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The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries*Matthew Littleton*

Abstract

Despite numerous international commitments to promote transfer of climate-change related technologies to developing countries, such transfers are not occurring at a sufficient rate to aid these nations in mitigating and adapting to the effects of climate change. The impact of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) on transfer of these technologies is discussed through a detailed examination of relevant TRIPS provisions. The paper also addresses options for improving technology transfer through exploitation of existing TRIPS flexibilities, modification of the Agreement, and other public and private legal and policy avenues.

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Executive Summary

Technology transfer to developing countries is crucial to their economic growth and competitiveness in world markets. There are also environmental benefits to technology transfer. Climate-change-related technologies assist countries, firms, and individuals in mitigating greenhouse gas emissions and coping with the adverse consequences of climate change. Their transfer to developing countries is a crucial element of efforts to meet the challenges posed by climate change. However, despite numerous commitments by the international community over the past generation, technology transfer is not happening quickly enough.

There are many reasons for this delay, one of which is global intellectual property rights (IPR) protection. IPRs are designed to foster innovation by protecting assets and rewarding innovators, but they do so at a cost of delayed access, reduced competition and higher prices. These problems are particularly acute in developing nations. Many climate-change-related technologies are unavailable in developing countries at reasonable prices, meaning that these technologies cannot be employed in parts of the world where they may be needed most.

There is an intense empirical debate as to whether, on balance, strong IPR protection helps or hinders technology transfer to developing countries. Leaving this question aside, it is clear that certain components of the present IPR regime tilt in favor of innovator protections and profits at the expense of the economic and environmental benefits that flow from climate-change-related technology transfer.

The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), passed in 1994 at the conclusion of the Uruguay Round, is the primary global IPR treaty. The TRIPS Agreement mandates strong patent protections for nearly all inventions and effectively limits opportunities to contest IPR abuses. There are few clear restrictions on anti-competitive practices, and transition periods for developing countries are set to expire. With the threat of trade sanctions behind it, TRIPS poses a formidable barrier to diffusion of critical technologies.

On the other hand, the TRIPS Agreement contains several principles and provisions that are potential motivators of climate-change-related technology transfer. The Agreement explicitly promotes environmental, public health, and development goals and gives Members some discretion to determine when those goals should override the normal TRIPS restrictions. These flexibilities have already been employed to promote affordable essential medicine availability in the developing world.

There are three ways to remedy the problems that TRIPS creates for climate-change-related technology transfer. First, the TRIPS flexibilities just mentioned must be exploited in favor of technology transfer. The Agreement must be viewed as a unified document, guided by concerns of public health and economic development. Developed-country obligations to promote technology transfer must be enforced. And the public health exemptions granted during the Doha Round of WTO negotiations must be construed broadly so as to include some technologies that guard against climate change.

The second approach is to modify the TRIPS Agreement in order to propel technology transfer. Developing countries could be given increased discretion in adapting IPR laws to their economic, social and environmental needs. Climate-friendly technologies could receive special treatments like those afforded to essential medicines. And pro-competition provisions in TRIPS could be strengthened.

Finally, institutions unrelated to TRIPS could take the lead in encouraging technology transfer. An agreement on information access and benefit sharing could curtail excessive patenting and improve prospects for innovation in both developed and developing countries. A world competition agreement could limit abusive IPR practices and lower prices for developing country consumers. Individual government or inter-governmental funding sources could provide financial incentives for both technological innovation and its diffusion. Technology needs assessments conducted in developing countries could be matched with specific R&D projects. Each of these mechanisms could be set up so as to favour the climate-change-related technology sector.

Concurrent policies will also be needed to ensure that climate-change-related technologies are not only available to developing countries, but also that they are used effectively to reduce greenhouse gas emissions, to adapt to the negative effects of climate change, and to stimulate domestic innovation. Bilateral and regional free trade agreements should protect the existing TRIPS flexibilities and avoid unduly burdensome “TRIPS-plus” provisions. Investment in education, training, and management in both developed and developing countries should increase the capacities of developing countries to employ technologies effectively.

Attempts to rebalance the global IPR regime face many of the same political challenges that have doomed past efforts. However, there is heightened awareness of the dangers climate change poses and an accompanying sense of urgency among politicians, as well as scientists, to address the problem. Climate-change-related technologies can be viewed as public goods that are essential for developing countries to fend off a climate crisis precipitated principally by their industrialized neighbours. Now is the time to call for firm commitments to minimize barriers to climate-change-related technology transfer, including barriers posed by unduly stringent IPR protection. Developed and developing nations share the obligation to find solutions to this problem, both within and outside the context of the TRIPS Agreement.

The TRIPS Agreement and Transfer of Climate-Change-Related Technologies to Developing Countries

*Matthew Littleton*¹

Introduction

Modification of the global intellectual property regime is vital to climate change mitigation and adaptation efforts in developing countries. Intellectual property rights (IPRs) have significant effects on economic development and the environment, largely through their impact on the availability and deployment of technologies in the developing world. Many of these are climate-change-related technologies that limit greenhouse gas emissions by reducing pollution, increasing efficiency of production and energy usage, or facilitating the capture and storage of carbon. These technologies are sorely needed to support sustainable development. Yet, most climate-change-related technologies are concentrated in industrialized countries, and technology transfer to the developing world is not happening fast enough (World Bank, 2008).

The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS, or “the Agreement”) is the most significant global IPR treaty (WTO, 1994d).² While there are other forums in which to pursue IPR reform, the TRIPS Agreement has become the focal point for debate on intellectual property’s impact on economic development, technology transfer, and public health. Despite significant attention, the impact of policy discussions within and outside the WTO has been minimal in the case of climate-friendly technology transfer.

This paper surveys the relationship between IPRs and technology transfer, examines the relevant provisions of TRIPS, and discusses prospects for motivating climate-change related technology transfer through exploitation, modification, or circumvention of the Agreement. Part II defines relevant terminology, lists the benefits from and barriers to climate-friendly technology transfer, and summarizes past commitments and failed efforts for IPR reform. Part III consists of a detailed examination of the TRIPS principles and provisions relevant to technology transfer. Part IV discusses the flexibilities inherent in TRIPS, potential modifications of the Agreement, and alternative regimes, both pre-existing and hypothetical, which could be used to promote technology transfer in concert with, or in spite of, TRIPS. Finally, Part V discusses concurrent economic policies necessary to ensure sufficient climate-friendly technology transfer.

The conclusion of this paper is that climate-change-related technology transfer is insufficiently stimulated under the current IPR regime. Industrialized and developing countries share responsibility for overhauling TRIPS and domestic IPR laws to address climate change, following in the footsteps of recent public health exceptions to IPR regulations. Achievement of this goal will require simultaneous actions within and outside the WTO. Firm, measurable, and verifiable commitments are needed to ensure that environmentally-friendly technology transfer to developing countries moves past rhetoric and into reality.

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- ¹ This paper was written during an internship with the Policy Integration and Analysis Branch of the Division for Sustainable Development, UN Department of Economic and Social Affairs. Extensive and thoughtful comments were provided by David O’Connor and Chantal Line Carpentier.
 - ² Several other multilateral, regional and bilateral intellectual property and free trade agreements exist but will not be addressed here.

Background

This Part provides working definitions for the terms “technology transfer” and “environmentally sound technology,” outlines the economic and environmental benefits of technology transfer, and discusses potential barriers to technology transfer. It then summarizes the various commitments and actions promoting technology transfer already agreed to by intergovernmental bodies and parties to several international environmental agreements. Two failed attempts at IPR reform favouring technology transfer are also reviewed.

Definitions

Technology Transfer

Technology transfer is problematic to define, since it can happen in many different ways. For the sake of simplicity, however, this paper will adopt the definition of the Intergovernmental Panel on Climate Change (IPCC):

the broad set of processes covering the flows of knowledge, experience and equipment amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs and research/educational institutions (IPCC, 2000).

Technology transfer occurs predominantly in the private marketplace and takes a number of forms. Intra-firm transfers take place between headquarters and subsidiaries of a trans-national corporation, either through direct product or process transfer, training, or information sharing. Inter-firm transfers occur through joint ventures between foreign and domestic companies, sales or management contracts that transfer products and personnel, or licensing agreements. Foreign direct investment is a prime source of technology transfer.³ Finally, unsanctioned technology transfers take place through imitation, which may take the form of simple product inspection, trial-and-error, or complex reverse engineering.

Climate-Change-Related Technologies

A key issue in defining the set of technologies that combat climate change is whether technologies relating to *adaptation* should be treated on an equal footing with those relating to *mitigation*. If so, the range of technologies becomes very broad and includes any technology that helps individuals or firms deal with the negative results of climate change. This paper will deal mainly with mitigation technologies but highlight areas where adaptation technology transfer could also be encouraged.

Climate-change-related technologies are a subset of so-called “environmentally sound technologies” (ESTs). For present purposes, the two terms will be used interchangeably. Environmentally sound technologies are defined primarily by their functions:

Environmentally sound technologies protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes.... Environmentally sound technologies in the context of pollution are ‘process and product technologies’ that generate low or no waste, for the prevention of pollution. They also cover ‘end of the pipe’ technologies for treatment of pollution after it has been generated (United Nations, 1992b).

³ This investment might take the form of “turn-key” packages, where the transnational corporation supplies equipment, infrastructure, and management and production plans; or build-operate-transfer (BOT) agreements, where a private company builds a factory, operates it until the desired return is achieved, and then turns it over to a government or domestic firm (Verhoosel, 1998).

Classifying technologies in this manner makes it difficult to define clear boundaries. A major problem is that this definition depends on the temporal and geographic setting. An EST in rural Chad, for example, might not be considered as such in Belgium, and the same technology might not be environmentally sound anywhere ten years later.⁴ It is also unclear how ESTs relate to or overlap with environmental goods and services. Finally, some argue that traditional knowledge and technology should be placed on an equal footing with cutting-edge ESTs.

Benefits of Climate-Change-Related Technology Transfer

Environmentally-sound technology transfer to developing countries has both economic and environmental benefits. In many developing countries, domestic industry is far from the technology frontier, and adoption of existing technologies has a higher return than innovation. Technology transfers can also increase domestic industrial competitiveness and have spillover effects through learning-by-doing and learning-by-watching (Juma, 2005).

Transfers of climate-change-related technologies have environmental benefits as well. In addition to the immediate reduction in greenhouse gas emissions, these technologies represent a positive step toward sustainable consumption and production in the longer term. More difficult to measure, but arguably as important, is the impact they have on changing industry and consumer attitudes toward environmental protection. Finally, these transfers have the potential to promote “voluntary standardization” of cleaner process and production methods, which could eventually facilitate stricter environmental regulations (Matsushita, 2006).⁵

Barriers to Technology Transfer

The barriers to EST transfer vary by the product, process, or information concerned, but they can generally be broken down into supply-side and demand-side barriers. On the supply side, the basic problem is that the vast majority of technologies are held by a handful of firms in industrialized countries. Trade and investment policy barriers, limited market size, high transaction costs, and fear of losing control over proprietary technologies can discourage firms in these countries from making their technologies available abroad.

On the demand side, the barriers are just as daunting. Developing country firms often have little to offer financially or otherwise in exchange for new technologies. In addition, low human capital,⁶ lack of physical capital, and poor credit access hamper the prospects for EST transfer. Finally, domestic laws and policies can deter demand for ESTs. For example, weak environmental protection standards will eliminate firms’ incentives to switch to more environmentally-friendly technologies.

One barrier that can affect EST transfer on both the supply and demand sides is the intellectual property regime. One could think of IPRs as affecting technology supply (firms may refuse to transfer without asset protection) or technology demand (one of the domestic policies that can affect technology demand, as mentioned above). There is vigorous debate over whether IPRs, on balance, help or hinder technology transfer.

4 This problem is particularly acute in the climate change context, since “[t]he technology to be transferred under the climate change conventions is, by and large, much less specific [than that, say, under the Montreal Protocol] and is, in fact, virtually boundless” (Verhoosel, 1998).

5 This *de facto* standardization is often followed in time by official standardization (i.e., under the International Organization for Standardization (ISO)).

6 Lack of highly skilled workers (i.e., engineers, technicians, and managers) in high-technology sectors is particularly damaging.

The empirical evidence is mixed on this question. There is clearly variation by industry, as characteristics like market dynamism, technological sophistication, importance of research and development (R&D), and ease of imitation come into play. The evidence suggests that increased technology transfer can be induced by stronger IPR protection in large economies and economies in transition (Branstetter, 2006; Hoekman, 2004).

On the other hand, small developing countries and least-developed countries (LDCs) do not appear to receive such benefits (Blyde and Acea, 2003; Smith, 2001).⁷ This trend is likely due to reduced incentives for technology transfer on the part of firms due to lesser economies of scale in small countries and poor governance in LDCs. Clearly, strong IPR protection is neither necessary nor sufficient for extensive foreign investment, as the cases of China and Brazil demonstrate. However, there could conceivably be “threshold effects,” where strong IPR protection in developing countries only promotes technology transfer under certain conditions (Reichman and Maskus, 2004). While not the focus of this paper, further empirical studies must be conducted in order to determine the IPR regime that would achieve optimal balance between IPR holder protection and diffusion of technology to developing countries.

Past Commitments to Encourage Technology Transfer

The role of technology transfer in development has been recognized for several decades (Menescal, 2006). The need for improved technology transfer and the recognition of the role IPRs play in the process have been clearly stated by the WTO, various UN agencies, multilateral environmental agreements (MEAs), and several nongovernmental organizations. However, this rhetoric has not been followed up sufficiently by concrete action. This section summarizes past commitments in order to emphasize that progress in this area is long overdue. A comprehensive list of these commitments, including relevant language, is provided in Annex A.

Early Commitments

An obligation to share technologies vital to environmental protection and, therefore, public health could be implied from the duty to cooperate under the UN Charter, Articles 55-56. The earliest explicit language referring to the importance of technology transfer for environmental and developmental goals occurred in the Stockholm Declaration of the UN Conference on the Human Environment in 1972 (United Nations 1972). Two subsequent MEAs, the Montreal Protocol and the Basel Convention, also included language to encourage technology transfer (Montreal Protocol, 1987; Basel Convention, 1989).⁸

Rio Conventions

The commitment to EST transfer took on new urgency during the United Nations Conference on Environment and Development in 1992. The UN Framework Convention on Climate Change, in particular, emphasized the importance of technology as a route to climate change mitigation (UNFCCC, 1992). Subsequent developments in the UNFCCC related to technology transfer include:

- endorsement of the Buenos Aires Plan of Action, which requests that developed countries “take all practicable steps to promote, facilitate and finance” EST access and transfer to developing countries (UNFCCC, 1998a). In particular, the plan envisions an “enabling environment ... to stimulate private sector investment” in EST transfer (UNFCCC, 1998b);

⁷ However, at least one investigator finds positive associations between strong IPR protection and economic growth for low-income, but not middle-income, countries (Falvey, 2006).

⁸ The Montreal Protocol is still thought of as a successful model for EST transfer (WTO, 2007).

- creation of a technology transfer clearinghouse, termed TT:CLEAR, which inventories ESTs to improve access to knowledge and stimulate transfers;
- Clean Development Mechanism (CDM) projects under the Kyoto Protocol to the UNFCCC which transfer energy-efficiency and renewable energy technologies;⁹
- a possible commitment under the Bali Road Map to “measurable, reportable and verifiable” technology transfer and financing to developing countries (UNFCCC, 2007a); and
- passage of numerous decisions targeted towards technology transfer.¹⁰ These decisions typically provide for country-based technology needs assessments as well as “the identification and removal of barriers at each stage of the process” (UNFCCC, 2001). These include “encourag[ing] Parties to avoid ... [IPR] policies, or lack thereof, restricting transfer of technology” (UNFCCC, 2007b). A specialized Expert Group on Technology Transfer has been formed in order to carry out these functions.

The Convention on Biological Diversity (CBD, 1992), while espousing consistency with strong IPR protection, has committed financial resources to promote technology transfer and promulgated voluntary guidelines for access and benefit sharing (ABS) in relation to plant varieties (CBD, 2002). Like the UNFCCC, the CBD has passed decisions emphasizing the creation of “enabling environments,” improvement in information systems, and completion of needs-based technology assessments (CBD, 2004).

Building on the CBD work, the International Seed Treaty has established a “Multilateral System” (MLS) of free ABS of certain plant genetic resources (FAO, 2001). Under the MLS terms, new materials developed with the resources must be shared or a share of the profits contributed to a fund used to promote conservation and sustainable use of the resources in developing countries. While many key genetic resources are excluded, the MLS could serve as a prototype for an ABS treaty for climate-change-related technologies, as discussed in Part IV (Barton and Maskus, 2006).

World Intellectual Property Organization

The World Intellectual Property Organization (WIPO), a UN agency, sets international norms for IPR rights. While it has traditionally focused on strengthening IPRs, WIPO also has responsibility for “facilitating the transfer of technology related to industrial property to the developing countries” (United Nations, 1974).

Unfortunately, WIPO has struggled to carry out this mandate. Instead, attempts to harmonize IPR laws have resulted in coerced conformity with the strictest IPR regulations of industrialized countries. Prospects for a reversal of this trend have improved recently, with the initiation of the so-called “WIPO Development Agenda.”¹¹ On the heels of WIPO General Assembly approval (WIPO, 2007), the Committee on Development and Intellectual Property is currently negotiating action on a number of development-friendly proposals for modification of IPR law (WIPO, 2008). In addition, WIPO has begun to provide information to developing countries about their range of options for domestic IPR regimes under current international laws.¹²

⁹ However, the vast majority of these projects are concentrated in a few large developing countries; few are in LDCs.

¹⁰ In fact, decisions on “Development and transfer of technologies” have been passed at 10 of the 13 sessions of the UNFCCC Conference of the Parties.

¹¹ Begun in 2004, this initiative was spearheaded by the Group of Friends of Development, led by Argentina and Brazil (WIPO, 2004). A long list of academics, businesspeople, and other civil society members endorsed this initiative and pressed WIPO to “formally embrace the notions of balance, appropriateness, and the stimulation of both competitive and collaborative models of creative activity” (Geneva Declaration, 2004).

¹² This information is provided through the WIPO Cooperation for Development Programme.

World Trade Organization

The World Trade Organization (WTO) is most closely involved with IPRs and technology transfer through the TRIPS Agreement, which is treated extensively in Part III. However, other WTO Agreements also impact EST transfer. The General Agreement on Trade and Services (GATS) regulates trade in “technology services” and “environmental services,” as well as labour mobility (WTO, 1994f).¹³ Standards promulgated under the Agreement on Sanitary and Phytosanitary Measures (WTO, 1994a) and the Agreement on Technical Barriers to Trade (WTO, 1994c) shape markets by determining which products may be transferred. The commitments to technology transfer in these agreements are generally “best endeavor clauses” that lack firm, measurable commitments by either developed or developing countries.¹⁴

The WTO has assigned responsibility for negotiations on technology transfer to subsidiary bodies. The Ministerial Decision on Trade and Environment created the Committee on Trade and Environment to deal with, *inter alia*, issues of technology transfer (WTO, 1994g), but the group has been largely impotent. More recently, the Doha Ministerial Declaration prompted the creation of the Working Group on Trade and Technology Transfer (WGTTT) (WTO, 2001c). Despite the specificity of its mandate, the WGTTT “has made no progress in developing concrete and practical recommendations” (South Centre, 2005).

The 2001 Doha Declarations had a number of important references to technology transfer and, as will be discussed in Part IV, may represent a breakthrough in WTO negotiations on IPRs.¹⁵ The Doha Ministerial Declaration underscored that countries are able to take measures “acting for the protection of human, animal or plant life or health, or of the environment” (WTO, 2001c). However, such measures must be compatible with WTO agreements, and they cannot be “arbitrary” or “disguised restrictions on international trade” (WTO, 2001c). This statement might be read narrowly as simply reiterating that countries have flexibilities to take such measures under current WTO law. However, it also suggests that WTO agreements ought to be read with a sympathetic eye toward countries acting in the interest of environmental protection.

The Doha Declaration on TRIPS & Public Health lends credence to that interpretation. It states that the TRIPS Agreement “can and should be interpreted and implemented in a manner supportive of WTO Members’ right to protect public health” (WTO, 2001a). Finally, the Doha Implementation Declaration obligates developed countries to submit “detailed reports on the functioning *in practice* of the incentives provided to their enterprises for the transfer of technology” (emphasis added) to LDCs (WTO, 2001b).¹⁶ The texts of the Doha Declarations will be further examined later in the paper.

Failed Negotiations on Technology Transfer

In the 1970s, the UN Conference on Trade and Development (UNCTAD) began to coordinate work on a Draft International Code of Conduct on the Transfer of Technology.¹⁷ The initial focus of negotiations was a rebalancing of technology licensing regulations to be more favourable to developing countries. In particular, the code “would have affirmed the right of nations to review technology transfer contracts and object to

13 Labor mobility effects technology absorption through its effects on human capital.

14 Best endeavor clauses simply require parties to make a good faith effort to achieve the goals at issue, with no clear consequences if the goals are not achieved.

15 This progress could help to motivate developing countries to revive the now-floundering Doha talks.

16 This directive, echoed in the Doha Declaration on TRIPS & Public Health (WTO, 2001a) was intended to help developed countries fulfill their obligations under TRIPS Article 66.2.

17 These negotiations were a subset of a larger project, termed the New International Economic Order, which aimed to realign the global balance of power to allow developing countries to compete economically with the industrial world.

restrictive clauses favouring transnational foreign companies” (Matsushita, 2006).¹⁸ After protracted negotiations began to consider the wider framework of competition law, the process collapsed, leaving no affirmative commitments (Ullrich, 2001).

Another failed attempt to reach common ground on technology transfer was the short-lived Inter-Sessional Ad Hoc Open-Ended Working Group on Technology Transfer and Cooperation, created by the first session of the UN Commission on Sustainable Development. The group could not overcome ideological differences and was quickly disbanded (Verhoosel, 1998). Like the Draft Code of Conduct, this effort was started in a spirit of cooperation and ended in failure. In some respects, it is hard to see what has changed diplomatically since the failure of these two efforts that would increase the likelihood of success for negotiations today (Faundez, 2001). In any case, it is important to consider this history when discussing politically-feasible avenues for strengthening commitments to technology transfer.

The Trips Agreement and Technology Transfer

This Part examines the principles and provisions in TRIPS that affect climate-change-related technology transfer. It begins by looking at the Preamble to the Agreement and three TRIPS principles that merit consideration in interpreting the provisions of the Agreement. The discussion then moves to protection of patents, which are the most common type of IPR for ESTs. After a brief treatment of TRIPS protections for trade secrets, measures to promote competition are discussed. Next, the flexibilities allowed for developing countries are addressed. This Part concludes by summarizing the strengths and weaknesses of TRIPS as a motivator of technology transfer. Annex B provides the full texts of the TRIPS Articles discussed here.

Preamble and Principles

Principles play an important role in interpreting substantive provisions of international treaties as they apply to specific cases (United Nations, 1969).¹⁹ As mentioned previously, the Doha Declarations have emphasized the importance of the TRIPS principles. While ministerial declarations may not carry the same weight as the formal agreement,²⁰ they do indicate that Members consider the guiding principles to be crucial to TRIPS interpretation.

The Preamble to the TRIPS Agreement contains two references to promotion of technology transfer to developing countries. The Members recognize:

the underlying public policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives

and

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 (WTO, 1994d).

¹⁸ Restrictive business conditions are discussed further in Parts III and IV.

¹⁹ Both the WTO Dispute Settlement Mechanism and Member legislatures need to interpret the TRIPS Agreement.

²⁰ The precise legal status of Declarations is unclear, and it may be different depending on declaration (Charnovitz, 2002; Gathii, 2002).

These statements, in the tradition of the commitments to technology transfer discussed in Part II, help to set the tone for the Agreement. The objectives of the IPR system include promoting development goals, and this can only be done if protected assets are transferred to developing countries. It is also important to note that LDCs are entitled to *maximum* flexibility in TRIPS implementation.

After the Preamble, there are three principles that are particularly relevant for technology transfer. The first is stated in Article 6, which deals with exhaustion. Exhaustion is the legal term of art referring to the expiration of patent protection for a specific item (not the expiration of general patent rights) once that item has been sold by or under the authority²¹ of the IPR holder. Article 6 explicitly leaves the determination of exhaustion rules in the hands of individual Members.²²

There are generally two ways that countries deal with exhaustion. Under *universal exhaustion*, the patent holder on a particular item cannot limit that item's distribution once it has been initially sold by or under authority of the IPR holder. In other words, parallel or "gray market" importing is permitted, wherein competitors may buy products from the IPR holder and compete directly with that right holder in other countries. *Territorial exhaustion*, on the other hand, requires that a patent be sold *domestically* by or under authority of the IPR holder in order to exhaust patent rights. In this case, no parallel importing can occur without the patent owner's consent. Because parallel importing cuts into IPR holders' profits, patent owners generally favour territorial exhaustion. On the other side, universal exhaustion may be in the best interest of developing country consumers.

Depending upon the incentives different exhaustion systems create, they may aid or hinder technology transfer to developing countries. Parallel imports increase competition, which lowers prices and makes technologies more accessible in developing countries. However, by the same reasoning, they limit IPR holder profits and may discourage innovation and thus, ultimately, technology transfer. A novel possibility, which has been suggested as a compromise for small developing countries, is regional exhaustion (Maskus, 2001). Here, parallel importing would only be allowed when the product was sold within the region at issue. By creating geographic buffer zones for patent protection, yet at the same time allowing for parallel importing, regional exhaustion might properly balance technology transfer with incentives to innovate.

Article 7, entitled "Objectives," presents the clearest statement in TRIPS regarding the importance of technology transfer:

The protection and enforcement of intellectual property rights 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 (WTO, 1994d).

This Article is treated only as a goal without specific obligations imposed. However, its importance as a guiding principle of the agreement was supported by both the Doha Ministerial Declaration and the Declaration on TRIPS & Public Health (WTO, 2001c; 2001a).

Finally, Article 8 establishes the rights of Members to protect public health and the public interest. The TRIPS Agreement specifically recognizes the potential for abuse of IPRs and states unambiguously that Members have a right to defend themselves against such abuses.

²¹ Licensees are considered to be under the authority of the IPR holder with respect to the protected asset. Subsidiaries and affiliated firms are also considered to be authorized.

²² This interpretation was confirmed in the Doha Declaration on TRIPS & Public Health (WTO, 2001a).

Members may ... adopt [TRIPS-consistent] measures 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.... Appropriate [TRIPS-consistent] measures ... may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology (WTO, 1994d).

The potential for corrective action remains constrained by the requirement that such measures be consistent with the provisions (rather than the principles) of TRIPS. Thus, while providing some ammunition for Members who wish to oppose IPR abuses, Article 8 could be read as subordinating the TRIPS principles to the subsequent provisions. However, the Doha Ministerial Declaration and the Declaration on TRIPS & Public Health singled out Article 8 for consideration in its own right (WTO, 2001c; 2001a).

Patent Protection

The TRIPS Agreement dictates the length, breadth and exclusive rights awarded under patents, while carving out exceptions to IPR protection under limited circumstances. Patents are typically awarded for twenty-year periods, with shorter terms granted for particular categories of patents. Right holders can prevent unauthorized third-party use or initial sale of the protected matter. They may also assign, transfer, or license their rights to other parties (WTO, 1994d).

Coverage

TRIPS provides coverage for a wide range of inventions, irrespective of where they are invented or initially patented. In addition, “any inventions, whether products or processes, in all fields of technology” are eligible for patent protection (WTO, 1994d). This could make it difficult to single out ESTs for patent exceptions. However, certain pharmaceutical products have been exempted, as discussed previously, and the WTO Appellate Body has interpreted this non-discrimination provision leniently (Abbott, 2001),²³ so this language may not pose a problem for countries wishing to isolate ESTs for special treatment.

Article 27 enumerates a few exceptions to this otherwise broad coverage. Most notably, Members may refuse to patent technologies if “necessary to protect *ordre public* or morality” (WTO, 1994d). Such exemptions may be required to “protect human, animal or plant life or health” or “to avoid serious prejudice to the environment” (WTO, 1994d). It is certainly possible that ESTs could be construed to fall under this exception, although this extension might be difficult politically. The other two exceptions relate to medical techniques and plants and animals.

One ambiguity in TRIPS that might limit patent coverage is that standard patentability criteria are not defined. Typically, such criteria include novelty of the invention, the “inventive step” requirement, and industrial applicability. Without uniform criteria, Members may be able to exclude some inventions from patentability based on particularly stringent patentability criteria (ITCSD, 2008). However, fine-tuning patent rules to this end would be difficult in practice, and negotiations are now underway at WIPO on a Substantive Patent Law Treaty that would eliminate this loophole (WIPO, 2008a).

²³ Abbott cites a WTO Appellate Body Report (WTO Appellate Body, 1997) which found that the plain language of TRIPS, as interpreted under Article 31 of the Vienna Convention on the Law of Treaties (United Nations, 1969), indicated a right to compulsory licensing in certain cases.

Unauthorized Use Exceptions

Once a patent is awarded, TRIPS allows for unauthorized use by third parties (typically in the form of compulsory licensing) under certain conditions. There are three categories of such exceptions. The first, stated in Article 30, grants exemptions “provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties” (WTO, 1994d). It is unlikely that these criteria would be met in the case of an EST, unless the “legitimate interests of third parties” in mitigating or adapting to climate change are given tremendous weight.

The second category of unauthorized use exceptions is the security exception. TRIPS may not “prevent a Member from taking any action which it considers necessary for the protection of its essential security interests” or “prevent a Member from taking any action in pursuance of its obligations under the United Nations Charter for the maintenance of international peace and security” (WTO, 1994d). Barring an imminent global climate catastrophe, it is difficult to imagine these conditions being met by EST patents.

More promising are exceptions granted on a case-by-case basis under Article 31. Several criteria must be met to qualify as an Article 31 exception. First, reasonable efforts must be made to gain appropriate authorization from the IPR holder. This negotiation requirement is waived when the Member determines (using its own judgment) that a “national emergency” or “other circumstances of extreme urgency” demand unauthorized use without delay (WTO, 1994d). The IPR holder must still be notified immediately.

Discussions on public health exceptions have echoed countries’ flexibility to determine what constitute exigent circumstances, opening the door to potential use of these exceptions in the climate change context.²⁴ The negotiation prerequisite may also be waived in cases where a government or its contractor aims to engage in “non-commercial use” of the patent (e.g., use for national defence purposes). It should be emphasized that a finding of exigency is only required to waive the negotiation requirement for an Article 31 exception; compulsory licensing may still be permissible in the absence of exigent circumstances.

Sales of protected assets must occur predominantly in the domestic market for the firm granted the exception. This presents a number of problems for technology transfer. Exceptions must be sought by firms in multiple developing countries in order to diffuse technologies rapidly. In addition, economies of scale may foreclose domestic distribution as a viable economic activity.²⁵

In recognition of this problem, the domestic market requirement has been temporarily waived for public health emergencies in countries with insufficient domestic production (WTO, 2003). The WTO has adopted an amendment to Article 31 that would create a permanent waiver of the domestic market restriction for certain pharmaceuticals and open up the possibility of regional markets for these products (WTO, 2005a).²⁶ Again, this waiver could theoretically be extended to ESTs, particularly in light of the Declaration on TRIPS & Public Health’s pronouncement that “[e]ach Member has the right to grant compulsory

²⁴ “Each Member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises ... can represent a national emergency or other circumstances of extreme urgency” (WTO, 2001a).

²⁵ This problem would not be applicable in the case of large developing country economies like China or Brazil, however.

²⁶ Proposed Article 31bis and its accompanying Annex are not yet in force, since two-thirds of WTO Members have not ratified the amendments. It is likely that the number of ratifications will increase as the developing-country transition periods, discussed in Section E below, near their expiration date.

licences and the freedom to determine the grounds upon which such licences are granted” (WTO, 2001a). On the other hand, such a concession would meet with strong resistance from IPR holders and several industrialized countries.

The requirements for good faith negotiation and predominantly domestic production are both waived in cases where anti-competitive IPR abuse has been determined by a judicial or administrative body. This provision is discussed in Section D below.

Article 31 exceptions are limited in scope and duration to the original motivation for the exception. Patent licensing is non-exclusive and cannot be reassigned without the right holder’s consent. Finally, and crucially, the right holder must be compensated, with the amount subject to domestic judicial review. For many developing country firms, even a small level of compensation may doom efforts to market protected ESTs.

Trade Secret Protection

Protection for undisclosed information, or trade secrets, is required under Article 39. Health and safety data are particularly relevant for ESTs, as they often need to be submitted for government approval. However, governments may not circulate these data except “where necessary to protect the public” or where “steps are taken to ensure that the data are protected against unfair commercial use” (WTO, 1994d). Even if patents are transferred, the absence of this data may make it practically difficult to use them, presenting a further obstacle for many developing countries (Verma, 1998; Heald, 2002). This topic is explored further in Part IV.

Pro-Competition Measures

Competition laws promote consumer welfare and a healthy commercial life by restricting monopolistic and abusive firm behaviours. There is no global competition pact analogous to TRIPS, but the Agreement does contain several competition-related provisions.

As mentioned in Section A, Article 8 authorizes Members to take measures to prevent abuse of IPRs and promote trade and technology transfer. The scope of this provision could be interpreted in vastly different ways. For one thing, “unreasonable” practices are in the eye of the beholder. Nor is it clear what measures are “appropriate.” Finally, Article 8 does not address other restrictions on technology transfer that are not anti-competitive. However, this Article still has the potential to motivate technology transfer in some cases, if developing countries are able to enforce it.²⁷

Article 40 allows Members to designate particular licensing practices as anti-competitive and adopt TRIPS-consistent policies to “prevent or control” these practices (WTO, 1994d). Three practices are listed as examples: exclusive grant-back conditions, where rights to new inventions stemming from the patented asset must be turned over to the initial IPR holder; conditions preventing challenges to patent validity; and coercive package licensing, where licensees must purchase the rights to use several patents at once.²⁸

While Article 40 may be helpful in controlling certain anti-competitive practices, its practical importance is limited for technology transfer. Most importantly, it only addresses licensing practices and thus “fails to control a major part of technology transfer transactions” (joint ventures, subcontracting, patent

²⁷ “[R]efusal to deal to a competitor on commercial terms, thus adversely affecting the international transfer of technology, is an abuse under Article 8.2 which Members may address in their legislation” (Hutchison, 2006).

²⁸ Other potentially anti-competitive licensing practices include exclusive dealing, tying, and resale price maintenance.

assignment to another party, etc.) (Ullrich, 2001). Article 40 focuses squarely on practices that hurt competition, not on those that harm the environment or hamper economic development.²⁹ Any overlap is incidental.

The three example conditions listed in Article 40 may constitute an exhaustive list in a practical sense.³⁰ The potential for anti-competitive practices is difficult to determine *ex ante*, meaning that Member complaints would have to be brought *post facto* in the WTO Dispute Settlement Mechanism. It is hard to imagine many developing countries willing to invest significant resources in this process when the charges are not easy to define, and the lack of WTO disputes over Article 40 supports this contention.

The final competition-related provision in TRIPS occurs in the context of Article 31 unauthorized use exceptions, discussed in Section B. Compulsory licensing may proceed without efforts at negotiation and without regard to the location of the predominant market when licensing is “permitted to remedy a practice determined after judicial or administrative process to be anti-competitive” (WTO, 1994d). The requirements for making the determination of anti-competitiveness are unclear. Both the text and subsequent practice are ambiguous about whether such a license is temporary or indefinite, but a reasonable reading is that compulsory licensing could persist at least until the anti-competitive practice has ceased.

In general, anti-competitive provisions in the TRIPS Agreement are vague and limited. Both Article 8 and Article 40 require that any remedies must be consistent with the remainder of the TRIPS Agreement. “Consistency” could be read so broadly as to render these Articles practically useless (Ullrich, 2001). Leaving these issues up to domestic law would appear to grant developing countries more freedom to regulate, but political realities make it difficult for most developing countries to unilaterally interpret the consistency requirement narrowly. Seeking a source for technology transfer, most developing countries cannot afford to be selective and may find themselves forced to accept anti-competitive terms.

Flexibilities for Developing Countries

Developing country Members are allowed additional time to comply with the TRIPS Agreement after joining the WTO. They are given five years before the provisions come into effect (as opposed to one year for other Members) and an additional five years with respect to technologies that were not patentable under domestic laws prior to the date that TRIPS applied to that Member. Least-developed countries are given ten years to comply with all provisions of the Agreement other than national treatment and most-favoured nation principles.³¹ These transition periods have been further eased in the context of public health, with a series of waivers culminating in a developing country extension of compliance with respect to essential medicines until 2016.³²

²⁹ In TRIPS negotiations, the “competition test” favored by industrialized countries during the negotiations of the Draft Code of Conduct, discussed in Part II, won out over the “development test” preferred by developing countries.

³⁰ The list may actually make it easier for challenged IPR holders to deny wrongdoing, as they can point out that none of the three stated conditions was violated. It may also stunt negotiations of stronger competition laws. “[T]he very existence of Article 8(2) and Article 40 may serve as an excuse for firms not to re-enter into new discussions” (Ullrich, 2001).

³¹ The national treatment principle requires that foreign firms receive the same treatment as domestic firms, and the most-favored nation principle requires that firms from one country receive the same treatment as firms from another country, *ceteris paribus*.

³² A proposed permanent waiver on this front has been adopted by the WTO General Council but not ratified by many countries (WTO, 2005a). This may be due to the fact that 2016 is sufficiently far in the future to make the political risks of ratification not worthwhile.

Developed country Members are required to provide “technical and financial cooperation” for TRIPS implementation to all developing countries and “incentives to enterprises and institutions in their territories” to promote technology transfer to least-developed countries (WTO, 1994d). Cooperative measures include, *inter alia*, “assistance in the preparation of laws and regulations on the protection and enforcement of [IPRs] as well as on the prevention of their abuse” (WTO, 1994d). The level of cooperation required is not defined, nor are rubrics provided for evaluating compliance with this provision by developed countries.

The Doha Declaration on TRIPS & Public Health reiterated developed countries’ obligation to provide incentives to domestic businesses and institutions to promote technology transfer to LDCs (WTO, 2001a). The Doha Implementation Declaration mandated annual reports to the WTO from developed countries summarizing their efforts in this area (WTO, 2001b). While these reports have been submitted since 2002,³³ the initiatives described “tend to be small, focused on specific projects, and not specific to the needs of the [LDCs]” (Barton and Maskus, 2006). There is considerable room for expansion of these reports and their importance, as will be discussed in Part IV.

Evaluation of the TRIPS Agreement as a Motivator of Technology Transfer

Strengths

TRIPS provides a comprehensive, enforceable private IPR regime that reduces uncertainty about IPR protection and may encourage innovation of new ESTs and their transfer to some developing countries. The Agreement also promotes domestic innovation in developing countries and provides some protection for traditional knowledge, both of which can improve environmental outcomes in the absence of technology transfer. The national treatment and most-favoured nation principles of TRIPS encourage free trade, which can promote technology transfer. The Agreement also includes a number of flexibilities, described above and elaborated in Part IV, which favour developing countries.

Weaknesses

On the whole, TRIPS is more concerned with how developing countries can provide an appropriate environment for technology transfer than how developed countries can actively propel technology transfer. In other words, TRIPS favours “pull” factors over “push” factors (Hutchison, 2006). The demands on developed countries are vaguely worded, subject to numerous loopholes, and largely unenforceable.

TRIPS, unlike most WTO Agreements, is legislatively proscriptive, meaning that countries must enact affirmative policies to implement the Agreement (rather than simply repealing tariffs or other trade barriers). Given that developed countries have expertise on IPR legislation, and developing countries may want guidance, there is a strong possibility of foreign pressure on developing countries to strengthen IPR laws beyond the TRIPS requirements. So-called “TRIPS-plus” requirements are discussed more extensively in Part V.

For reasons outlined in Section B, firms in the poorest countries may not be able to take advantage of compulsory licensing exceptions. Even if granted licenses, domestic companies may not be able to afford to compensate IPR holders. Temporal and geographic limitations on licenses can prevent firms from recouping their investment. And competition from a more sophisticated foreign competitor with economies of scale

³³ These reports are available at <http://docsonline.wto.org> (search for “Report on the Implementation of Article 66.2 of the TRIPS Agreement”).

may drive licensees out of business. While proposed amendments to TRIPS would lessen these problems for essential medicines, EST seekers may not be able to take advantage of the amendments in their current form.

Finally, developing countries face several challenges when contesting violations of the pro-technology transfer obligations of TRIPS. In addition to political difficulties, the WTO Dispute Settlement Mechanism (DSM) requires large financial and human capital expenditures. While the DSM may be more favourable to developing countries than bilateral dispute resolution bodies, it does not go far enough in levelling the playing field.

Options for Dealing With TRIPS Deficiencies

There are three ways in which insufficient technology transfer under the TRIPS Agreement can be addressed. First, the existing flexibilities within TRIPS can be exploited. Second, developing countries can push for formal modification of TRIPS. Third, other instruments can be brought to bear on the problem. These outside regimes could work in conjunction with TRIPS, in opposition to the Agreement, or in a completely separate arena. It is not clear which of these strategies is most promising, meaning that each should be encouraged in its own right and pursued by a combination of governmental, NGO and private actors. This Part concludes by providing a rationale for customizing domestic IPR laws to specific developing country circumstances.

Exploiting Existing Flexibilities within the TRIPS Agreement

Part III pointed out a number of ways in which TRIPS could allow both developing and developed countries to encourage technology transfer. Working within TRIPS is likely to be easier than modifying or abandoning the Agreement, so it would behove developing countries to test its limits.

First, developing countries should demand accountability from developed countries regarding their incentive and reporting obligations vis-à-vis technology transfer. These obligations must be met in spite of the recent deadlock in Doha Round negotiations. A united group of developing country Members could put significant pressure on the WTO to monitor the fulfilment of these obligations. Nongovernmental organizations with access to reports could pursue a policy of “naming and shaming.” While results are not assured, heightened awareness of unmet obligations by developed nations should at least place developing countries in a stronger negotiating position.

Second, developing countries should stress the stated goals of TRIPS regarding technology transfer. Given these guiding principles, actions to exempt certain technologies from patentability and restrict anti-competitive measures ought to be viewed as “TRIPS-consistent.” The provisions discussed in Part III should be read as a unified document, not in isolation (WTO, 2007). The manner in which provisions are interpreted should be consistent with the principles, and not only the other way around.

Third, EST transfer should be connected in the minds of Members with recent allowances made for pharmaceutical products. The Doha Declarations were a watershed in WTO negotiations concerning the importance of outside factors in interpreting TRIPS. While EST transfer may not currently address a public health “emergency,” the anticipated consequences of climate change could plausibly create an “urgent” situation that would justify compulsory licensing exceptions under Article 31.³⁴ The issues are undoubtedly more

³⁴ An impending lawsuit to be filed by the State of California and others against the U.S. Environmental Protection Agency regarding regulation of greenhouse gases will make the argument that public health concerns justify immediate actions on climate change (Brown, Jr., 2008).

complex in the EST context than for essential medicines, given the murky definition of terms discussed in Part II and the less visible nature of the problem. However, developing countries might well choose to advocate broadening the conception of current licensing exceptions beyond essential medicines.

Potential Modifications of the TRIPS Agreement

“[T]o benefit from [TRIPS] flexibilities requires a degree of legal and regulatory expertise that may exceed the capacity of many countries for the foreseeable future” (Reichman and Maskus, 2004). If efforts to work within the existing Agreement fail, there are a number of tacks that WTO negotiators could take to make TRIPS more EST transfer-friendly.

Climate-change-related technology exceptions could be sought along the lines of essential medicines exceptions, discussed previously. Perhaps a new “Declaration on TRIPS and Climate Change” could clarify existing flexibilities and offer new incentives for EST transfer. In particular, exceptions for small island LDCs could be pursued, given that trade and investment flows are not as responsive to IPR protections in these countries and the dangers posed by climate change are particularly acute. As suggested earlier, such a modification would have to take into account the uncertain and ever-changing nature of the climate change problem and address adaptation as well as mitigation technologies.

Strong, integrated pro-competition provisions would also promote technology transfer. The class of restrictive business conditions in Article 40 could be expanded, and compulsory licensing under Article 31 could be facilitated for ESTs. “[M]any developing countries take the view that compulsory licensing should be required if the public interest is injured due to an abuse of patent monopoly” (Matsushita, 2006). With their growing clout in the WTO, these Members could redefine “abuse” in this context to extend beyond licensing restrictions and into other IPR-related practices which present barriers to EST transfer (Hutchison, forthcoming).³⁵ Developed countries could also take the lead here by mandating compulsory licensing for climate-change-related IPRs held domestically, a strategy that has yet to be tried.³⁶ Pro-competition provisions would, however, meet with strong resistance from IPR holders who exert great influence with several WTO Members.

Procedures for challenging patents could be made less cumbersome in order to lower costs for developing countries (Stiglitz, 2008). Creation of a straightforward pre-patent opposition process could further reduce costs and prevent abuses. On a related note, patentability criteria should be strengthened to minimize fraudulent and frivolous patents.

Licensing guidelines might be promulgated which provide for fixed, moderate fees for EST patent licensees. In cases where the protected asset clearly has environmental benefits, the IPR holder would bear the burden of proof in demonstrating why compulsory licensing would be unwarranted (Scherer, 1984; Stiglitz, 2008). A tiered application fee system for IPRs could waive payments for patent holders who authorize ESTs for transfer to developing countries (Barton and Maskus, 2006; Maskus, 2004). These proposals would constitute a major shift in the WTO’s approach to IPRs, however, and would require protracted negotiations.

³⁵ On the other hand, too much fear of increased competition might hinder technology transfer on balance.

³⁶ For example, the United States could mandate that EST patent holders license their technologies abroad under specified terms. Admittedly, this proposal would be quite difficult politically.

If full licenses are unrealistic, temporary licenses could be granted along the lines of plant breeders' exemptions and farmers' privileges under the International Seed Treaty.³⁷ For example, IPR holders could provide developing country users with technologies for a limited period, with the expectation of receiving payment once the technology was "tropicalized," i.e., adapted to local requirements. This proposal would work with climate-change adaptation technologies as well as mitigation technologies.

As mentioned earlier, evaluation mechanisms for progress on technology transfer could stand to be strengthened. Such a mechanism might be TRIPS-based or involve multiple WTO Agreements (Maskus, 2004). The problem with current evaluation is twofold: non-transparency and lack of a viable enforcement mechanism. In the absence of formal enforcement, naming and shaming would at least provide some measure of accountability.

There are, of course, great political difficulties involved in modifying any WTO Agreement. Technology transfer often disadvantages IPR holders, who have great political influence in developed countries. And despite the recognition of development goals, equal treatment of nations is at the heart of TRIPS. However, equal treatment of technologies may not be as crucial, as evidenced by the progress on essential medicines. Global environmental progress is certainly not a zero-sum game, and the best hope for any WTO Member interested in TRIPS modification in this area will be to stress common interests in advancing environmental aims.³⁸

Regimes Outside of TRIPS Related to Intellectual Property Rights

There are a number of options for promoting technology transfer through IPRs outside of the TRIPS context. These include an open-source approach to technological information, a formal global competition agreement, fiscal subsidies or international funding mechanisms, and an organization devoted to matching technology needs to existing and prospective innovations.

Open-source Information Access

Access to information is a key barrier to technology transfer, even when licensing or other options are available. The seriousness of this problem is growing, as increasing intellectual property privatization is stunting even basic research.³⁹ Joint university ventures, which are often conducted largely with public funding, present fundamental problems of fairness when the fruits of research are protected. Compounding the problem, patentability criteria are becoming increasingly lax in industrialized countries, opening the door for over-patenting.⁴⁰

One solution to this problem would be an information access agreement. As far back as 1992, there have been calls for an information clearinghouse of ESTs (United Nations, 1992b). However, these efforts

37 Breeders' exemptions allow breeders of plant varieties to use protected plant varieties for experimental purposes to create new varieties. Farmers' privileges permit farmers to save and re-use protected seed varieties for subsequent harvests.

38 One avenue for compromise might be to stress and strengthen other incentives for innovation in lieu of IPR rights. These include reputation advantage and innovation lag (the first mover has a head start).

39 "[G]overnments are increasingly imposing restraints on the use of knowledge generated by public research or through public funding.... This protection is expanding beyond products and applied technologies to basic ideas, procedures, and materials.... Increasing privatization of basic data by entities in the developed countries threatens to retard the diffusion of such knowledge into science and competition in developing countries" (Barton and Maskus, 2006). This basic scientific research is the bedrock for most innovation at the technology frontier (David, 2004).

40 For example, the United States' "utility standard" for patents has been weakened in recent years, as has the EU's standard for patenting research databases (Barton and Maskus, 2006).

tend to be too supply-oriented and lack needs-based assessments to match appropriate technologies to different circumstances.

The International Seed Treaty's Multilateral System of Access and Benefit-Sharing, discussed in Part II, could be a model for an agreement on access to ESTs (Halewood and Nnadozie, 2008). Along these lines, John Barton and Keith Maskus have proposed a formal Agreement on Access to Basic Science and Technology (ABST) "to ensure widespread access to essential scientific results and to enhance the transfer of basic technological information to the developing world at reasonable cost" (Barton and Maskus, 2006). As a WTO Agreement, the ABST could take advantage of the DSM and other institutional structures.

Such an agreement would encounter some difficulties. Drawing a satisfactory line between "basic" and "applied" research would be a challenge. In order to favour ESTs, the definition of "basic" could be construed more broadly in the context of global public goods (Barton and Maskus, 2006). In borderline cases, there would need to be guidelines about which research results were confidential and which were made public.

Another option for promoting information access related to EST patents is a private voluntary system. Such an effort is currently underway, led by the World Business Council for Sustainable Development and IBM Corporation. The Eco-Patent Commons, a database of freely available EST patents, operates on the principle of "share one, take one." While the initiative has promise, there has been little activity after six months.⁴¹ Without a more coercive approach, it is difficult to see a useful system of information access emerging from a voluntary effort. Naming and shaming has limitations, particularly when no one is paying much attention.

World Competition Agreement

As discussed in Part III, the lack of a unified pro-competition agreement may be hindering EST transfer to developing countries. A competitive marketplace can be thought of as a type of public good. This good cannot be provided adequately through a piecemeal process, particularly when the source of pro-competition rules is an agreement designed to protect intellectual property rights (Ullrich, 2001; Guasch and Rajapatirana, 1994). IPRs are fundamentally opposed to free competition; they can only be justified in light of the dynamic incentives for innovation which they create. And, as discussed above, the current TRIPS provisions focus on "post-grant intervention" (after patents are awarded) and fail to address the competition problem at its formative stages by preventing opportunistic behaviour of IPR-holding firms (Biadgleng, 2006).

The details of a comprehensive competition agreement are beyond the scope of this paper, but possible provisions include outlawing "consensus wrongs" like price-fixing, bid-rigging, and boycotts (Ullrich, 2001); agreement by developed countries to prosecute competition cases against domestic firms engaging in abusive practices abroad (Maskus, 2004); and pre-emption clauses which supersede regional and bilateral trade and investment agreements (Biadgleng, 2006).⁴²

A potential world competition agreement would face a number of challenges. First, domestic competition laws of different countries are currently very dissimilar. Many industrialized countries have

⁴¹ Only 31 patents were available as of August 8, 2008, 27 of which were issued by IBM. A complete list is available at <http://www.wbcds.org/>.

⁴² A preemption clause would make other trade and competition agreements subservient to the provisions of the world competition agreement.

extremely complex competition law regimes that would be difficult to mesh. Prior to serious negotiations, some informal headway must be made toward harmonization of these laws, at least on the theoretical level. Second, it would be politically difficult to engage in extraterritorial enforcement of anti-competition laws which harmed domestic firms. Finally, a balance would need to be struck between promoting competition and providing a degree of IPR protection adequate to recoup investments (Ullrich, 2001).

Just as TRIPS may be a poor forum for reforming competition laws, a global competition agreement might not be appropriate to address many IPR issues. The Doha Ministerial Declaration has already suggested that negotiations begin on a world competition pact, but little progress has been made (WTO, 2001c).

Funding Mechanisms

Governments can subsidize technology development and transfer, either individually or in concert. Individual countries' subsidies, tax breaks and other fiscal incentives are the most straightforward method of funding. They can focus private firms on particular sectors like climate-change-related technologies by reducing the risk level of R&D projects (Stiglitz, 2008). However, individual governments are limited in their financial impact, and such expenditures are subject to a free rider problem on the global level (Barton and Maskus, 2006).

A coordinated international funding mechanism would help solve the free rider problem. Possibilities for such a fund include a trust fund encouraging R&D directly in developing countries (Roffe, 2002), a patent acquisition fund to buy IPRs from patent holders (United Nations, 2008), and a fund which covered the difference in cost between the EST and the business-as-usual technology for developing country firms.⁴³

Another possibility is an advance purchase commitment, also known as a guaranteed purchase fund. Under this scheme, an organization, government, or consortium promises to buy a certain amount of a product from the innovator. Such a system has been used to stimulate R&D for orphan drugs and for other public health initiatives.⁴⁴ A guaranteed purchase fund would improve incentives to innovate, but it would not address the other problems with IPRs.

A prize system, on the other hand, would eliminate many of these problems. A contest is pre-announced and a one-time prize is awarded to the successful innovator in exchange for the IPR. Prizes help to reduce wasteful spending on marketing and lower incentives for anti-competitive behaviours (Stiglitz, 2008). On the other hand, prizes, like guaranteed purchase funds, work best with a specific objective. Once again, essential medicines are much more amenable to this requirement ("find a cure for breast cancer") than are climate-change-related technologies ("find a viable alternative to fossil fuel consumption").

Technology-Matching Organization

A new public institution could be created, or an existing one given the responsibility, for actively matching specific EST needs of developing countries to innovators in developed countries. This organization could also be responsible for monitoring patent protection on ESTs, alerting key players in developing countries when patents are about to expire, and brokering licensing agreements. This matching, which could be done at the target project level rather than the early-stage R&D level, has the potential to create value for the in-

⁴³ This system is used by the Multilateral Fund of the Montreal Protocol.

⁴⁴ Examples include the Orphan Drug Act in the United States, the Global Alliance for Vaccines and Immunization (GAVI), and the AIDS vaccine fund in the U.S. State of California.

novator, through diminished demand uncertainty, and for the buyer, through lowered prices.⁴⁵ However, a pilot project run by UNDP along these lines failed in the late 1990s (Verhoosel, 1998).

Customizing Domestic Intellectual Property Laws

For developing countries, tailoring IPR protections to national circumstances is a difficult balancing act. As discussed in Part II, the effects of IPR laws on technology transfer vary with country characteristics. Thus, the “one size fits all” model of TRIPS is insufficient to deal with the diverse economic needs of developing countries and the vastly different levels of EST technology present in different countries (Hoekman, 2004; Chang, 2001). Flexibility is needed to allow countries to set their own IPR practices, within reasonable boundaries, to meet their economic, social and environmental needs.

The principle of common but differentiated country responsibilities is well-established in international law (United Nations, 1992a). When judging IPR regimes, it is important to take account of the historical context of IPRs in development. Modern industrialized countries routinely violated IPRs of foreign citizens and firms well into the twentieth century (Chang, 2001). In this context, asking developing countries to adhere to a stricter standard at this point in time seems unreasonable. Add to this the fact that developed countries are responsible for the majority of the greenhouse gases in the atmosphere, and the case for differential treatment for ESTs looks even stronger. Developing countries should be permitted to consider this historical backdrop when tailoring domestic IPR laws.

Concurrent Policies Promoting Climate-Change-Related Technology Transfer

Given the broad definition of technology transfer stated in Part II, it comes as no surprise that IPR laws are only one of a host of legal, institutional and other factors that affect transfer of climate-change-related technologies. Concurrent trade and economic policies will be needed to complement TRIPS and other intellectual property agreements in order to promote EST transfer. At the national, regional and global levels, effective technology transfer must come from a holistic approach.⁴⁶ Rather than a uniform policy strategy, a heterogeneous solution that integrates technology transfer concerns at all levels of public policy is required (WTO, 2002).

Trade Policies

The United States and the European Union, among others, are steadily strengthening IPRs and eroding the TRIPS flexibilities by including more stringent “TRIPS-plus” provisions in regional and bilateral free trade agreements (World Bank, 2005). Examples include:

- extended patent protection periods;
- broadened patentability coverage (e.g., life forms);
- “evergreening,” or patent re-registration for different uses of a single innovation;
- “regulatory linkage,” which effectively prevents licensees from entering the market;⁴⁷

⁴⁵ India has proposed a project-based approach similar to that described here (WTO, 2005b).

⁴⁶ The IPCC has termed this the “National System of Innovation” approach (IPCC, 2000).

⁴⁷ An example of regulatory linkage would be a requirement that safety product manufacturers submit extensive test data before they can sell products, even if such data has already been submitted by the IPR holder. Without gaining access to the protected data through further negotiations with the IPR holder, the licensee will not be able to enter the market.

- enhanced data exclusivity provisions (e.g., clinical trial data);
- treatment of IPRs as investments, which opens them up to extensive investor protections;
- greater deference allowed to individual private contracts in addressing access and benefit sharing; and
- creation of dispute settlement mechanisms less receptive to developing countries than that of the WTO.

The bulk of the responsibility here lies with developed country trade negotiators and the political leaders they serve. Developed countries could adopt a “Domestic Doha Agenda” agreeing not to undermine developing country rights under TRIPS, but this seems politically unrealistic (Fink, 2008). In any case, developing countries are advised to resist these provisions and try to maintain TRIPS as a ceiling on IPR protections (Barton, 2007).

Conversely, regional and bilateral trade agreements offer an opportunity to encourage provisions that go beyond TRIPS in encouraging technology transfer. These “TRIPS-minus” provisions might include reduction of tariff barriers for ESTs, prohibition of certain anti-competitive contractual provisions, and several other potential TRIPS modifications suggested in Part IV. Developing countries should also be allowed and empowered to play a greater role in other trade-related negotiations (e.g., those involving technical standards) (Maskus, 2004).

Other Policies

Technology absorption is at least as important as technology transfer. Once technologies are transferred, they must be adopted and used effectively. The most important element of technology absorption is human capital (Hoekman, 2004).⁴⁸ Particularly with cutting-edge technologies, well-educated engineers and managers are essential.⁴⁹ In addition to making improvements in domestic education, developing countries should offer incentives to students to guard against a “brain drain.” Developed countries, for their part, should subsidize offshore training, conference attendance and, in some cases, temporary employment for graduates from developing countries. Grant proposals for EST research involving developing country teams should also receive special consideration (Maskus, 2004).

Working within the boundaries of the General Agreement on Tariffs and Trade (GATT) (WTO, 1994e) and other WTO Agreements, developed country governments can provide incentives for R&D and technology diffusion in the climate change context. For example, equal or better tax treatment could be awarded to R&D performed in developing countries (Maskus, 2004).⁵⁰ Tax credits could also be awarded to companies that transfer ESTs or make them publicly available. Developing country governments can reduce

⁴⁸ Technologies can be separated into two general categories: hard technologies, which are not necessarily physical objects but can be codified in some way using detailed instructions; and soft technologies, which consist of “know-how” or training. Both are ultimately necessary to successful technology deployment, but either one could be the binding constraint in a given circumstance.

This is an empirical question whose answer cannot be generalized, but it is worthwhile to point out that proponents of strong IPRs typically argue that soft technologies are the binding constraint. The implication, of course, is that stricter IPR protections for hard technologies are not slowing technology transfer. It would also suggest, though, that transfer agreements ought to include provisions for training and management exchange to increase absorption.

⁴⁹ One advantage of traditional knowledge and technology, on the other hand, is that sufficient human capital is probably already in place in developing countries.

⁵⁰ However, this proposal may run into problems with the WTO Agreement on Subsidies and Countervailing Measures (WTO, 1994b; Verhoosel, 1998).

entry barriers in supplier industries to make FDI and R&D more attractive to multinational corporations (Maskus, 2004). They can also pass stricter environmental legislation in order to increase the market for ESTs. Infrastructure improvements can improve domestic capacity for EST utilization. Finally, unprotected pre-commercial ESTs could be incubated with government funds in exchange for public access for domestic firms (Ockwell, 2007).

Conclusion

The need for IPR protection as a stimulant for innovation needs to be properly balanced with the growing need for climate-change-related technology transfer to developing countries. Despite the development-friendly language in the TRIPS Agreement, economic and sustainable development goals of developing countries are currently subsidiary to IPR privileges. The TRIPS Agreement should not focus solely on protecting IPRs; its goal is to create an IPR regime that provides incentives for technological innovation *and* its global diffusion and usage. The climate change problem may soon approach the status of a global emergency, in the vein of current epidemics, and IPR protections cannot be allowed unduly to hinder EST transfer.

At the heart of this issue is a fundamental question: to what extent is knowledge a public good? The recent trend has been to privatize many forms of knowledge, which has created an “anti-commons” that stifles both innovation and technology diffusion (Barton and Maskus, 2006; Heller, 2008; Boyle, 2003). Intellectual property rights are not primarily a means to ensure competition, as many IPR holders argue. Rather, IPRs are a barrier to free competition that must be tolerated only to the extent necessary to encourage technological progress (Ullrich, 2001).⁵¹ To emphasize this view and reverse the privatization of knowledge, open-source models must be used and *public* innovation encouraged through financial and policy incentives. Technologies that supply a “global public good,” as climate-change-related technologies do, merit special treatment under TRIPS and other trade agreements. In this regard, further examination of the similarities and differences between the cases of essential medicines and ESTs is warranted.

This debate must also be viewed as an ethical one. Intellectual property rights are held overwhelmingly by firms in countries which are the most responsible for the climate change problem, yet those who will suffer most from climate change are located in developing countries that lack access to ESTs. In addition to the economic and environmental reasons for encouraging EST transfer, there is a moral imperative to do so (Haugen, 2007; Chapman, 2002).

Many avenues for moving toward an IPR regime favouring EST transfer have been discussed in this paper. None of them alone will be up to the task. Developing countries must use TRIPS to their full advantage, amendments of TRIPS must be pursued, and other methods of encouraging technology transfer must be generated.

Intellectual property rights are not the only barrier to technology transfer, and they may not be the binding constraint in many cases. To make this determination, further empirical analysis of the role they play in EST transfer is needed (Musungu, 2005). Setting strict rules for IPRs without knowing more about how they affect technology transfer would be counterproductive (Reichman and Maskus, 2004).

At the present moment, there are reasons to be concerned about IPR effects on technology transfer. For instance, TRIPS-plus agreements continue to proliferate, undermining some of the flexibilities in the

⁵¹ The TRIPS Agreement’s Preamble and Article 7 language strongly support this view.

initial Agreement. Still, there are also reasons for optimism. The developing world's increasing economic and political influence is sure to change negotiation dynamics in the WTO. A "second enclosure movement" threatens to overrun key scientific research and technologies (Boyle, 2003),⁵² but the profound threat posed by climate change is increasingly being recognized and addressed by the policy makers. The TRIPS Agreement, in its current form, does not provide an appropriate environment for large-scale climate-change-related technology transfer to developing countries. However, whether through reinterpretation, modification, or circumvention of the Agreement, a number of promising avenues exist for strengthening the global framework for transfer of climate-change-related technologies to developing countries.

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⁵² The first enclosure movement occurred gradually in Britain in the years leading up to the Industrial Revolution, when large tracts of communally arable land were brought under private domain. In speaking of the second enclosure movement, Boyle refers to the recent expansion of protected property to include traditionally public goods and knowledge.

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ANNEX A

PRIOR INTERNATIONAL COMMITMENTS TO TECHNOLOGY TRANSFER

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
United Nations Conference on the Human Environment	Stockholm Declaration	16-Jun-72	Principle 20	"[E]nvironmental technologies should be made available to developing countries on terms which would encourage their wide dissemination without constituting an economic burden on the developing countries."
Vienna Convention for the Protection of the Ozone Layer	Montreal Protocol	16-Sep-87	Article 10A	"Each Party shall take every practicable step ... to ensure: (a) that technologies [related to ozone depletion] are expeditiously transferred to Parties [under treaty obligations] ... and (b) that the transfers ... occur under fair and most favourable conditions."
Basel Convention on the Prevention of Transboundary Movements of Hazardous Wastes	Convention	22-Mar-89	Preamble	"Recognizing the need to promote the transfer of technology for the sound management of hazardous wastes and other wastes produced locally, particularly to the developing countries."
			Article 10.2	"Parties shall ... [c]o-operate actively, subject to their national laws, regulations and policies, in the transfer of technology and management systems related to the environmentally sound management of hazardous wastes and other wastes."
			Article 4.1	"All Parties ... shall ... (c) [p]romote 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 ...; (h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change ..."
United Nations Framework Convention on Climate Change	Convention	09-May-92	Article 4.5	"The developed country Parties ... shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, [ESTs] and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention."
			Article 4.9	"The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology."

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
Convention on Biological Diversity	Convention	22-May-92	Article 16	<p>“Each Contracting Party, recognizing that ... both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention, undertakes ... to provide and/or facilitate access for and transfer to other Contracting Parties of technologies [relevant to biodiversity].... Access to and transfer of technology ... to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed.... In the case of technology subject to patents and other [IPRs], such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of [IPRs].... Each Contracting Party shall take legislative, administrative or policy measures ... with the aim that the private sector facilitates access to, joint development and transfer of technology ... for the benefit of both governmental institutions and the private sector of developing countries.”</p>
United Nations Conference on Environment and Development	Agenda 21	14-Jun-92	Article 20.5 Chapter 8.33 Chapter 34.10 Chapter 34.14(c)	<p>“The Parties shall take full account of the specific needs and special situation of least developed countries in their actions with regard to funding and transfer of technology.”</p> <p>“Governments should explore ... how effective use can be made of economic instruments and market mechanisms in ... [t]he development and introduction of [EST] and its adaptation, diffusion and transfer to developing countries.”</p> <p>"Consideration must be given to the role of patent protection and [IPRs] along with an examination of their impact on the access to and transfer of [EST], in particular to developing countries, as well as to further exploring efficiently the concept of assured access for developing countries to [EST] in its relation to proprietary rights with a view to developing effective responses to the needs of developing countries in this area."</p> <p>"[P]romote, facilitate, and finance, as appropriate, the access to and the transfer of [ESTs] and corresponding know-how, in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect [IPRs] as well as the special needs of developing countries."</p>

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
United Nations Conference on Environment and Development	Agenda 21	14-Jun-92	Chapter 34.18	<p>“[P]romote ... effective modalities for the access and transfer, in particular to developing countries, of [ESTs] by ... (c) Examination ... of existing policies ... and regulations to determine whether they encourage or impede the access to, transfer of and introduction of [ESTs]; (d) Addressing, in a framework which fully integrates environment and development, barriers to the transfer of privately owned [ESTs] and adoption of appropriate general measures to reduce such barriers while creating specific incentives, fiscal or otherwise, for the transfer of such technologies; (e) In the case of privately owned technologies, the adoption of the following measures, in particular for developing countries: (i) Creation and enhancement by developed countries ... of appropriate incentives, fiscal or otherwise, to stimulate the transfer of [EST] by companies, in particular to developing countries ... ; (ii) Enhancement of the access to and transfer of patent protected [ESTs], in particular to developing countries; (iii) Purchase of patents and licences on commercial terms for their transfer to developing countries on non-commercial terms as part of</p> <p>development cooperation for sustainable development, taking into account the need to protect [IPRs]; (iv) ... [T]he undertaking of measures to prevent the abuse of [IPRs], including rules with respect to their acquisition through compulsory licensing, with the provision of equitable and adequate compensation; (v) Provision of financial resources to acquire [ESTs] in order to enable in particular developing countries to implement measures to promote sustainable development that would entail a special or abnormal burden to them; (vi) Development of mechanisms for the access to and transfer of [ESTs], in particular to developing countries.”</p>
	Rio Declaration on Environment and Development	12-Aug-92	Principle 9	<p>“States should ... enhanc[e] the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.”</p>
World Trade Organization	General Agreement on Trade in Services	15-Apr-94	Article IV.1	<p>“The increasing participation of developing country Members in world trade shall be facilitated through negotiated specific commitments, by different Members ... relating to ... the strengthening of their domestic services capacity and its efficiency and competitiveness, <i>inter alia</i> through access to technology on a commercial basis.”</p>

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
World Trade Organization	Agreement on Trade-Related Aspects of Intellectual Property Rights	15-Apr-94		See Annex B, <i>infra</i>
United Nations	General Assembly	28-Jun-97	A/RES/S-19-2, Paragraph 88	"The international community should promote, facilitate and finance, as appropriate, access to and transfer of [ESTs] and the corresponding know-how, in particular to developing countries, on favourable terms, including concessional and preferential terms, as mutually agreed, taking into account the need to protect [IPRs] as well as the special needs of developing countries for the implementation of Agenda 21.... In this context, it is important to identify barriers and restrictions to the transfer of publicly and privately owned [ESTs], with a view to reducing such constraints while creating specific incentives, fiscal and otherwise, for the transfer of such technologies."
United Nations Framework Convention on Climate Change	Kyoto Protocol	11-Dec-97	Article 10	"All Parties ... shall ... [c]ooperate in the promotion of 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], know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of [ESTs] that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, [ESTs]."
Stockholm Convention on Persistent Organic Pollutants	Convention	22-May-01	Article 12.4	"The Parties shall establish ... arrangements for the purpose of ... promoting the transfer of technology to developing country Parties and Parties with economies in transition relating to the implementation of this Convention."
Food and Agriculture Organization of the United Nations	International Treaty on Plant Genetic Resources for Food and Agriculture	03-Nov-01	Article 7.2	"International cooperation shall, in particular, be directed to ... sharing, providing access to, and exchanging ... plant genetic resources for food and agriculture and appropriate information and technology."

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
Food and Agriculture Organization of the United Nations	International Treaty on Plant Genetic Resources for Food and Agriculture	03-Nov-01	Article 13.2(b)	"Access to and transfer of technology ..., including that protected by [IPRs], to developing countries that are Contracting Parties, in particular least developed countries, and countries with economies in transition, shall be provided and/or facilitated under fair and most favourable terms ..., including on concessional and preferential terms where mutually agreed, <i>inter alia</i> , through partnerships in research and development under the Multilateral System. Such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of [IPRs]."
World Trade Organization	Doha Ministerial Declaration	14-Nov-01	Paragraph 31	"[W]e agree to negotiations ... on ... the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services."
	Doha Implementation Declaration	14-Nov-01	Paragraph 37	"We agree to an examination ... of the relationship between trade and transfer of technology, and of any possible recommendations on steps that might be taken within the mandate of the WTO to increase flows of technology to developing countries."
World Trade Organization	Doha Implementation Declaration	14-Nov-01	Paragraph 10.2	"Takes note of the proposal to treat measures implemented by developing countries with a view to achieving legitimate development goals, such as regional growth, technology research and development funding, production diversification and development and implementation of environmentally sound methods of production as non-actionable subsidies.... During the course of the negotiations, members are urged to exercise due restraint with respect to challenging such measures."
	Doha Implementation Declaration	14-Nov-01	Paragraph 11.2	"Reaffirming that the provisions of Article 66.2 of the TRIPS Agreement [quoted above] are mandatory, it is agreed that the TRIPS Council shall put in place a mechanism for ensuring the monitoring and full implementation of the obligations in question. To this end, developed-country members shall submit ... detailed reports on the functioning in practice of the incentives provided to their enterprises for the transfer of technology in pursuance of their commitments under Article 66.2."

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
World Trade Organization	Doha Declaration on the TRIPS Agreement and Public Health	14-Nov-01	Paragraph 4	<p>"We agree that the TRIPS Agreement does not and should not prevent members from taking measures to protect public health. Accordingly, 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.... In this connection, we reaffirm the right of WTO members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose."</p>
			Paragraph 5	<p>"[W]e recognize that these flexibilities [in the TRIPS Agreement] include: (a) In applying the customary rules of interpretation of public international law, each provision of the TRIPS Agreement shall be read in the light of the object and purpose of the Agreement as expressed, in particular, in its objectives and principles. (b) Each member has the right to grant compulsory licences and the freedom to determine the grounds upon which such licences are granted. (c) Each member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises ... can represent a national emergency or other circumstances of extreme urgency. (d) The effect of the provisions in the TRIPS Agreement that are relevant to the exhaustion of [IPRs] is to leave each member free to establish its own regime for such exhaustion without challenge, subject to the MFN and national treatment provisions..."</p>
			Paragraph 7	<p>"We reaffirm the commitment of developed-country members to provide incentives to their enterprises and institutions to promote and encourage technology transfer to least-developed country members pursuant to [TRIPS] Article 66.2 [quoted above]."</p>
World Summit for Sustainable Development	Johannesburg Plan of Implementation	04-Sep-02	Paragraph 20	<p>"Call upon Governments as well as relevant regional and international organizations and other relevant stakeholders to ... take further action to mobilize the provision of financial resources, technology transfer, capacity-building and the diffusion of [ESTs]."</p>

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
World Summit for Sustainable Development	Johannesburg Plan of Implementation		Paragraph 105	"Promote, facilitate and finance, as appropriate, access to and the development, transfer and diffusion of [ESTs] and corresponding know-how, in particular to developing countries ... on favourable terms, including through concessional and preferential terms, as mutually agreed ... including through urgent actions at all levels to ... [establish] legal and regulatory frameworks in both supplier and recipient countries that expedite the transfer of [ESTs] in a cost effective manner by both public and private sectors and support their implementation."
United Nations	General Assembly	20-Dec-06	A/RES/61/207, Paragraph 17	"Stresses the need to promote and facilitate access to the development, transfer and diffusion of technologies for the developing countries through the articulation of policies and measures to foster an enabling environment to facilitate the acquisition and development of technology and to enhance innovation capacity, on the basis of the mandates contained in the Doha Ministerial Declaration; ... and reaffirms the commitment to promoting and facilitating ... access to and the development, transfer and diffusion of technologies, including [ESTs] and corresponding know-how, for developing countries."
United Nations Framework Convention on Climate Change	Bali Road Map	15-Dec-07	Bali Action Plan (Dec. 1/CP.13)	Directs the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention to address "[e]nhanced action on technology development and transfer to support action on mitigation and adaptation, including, inter alia, consideration of: (i) Effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology to developing country Parties in order to promote access to affordable [ESTs]; (ii) Ways to accelerate deployment, diffusion and transfer of affordable [ESTs]...."
			Dec. 3/CP.13, Annex I.C	Recommendation "[t]o encourage Parties to avoid trade and [IPRs] policies, or lack thereof, restricting transfer of technology."
			Dec. 4/CP.13, Paragraph 2	"[T]he following points are important for funding through existing vehicles and new initiatives: ... (d) Enabling environments for technology transfer; ... (i) Licences to support the access to and transfer of low-carbon technologies and know-how."

Body	Instrument	Adoption	Reference	Language promoting or mandating action to enhance EST transfer
United Nations	General Assembly	19-Dec-07	A/RES/62/201, Paragraph 8	"Encourages the international community to continue to facilitate, in view of the difference in level of development between countries, an adequate diffusion of scientific and technical knowledge and transfer of, access to, and acquisition of technology for developing countries, under fair, transparent and mutually agreed terms, in a manner conducive to social and economic welfare for the benefit of society."
Group of 8	Leaders' Statement on Environment and Climate Change	08-Jul-08	Paragraph 23	"Substantial progress toward [a goal of 50% emissions reductions by 2050] requires, <i>inter alia</i> , in the near-term, the acceleration of the deployment of existing technologies, and in the medium- and long-term, will depend on the development and deployment of low-carbon technologies.... we emphasize the importance and urgency of adopting appropriate measures to stimulate development and deployment of innovative technologies and practices."
			Paragraph 34	"Efforts in the WTO negotiations to eliminate tariffs and non-tariff barriers to environmental goods and services should be enhanced with a view to disseminating clean technology and skills. Additionally, consideration should be given to the reduction or elimination of trade barriers on a voluntary basis on goods and services directly linked to addressing climate change."
Group of 8+	Declaration of Leaders Meeting of Major Economies on Energy Security and Climate Change	09-Jul-08	Paragraph 8	"We affirm the critical role of technology and the need for technological breakthroughs in meeting the interlinked global challenges of energy security and climate change. In the near term, broader deployment of many existing technologies will be vital for both mitigation and adaptation.... Technology cooperation with and transfer to developing countries are also vital in this effort.... For the longer term, research, development, demonstration, deployment, and transfer of innovative technologies will be crucial, and we acknowledge the need to enhance our investment and collaboration in these areas."
			Paragraph 9	"There is an urgent need to ... lower costs by creating appropriate incentives for and reducing and eliminating obstacles to technology transfer relevant to both [climate change] mitigation and adaptation."
			Paragraph 10	"[W]e will ... [a]ccelerate enhanced action on technology development, transfer, financing, and capacity building to support mitigation and adaptation efforts."

RELEVANT SELECTIONS FROM THE TRIPS AGREEMENT

PREAMBLE

Members,

...

Recognizing the underlying public policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives;

Recognizing also 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;

...

ARTICLE 6

Exhaustion

For the purposes of dispute settlement under this Agreement, subject to the provisions of Articles 3 and 4 nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights.

ARTICLE 7

Objectives

The protection and enforcement of intellectual property rights 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.

ARTICLE 8

Principles

1. Members may, in formulating or amending their laws and regulations, adopt measures 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, provided that such measures are consistent with the provisions of this Agreement.

2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.

...

SECTION 5: PATENTS

ARTICLE 27

Patentable Subject Matter

1. Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.
2. Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.
3. Members may also exclude from patentability:
 - (a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
 - (b) 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. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

ARTICLE 28

Rights Conferred

1. A patent shall confer on its owner the following exclusive rights:
 - (a) where the subject matter of a patent is a product, to prevent third parties not having the owner's consent from the acts of: making, using, offering for sale, selling, or importing^a for these purposes that product;
 - (b) where the subject matter of a patent is a process, to prevent third parties not having the owner's consent from the act of using the process, and from the acts of: using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process.
2. Patent owners shall also have the right to assign, or transfer by succession, the patent and to conclude licensing contracts.

...

^a This right, like all other rights conferred under this Agreement in respect of the use, sale, importation or other distribution of goods, is subject to the provisions of Article 6.

ARTICLE 30*Exceptions to Rights Conferred*

Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties.

ARTICLE 31*Other Use Without Authorization of the Right Holder*

Where the law of a Member allows for other use^b of the subject matter of a patent without the authorization of the right holder, including use by the government or third parties authorized by the government, the following provisions shall be respected:

- (a) authorization of such use shall be considered on its individual merits;
- (b) such use may only be permitted if, prior to such use, the proposed user has made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time. This requirement may be waived by a Member in the case of a national emergency or other circumstances of extreme urgency or in cases of public non-commercial use. In situations of national emergency or other circumstances of extreme urgency, the right holder shall, nevertheless, be notified as soon as reasonably practicable. In the case of public non-commercial use, where the government or contractor, without making a patent search, knows or has demonstrable grounds to know that a valid patent is or will be used by or for the government, the right holder shall be informed promptly;
- (c) the scope and duration of such use shall be limited to the purpose for which it was authorized, and in the case of semi-conductor technology shall only be for public non-commercial use or to remedy a practice determined after judicial or administrative process to be anti-competitive;
- (d) such use shall be non-exclusive;
- (e) such use shall be non-assignable, except with that part of the enterprise or goodwill which enjoys such use;
- (f) any such use shall be authorized predominantly for the supply of the domestic market of the Member authorizing such use;
- (g) authorization for such use shall be liable, subject to adequate protection of the legitimate interests of the persons so authorized, to be terminated if and when the circumstances which led to it cease to exist and are unlikely to recur. The competent authority shall have the authority to review, upon motivated request, the continued existence of these circumstances;
- (h) the right holder shall be paid adequate remuneration in the circumstances of each case, taking into account the economic value of the authorization;

b “Other use” refers to use other than that allowed under Article 30.

- (i) the legal validity of any decision relating to the authorization of such use shall be subject to judicial review or other independent review by a distinct higher authority in that Member;
- (j) any decision relating to the remuneration provided in respect of such use shall be subject to judicial review or other independent review by a distinct higher authority in that Member;
- (k) Members are not obliged to apply the conditions set forth in subparagraphs (b) and (f) where such use is permitted to remedy a practice determined after judicial or administrative process to be anti-competitive. The need to correct anti-competitive practices may be taken into account in determining the amount of remuneration in such cases. Competent authorities shall have the authority to refuse termination of authorization if and when the conditions which led to such authorization are likely to recur;
- (l) where such use is authorized to permit the exploitation of a patent (“the second patent”) which cannot be exploited without infringing another patent (“the first patent”), the following additional conditions shall apply:
 - (i) the invention claimed in the second patent shall involve an important technical advance of considerable economic significance in relation to the invention claimed in the first patent;
 - (ii) the owner of the first patent shall be entitled to a cross-licence on reasonable terms to use the invention claimed in the second patent; and
 - (iii) the use authorized in respect of the first patent shall be non-assignable except with the assignment of the second patent.

ARTICLE 31bis (not yet in force)^c

1. The obligations of an exporting Member under Article 31(f) shall not apply with respect to the grant by it of a compulsory licence to the extent necessary for the purposes of production of a pharmaceutical product(s) and its export to an eligible importing Member(s) in accordance with the terms set out in paragraph 2 of the Annex to this Agreement.
2. Where a compulsory licence is granted by an exporting Member under the system set out in this Article and the Annex to this Agreement, adequate remuneration pursuant to Article 31(h) shall be paid in that Member taking into account the economic value to the importing Member of the use that has been authorized in the exporting Member. Where a compulsory licence is granted for the same products in the eligible importing Member, the obligation of that Member under Article 31(h) shall not apply in respect of those products for which remuneration in accordance with the first sentence of this paragraph is paid in the exporting Member.
3. With a view to harnessing economies of scale for the purposes of enhancing purchasing power for, and facilitating the local production of, pharmaceutical products: where a developing or least developed country WTO Member is a party to a regional trade agreement within the meaning of Article XXIV of the GATT 1994 and the Decision of 28 November 1979 on Differential and More Favourable Treatment Reci-

^c Article 31bis shall take effect for the Members that have accepted it upon acceptance by two-thirds of the Members and thereafter for each other Member upon acceptance by it. As of 11 July, 2008, 43 of 151 Members had ratified the amendment.

procuity and Fuller Participation of Developing Countries (L/4903), at least half of the current membership of which is made up of countries presently on the United Nations list of least developed countries, the obligation of that Member under Article 31(f) shall not apply to the extent necessary to enable a pharmaceutical product produced or imported under a compulsory licence in that Member to be exported to the markets of those other developing or least developed country parties to the regional trade agreement that share the health problem in question. It is understood that this will not prejudice the territorial nature of the patent rights in question.

4. Members shall not challenge any measures taken in conformity with the provisions of this Article and the Annex to this Agreement under subparagraphs 1(b) and 1(c) of Article XXIII of GATT 1994.

5. This Article and the Annex to this Agreement are without prejudice to the rights, obligations and flexibilities that Members have under the provisions of this Agreement other than paragraphs (f) and (h) of Article 31, including those reaffirmed by the Declaration on the TRIPS Agreement and Public Health (WT/MIN(01)/DEC/2), and to their interpretation. They are also without prejudice to the extent to which pharmaceutical products produced under a compulsory licence can be exported under the provisions of Article 31(f).

...

ARTICLE 33

Term of Protection

The term of protection available shall not end before the expiration of a period of twenty years counted from the filing date.^d

...

SECTION 7: PROTECTION OF UNDISCLOSED INFORMATION

ARTICLE 39

1. In the course of ensuring effective protection against unfair competition as provided in Article 10*bis* of the Paris Convention (1967), Members shall protect undisclosed information in accordance with paragraph 2 and data submitted to governments or governmental agencies in accordance with paragraph 3.

2. Natural and legal persons shall have the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices^e so long as such information:

(a) is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;

^d It is understood that those Members which do not have a system of original grant may provide that the term of protection shall be computed from the filing date in the system of original grant.

^e For the purpose of this provision, "a manner contrary to honest commercial practices" shall mean at least practices such as breach of contract, breach of confidence and inducement to breach, and includes the acquisition of undisclosed information by third parties who knew, or were grossly negligent in failing to know, that such practices were involved in the acquisition.

(b) has commercial value because it is secret; and

(c) has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret.

3. Members, when requiring, as a condition of approving the marketing of pharmaceutical or of agricultural chemical products which utilize new chemical entities, the submission of undisclosed test or other data, the origination of which involves a considerable effort, shall protect such data against unfair commercial use. In addition, Members shall protect such data against disclosure, except where necessary to protect the public, or unless steps are taken to ensure that the data are protected against unfair commercial use.

SECTION 8: CONTROL OF ANTI-COMPETITIVE PRACTICES IN CONTRACTUAL LICENCES

ARTICLE 40

1. Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology.

2. Nothing in this Agreement shall prevent Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market. As provided above, a Member may adopt, consistently with the other provisions of this Agreement, appropriate measures to prevent or control such practices, which may include for example exclusive grantback conditions, conditions preventing challenges to validity and coercive package licensing, in the light of the relevant laws and regulations of that Member.

3. Each Member shall enter, upon request, into consultations with any other Member which has cause to believe that an intellectual property right owner that is a national or domiciliary of the Member to which the request for consultations has been addressed is undertaking practices in violation of the requesting Member's laws and regulations on the subject matter of this Section, and which wishes to secure compliance with such legislation, without prejudice to any action under the law and to the full freedom of an ultimate decision of either Member. The Member addressed shall accord full and sympathetic consideration to, and shall afford adequate opportunity for, consultations with the requesting Member, and shall cooperate through supply of publicly available non-confidential information of relevance to the matter in question and of other information available to the Member, subject to domestic law and to the conclusion of mutually satisfactory agreements concerning the safeguarding of its confidentiality by the requesting Member.

4. A Member whose nationals or domiciliaries are subject to proceedings in another Member concerning alleged violation of that other Member's laws and regulations on the subject matter of this Section shall, upon request, be granted an opportunity for consultations by the other Member under the same conditions as those foreseen in paragraph 3.

...

ARTICLE 65*Transitional Arrangements*

1. Subject to the provisions of paragraphs 2, 3 and 4, no Member shall be obliged to apply the provisions of this Agreement before the expiry of a general period of one year following the date of entry into force of the WTO Agreement.
2. A developing country Member is entitled to delay for a further period of four years the date of application, as defined in paragraph 1, of the provisions of this Agreement other than Articles 3, 4 and 5.
3. Any other Member which is in the process of transformation from a centrally-planned into a market, free-enterprise economy and which is undertaking structural reform of its intellectual property system and facing special problems in the preparation and implementation of intellectual property laws and regulations, may also benefit from a period of delay as foreseen in paragraph 2.
4. To the extent that a developing country Member is obliged by this Agreement to extend product patent protection to areas of technology not so protectable in its territory on the general date of application of this Agreement for that Member, as defined in paragraph 2, it may delay the application of the provisions on product patents of Section 5 of Part II to such areas of technology for an additional period of five years.
5. A Member availing itself of a transitional period under paragraphs 1, 2, 3 or 4 shall ensure that any changes in its laws, regulations and practice made during that period do not result in a lesser degree of consistency with the provisions of this Agreement.

ARTICLE 66*Least-Developed Country Members*

1. In view of the special needs and requirements of least-developed country Members, their economic, financial and administrative constraints, and their need for flexibility to create a viable technological base, such Members shall not be required to apply the provisions of this Agreement, other than Articles 3, 4 and 5, for a period of 10 years from the date of application as defined under paragraph 1 of Article 65. The Council for TRIPS shall, upon duly motivated request by a least-developed country Member, accord extensions of this period.
2. Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.

ARTICLE 67*Technical Cooperation*

In order to facilitate the implementation of this Agreement, developed country Members shall provide, on request and on mutually agreed terms and conditions, technical and financial cooperation in favour of developing and least-developed country Members. Such cooperation shall include 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, and shall include support regarding the establishment or reinforcement of domestic offices and agencies relevant to these matters, including the training of personnel.

...

ARTICLE 73

Security Exceptions

Nothing in this Agreement shall be construed:

- (a) to require a Member to furnish any information the disclosure of which it considers contrary to its essential security interests; or
- (b) to prevent a Member from taking any action which it considers necessary for the protection of its essential security interests;
 - (i) relating to fissionable materials or the materials from which they are derived;
 - (ii) relating to the traffic in arms, ammunition and implements of war and to such traffic in other goods and materials as is carried on directly or indirectly for the purpose of supplying a military establishment;
 - (iii) taken in time of war or other emergency in international relations; or
- (c) to prevent a Member from taking any action in pursuance of its obligations under the United Nations Charter for the maintenance of international peace and security.

...

ANNEX TO THE TRIPS AGREEMENT (not yet in force)^f

1. For the purposes of Article 31bis and this Annex:

- (a) “pharmaceutical product” means any patented product, or product manufactured through a patented process, of the pharmaceutical sector needed to address the public health problems as recognized in paragraph 1 of the Declaration on the TRIPS Agreement and Public Health (WT/MIN(01)/DEC/2). It is understood that active ingredients necessary for its manufacture and diagnostic kits needed for its use would be included;^g
- (b) “eligible importing Member” means any least-developed country Member, and any other Member that has made a notification^h to the Council for TRIPS of its intention to use the system set out in Article 31bis and this Annex (“system”) as an importer, it being understood that a Member may notify at any time that it will use the system in whole or in a limited way, for example only in the case of a national emergency or other circumstances of extreme urgency or in cases of public non-commercial use. It is noted that some

^f This Annex shall take effect for the Members that have accepted it upon acceptance by two-thirds of the Members and thereafter for each other Member upon acceptance by it. As of 11 July, 2008, 43 of 151 Members had ratified the amendment.

^g This subparagraph is without prejudice to subparagraph 1(b).

^h It is understood that this notification does not need to be approved by a WTO body in order to use the system.

Members will not use the system as importing Membersⁱ and that some other Members have stated that, if they use the system, it would be in no more than situations of national emergency or other circumstances of extreme urgency;

(c) “exporting Member” means a Member using the system to produce pharmaceutical products for, and export them to, an eligible importing Member.

2. The terms referred to in paragraph 1 of Article 31bis are that:

(a) the eligible importing Member(s)^j has made a notification^k to the Council for TRIPS, that:

(i) specifies the names and expected quantities of the product(s) needed;^l

(ii) confirms that the eligible importing Member in question, other than a least developed country Member, has established that it has insufficient or no manufacturing capacities in the pharmaceutical sector for the product(s) in question in one of the ways set out in the Appendix to this Annex; and

(iii) confirms that, where a pharmaceutical product is patented in its territory, it has granted or intends to grant a compulsory licence in accordance with Articles 31 and 31bis of this Agreement and the provisions of this Annex;^m

(b) the compulsory licence issued by the exporting Member under the system shall contain the following conditions:

(i) only the amount necessary to meet the needs of the eligible importing Member(s) may be manufactured under the licence and the entirety of this production shall be exported to the Member(s) which has notified its needs to the Council for TRIPS;

(ii) products produced under the licence shall be clearly identified as being produced under the system through specific labelling or marking. Suppliers should distinguish such products through special packaging and/or special colouring/shaping of the products themselves, provided that such distinction is feasible and does not have a significant impact on price; and

(iii) before shipment begins, the licensee shall post on a websiteⁿ the following information:

— the quantities being supplied to each destination as referred to in indent (i) above; and

— the distinguishing features of the product(s) referred to in indent (ii) above;

i Australia, Canada, the European Communities with, for the purposes of Article 31bis and this Annex, its member States, Iceland, Japan, New Zealand, Norway, Switzerland, and the United States.

j Joint notifications providing the information required under this subparagraph may be made by the regional organizations referred to in paragraph 3 of Article 31bis on behalf of eligible importing Members using the system that are parties to them, with the agreement of those parties.

k It is understood that this notification does not need to be approved by a WTO body in order to use the system.

l The notification will be made available publicly by the WTO Secretariat through a page on the WTO website dedicated to the system.

m This subparagraph is without prejudice to Article 66.1 of this Agreement.

n The licensee may use for this purpose its own website or, with the assistance of the WTO Secretariat, the page on the WTO website dedicated to the system.

(c) the exporting Member shall notify^o the Council for TRIPS of the grant of the licence, including the conditions attached to it.^p The information provided shall include the name and address of the licensee, the product(s) for which the licence has been granted, the quantity(ies) for which it has been granted, the country(ies) to which the product(s) is (are) to be supplied and the duration of the licence. The notification shall also indicate the address of the website referred to in subparagraph (b)(iii) above.

3. In order to ensure that the products imported under the system are used for the public health purposes underlying their importation, eligible importing Members shall take reasonable measures within their means, proportionate to their administrative capacities and to the risk of trade diversion to prevent re-exportation of the products that have actually been imported into their territories under the system. In the event that an eligible importing Member that is a developing country Member or a least-developed country Member experiences difficulty in implementing this provision, developed country Members shall provide, on request and on mutually agreed terms and conditions, technical and financial cooperation in order to facilitate its implementation.

4. Members shall ensure the availability of effective legal means to prevent the importation into, and sale in, their territories of products produced under the system and diverted to their markets inconsistently with its provisions, using the means already required to be available under this Agreement. If any Member considers that such measures are proving insufficient for this purpose, the matter may be reviewed in the Council for TRIPS at the request of that Member.

5. With a view to harnessing economies of scale for the purposes of enhancing purchasing power for, and facilitating the local production of, pharmaceutical products, it is recognized that the development of systems providing for the grant of regional patents to be applicable in the Members described in paragraph 3 of Article 31bis should be promoted. To this end, developed country Members undertake to provide technical cooperation in accordance with Article 67 of this Agreement, including in conjunction with other relevant intergovernmental organizations.

6. Members recognize the desirability of promoting the transfer of technology and capacity building in the pharmaceutical sector in order to overcome the problem faced by Members with insufficient or no manufacturing capacities in the pharmaceutical sector. To this end, eligible importing Members and exporting Members are encouraged to use the system in a way which would promote this objective. Members undertake to cooperate in paying special attention to the transfer of technology and capacity building in the pharmaceutical sector in the work to be undertaken pursuant to Article 66.2 of this Agreement, paragraph 7 of the Declaration on the TRIPS Agreement and Public Health and any other relevant work of the Council for TRIPS.

7. The Council for TRIPS shall review annually the functioning of the system with a view to ensuring its effective operation and shall annually report on its operation to the General Council.

o It is understood that this notification does not need to be approved by a WTO body in order to use the system.

p The notification will be made available publicly by the WTO Secretariat through a page on the WTO website dedicated to the system.

APPENDIX TO THE ANNEX TO THE TRIPS AGREEMENT

Assessment of Manufacturing Capacities in the Pharmaceutical Sector

Least-developed country Members are deemed to have insufficient or no manufacturing capacities in the pharmaceutical sector.

For other eligible importing Members insufficient or no manufacturing capacities for the product(s) in question may be established in either of the following ways:

(i) the Member in question has established that it has no manufacturing capacity in the pharmaceutical sector;

or

(ii) where the Member has some manufacturing capacity in this sector, it has examined this capacity and found that, excluding any capacity owned or controlled by the patent owner, it is currently insufficient for the purposes of meeting its needs. When it is established that such capacity has become sufficient to meet the Member's needs, the system shall no longer apply.