

Does TRIPS Facilitate or Impede Climate Change Technology Transfer into Developing Countries?

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THE DEVELOPMENT AND WIDESPREAD DISSEMINATION of climate change technologies is critical to the reduction of global greenhouse gas emissions. This paper analyses and assesses the climate change regime and WTO TRIPS Agreement as they pertain to climate change technology transfer into developing countries. This international legal regime employs a mixture of “push” (encouraging technology transfer from developed countries) and “pull” (encouraging private sector trade and investment into developing countries) obligations. The most developed of these obligations is the TRIPS regime of strong patent protection rights in WTO Member countries (a pull obligation).

The main findings of the TRIPS regime as it relates to climate change technology transfer are twofold. First, strong patent protection rights increase the cost of technological acquisition while having no positive bearing on increased foreign direct investment in, or technology trade to, many developing countries. The overall effect of TRIPS, then, is that it likely hinders technology transfer and dissemination in developing countries. Secondly, and more specifically, TRIPS forecloses an effective remedy of international compulsory licensing in cases where developed country patent holders refuse to license technologies to developing country firms due to fear of competition. While this kind of refusal to license may be cured by a remedy of compulsory licensing within domestic markets, TRIPS placed severe limits on compulsory licensing to supply export markets. An important avenue of technology transfer has therefore been closed off under TRIPS.

L'ÉVOLUTION ET LA DIFFUSION À LARGE ÉCHELLE des technologies liées aux changements climatiques sont fondamentales pour la réduction des émissions de gaz à effet de serre dans le monde. Cet article étudie et évalue le régime des changements climatiques et l'Accord de l'OMC sur les aspects des droits de propriété intellectuelle qui touchent au commerce (ADPIC) en matière du transfert des technologies liées aux changements climatiques dans les pays en développement. Ce régime juridique international crée des obligations visant à la fois à encourager le transfert de technologies par les pays développés et à faciliter le commerce et les investissements du secteur privé dans les pays en développement. Le régime de l'ADPIC est le mieux développé en la matière; il assure aux États membres de l'OMC une solide protection des droits de brevet (une mesure facilitante).

Deux grandes conclusions se dégagent du régime de l'ADPIC en matière du transfert des technologies liées aux changements climatiques. Premièrement, la forte protection des droits de brevet augmente le coût d'acquisition des technologies sans qu'il s'ensuive une augmentation des investissements étrangers directs ou du commerce des technologies dans les pays en développement. Globalement, l'ADPIC semble plutôt nuire au transfert et à la diffusion des technologies dans les pays en développement. Deuxièmement, l'ADPIC vient surtout faire obstacle au remède des licences internationales obligatoires lorsque les titulaires de brevets des pays développés refusent d'accorder une licence aux firmes technologiques des pays en développement par crainte de concurrence. S'il est possible de corriger cet état de choses par la concession de licences obligatoires sur les marchés nationaux, l'ADPIC restreint largement la concession de licences obligatoires pour l'approvisionnement des marchés d'exportation. L'ADPIC a bloqué une importante avenue pour le transfert de technologies.

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519	1. INTRODUCTION
519	2. PARAMETERS OF THE DISCUSSION
521	3. THE INTERNATIONAL LEGAL REGIME
522	3.1. <i>The Push Obligations</i>
522	3.1.1. Climate Change
523	3.1.2. TRIPS
524	3.2. <i>The Pull Obligations</i>
524	3.2.1. Climate Change
524	3.2.2. TRIPS
527	4. DOES TRIPS FACILITATE OR IMPEDE THE INTRODUCTION OF ENVIRONMENTALLY SOUND TECHNOLOGY INTO DEVELOPING COUNTRIES?
527	4.1. <i>Effect on Local Innovation</i>
528	4.2. <i>Trade and Licensing</i>
529	4.3. <i>Foreign Direct Investment</i>
529	4.4. <i>Assessment</i>
530	5. COMPULSORY LICENSING FOR EXPORT TO DEVELOPING COUNTRIES
530	5.1. <i>The Challenge Posed by Environmental Standards</i>
533	5.2. <i>TRIPS and Refusal to Deal (License)</i>
537	6. CONCLUSION

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1. INTRODUCTION

THE DEVELOPMENT AND WIDESPREAD DISSEMINATION of climate change technologies are a key component in the battle to reduce global greenhouse gas (GHG) emissions. As with many other multilateral environmental agreements, the climate change regime addresses the challenge of technology transfer by promoting two complementary approaches: active transfer by governments of developed countries (so-called “push factors”) and the creation of favourable conditions in developing countries to attract technology through trade and investment (so-called “pull factors”). Legal obligations within the climate regime are broadly conceived, leaving much discretion as to how countries animate these push and pull factors through their national legislation. The WTO TRIPS Agreement is concerned almost exclusively with pull factors, that is, creating an enabling environment for trade and investment by patent-rights holders. This paper will (1) offer a brief overview of the international legal regime for technology transfer under the climate change and TRIPS regimes according to push and pull factors, (2) discuss in general terms whether TRIPS facilitates or impedes the pull of technology transfer through private capital trade and investment, and (3) focus on the important push issue of whether TRIPS allows compulsory licensing in cases where a patent holder refuses to license in an export market.

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2. PARAMETERS OF THE DISCUSSION

THE TERM “TECHNOLOGY TRANSFER” HAS BEEN defined in the context of climate change as “a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions,

NGOs and research/education institutions.”¹ This definition gives a flavour of the wide scope and complexity of the task that confronts the international community in facilitating international technology transfer to combat climate change. In the context of climate change, the Intergovernmental Panel on Climate Change (IPCC) organized this complexity into stakeholder, pathway, stage, and barrier dimensions.² There is a variety of potential stakeholders that may be involved in any given technology transfer—from governments to the private sector to intergovernmental organizations and non-governmental organizations. The various pathways of technology diffusion include government assistance programs, direct purchasing, licensing, foreign direct investment (FDI) and joint ventures. The stages of technology transfer can be broken down into identification of needs, choice of technology, assessment of conditions of transfer, agreement, implementation, adjustment and diffusion. Finally, and of greatest relevance here, are the barriers to the transfer of environmentally sound technologies (ESTs) that may arise at each stage of the process. These barriers include lack of information, insufficient human capabilities, lack of capital, high transaction costs, trade and policy barriers, business limitations such as risk aversion, and institutional limitations such as weak intellectual property protection laws and enforcement.³

The focus in this paper is narrowed to the transfer of patented “hard” technologies, such as equipment, as opposed to “soft” aspects of technology transfer that include the flow of know-how and experience that are not patentable.⁴ This in no way implies the severability of the two—indeed, the transfer of hard, patented technologies without accompanying technical expertise can be useless—but only underscores the fact that one is patentable (the subject of this paper), and the other is not. Furthermore, I am concerned here with access and absorption of *patented* technologies as opposed to the problems of dissemination that occur with respect to clean technologies available in the public domain.⁵ As the focus of this paper is on technology transfer through private trade and investment, the important issue of public R&D is not raised.⁶ Finally and most importantly, I focus on private capital trade and

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1. Intergovernmental Panel on Climate Change [Bert Metz *et al.*, eds.], *Methodological and Technological Issues in Technology Transfer* (2000), <<http://www.grida.no/climate/ipcc/tectran/index.htm>> at p. 3 [IPCC, *Issues in Technology Transfer*]. See generally, United Nations Conference on Environment and Development, 46th Sess., Agenda Item 21, UN Doc A/Conf.151/26 (1992), <<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm>> at para. 34.3 [Agenda 21].
 2. IPCC, *Issues in Technology Transfer*, *ibid.* at p. 4.
 3. *Ibid.* See also UNFCCC, *Technical Paper on Terms of Transfer of Technology and Know How: Barriers and Opportunities Related to the Transfer of Technology*, FCCC/TP/1998/1 (1998), <<http://unfccc.int/resource/docs/tp/tp0198.pdf>> at p. 6 [UNFCCC, *Barriers and Opportunities*], which identifies barriers as institutional (e.g. lack of legal and regulatory frameworks), political (corruption and instability), technological (e.g. lack of infrastructure, low technical capacities and knowledge base), economic (e.g. inflation, non-transparent markets), informational, financial (e.g. lack of investment and financing), cultural, and general (e.g. intellectual property protection). Of these, financial, economic, technological, institutional, and cultural aspects are identified as the key barriers in decreasing order of importance, at p. 8.
 4. Examples of soft technologies include capacity building, information networks, training, and research, while examples of hard technologies include equipment and products to control, reduce, or prevent anthropogenic emissions of GHGs in the energy, transportation, forestry, agriculture, industry, and waste management sectors: UNFCCC, *Barriers and Opportunities*, *ibid.* at p. 5, note 4.
 5. Many ESTs are not protected, either because they are non-patentable, no patent is registered for them, or the patent has expired. Even so, many non-patent barriers remain, such as inadequate technical expertise, absence of trained personnel, lack of expertise to negotiate transfer, or lack of willingness of technology holders to license or sell: see IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 96.
 6. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 95. Over 40% of R&D spending in OECD countries is publicly funded.

investment flows from developed countries (the source of the vast majority of advanced technologies and R&D) into developing countries that tend to have problems accessing and absorbing these technologies. This is in recognition of the fact that, in the short term, many EST innovations are more likely to occur in developed economies.⁷

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3. THE INTERNATIONAL LEGAL REGIME

PRIOR TO TRIPS,⁸ DEVELOPING COUNTRIES as a whole had “weak” intellectual property rights (IPR) laws while developed countries had strong regimes of IPR protection. In the 1990s, some developing countries accepted the premise that stronger IPR protection would attract technology trade and foreign direct investment (FDI) and thus adopted strict patent regimes.⁹ As part of the WTO Agreement package, developing countries acceded to demands of strong IPR protection, as embodied in the TRIPS Agreement, in exchange for greater market access rights to developed country markets—particularly with respect to textiles and agricultural products. While developing countries have entered the fold of adopting regimes of strong patent protection under the TRIPS Agreement, the developed world has taken on corresponding obligations to facilitate technology transfer. In international treaties on the subject, there are typically provisions obliging both push factors from developed countries (such as stimulating private sector transfer, initiating government to government transfers, and increasing financial and technical support to enhance domestic capacities) as well as pull factors by developing countries (such as adequate intellectual property protection).¹⁰ Both push and pull factors are present, to varying degrees, in both the climate change regime and TRIPS.

Multilateral environmental agreements and declarations are replete with generalized obligations of states to co-operate in transferring ESTs to developing countries. Principle 9 of the Rio Declaration on Environment and Development, for example, provides that “[s]tates should cooperate...by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.”¹¹ Chapter 34 of Agenda 21 specifically addresses

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7. See Carlos M. Correa, “Can the TRIPS Agreement Foster Technology Transfer to Developing Countries” in Keith Maskus & Jerome Reichman, *International Public Goods and Transfer of Technology Under a Globalized Intellectual Property Regime* (Cambridge: Cambridge University Press, 2005) 227–256 at p. 232 [Correa, “TRIPS and Developing Countries”]: Ten developed countries account for 84% of global R&D resources, 94% of patents filed in the US, and 91% of the recipients of cross-border licensing fees and royalties.
 8. *Agreement on Trade-Related Aspects of Intellectual Property Rights, Annex 1C to the Marrakesh Agreement Establishing the World Trade Organization*, 14 April 1994, <http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm>, 1869 U.N.T.S. 299; 33 I.L.M. 1197 [TRIPS Agreement].
 9. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 97.
 10. Secretariat of the UN Framework Convention on Climate Change (UNFCCC), *Enabling Environments for Technology Transfer*, Technical Paper, UN Doc FCCC/TP/2003/2 (2003), <<http://unfccc.int/resource/docs/tp/tp0302.pdf>> at para. 8 [UNFCCC, *Enabling Environments*].
 11. United Nations Conference on Environment and Development, *Rio Declaration on Environment and Development*, UN Doc. A/CONF.151/26 (vol. I), <<http://www.unep.org/Documents/Default.asp?DocumentID=78&ArticleID=1163>>, 31 I.L.M. 874. See also *Declaration of the United Nations Conference on the Human Environment*, <<http://www.unep.org/Documents/Default.asp?DocumentID=97&ArticleID=1503>>, UN Doc A/Conf.48/14/Rev. 1(1973), 11 I.L.M. 1416, Principles 9, 12 & 20. For example, Principle 20 states that “... environmental 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.”

the role of patent protection in EST innovation and transfer. It acknowledges the need for patent protection as a means of providing incentive to innovators, but also highlights that these technologies should be disseminated into developing countries.¹² Specific activities stipulated are for governments and international organizations to create incentives for private sector EST transfer, to purchase patents and licences on commercial terms for their transfer to developing countries on non-commercial terms, to prevent abuses of IPRs, and to provide financial resources to developing countries to purchase EST.¹³ Additionally, developed states are to promote, facilitate, and finance the transfer of EST to developing countries "on favorable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries...."¹⁴

3.1. The Push Obligations

3.1.1. Climate Change

The UN climate change convention contains generally worded provisions on EST transfer.¹⁵ Specific obligations for developed countries, including Annex II States, include the provision of financial resources to meet the full incremental costs of EST. These States are to "provide such financial resources, including for the transfer of technology, needed by developing country Parties to meet the agreed full incremental costs of implementing measures that are covered in paragraph 1 and that are agreed between a developing country"¹⁶ and the Article 11 financial mechanism, that is, the Global Environmental Facility (GEF);¹⁷ and "take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention."¹⁸

The special needs of developing countries and the enhanced capacities of developed countries are central to these obligations. All parties are to "[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...,"¹⁹ "taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances";²⁰ and "take full account of the specific needs and special situations of the least

12. *Agenda 21*, *supra* note 1 at chs. 34.10-11.

13. *Ibid.* at ch. 34.18.

14. *Ibid.* at ch. 34.14(b).

15. *United Nations Framework Convention on Climate Change*, 1771 UNTS 107, UN Doc. A/AC.237/18 (Part II)/Add.1 (1982), <<http://unfccc.int/resource/docs/convkp/conveng.pdf>> [*Climate Change Convention*].

16. *Ibid.* at art. 4.3.

17. The Article 11 mechanism is "for the provision of financial resources on a grant or concessional basis, including the transfer of technology" (Art 11.1 of the *Climate Change Convention*) and *de facto* is the Global Environmental Facility (GEF). For the period 2002–2006, the GEF will have funded US\$960 million in climate change projects: Global Environment Facility, *Revised Programming Document GEF-4*, GEF/R.4/22 (2005), <http://www.gefweb.org/Replenishment/Reple_Documents/documents/R.4.22ProgrammingDocument_000.pdf> at p. 8.

18. *Climate Change Convention*, *supra* note 15 at art. 4.5.

19. *Ibid.* at art. 4.1(c).

20. *Ibid.* at art. 4.1.

developed countries in their actions with regard to funding and transfer of technology.”²¹

Importantly, Article 4.7 states the following:

The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology²²

given the economic and social priorities of developing countries.

In light of the above commitments and provisions, the Kyoto Protocol provides that all parties are to²³ “[c]o-operate 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, environmentally sound technologies, 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 environmentally sound technologies 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, environmentally sound technologies.”²⁴ In addition, developed countries are to provide “financial resources, including the transfer of technology, needed...to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention that are covered by Article 10...” and as arranged through the GEF.²⁵

3.1.2. TRIPS

Article 66 delays implementation of TRIPS for the least developed countries (LDCs). This special exemption expired at the end of 2005 with an exception made for pharmaceutical products.²⁶ In addition, developed countries are obliged to create incentives for technology transfer to LDCs under Article 66.2:

21. *Ibid.* at art. 4.9.

22. *Ibid.* at art. 4.7.

23. *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 10 December 1997, <http://unfccc.int/essential_background/kyoto_protocol/items/1678.php>, UN Doc FCCC/CP/1997/7/Add.1, 37 I.L.M.

22. [Kyoto Protocol]. See art. 10: “...taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances...” and taking into account arts. 4.3, 4.5 and 4.7 of the *Climate Change Convention*, *supra* note 15.

24. *Ibid.* at art. 10 (c). Art. 11.1: in implementing art. 10, parties are to take into account arts. 4.5, 4.7 and 4.9 of the *Climate Change Convention*, *supra* note 15.

25. *Ibid.* at art. 11.2(b).

26. Decision of the Council of TRIPS, WTO 2002 Press Releases, “Council approves LDC decision with additional waiver,” *WTO News* (28 June 2002), <http://www.wto.org/english/news_e/pres02_e/pr301_e.htm> delays application of ss. 5 (patents) and 7 of TRIPS for LDCs until 1 January 2016.

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.²⁷

Of course, the nature of the technological transfer is broader here (that is, a sound and viable technological base) than in multilateral environmental agreements that concern ESTs. Much discretion is given to states in designing measures to comply with this obligation.²⁸ Unfortunately, Article 66.2 has not resulted in much concrete action beyond technical programs to implement intellectual property laws.²⁹

3.2. The Pull Obligations

3.2.1. Climate Change

The Kyoto Protocol is explicit in enlisting the assistance of the private sector in facilitating technology transfer. Article 10(c) above specifies the “creation of an enabling environment for the private sector” for technology transfer, which has been interpreted by the Conference of the Parties (COP) to mean the removal of “legal and administrative barriers...[as well as] regulatory frameworks and transparency, all of which create an environment conducive to private and public sector technology transfer.”³⁰ One of the areas specifically identified for the creation of an enabling environment is the protection of intellectual property rights.³¹ Nevertheless, citing the importance of protecting IPRs is not the same thing as suggesting a regime of strong patent protection.

3.2.2. TRIPS

The TRIPS Agreement sets strong minimum standards of intellectual property protection that may offer a component of the enabling environment identified in the climate change regime. The protection of foreign inventions is achieved through the following standards:³²

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27. TRIPS Agreement, *supra* note 8 at art. 66.2.
 28. Correa, “TRIPS and Developing Countries,” *supra* note 7 at p. 251. See also at p. 252: the fact that this obligation appears in the TRIPS Agreement must mean it refers to patented technologies, not public domain technologies.
 29. Frederick Abbott, “The Future of IPRs in the Multilateral Trading System” in Christophe Bellmann, Graham Dutfield & Ricardo Meléndez-Ortiz, eds., *Trading in Knowledge: Development Perspectives on TRIPS, Trade and Sustainability* (Earthscan: London, 2003) 36–44 at p. 37. While art. 66.2 is part of the Doha negotiation agenda, not much has happened. See, for example, WTO Council for TRIPS Decision, *Implementation of Article 66.2 of the TRIPS Agreement*, IP/C/28 (2003), <http://www.ip4all.ch/E/jurinfo/documents/IP_C_28_03-02-20.pdf>. Developed countries are to submit annual reports on their technology transfer activities under art. 66.2. See also Correa, “TRIPS and Developing Countries,” *supra* note 7 at p. 251. LDCs have repeatedly complained that little or no action has been taken under this provision.
 30. UNFCCC COP, *Report of the Conference of the Parties on its Seventh Session, held at Marrakesh from 29 October to 10 November 2001: Addendum*, FCCC/CP/2001/13/Add.1 (2002), <<http://unfccc.int/resource/docs/cop7/13a01.pdf>> at p. 26.
 31. *Ibid.* at p. 26.
 32. TRIPS Agreement, *supra* note 8.

- 20-year term of protection from patent filing date;³³
- Patents to be provided without discrimination as to place of invention, field of technology or whether imported or locally produced;³⁴
- National treatment such that IPR protection of non-nationals is to be no less favorable than for nationals;³⁵ and
- Exclusive patent rights with respect to making, using, selling or importing of the technology.³⁶

These provisions mean that states are obliged to grant a twenty-year period of monopoly rights to patent holders and are prevented from affording preferential treatment to foster domestic innovation industries.

The TRIPS Agreement, however, qualifies patent protection rights. The purpose of the Agreement, as revealed in Article 7, is to protect the rights of patent holders but also to *promote the transfer and dissemination of technology* to the mutual advantage of producers and users:

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.³⁷

The Article 8 principles, furthermore, allow Members to adopt provisions 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.”³⁸ The Doha Public Health Declaration reaffirms that “each provision of the TRIPS Agreement shall be read in light of the object and purpose of the Agreement as expressed [...] in its object and principles.”³⁹ As Howse has commented, TRIPS contains a balance of rights and obligations “providing some

33. *Ibid.* at art. 33; see Jayashree Watal, *Intellectual Property Rights in the WTO and Developing Countries* (The Hague: Kluwer Law International, 2001) at p. 329 [Watal, *Developing Countries*]. Notwithstanding the twenty-year term, patents may be revoked under art. 32 provided there is judicial review. This permits revocation for failure to work the patent locally under the terms of the *Paris Convention for the Protection of Industrial Property*, 20 March 1883, as amended 28 September 1979, <http://www.wipo.int/treaties/en/ip/paris/pdf/trtdocs_wo020.pdf>, 828 U.N.T.S. 303, 21 U.S.T. 1583 [*Paris Convention*] and may be used to revoke on the basis of patent abuse, public interest or to protect the environment. On the twenty-year term, see Carlos M. Correa, “Managing the Provision of Knowledge: The Design of Intellectual Property Laws” in Inge Kaul, ed., *Providing Global Public Goods: Managing Globalization* (Oxford: Oxford University Press, 2003) at footnote 15. This one-size-fits-all standard of patent protection defies economic rationalization. The premise of the monopoly interest is to allow innovators to recoup their R&D and allow some measure of profit; however, the patent term does not take into account the varying amounts of R&D resources that go into inventions. A more economically efficient model, and one that would balance innovation with dissemination, would see patent terms commensurate with the degree of financial and research investment.

34. TRIPS Agreement, *supra* note 8 at art. 27.

35. *Ibid.* at art. 3.

36. *Ibid.* at art. 28.

37. *Ibid.* at art. 7.

38. *Ibid.* at art. 8.1.

39. WTO Ministerial Conference, *Declaration on the TRIPS Agreement and Public Health*, WTO Doc. WT/MIN(01)/DEC/2 (2001), <http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_trips_e.htm> para. 5(a) [WTO, *Doha Public Health Declaration*] (emphasis added).

significant scope for Members to circumscribe intellectual property rights in the name of competing public values.⁴⁰

Articles 7 and 8 infuse meaning into how states are to implement and amend legislation in conformity with TRIPS, particularly in respect of the following provisions:⁴¹

- The patentability criteria of novelty, usefulness and non-obviousness;⁴²
- Patentability exclusions “necessary to protect *ordre public* or morality, including to protect human, animal or plant life or to avoid serious prejudice to the environment”;⁴³
- Exceptions to exclusive rights conferred by patents based on the legitimate interests of patent owner and those of third parties;⁴⁴
- Compulsory licensing requirements, that is, the granting of a non-exclusive licence with adequate remuneration to the patent holder

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40. Robert Howse, “The Canadian Generic Medicines Panel: A Dangerous Precedent in Dangerous Times” (2000) 3:4 *The Journal of World Intellectual Property* 493 at p. 494 [Howse, “Canadian Generic Medicine Panel”].
41. TRIPS Agreement, *supra* note 8 at arts. 7–8; “Members shall be free to determine the appropriate method of implementing the provisions of this Agreement within their own legal system and practice.” *Ibid.* at art. 1.1.
42. *Ibid.*, art. 27.1, only requires that patents be granted for products and processes, in all fields of technology, provided they are “new, involve an inventive step and are capable of industrial application.” How countries choose to set thresholds for these criteria is a matter of discretion. Commission on Intellectual Property Rights, *Integrating Intellectual Property Rights and Development Policy* (London: Commission on Intellectual Property Rights, 2002), <http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf> at pp. 114–118 [CIPR, *IP Rights and Development Policy*] recommends that developing countries devise patent systems that take into account their particular economic and social circumstances. While the TRIPS Agreement, *supra* note 8, has “blunted” the tools available to legislators, states should use the flexibility under the Agreement to impose strict standards of novelty, utility, and non-obviousness for patentability, thus avoiding clusters of trivial inventions that may impede further research, and ensure the breadth of patent protection is commensurate with the inventive contribution and disclosure. See also Bernard M. Hoekman, Keith E. Maskus & Kamal Saggi, “Transfer of Technology to Developing Countries: Unilateral and Multilateral Policy Options,” *World Bank Policy Research Working Paper 3332* (2004), <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=610377> at p. 20 [Hoekman, Maskus & Saggi, “Transfer of Technology to Developing Countries”]: “Based on the experience of Asian economies, developing countries should adopt standards for patentability, novelty, and utility that are stricter (i.e., they raise a higher bar to patenting) than those found in the US and EU members.” See also Carlos M. Correa, “Patent Rights” in Carlos M. Correa & Abdulqawi A. Yusuf, eds., *Intellectual Property and International Trade: The TRIPs Agreement* (Kluwer Law: The Hague, 1998) 189–221 at p. 201 [Correa, “Patent Rights”]: “countries have discretion whether to patent new uses for known or patented products”; and at p. 205, “countries have discretion as to whether they interpret claims literally or purposively.” See also Carlos A. Primo Braga, Carsten Fink & Claudia Paz Sepulveda, “Intellectual Property Rights and Economic Development” in Keith Maskus, ed., *The WTO, Intellectual Property Rights and the Knowledge Economy* (Cheltenham: Elgar, 2004) 245–291 at p. 267 [Braga, Fink & Sepulveda, “IP and Economic Development”]: “broad patent claims may stifle follow on innovation since subsequent inventors will find it difficult to ‘invent around’ a previous innovation, or too costly to obtain a licence from the patent holder.” Correa, “Managing the Provision of Knowledge,” *supra* note 33. There is also nothing which prevents, as Correa advocates, the institution of inexpensive and accessible mechanisms to challenge wrongly granted patents.
43. TRIPS Agreement, *supra* note 8 at art. 27.2.
44. *Ibid.* at art. 30; Watal, *Developing Countries*, *supra* note 33 at pp. 314–315: “Most commentators agree that the limited exceptions are those recognized in most patent laws: private and non-commercial use, use for research, experimental or academic purposes, use in the direct preparation of individual medicines by pharmacies....” See also *Panel Report Canada—Patent Protection of Pharmaceutical Products*, WT/DS114/R (2000), <http://www.wto.org/english/tratop_e/dispu_e/7428d.pdf>, which tied art. 30 to art. 27.1 non-discrimination provisions, and otherwise interpreted the art. 30 exceptions narrowly. Howse, “Canadian Generic Medicines Panel,” *supra* note 40 comments at p. 494 that the panel in that case “ignores these words about balance and mutual advantage, interpreting the patent provisions of the TRIPS Agreement largely from the perspective of intellectual property rights holders, abstracting from competing social interests, and reducing considerably the range of regulatory diversity permitted under TRIPS.” Confirming both these points, see also Amit Gupta, “Patent Rights on Pharmaceutical Products and Affordable Drugs: Can TRIPS Provide a Solution,” (2004) 2 *Buffalo Intellectual Property Law Journal* 127, <<http://users.ox.ac.uk/~edip/gupta.pdf>> at pp. 134, 144. Gupta asserts in particular that the panel failed to follow rules of treaty interpretation under *Vienna Convention on the Law of Treaties*, 23 May 23 1969, <http://untreaty.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf>, 1155 U.N.T.S. 331, art 31.

- according to grounds prescribed under the laws of the state;⁴⁵
- The adoption of “appropriate measures” to prevent patent abuses that unreasonably restrain trade or adversely affect international technology transfer, provided these measures are consistent with the agreement;⁴⁶
 - The adoption of measures to prevent and to control licensing practices or conditions that may have adverse effects on trade and that may impede the transfer and dissemination of technology, including exclusive grant back conditions, conditions preventing challenges to validity and coercive packaging licensing;⁴⁷
 - No prohibition on international exhaustion of patent rights upon first sale or distribution, thereby permitting parallel imports (competitive pricing) according to national legislation.⁴⁸

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4. DOES TRIPS FACILITATE OR IMPEDE THE INTRODUCTION OF EST TRANSFER INTO DEVELOPING COUNTRIES?

THE CLIMATE CHANGE CONVENTION is not explicit in identifying the *specific* means for technology transfer, other than through the financial mechanism (GEF). As a result, the technology transfer provisions are capable of varied interpretations, and compliance with Article 4.5 is not possible to measure.⁴⁹ The language of the Kyoto Protocol, while more explicit in emphasizing the role of the private sector (as well as public sector and public domain technologies), is similarly devoid of *specific* commitments. There is then no conflict on the face between the climate change regime and TRIPS. The real question, however, is whether the TRIPS Agreement creates a regime that *de facto* impedes the flow of EST into developing countries.

4.1. Effect on Local Innovation

Patents create a proprietary interest in non-excludable, non-rivalrous goods (that is, the invention) by giving rights of exclusive use, manufacture, and sale to the owner of an invention, and by providing legal recourse against infringement (that is, unauthorized use, manufacture, or sale). These rights prevent free riding by

45. TRIPS Agreement, *supra* note 8 at art. 31; CIPR, *IP Rights and Development Policy*, *supra* note 42 at p. 119 quite rightly notes that countries can develop their own grounds for compulsory licensing. This appears to be confirmed by the WTO, *Doha Public Health Declaration*, *supra* note 39 at para. 5: “Each Member has the right to grant compulsory licenses and the freedom to determine the grounds upon which such licenses are granted.” Watal, *Developing Countries*, *supra* note 33 at p. 319: “Although there is a reference to some grounds in Article 7, 8 and 30 of TRIPS, these are by no means the only grounds.”

46. TRIPS Agreement, *supra* note 8 at art 8.2.

47. TRIPS Agreement, *supra* note 8 at art. 40; Correa, “TRIPS and Developing Countries,” *supra* note 7 at p. 238 describes these licensing practices: “[1] exclusive grant-back provisions, i.e., those that oblige the licensee to transfer the improvements made on the licensed technology exclusively to the licensor; [2] obligations imposed on the licensee not to challenge the validity of licensed rights [and 3] coercive package licensing, i.e., the obligation for the licensee to acquire from the licensor other technologies or inputs he does not need or desire.”

48. TRIPS Agreement, *supra* note 8 at art. 6. Parallel imports would allow developing countries to purchase cheaper imported patented products, thus taking advantage of competitive differential pricing.

49. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 94–95: “However, because these provisions are ambiguous, it is difficult to assess performance in a compliance sense.”

imitators and encourage the disclosure of inventions that otherwise might remain trade secrets.⁵⁰ Patents thus allow innovators to recoup their costs and make a profit from their inventions, offering incentive to invest in the research and development of technologies and, upon fruition, to disclose the details of their inventions. While local innovators in developing countries may benefit from strong patent protection, the reality is that research and development capacities in developing countries are generally limited and tend to focus or follow on innovation (or adaptation or improvement of developed world technologies). Thus, any benefit of strong patent laws accruing to local innovators in developing countries is, in most cases, overwhelmingly outweighed by the high cost of importing patented technologies from developed countries.⁵¹ Many commentators have suggested that overly protective IPR regimes may inhibit follow-on innovations, thus slowing down technological development, particularly in developing countries.⁵²

4.2. International Trade and Licensing

In terms of technology flows from developed countries, it is speculated that firms will be more willing to trade, license, and invest in technologies in countries with strong IPR regimes.⁵³ Patent protection facilitates trade in goods by assuring exporters of remedies for infringement when imitators illegally copy or reverse engineer patented technologies without permission.⁵⁴ According to one study, increased IP protection facilitates trade flows of patented goods into middle-income and large developing countries (where there is an imitation threat), whereas trade flows to poor countries “are not responsive to patent rights.”⁵⁵ Trade may also occur through technology licensing to arm’s length or competitor firms, that is, “the purchase of production or distribution rights and the technical information and know-how needed to exploit them.”⁵⁶ While strong patent laws provide the legal security and mechanism for such licensing to occur, the larger issue (again) is the extent to which firms within developing countries can afford

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50. Meir Perez Pugatch, *The International Political Economy of Intellectual Property Rights* (Cheltenham: Edward Elgar, 2004) at p. 19 [Pugatch, *International Political Economy of IP Rights*].
 51. Duncan Matthews, *Globalising Intellectual Property Rights: The TRIPs Agreement* (New York: Routledge, 2002) at p. 110 [Matthews, *Globalising IP Rights*].
 52. See, for example, World Bank, *World Development Report 1998–99: Knowledge for Development* (Washington DC: World Bank, 1999), <<http://www.worldbank.org/wdr/wdr98/contents.htm>> at pp. 34–35 [World Bank, *World Development Report*].
 53. Keith Maskus & Jerome Reichman, “The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods” in Keith Maskus & J.H. Reichman, eds., *International Public Goods and Transfer of Technology* (Cambridge: Cambridge University Press, 2005) 3–45, <<https://www.law.duke.edu/cspd/articles/reichman.pdf>> at p. 13 [Maskus & Reichman, “Globalization and Privatization”]; Guifang Yang & Keith E. Maskus, “Intellectual Property Rights Ad Licensing: An Econometric Investigation” in Carsten Fink & Keith E. Maskus, eds., *Intellectual Property and Development: Lessons from Recent Economic Research* (Washington DC: World Bank 2005) 111–131, <http://www.worldbank.org/research/IntellProp_temp.pdf> at p. 112, refers to one study which indicated that US MNEs “were less likely to transfer advanced technologies to unaffiliated firms in countries with weak patent laws.” Furthermore, at p. 113, the degree of patent protection may influence whether a firm licenses the technology (strong patent laws) or invests directly (weak patent laws). Strong patent laws reduce imitation risk, uncertainty, and transaction costs involved in technology contracts thereby encouraging licensing relative to trade.
 54. Put another way, IPRs “create a market for knowledge by providing a legal basis for technology sales and licensing”: World Bank, *World Development Report*, *supra* note 52 at p. 34.
 55. Hoekman, Maskus & Saggi, “Transfer of Technology to Developing Countries,” *supra* note 42 at p. 15.
 56. Maskus & Reichman, “Globalization and Privatization,” *supra* note 53 at p. 11.

to purchase expensive patented technologies.⁵⁷

4.3. Foreign Direct Investment

It is unclear whether technologies from transnational corporations that invest in developing countries tend to be more environmentally sound than technologies employed by local firms.⁵⁸ Foreign direct investment (usually meaning technology transfer from the parent firm to the subsidiary in a developing country) may be facilitated by strong patent laws. The rationale here is that transnational corporations will be more willing to invest in countries, either through joint ventures or through subsidiaries, where innovations will be protected against infringement.⁵⁹ Significantly, evidence exists that strong IPR protection is not a determinative consideration for investment decisions by transnational corporations and thus relatively few developing countries have benefited from it. Specifically, the countries that benefit have favourable investment conditions as well as IPR protection.⁶⁰ While available evidence is ambiguous, some studies conclude that strong patent rights are a positive inducement for FDI into middle income and large developing countries—although they have no impact on attracting capital into poor countries.⁶¹

4.4. Assessment

In light of the above, it is not surprising that the overall effect of strong patent protection on the transfer of technology into developing countries is not clear.⁶² Discussion on this point tends to focus on the complex trade-offs that occur through the adoption of a system of strong patent protection. There is no “right”

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57. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 24. Further at pp. 124–125, the IPCC emphasizes the limited importance of stronger IPR protection in the absence of stronger legal institutions more generally in developing countries.
58. While FDI flows can lead to lower environmental standards in developing countries, firms in most cases tend to use company-wide standards according to Jean Chin, “The Framework Convention on Climate Change: A General Overview of Innovation Approaches to Technology Transfer” in Tim Forsyth, ed., *Positive Measures for Technology Transfer Under the Climate Change Convention* (London: Royal Institute of Environmental Affairs, 1998) 77–97 at p. 81. See also World Bank, *World Development Report*, *supra* note 52 at pp. 28–29: where the purpose of investment is to jump tariff walls, technologies will likely be older and more inefficient since they need only compete with domestic firms. Developing countries that have more open trade regimes will attract competitive, outward-oriented FDI, bringing more efficient technology and management.
59. See Braga, Fink & Sepulveda, “IP and Economic Development,” *supra* note 42 at pp. 270–271.
60. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 96. See also Arvind Panagariya, “TRIPS and the WTO: An Uneasy Marriage” in Keith Maskus, ed., *The WTO, Intellectual Property Rights and the Knowledge Economy* (Cheltenham: Elgar, 2004) 42–53, <<http://www.bsos.umd.edu/econ/Panagariya/song/tripswto2.pdf>> at p. 46 [Panagariya, “TRIPS and the WTO”]. The success of FDI in China, in the absence of strong patent protection may support this view. See also Matthews, *Globalising IP Rights*, *supra* note 51 at p. 112. Countries that appeared on the USTR watch list for the worst violators of IP were the ones to receive some of the most significant inflows of FDI—including Argentina, Brazil and PR China. At p. 109, even if IP laws do encourage technology transfer in individual cases, it is clear that FDI has tended to concentrate in a few countries, such as China, Mexico, Malaysia and Brazil, rather than developing countries generally. See also Richard C. Levin et al., “Appropriating the Returns from Industrial Research and Development” in Robert P. Merges & Jane C. Ginsburg, eds., *Foundations of Intellectual Property* (New York: Foundation Press, 2004) 61–68, <<http://cowles.econ.yale.edu/P/p07a/p0714.pdf>> at p. 63. There is empirical evidence that, at least in some high technology sectors, lead-time and high learning curve advantages—even secrecy—are more effective tools of appropriation of new technology than patent protection.
61. Hoekman, Maskus & Saggi, “Transfer of Technology to Developing Countries,” *supra* note 42 at p. 15. According to Correa, “TRIPS and Developing Countries,” *supra* note 7 at p. 228, the available evidence on the impact of IPR on technology transfer and in attracting FDI is limited and ambiguous.
62. See IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 96. In light of the complex trade-offs that must be made by individual countries, generalizations about intellectual property rights may not be helpful.

degree of patent protection, and the benefits and impediments for technology transfer will differ according to factors such as the technology, the sector, and the country involved.⁶³ Under TRIPS, developing countries must adopt minimum standards of protection, meaning twenty-year patent terms, and are prohibited from favouring domestic innovation industries. This will not be a good bargain for all states, especially those that cannot afford to license new technologies or those that are not attracting the FDI that stronger patent laws promise. To the extent that minimum levels of patent protection make technologies prohibitively expensive (and for which developed countries do not pay through development assistance or the GEF) or fail to attract FDI, it is probably the case that TRIPS is an impediment to technology transfer.

Developing countries need to assess the extent to which strong patent protection helps to develop their economies through technology transfer. The TRIPS Agreement permits considerable flexibility in terms of what is patented and on what basis, the interpretation of claims, permitted exceptions, compulsory licensing, and remedying abuses and anti-competitive practices. Many commentators and reports suggest that countries should take advantage of these flexibilities.⁶⁴ However, too much should not be read into these flexibilities since Article 7 demands a balance between public interest concerns and the rights of patent holders. Prior to TRIPS, states could choose an appropriate level of patent protection based on their level of economic development, innovation policies, and public interest priorities.⁶⁵ It is probably the case that freedom of choice in the design of patent laws is the best system to maximize technology transfer into individual countries.

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5. COMPULSORY LICENSING FOR EXPORT TO DEVELOPING COUNTRIES

5.1. The Challenge Posed by Environmental Standards

PATENT RIGHTS MAY GIVE RISE to abuses rooted in the desire to ward off competition. Abusive practices include a refusal to license patented technologies, restrictive licensing, and both cluttering up the patent register and dumping

63. *Ibid.* at p. 96.

64. See CIPR, *IP Rights and Development Policy*, *supra* note 42. See also J.H. Reichman, "From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement," (1997) 29:1-2 *New York University Journal of International Law and Politics* 11 at pp. 25-26: "[...]developing countries should seek to maintain the maximum amount of competition in their domestic markets that is consistent with a good faith implementation of the international minimum standards of intellectual property protection. In carrying out this task, they will find much room to maneuver from within the international conventions themselves, which leave wide and crucial issues, especially scope of protection issues, to the vagaries of WTO Member States' domestic laws."

65. This point is made by Panagariya, "TRIPs and the WTO," *supra* note 60 at p. 43 and at p. 46.

patented goods in developing countries.⁶⁶ While the matter has not been adequately studied in the context of EST transfer, there is evidence of patent abuse in the environmental protection context. In the ozone regime, fear of competition led to refusal by certain patent holders to license technologies to firms in some developing countries:

According to Korean firms and R&D institutions, there were cases where the private firms and even public institutions of industrialised countries refused to license such ESTs like HFC-134a, fuel cell and IGCC (Integrated Gasification Combined Cycle).⁶⁷

The refusal to export non-ozone depleting substances to Korea forced local firms to invest twelve-million dollars over a six-year period to develop their own technology.⁶⁸ Furthermore,

...there were examples in the implementation of the Montreal Protocol in India where Indian firms were refused licenses on patented technologies for substitutes for ozone depleting substances. These technologies were closely held by a small group of transnational companies, which could be operating as a cartel to control production. This refusal constituted a violation of the obligation in the Montreal Protocol that placed the onus on developed countries to take every practicable step to ensure the transfer of such technologies.⁶⁹

The apparent reason for the refusal to license was that patent holders viewed

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66. IPCC, *Issues in Technology Transfer*, *supra* note 1 at p. 99. Abuses and restrictive trade practices tend to occur at the initial stage of innovation when there are few competitors. At p. 99, one way that a firm might seek to maximize its monopoly is to register patents in competitor countries as well as dump the product in that matter to drive out competition. When Korea was developing non-ozone depleting technologies, companies with HFC technology refused to license or sell the technology and one foreign company registered forty patents in Korea in 1993 in an effort to block indigenous development. As Korea neared completion of its own HFC-134a technology development, the company changed its policy and offered to sell the company's HFC-134a technology. See also Rae Kwon Chung, "The Role of Government in the Transfer of Environmentally Sound Technology" in Tim Forsyth, ed., *Positive Measures for Technology Transfer Under the Climate Change Convention* (London: Royal Institute of International Affairs, 1998) 47–61 at p. 52 [Chung, "Transfer of Environmentally Sound Technology"]: "As the level of sophistication of ESTs grows, there will also be a trend towards monopolization of ESTs, in order to maintain control over their potentially profitable impacts and increasing demand. Already, a large proportion of cutting-edge technologies cannot be bought or licensed."
67. IPCC, *Issues in Technology*, *supra* note 1 at p. 99.
68. See Chung, "Transfer of Environmentally Sound Technology," *supra* note 66 at p. 52. See also Korean Trade Promotion Agency, "Case Study 4: The Republic of Korea and the Montreal Protocol" in Veena Jha & Ulrich Hoffmann, eds., *Achieving Objectives of Multilateral Environmental Agreements: a package of trade measures and positive measures* (United Nations Conference on Trade and Development UNCTAD/ITCD/TED/6), <http://www.unctad.org/en/docs/itcdted6_en.pdf> at p. 62: "In the opinion of Korean firms, the exorbitant high royalties are an expression of a lack of intention to transfer the alternative technology on the part of technology owners."
69. Watal, *Developing Countries*, *supra* note 33 at p. 389.

Indian companies as potential competitors.⁷⁰ There is also some evidence that fear of competition is an impediment to the transfer of climate change technologies.⁷¹

As these incidents seem to demonstrate, the setting of environmental standards can lead to abuses by IPR holders, which may conflict with multilateral environmental agreement provisions that oblige states to transfer EST.⁷² Indeed, the setting of standards under multilateral environmental agreements may tempt IPR owners to “maximize their returns by charging high prices and setting restrictive licensing terms”⁷³ or to simply refuse to deal their technology. There are at least two reasons to believe that, as the climate change regime evolves, refusal to license to maintain competitive advantage will become a real problem. First, as the actual costs associated with GHG emissions increase, innovators will respond to the market opportunity with greater investment in the development and production of cleaner or more efficient environmental technologies.⁷⁴ Second, if there is a move to adopt industry- or product-specific environmental standards, patent holders of technologies that help industries meet those standards may refuse to deal in order to maintain their competitive advantage.⁷⁵ Commentators in the climate change debate have suggested the use of

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70. Jayashree Watal, “Case Study 3: India: The Issue of Technology Transfer in the Context of the Montreal Protocol” in Veena Jha & Ulrich Hoffman, eds., *Achieving Objectives of Multilateral Environmental Agreements: A Package of Trade Measures and Positive Measures* (United Nations Conference on Trade and Development UNCTAD/ITCD/TED/6) 45–55, <http://www.unctad.org/en/docs/itcdted6_en.pdf> at p. 49: “Given the growing importance of HFC 134a domestically and in the international market, producers of CFCs in India are very keen to acquire the technology for this alternative[...]. However, the efforts of these producers in accessing the relevant technology has been largely futile so far, owing mainly to the high cost and the reluctance among the technology owners to sell the technology to a potential competitor,” and at p. 54: “According to industry sources, the technology suppliers are concerned that equipped with the alternative technology, India could become a potential competitor in both the sizeable Indian market, as well as internationally.”
71. See UNFCCC, *Enabling Environments*, *supra* note 10 at para. 69: “Recent results from the GEF climate change programme, however, reveal that know-how transfer can prove difficult when foreign manufacturers perceive competition threats.” At para. 77(c): “[...] although international power plant manufacture[r]s are enthusiastic about closer relationships with Chinese equipment suppliers, they often feel that licensing will ‘lead to an erosion of their technological position and loss of revenue.’” See also Keith E. Maskus, Kamal Saggi & Thitima Puttitanun, “Patent Rights and International Technology Transfer through Direct Investment and Licensing” (Paper prepared for Duke University Law School conference, 4–6 April 2003), <spot.colorado.edu/~maskus/papers/MSP-paper_6-04.doc> at p. 3: “Firms may chose to withhold technological information from particular countries for competitive reasons, a strategy that is facilitated by globalized IPRs. The specter of anticompetitive deployment of patents and patent pools in order to discourage local firms from learning technologies through imitation and reverse engineering surely looms large in the context of weak competition enforcement in most developing economies.”
72. Braga, Fink & Sepulveda, “IP and Economic Development,” *supra* note 42 at p. 276. In the case of the Montreal Protocol, the obligation is to transfer EST on fair and favorable terms.
73. *Ibid.* at p. 276. The authors note at p. 275, however, that standard-setting bodies typically avoid using patented technologies as the standard unless a deal is first struck with the patent holder to ensure licensing on fair and reasonable terms.
74. Terence H. Thorn, “The Role of the Private Sector in the Transfer of Environmentally Sound Technology” in Tim Forsyth, ed., *Positive Measures for Technology Transfer Under the Climate Change Convention* (London: Royal Institute of International Affairs, 1998) 63–75 at p. 71. Thorn offers a prescriptive dimension of this phenomenon, that is, innovators need “clear and steady price signals for carbon reduction upon which they can predicate investments for the development or production of clean energy technologies. Such signals can only be achieved by demand. With demand, suppliers will develop massive production facilities and benefit from economies of scale.”
75. Standards may take many forms—ambient, emission, performance, product and/or technology standards—though many commentators have suggested the use of technology standards. See Veena Jha & Ana Paolo Teixeira, “Are Environmentally Sound Technologies the New Emperor’s Clothes?” Discussion Paper No. 89, United Nations Conference of Trade and Development, 1994 at p. 12: “Ambient standards: to determine the permitted concentration of pollutants in a given medium (air, water or soil); Emission standards: to set maximum levels of pollution releases, by plant, industry or region; Technology standards: to determine the technology to be used in the production process; Performance standards: to specify pollution releases per unit of output from a given plant; Product standards: to specify the physical or chemical properties of a product.”

technology-based standards as an effective way to reduce and monitor compliance with greenhouse gases.⁷⁶ Barrett, for example, argues that the climate change regime should create protocols that establish technology standards for electricity generation, carbon capture and storage, and vehicles since these are relatively easy to administer.⁷⁷

5.2. TRIPS and Refusal to Deal (License)

Developing countries may implement compulsory licensing provisions to remedy a refusal to deal in situations where the patent has been filed in that country.⁷⁸ However, this may not be as sound a solution to the problem as may first appear. Developing country firms may lack the expertise to develop the technology without more than just the blueprint. In particular, compulsory licensing does not oblige the patent holder to transfer know-how (nor does patent law in general).⁷⁹ The question turns then to whether a firm in a developed country where the patent is registered may obtain a compulsory licence to supply an export market in a developing country?

According to one view, a patent holder has the absolute right not to license or sell her patent and thus a refusal to deal is neither abusive nor anti-competitive.⁸⁰ There is no basis under TRIPS, according to this view, to compulsorily license technologies which companies refuse to deal because "there is no sounder business practice than refusing to engage in commercial deals with competitors."⁸¹ This argument, however, runs counter to the terms of Article 8.2. A refusal 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:

Appropriate measures, provided that they are consistent with the provisions of the 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.⁸²

This Article leaves intact "broad authority to define what may constitute an

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76. See, for example, Richard E. Benedick, "Striking a New Deal on Climate Change" (2001) 18 *Issues in Science and Technology* 71, <<http://issues.org/18.1/benedick.html>> at p. 76. See Deborah Murphy, John Van Ham & John Drexhage, *Climate Change and Technology* (International Institute for Sustainable Development, 2005), <http://www.iisd.org/pdf/2005/climate_tech.pdf> at paras. 55-62 for a general discussion of the issue.
77. Scott Barrett, "Creating Incentives for Cooperation: Strategic Choices," in Inge Kaul *et al.*, eds., *Providing Global Public Goods: Managing Globalization* (New York: Oxford University Press, 2003) 308-328.
78. See discussion of compulsory licensing, below. If the patent is not filed in a particular country, then nothing would prevent the working of the patent subject to any restrictions in connection with national exhaustion rules. See Pugatch, *International Political Economy of IP Rights*, *supra* note 50 at p. 57. Developing countries can in most cases access this disclosure in the patent offices of the firm's home countries.
79. TRIPS Agreement, *supra* note 8 at art. 29 requires sufficiently clear and complete disclosure, and best mode, of the invention to the skilled addressee in the art.
80. Nuno Pires de Carvalho, *The TRIPS Regime of Patent Rights* (The Hague: Kluwer Law International, 2005) at p. 162 [de Carvalho, *TRIPS Regime of Patent Rights*].
81. *Ibid.* at p. 319. Furthermore, at p. 317, "[T]he essence of the patent right is to say 'no' to third parties" and at p. 320, a compulsory license should not be granted for refusal to deal as it would violate art. 28.1.
82. TRIPS Agreement, *supra* note 8 at art. 8.2.

abusive unilateral exercise of intellectual property rights.⁸³ An abuse of a patent is broader in scope than anti-competitive practices under Article 40, and may include the refusal to work or license a patent.⁸⁴ As one writer notes, the refusal to deal constitutes a pre-condition to the granting of a compulsory licence (as we will see) but also serves as an autonomous ground.⁸⁵

The legislation of developed countries varies on the question of refusal to deal as a ground for compulsory licensing. In Canada, refusal to license or to grant a licence on reasonable terms is a ground for compulsory licensing if trade or industry in the country is prejudiced and it is in the public interest that a licence be granted.⁸⁶ In the UK, grounds for compulsory licensing include when national demand for the product or process is not met on reasonable terms and establishment or development of national commercial activities is unfairly prejudiced.⁸⁷ Furthermore, in the case of non-WTO countries, a compulsory licence may be granted for a refusal to license a patent on reasonable terms and "a market for the export of any patented product made in the United Kingdom is not being supplied."⁸⁸ The situation in Australia, Europe, and the US is far less permissive on refusal to deal as a ground for compulsory licensing and is usually tied in with anti-competitive practices.⁸⁹ Thus, while a refusal to deal is a recognized abuse of patent in some countries, none offer a refusal to license in a WTO country export market as a ground for compulsory licensing.

Does TRIPS prohibit compulsory licensing for a refusal to license on reasonable commercial terms in export markets? There are some possible arguments to support an affirmative response. First, the exclusive rights of patent holders under Article 28.1 are silent on exports, and thus a licensee could theoretically supply an export market without infringement, subject to rules of

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83. Hanns Ullrich, "Expansionist Intellectual Property Protection and Reductionist Competition Rules: A TRIPS Perspective" in Keith Maskus & J.H. Reichman, eds., *International Public Goods and Transfer of Technology under a Globalized Intellectual Property Regime* (Cambridge: Cambridge University Press, 2005) 726–755 at p. 733.
84. See de Carvalho, *TRIPS Regime of Patent Rights*, *supra* note 80 at p. 155: "Anti-competitive practices are always abusive. But there are abusive practices that are not necessarily anti-competitive."
85. Correa, "TRIPS and Developing Countries," *supra* note 7 at p. 243. Correa also points to paragraph 5(b) of WTO, *Doha Public Health Declaration*, *supra* note 39 in which it is said that TRIPS does not limit the grounds that Members may determine for granting compulsory licences. See Mark D. Janis, "'Minimal' Standards for Patent-Related Anti-trust Law under TRIPS" in Keith Maskus & J.H. Reichman, eds., *International Public Goods and Transfer of Technology under a Globalized Intellectual Property Regime* (Cambridge: Cambridge University Press, 2005) 774–792 at p. 776. Janis suggests there are plausible arguments for both broad and narrow interpretations of TRIPS Agreement art. 8.2, referring in n. 15 to UNCTAD position that art. 8.2 should cover "practices which unreasonably restrain trade or adversely affect the international transfer of technology."
86. Patent Act, R.S.C. 1985, c. P-4, s. 65(2)(d), <<http://laws.justice.gc.ca/en/P-4/index.html>>. See also s. 65(2)(c): another ground for a compulsory licence is where demand for a patented article in Canada is not met to an adequate extent and on reasonable terms.
87. See CIPR, *IP Rights and Development Policy*, *supra* note 42 at p. 119.
88. Patents Act 2004 (U.K.), 2004, c. 16, <<http://www.opsi.gov.uk/acts/acts2004/20040016.htm>>, s. 48B(1)(d)(i).
89. See Correa, "TRIPS and Developing Countries," *supra* note 7 at pp. 244–247.

exhaustion in the export country.⁹⁰ This loophole could be closed, however, through licensing provisions that prohibit exports of the product or process. One could also argue that Article 8.2 or Article 30 is an autonomous basis for compulsory licensing *outside* of the requirements imposed under Article 31 which prevent compulsory licences in order to supply an export market. However, in light of the approach taken by WTO members to use Article 31 rather than Article 30 exceptions for compulsory licences for HIV/AIDS and other essential medicines in the developing world, it seems likely that the Article 31 compulsory licensing provisions are intended to be definitive on the matter.⁹¹

The only avenue for compulsory licensing appears to be Article 31. Members may, at their discretion and in taking account of the balance of rights and obligations, set grounds for compulsory licensing under their national legislation. There are eleven safeguards to compulsory licences, the main stipulations being as follows:

- 1) Licences are to be given on their individual merits thus suggesting a case-by-case basis;⁹²
- 2) The proposed user first attempts to obtain authorization on reasonable commercial terms and conditions, and such efforts are unsuccessful within a reasonable period of time;⁹³
- 3) *Scope and duration of use is limited to the purpose for which it was authorized, and authorization is to be terminated when circumstances which led to the licence "cease to exist and are unlikely to recur";*⁹⁴
- 4) *Use is to be non-exclusive and non-assignable;*⁹⁵
- 5) *"[U]se shall be authorized predominantly for supply of the domestic market of the Member authorizing such use";*⁹⁶
- 6) Right holder is to be paid adequate remuneration taking into account the economic value of the authorization, and subject to judicial review;⁹⁷
- 7) More permissive rules for authorization as a remedy for anti-competitive practice as determined by a judicial or administrative process.⁹⁸

90. See de Carvalho, *TRIPS Regime of Patent Rights*, *supra* note 80 at p. 329, footnote 865, for a discussion of this point. Developing countries have made this argument, though it is countered that unauthorized making of products or using of processes for export markets would nonetheless be an infringement. TRIPS Agreement, *supra* note 8 at art. 6 does not prevent a country from adopting a rule of international exhaustion in which the title holder would lose its exclusive privilege after first distribution of the product, thus allowing for parallel imports in the exporting country. See Carsten Fink, "Entering the Jungle of Intellectual Property Rights Exhaustion and Parallel Importation" in Carsten Fink & Keith Maskus, eds., *Intellectual Property and Development: Lessons from Recent Economic Research* (Washington: World Bank, 2005) 171–187, <http://www.worldbank.org/research/IntellProp_temp.pdf> at p. 171.

91. Richard Elliot, "TRIPS from Doha to Cancun...to Ottawa: Global Developments in Access to Treatment and Canada's Bill C-56," (2003) 8 *Canadian HIV/AIDS Policy & Law Review* 3, <<http://www.aidslaw.ca/publications/interfaces/downloadFile.php?ref=1161>> at pp. 11–12.

92. TRIPS Agreement, *supra* note 8 at art. 31(a).

93. *Ibid.* at art. 31(b).

94. *Ibid.* at arts. 31(c) and (g).

95. *Ibid.* at art. 31(d) and (e).

96. *Ibid.* at art. 31(f).

97. *Ibid.* at art. 31(h) and (j).

98. *Ibid.* at art. 31(k).

These requirements permit some flexibility in the drafting of compulsory licensing laws.⁹⁹ Still, the emphasized requirements above (numbers 3–5) pose important prohibitions and constraints to compulsory licensing for the purpose of exporting technologies. The main limitation is that the compulsory licence must primarily serve the domestic market, and only incidentally may they be exported.¹⁰⁰ States, then, cannot grant compulsory licences to serve export markets¹⁰¹ and, as per the WTO Decision on Public Health, would need to waive the requirements of Article 31(f) to supply export markets with needed technologies.¹⁰² Second, the limited duration of the compulsory licence presents a practical economic disincentive to pursue a compulsory licence. Potential compulsory licensee applicants may be discouraged by the strict time-limited nature of the licence and the fact that a non-exclusive licence does not prevent the patent holder from competing in the same market with a brand name advantage.¹⁰³ According to Correa, the licensee must be allowed to recoup its investment, and this may require the life of the patent.¹⁰⁴ Third, licensees should not be limited to single-country markets but should be able to take advantage of economies of scale by serving all potential export markets. While Article 31 does not impose such a restriction, the WTO Public Health Decision follows a system of single Member country export, and thus generic drug manufacturers are not able to take advantage of economies of scale.¹⁰⁵

Environmentally sound technology transfer to developing countries could be facilitated by allowing states to issue compulsory licences to competitors in order to serve export markets in refusal to deal situations. The probable main effect of such measures would be to create a disincentive for patent owners not to sell their inventions. Furthermore, compulsory licensing for export markets would be consistent with push obligations contained within the climate change regime requiring states to promote and facilitate technology transfer. Nevertheless, the compulsory licensing provisions of the TRIPS Agreement prohibit licences for primarily export markets, and more than that, discourage competitor firms from investing in such projects.

99. See discussion in Watal, *Developing Countries*, *supra* note 33 at pp. 317–329.

100. See de Carvalho, *TRIPS Regime of Patent Rights*, *supra* note 80 at p. 330: “The main purpose of the compulsory license must be...to supply the national market. Only eventual or unintended (or unavoidable) surpluses may be exported.”

101. Unless the refusal to license is also determined to be anti-competitive: See TRIPS Agreement, *supra* note 8 at art. 31(k).

102. WTO General Council, *Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health*, WT/L/540 (2003), <http://www.wto.org/English/tratop_e/trips_e/implem_par6_e.htm> at para. 2 [WTO, *Implementation of Paragraph 6 of the Doha Declaration*]. Alternatively, art. 31 could be amended under the provisions of art. X of the *Marrakesh Agreement Establishing the World Trade Organization*, <http://www.wto.org/english/docs_e/legal_e/04-wto.doc>, 1867 U.N.T.S. 154; 33 I.L.M. 1144.

103. Correa, “TRIPS and Developing Countries,” *supra* note 7 at p. 249. Canada’s amendment to its patent legislation to implement the WTO Public Health decision, for example, limits compulsory licensing for essential medicines to a two-year term.

104. Correa, “Patent Rights,” *supra* note 42 at p. 214. See also Watal, *Developing Countries*, *supra* note 33 at p. 324. The scope and duration according to the purpose requirement of art. 31(c) has been applied liberally in some countries, allowing the licensee to work the whole patent; or so long as prices remain unreasonably high and the market is not being adequately supplied; or as long as the public interest is not met, referring to the patent laws of China, New Zealand, and Germany respectively.

105. With the exception of regional trade agreement members. See para. 6 of WTO, *Implementation of Paragraph 6 of the Doha Declaration*, *supra* note 102. Canada’s implementing legislation follows this country-by-country export regime.

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6. CONCLUSION

IN SUM, THIS PAPER HAS ATTEMPTED to address one piece of the environmentally sound technology transfer puzzle, namely private capital trade and investment as facilitated through intellectual property protection regimes. The effects of TRIPS on technology transfer in general tell us much about the impact of TRIPS on environmentally sound technology transfer in particular. While the evidence is inconclusive, TRIPS imposes minimum standards of patent protection that may impede technological development and transfer in developing countries that do not significantly benefit from increased flows of licensed technologies or foreign direct investment. It is probable that developing states would do better to tailor IP standards to meet national priorities set for technological access and development. Given that TRIPS is here to stay (at least in the short term), these countries can still take advantage of the flexible language in TRIPS, such as strict criteria for patentability, in a way that achieves the purposes of the Agreement.

Evidence exists that patent holders have refused to license environmentally sound technologies to the developing world due to fear of competition. Similarly, as the climate change regime evolves to increase the demand for new technologies, competitive impulses of the private sector may frustrate technology transfer through the refusal to license and other restrictive business practices. TRIPS prohibits and discourages firms from seeking compulsory licensing for export markets when patent holders refuse to deal (license) on reasonable commercial terms. A strong argument could be made that, in this respect, TRIPS conflicts with obligations in the climate change regime to push technology transfer into developing countries and the export prohibition on compulsory licensing should therefore be abandoned.

