EXPLORING THE NEXUS BETWEEN TRANSFER OF TECHNOLOGY OBLIGATIONS AND THE PROMOTION OF FOREIGN INVESTMENTS IN RENEWABLE ENERGY

Explorando o nexo entre obrigações de transferência de tecnologia e a promoção de investimentos estrangeiros em energias renováveis

Mohammad Akefi Ghaziani
University of Qom, Irã
ORCID: http://orcid.org/0000-0002-5923-8684
E-mail: M.Akefi@stu.qom.ac.ir

Seyed Yaser Ziaee
University of Qom, Irã
ORCID: http://orcid.org/0000-0003-0649-5318
E-mail: yaserziaee@gmail.com

Mostafa Fazaeli
University of Qom, Irã
ORCID: http://orcid.org/0000-0002-5018-2418
E-mail: m-fazaeli@qom.ac.ir

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ABSTRACT

Renewable energies are among the alternatives for developing countries to fulfil their growing energy needs and meet the energy transition requirements. However, many developing countries are not able to afford the costs and technologies required to launch and utilise them. Therefore they strive to attract investments and acquire modern renewable energy technologies to upgrade their capabilities to international levels. Several IIAs have incorporated the transfer of technology clauses to contribute to this aim. However insisting on these obligations may *ceteris paribus* make foreign investors reluctant to invest, as there is a prevailing disagreement regarding who should bear the costs associated with this process. It is in the light of these challenges that the question is raised as to how IIAs may better contribute to the promotion of foreign investments in this sector. The objective of this research is to find out the potential legal solution to this dilemma. It employs a qualitative method – a thematic analysis of the IIAs and their approaches to this issue. It singles out the relevant trends and concludes that so far, the prohibition of such performance requirements has been the best solution to overcome these challenges for the promotion of foreign investments in this sector.

Keywords: transfer of technology, International investment agreements, renewable energy, Intellectual property rights, developing countries.

RESUMO

As energias renováveis estão entre as alternativas para os países em desenvolvimento suprirem suas crescentes necessidades energéticas e atenderem aos requisitos de transição energética. No entanto, muitos países em desenvolvimento não têm condições de arcar com os custos e as tecnologias necessárias para lançá-los e utilizá-los. Portanto, eles se esforçam para atrair investimentos e adquirir tecnologias modernas de energia renovável para atualizar suas capacidades para níveis internacionais. Vários *IIAs* incorporaram cláusulas de transferência de tecnologia para contribuir com esse objetivo. No entanto, insistir nessas obrigações pode *ceteris paribus* tornar os investidores estrangeiros relutantes em investir, pois prevalece um desacordo sobre quem deve arcar com os custos associados a esse processo. É à luz destes desafios que se coloca a questão de como os IIAs podem contribuir melhor para a promoção de investimentos estrangeiros neste setor. O objetivo desta pesquisa é descobrir a possível solução jurídica para esse dilema. Emprega um método qualitativo – uma análise temática dos *IIAs* e suas abordagens a esta questão. Destaca as tendências relevantes e conclui que, até agora, a proibição de tais requisitos de desempenho tem sido a melhor solução para superar esses desafios para a promoção de investimentos estrangeiros neste setor.

Palavras-chave: transferência de tecnologia, Acordos internacionais de investimento, energia renovável, direitos de propriedade intelectual, países em desenvolvimento.

INTRODUCTION

Many economists consider foreign investment and trade to be an important route for the transfer of technology to emerging markets.[1] It appears that the transfer of technology is in favour of the host States rather than in favour of foreign investors. In other words, it is functionally a venue to fill the gap between developing and developed countries in current technology or the ability to discover and innovate.[2] Therefore various international instruments impose technology transfer obligations on developed countries towards developing countries.[3]

Historically performance requirements have played a crucial role in technology transfer.[4] Still, many developing host States insist on such clauses, something that foreign investors are often reluctant to do.[5] Although the positive contribution of technology transfer obligations to the promotion of foreign investments is rather ambiguous and indeterminate compared to other investment promotion provisions, these obligations are helpful for the implementation of sustainable development through the diffusion of clean technologies and technological developments.[6] Therefore particularly in the light of increasing climate change and energy security crises, several international environmental agreements have explicit provisions on the transfer of technologies to developing countries for greenhouse gas emission reduction as well as enhancing climate change resilience.[7]

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[1] Economic and Social Commission for Asia and Pacific, *Handbook on Policies, Promotion, and the Facilitation of Foreign Direct Investment for Sustainable Development in Asia and the Pacific,* Ed. United Nations Publication, Thailand, 2022, p. 54.

[2] Vanhonnaeker, Lukas, *Intellectual Property Rights as Foreign Direct Investments: From Collision to Collaboration*, Ed. Edward Elgar Publishing, Cheltenham, 2015, pp. 117-18. Ahmed Raslan, Reem Anwar, "Transfer of Technology: a North-South Debate?", *Queen Mary Journal of Intellectual Property*, No. 11(3), 2021, pp. 339-361.

[3] See eg General Agreement on Trade in Services, 1869 UNTS 183 (adopted 15 April 1994, entered into force 1 January 1995) (GATS) art IV. Agreement on Trade-Related Aspects of Intellectual Property Rights (adopted 15 April 1994, entered into force 1 January 1995) (TRIPS) art 66(2). This Article obliges developed-country Members towards least-developed-country Members in respect of the transfer of technology. See also World Trade Organization, Ministerial Declaration of 14 November 2001, WTO Doc. WT/MIN(01)/DEC/1, 41 ILM 746 (2002) (Doha Declaration) para 37. This declaration addresses the transfer of technology to developing countries and calls for recommendations and steps to increase the transfer of technology to developing countries.

[4] Third World Resurgence, "Transfer of Technology and IPRs: A Development Perspective", No. 269/270, (February 2013), available at https://www.twn.my/title2/resurgence/2013/269-270/econ1.htm.

[5] Sornarajah, M., *The International Law on Foreign Investment,* Ed. Cambridge University Press, Cambridge, 2021, §. 2.1.1.5.

[6] Corsi, Alana, Kovaleski, João Luiz & Pagani, Regina Negri, "Technology Transfer, Anthropotechnology and Sustainable Development: How Do the Themes Relate?", *Journal of Technology Management & Innovation*, No. 16(4), 2021, pp. 96-108.

[7] See eg. United Nations Framework Convention on Climate Change: resolution / adopted by the General Assembly, 20 January 1994, A/RES/48/189 (adopted 20 January 1994). UNFCCC (1997) Kyoto Protocol to the United Nations Framework Convention on Climate Change adopted at COP3 in Kyoto, Japan, (11 December 1997). Paris Agreement, 55 ILM 740 (adopted 12 December 2015, entered into force 4 November 2016).

In recent years foreign investments have led to technology transfers in various fields. In essence, a successful transfer of technology depends on the capacity of the host State and the local partners and institutions (including but not limited to education and vocational skills development centres, and R&D centres) to absorb them. This capacity is presently lacking in many developing countries and there is a lack of consensus on how Parties can and should overcome it.[8] Therefore, governments have a significant role to play in creating and facilitating a favourable investment climate to develop local technological capacity and a proactive government policy towards the promotion of learning technical skills to provide the overall environment conducive to the protection of foreign investments, and particularly, the associated Intellectual Property Rights (IPR).[9] It is an important task since the complexities around the transfer of technology in the renewable energy sector are far more, as it is a relatively novel and emerging sector and a few countries have a monopoly on technologies and innovations in this sector where the need to develop the technical skills of local staff and to use indigenous inputs or end-products is recognised.[10] According to World Bank data, five countries - Japan, the United States, Germany, South Korea, and China - accounted for 73% of the global low-carbon technology patent output during 2010–2015, whereas the rest of the countries accounted for merely 27%.[11]

On the other hand, transfer of technology obligations are categorised as performance requirements which make the investors reluctant to invest as they are known as a common discriminatory barrier to investment.[12] Particularly in the renewable energy sector, many foreign investors and technology holders consider them to be policy impediments to international investment and trade.[13] This challenge is exacerbated by the fact that renewable energy investments

[8] Kidunduhu, Noreen, "Energy Transition in Africa: Context, Barriers and Strategies" in Victoria R. Nalule (ed.), *Energy Transitions and the Future of the African Energy Sector Law, Policy and Governance,* Ed. Springer, Switzerland, 2021, p. 91.
[9] Economic and Social Commission for Asia and Pacific, op. cit., p. 54. Mehta, Pradeep S. & Gerard, Josephine Shreela, "Climate technology: US will seek revamp of India's IP regime", *Policy Circle,* 21 September 2022, available at https://www.policycircle.org/environment/india-needs-us-climate-technology/.
[10] Mallett, Alexandra, *Technology adoption, cooperation and trade and competitiveness policies: Re-examining the uptake of Renewable Energy Technologies (RETs) in urban Latin America using systemic approaches*, Ed. ProQuest LLC, Michigan, 2014, pp. 67-68.
[11] Pigato, Miria A. et al., *Technology Transfer and Innovation for Low-Carbon Development,* Ed. World Bank Group, Washington DC, 2020, pp. XXI-XXII.
[12] Verburg, Cees & Waverijn, Jaap, "Liberalizing the Global Supply Chain of Renewable Energy Technology: The Role of International Investment Law in Facilitating Flows of Foreign Direct Investment and Trade", *Brill Open Law,* No. 2, 2019, pp. 121-127. Chaisse, Julien, "Renewables Re-energized? The Internationalization of Green Energy Investment Rules and Disputes", *World Energy Law & Business*, No. 9, 2016, pp. 272-74. Sornarajah, M., *The International Law on Foreign Investment*, Ed. Cambridge University Press, Cambridge, 2010, p. 342.
[13] OECD, *Green Finance and Investment: Overcoming Barriers to International Investment in Clean Energy,* Ed. OECD Publishing, Paris, 2015, pp. 58-114. See also Kulkarni, Siddharth Suhas, Wang, Lin & Venetsanos, Demetrios, "Technology Transfer Challenges in the Renewable Energy Sector", *Scholarly Community Encyclopedia,* 7 April 2022, available at https://encyclopedia.pub/entry/21444.

are often long-term capital-intensive projects that cost billions of dollars and many countries are not able to afford the costs and technologies required to launch and utilise them.[14] This dilemma calls for the promotion of investments in this sector and the regional presence of giant international corporations that have the financial resources and the expertise to perform this task. These corporations offer beneficial opportunities as they often rely on local personnel. This means that there will be many opportunities for local job creation, transfer of technology and knowledge, and the local renewable energy sources may be further explored and utilised.[15]

Several studies admit the possible contribution of IIAs to overcome these challenges.[16] Particularly because IIAs can *inter alia* promote the flows of foreign investments by addressing the barriers and mitigating the perceived costs of investment.[17] As Egger and Merlo have observed, for German multinationals, the applicable BITs have an increasing effect on both the number of multinational firms and the number of plants per firm.[18]

Generally, IIAs consist of a mixture of binding obligations with direct and indirect effects, and technology transfer obligations are among these.[19] Although there is no - and there can never be - a mono-causal link between the provisions of IIAs and investment flows, it is impossible to deny the *ceteris paribus* effects of these provisions on the promotion of foreign investments in the renewable energy sector, because they principally follow the same economic determinants as other types of foreign investments in general.[20] Therefore IIAs need to incorporate pro-renewable energy investment clauses. Today a growing number of studies support this proposition. Most notably, Schefer who has proposed the new theory of "The Strong Responsibility to Protect (R2P*)" claims that all parties to IIAs have an obligation to promote climate-friendly activities and to pursue low-carbon economies. Accordingly, IIAs must offer full protection to investments in renewable energy

[14] International Energy Agency, *Perspectives for the Energy Transition – Investment Needs for a Low Carbon Energy System,* Ed. IEA/IRENA, Bonn, 2017, p. 8. Bruce, Stuart, "International Law and Renewable Energy: Facilitating Sustainable Energy for All?", *Melbourne Journal of International Law*, No. 14(1), 2013, pp. 26-27.
[15] Verburg, Cees & Waverijn, Jaap, op. cit., p. 136.
[16] OECD, *Better Policies for Development 2015: Policy Coherence and Green Growth,* Ed. OECD Publishing, Paris, 2015, p. 73. Sussman, Edna, "The Energy Charter Treaty's Investor Protection Provisions: Potential to Foster Solutions to Global Warming and Promote Sustainable Development," *ILSA Journal of International & Comparative Law*, No. 14(2), 2008, pp. 400-404.
[17] Leal-Arcas, R. & Nalule, V., "Multilateral and Bilateral Energy Investment Treaties", in Chaisse, Julien, Choukroune, Leila & Jusoh, Sufian (eds.), *Handbook of International Investment Law and Policy,* Ed. Springer, Singapore, 2021, p. 2118. See also Mbengue, Makane M. & Raju, Deepak, "Energy, Environment and Foreign Investment", in De Brabandere, Eric & Gazzini, Tarcisio (eds.), *Foreign Investment in the Energy Sector – Balancing Private and Public Interests,* Ed. Koninklijke Brill NV, Leiden, 2014, pp. 172-4.
[18] Egger, Peter & Merlo, Valeria, "BITs Bite: An Anatomy of the Impact of Bilateral Investment Treaties on Multinational Firms", *The Scandinavian Journal of Economics,* No. 144, 2012, pp. 1240–60.
[19] Tienhaara, Kyla & Downie, Christian, "Risky Business? The Energy Charter Treaty, Renewable Energy, and Investor-State Disputes", *Global Governance: A Review of Multilateralism and International Organizations*, No. 24, 2018, p. 452.
[20] World Investment Report, *Investing in a Low Carbon Economy,* Ed. UNCTAD, Geneva, 2010, pp. 117, 136.

or low-carbon technologies, and mitigate the barriers with the same normative perspective of R2P*.[21]

Against this background, this article aims at exploring the legal nexus between the transfer of technology obligations and foreign investments in the renewable energy sector and tries to answer the key question: "what are the challenges associated with the transfer of renewable energy technologies and in the light of these challenges how can IIAs contribute to the promotion of foreign investments in this sector?" From this perspective, it is the objective of this research to single out the major challenges for the transfer of renewable energy technologies and to reflect on the relevance of these challenges before the promotion of renewable energy investments. It focuses on finding the potential solutions to this dilemma by analysing the content of IIAs and underpinning the relevant approaches.

To this end, the article employs a descriptive and qualitative approach and has a theoretical element based on the concept of R2P*. By using a descriptive method, it intends to provide a rich understanding of the transfer of technology and its determinants. Furthermore, by adopting a qualitative research methodology, this article conducts a thematic analysis of IIAs and their approaches to the international transfer of renewable energy technologies.

The article is therefore in three parts, expounding on the concept of the transfer of technology and describing the challenges for the transfer of technology in renewable energies. Finally, it analyses the legal features of IIAs in this regard and singles out the relevant trends. It concludes that so far, the approach of the IIAs signed by a few developed countries, notably the US, Canada, and Japan, in prohibiting performance requirements, including the transfer of technology obligations, has been the best solution to overcome the challenges for the promotion of foreign investments in this sector. Particularly since the promotion of renewable energy investments *per se* can lead to positive technological spill-overs in the host States anyway, and thus the demerits of the transfer of technology obligations in IIAs outweigh the merits.

[21] Schefer, Krista Nadakavukaren, "Climate Change, Trade, and Investment Law: What Difference Would a Real Responsibility to Protect Make?" in Matsushita, Mitsuo & Schoenbaum, Thomas J. (eds.), *Emerging Issues in Sustainable Development: International Trade Law and Policy Relating to Natural Resources, Energy, and the Environment,* Ed. Springer, Japan, 2016, p. 383. In this work, Schefer has proposed a new theory named "The Strong Responsibility to Protect (R2P*)". According to this concept, the investment law system should recognise the responsibility of States towards the goal of climate stabilisation. Accordingly, the international investment law system should evolve to better reflect contemporary concerns of climate change. Therefore they must offer full protection and encourage investments that have lower emission levels or assist in the resilience of local communities: pp. 383-95.

EXPOUNDING ON THE CONCEPT OF TRANSFER OF TECHNOLOGY

Before discussing the concept of "transfer of technology" it is important to determine what is meant by "technology". So far, there is no universally agreed upon definition of "technology".[22] In fact, due to its dynamic nature, there are various definitions of this concept from different perspectives. According to Merriam-Webster's Dictionary, technology can be defined as "the practical application of knowledge, especially in a particular area" or "a manner of accomplishing a task especially using technical processes, methods, or knowledge".[23] However, some scholars have verified two primary components of technology and described this concept in terms of its components. They suggest that technology consists of 1) a physical component which comprises items such as products, tooling, equipment, blueprints, techniques, and processes; and 2) the informational component which consists of know-how in management, marketing, production, quality control, reliability, skilled labour, and functional areas.[24] An earlier definition of this concept is put forward by Devendra Sahal who views technology as "configuration", observing that it relies on a subjectively determined but specifiable set of processes and products.[25]

As we have already seen, the definition of technology varies and economists, sociologists, anthropologists, and management researchers may have different perceptions of this term.[26] And the same goes for the concept of transfer of technology. This concept has connected technology with knowledge and therefore more attention is given to the process of R&D and the possible contribution of governments, non-government entities, and the private sector to this process.[27] Although there is no consensus on a definition of transfer of technology, it may be defined as "the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the transactions involving the mere sale or mere lease of goods".[28] This is perhaps the most precise and comprehensive definition of this concept.

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[22] Ahmed Raslan, Reem Anwar, op. cit., p. 345.
[23] Merriam-Webster Dictionary, "Technology", accessed 10 January 2023, available at https://www.merriam-webster.com/dictionary/technology.
[24] Kumar, Vinod, Kumar, Uma & Persaud, Aditha, "Building Technological Capability Through Importing Technology: The Case of Indonesian Manufacturing Industry", *Journal of Technology Transfer*, No.24, 1999, p. 82.
[25] Sahal, Devendra, "Alternative Conceptions of Technology", *Research Policy,* No. 10, 1981, pp. 15-22.
[26] Abdul Wahab, Sazali, Che Rose, Raduan & Osman, Suzana Idayu Wati, "Defining the Concepts of Technology and Technology Transfer: A Literature Analysis", *International Business Research*, No. 5(1), 2012, p. 63.
[27] Dunning, John H., "Multinational Enterprises and the Globalization of Innovatory Capacity", *Research Policy*, No. 23(1), 1994, pp. 67-81.
[28] Edoardova, Costaggiu Catherine, & Marie-Hélène, Ludwig, "Performance Requirements", *Jus Mundi,* (22 April 2022), available at https://jusmundi.com/en/document/publication/en-performance-requirements. United Nations Conference on an International Code of Conduct on the Transfer of Technology, *Draft International Code of*

However, a common mistake that causes disputes in scholarship on this concept is the failure to differentiate between the transfer of technology and technology diffusion.[29] Technology diffusion may be described as "the progressive adoption of a particular kind of technology among a given population".[30] This is a relatively passive concept that connotes the "spill-over" effects to other sectors of the economy of a host state.[31] In fact, foreign investment has often its own spill-over effects regardless of any technology transfer obligations. For instance, foreign investments and technological spill-overs in India show a significant positive effect on domestic firms. Similarly, in Indonesia, foreign investments and supply chains have facilitated technology diffusion and the productivity enhancement of local firms.[32] Transfer of technology, by contrast, refers to a more proactive process in which users seek to acquire the knowledge to use technology and manage its material and immaterial elements. Transfer of technology may refer to a variety of situations, ranging from patent and/or know-how licenses to more complex dealings involving the supply of technical assistance, equipment, etc.[33] Thus the transfer of technology is a purposeful process and involves the agreement between at least two parties while technology diffusion is not a bilateral transaction.[34]

THE CHALLENGES OF TRANSFER OF TECHNOLOGY IN RENEWABLE ENERGIES

Although in the 30 years since the UNFCCC was signed, green technology transfer has become a widely discussed topic in academia and various institutions and governments have undertaken to promote renewable energy technologies, almost no new renewable energy is being transferred to low-income countries.[35] This is in spite of the fact that the renewable energy sector

Conduct on the Transfer of Technology as at the close of the sixth session of the Conference on 5 June 1985, TD/CODE TOT/47, Ed. United Nations, Geneva, 1985, p. 1.

[29] Ahmed Raslan, Reem Anwar, op. cit., p. 347.

[30] UNCTAD, *Transfer of Technology and Knowledge Sharing for Development: Science, Technology and Innovation Issues for Developing Countries,* Ed. United Nations Publication, Geneva, 2014, p. 2.

[31] Ahmed Raslan, Reem Anwar, op. cit., p. 348. UNCTAD, 2014, op. cit., p. 2.

[32] Kidunduhu, Noreen, "Energy Transition in Africa: Context, Barriers and Strategies" in Victoria R. Nalule (ed.), *Energy Transitions and the Future of the African Energy Sector Law, Policy and Governance,* Ed. Springer, Switzerland, 2021, p. 91.

[33] International Chamber of Commerce, *ICC Model International Transfer of Technology Contract,* Ed. ICC, Paris, 2009.

[34] UNCTAD, 2014, op. cit., p. 2.

[35] Pigato, Miria A. et al., op. cit., pp. XXI-XXII.

has been continuously experiencing an increase in research and innovation. And the number of renewable energy patents filed worldwide has increased by 28% only from 2017 to 2019.[36]

In practice, delivering effective and sustainable transfer of renewable energy technology is not an easy task as it is often constrained by the absorptive capacity of the host State and the technological ability of domestic firms.[37] These difficulties are due to a range of general and particular concerns, such as financial barriers, political barriers, lack of skills and know-how for operating the technology and developing new production capacity, lack of demand for technology transfer, the pre-commercial or supported status of renewable energy technologies, government interventions, market structures, and concerns over IPRs.[38]

For instance, the Government of Malaysia has placed emphasis on industrialisation and technology development in many of the Government's policies. The Government has encouraged foreign investors to invest in their industries. Besides, it has formulated specific industrial policies to attract Multinational Corporations (MNCs) in technology-intensive industries. As a result Malaysia has managed to attract an average annual foreign investment of higher than US$10 billion since 2010. This has helped in improving both the quantity and quality of the domestic stock of capital goods and production facilities. In addition, it has brought about the upgrading of machinery and product lines and increased the production capabilities of local workers.[39] Similarly, Singapore has been the most successful Government in ASEAN with regard to technology transfer through foreign investments, particularly because of the speed, efficiency, and flexibility of the Government and the level of IPR protection that give Singapore its competitive advantage compared to other countries in the region.[40]

Notably, IPR protection has become an increasingly important issue in international investment law and renewable energy projects. As a result, most MNCs either transfer outdated technologies or hesitate to transfer technology due to inadequate intellectual property rights protection in the host States.[41] For instance, IPR challenges have directly affected the technology transfer of marine renewable energy technologies. Often these technologies are still young and in the developing stage. As a result, the custodians of these technologies are unwilling to share them with the masses since they feel that sharing the IPR of these technologies may lead to them losing

[36] "Renewable Energy Patents "Increase 28%": Almost 21,000 Clean Power Patents Were Filed in 2018/19 According to Law Firm EMW", *Renews* (27 January 2020), available at https://renews.biz/57607/renewable-energy-patents-increase-28/.
[37] Economic and Social Commission for Asia and Pacific, op. cit., pp. 53-54.
[38] Shujing, Qian, "The Analysis on Barriers of Low Carbon Technology Transfer", *Energy Procedia,* No. 14, 2012, pp. 1401–03.
[39] Economic and Social Commission for Asia and Pacific, op. cit., p. 54.
[40] Ibídem, p. 55.
[41] Economic and Social Commission for Asia and Pacific, op. cit., pp. 53-54. Third World Resurgence, op. cit.

any benefits that may be associated with them. Moreover, there is a disagreement among States regarding who should bear the costs associated with sharing the IPR. On the one hand, governments that have developed and are implementing marine energy technologies are reluctant to share these technologies since they assume that free sharing of the technology and know-how will hurt their research and development industry. On the other hand, governments in need of these technologies expect their developed counterparts to bear any costs associated with technology transfer.[42]

Therefore, it appears that there is a stalemate among governments, business communities, and corporations regarding who should be responsible for the transfer of intellectual property rights associated with marine energy technologies.[43] Pretty much the same dilemma goes for most other renewable energy sectors.[44] This is in spite of the fact that TRIPS has called on the contracting parties to take appropriate measures to prevent the abuse of intellectual property rights or "the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology", and to "contribute to the promotion of technological innovation and to the transfer and dissemination of technology" through the protection and enforcement of intellectual property rights.[45] Although, with the rise of Global Value Chains (GVCs) an increasing number of MNCs transfer technologies to local suppliers as a strategy to establish efficient supply chains for overseas operations, it is evident that technology transfer remains to be a complicated issue that still largely depends on the host Sate's absorptive capacity.[46]

Against this background, it is interesting to refer to the research of Ana Pueyo and Pedro Linares (2012) who have broadly classified developing countries into four groups according to their overall performance in renewable energy technology transfer. These are technology developers, technology implementers, countries requiring structural changes, and aid recipients. According to this classification, while technology developers (eg, Brazil, China, India, and Turkey) have been successful in attracting foreign flows of technologies, operating and maintaining foreign equipment, and generating and managing technological change through indigenous efforts to absorb foreign technologies, others are suffering from drawbacks, such as the lack of sufficient internal demand, lack of a competitive industrial sector, low credit availability for the private sector, low IPR protection, low logistical performance, and unfavourable environment for private investment.[47] Although some of these countries are relatively large economies with good levels of income per

[42] Kulkarni, Siddharth Suhas, Wang, Lin & Venetsanos, Demetrios, op. cit.
[43] Ibídem.
[44] Ibídem.
[45] TRIPS, arts 7-8(2).
[46] Economic and Social Commission for Asia and Pacific, op. cit., pp. 53-54. Kidunduhu, Noreen, op. cit., p. 91.
[47] Pueyo, Ana & Linares, Pedro, *Renewable Technology Transfer to Developing Countries: One Size Does Not Fit All,* Ed. Institute of Development Studies, Brighton, 2012, pp. 25-29.

capita to attract foreign investments, they are in need of structural changes to improve their business environment and create clear demand signals favouring renewable energy technologies over conventional energy.[48] This can be done by adopting stable and predictable regulations and innovative financing schemes such as public-private partnerships and long-term Power Purchase Agreements.[49]

It is interesting to know that in the absence of internal reforms and alteration of municipal laws, IIAs can play a significant role in creating absorptive capacity for the host States. In addition, given that international efforts to establish a regime for technology transfer on fair and equitable terms, including the International Code of Conduct on Technology Transfer, Code of Conduct on Transnational Corporations, and renegotiation of the Paris Convention have not yielded significant results, challenges around renewable energy technology transfer can, to a large extent, be regulated by various investment agreements.[50] Similarly, several IIAs have incorporated the transfer of technology clauses to contribute to this aim. These obligations are categorised as performance requirements that are not only inconsistent with National Treatment (NT) but also are generally known as a common discriminatory barrier to FDI.[51] Nevertheless, the economic impact of such requirements remains disputable.[52] Studies are concluding that such requirements promote the economic sectors of the host States, while others consider these requirements to have trade and investment distortive effects.[53] The proponents often claim that such requirements can foster economic benefits, such as the creation of domestic industries and the development of a manufacturing base for renewables.[54] However, so far there has been relatively little empirical analysis of the potential of these requirements being used in conjunction with the globally competitive innovators. Particularly because, the renewable energy sector is experiencing a shift away from the classical context of North-South transfer of technology, and emerging economies such as China, India, and Brazil are increasingly playing a bolder role in technology transfer to the global south.[55] Besides data from contemporary countries - be they developed or developing - show that renewable energy technology innovation activities and equipment are usually highly

[48] Pueyo, Ana & Linares, Pedro, op. cit., p. 26.
[49] Ibídem, p. 28.
[50] Third World Resurgence, op. cit.; Ahmed Raslan, Reem Anwar, op. cit., p. 349.
[51] Verburg, Cees & Waverijn, Jaap, op. cit., pp. 121-127. Chaisse, Julien, op. cit., pp. 272-74. Sornarajah, M., 2010, op. cit., p. 342.
[52] OECD, *Green Finance and Investment*, op. cit., pp. 58-114.
[53] Sornarajah, M., 2021, op. cit., §. 5.4.4. OECD, *Green Finance and Investment,* op. cit., pp. 58 -114.
[54] Kuntze, Jan-Christoph & Moerenhout, Tom, *Local Content Requirements and the Renewable Energy industry - A Good Match?,* Ed. International Centre for Trade and Sustainable Development, Geneva, 2013, pp. 6-7.
[55] Kirchherr, Julian & Urban, Frauke, "Technology Transfer and Cooperation for Low Carbon Energy Technology: Analysing 30 Years of Scholarship and Proposing a Research Agenda", *Energy Policy*, No. 119, 2018, p. 606.

concentrated in a few economies.[56] And some instances show the transfer of technology from developed countries has been more fruitful than technology transfers from developing countries.[57] Therefore, in terms of renewable energy technology transfer, developing countries are not necessarily providing a more favourable treatment for other States of the Global South either.

However, as for now the researches suggest that incorporating the transfer of technology obligations in IIAs may make investors reluctant to invest.[58] These obligations are principally considered policy impediments to international investment across the renewable energy sector.[59] As is evident from the case of China's wind-energy sector, removing performance requirements can benefit the industry, including in terms of technology transfer and investment. Although such requirements helped to develop China's nascent wind-turbine manufacturing industry, they deterred higher-quality imports from other well-known foreign wind-energy producers, and due to such requirements, several foreign manufacturers left the Chinese market. Conversely, since 2011, when various performance requirements were removed, evidence suggests that China's wind-energy sector (particularly following negotiations with the US) has encouraged technology transfer, through imports of higher-quality products. These reforms also led to an increase in foreign investors' interest in investing in China (eg, Vestas and Gamesa).[60]

[56] OECD, *Green Finance and Investment,* op. cit., pp. 32-51. Shang, Yongmin, Lyu, Guoqing & Mi, Zefeng, "Green Technology Transfer, Environmental Regulation, and Regional Green Development Chasm: Based on the Empirical Evidence from Yangtze River Delta", *International Journal of Environmental Research and Public Health,* No. 19, 2022, p. 2.
[57] Chen, Yanning, "Comparing North-South technology transfer and South-South technology transfer: The technology transfer impact of Ethiopian Wind Farms", *Energy Policy*, No. 116, 2018, pp. 1-9.
[58] Verburg, Cees & Waverijn, Jaap, op. cit., pp. 121-127. Chaisse, Julien, op. cit., pp. 272-74. Sornarajah, M., 2010, op. cit., p. 342.
[59] OECD, *Green Finance and Investment*, op. cit., pp. 58-114.
[60] OECD, *Green Finance and Investment,* op. cit., p. 63. Oh, Seung-Youn, "How China Outsmarts WTO Rulings in the Wind Industry", *Asian Survey*, No. 55(6), 2015, pp. 1116-1145. See also Cai, Lei, "Where does China Stand: the Evolving National Treatment Standard in BITs?", *The Journal of World Investment & Trade*, No. 13, 2012. Interestingly the Government of China has dynamically modified its laws from time to time. For instance, it has amended the Chinese-Foreign Equity Joint Ventures Law of the PRC in 2001, the Chinese-Foreign Contractual Joint Ventures Law of the PRC in 2000, and the Wholly Foreign-owned Enterprise Law of the PRC in 2001, deleting several mandatory requirements which were imposed on foreign-invested companies, such as export performance requirement, local purchase requirement, foreign exchange balance requirements, etc.: p. 386.

THE APPROACH OF IIAs TO TRANSFER OF RENEWABLE ENERGY TECHNOLOGIES

It is nearly indisputable that IIAs can foster international cooperation, R&D, and financing mechanisms for renewable energy projects.[61]Today many IIAs provide guidance and commitments on governing investments in line with the Sustainable Development Goals (SDGs), including cooperation mechanisms to address challenges with respect to intellectual property rights, and technology transfer, and some agreements specifically seek to promote the transfer of technology.[62] For instance, the economic cooperation and association agreements concluded by the EU with third parties often contain provisions facilitating the transfer of technology. Some of these agreements exclusively focus on benefiting the least developed partners. An illustration is the Cooperation Agreement concluded between the EU and Sri Lanka (1994) which states: "The Contracting Parties agree that economic cooperation will involve […] improving the economic environment in Sri Lanka by facilitating access to Community know-how, technology and capital".[63] This agreement also contains a general provision on technology transfer which provides that

> 1. The Contracting Parties will, in accordance with their mutual interest and the aims of their development strategy in this area, promote scientific and technological cooperation with a view to: (a) fostering the transfer of know-how and stimulating innovation; (b) disseminating information and expertise in science and technology; […].[64]

Most IIAs contain technology transfer obligations in soft law, and they do intermittently provide somewhat more specific provisions in this regard. A prominent example is Article 8 of the ECT which provides that

> (1) The Contracting Parties agree to promote access to and transfer of energy technology on a commercial and non-discriminatory basis to assist effective trade in Energy Materials and Products and Investment and to implement the objectives of the Charter subject to their laws and regulations, and to the protection of Intellectual Property rights.

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[61] Columbia Center on Sustainable Investment, *Investment Treaties and Climate Change: OECD Public Consultation,* Ed. OECD, Paris, 2022, p. 81.
[62] Ibídem. UNCTAD, *UNCTAD Series on International Investment Policies for Development: Investment Promotion Provisions in International Investment Agreements,* Ed. United Nations Publication, Geneva, 2008, pp. 13-59.
[63] Cooperation Agreement between the European Community and Sri Lanka on Partnership and Development (signed 18 July 1994, entered into force 1 April 1995) art. 4(2). See also The Association Agreement Establishing a Free Trade Area between Turkey and Tunisia (signed 25 November 2004, entered into force 1 July 2005) ('Tunisia-Turkey FTA') art. 38
[64] Cooperation Agreement between the European Community and Sri Lanka on Partnership and Development, art 9(1).

> (2) Accordingly, to the extent necessary to give effect to paragraph (1) the Contracting Parties shall eliminate existing and create no new obstacles to the transfer of technology in the field of Energy Materials and Products and related equipment and services, subject to non-proliferation and other international obligations.

Another approach is to link the transfer of technology to investment and joint ventures. For instance, Tunisia-Turkey FTA (2004) calls on the parties to cooperate on trade, with a primary focus on "exchanges of information on market requirements know-how and technology transfer through investment and joint-ventures".[65]

Such requirements may take the form of technical assistance to developing countries, to help them improve their regulatory regimes and enhance their institutional capacity to attract and benefit from foreign investments. These requirements appear primarily in the form of general soft law provisions with variations in terms of their scope and coverage.[66] For instance, Article 6.2 of the Economic Framework Agreement between ASEAN and India (2003) calls on the parties to "implement capacity building programmes and technical assistance, particularly for the New ASEAN Member States, in order to adjust their economic structure and expand their trade and investment with India".[67]

Although these obligations are often drafted in soft law, they demonstrate the original intention of the parties to deliver technology transfer and capacity building between the parties and their investors. Thus such provisions possibly create a sort of legitimate expectation of the need to transfer modern technologies, including in the renewable energy sector. This is significant since the standard of Fair and Equitable Treatment (FET) and legitimate expectations are inherently linked. These expectations are an important element of FET.[68] And according to the general rules of interpretation, investment tribunals are required to interpret the provisions of each agreement "in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context …".[69] And the term "context" inevitably includes the full text of the agreement, including all soft law provisions.[70] For instance, there are a few cases where the tribunals have found a broad

[65] UNCTAD, 2014, op. cit., pp. 28-30.
[66] Ibídem, p. 30-31.
[67] Framework Agreement on Comprehensive Economic Cooperation between ASEAN and India (opened for signature 8 October 2003, entered into force 1 July 2004). See also Free Trade Agreement between the EFTA States and Lebanon (signed 24 June 2004, entered into force 1 January 2007) art. 29.
[68] Gjuzi, Jola, *Stabilization Clauses in International Investment Law: A Sustainable Development Approach,* Ed. Springer, Switzerland, 2018, p. 297.
[69] Vienna Convention on the Law of Treaties, 1155 UNTS 331 (adopted 23 May 1969, entered into force 27 January 1980) art. 31(1).
[70] Ibídem, art. 31(2).

interpretation of FET in the light of the preamble to the IIA, or other soft law provisions.[71] As rightly stated by the tribunal in *SGS v Pakistan*,

> A treaty interpreter must of course seek to give effect to the object and purpose projected by that Article and by the BIT as a whole. That object and purpose must be ascertained, in the first instance, from the text itself … and the rest of the BIT.[72]

In this way, such soft law obligations may impose additional duties on foreign investors towards host States and/or their enterprises. As a result, technology transfer obligations, be they hard or soft law, are generally against the economic interests of foreign investors.[73]

To alleviate this concern, several government and public-private institutions have adopted measures, including financing mechanisms, to facilitate access to and transfer of technologies to developing countries.[74] A notable example is the Finnish Fund for Industrial Cooperation (FINNFUND) which has more than forty years of experience in advancing business operations in Africa, Asia, and Latin America with risk capital, long-term investment loans, mezzanine financing, and expertise on how to invest in viable investment projects. It puts special emphasis on sectors that are critical to sustainable development, including renewable energy sectors such as wind, solar, hydro, and bioenergy, as well as energy efficiency and storage and services. At the end of 2021, Finnfund's energy portfolio commitments, and decisions stood at 201 million euros.[75] However, most financial mechanisms are often acting on a relatively small or medium scale and still many developing States are not availed of such institutional frameworks.[76]

In any case, as mentioned earlier, technology transfer obligations are considered among performance requirements that expose foreign investments, including renewable energy projects, to various construction, technological, planning, and design risks.[77] Therefore, econometric modelling of performance requirements for renewable energy growth is particularly needed.[78] This is in line with the concept of R2P* which calls on the parties to IIAs to provide full protection to investments in renewable energy and other low-carbon technologies and mitigate barriers in order to make

[71] Whitsitt, Elizabeth & Bankes, Nigel, "The Evolution of International Investment Law and Its Application to the Energy Sector", *Alberta Law Journal*, No. 51(2), 2013, pp. 222-23.
[72] *SGS Société Générale de Surveillance SA v Islamic Republic of Pakistan (Decision of the Tribunal on Objections to Jurisdiction)* (ICSID Arbitral Tribunal, Case No ARB/01/13, 6 August 2003) para. 165. See also *Noble Ventures, Inc v Romania (Award)* (ICSID Arbitral Tribunal, Case No ARB/01/11, 12 October 2005) paras. 48-50.
[73] Kulkarni, Siddharth Suhas, Wang, Lin & Venetsanos, Demetrios, op. cit. OECD, *Green Finance and Investment,* op. cit., pp. 36-58.
[74] UNCTAD, *Facilitating Transfer of Technology to Developing Countries: A Survey of Home-Country Measures*, Ed. United Nations Publication, Geneva, 2004, pp. 5-43.
[75] Finnfund, "Renewable Energy", accessed 20 January 2023, available at https://www.finnfund.fi/en/investing/sectors/renewable-energy-and-infrastructure/
[76] UNCTAD, 2004, op. cit., pp. 5-43.
[77] Verburg, Cees & Waverijn, Jaap, op. cit., pp. 129-30.
[78] Kuntze, Jan-Christoph & Moerenhout, Tom, op. cit., p. 44.

investments more attractive and lucrative.[79] As for now, it is doubtful that such econometric modelling exists. Therefore many IIAs, particularly the agreements belonging to the US, Canada, and Japan, contain explicit prohibitions of performance requirements. In fact, these requirements are slowly disappearing as a policy option. For instance, the US Model BIT prohibits any requirement "to transfer a particular technology, a production process, or other proprietary knowledge to a person in its territory".[80]

Historically, it is the WTO that first prohibited performance requirements in the form of local content requirements, trade balancing requirements, foreign exchange restrictions related to the foreign exchange inflows attributable to the enterprises, and export controls. These prohibitions of performance requirements have been completed with some newer and less frequent performance requirements, such as the requirement to transfer technology which is tolerated and intermittently encouraged by WTO agreements but prohibited by a growing number of IIAs such as the previous North American Free Trade Agreement (NAFTA),[81] the Agreement between the United States of America, Mexico, and Canada (USMCA),[82] and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).[83]

However, some IIAs have prohibited the transfer of technology as a performance requirement, but they nevertheless allow competent courts, administrative tribunals, or competition authorities to impose such commitments to remedy an alleged violation of domestic competition laws.[84] Besides, other agreements have also taken a more lenient approach by accepting such requirements where it "concerns the transfer of intellectual property which is undertaken in a manner not inconsistent with the Agreement on Trade Related Aspects of Intellectual Property Rights in Annex 1C to the WTO Agreement".[85]

It is interesting to know that some agreements like the EU-Vietnam FTA have particularly prohibited non-tariff barriers to trade and investment in renewable energy generation, including "any undertaking that imposes the use of a local content requirement, local suppliers, technology

[79] Schefer, Krista Nadakavukaren, op. cit., pp. 383-95.
[80] US Model BIT (2012) art. 8(f). See also United States - Singapore Free Trade Agreement (signed 6 May 2003, entered into force 1 January 2004) art. 15.8(1). Edoardova, Costaggiu Catherine, & Marie-Hélène, Ludwig, op. cit.
[81] North American Free Trade Agreement (opened for signature, 17 December 1992, entered into force 1 January 1994), (NAFTA) art. 1106.
[82] Agreement between the United States of America, the United Mexican States, and Canada (opened for signature 30 November 2018, entered into force 1 July 2020) (USMCA) art. 14.10.
[83] Chaisse, Julien, op. cit., pp. 272-277. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (opened for signature 8 March 2018, entered into force 30 December 2018) (CPTPP) art. 9.10(1).
[84] See eg. Agreement between Canada and Moldova for the Promotion and Protection of Investments (signed 12 June 2018, entered into force 23 August 2019) art. 9.4.
[85] See eg Agreement between Japan and Singapore for a New-Age Economic Partnership (13 January 2002, 30 November 2002) art. 75. 1(f)(ii).

transfer, investment, countertrade or similar actions to encourage local development" affecting the other Party's products, service suppliers, investors or enterprises.[86] In any case, prohibiting either technology transfer obligations in the renewable energy sector or performance requirements in *toto,* will not only mitigate the barriers and costs associated with these projects but also enhance predictability and confidence for the prospective investors; an important factor that is often analysed by the foreign investors, particularly in long term capital intensive renewable energy projects.[87] Therefore, it appears to be the right solution to overcome the challenges of technology transfer obligations in the course of foreign investments in the renewable energy sector.

CONCLUSION

This research has been both a tribute to and a critique of the contemporary IIAs. There is no doubt that IIAs can play a significant role in creating absorptive capacity for the host States and help establish a framework for technology transfer on fair and equitable terms. In addition, they can promote foreign investments and facilitate the regional presence of giant international corporations and their subsidiaries which provides the momentum required for the renewable energy transition, as they have technologies to explore and utilise renewable sources in an efficient and economic manner. However, most international corporations are seriously concerned about their intellectual properties being accessed by the host States and other small and medium-sized enterprises. These are among the major challenges for the transfer of renewable energy technologies, and to alleviate similar concerns a growing number of IIAs have prohibited performance requirements, including the transfer of technology obligations, but many agreements have remained indifferent or even antagonistic by generally calling on the parties to facilitate technology transfer and know-how to other parties. This approach may give rise to a sort of legitimate expectations on the part of the host State and its enterprises. Thus it represents another challenge for the promotion of renewable energy investments.

Some reflection on deeper IIAs approaches to technology transfer reveals how many of these instruments have overlooked the importance of protecting foreign investors against excessive requirements made by the host State, particularly where the host State rarely has any absorption

[86] Free Trade Agreement between the European Union and Vietnam (30 June 2019) [2020] OJ L 186/3 (entered into force 1 August 2020) arts. 7.2 - 7.4.

[87] Timofeyev, Igor V. et al., "Investment Disputes Involving the Renewable Energy Industry under the Energy Charter Treaty", in Rowley, J. W., Bishop, Doak & Kaiser, Gordon E. (eds.), *The Guide to Energy Arbitrations*, Ed. Law Business Research, London, 2020, pt. 1. Komendantova, Nadejda, Schinkoa, Thomas & Patt, Anthony, "De-risking Policies as a Substantial Determinant of Climate Change Mitigation Costs in Developing Countries: Case study of the Middle East and North African Region", *Energy Policy*, No. 127, 2019, pp. 404-411.

capacity. Should IIAs directly deal with the protection of foreign investments in renewable energies by addressing the barriers and mitigating the perceived investment costs, the outcome will principally be far greater, and more investment and trade will come true in this sector. Particularly since the promotion of renewable energy investments *per se* can lead to positive technological spill-overs in the host States anyway, and thus the demerits of the transfer of technology obligations in IIAs outweigh the merits. Therefore a growing number of IIAs, particularly those belonging to the US, Canada, and Japan, have rightly prohibited any performance requirements. Most notably, the EU - Vietnam FTA remains to be a salient example of how an IIA can remove technology transfer barriers, particularly concerning the promotion of foreign investments in the renewable energy sector. These are relevant legal approaches that can best promote foreign investments in this sector by protecting the investors against technology transfer requirements.

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Sobre os autores:

Mohammad Akefi Ghaziani
PhD student in International Law, Department of International Law, Faculty of Law, University of Qom, Qom, Iran
University of Qom, Irã
ORCID: http://orcid.org/0000-0002-5923-8684
E-mail: M.Akefi@stu.qom.ac.ir

Seyed Yaser Ziaee
Associate Professor, Department of International Law, Faculty of Law, University of Qom
University of Qom, Irã
ORCID: http://orcid.org/0000-0003-0649-5318
E-mail: yaserziaee@gmail.com

Mostafa Fazaeli
Associate Professor, Department of International Law, Faculty of Law, University of Qom
University of Qom, Irã
ORCID: http://orcid.org/0000-0002-5018-2418
E-mail: m-fazaeli@qom.ac.ir

Os autores contribuíram igualmente para a redação do artigo.