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INTRODUCTION

Electricity powers the social and economic development of modern society and accounts for 18.8% of energy consumption worldwide.[1] It is a public service that is essential for the smooth running of society, and it must be stable. Therefore, the electricity industry is usually strictly regulated, and electricity transactions largely take place domestically. However, this situation is changing, and transboundary electricity trade is expected to increase.[2]

A rising driving force behind this increase is the facilitation of large-scale renewable energy integration. Since renewable energy such as solar and wind energy is intermittent, the integration of large amounts of renewable energy into the electric power system raises challenges to traditional power grids. A promising solution to these challenges is to connect renewable sources over large geographic areas, linking sources in different time zones. In this way, power can be balanced over larger regions, and uncertainties associated with renewable energy sources can be reduced.[3] In 2015, Chinese President Xi Jinping called for the establishment of a Global Energy Interconnection[4] to meet global power demand with clean and green energy.[5] According to Liu Zhenya, the former Chairman of the State Grid Corporation of China, the Global Energy Interconnection will be a worldwide power grid connecting wind

1. *Key World Energy Statistics*, INTERNATIONAL ENERGY AGENCY 16 (2018), https://webstore.iea.org/download/direct/2291?fileName=Key_World_2018.pdf (last visited Feb. 5, 2019).

2. Yulia Selivanova, Clean Energy and Access to Infrastructure: Implications for the Global Trade System 1, The E15 Initiative (June 2015), https://perma.cc/S4RB-WWU9.

3. Ottmar Edenhofer et al., *Special Report on Renewable Energy Sources and Climate Change Mitigation, Summary for Policymakers and Technical Summary*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC] 109, (2012) http://www.ipcc.ch/pdf/special-reports/srren/SRREN_FD_SPM_final.pdf.

4. Also translated as the Global Energy Internet.

5. Xi Jinping, *Towards a Mutually Beneficial Partnership for Sustainable Development*, CHINA.ORG.CN (Nov. 4, 2015), https://perma.cc/DD5J-QDA4.

farms in North Pole areas, solar panels in equatorial regions, and other large-scale renewable bases on different continents with major power-consuming areas.[6]

Meanwhile, market-oriented electricity regulation reforms in many countries are eliminating domestic barriers for international electricity trading; and ultra-high voltage transmission technologies enable the long-distance transmission of electricity. These factors all lead to the growing importance of trans-boundary electricity transaction and regulation.

Various preferential treatments are available to promote renewable energy development, such as prioritized grid access. When electricity generated from different sources is traded across borders and renewable- and fossil fuel-sourced electricity are given differential treatments, it is very likely that these measures will be challenged under trade rules, such as the principles of Most-Favored-Nation (MFN) Treatment and National Treatment.[7] However, the multilateral trade system is poorly developed in regard to trade in electricity.

The question of whether renewable- and fossil fuel-sourced electricity are "like products" is of central importance.[8] This is a fundamental issue

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6. Liu Zhenya (**刘振**亚) & Quanqiu Nengyuan Hulianwang (**全球能源互**联网) GLOBAL ENERGY INTERNET 205 (Zhongguo Dianli Chubanshe (**中国**电力出版社) China Elec. Power Press (Jan. 2015).

7. Thomas Cottier, *Renewable Energy and Process and Production Methods*, E15INITIATIVE, GENEVA: INTERNATIONAL CENTRE FOR TRADE AND SUSTAINABLE DEVELOPMENT (ICTSD) AND WORLD ECONOMIC FORUM (Aug. 2015), https://perma.cc/QL2X-REQR.

8. Whether electricity is a good or a service is a question having no confirmed answer. WTO rules do not contain specific articles concerning electricity. The World Custom Organization (WCO) Harmonized Commodity Description and Coding System (HS) classifies electrical energy as a commodity. However, this is an optional heading, which means that WCO Members can choose whether to consider it as a commodity for tariff purposes. It reflects the disparity among WCO members regarding their view of the nature of electricity. This classification is followed by the WTO tariff schedules. Thus, it is reasonable to treat electricity as a good, which is therefore governed by GATT 1994.
This issue also relates to the structure of the electricity industry. Electricity trading between vertically integrated power companies is generally regarded as a good. However, when generation is separated from transmission and distribution, the issue becomes more complex. The majority view is that the generation of electricity is subject to GATT 1994, but its transmission and distribution should be covered by General Agreement on Trade in Services (GATS). For the purposes of this Article, the author adopts the majority view. For a more detailed discussion, *see* Thomas Cottier et al., *Energy in WTO Law and Policy*, NATIONAL CENTRES OF COMPETENCE IN RESEARCH (NCCR) 4-5, Trade Working Paper No.

because, as Professor Raj Bhala states, "[T]he General Agreement on Tariffs and Trade (GATT)] relies on the term 'like product' heavily, and other close terms, to expound its trade liberalizing rules."[9] More specifically, this issue is the starting point for a legal analysis of MFN and National Treatment under the rules of the World Trade Organization (WTO).

Despite its significance, the classification is "one of the most controversial issues in renewable energy trade."[10] If renewable- and fossil fuel-sourced electricity are "like products" then without doubt, preferential treatments to renewable-sourced electricity would face great risks of violating MFN or National Treatment rules. If it is possible that they are not "like products," countries would be more encouraged to facilitate the adoption of environmentally friendly sources of energy.

Bearing in mind that the judgment of likeness should be made on a case-by-case basis, the author argues there are possibilities that renewable- and fossil fuel-sourced electricity might be "unlike." It is necessary to note that this Article discusses only the "likeness" issue under Article III: 4 of the GATT 1994 (GATT 1994).[11] The GATT 1994 contains several articles concerning "like products," but the meaning and scope for "like products" varies.[12] Article III: 4, which addresses domestic regulation, is the most relevant article to the treatment of electricity coming from different sources.[13] In addition, the author is not in support of measures that are

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2009/25 (May 2009), https://perma.cc/ZXT7-HEU9; Robert Howse, *World Trade Law and Renewable Energy: The Case of Non-Tariff Barriers*, UNITED NATIONS PUBLICATION 1 (2009), https://perma.cc/A39G-KQE6; *Council for Trade in Services, Background Note by the Secretariat*, ¶ 7-14, WTO DOC. S/C/W/52 (Sept. 9, 1998).

9. RAJ BHALA, MODERN GATT LAW: A TREATISE ON THE GENERAL AGREEMENT ON TARIFFS AND TRADE 3 (2005).

10. Selivanova, *supra* note 2.

11. General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994).

12. As the Appellate Body (AB) said in *Japan—Alcoholic Beverages II*: "The concept of 'likeness' is a relative one that evokes the image of an accordion. The accordion of 'likeness' stretches and squeezes in different places as different provisions of the WTO Agreement are applied." (Edited by the author) Appellate Body Report, *Japan—Alcoholic Beverages*, 21, WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R (Oct. 4, 1996) (hereinafter *Japan—Alcoholic Beverages II* AB Report).

13. Besides, Article III: 2 contains two parts; one concerns "like products," and another concerns "directly competitive or substitutable products," while Article III: 4 does not. The author wants to focus on the key issue at hand rather

country-based;[14] therefore, this Article only discusses "likeness" issues under the heading of origin-neutral measures.

To present an argument that renewable- and fossil fuel-sourced electricity could be "unlike" under Article III: 4 has many implications. First, it is crucial for determining whether domestic regulations are in conformity with WTO rules, especially those giving preferential treatment to renewable energy. Second, it may also broaden thoughts on "likeness" analysis, considering that electricity generated from different sources is always deemed physically the same. Last but not least, it might serve as a catalyst for rethinking non-product-related Processes and Production Methods (NPR-PPMs) in a broader sense, such as in environmental protection and climate change mitigation.

It is necessary to briefly introduce some important concepts, namely PPMs, PR-PPMs, and NPR-PPMs, because one may assume that, regardless of its generation source, electricity becomes indistinguishable once uploaded to the power grid and blended. The key to the "likeness" judgment lies in the different sources used and the corresponding generating technologies implemented. These distinctions are known collectively as Processes and Production Methods (PPMs). PPMs are ways "in which products are manufactured or processed and natural resources are extracted or harvested."[15] There are two kinds of PPMs; namely,

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than to debate the differences in the coverage of "like products" in these two paragraphs, an issue that is also very important but not the focus of this Article.

14. It has been repeatedly ruled that if origin is the sole criterion distinguishing regulations on products, such products are treated as "like products" within the meaning of Article III: 2 and 4. This is known as the "alternative route" for "likeness" analysis, which contrasts with "traditional criteria" developed from the *Border Tax Adjustments* case. *See* Panel Report, *Indonesia—Measures Affecting the Automotive Industry*, ¶ 14.113, WT/DS54/R, WST/DS55/R, WT/DS59/R, WT/DS64/R (July 2, 1998); Panel Report, *Canada—Certain Measures Affecting the Automotive Industry*, ¶ 10.74, WT/DS139/R, WT/DS142/R (Feb. 11, 2000), as modified by the Appellate Body Report WT/DS139/AB/R, WT/DS142/AB/R; Panel Report, *United States—Tax Treatment for "Foreign Sales Corporations"—Recourse to Article 21.5 of the DSU by the European Communities*, ¶ 8.133, WT/DS108/RW (Aug. 20, 2001), as modified by Appellate Body Report WT/DS108/AB/RW; Panel Report, *India—Measures Affecting the Automotive Sector*, ¶ 7.174-176, WT/DS146/R, WT/DS175/R (Dec. 21, 2001). *See also* Shi Jingxia, *Factoring Cultural Element into Deciding the 'Likeness' of Cultural Products: A Perspective from the New Haven School*, 20 ASIA PAC. L. REV. 167, 171-2 (2012).

15. *Processes and Production Methods (PPMs): Conceptual Framework and Considerations on Use of PPM-based Trade Measures*, ORGANIZATION FOR

product-related PPMs (PR-PPMs) and non-product-related PPMs (NPR-PPMs). For PR-PPMs, the PPMs used actually affect the final products. However, for NPR-PPMs, the final products are physically the same.

Part I of this Article analyzes the applicability of NPR-PPMs to distinguish renewable- and fossil fuel-sourced electricity by scrutinizing the text of Article III: 4 of GATT 1994, analyzing relevant cases, and exploring possible policy concerns. Part II examines how different sources and means of electricity generation distinguish electricity under Article III: 4. It starts by analyzing the competitive relationship between renewable- and fossil fuel-sourced electricity; then, it applies the traditional criteria developed from the *Report by the Working Party on Border Tax Adjustments,* mainly focusing on physical properties and consumer preferences. This is followed by a consideration of regulatory aims and different consequences of consumption.

I. THE APPLICABILITY OF NPR-PPMS TO DISTINGUISH RENEWABLE- AND FOSSIL FUEL-SOURCED ELECTRICITY

To find out whether NPR-PPMs are applicable to the determination of "likeness" between renewable- and fossil fuel-sourced electricity, this Part first returns to the legal text of "like products" for answers. Then, it examines almost all cases related to NPR-PPMs, such as *Tuna/Dolphin* cases, *U.S.—Shrimp*, *Belgium—Family Allowances*, *U.S.—Malt Beverages* and *U.S.—Taxes on Automobiles*. In addition, it addresses some concerns and problems which play important roles in resisting NPR-PPMs while assessing "likeness." In sum, this part argues from aspects of the legal text, judicial practices, and policy concerns[16] to explore whether WTO rules exclude the possibility of distinguishing renewable- and fossil fuel-sourced electricity.

A. The Legal Text

Article III: 4 of the GATT 1994 does not provide any explanation about what constitutes "like products."[17] The Appellate Body (AB) in

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ECONOMIC CO-OPERATION AND DEVELOPMENT (1997), https://perma.cc/X7MR-NDGV.

16. This "laws, judicial practices and policies" analysis method is illuminated by Robert Howse & Donald Regan, *The Product/Process Distinction—An Illusory Basis for Disciplining 'Unilateralism' in Trade Policy*, Vol.11, No. 2 EUR. J. INT'L L. 249, (2000).

17. It writes, in relevant part:

Japan—Alcoholic Beverages II explained "likeness" generally and said, "there can be no one precise and absolute definition of what is 'like'. The concept of 'likeness' is a relative one that evokes the image of an accordion."[18]

The Appellate Body (AB) in *EC—Asbestos* specifically dealt with the "like products" issue under Article III: 4 for the first time. It tried to find a definition of "like" in the dictionary, which is "having the same characteristics or qualities as some other . . . thing; of approximately identical shape, size, etc., with something else; similar."[19] As the AB noted, the dictionary definition did not answer three important questions: in the process of analyzing "likeness," what characteristics or qualities were the most important? To what degree or extent should the products at issue be similar? From whose perspective should such a judgment be made?[20] Therefore, the dictionary definition provided little help in determining what "like products" were.

The AB then turned to the relevant context of Article III: 4. The AB took the view that Article III: 1 must be considered in the interpretation of Article III: 4.[21] The essence of such consideration is to determine the competitive relationship between and among products.[22] Article III: 1 also does not contain any indication to exclude NPR-PPMs, especially considering that NPR-PPMs can affect the competitive relationship between products.

The idea that renewable- and fossil fuel-sourced electricity are "like products" is usually based on criteria that are developed from the *Report of the Working Party on Border Tax Adjustments*, namely: (i) the product's properties, nature, and quality; (ii) the product's end-uses in a given market; (iii) consumers' tastes and habits;[23] and (iv) the tariff classification

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> The products of the territory of any Member imported into the territory of any other Member shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use . . . .

18. *Japan—Alcoholic Beverages II*, AB Report, *supra* note 12, at 21.

19. THE NEW SHORTER OXFORD ENGLISH DICTIONARY, Vol. I, 1588 (Lesley Brown ed., Clarendon Press, 1993).

20. Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, ¶ 92, WTO Doc. WT/DS135/AB/R (adopted Mar. 12, 2001) (hereinafter *EC—Asbestos* AB Report).

21. *Id.* at ¶ 93.

22. *Id.* at ¶ 99. This problem will be discussed in detail in Part II.

23. Working Party on Border Tax Adjustments, *Report of the Working Party on Border Tax Adjustments*, ¶18, B.I.S.D. 18S/97, L/3464 (Nov. 20, 1970).

of the products.[24] This notion suggests that electricity obtained from renewables and fossil fuels are identical in terms of their physical properties and have the same end-uses. Therefore, they are "like products." Accordingly, it is argued that regulatory distinctions based on generation method are not allowed.[25]

However, there might be other possibilities. On one hand, the competitive relationship between renewable- and fossil fuel-electricity and "consumers' tastes and habits" should also be considered. As increasing numbers of people care about environmental issues, having a cleaner way to produce electricity is very likely to affect consumer preferences, thus differentiating those two kinds of electricity. Moreover, electricity is a process, which means different sources of generation may actually affect the physical properties such as the continuity of the process. These issues will be discussed in Part II of this Article. On the other hand, there might be other factors that affect the "likeness" of products other than those four criteria. In *EC—Asbestos*, the AB noted that, "the adoption of a particular framework to aid in the examination of evidence *does not dissolve the duty or the need to examine, in each case, all of the pertinent evidence*."[26]

In conclusion, there is no proof that relevant legal text of GATT 1994 excludes NPR-PPMs while determining "likeness."

B. Judicial Practices

As the hostility towards NPR-PPMs seems to mainly come from judicial practices, one must analyze relevant cases to find out whether it is true that judicial practices have excluded a "likeness" analysis based on NPR-PPMs.

1. Tuna/Dolphin *cases*

Three *Tuna/Dolphin* cases are related to the issue at hand: *United States—Restrictions on Imports of Tuna* (Mexico) (hereinafter

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24. The fourth criterion was developed later from other cases such as *Japan—Customs Duties* and *EEC—Animal Feed*. *See* Panel Report, *Japan—Customs Duties, Taxes and Labeling Practices on Imported Wines and Alcoholic Beverages*, ¶ 5.6, B.I.S.D. 34S/83 (adopted Oct. 13, 1987) (hereinafter *Japan—Alcoholic Beverages* Panel Report); Panel Report, *EEC—Measures on Animal Feed Proteins*, ¶ 4.2, B.I.S.D. 25S/49 (adopted Dec. 2, 1977); *see also* BHALA, *supra* note 9, at 18.

25. Cottier, *supra* note 7, at i.

26. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 102 (emphasis added).

Tuna/Dolphin I),[27] *United States—Restrictions on Imports of Tuna* (European Economic Community) (hereinafter *Tuna/Dolphin II*),[28] and *United States—Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products* (Mexico) (hereinafter *U.S.—Tuna II (Mexico)*).[29] The first two took place during the GATT era, and the third occurred after the establishment of the WTO.

a. Tuna/Dolphin I *and* II

Current trade law does not favor NPR-PPMs generally. This attitude is closely related to the *Tuna/Dolphin* cases that occurred during the GATT era. In these cases, the United States put in place domestic regulations to limit the number of dolphins killed during the process of fishing for tuna. These regulations resulted in the prohibition of imports of certain tuna from some countries that did not meet the requirements. The Panels were of the view that Article III did not cover such process measures because it covered only measures on products.[30] Thus, when a regulation is based on NPR-PPMs, it falls outside the governance of Article III, even if the measures taken are non-discriminatory. The Panels applied Article XI and ruled that the measures constituted quantitative restrictions and could not be justified by Article XX.[31]

Although both Panel reports were not adopted, they publicly signaled that the trade system did not favor NPR-PPMs.[32] Consequently, there is an understanding that treating products differently based on NPR-PPMs is a *prima facie* violation of GATT unless justified by Article XX.[33]

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27. Panel Report, *United States—Restrictions on Imports of Tuna*, WTO Doc. DS21/R - 39S/155 (adopted Sept. 3, 1991) (hereinafter *U.S.—Tuna I* Panel Report).

28. Panel Report, *United States—Restrictions on Imports of Tuna*, WTO Doc. DS29/R (adopted June 16, 1994) (hereinafter *U.S.—Tuna II* Panel Report).

29. Appellate Body Report, *United States—Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products*, WTO Doc. WT/DS381/AB/R (adopted May 16, 2012) [hereinafter *U.S.—Tuna II (Mexico)* AB Report]; Panel Report, *United States—Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products*, WTO Doc. WT/DS381/R (adopted Sept. 15, 2011), as modified by Appellate Body Report WT/DS381/AB/R [hereinafter *U.S.—Tuna II (Mexico)* Panel Report].

30. *U.S.—Tuna I* Panel Report, *supra* note 27, at ¶ 5.8-5.16; *U.S.—Tuna II* Panel Report *supra* note 28, at ¶ 5.6-5.10.

31. *U.S.—Tuna I* Panel Report, *supra* note 27, at ¶ 7.1; *U.S.—Tuna II* Panel Report *supra* note 28, at ¶ 6.1.

32. Howse & Regan, *supra* note 16, at 250.

33. Howse & Regan, *supra* note 16, at 251.

However, the accuracy of this idea is doubtful. In order to make a reasonable judgment, there are at least two tiers of questions to answer. First, does Article III apply to NPR-PPM-based measures? Second, if it applies, how do NPR-PPMs affect a "likeness" analysis? Is origin-neutral regulation based on NPR-PPMs a violation of Article III?

The Panels of *Tuna/Dolphin I and II* rejected the application of Article III based on NPR-PPM-based measures. However, this position invited much criticism. To explain briefly, imagine if different tax rates were applied to two kinds of products that differ only in their NPR-PPMs: one type was imported, and the other was domestically manufactured. According to the view that Article III concerns only products and does not regulate measures based on NPR-PPMs, this tax scheme would not be reviewed under Article III; furthermore, because this is not a quantity control issue, Article XI could not be applied either. This would leave measures of this type totally uncovered. Thus, it was unreasonable to interpret Article III as such. This problem has been discussed extensively in the literature, which explains why the *Tuna/Dolphin* Panels erred.[34]

With regard to the second question, despite the negative attitude taken toward NPR-PPMs, the Panels actually never touched upon the issue of whether NPR-PPMs affected "likeness" in these two cases. Therefore, there are no grounds to deduce from these cases that NPR-PPMs cannot be considered in a "likeness" analysis.[35]

b. U.S.—Tuna II (Mexico)

U.S.—Tuna II (Mexico) concerned dolphin-safe labeling conditions set by the United States. The United States required that, for tuna products to obtain dolphin-safe labels, large purse seine vessels could not catch tuna

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34. *See* Howse & Regan, *supra* note 16; *see also* David M. Driesen, *What is Free Trade?*: *The Real Issue Lurking Behind the Trade and Environment Debate*, 41 VA. J. INT'L L., 279 (2000).

35. It is also worth noting that the reasoning in both *Tuna/Dolphin I and II* could not be used as guidance for following practices. The AB in *Japan—Taxes on Alcoholic Beverages II* confirmed that:

> unadopted panel reports "have no legal status in the GATT or WTO system since they have not been endorsed through decisions by the CONTRACTING PARTIES to GATT or WTO Members" Likewise, we agree that "a panel could nevertheless find useful guidance in the reasoning of an unadopted panel report that it considered to be relevant."

Japan—Alcoholic Beverages II AB Report, *supra* note 12, at 14-15 (quoting Panel Report, ¶ 6.10) (*edited by the author*).

by the method of setting on dolphins.[36] "Setting on dolphins occurs especially in the ETP [Eastern Tropical Pacific Ocean], because of the regular association observed between tuna and dolphins in that area."[37] Mexico explained that "Mexican tuna are almost exclusively caught in the ETP using purse seine nets set on dolphins."[38] Thus, Mexico claimed that the requirement set by United Sates actually barred most Mexican tuna products from using dolphin-safe labels and deprived those products of equal opportunities to compete with like products from the United States and other countries.[39]

In this case, the Panel and AB ruled under the Agreement on Technical Barriers to Trade (TBT Agreement).[40] In analyzing whether measures taken by United States violated Article 2.1,[41] the Panel considered "whether Mexican tuna products are like tuna products originating in the United States or any other country."[42] This discussion is relevant here because methods of fishing are typical NPR-PPMs. Different methods used to capture tuna do not affect the physical properties of tuna.

The Panel confirmed that approaches of conducting a "likeness" analysis under Article III: 4 could serve as guidance to Article 2.1 of the

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36. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 2.12.

37. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.306. "Setting on Dolphins" refers to fishermen locating schools of underwater tuna by finding and chasing dolphins on the ocean's surface and intentionally encircling them with purse seine nets to harvest the tuna underneath. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29 at ¶ 4.6, 4.7.

38. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.253 (Mexico's first written submission, ¶ 165).

39. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.255 (Mexico's second written submission, ¶ 150).

40. Agreement on Technical Barriers to Trade, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1868 U.N.T.S. 120 (hereinafter the TBT Agreement). Mexico also raised claims under Articles I: 1 and III: 4 of GATT 1994, but the Panel excised judicial economy and declined to rule. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.748. The AB found that the Panel erred in excising judicial economy. However, Mexico did not request for the AB to rule under the GATT 1994 if it were to find that measures taken by the United States violated Article 2.1. The AB did not rule under the GATT 1994 as well. *U.S.—Tuna II (Mexico)* AB Report, *supra* note 29, at ¶ 406.

41. Article 2.1 of the TBT Agreement prescribes that Members shall ensure that, in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favorable than that accorded to like products of national origin and to like products originating in any other country.

42. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.235.

TBT Agreement.[43] It was "*a priori* appropriate to consider the four general criteria" developed from the *Report of the Working Party on Border Tax Adjustments* in this case.[44] The Panel also adopted the view that "all of the pertinent evidence" should be examined.[45] Therefore, the reasoning in this case is a valuable reference for a "likeness" analysis under Article III: 4.

The Panel discussed "consumer preferences" in this case. Because products in this case shared the same physical properties, end-uses, and tariff classification,[46] the criterion of "consumer preferences" plays a critical role. Mexico argued "consumers' tastes and habits are identical with respect to Mexican and U.S. tuna products and tuna."[47] The United States did not challenge this assertion.[48]

However, the European Union as a third party in this case pointed out "the elements presented to the Panel suggest that there may be different consumer perceptions and preferences with respect to dolphin safe and not dolphin safe tuna and tuna products, and that this may have an impact on whether the two types of products are like."[49]

This observation also gained support from the Panel, which said:

> The information presented to the Panel does suggest that U.S. consumers have certain preferences with respect to tuna products, based on their dolphin safe status, and we do not exclude that such preferences may be relevant to an assessment of likeness. To the extent that consumer preferences, including preferences relating to the manner in which the product has been obtained, may have an impact on the competitive relationship between these products, we consider it *a priori* relevant to take them into consideration in an assessment of the likeness.[50]

This statement is of crucial importance. The EU and the Panel explicitly supported the idea that different manners of obtaining products may affect their "likeness" because consumers may have different preferences in this respect. This actually provides a very strong authority to support the view

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43. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.215–7.227.
44. *Id,* at ¶ 7.240.
45. *Id.* at ¶ 7.241.
46. *Id*, at ¶ 7.246.
47. *U.S.—Tuna II (Mexico)* Panel Report, citing Mexico's first written submission ¶ 151, *supra* note 29, at ¶ 7.247.
48. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.247.
49. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.248 (citing European Union's third party written submission, ¶ 28).
50. *Id.* at ¶ 7.249.

of this Article that NPR-PPMs can be factors that affect a "likeness" determination.

The Panel then emphasized that this case was about "a comparison between Mexican tuna products and tuna products of U.S. origin and tuna products originating in any other country, not between dolphin safe and not dolphin safe tuna."[51] "A comparison on the basis of dolphin-safe status would imply that Mexican tuna products are assumed not to be dolphin safe while U.S. tuna products and tuna products originating in any other country would be assumed to be dolphin safe."[52]

Based on this premise, the Panel adopted the view that Mexican tuna products and tuna products of U.S. origin and tuna products originating in any other country are "like products." Although U.S. consumers had different preferences for dolphin safe and dolphin unsafe products, they did not show different tastes for tuna products made from tuna caught by different countries.[53] The United States did not raise this "likeness" issue on appeal, so the AB did not discuss it.[54]

Therefore, one cannot conclude from this case that NPR-PPMs are not relevant to a "likeness" determination. On the contrary, the Panel in this case actually supported the idea that NPR-PPMs can affect consumer preferences and the "likeness" of products.

2. U.S.—Shrimp

United States—Import Prohibition of Certain Shrimp and Shrimp Products (U.S.—Shrimp) is another case involving NPR-PPMs. This case arose from the United States' requirements regarding the preservation of sea turtles during shrimp trawling. While "most populations of sea turtles are considered to be endangered or threatened,"[55] studies led by the United States showed that the "incidental capture and drowning of sea turtles by shrimp trawlers is a significant source of mortality for sea turtles."[56] The United States prohibited the importation of shrimp or shrimp products from countries that had not been certified. To obtain certification, that country must have a regulatory program controlling the incidental killing of sea turtles comparable to that of United States, including a requirement

51. *Id.* at ¶ 7.250.
52. *Id.* at ¶ 7.250.
53. *Id.* at ¶ 7.250.
54. *U.S.—Tuna II (Mexico)* AB Report, *supra* note 29, at ¶ 7.230.
55. Panel Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, ¶ 7.1, WT/DS58/R (May 15, 1998), as modified by Appellate Body Report WT/DS58/AB/R (hereinafter *U.S.—Shrimp* Panel Report).
56. *Id.* at ¶ 7.2.

to install turtle excluder devices (TEDs)[57] in commercial shrimp trawling vessels.[58]

The complaints claimed that the measures taken by the United States violated Article XI: 1, Article XIII: 1, and Article I: 1 of the GATT 1994. The Panel concluded the measures violated Article XI: 1 regarding the general elimination of quantitative restrictions. MFN Treatment in Article I: 1 requires the equal treatment of like products from different countries. In this case, the measures concerned treated shrimp and shrimp products caught in different ways.[59] The Panel could have analyzed NPR-PPMs. However, the Panel found that it was not necessary to review the claims under Article XIII: 1 and Article I: 1. Neither party challenged this on appeal. Therefore, this case cannot serve as guidance about NPR-PPMs in "like products" analysis.[60]

3. Other cases

There are three other cases related to NPR-PPMs: *Belgium—Family Allowances,*[61] *United States—Measures Affecting Alcoholic and Malt Beverages,*[62] and *United States—Taxes on Automobiles*.[63] The reason these are included together is that the NPR-PPMs in these cases were not typical environmental measures like those discussed above. These measures were

57. TEDs were developed by the United States National Marine Fisheries Service to reduce the mortality of sea turtles in shrimp trawls. *Id.* at ¶ 7.2. It was required that TEDs used by other countries must be comparable in effectiveness to those used by United States. *Id.* at ¶ 7.5.

58. There were other detailed limitations and conditions. The author makes this brief but sufficient for readers to understand the issue at hand. For those who are interested in the full situation, *see U.S.—Shrimp* Panel Report, *supra* note 55, at ¶ 7.2-7.6.

59. "Shrimp harvested by manual methods that do not harm sea turtles, by aquaculture and in cold water, could continue to be imported even from countries that have not been certified under Section 609." *Id.* at ¶ 7.6.

60. It is also worth noting that in this case, the measures were country-based in some respects. Shrimp captured with TEDs still could not enter the United States if the country of origin was not certified by the United States. *Id.* at ¶ 7.6.

61. Panel Report, *Belgium—Family Allowances (Allocations Familiales)*, B.I.S.D. 1S/59 (Nov. 6, 1952) (hereinafter *Belgium—Family Allowances* Panel Report).

62. Panel Report, *United States—Measures Affecting Alcoholic and Malt Beverages*, B.I.S.D. 39S/206, DS23/R (Mar. 16, 1992) (hereinafter *U.S.—Malt Beverages* Panel Report).

63. Panel Report, *United States—Taxes on Automobiles*, DS31/R (Oct. 11, 1994) (hereinafter *U.S.—Taxes on Automobiles* Panel Report).

related to manufacturers or countries of origin. In these cases, the Panel agreed that Article I and/or Article III of the GATT 1947[64] were applicable even though the measures were not directly based on products. This attitude was quite different from that adopted in the *Tuna/Dolphin I* and *II* cases. Additionally, in contrast to the cases discussed above, in which either the Panels did not rule under Article I or Article III or the Panel ruled under Article III but did not rule on NPR-PPMs issues, these three cases actually ruled that NPR-PPMs-based measures violated Article I and/or Article III.

a. Belgium—Family Allowances

The measure in dispute in *Belgium—Family Allowances* was a Belgian law levying a charge on foreign goods purchased by its public bodies when these goods originated in a country whose system of family allowances did not meet specific requirements.[65] In this case, the Panel applied Article I: 1 and Article III: 2 but did not provide much reasoning. The Panel stated that because Belgium granted an exemption from the charges to products that originated from six countries that it thought complied with family allowance requirements, it was clear that Belgium should do the same for products from the complainants.[66] The Panel did not analyze the "like products" issue.

The Panel said that it "felt . . . it would be difficult for the CONTRACTING PARTIES to arrive at a very definite ruling." Then, the Panel concluded that "the Belgian legislation on family allowances was not only inconsistent with the provisions of Article I (and *possibly* with those of Article III, paragraph 2), but was based on a concept which was difficult to reconcile with the *spirit of the General Agreement*."[67]

In summary, the Panel did not provide a reasonable explanation for its decision, and it ruled that the measures adopted in the case possibly violated Article III: 2. More importantly, the measures in this case were not origin-neutral but were country-based. Under such circumstances, the products at issue could be deemed "like products" directly.[68] Thus, it is difficult to draw any conclusion regarding NPR-PPMs and "likeness" based on this case.

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64. General Agreement on Tariffs and Trade, Oct. 30, 1947, 55 U.N.T.S. 194 (GATT 1947).

65. *Belgium—Family Allowances* Panel Report, *supra* note 61, at ¶ 1.

66. *Id.* at ¶ 3.

67. *Id.* at ¶ 8 (emphasis added).

68. *See supra* note 14.

b. U.S.—Malt Beverages

United States—Measures Affecting Alcoholic and Malt Beverages was the only case in which the adopted Panel Report explicitly ruled on the issue of "likeness" related to origin-neutral NPR-PPMs. In this case, some of the United States provided tax credits on beer from small domestic breweries.

With respect to the Minnesota tax credit, the United States argued "the tax credit in Minnesota applied to all qualifying brewers, including Canadian brewers, who met the maximum annual production limitations. This statute had no discriminatory intent or impact."[69]

The Panel found that "beer produced by large breweries is not unlike beer produced by small breweries."[70] However, it did not further explain the "likeness" issue in detail. It then immediately pointed out that "the United States did not assert that the size of the breweries affected the nature of the beer produced or otherwise affected beer as a product."[71] It was irrelevant whether the Minnesota tax credit was available to imported beer because imported beer from large breweries would be treated differently from small breweries.[72]

Some information was revealed by these limited words. First, the Panel not only mentioned "the nature of the beer produced" but also "beer as a product."[73] Considering that these limited sentences were of critical importance, it was unlikely that the Panel added "beer as a product" just as repetition. This statement revealed that elements other than physical properties affecting "beer as a product" should also be considered. This left space for arguments based on NPR-PPMs. Second, in this case, the NPR-PPM was the breweries' annual production of beer rather than how the beer was produced. Such a distinction based only on the manufacturers made it difficult to argue how it affected the competitive relationship between products. It is important to consider that not all NPR-PPMs result in differences, just as not all product-based measures lead to distinctions. In conclusion, the ruling of this case did not shut the door to NPR-PPMs.

c. U.S.—Taxes on Automobiles

The unadopted *Panel Report on the United States—Taxes on Automobiles* is also relevant to NPR-PPMs. One of the issues concerned

69. *U.S.—Malt Beverages* Panel Report, *supra* note 62, at ¶ 3.35.
70. *Id.* at ¶ 5.19.
71. *Id.*
72. *Id.*
73. *Id.*

the Corporate Average Fuel Economy (CAFE) regulation, which required that each manufacturer and importer must meet CAFE requirements. The CAFE value was calculated for each manufacturer's and importer's entire fleet of vehicles.[74] Therefore, domestic and imported cars were calculated and averaged separately. With regard to the "fleet averaging" approach, the EC argued that "because the CAFE regulation placed only full-line manufacturers in a position to sales-average large cars with small cars within the same fleet to attain the required 27.5 mpg standard, EC limited-line car manufacturers were prejudiced under Article III: 4."[75] The United States thought that "the CAFE measure applied equally to cars of all origins and was thus consistent with Article III: 4."[76]

The regulation herein was based on "the ownership or control of the manufacturers or importers," rather than on the products.[77] At the beginning of the analysis of CAFE, the Panel specifically examined the applicability of Article III and wrote, "The Panel noted that, for a measure to be subject to Article III, it does not have to regulate a product directly."[78]

When analyzing this measure under Article III: 4, the Panel first examined the text of Article III and noted that Article III concerned "products." Then, it cited a paragraph from the *Report of the Working Party on Border Tax Adjustments*, which said *inter alia* "taxes that were not directly levied on products were not eligible for adjustment" to support its idea on Article III.[79] The Panel then stated that such an idea was important to tariff security. The Panel concluded, "[I]f it were permissible to *justify* under Article III less favourable treatment to an imported product on the basis of factors not related to the product as such, *Article III would not serve its intended purpose*."[80]

The Panel's logic appears to be that Article III *applies to* measures that are not directly based on products. However, it *could not justify* such measures because they were not directly related to products.

Then the Panel stated that "these considerations confirmed in the view of the Panel that Article III: 4 does not permit treatment of an imported

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74. *U.S.—Taxes on Automobiles* Panel Report, *supra* note 63, at ¶ 2.14.

75. *Id.* at ¶ 5.50.

76. *Id.* at ¶ 5.50.

77. *Id.* at ¶ 5.51.

78. *Id.* at ¶ 5.45. It is interesting to note the example it cited to support this idea was the same paragraph cited by the *U.S.—Tuna I* Panel in arguing that Article III was not applicable to measures that are not directly related to products.

79. Report of the Working Party on Border Tax Adjustments, *supra* note 23, at 14.

80. *U.S.—Taxes on Automobiles* Panel Report, *supra* note 63, at ¶ 5.53 (emphasis added).

product less favourably than that accorded to a like domestic product, based on factors not directly relating to the product as such."[81] It seems the Panel directly concluded that the products at issue were "like products." It did not address the question of NPR-PPMs in "like products" analysis. However, as stated in analyzing *U.S.—Malt Beverages*, it is difficult to say how NPR-PPMs affect "likeness" judgments considering that the measures discussed here were based on different manufacturers and importers.

In summary, there are countless types of NPR-PPMs; some may affect likeness judgments, and others may not. It is unreasonable to deny the entire class of origin-neutral process-based measures simply because some cases ruled negatively toward NPR-PPMs. The issue should be analyzed carefully. The PPMs in these three cases were PPMs in a broad sense and were actually based on manufacturers. Whether the manufacturers used the same method to produce the products was not the issue. Distinguishing between renewable- and fossil fuel-sourced electricity is quite different and cannot be considered unacceptable because they are under the same broad umbrella of the concept NPR-PPMs. Furthermore, in these cases, the measures discussed were either country-based, lacking a strong defense by defendants, or the the Panel reports were ambiguously worded.

C. Concerns and Problems

Regarding NPR-PPMs, the differences are not embodied in products themselves. Even if there is no basis in the legal text and judicial practices for a general opposition to NPR-PPMs, one may still be concerned that NPR-PPMs might cause problems. For example, it may be difficult for customs to determine how the products were processed, thus increasing administrative costs; NPR-PPMs may vary from country to country, and a lack of harmonization of standards may result in market segmentation. Distributive injustice might also increase because developed countries always propose NPR-PPMs regulations and developing and poorly developed countries might lack the conditions to do so; and some may also presume measures based on NPR-PPMs are extraterritoriality by allowing one country to regulate process and production behaviors taken outside its borders. These concerns may constitute major barriers to the acceptance of NPR-PPMs in distinguishing electricity obtained from different sources.

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81. *U.S.—Taxes on Automobiles* Panel Report, *supra* note 63, at ¶ 5.54.

1. Difficulties in Tracking Different NPR-PPMs

Because the final products are physically very similar or the same, it is sometimes difficult to determine the NPR-PPMs that have been used based on the products.[82] This may be true for normal products, but not for electricity. Electricity is generated from different power plants (or from distributed sites, such as rooftop solar systems) by using various sources, such as coal, natural gas, wind or solar energy. The generation facilities must be connected to the power grid and then transmitted to consumers. Thus, the grid control system is not only able to know but must know how much electricity each facility uploaded to run the system. This feature distinguishes electricity from other products. In the mixture of electricity provided, it is possible to know how much comes from each source.

Another closely related concern is that consumers in most countries cannot choose what type of electricity to use. They cannot tell whether the electricity was obtained from renewable sources or fossil fuels when they turn on their switch. This concern is very persuasive at first glance. However, a little thought provides a different story because almost all regulations concerning renewable generation govern the stages at which the two kinds of electricity can be distinguished. Such regulations include prioritized grid access, electricity portfolio, and minimum price requirements. Moreover, consumers are able to know the percentage of electricity they use that comes from renewable sources.

2. Conflicts of National Standards, Market Segmentation, and Distributive Injustice

Concerns on conflicts of national standards regarding NPR-PPMs, market segmentation, complicated administrative procedures, and distributive injustice are interrelated. These concerns all arise from the same cause: different countries may use various methods to process and produce a particular good. The concern is that using NPR-PPMs as factors to distinguish between goods will increase the cost of manufacturing and cause market segmentation. The corresponding administrative procedures to handle such NPR-PPMs at the customs level will be complicated and prolonged. In addition, using NPR-PPMs as factors tends to become a disguised form of trade protectionism.[83]

However, if "electricity" is considered in this scenario, such concerns are not equally warranted. The question at hand is whether to treat

82. OECD, *supra* note 15, at 20.
83. *Id*. at 21.

renewable- and fossil fuel-sourced electricity as different products. The divide between renewable energy and fossil fuels is generally the same worldwide. Renewable energy always refers to solar, wind, geothermal, wave, tidal, biomass, biofuels, and small-scale hydro energy; whereas major forms of fossil fuels include coal, natural gas, and oil. The different sources are very clear and widely accepted. Although there are some differences among countries regarding the coverage of renewables and different standards might be used to decide whether energy sources qualify as renewables,[84] similar controversies regarding coverage and standards also exist in trades for which NPR-PPMs are not an issue.

While there is a risk of abuse by protectionists, this risk is not unique. Many accepted trade measures also have the possibility of abuse. What matters most is whether it is possible to regulate such measures and control the risk and whether it is worth the risks. Considering the environmental benefits of encouraging the use of renewable energy and the low risk of abuse, it is worth admitting the difference and regulating the risks.

Many also worry that the acceptance of NPR-PPMs might result in distributive injustice because developed countries are often more concerned about environmental protection and tend to adopt NPR-PPM-based regulations. Such regulations always increase the cost of manufacturing in developing countries. However, the effects of promoting renewable energy may be just the opposite of "distributive injustice." Because fossil fuel resources are distributed unevenly, in countries lacking such natural resources,[85] renewable energy offers an alternative for power generation. Indeed, renewable energy shows great potential for providing electricity to people who would otherwise lack access to it.

3. The Scope of Concession and Extraterritoriality

The admission of NPR-PPMs might lie outside the scope of concessions made during negotiations for WTO.[86] This view presumes that the criteria used to determine likeness do not contain the factor of NPR-PPMs. However, nothing in the text of Article III denies that NPR-PPMs can be a factor. The AB in the *EC—Asbestos* Report clearly

84. For example, regarding biofuels, the EU requires that a certain percentage of greenhouse gas reduction should be met. *See* Directive 2009/28/EC (the 2009 Renewable Energy Directive), OJ L 140/16.

85. These countries are not necessarily developing or the least developed countries; they also may be developed countries.

86. OECD, *supra* note 15, at 21.

emphasized that "[i]n examining the 'likeness' of products, panels must evaluate *all* of the relevant evidence."[87]

Extraterritoriality is another major concern regarding NPR-PPMs. It is presumed that accepting distinctions based on NPR-PPMs would allow one country to regulate process and production behaviors that are adopted outside its borders. However, this is not the case for electricity generation. The distinction between renewable- and fossil fuel-based electricity allows countries to make special arrangements to promote renewable energy development but does not force other countries to do the same.

Moreover, an important reason for the association between PPMs and extraterritoriality is that these special procedures or devices are always created or designed by the countries that require their deployment. This leaves an impression that these countries want others to follow the PPMs that they set. Even for such kinds of PPMs, the AB allowed the possibility of applying Article XX to justify them.[88] Regarding the issue at hand, renewable- and fossil fuel-sourced means of generation already widely exist and have been adopted by countries worldwide. It is difficult to consider such a distinction as forcing any country to adopt certain kinds of generation methods.

Thus, with regard to distinguishing renewable- and fossil fuel-sourced electricity, the general policy concerns regarding NPR-PPMs either do not apply to the special characteristics of electricity or are not unique to NPR-PPMs. A detailed exploration of these concerns shows that these concerns should not be used to reject the possibility of distinguishing between renewable- and fossil fuel-sourced electricity.

In summary, after closely examining the text, judicial practices, and policy concerns, there is no basis in any of these respects for the idea that WTO rules exclude the possibility of distinguishing between renewable- and fossil fuel-sourced electricity.

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87. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 113 (emphasis in the original).

88. The Appellate Body held:

> It is not necessary to assume that requiring from exporting countries compliance with, or adoption of, certain policies (although covered in principle by one or another of the exceptions) prescribed by the importing country, renders a measure *a priori* incapable of justification under Article XX. Such an interpretation renders most, if not all, of the specific exceptions of Article XX inutile, a result abhorrent to the principles of interpretation we are bound to apply.

Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, ¶ 121, WT/DS58/AB/R (Oct. 12, 1998).

II. WHY RENEWABLE- AND FOSSIL FUEL-SOURCED ELECTRICITY COULD BE "UNLIKE" UNDER ARTICLE III: 4

While Part I explained that WTO rules do not exclude the possibility of distinguishing renewable- and fossil fuel-sourced electricity, this Part argues why renewable- and fossil fuel-sourced electricity could be considered "unlike" under Article III: 4. It is important to emphasize that this Article analyzes some general factors that may affect a "likeness" analysis of electricity obtained from different sources, and whether these forms of electricity are actually "like" should be considered under the specific situation in each case.

Remembering that Part I(A) preliminarily explained "like products" under Article III: 4, this Part directly carries out a "likeness" analysis. As the AB noted in *EC—Asbestos*, Article III: 1 must be considered in the interpretation of Article III: 4.[89] Combined thinking of these ideas leads to the explanation that a determination of "likeness" under Article III: 4 is fundamentally a determination about the nature and extent of a competitive relationship between and among products.[90] Therefore, this Part specifically examines the competitive relationship between renewable- and fossil fuel-sourced electricity; then it applies the traditional criteria that were developed based on the *Report by the Working Party on Border Tax Adjustments*; and argues that the regulatory aims and differences in the consequences of consumption are important factors to consider as well.

A. Competitive Relationship

An examination of the competitive relationship between renewable- and fossil fuel-sourced electricity must fully consider the unique characteristics of the electricity market. This industry sector is usually under strict regulation to ensure a stable supply of electricity. Meanwhile, because fossil fuels are exhaustible and polluting, renewable energy must be introduced into the system to secure the long-term supply of electricity and to protect the environment.[91] Generally, however, electricity generated from renewable sources is more expensive than that generated from fossil

89. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 93.

90. *Id.* at ¶ 99.

91. Appellate Body Reports, *Canada—Certain Measures Affecting the Renewable Energy Generation Sector / Canada—Measures Relating to the Feed-in Tariff Program*, ¶ 5.186, WT/DS412/AB/R / WT/DS426/AB/R (May 6, 2013) (hereinafter *Canada—Renewable Energy / Canada—Feed-in Tariff Program* AB Reports).

fuels. Therefore, in most cases, governments intervene to create a market for renewable energy by using tools such as the mandatory inclusion of a certain percentage of renewable-sourced electricity (Renewable Portfolio Standards) and launching Feed-in Tariff (FIT) Programs.[92]

Under such circumstances, competitive relationships are not the same as those for commodities of which supply and demand fully follow market rules. Some inferences can be drawn from *Canada—Renewable Energy / Canada—Feed-in Tariff Program* in which one of the issues was whether the FIT program constituted a subsidy, which violated the Agreement on Subsidies and Countervailing Measures (the SCM Agreement).[93] In determining whether the FIT Program conferred a benefit within the meaning of Article 1.1(b) of the SCM Agreement, a "relevant market" must be found to identify a benefit benchmark for the electricity produced from wind power and solar PV technologies because "the existence of a benefit can properly be established only by comparing the prices of goods and services in the relevant market where they compete."[94] The location of a "relevant market" is, in essence, the determination of a competitive relationship. Thus, although *Canada—Renewable Energy / Canada—Feed-in Tariff Program* concerned subsidies, the analysis of a competitive relationship for renewable-sourced electricity and other forms of electricity is highly relevant here.

The AB explored the competitive relationship based on two aspects: demand-side and supply-side substitutability. With regard to the first aspect, electricity supplies obtained from different sources are physically identical; apparently, these are substitutable from the viewpoint of consumers. However, the AB observed that other factors might affect demand-side choice such as "the type of contract, the size of the customer, and the type of electricity generated (base-load versus peak-load)."[95]

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92. The FIT Program can generally be described as a scheme implemented by the government through which generators of electricity, produced from certain forms of renewable energy, are paid a guaranteed price per kWh of electricity. (Panel Reports, *Canada—Certain Measures Affecting the Renewable Energy Generation Sector / Canada—Measures Relating to the Feed-in Tariff Program*, ¶ 7.64, WT/DS412/R / WT/DS426/R (Dec. 19, 2012)).

93. *Canada—Renewable Energy / Canada—Feed-in Tariff Program* AB Reports, *supra* note 91, at ¶ 5.5. Agreement on Subsidies and Countervailing Measures, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14 (SCM Agreement) (Apr. 15, 1994).

94. *Canada—Renewable Energy / Canada—Feed-in Tariff Program* AB Reports, *supra* note 91, at ¶ 5.169.

95. *Id.* at ¶ 5.170.

Regarding supply-side substitutability, first, the construction costs involved in producing renewable electricity were much higher than those for producing conventional electricity. Without governmental regulation, the markets for wind- and solar PV-generated electricity could not come into existence.[96] Second, the market for electricity had two tiers. Electricity was bought by "the Government of Ontario at the wholesale level and then resold to consumers at the retail level."[97] The Government put requirements in place dictating the energy supply mix. Certain portions of electricity had to come from wind and solar PV. Although electricity from different sources was blended and undistinguishable by the final consumers, on the supply-side, the electricity generated using different technologies was not substitutable at the wholesale level.[98]

Thus, the AB concluded the relevant market was not the competitive wholesale electricity market as a whole but rather competitive markets for wind- and solar PV-generated electricity that were created by the government.[99]

The analysis by the AB in this case is very enlightening regarding the competitive relationship between renewable and fossil fuel-sourced electricity. Although a competitive relationship should be considered in specific cases according to the different situations thereof, the factors that led to the conclusion reached in *Canada—Renewable Energy / Canada—Feed-in Tariff Program* exist in many countries as governments create markets for renewable electricity. For those countries that adopt renewable portfolio standards requiring certain portions of electricity to come from renewable energy, renewable and fossil fuel electricity supplies are not substitutable and are not in a competitive relationship with each other. Recalling that "a determination of 'likeness' under Article III: 4 is, fundamentally, a determination about the nature and extent of a competitive relationship between and among products,"[100] renewable- and fossil fuel-sourced electricity are not "like products" under such circumstances.

B. Traditional Criteria

The previous part discussed the competitive relationship mainly from the market structure perspective. However, if electricity markets in certain countries do not share those features, or if renewable electricity becomes

96. *Id.* at ¶ 5.175.
97. *Id.* at ¶ 5.176.
98. *Id.* at ¶ 5.176.
99. *Id. at* ¶ 5.178.
100. *EC—Asbestos* AB Report, *supra* note 20, ¶ 99.

cheap enough to compete with fossil fuel-based electricity such that it does not need government regulation to maintain its market place, then an analysis following the traditional criteria remains necessary.

The opinion that renewable- and fossil fuel-sourced electricity are "like products" is usually based on criteria developed from the *Report of the Working Party on Border Tax Adjustments* including: the product's properties, nature, and quality; end-uses in a given market; consumers' tastes and habits; and the tariff classification of the products.[101] The logic behind this opinion is that supplies of electricity from renewables and fossil fuels are identical in their physical properties and have the same end-uses, making them "like products." For end uses and tariff classification, it is true that renewable- and fossil fuel-sourced electricity are the same. However, with regard to their physical properties and consumer preferences, there are spaces for other possibilities.

1. Physical Properties

The opinion that electricity generated from renewable energy and fossil fuels share the same physical properties is based on the idea that electricity is electricity regardless of the generating technologies. This idea treats electricity the same way as other goods for which the physical properties independently bear on the final product itself. However, this is not true for electricity. The dictionary definition of "electricity" is as follows: "A fundamental form of energy observable in positive and negative forms that occurs naturally (as in lightning) or is produced (as in a generator) and that is expressed in terms of the movement and interaction of electrons."[102]

Electricity is a form of energy that is based on the process of the "movement and interaction of electrons." Once generation stops, electricity disappears. People in electrified society become unaware of this important physical characteristic, perhaps because today's power supply is centralized. Electricity is transmitted from power plants that are far from the consumers. To consumers, electricity comes and goes with a simple turn of a switch. It seems to always be right there, like other commodities. The generation process is separated from electricity itself in people's minds. However, this long-distance transmission mode was enabled by alternating current technologies, which became popular not long ago. When Thomas Edison invented light bulbs, he used direct current to

101. Working Party on Border Tax Adjustments, *supra* note 23.

102. *Electricity*, MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY (11th ed. 2003).

transmit electricity and light up those bulbs. Electricity could not be transmitted over long distances using this technology at that time. Therefore, initially, he had to install noisy and dangerous generators in customers' houses to power the bulbs there. It would be difficult for people who experienced this process to say that solar PV-electricity is the same as that generated by a large, hot generator next door. Electricity is a process rather than an independent commodity. Thus, it is important to consider by what sources and technologies it is generated when one discusses the physical properties of electricity.[103]

Electricity supplies generated from wind power and solar PV are intermittent and cannot provide a stable base-load.[104] Moreover, these sources are not flexible like natural gas, which can generate electricity whenever needed; thus, they cannot be used as stand-by sources to support peak loads. These unique physical characteristics put solar and wind power in a very weak (if not impossible) position to compete with fossil fuel-sourced electricity for such contracts. Furthermore, wind power and solar PV technologies entail higher capital costs, low operating costs, and "fewer, if any, economies of scale" in comparison with conventional sources. These features "make it very unlikely, if not impossible, that the former may exercise any form of price constraint on the latter."[105] Thus, electricity's different physical characteristics resulting from various sources and technologies also affect competitiveness.

One may also argue that once electricity is uploaded to the grid and blended, consumers cannot tell which part was generated from renewables. This seems to be a sound argument. However, if one thinks more deeply, this idea is misleading because, crucially, almost all regulations targeting renewable electricity rely on phases where it is distinguishable. Such regulations include investment subsidies, preferential tariffs, renewable portfolio standards and renewable energy certificates.[106] As previously noted, it is not only possible to know, but it is necessary to know how

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103. Professor Robert Howse holds the same position. *See* Howse, *supra* note 8, at 3.

104. The Global Energy Interconnection is designed to solve this problem. If renewable energy-sourced electricity could be transmitted across time zones, it might be able to serve the base-load.

105. *See* WILLIAM W. HOGAN, OVERVIEW OF THE ELECTRICITY SYSTEM IN THE PROVINCE OF ONTARIO, at 6-8, Panel Exhibit CDA-2 (Dec, 21, 2011) (cited by *Canada—Renewable Energy / Canada—Feed-in Tariff Program* AB Reports, *supra* note 91, ¶ 5.174.).

106. *See Fostering Low Carbon Growth: The Case for a Sustainable Energy Trade Agreement*, ICTSD GLOBAL PLATFORM ON CLIMATE CHANGE, TRADE AND SUSTAINABLE ENERGY at 17, https://perma.cc/V9YA-7KZL.

much electricity has been uploaded from each facility to operate the grid control system. Consumers are thus able to know what percentage of the electricity they use comes from renewable energy sources.

In summary, electricity is a process. Differences in the sources and technologies used distinguish it in terms of its physical properties and affect its competitiveness. Although it is not readily distinguishable by final consumers, almost all renewable energy regulations rely on phases in which it is possible to distinguish the sources.

2. Consumer Preferences

Consumer preferences play an important role in the "likeness" determination. Overreliance on fossil fuel energy has caused serious environmental problems, such as air pollution and climate change. The consequences are trans-boundary and have global effects, which can affect the life of everyone on earth. Public awareness of fossil fuels' negative effects has led to increased enthusiasm for renewable energy.

Even those who insist that renewable- and fossil fuel-based electricity supplies have the same physical characteristics must consider consumer preferences, otherwise they will run afoul of the four criteria the WTO developed and adopted.[107] In *EC—Asbestos*, the AB considered that health risks associated with products could influence consumer behavior and were relevant in assessing the competitive relationship in the marketplace.[108] In *U.S.—Tuna II (Mexico)*, the Panel explicitly supported the idea that different ways of obtaining products may affect their "likeness," as consumers may have different preferences in this respect. This "may have an impact on the competitive relationship between these products," so the Panel "consider it *a priori* relevant to take them into consideration in an assessment of the likeness."[109]

The consumption of electricity generated by fossil fuels will encourage its exploration and burning. Consumers who care about the environment and health are very likely to support government decisions that encourage renewable energy development. As the AB noted in *Canada—Renewable Energy / Canada—Feed-in Tariff Program*, "the government definition of the energy supply-mix may reflect the fact that consumers are ready to purchase electricity that results from the combination of different generation technologies, even if this is more expensive than electricity that is produced exclusively from conventional

107. Howse, *supra* note 8, at 6.
108. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 113-6, 122,128, and 145.
109. *U.S.—Tuna II (Mexico)* Panel Report, *supra* note 29, at ¶ 7.249.

generation sources."[110] In areas where consumers can choose their electricity supplies, caring consumers are also likely to choose the suppliers who provide a greater proportion of renewable-sourced electricity. Consumer preferences for renewable energy-sourced electricity could influence its competitive relationship with fossil fuel-sourced electricity.

C. Other factors

As the AB noted in *EC—Asbestos*, in the "likeness" analysis, *all* of the pertinent evidence should be considered.[111] After considering the relevant markets, physical properties and consumer preferences, two important factors remain to be studied: regulatory aims and the consequences of consumption.

1. Regulatory Aims

The consideration of regulatory aims derives from Article III: 1, which requires that internal tax and regulatory measures "should not be applied to imported or domestic products so as to afford protection to domestic production." This Article lays down a general principle to avoid protectionism in the application of internal tax and regulatory measures.[112] Thus, on the one hand, Article III requires that equal competitive conditions be provided for imported and domestic products;[113] on the other hand, "members of the WTO are free to pursue their own domestic goals through internal taxation or regulation so long as they do not do so in a way that violates Article III or any of the other commitments they have made in the WTO Agreement."[114] As the AB explained in *Japan—Alcoholic Beverages II*:

> This general principle informs the rest of Article III. The purpose of Article III: 1 is to establish this general principle as a guide to understanding and interpreting the specific obligations contained in Article III: 2 and in the other paragraphs of Article III, while

110. *Canada—Renewable Energy / Canada—Feed-in Tariff Program* AB Reports, *supra* note 91, at ¶ 5.177.

111. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 102 (emphasis in the original).

112. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 18.

113. Panel Report, *United States—Taxes on Petroleum and Certain Imported Substances*, ¶ 5.1.9, B.I.S.D. 34S/136 (June 5, 1987); *Japan—Alcoholic Beverages* Panel Report, *supra* note 24, at ¶ 5.5(b).

114. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 16.

> respecting, and not diminishing in any way, the meaning of the words actually used in the texts of those other paragraphs.[115]

When dealing with regulatory aims, people always classify such consideration as the *aim-and-effect test*. This test was first adopted by the Panel in *U.S.—Malt Beverages.* Then, some believed the Panel in *Japan—Alcoholic Beverages II* rejected this test,[116] and this position was implicitly admitted by the AB afterwards.[117]

This Article does not argue whether or not to adopt the *aim-and-effect test*. Instead, it argues that regulatory aims are important for the "likeness" determination by an analysis of the following three questions: First, is it permissible to consider regulatory aims? Second, if it is, should regulatory aims be considered as a separate step? Third, how should the aims be considered: should it be based on subjective intent or objective purpose?

The answers to these questions differ according to three relevant parts of Article III: the first sentence of Article III: 2, the second sentence of Article III: 2, and Article III: 4. Article III: 2 refers to internal taxation and charges; the first sentence concerns "like products," and the second sentence combined with Ad Article III Paragraph 2[118] concerns "directly competitive or substitutable products;" Article III: 4 concerns internal regulations.

Only the second sentence of Article III: 2 clearly mentions Article III: 1. Therefore, there is little dispute about considering "so as to afford protection" as a separate step under the second sentence of Article III: 2. Disagreement concentrates on whether to consider "so as to afford protection" under the first sentence of Article III: 2 and Article III: 4. Although regulatory aims under the first and second sentences of Article III: 2 are not the focus of this Article, it is necessary to discuss these two parts first in order to draw a clear picture of the consideration of regulatory aims in Article III: 4.

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115. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 18.

116. Panel Report, *Japan—Taxes on Alcoholic Beverages*, ¶ 6.16, WT/DS8/R, WT/DS10/R, WT/DS11/R (July 11, 1996), as modified by Appellate Body Report WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R (hereinafter *Japan—Alcoholic Beverages II* Panel Report).

117. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 23.

118. General Agreement on Tariffs and Trade 1994, *supra* note 11.

a. "So as to afford protection" under Article III: 2 First and Second Sentences

The Panel in *U.S.—Malt Beverages* took the position that regulatory purposes should be considered when making a "like products" determination under both the first sentence of Article III: 2 and Article III: 4. The Panel explained that:

> The purpose of Article III is thus not to prevent contracting parties from using their fiscal and regulatory powers for purposes other than to afford protection to domestic production. Specifically, the purpose of Article III is not to prevent contracting parties from differentiating between different product categories for policy purposes unrelated to the protection of domestic production. The Panel considered that the limited purpose of Article III has to be taken into account in interpreting the term "like products" in this Article. Consequently, in determining whether two products subject to different treatment are like products, it is necessary to consider whether such product differentiation is being made 'so as to afford protection to domestic production.[119]

In *U.S.—Taxes on Automobiles*, the Panel followed this position and considered regulatory aims and effects under the first sentence of Article III: 2. However, later, the Panel in *Japan—Alcoholic Beverages II* denied the *aim-and-effect test* under Article III: 2;[120] and the AB was of the view that, since it did not contain any words related to "so as to afford protection," "the presence of a protective application need not be established separately from the specific requirements that are included in the first sentence" and "this does not mean that the general principle of Article III: 1 does not apply to this sentence."[121]

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119. Panel Report, *U.S.—Malt Beverages* Panel Report, *supra* note 62, at ¶ 5.25.

120. Panel Report, *Japan—Alcoholic Beverages II* Panel Report, *supra* note 116, at ¶ 6.16.

121. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 18. The Panel also argued that an "aims and effects" test would make Article XX inutile. (*Japan—Alcoholic Beverages II* Panel Report, *supra* note 116, at ¶ 6.17). However, when the AB made the comprehensive argument about whether to include "so as to afford protection" as a separate consideration, it did not mention this reason. (*See generally Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 18-23). The AB in *EC—Asbestos* explicitly denied such reasoning in a similar situation, arguing:

This leads to the question of whether *Japan—Alcoholic Beverages II* totally rejected the consideration of regulatory aims. The answer is not a simple yes or no. First, the Panel dealt only with Article III: 2. The Panel and the AB never examined Article III: 4 in that case. Second, it can be inferred that the AB was not opposed to the consideration of protective aims. However, they should not be considered as a separate step in the first sentence of Article III: 2, and the consideration of protective purpose is embedded in the sentence itself. Thus, there still seems to be space to argue that *Japan—Alcoholic Beverages II* did not totally reject the consideration of regulatory aims.

With regard to "so as to afford protection" under the second sentence of Article III: 2, the AB treated this as a separate step. However, it was of the view that "this is not an issue of intent."[122] By saying this, it did not deny the consideration of regulatory aims. As Professors Robert Howse and Donald Regan have noted, this was an issue of subjective purpose and objective purpose.[123] As to the subjective purpose, the AB said it was irrelevant to consider whether the legislators and regulators had a protective intent in their minds when making their decisions.[124] Instead, it was important "how the measure in question is applied."[125] As for the

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> Article III: 4 and Article XX(b) are distinct and independent provisions of the GATT 1994 each to be interpreted on its own. The scope and meaning of Article III: 4 should not be broadened or restricted beyond what is required by the normal customary international law rules of treaty interpretation, simply because Article XX(b) exists and may be available to justify measures inconsistent with Article III: 4. The fact that an interpretation of Article III: 4, under those rules, implies a less frequent recourse to Article XX(b) does not deprive the exception in Article XX(b) of *effet utile*. (*EC—Asbestos* AB Report, *supra* note 20, at ¶ 115.)

For a detailed analysis of why this reason does not stand, *see* Howse & Regan, *supra* note 16, at 266.

Another case, *Canada—Certain Measures Concerning Periodicals*, is always cited when dealing with the *aim-and-effect test*. However, the AB in this case thought that the Panel Report did not provide an adequate analysis for it to make a decision on "like products." "In light of our conclusions on the question of 'like products' in Article III: 2, first sentence, we do not find it necessary to address Canada's claim of 'non-discrimination' in relation to that sentence." (Appellate Body Report, *Canada—Certain Measures Concerning Periodicals*, 22-3, WT/DS31/AB/R (June 30, 1997)). Thus, the AB did not actually show any position on regulatory aims under Article III: 2, first sentence.

122. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 27.

123. Howse & Regan, *supra* note 16, at 265.

124. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 27.

125. *Id.* at 28.

objective purpose, the AB believed that "although it is true that the *aim of a measure* may not be easily ascertained, nevertheless its protective application can most often be discerned from the design, the architecture, and the revealing structure of a measure."[126] By directly mentioning the phrase "aim of a measure," it is obvious that the AB did not reject the consideration of regulatory aims. The essence lies in how to determine the "aims." In this case, the AB made clear that the approach taken should be to examine the objective evidence rather than the subjective intention.

In conclusion, *Japan—Alcoholic Beverages II* did not totally reject the consideration of regulatory aims. It did not address Article III: 4; and it seemed to leave room for the consideration of regulatory aims under the first sentence of Article III: 2 as long as this was not taken as a separate step; it explicitly confirmed the consideration of regulatory aims under the second sentence of Article III: 2. Furthermore, this consideration should be based on objective factors such as the design, architecture, and revealing structure of a measure rather than the subjective intent of legislators and regulators.

b. "So as to afford protection" under Article III: 4

Japan—Alcoholic Beverages II did not touch upon Article III: 4; therefore, it is unreasonable to conclude that Article III: 4 excludes the consideration of regulatory aims. On the contrary, if one compares the structures of Article III: 4 and III: 2, the scope of "like products" in Article III: 4 is different from that in the first sentence of Article III: 2.

Article III: 2 contains two separate sentences. The second explicitly mentions Article III: 1. As the AB in *Japan—Alcoholic Beverages II* emphasized:

> Because the second sentence of Article III: 2 provides for a separate and distinctive consideration of the protective aspect of a measure in examining its application to a broader category of products that are not "like products" as contemplated by the first sentence, we agree with the Panel that the first sentence of Article III: 2 must be construed narrowly so as not to condemn measures that its strict terms are not meant to condemn. Consequently, we agree with the Panel also that the definition of "like products" in Article III: 2, first sentence, should be construed narrowly.[127]

126. *Id.* at 29 (emphasis added).
127. *Id.* at 19-20.

Conversely, Article III: 4 does not contain such a part. The AB in *EC—Asbestos* concluded that, "given the textual difference between Articles III: 2 and III: 4, the 'accordion' of 'likeness' stretches in a different way in Article III: 4."[128] "The scope of 'like' in Article III: 4 is broader than the scope of 'like' in Article III: 2, first sentence."[129] Moreover, this is also true because the fiscal measures regulated by Article III: 2 and the non-fiscal measures governed by Article III: 4 can serve the same purposes. There should not be a sharp difference between the coverage of the two paragraphs. Great disparity between them "would frustrate a consistent application of the 'general principle' in Article III: 1."[130]

Since the second sentence of Article III: 2 takes regulatory aims as a separate step to consider, it is unreasonable to totally shut the door to an analysis of regulatory aims under Article III: 4. Otherwise, analysis under the two paragraphs would be too disparate.

Moreover, as previously cited, the AB in *Japan—Alcoholic Beverages II* itself agreed that the general principle set by Article III: 1 informs the rest of the article.[131] This has particular contextual significance in interpreting Article III: 4.[132] The Panel in *U.S.—Malt Beverages* noted the significance of taking regulatory aims into consideration when analyzing Article III: 4:

> [O]nce products are designated as like products, a regulatory product differentiation, e.g., for standardization or environmental purposes, becomes inconsistent with Article III even if the regulation is not "applied . . . so as afford protection to domestic production." In the view of the Panel, therefore, it is imperative that the like product determination in the context of Article III be made in such a way that it does not unnecessarily infringe upon the regulatory authority and domestic policy options of contracting parties.[133]

Therefore, to consider regulatory aims in a "like products" analysis under Article III: 4 is not only in conformity with Article III: 1, but it is also crucial. It is also important to emphasis that because the text of Article III: 4 does not specifically contain the phrase "so as to afford protection," this

128. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 96.
129. *Id.* at ¶ 99.
130. *Id.* at ¶ 99.
131. *Japan—Alcoholic Beverages II* AB Report, *supra* note 12, at 18.
132. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 93.
133. *U.S.—Malt Beverages* Panel Report, *supra* note 62, at ¶ 5.72.

Article does not suggest treating regulatory aims as a separate step independent from a "like products" determination.

Before concluding it is important to discuss another case frequently mentioned in this context: *EC—Bananas*. In this case, hurricane licenses were issued "exclusively to EC producers and producer organizations, or operators including or directly representing them."[134] This created an advantage for bananas of EC-origin that was not available to bananas of third-country origin. The Panel found that this measure violated Article III: 4.[135] The measure in this case was country-based. As previously discussed, under such circumstances, products at issue are deemed "like products" and do not need further analysis. Violation can be established if different treatments are accorded. This is known as the "alternative route" for "likeness" analysis. In essence, this route covers the consideration of regulatory aims because the design of a measure as treating products differently based only on their country-of-origin is in itself protective and sufficient to establish that the measure is adopted "so as to afford protection" to domestic products. Thus, although in *EC—Bananas*, the Panel said it did not require a separate consideration of whether a measure "afford[s] protection to domestic production,"[136] this does not necessarily mean the Panel denied the consideration of regulatory aims. In fact, the Panel had already considered the protective nature of the measure in its analysis of the Article III: 4 violation.

Hence, if the design, architecture, and revealing structure of a measure and other relevant factors show that the aims of the measure are not protective and that the measure was adopted to promote the development of renewable energy, protect the environment, and mitigate climate change, there shall be possibilities that renewable- and fossil fuel-sourced electricity supplies are not "like products" under Article III: 4.

2. Different Consequences of Consumption

Recalling that one should examine "all of the pertinent evidence" when determining "likeness" issues,[137] one must briefly analyze another important factor, different consequences of consumption. Usually, the consumption of certain products encourages suppliers to replenish their

134. Appellate Body Report, *European Communities—Regime for the Importation, Sale and Distribution of Bananas*, ¶ 212, WT/DS27/AB/R (Sept. 9, 1997) (hereinafter *EC—Bananas III* AB Report).

135. *Id.* at ¶ 212, 214.

136. *Id.* at ¶ 216.

137. *EC—Asbestos* AB Report, *supra* note 20, at ¶ 102.

stocks from the same source.[138] The increasing consumption of electricity from renewable energy could stimulate the deployment of renewable sources, while the reliance on fossil-fuel-sourced electricity tends to send signals to suppliers to maintain or expand their investment in fossil fuels. The environmental consequences of these two kinds of behaviors are completely different. The resulting air pollution and GHG emissions have transboundary, even global, impacts. This factor could be considered under "consumer preferences" but is so important that it should be considered as an independent element affecting the competitive relationship between electricity obtained from these two kinds of sources.

To summarize this part, first, the unique characteristics of renewable energy-sourced electricity and regulatory regimes may lead to the conclusion that renewable and fossil fuel-sourced electricity are not in the same competitive market. Thus, no competitive relationship exists between them, as is essential to establish "likeness." Second, traditional criteria such as physical properties and consumer preferences could also differentiate them. Third, regulatory aims and different consequences of consumption could affect the "likeness" determination of renewable- and fossil fuel-based electricity under Article III: 4 as well.

CONCLUSION

Whether renewable- and fossil fuel-sourced electricity supplies are "like products" is a fundamental, yet extremely controversial issue in transboundary electricity trade regulation. Bearing in mind that the judgment of likeness should be made on a case-by-case basis, there are possibilities that renewable- and fossil fuel-sourced electricity might be "unlike."

The idea that WTO rules exclude the possibility of distinguishing between renewable- and fossil fuel-sourced electricity is unfounded, as seen in analyzing: the applicability of NPR-PPMs to distinguish renewable- and fossil fuel-sourced electricity through Article III: 4 of GATT 1994; almost all of the cases related to NPR-PPMs; and main policy concerns.

Renewable- and fossil fuel-sourced electricity could be considered "unlike" under Article III: 4 due to the lack of a competitive relationship between renewable- and fossil fuel-sourced electricity, the traditional criteria from the *Report by the Working Party on Border Tax Adjustments*, and regulatory aims and differences in the consequences of consumption.

138. Howse & Regan, *supra* note 16, at 262.

A comprehensive analysis finds that, first, the unique characteristics of renewable energy-based electricity and regulatory regimes may lead to the fact that renewable and fossil fuel-sourced electricity are not sharing the same competitive market. Therefore, there would be no competitive relationship between them, as is essential to establish "likeness." Second, with regard to traditional criteria, electricity is an energy process, unlike normal goods. Renewable- and fossil fuel-sourced electricity could have different physical characteristics. Consumer preferences could differentiate these forms of electricity as well. Third, regulatory aims and different consequences of consumption could affect the "likeness" determination of renewable- and fossil fuel-based electricity under Article III: 4.

In conclusion, there are possibilities that renewable and fossil fuel-sourced electricity could be "unlike" under Article III: 4 of GATT 1994. Although this Article discusses some general elements that may be used to differentiate renewable- and fossil fuel-based electricity under Article III: 4, it is based on current rules and practices. The "likeness" determination of electricity obtained from different sources remains unpredictable. If the world wants to bring about a robust transition from a fossil fuel-dominated energy model to a green and sustainable energy model, it is necessary to negotiate rules in this regard.