by the UNDP. [1047]

Thus, the project will result in the continuation, expansion and improvement of landfill gas capture, flaring and energy use activities, in addition to maintaining and

[1045] ibid.
[1046] ibid.
[1047] UNFCCC, 'Validation Report Jordan Biogas Company VALIDATION OF THE CDM-PROJECT: "Reduction of Methane Emissions from Ruseifeh Landfill" in Amman, Jordan: REPORT NO 1129133' (UNFCCC Validation, 25 September 2009) <https://cdm.unfccc.int/filestorage/L/O/5/LO5R06TV3KN2Y4QAMEWJGDPHXC7Z9B/Validation%20Report.pdf?t=QnF8b2swbzM1fDD37K16iQMO1W2oITduOKdV> accessed 18 January 2017.

enhancing local environmental benefits like: odour control and the reduction of toxic leakage to groundwater. At the same time, the project will not result in any negative environmental impacts.[1048]

l) Parties

The project partners are the Jordan Biogas Company (JBC) and the Ministry of Foreign Affairs of Finland.[1049] JBC is representing the host country in this project, which is a developing country from Non-Annex I Parties[1050] The Ministry of Foreign Affairs of Finland represents Finland as a developed country from the Annex I Parties.[1051]

m) TOT and IP in the project

This project includes TOT and know-how related to the deployment and appropriate use of EST in Jordan, in addition to the support for capacity building and wider deployment of this technology in the region by Jordan. The transfer will be done by the Finnish representative in the Ministry of Foreign Affairs (the transferor) to the Jordanian representative at JBC (transferee).[1052]

Section A.4.3 of the PDD is well-written in this project, in comparison to those in the case studies of Kuwait and the UAE. It specifies all information related to the technology employed and identifies TOT provisions clearly. The technology

[1048] ibid.
[1049] ibid.
[1050] See Chapter 5 p.222.
[1051] UNFCCC, 'List of Annex I Parties to the Convention' (Annex I, n.d) <http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php> accessed 18 January 2017.
[1052] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/1/A/H/1AHIME9FCT0SLQ43O5VNYUGXK26PJ8/PDD.pdf?t=c1l8b2MzaDNhfDBqEnzmcgKxpfHHfdbYWxB8> accessed 8 December 2016.

employed under this project is the first of its kind in the region that has been transferred under this project to Jordan as a developing country.[1053]

Jordan as a host country under Section A.4.3 has followed the guidelines for completing this section. First, it states that the project includes TOT under this section. Second, the contents of this transfer were mentioned as the transferor has to transfer technology and know-how relating to the deployment and appropriate use of EST under this project. Third, the objective of this transfer is clearly shown under this section. It states that the transfer will lead to supporting the building capacity and widening the deployment of the technology in the region. Therefore, the host country as a transferee will be able to use all IP and patent rights with regard to this technology and can depend on this technology as a resource for further development in the region.[1054]

These findings were explored in the Validation Report dated 25 September 2009. It confirmed the fact that the project includes TOT to the host country. Also, it specifies the contents of the technology to be transferred. It includes a transfer of the patented design, know-how expertise regarding the landfill gas (LFG) capture and the utilization of the LFG. All of these will be transferred to Jordan from Finland through the European Community countries.[1055]

[1053] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/1/A/H/1AHIME9FCT0SLQ43O5VNYUGXK26PJ8/PDD.pdf?t=c1l8b2MzaDNhfDBqEnzmcgKxpfHHfdbYWxB8> accessed 8 December 2016.

[1054] ibid.

[1055] UNFCCC, 'Validation Report Jordan Biogas Company VALIDATION OF THE CDM-PROJECT: "Reduction of Methane Emissions from Ruseifeh Landfill" in Amman, Jordan: REPORT NO 1129133' (UNFCCC Validation, 25 September 2009) <https://cdm.unfccc.int/filestorage/L/O/5/LO5R06TV3KN2Y4QAMEWJGDPHXC7Z9B/Validation%20Report.pdf?t=QnF8b2swbzM1fDD37K16iQMO1W2oITduOKdV> accessed 18 January 2017.

Also, the agreement signed between parties included TOT provisions to the host country. As per the terms and conditions of the agreement, parties had signed a TOT licence to implement such a transfer and identify elements of the transfer, the rights of both parties and limitations of the transfer. [1056]

A number of good practices are found here in this project. Jordan as a developing country is aware of how best to benefit from the CDM as a tool for transferring technology. The way TOT is drafted in both the PDD and the contract represents the level of understanding and knowledge of the objective of the CDM.

For example, in the previous two case studies, the way TOT was mentioned was broad and misleading. In addition, the ability to absorb the new technology by the host country and reuse, resell and reproduce the same technology independently of the transferor was missing under Section A.4.3.

The Ministry for Foreign Affairs of Finland and JBC had signed, in September 2007, an Emission Reductions Purchase Agreement (ERPA) for the sale and purchase of CERs generated by the project.[1057] Five CER issuance requests were submitted under this project. Four CER requests were issued and the fifth is still in the process of being issued.[1058] The Ministry for Foreign Affairs of Finland purchases and

[1056] UNFCCC, 'Validation Report Jordan Biogas Company VALIDATION OF THE CDM-PROJECT: "Reduction of Methane Emissions from Ruseifeh Landfill" in Amman, Jordan: REPORT NO 1129133' (UNFCCC Validation, 25 September 2009) <https://cdm.unfccc.int/filestorage/L/O/5/LO5R06TV3KN2Y4QAMEWJGDPHXC7Z9B/Validation%20Report.pdf?t=QnF8b2swbzM1fDD37K16iQMO1W2oITduOKdV> accessed 18 January 2017.

[1057] UNFCCC, 'Validation Report Jordan Biogas Company VALIDATION OF THE CDM-PROJECT: "Reduction of Methane Emissions from Ruseifeh Landfill" in Amman, Jordan: REPORT NO 1129133' (UNFCCC Validation, 25 September 2009) <https://cdm.unfccc.int/filestorage/L/O/5/LO5R06TV3KN2Y4QAMEWJGDPHXC7Z9B/Validation%20Report.pdf?t=QnF8b2swbzM1fDD37K16iQMO1W2oITduOKdV> accessed 18 January 2017.

[1058] UNFCCC, 'Project 2487: Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC , n.d) <https://cdm.unfccc.int/Projects/DB/TUEV-SUED1239267670.4/view> accessed 20 January 2017.

transfers the CERs generated by this project under the Kyoto Protocol's Clean Development Mechanism (CDM).[1059]

According to this agreement, Finland purchased 362,709 CERs generated by the project over the period 2008–2012. Hence, Finland intends to use these CERs to meet its Kyoto target of stabilizing its national emissions of GHGs to the 1990 level during the first commitment period.[1060]

In sum, we noted a successful TOT under this project to the host country. So the project as a CDM project has achieved its objective on a win-win basis. Finland as a host country gained the CERs and Jordan as a developing country gained the technology employed under this project.

8.3.2 Samra 300 MW Combined Cycle Project

n) Project objective and description

This project is a large-scale project registered as a CDM project under Project No. 4958 titled 'Samra 300 MW Combined Cycle Project' on 20 September 2011. It is related to the scope of energy industries (renewable/non-renewable sources).[1061] The project is expected to have an operational lifetime of 23 years. The crediting period for this project is seven years.[1062]

[1059] Energy enviro world, 'Finland buys emission reductions from a landfill gas project in Jordan' (Energy Enviro World, 27 September 2007) <http://www.energy-enviro.com/demo47/index.php?PAGE=1077&NODE_ID=1077&LANG=1> accessed 20 January 2017.
[1060] ibid.
[1061] UNFCCC, 'Project 4958: Samra 300 MW Combined Cycle Project' (UNFCCC, n.d) <https://cdm.unfccc.int/Projects/DB/DNV-CUK1309497987.25/view> accessed 18 January 2017.
[1062] ibid.

Actually 70% of the project cost is funded by a loan from the Kuwait-based Arab Fund for Economic and Social Development.[1063] Also, the natural gas is supplied to this Samra Power Plant from the Egyptian natural gas pipeline project by the Al-Fajer Gas Supplying Co.[1064]

This project was constructed by the US Black and Veatch company and the Turkish GAMA company (Gama Consortium). The project related to the installation of a combined cycle power plant at Al-Hashimyah town in Zarqa Governorate by with a total installed capacity of 300 MW. The project responded to an estimated 6% annual power demand increase in Jordan.[1065]

This project contributes to sustainable development in Jordan. First, it provides cleaner energy as it uses natural gas instead of other fossil fuels. Second, this project will transfer this technology to Jordan and it constitutes an opportunity to be replicated elsewhere in the future. Third, it will improve the technical expertise of local manpower in Jordan through training.[1066]

o) Type of technology used under the project

The technology used under this project are well-known technologies that used to be applied in Europe but it is new in Jordan. Two types of technologies are provided under this project and are supplied by two different manufacturers. The Samra

[1063] Alexander's oil & gas connections, 'Jordan signs expansion agreement for Al Samra power plant' (Alexander's oil & Gas Connections, 11 August 2004) <http://www.gasandoil.com/news/2004/09/cnm43592> accessed 20 January 2017.
[1064] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Samra 300 MW Combined Cycle Project' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/T/6/U/T6U1MAWKR3DSVYXLNO5QFPI9ZEH87J/4958-%20PDD.pdf?t=aDl8b2MzamlsfDBdvDWh0Bfxfh5zR_NszA5A > accessed 20 January 2017.
[1065] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Samra 300 MW Combined Cycle Project' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/T/6/U/T6U1MAWKR3DSVYXLNO5QFPI9ZEH87J/4958-%20PDD.pdf?t=aDl8b2MzamlsfDBdvDWh0Bfxfh5zR_NszA5A > accessed 9 August 2016.
[1066] ibid.

Power Plant consists of two outdoor gas turbines, two heat recovery steam generators and one steam turbine. So the first technology is related to two gas turbine units and is owned by the US company Black and Veatch.[1067] The second technology is related to a steam turbine owned by Fuji, a Japanese manufacturer.[1068] The technologies used in this turbine are types of machinery technology.

In addition, the project includes know-how with regard to the building of a Combined Cycle Gas Turbine (CCGT), its infrastructure and supporting facilities. The combined cycle power generation results in a better performance compared to the single cycle.[1069] This know-how relates to the utilization of waste gas heat to generate additional electricity. Accordingly, less fossil fuel is combusted per unit of electricity generated.[1070]

Also, the technology is reflected in the know-how expertise for the construction and operation of a Distributed Control System (DCS) for data acquisition and control of the generating units and auxiliaries of the combined cycle plant. Also, a three-story steam turbine building will be constructed for the steam turbine generator, with a central control room, auxiliary mechanical equipment, electrical switchgear room, and other necessary facilities.[1071]

[1067] Alexander's Oil & Gas connections, 'Jordan signs expansion agreement for Al Samra power plant' (Alexander's Oil & Gas Connections, 11 Aug 2004) <http://www.gasandoil.com/news/2004/09/cnm43592> accessed 20 January 2017.
[1068] Samra electric power generating company (spego), 'Annual Report ' [2005] n.d (n.d) Annual Report <http://www.sepco.com.jo/en/Publication/AnnualReports/SEPCO2005EN.pdf> accessed 21 January 2017.
[1069] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Samra 300 MW Combined Cycle Project' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/T/6/U/T6U1MAWKR3DSVYXLNO5QFPI9ZEH87J/4958-%20PDD.pdf?t=aDl8b2MzamlsfDBdvDWh0Bfxfh5zR_NszA5A > accessed 20 January 2017.
[1070] ibid.
[1071] ibid.

p) Parties

The project partners are the Samra Electric Power Generation Company (SEPGCO), which represents the host country of Jordan and a consortium of the Black and Veatch company from the US and the Turkish GAMA company (Gama Consortium).[1072]

q) TOT and IP in the project

In fact, in Section A.4.3 there is no provision related to TOT to the host country. Instead, this section states mainly the technical specifications of the project. This is in violation of the guidelines set out by the UNFCCC for filling in this section, as we mentioned before.

By contrast, Section A.2, 'Description of Project Activities', states some provisions related to TOT but only under a general statement of bringing new technologies into Jordan and subject to further use in new projects in the country. Section A.2 states that:

> 3) The proposed CCGT is the first in Jordan together with the Rehab power station and will transfer this technology to the country. It constitutes an example to be replicated elsewhere.[1073]

Accordingly, this TOT does not specify how such technology will be transferred; the objective of such a transfer is not mentioned. The transfer will enable the transferee to reuse, resell and reproduce the same technology in the future independently of the transferor.

[1072] ibid.
[1073] ibid.

Hence, this is considered technology diffusion and does not reflect a real TOT. This is because the project lacks TOT licences or TOT agreements. The project includes only a provision for transferring the know-how through training in operation and maintenance. It is a basic level of transferring technology because it just applies new technology to Jordan and trains local manpower to use it.

8.3.3 Amman East 386.96 MW Combined Cycle Power Plant

a) Project objective and description

The project is related to the construction of a combined cycle gas-fired power plant in Al-Manakher, Jordan. The project is a large-scale project under the validation process and is related to the scope of energy industries (renewable/non-renewable sources).[1074] The methodology used under this project is the 'Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas'.[1075]

The project consisted of two phases. In the first phase of the project, the plant operated as a simple cycle with a capacity of 247.28 MW. Then in the second phase the plant operated as a combined cycle with a capacity of 139.68 MW.[1076] The main

[1074] UNFCCC, 'Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC Validation, n.d) <https://cdm.unfccc.int/Projects/Validation/DB/6HCA9I7PI9NP9APC1Y4CVQ6MIXHP50/view.html> accessed 18 January 2017.
[1075] UNFCCC, 'AM0029: Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas --- Version 30' (UNFCCC Methodologies, n.d) <https://cdm.unfccc.int/methodologies/DB/WW4I82DG7LJUQE5E5YGT1NZE4PNS60> accessed 22 January 2017.
[1076] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 28 July 2016.

objective of the project is to meet the electricity needs of Jordan in an environmentally sustainable manner and achieve economic growth.[1077]

The project takes the form of a Build, Own and Operate (BOO) project operated by an incorporated joint venture between the US partner AES Corporation and the Japanese partner Mitsui & Co. The joint venture was implemented by AES Jordan PSC, which is a subsidiary of AES Corporation and Mitsui & Co.[1078]

The plant was built and commissioned in 2009 and is still owned and operated by AES Jordan PSC on a 25-year build-own-operate (BOO) basis. The cost of the project was financed by the U.S. Overseas Private Investment Corporation (OPIC), the Japan Bank for International Cooperation (JBIC) and the Sumitomo Banking Corporation (SMBC), with International Bank for Reconstruction and Development (IBRD) risk guarantees.[1079]

This plant is considered the first independent power plant in Jordan with a capacity of 380 MW.[1080] The joint venture agreement included a power purchase agreement with NEPCO. This allows AES Jordan PSC to sell 100% of the generated electricity to NEPCO.[1081]

Before the implementing of the project activity, power generation in other new facilities uses alternatives that emit GHGs. Through this project 'the electricity

[1077] L & T, 'Amman East Power Plant awarded '2013 Top Gas Plant'' (Corporate News, 10 Sep 2013) <http://www.lntsnl.com/media/32134/amman-east-power-plant.pdf> accessed 22 January 2017.
[1078] Jordan annual report, 'Jordan Risk & Compliance Report' [December 2014] n.d (n.d) KNOWYOURCOUNTRYCOM <http://www.knowyourcountry.com/files/jordanamlaug14_3_.pdf> accessed 22 January 2017.
[1079] ibid.
[1080] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 22 January 2017.
[1081] ibid.

produced would displace the electricity produced by other power plants connected to the grid, avoiding the CO_2 emissions from the combustion of fossil fuel'.[1082]

As a result, the project contributes to sustainable development in Jordan. First, the project will improve power generation efficiency because the project activity is a natural gas–based combined cycle power plant. Second, the project improves local environment quality since it reduces other pollutants including SO_2, NO_X and particulates resulting from the power generation industry in Jordan.[1083]

b) Technology to be employed under the project

The technology employed in the plant consists of gas turbines that are manufactured by Ansaldo Energia S.p.A. under a licence from Siemens AG. Also the technology in the steam turbine manufactured by Fuji Electric System Co and in the Heat Recovery Steam Generators (HRSGs) that will be supplied by the EPC contractor Doosan Heavy Industries & Construction Co. Ltd, Korea.[1084] The project uses state-of-the-art equipment and technology that meet all health, safety and environmental standards. In addition, it meets the World Bank, JBIC and OPIC environmental standards.[1085]

c) Parties

The host country of Jordan in this project is represented by the National Electric Power Company (NEPCO). NEPCO is the main electricity actor in Jordan. The

[1082] ibid.
[1083] ibid.
[1084] The World Bank and MIGA, 'Project Appraisal Document: Amman East Power Plant' [14 February 2007] Report No: 37098-50(Annex:17) World Bank <http://documents.worldbank.org/curated/en/681651468273612665/pdf/370980JO0R20071002811.pdf> accessed 22 January 2017.
[1085] AES Jordan PSC, 'AES Jordan PSC (IPP1)' (AES Jordan PSC, n.d) <http://aes-jordan.web-dev.methodiaweb.com/our-business/aes-jordan-psc-amman-east-power-plant-ipp1/> accessed 22 January 2017.

foreign partner in this project, as previously mentioned, consists of AES Jordan PSC, a project company on behalf of the joint venture of AES Corporation and Mitsui to build, operate and own (BOO) a new natural gas-fired grid-connected power plant.[1086]

In fact, 40% of AES Jordan PSC is owned by Mitsui while 60% is owned by AES Oasis, a subsidiary of AES Corporation.[1087] The EPC contractor for AES Jordan PSC is Doosan Heavy Industries & Construction Co. Ltd, Korea.[1088] The design engineering for the entire plant was done by L&T- Sargent & Lundy for the EPC contractor.[1089]

Coordination between parties is under the umbrella of a 'Joint Coordinating Committee (JCC)' that was established for the purpose of implementing the project. The JCC consists of AES Jordan PSC and NEPCO staff. The JCC has been responsible for overall project coordination during the construction and operational phases.[1090]

d) TOT and IP in the project

Section A.4.3 of the PDD includes a technical specification of how to reduce GHG emissions through the scope of work under this project. Therefore, it does not

[1086] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 22 January 2017.
[1087] Mitsui, 'Mitsui and AES signed the financing agreements for Jordan's first IPP' (Mitsui, 30 March 2007) <https://www.mitsui.com/jp/en/release/2007/1205382_6466.html> accessed 22 January 2017.
[1088] The World Bank and MIGA, 'Project Appraisal Document: Amman East Power Plant' [14 February 2007] Report No: 37098-50(Annex:17) World Bank <http://documents.worldbank.org/curated/en/681651468273612665/pdf/370980JO0R20071002811.pdf> accessed 22 January 2017.
[1089] L & T, 'Amman East Power Plant awarded '2013 Top Gas Plant'' (Corporate News, 10 Sep 2013) <http://www.lntsnl.com/media/32134/amman-east-power-plant.pdf> accessed 22 January 2017.
[1090] ibid.

include any provision related to TOT.[1091]

At the same time, under Section B.5, which is related to a 'Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity', there are some provisions related to TOT through the exchange of equipment between the host country and the partner.[1092]

As per the guidelines for completing the PDD, Section B.5 is related to detailed baseline information, including the date of completion of the baseline study and the name of the entities that are responsible for determining the baseline. So it is not the correct section to be completed with TOT provisions.

Nevertheless, the transfer meant here is only a basic level of transfer by way of 'exchange of the equipment market for technology'. Therefore, the contents of this TOT are at a very basic level, which is a very narrow transfer that relates mainly to adopting new equipment. Also, after reviewing the contract documents with concerned parties in the host country, there is nothing more in the contract documents than what is mentioned in the PDD. [1093]

Hence, the contents of TOT, as per the definition, are not reflected in the contract nor in the PDD. The contents will constitute: 'technology, know-how, patents, IPRs, detailed design, technical assistance, equipment or tools, …'[1094] The only content mentioned in this project is equipment exchange and the technical expertise that is

[1091] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 28 July 2016.
[1092] ibid.
[1093] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 28 July 2016.
[1094] ICC, *ICC International Technology Transfer Contract* (ICC Publication No.674 2009) 9-10.

provided to local manpower. The reason behind that is that Jordan, as a host country, needs only the equipment exchange for this project. [1095]

This is related to TOT under the PDD. In fact, the contractual arrangements of this joint venture include a number of agreements: the Implementation Agreement (IA), Power Purchase Agreement (PPA), Fuel Supply Agreement (FSA), Water Supply Agreement (WSA), Land Lease Agreement, Engineering, Procurement, and Construction Contract (EPC Contract), Technical Services Agreement (TSA) and Financing agreements.[1096]

In fact, the agreements include licence agreements for the equipment supplied under the project but limited to the use of patented equipment. Nevertheless, all of these agreements and licences lack any provision for TOT.[1097]

8.4 Evaluation of Jordan Experience in TOT

The case study of Jordan in the above-mentioned EST projects, which are submitted to be registered as CDM projects, is better than the previous two case studies. In fact, Jordan had worked on creating a suitable market for analysing the type of technology needed.

Regardless of the fact that there is only one project that includes TOT, it is important to highlight the reasons behind not including TOT in the second and third projects.

In summary, all of the three above-mentioned EST projects are large-scale projects. The 'Reduction of Methane Emissions from Ruseifeh Landfill' is the only project that

[1095] UNFCCC, 'Clean Development Mechanism: Project Design Documents Form (CDM-PDD) for Amman East 38696 MW Combined Cycle Power Plant' (UNFCCC, n.d) <https://cdm.unfccc.int/filestorage/E/U/9/EU9HCKZQ40VF3IBDNLM2R5AW7TJX18/PDD%20Version 1.pdf?t=U1R8b2Jsd3U1fDBpL8S-BWsDLvTKjZ98Wp48> accessed 28 July 2016.

[1096] World Bank, 'World Bank Issues Guarantee in Support of Jordan's First Independent Power Producer' (Financial Solutions: Partial Risk Guarantee, May 2007) <http://siteresources.worldbank.org/INTGUARANTEES/Resources/JordanAmmanEastPower.pdf> accessed 18 January 2017.

[1097] ibid.

included a real TOT to Jordan as a host country. Jordan as a host country under Section A.4.3 states explicitly that the project includes TOT under this section. Also, the contents of such a transfer and the objective were mentioned.[1098] On the other hand, the Annex I Party had received the related CERs. As we mentioned earlier, four CER requests were issued and the fifth is still in the process of being issued.[1099] Under the second project, the 'Samra 300 MW Combined Cycle Project', we found that it is only a technology diffusion, or a basic level of transfer, as explained in Chapter 5. The project lacks a TOT licence or TOT agreement. [1100]

The reason behind this is that the project is implemented through a consortium between two different parties. A joint venture agreement is usually a complex type of commercial dealing. It includes a number of parties and relationships. Also under this project, there are some technologies that are supplied by a third party. So the technology owner has not licensed the technology to be transferred to the host country (Fuji company). Nevertheless, in order to enable TOT under this project, the UNFCCC role is important for encouraging that transfer by reviewing all IP and patent licence agreements to seek the best way to transfer them to the host country. The 'Amman East 386.96 MW Combined Cycle Power Plant' includes a basic level of transfer so as to exchange the equipment market for technology. In fact, this project is an incorporated joint venture to implement a 25-year of build- own-operate

[1098] UNFCCC, 'Clean Development Mechanism: Project Design Document Form for Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, 2009) <https://cdm.unfccc.int/filestorage/1/A/H/1AHIME9FCT0SLQ43O5VNYUGXK26PJ8/PDD.pdf?t=c1l8b2MzaDNhfDBqEnzmcgKxpfHHfdbYWxB8> accessed 9 August 2016.
[1099] UNFCCC, 'Project 2487: Reduction of Methane Emissions from Ruseifeh Landfill' (UNFCCC, n.d) <https://cdm.unfccc.int/Projects/DB/TUEV-SUED1239267670.4/view> accessed 20 January 2017.
[1100] See Chapter 5, p.198.

(BOO).[1101] The project includes a large number of agreements and different parties.[1102] This in fact adds more complexity to the objective of transferring technologies under this project. As we mentioned, without the role of the UNFCCC to foster such a transfer through the large-scale project, the opportunity to have TOT is limited as it is left to the sole discretion of parties.

In conclusion, Jordan has overcome some challenges related to TOT and has worked hard on the CDM as a tool for improving its energy resources and building its renewable energy industry. By performing all the necessary assessments and studies, Jordan made it clear what its internal technology needs are and what types of technology are most helpful and can be considered 'quick wins' for further development. We cannot say it is the best experience, but at least it achieved one TOT that is successful through local efforts.

Nevertheless, the role of the UNFCCC in promoting TOT still needs to be developed fully. We will present all findings related to all three of the case studies in the next chapter with a general focus on points that need to be developed to enhance TOT.

[1101] Jordan annual report, 'Jordan Risk & Compliance Report' [December 2014] n.d (n.d) KNOWYOURCOUNTRYCOM <http://www.knowyourcountry.com/files/jordanamlaug14_3_.pdf> accessed 22 January 2017.
[1102] World Bank, 'World Bank Issues Guarantee in Support of Jordan's First Independent Power Producer' (Financial Solutions: Partial Risk Guarantee, May 2007). <http://siteresources.worldbank.org/INTGUARANTEES/Resources/JordanAmmanEastPower.pdf> accessed 18 January 2017.

Chapter 9

Findings of the case studies and Conclusion

We prefer to conclude this thesis by summarising the main findings we reached after examining the case study of Kuwait, the UAE, and Jordan, along with the evidence presented in the preceding chapters. We next consider the implications of these findings in promoting TOT under both the TRIPS Agreement and the UNFCCC regime. We then make specific suggestions and recommendations based on the findings and barriers to promoting TOT.

9.1 General findings, in particular with regard to the case studies:

There are a number of challenges we found with regard to the implementation of the provision related to TOT under the TRIPS and the UNFCCC. The CDM, in particular still faces a lot of challenges with regard. This will be addressed in some details below.

9.1.1 Lack of linkage between the UNFCCC and the TRIPS Agreement:

The TRIPS Agreement sets out international standards for the protection and enforcement of IP rights. The TRIPS agreement sets also provisions related to TOT. The way the TRIPS Agreement deals with TOT is different than dealing with enforcement of IP protection. There are a number of binding obligations with regard to the minimum standards of IP protection in developing countries while the TRIPS Agreement lacks similar obligatory provisions for TOT.

On the other hand, the objective of the international transfer of ESTs under the UNFCCC is to mitigate and adapt to climate change. The UNFCCC tries to build a linkage between the IP system and patents and the development and transfer of the ESTs to developing and least-developed countries. This is on the basis that the transfer of ESTs is vital to addressing climate change mitigation and adaptation. [1103]

In fact, TOT still do not have an independent framework that works for certain objectives for developing and least-developed countries. As we mentioned in Chapter 3, the TRIPS Agreement looked at TOT as one of the main concerns of developing countries during the negotiations period. That is why the TRIPS Agreement includes a number of provisions with regard to the promotion of TOT to developing countries and LDCs. Nevertheless, the TOT provisions were not in line of what developing countries were promised in the Uruguay Round.

We noted that the TRIPS Agreement that is a trade-related aspects of IP agreement while the UNFCCC is an international environmental treaty.[1104] In fact, the international policy debate on how to mitigate and adapt the climate change threat 'has touched on several issues concerning intellectual property in general, and the TRIPS Agreement in particular'.[1105]

WTO members have discussed the impact of climate change on IP rights in the TRIPS council meetings.[1106] Both the TRIPS Agreement and the UNFCCC share a key issue: promotion of TOT. The TRIPS Agreement looks at promoting TOT from

[1103] WTO [2010] 'The WTO TRIPS Agreement: A Practical Overview for Climate Change Policymakers' 13xii(n.d) WTO, https://www.wto.org/english/tratop_e/trips_e/ta_docs_e/8_3_overviewclimatechange_e.pdf, accessed 3 February 2017.
[1104] See Chapter 4, p.150.
[1105] WTO, 'Climate Change and the WTO Intellectual Property (TRIPS) Agreement' (TRIPS: Climate Change, n.d), https://www.wto.org/english/tratop_e/trips_e/cchange_e.htm, accessed 10 February 2017.
[1106] ibid.

an IP protection–linked to trade aspect. It looks at how to create balanced rights and obligations among all countries: developed, developing and LDCs.

In other words, the TRIPS Agreement concerns how all parties can benefit from the protection of the IP in international trade and economic welfare development. This should be done through ensuring that 'the protection and enforcement of IP rights…contribute[s] to the promotion of technological innovation and to the transfer and dissemination of technology'.[1107] Also, Article 8 of the TRIPS Agreement ensures that members take appropriate measures to prevent the abuse of IP rights or that affect TOT.[1108]

The UNFCCC looks mainly on how to stabilise GHG emissions in the atmosphere on a level that 'would prevent dangerous anthropogenic interference with the climate system'.[1109] In addition, the UNFCCC recognises the need that developing countries to have access to 'resources required to achieve sustainable social and economic development' through the application of new technologies to mitigate and adapt the climate change threat.[1110]

So both agreements share the objective of promoting TOT. Nevertheless, we concluded in Chapter 3 that TOT provisions under the TRIPS Agreement are soft commitments in comparison with the minimum standards commitments.[1111] The TRIPS Agreement provides enforcement mechanisms related to the obligation of

[1107] The TRIPS Agreement (entered into force on 1 January 1995), art 7.
[1108] The TRIPS Agreement (entered into force on 1 January 1995), art 8.2; See also Chapter 3, p.
[1109] The TRIPS Agreement (entered into force on 1 January 1995) preamble; See also Chapter 3, p.
[1110] UNFCCC—The United Nations Framework Convention on Climate Change (adopted on 9 May 1992 and entered into force on 21 March 1994), preamble.
[1111] See Chapter 3, p.76.

providing the minimum standards of IP protection. In contrast, the TRIPS Agreement lacks similar enforceability measures regarding TOT.[1112]

The UNFCCC as well promotes TOT. In fact, it develops criteria to ensure the enhancement of EST projects in developing countries through the process of registration for CDM projects. It obliges developed countries to participate and assist developing countries in the application of new ESTs. Consequently, if they do so, they will obtain the CERs. This will be analysed separately in this chapter to evaluate the balance between the CERs received and the actual TOT made.[1113] The UNFCCC encourages developed countries to apply new ESTs in their countries but it does not force them to do so; the decision is left to the sole discretion of both parties.

We saw in the case studies of Kuwait, the UAE and Jordan that it is not obligatory that an EST project includes TOT provision. In fact, the UNFCCC has no role in encouraging parties to do so under the process of evaluating and reviewing the components of the EST project that is submitted to be registered as a CDM project. The main concern is to check whether such a project leads to a realistic reduction in GHG emissions.

The UNFCCC Secretariat recognised that 'promoting the effective development and transfer of environmentally sound technologies is critical in enabling developing countries to pursue their objectives for sustainable development in a climate-friendly

[1112] See Chapter 3, p.76.
[1113] See p.339.

manner'.[1114] Thus, the transfer of ESTs under the UNFCCC regime took more care and effort than the TRIPS Agreement.

Under the UNFCCC this benefits the Parties from developed countries as they are responsible for mitigating and adapt the climate change threat.[1115] That is why Article 4.5 of the UNFCCC and Article 10(c) of the Kyoto Protocol had worked on this issue. As per these two articles, the developed countries should 'take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly to developing countries to enable them to implement the provisions of the convention'.[1116] In fact, the UNFCCC Parties have taken decisions to promote the development and transfer of ESTs at each session of the COP.[1117]

As per the decisions of these COPs, the UNFCCC had established the technology mechanism, and with it, two main bodies the TEC and the CTCN,[1118] in addition to the Technology Transfer Framework under the decision of COP 7, and the Poznan Strategic Programme on Technology Transfer under the decision of COP 14.[1119]

All of these frameworks, mechanisms and programmes work to facilitate the transfer of ESTs. Nevertheless, still this left for the parties to agree on whether to include a CDM project a transfer of EST or not. So it is left solely to the bargaining process by

[1114] WTO, 'Climate Change and the WTO Intellectual Property (TRIPS) Agreement' (TRIPS: Climate Change, n.d), https://www.wto.org/english/tratop_e/trips_e/cchange_e.htm, accessed 10 February 2017.
[1115] See Chapter 4, p. 150.
[1116] UNFCCC—The United Nations Framework Convention on Climate Change (adopted on 9 May 1992 and entered into force on 21 March 1994), Article 4.5; Kyoto Protocol (adopted in Kyoto, Japan, in December 1997 and entered into force on 16 February 2005), art 10(c); See also Chapter 4, p.
[1117] UNFCCC, 'Technology' (UNFCCC, n.d), http://unfccc.int/technology/items/2681.php, accessed 10 February 2017.
[1118] See Chapter 4, p.150
[1119] UNFCCC, 'Technology' (UNFCCC, n.d), http://unfccc.int/technology/items/2681.php, accessed 10 February 2017; See also Chapter 4, p.150.

both developed and developing countries, and accordingly TOT will not be promoted effectively.

TOT are lost under both the TRIPS and the UNFCCC by setting, in general, soft advice, guidelines and commitments without creating a mechanism that fosters such transfers and looks forward to its achievement after a project is implemented in any developing country.

The UNFCCC is working for the promotion of TOT in the absence of the IP or patent role in this regard. There is no special mechanism to help developing countries concerning how to fully transfer EST patented technologies to their country and allow them to reuse, resell or reproduce the same in the future. The TRIPS Agreement also has not set out how the IP licenses will work for TOT and how this can be achieved.

So we recommend here, in order to promote TOT, that the TRIPS Agreement creates a mechanism similar to the CDM, but with the objective of transferring all types of technologies. All Parties will be bound to it, starting with minimum levels of transfer, and then providing some incentives to developed countries to carry out this obligation – an incentive similar to the CERs under the UNFCCC.

With regard to the UNFCCC, we find that the CDM as a tool also does not foster TOT; instead it fosters reductions in GHG emissions. So this mechanism will be further developed to include obligations for parties from developed countries to transfer ESTs in order to obtain CERs.

9.1.2 The absence of a definition for TOT

Regardless of the efforts undertaken during the TRIPS Agreement negotiations and in its development agenda, the TRIPS Agreement lacks a definition for what constitutes TOT. Also the UNFCCC, and its subsequent protocols and agreement, still does not set out a definition for what constitutes a transfer of ESTs.

This has resulted in misunderstandings between the mere application of new technology in a developing country and the transfer of such technology to this country. We have repeated this several times in this thesis that any TOT should lead to enabling the transferee to reuse, resell and reproduce the same technology independently of the transferor. This will be done with the permission of the transferor to do so. So, the transferee will be able to register such transferred technology in his/her own country and enjoy all the patent holder's rights in this regard.

In the case studies, the lack of definition has resulted EST projects that led to technology diffusion and not to TOT. Developing countries still lack information about what constitutes TOT. Most of developing countries believe that the mere adoption of new technology is TOT. This will create a power monopoly for developed countries, so whenever a developing country requires this technology in the future it still has to depend on the role of the developed countries.

9.1.3 The lack of classification of developing countries

The TRIPS Agreement has not reached an agreed-upon convention or the agreement of parties to the TRIPS for TOT. Therefore, TOT to developing countries cannot be evaluated.

In contrast, the UNFCCC has set out categories for its parties; this was done to benefit the developed countries. This classification assists developed countries in obtaining CERs. Unless who the developing countries are is defined, CDMs cannot work. Accordingly, GHG emissions in developing countries could not be controlled and the developed countries could not obtain CERs.

So we suggest that the TRIPS Agreement develop such a list of parties in order to manage how to promote TOT to developing countries. This will be done according a similar mechanism for a pure TOT, as we suggested earlier.

9.1.4 Enhancing the TNAs by developing countries

Access to technologies is an important element for the success of any transfer deal.[1120] The main concern of developing countries is to have access to such technologies. Access to technology cannot be promoted without solving the problem of the differences between developed and developing countries. Developing countries lack information and knowledge about what type of technology is appropriate to their countries' special needs, internal conditions and the local market. The TNA is helpful in this regard and that is the basic reason for having it under the implementation of the UNEP and the UNEP DTU Partnership on behalf of the GEF.[1121] The non-Annex I Parties number 154;[1122] nevertheless, only 85 have completed TNAs.[1123]

[1120] UNEP [2001] 'Technology without Borders: Case Studies of Successful Technology Transfer', The International Energy Agency (IEA).
[1121] Technology Executive Mechanism (tec), 'Good Practices of Technology Needs Assessments' (UNFCCC, 6 October 2015), http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/ff2506265909481299786ef1e703bb99/01e45b9f64524bdda2185b65b04542fb.pdf, accessed 18 January 2017.

We find in the case studies that only Jordan had adopted four TNAs, while neither Kuwait not the UAE had adopted any, although a large number of EST projects were undertaken, particularly in the UAE. It is not obligatory under CDM to adopt the TNA prior to the engagement of any CDM project.

We wonder herein how for the UNFCCC in each continuous report and working group on TOT points, the lack of information and local needs of technologies are a major barrier to TOT. However, the enhancement of TNA is left to the sole discretion of non-Annex I Parties. This may result in enhancing types of ESTs that do not assist developing countries in promoting economic development and welfare.

This can be solved easily just by making a TNA a requirement prior to submitting any EST project for registration as a CDM project. Also, special regional workshops for this objective are required. TT:CLEAR is one solution provided by the UNFCCC.[1124] It works as a gateway for such information and for data regarding technologies. Nevertheless, if it is not supported with regional workshops for the developing countries, it will be useless. More effort should be made with regard to improving information and technical expertise, as well as with regard to a definition for TOT,

[1122] UNFCCC, 'List of Non-Annex I Parties to the Convention' (UNFCCC Parties, n.d), <http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php>, accessed 10 February 2017.
[1123] UNFCCC, 'Technology Needs Assessment Pathways for Climate Tech Implementation' (UNFCCC, n.d), <http://unfccc.int/ttclear/tna>, accessed 10 February 2017.
[1124] UNFCCC, 'About TT:CLEAR' (UNFCCC, n.d), <http://unfccc.int/ttclear/templates/render_cms_page?NAD_home> accessed 17 September 2016.

contents, IP role and type of license, and the outcome of enhancing this new technology in a host country.[1125]

9.1.5: CERs vs transfer of ESTs

The CERs issuance system is well-managed under the UNFCCC. The EST projects will not be validated unless there is a realistic calculation of how GHG emissions are in the PDD. Moreover, there is no way the CERs will be issued unless the UNFCCC reviews the calculations after implementing the project, and therefore counts the number of CERs issued to a developed country. The UNFCCC developed a data system for recording all CERs issued in each crediting period. [1126]

There are no similar criteria for determining the transfer of EST activities undertaken in the CDM projects. We suggest in this regard that the UNFCCC develops a similar data system for TOT. It is important to have a clear view of the number of EST transfers done by the Annex I Parties. Unless this is managed under the UNFCCC, the provisions for the promotion of transfer of ESTs will lead to a broad interpretation of what constitutes TOT.

In conclusion, the UNFCCC had adopted a co-benefits approach in the implementation of its rules and commitments. It is a win-win strategy that aimed to enable all parties to benefit from climate change mitigation and adaptation activities.[1127]

[1125] EGTT [2007] 'Expert Group on Technology Transfer: Five Years of Work', UNFCCC.
[1126] UNFCCC, 'Project activities' (UNFCCC , n.d)
<https://cdm.unfccc.int/Statistics/Public/CDMinsights/index.html> accessed 17 May 2017
[1127] Miyatsuka, A. & Zusman, E. 'What are Co-benefits?' (n.d) Fact Sheet No. 1, The Asian Co-Benefits Partnership (ACP),

The term co-benefit approach or 'climate co-benefits' refers to the global climate change benefits in development plans or sectoral policies and measures in all countries.[1128] Hence, the co-benefits approach focuses on two issues: development, and mitigating and adapting to climate change as well.[1129]

We wonder how development can be achieved without controlling all of the above-mentioned barriers. Finding solutions for those barriers will result in a successful TOT. The suggestions we made can lead to improving CDMs to improve the current situation of transferring ESTs to developing countries. Then, this does not hinder new development to take place under the TRIPS Agreement. The TRIPS Agreement should continue to work on creating tools for transferring technologies.

9.2: Conclusion

This thesis contributes to answering a question that represents a concern for developing countries as parties to the WTO. The WTO under the Annex (C1) TRIPS Agreement obliged all parties to comply with minimum standards of IP protection. This is based on the idea that protection of IP rights contributes to maintaining creativity and innovation as well as creating a good investment market. The main question that we tried to answer through this thesis is whether the TRIPS Agreement fosters TOT to developing countries, and if yes to what extent. This is in addition to a number of sub-questions that relate to the main question.

<https://pub.iges.or.jp/system/files/publication_documents/pub/nonpeer/2393/acp_factsheet_1_what_co-benefits.pdf> accessed 10 February 2017.

[1128] Miyatsuka, A. & Zusman, E. 'What are Co-Benefits?' (n.d) Fact Sheet No. 1, The Asian Co-Benefits Partnership (ACP), <https://pub.iges.or.jp/system/files/publication_documents/pub/nonpeer/2393/acp_factsheet_1_what_co-benefits.pdf> accessed 10 February 2017.

[1129] ibid.

In order to answer this question, it was important to give a background on the historical development of TOT as a legal commitment of concept. This was the main topic of Chapter 1. In fact, nobody denies the importance of TOT to developing countries. TOT contributed in the economic welfare and development in most of the European countries, USA and Japan during the industrial revolution period (1760 to 1840). This period lacked effective or strict standards for IP protection on the international level. So it was easy to have technologies and innovations transfer across borders from one country to another. The role of the IP protection in that period supports the view of developing countries that the more we protect the less technology can be transferred.

After World War II, countries started to look differently on technology itself. Technology is important and needs to be considered. This period was followed by the post-colonial era and the period prior to the TRIPS Agreement. In these stages, efforts were to enact stricter IP protection on the international level that limits IP infringement.

Also in Chapter 2, after the development of TOT, we addressed the types and forms of TOT. Then, we explained the relationship between IP protection and the promotion of TOT, in addition to defining the term (TOT).

Then we explored how the TRIPS Agreement deals with TOT, one of the objectives of the TRIPS Agreement. The application of these provisions in practice requires more analysis and evaluation of the TRIPS provisions themselves. This is the main

objective of Chapter 3 in which we analysed all of terms and conditions related to the promotion of TOT to developing countries.

So Chapter 2 and 3 answer the questions related to the definition of TOT, the difference between TOT and other similar concepts, the role of the IP in promotion of TOT. Also it answers the question related to whether the TRIPS terms and conditions foster TOT from a pure legal analysis and evaluation of the terms and conditions themselves.

Under Chapter 3, in particular, we explored the general features of the TRIPS Agreement. This was very important in order to evaluate the approach of the TRIPS Agreement with regard to TOT and the role of developing countries. Then, we analysed all the provisions related to TOT as per the TRIPS Agreement: Preamble, principles and objectives, scope and nature of the TRIPS, relationship with other IP conventions, national treatment and most-favoured-nation treatment, exhaustion of rights, transition periods, technical cooperation, and international cooperation. We explored how binding are those provisions to the TOT concept.

Chapter 4 described the legal framework for the international transfer of ESTs to developing countries under the UNFCCC regime. As TOT refers to number of conventions, protocols and decisions under the UNFCCC regime, it was important to identify the legal framework of the international transfer of ESTs. Chapter 4 answers questions related to the CDM as a tool for transferring technology to developing countries, in addition to analysing all provisions related to international transfer of ESTs to developing countries. So the most important part of the thesis is the type of technologies it examined to explore whether the TRIPS and the UNFCCC foster

TOT. The ESTs under the UNFCCC have special features that affect both developed and developing countries. Under the UNFCCC regime, developed countries are incentivised to participate in ESTs projects in developing countries as they can obtain CERs whenever an ESTs project is completed in a developing country and reduces GHG emissions. So the opportunity of transferring ESTs to developing countries need to be considered.

The case studies in Chapters 5 to 8 examined the international transfer of ESTs to Kuwait, the UAE and Jordan as parties of Non-Annex I parties to the UNFCCC (developing countries). The case studies chapters examined how TOT is taking place in a number of ESTs project, either completed or under operation in the host countries.

In Chapter 5, an outline of the case studies of Kuwait, the UAE and Jordan was given with regard to the objectives of the case study, these countries' classifications under both the WTO regime and the UNFCCC regime, data resources, the Clean Development Mechanism (CDM) as a tool for promoting the transfer of ESTs and finally the role of the IP and patent law in the in the international transfer of ESTs.
So this chapter answered questions related to the idea behind the CDM as a tool of transferring technology, the role of IP in transferring ESTs projects to developing countries.

In Chapters 6, 7 and 8, first a background on the ESTs industry in each country was given, and then the special conditions and local market and income of each country. Second, we analysed the total number of ESTs projects submitted to the UNFCCC

to be registered as CDM projects in each country. Third, we filtered these projects as to exclude those that do not relate to TOT at all. Then, we focused on only the projects that include, whenever applicable, some TOT provisions. We answered the question related to whether CDM as a tool promotes TOT to developing countries.
We found out that it is not obligatory to include TOT provisions in any ESTs project that are submitted to be registered as CDM project under the UNFCCC. Therefore, the main objective of the CDM is to reduce GHG emissions and not to transfer ESTs to developing countries. The process of reviewing the contents of PDD is for the purpose to ensure that the project reduces GHG emissions. In contrast, it is left to the sole discretion of both parties to include or exclude the transfer of ESTs to developing countries.

This is quite incomprehensive, especially if we take into consideration that mitigating and adapting to the climate change threat is the main responsibility of the developed countries, as per the UNFCCC and Kyoto Protocol. In fact, it is anomalous to provide the developed countries with an incentive in the form of CERs whenever they participate in ESTs projects in developing countries. Then, at the same time, developing countries are participating although they are not responsible to do so, and without fostering TOT to them as per the CDM.

This is in addition to the absence of the role of IP in such a transfer under the UNFCCC regime, therefore the general provisions under the TRIPS Agreement are the only one provided. We noted in Chapter 3 that the terms and conditions under the TRIPS Agreement do not foster TOT to developing countries.

Lastly, in Chapter 9 the significant findings and conclusions are addressed and evaluated. We conclude that a number of barriers still exist in CDM as a tool for transferring technologies. The co-benefit approach was not achieved with regard to the transfer of ESTs to developing countries, in addition to the lack of IP role in fostering the transfer of ESTs to developing countries.

Finally, TOT, if to be promoted, requires new special mechanism to be developed under the TRIPS Agreement in order to foster the transfer of technologies. This should be followed with special data systems for monitoring such transfers, and a mechanism developed that is similar to the CDM but set out particularly for transferring technologies to developing countries. With regard to ESTs, the CDM should be amended as to make the transfer of ESTs obligatory and should follow the same conditions of the transfer of ESTs.

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