

15 November 2022

## International Clean Technology Diffusion: Pathways and Prospects

By Wenting Cheng

International clean technology diffusion is essential to mitigate and adapt to climate change, while fast and optimal diffusion can be prevented by the paywall of patents. This article examines three pathways to foster international clean technology diffusion: through restriction of intellectual property, including imposing external restraints in environmental law; striking an internal balance in maximizing TRIPS flexibilities; and keeping the status quo. It finds that the first two treaty-based pathways may not work, and an operable pathway to promote clean technology diffusion is to maximize and consolidate TRIPS flexibilities in national laws. This option challenges the popular proposal of a “Doha-like” declaration on TRIPS and climate change due to the paralysed multilateral trade mechanism, asymmetrical negotiation power of developing countries, prolonged negotiation process, and categorization problem in treaty negotiations.

*La diffusion, à l'échelle internationale, des technologies propres est essentielle pour lutter contre le réchauffement climatique et s'y adapter, mais une diffusion rapide et optimale peut être empêchée par l'existence de brevets. Cet article examine trois voies pour favoriser la diffusion internationale des technologies propres : la première consiste à limiter les droits de propriété intellectuelle, notamment en imposant des restrictions dans le domaine de l'environnement ; la deuxième à trouver un équilibre interne en maximisant les flexibilités offertes par l'Accord sur les ADPIC ; et la troisième à maintenir le statu quo. L'étude conclut que les deux premières voies, qui s'appuient sur des traités, peuvent ne pas fonctionner et qu'une solution possible pour promouvoir la diffusion des technologies propres consiste à tirer le meilleur parti des flexibilités contenues dans l'accord sur les ADPIC et à les inclure dans les lois nationales. Cette option remet en question la proposition regardée comme souhaitable d'une déclaration de type « Doha » sur les ADPIC et le changement climatique en raison de la paralysie du mécanisme commercial multilatéral, du manque de poids des pays en développement dans les négociations, de leur durée et des difficultés de classification qui y sont liées.*

*La difusión internacional de tecnologías limpias es esencial para mitigar el cambio climático y adaptarse a él, pero la existencia de patentes puede impedir una difusión rápida y óptima. Este artículo examina tres vías para fomentar la difusión internacional de las tecnologías limpias: mediante la restricción de la propiedad intelectual, incluso imponiendo restricciones externas en la legislación medioambiental; logrando un equilibrio interno al maximizar las flexibilidades del Acuerdo sobre los ADPIC; y manteniendo el statu quo. El artículo concluye que las dos primeras vías basadas en tratados pueden no funcionar, y que una posible solución para promover la difusión de tecnologías limpias es maximizar y consolidar las flexibilidades del Acuerdo sobre los ADPIC en las legislaciones nacionales. Esta opción cuestiona la propuesta popular de una declaración "tipo Doha" sobre los ADPIC y el cambio climático, debido a la parálisis del mecanismo comercial multilateral, el poder de negociación asimétrico de los países en desarrollo, el prolongado proceso de negociación y el problema de categorización en las negociaciones de los tratados.*

## Introduction

Climate change is currently an existential threat to human beings. Civil society and international organizations have taken initiatives in this space. The Office of the United Nations High Commissioner for Human Rights (OHCHR) has linked human rights to climate change since 2009.[1] Investors and consumers have led the fossil fuel divestment movement,[2] and international youth protests and strikes for climate have gained momentum, in the real world as well as through social media. Despite these advancements, reaching the proposed 1.5 °C target in the 2018 Intergovernmental Panel on Climate Change (IPCC) report[3] will require a sharp decline in CO2 emissions. An effective response to climate change critically depends on the cost, performance, and availability of technologies that can lower greenhouse gas emissions, mitigate, and adapt to climate change. However, if clean technologies are stringently protected by intellectual property (IP), particularly through patents and trade secrets, both supply and demand for clean technologies will be restrained.

International negotiations to promote the diffusion of clean technology (including transfer and dissemination) have been slow and controversial, despite the United Nations Framework Convention on Climate Change (UNFCCC) promoting mechanisms to facilitate technology transfer and access to clean technologies as early as 1992.[4] The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) stipulates "minimum" standards for intellectual property protection, resulting in an increasing imbalance due to more extensive IP protections through TRIPS-plus provisions in bilateral trade agreements.[5]

Given the imperative of clean technologies in addressing the global challenge of climate change, a recently published article[6] explores possible pathways to restrict IP for clean technologies by examining existing mechanisms in international environmental law and international intellectual property law at multilateral, bilateral, and national levels. The evidence from practices on each of the pathways so far indicates that developing countries need to maximize TRIPS flexibilities at the national level instead of expecting a "Doha-like declaration".

## Three Theoretical Pathways to Promote Clean Technology Diffusion

Clean technology supply and demand are often located in different countries. The disparity in levels of technology development has, to some extent, shaped the positions of different states towards clean technology diffusion. Clean technology diffusion is often framed as a zero-sum game across the North-South divide. TRIPS established the requirement that every World Trade Organization (WTO) Member must establish an intellectual property system that meets the "minimum" standards required. With protecting IP as a prerequisite, the focus of international negotiations has been reiterated as *promoting technology transfer while respecting IP* rather than *restricting IP to promote*

[1] OHCHR, Report of the Office of the United Nations High Commissioner for Human Rights on the Relationship Between Climate Change and Human Rights (U.N. Doc. A/HRC/10/61) (2009). Available from <https://reliefweb.int/report/world/report-office-un-high-commissioner-human-rights-relationship-between-climate-change-and> (accessed 9 December 2020); Climate Change Reports and Related Activities (from 2014 to 2016). Available from <https://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/ClimateChange.aspx>.

[2] Julie Ayling and Neil Gunningham, "Non-State Governance and Climate Policy: The Fossil Fuel Divestment Movement", *Climate Policy*, Vol. 17, No. 2 (2017), pp. 131-149.

[3] IPCC, *Summary for Policymakers, Global Warming of 1.5°C* (Geneva, World Meteorological Organization, 2018). Available from <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/> (accessed 22 April 2021).

[4] Articles 4.5 and 4.7, UNFCCC (1992).

[5] Peter Drahos, "BITs and BIPs: Bilateralism in Intellectual Property", *The Journal of World Intellectual Property*, Vol. 4 (2001), p. 791; Susan K. Sell, "TRIPS Was Never Enough: Vertical Forum Shifting, FTAS, ACTA, and TTP", *Journal of Intellectual Property Law*, Vol. 18 (2011), p. 447.

[6] Wenting Cheng, "Intellectual Property and International Clean Technology Diffusion: Pathways and Prospects", *Asian Journal of International Law* (2022). Available from <https://doi.org/10.1017/S2044251322000108>.

*technology diffusion*. However, if the environment continues to deteriorate due to a lack of sufficient and rapid clean technology diffusion, nobody wins. Hence, reflecting on possible pathways of restrictions over IP in the current international regulatory frameworks of intellectual property and climate change is imperative.

There are two approaches to implementing restrictions to promote clean technology diffusion – those pursued *outside* of the international IP system, and those pursued *within* the international IP system. The debate about technology diffusion also reflects the contestation of values and which ones shall be prioritized.[7] Prioritizing ecological objectives over private profits for IP rights holders, international environmental law could be a useful external restriction over IP, promoting the diffusion of clean technology. Negotiations within the IP system consist of exceptions and limitations within the IP law. Between providing property rights to stimulate innovation and allowing exceptions and limitations to safeguard public interests, innovation stimulation and the interests of right holders are often prioritized. In addition to referring to this differentiation of external and internal restrictions, there is always a third possibility of taking no action. While there is not much to be discussed about “inaction” *per se*, it is important to understand the

consequences of inaction. Table 1 illustrates the three theoretical pathways with strategies/consequences at different levels.

### Three Pathways in Practice

- **Imposing External Restrictions**

In practice, there have been continuous efforts to impose such restrictions. To locate these attempts, we need to first identify the elementary institutions involved in the global governance of clean technologies transfer[8] — primarily the multilateral environmental institutions and the international economic institutions in which international IP institutions are determined. Figure 1 shows the structure of these institutions.

Within multilateral environmental institutions, the most important provision relating to external restriction to IP is Article 4.5 of the UNFCCC (1992):

*The developed country Parties and other developed Parties included in Annex II shall 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*

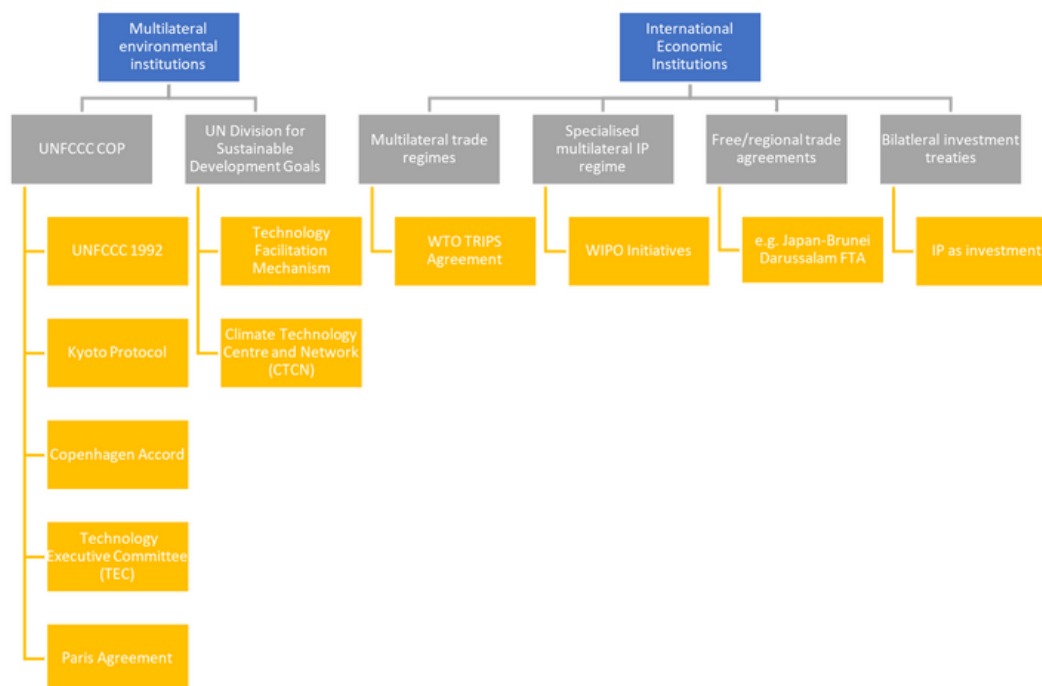
Table 1 Three pathways for technologies diffusion at various levels

Strategies/Level	National	Bilateral/plurilateral	Multilateral
<b>Imposing external restrictions</b>	· Reaffirming regulatory sovereignty over clean technologies as a response to climate change	· Restrictions on IP in environmental/energy chapters of trade agreements	· Restrict IP in multilateral environmental agreements
<b>Striking internal balance</b>	· Safeguarding TRIPS flexibilities in national law	· Special arrangement for clean technologies in IP chapters in FTAs	· Doha-like Declaration · Mandate TRIPS flexibilities
<b>Possible consequences of inaction</b>	· Increased IP standards to implement PTAs commitment · Regulatory chill due to risk of being sued via ISDS	· TRIPS Plus diminishing flexibility · FTA reaffirms IP protection in clean technologies	· Keep the status quo of IP provisions in TRIPs

[7] For the discussion of values as priorities, see Marc Tadaki, Jim Sinner and Kai M. A. Chan, “Making Sense of Environmental Values: A Typology of Concepts”, *Ecology and Society*, Vol. 22 (2017).

[8] Although the focus to promote better access to clean technology is through the broader concept of technology diffusion as discussed in this paper, the existing mechanisms are all designed for a much narrower activity of technology transfer. Dissemination beyond contract-based technology transfer can be considered breach of contract and unlawful.

Figure 1 Fragmented International Institutions on Environment and IP



Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties (emphasis added).

Although this provision mandates that developed countries promote, facilitate and finance clean technology diffusion, there is a gap between this provision and the external restriction on IP– the provision fails to explicitly mention ‘IP’ to achieve the mandate. Following the above provision of UNFCCC (1992), the Kyoto Protocol again addresses technology transfer in Article 10. With the qualifiers like “take all practicable steps” and “as appropriate”, obligations for promoting technology transfer are diluted. These permissive provisions lack teeth when they come into conflict with TRIPS. The Bali Action Plan (2007) reaffirmed the centrality of clean technologies, calling for “enhanced action on technology development and transfer”. The Cancun Accord created a Technology Mechanism to facilitate technology transfer. And yet, “delegates [at Cancun] decided to take one of the most contentious issues, intellectual property rights, off the table.”[9] Consequently, it is difficult to introduce IP as

an agenda in subsequent multilateral environmental negotiations. Although the United Nations Department of Economic and Social Affairs (UN DESA) 2009 World Economic and Social Survey recommended that “the parties to the UNFCCC need to agree on the role of IP in the transfer of technology”, [10] there has been no progress on the matter.

In the last decade, there have been efforts to impose external restrictions on IP in multilateral environmental agreements, but all have failed. The typical example is developing countries’ efforts to incorporate restrictions on IP in the Copenhagen Accord in 2009. The well documented negotiation process indicates that although there is no lack of proposals or solutions to tackle IP-related issues in clean technologies transfer, there is a lack of political will, particularly from developed countries, to commit to these solutions.

At the plurilateral level, recent negotiations on an *Agreement on Climate Change, Trade and Sustainability* (ACCTS) initiated by Costa Rica, Fiji, Iceland, New Zealand, and Norway that started in 2019 could indicate a new trend in trade and environment agreements.

[9] Jennifer Morgan and others, “Reflections on the Cancun Agreements” (World Resources Institute, 2010). Available from [http://pdf.wri.org/reflections\\_on\\_cancun\\_agreements.pdf](http://pdf.wri.org/reflections_on_cancun_agreements.pdf) (accessed 16 November 2020).

[10] UN DESA, *World Economic and Social Survey 2009: Promoting Development, Saving the Planet* (New York). Available from <https://desapublications.un.org/publications/world-economic-and-social-survey-2009-promoting-development-saving-planet> (accessed July 3, 2020).

Since the purpose of the negotiation is to address inter-related elements of climate change, trade, and sustainable development agendas, the negotiators could address clean technology diffusion more systematically and effectively. Given the negotiations started only in 2019, no negotiating drafts are yet available, and it may take some time to see the outcome.

Derogating from IP protection at the national level is always associated with costs, including the potential outflow of existing foreign direct investment to other countries with similar investment conditions but without IP derogation. Without adequate IP protection in clean technologies-related sectors, it is argued that owners of these technologies may avoid investing in or entering that market at all if there were a likelihood of imitation, which would make any national law futile. Therefore, if developing countries want to implement external restrictions at the national level, they need to form a coalition of many countries to introduce such rules simultaneously and concertedly. However, it has been difficult to build such a coalition given the diversified interests of countries and general shortage of trust. Without such a coalition, any country pioneering the introduction of these rules would probably face a WTO dispute for TRIPS violation. Said country may not have adequate resources and legal advice to win the dispute, and would additionally bear the consequences of losing the case. With no prevailing national practice, countries could not justify external restrictions on IP in customary international law.

- **Strike an Internal Balance – More Than a Doha-Like Declaration**

As TRIPS flexibilities either delineate or carve out the exclusivity of IP rights, a clear boundary of flexibilities is needed before they can be implemented. However, none of the flexibilities in TRIPS have a clear boundary — there are, in fact, considerable constructive ambiguities in TRIPS flexibility provisions. After TRIPS, there was no progress in consolidating flexibilities.

Although WTO Members such as India had proposed an amendment to the TRIPS Agreement to enhance the transfer of environmentally sound technologies by reducing patent terms and facilitating compulsory licenses, no substantive negotiations followed the proposal.

Few WTO Members have fully implemented these flexibilities in their national law. In international trade agreements, ambiguities are used intentionally to allow trade partners the capacity and flexibility to address certain legitimate concerns without limiting advances in trade liberalization. For instance, there can be multiple interpretations on the grounds for issuing a compulsory license, specifically what constitutes “national emergency”, “extreme urgency” and “public non-commercial use”,<sup>[11]</sup> and whether prior negotiation with the patent owner for a voluntary license is required, except in the case of national emergency or other extreme urgencies. Different definitions and formality requirements may have a significant impact on whether a compulsory license can ultimately be issued.

Without clarification of what is specifically permitted as a TRIPS flexibility, implementation risks being accused of violating TRIPS. Because of these ambiguities, post-TRIPS efforts at implementing TRIPS flexibilities at the multilateral level have focused on reaffirming activities as non-violation of TRIPS. The Doha Declaration exemplified such reaffirmation efforts.<sup>[12]</sup> Facing similar, if not more, ambiguities in implementing flexibilities in the area of clean technology diffusion, a Doha-like Declaration on TRIPS and climate change<sup>[13]</sup> has been proposed to clarify the boundaries in implementing TRIPS flexibilities to achieve access to clean technologies.<sup>[14]</sup> Following the example of the Doha Declaration, particularly its Paragraph 6 mechanism, a concrete proposal for a *Declaration on TRIPS and Environmentally Sound Technologies* has been made.<sup>[15]</sup> However, there are several reasons why a Doha-like declaration on TRIPS and climate change may take long to be adopted, or even be viable at all.

[11] These terms are all used in Article 31 TRIPS without being properly defined.

[12] Article 31 (f) of TRIPS requires that production under compulsory licensing has to supply predominantly a domestic market. Pursuant to paragraph 6 of the Doha Declaration, this requirement was waived so that firms outside of its jurisdiction could supply pharmaceutical products to countries without or with insufficient manufacturing capacity in that sector. Such a waiver was later incorporated into the TRIPS Agreement as Article 31 bis.

[13] This paper refers to relevant proposals as “Doha-like declaration on TRIPS and climate change” to avoid confusion about different terminologies used for clean technology and the scope of such technologies.

[14] Frederick M. Abbott, “Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on IP and Public Health”, Issue Paper 4 (Geneva, ICTSD, 2009); Carlos M. Correa, “Intellectual Property Rights under the UNFCCC: Without Response to Developing Countries’ Concerns”, in *Research Handbook on Intellectual Property and Climate Change*, Joshua Sarnoff, ed. (Edward Elgar, 2016), p. 74.

[15] UNFCCC, “Notes on sources for FCCC/AWGLCA/2009/INF.1, Parts I and II” at 184.

For one, despite considerable efforts made in the negotiations to establish the Paragraph 6 mechanism, it is hard to use. Additionally, the world has changed dramatically since a Doha-like model for clean technologies was initially proposed. Multilateral negotiations within the WTO remain in deadlock, and the WTO Appellate Body has been paralyzed. This indicates that the pathway for a Doha-like declaration would become bogged down in prolonged multilateral negotiations, which means this approach will not suffice in achieving a speedy response to climate change. While the current IP waiver proposal at the TRIPS Council may offer a necessary and proportionate legal measure to enhance equitable access to COVID-19 vaccines,[16] it is yet another example of prolonged negotiations of increasingly complex rules that diverge from its original objective. At the national level, striking internal balances may face the same challenge of collective action problems as instruments designed to impose external restrictions. However, flexibilities do not face the problem of competing mandates in international law, so the fundamental issue and the first step is about TRIPS interpretation. In a situation of constructive ambiguity, this is not only how to interpret the ambiguous terms of TRIPS flexibility, but also a clear statement of who has the power to interpret. The Declaration on Patent Protection: Regulatory Sovereignty under TRIPS (Patent Protection Declaration), initiated by the Max Planck Institute for Innovation and Competition, has made efforts to clarify certain terms in TRIPS concerning patents. The Patent Protection Declaration approaches flexibilities from the perspective of the regulatory sovereignty of states – states retain any regulatory power as long as it is not derogated by international treaties. Rather than clarifying how a specific provision in TRIPS can be interpreted, this approach affirms who can interpret TRIPS – it proposes that when encountering ambiguity, states retain the power to interpret TRIPS flexibilities in their national law.[17] Therefore, interpreting TRIPS flexibilities is within the remit of national law and does not require external consent.

Incorporating TRIPS flexibilities into national law requires a state to have access to expertise with sufficient understanding of TRIPS, in particular, the underlying debates and possible interpretations of relevant provisions, to design a more acceptable implementation mechanism in terms of TRIPS compliance. It also requires sufficient legal, financial, and media support to respond to questions about WTO compliance. However, as compared with the challenges of multilateral consensus for a Doha-like declaration, or mandating TRIPS flexibilities, national-level implementation of TRIPS flexibilities in clean technologies can be achieved by WTO Members right now.

- ***Is Keeping the Status Quo Possible?***

As the development of global IP protection standards follows an upward path, one can argue that there is no prospect of “keeping the status quo”. TRIPS-plus provisions in bilateral free trade agreements (FTAs) have continuously reinforced overall IP protection. More such extensive IP protection will apply to clean technologies if they are patent protected. Without an exception to the Most Favoured Nation (MFN), the benefit or privilege of enhanced protection for IP in an FTA needs to be immediately and unconditionally available to other WTO Members. The only way to fulfil such treaty obligations is to amend domestic IP laws to incorporate higher protection standards, generating further practices to support TRIPS-plus standards. Nonetheless, given that the TRIPS-plus provisions on patents have been sector specific, there has not yet been a proposal for more extensive protection for clean technology.

### **Concluding Remarks**

Among the three pathways for promoting international clean technology diffusion – imposing external restrictions on IP in environmental law, striking internal balance in using TRIPS flexibilities, and keeping the status quo, empirical evidence suggests that treaty pathways may not work or take too long. An operable pathway to promoting clean technology diffusion is to maximize and consolidate TRIPS flexibilities in national laws. This challenges the popular proposal of a “Doha-

[16] Sivaramjani Thambisetty and others, “Addressing vaccine inequity during the COVID-19 pandemic: the TRIPS intellectual property waiver proposal & beyond”, *Cambridge Law Journal*, Vol. 81 (2022), p. 384.

[17] Matthias Lamping and others, “Declaration on Patent Protection - Regulatory Sovereignty under TRIPS”, *IIC-International Review of Intellectual Property and Competition Law*, Vol. 45 (2014), p. 679.

like" declaration on TRIPS and climate change, due to the paralyzed multilateral trade mechanism, asymmetrical negotiation power of developing countries, prolonged negotiation process, and categorization problem in treaty negotiations. The national approach of implementing TRIPs flexibilities will be in "harmony" with existing international norms, while patent offices can play an active and important way in implementing these flexibilities: for instance, through the application of rigorous standards of patentability. At the centre of any treaty negotiations concerning clean technology diffusion taking place, should be boundaries for "clean technologies". This is not just a matter of providing a generally accepted abstract definition of clean technology—it involves issues such as dual use technologies and setting assessment criteria for categorisation of clean technologies, which will further be compounded by power asymmetry. Further research needs to be taken so that the boundaries for "clean technologies" do not prolong the treaty negotiations or undermine their outcomes.

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***\* This article was undertaken as part of the Australian National University's Grand Challenge Zero-Carbon Energy for the Asia-Pacific.***

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