

Renewable Energy and WTO Law: More Policy Space or Enhanced Disciplines?

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I. Introduction

The shift to renewable energy is of key importance to decarbonisation of economies and to achieving effective results addressing global warming and rapid climate change. Enhanced recourse in the production of electricity – the main driver and engine of modern life – to solar, wind and tidal energy, complementing hydropower, is essential if informally defined goals to keep the increase of average global temperatures below 2 degrees Celsius in this Century are to be realised. This process of transformation is slowly underway.¹ Renewable energies are increasing. Yet, they have remained overall at low levels of 13.3% percent of the world total primary energy supply in 2013.² The amount of carbon based production of electricity based upon oil and gas, next to atomic energy (with its unresolved long-term storage risks and problems of nuclear waste) have remained paramount on a global scale.

The process of transition from fossil fuel-based electricity production to renewable electricity currently is mainly driven by domestic regulations and policies seeking the introduction and promotion of renewable energy targets in more than 138 states.³ In addition, there are successful regional examples

where climate change and energy policies are integrated under a set of binding legislation with the aim to increase the share of renewable energy in the production of electricity. The European Union is the main and leading theatre exposing the challenges and difficulties in reaching a single energy market renewable energies.⁴ Beyond domestic and regional law, international law is bound to play an important role, providing the framework under which transnational and intercontinental grids operate. It shapes essential macro-legal conditions of decarbonisation. The question arises whether the existing framework in public international law is conducive and supportive in the massive process of transformation and decarbonisation under way. Neither does the United Nations Convention on Climate Change (UNFCCC) nor the current discussions on a future Agreement on climate Change to be negotiated at the COP 2015 in Paris explicitly address the production of electricity.⁵ Nor is electricity particularly addressed in the law of the WTO. Is it sufficiently developed to deal with these challenges?

The paper addresses the question from the point of view of WTO law. Does the transformation call for more policy space for domestic regulators, or do challenges ahead call for more precise and tighter

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1 See Mahesh Sugathan, Winds of Change and Rays of Hope: How Can the Multilateral Trading System Facilitate Trade in Clean Energy Technologies and Services? In: The E15 Initiative – Strengthening the Multilateral Trading System: Clean Energy and the Trade System Group: Proposals and Analysis, ICTSD Paper, Geneva 2013, p. 13, 15 (figure 5), available at: <http://www.ictsd.org/downloads/2014/01/e15-clean-energy-compilation.pdf> (accessed 17.7.2014).

2 International Energy Agency (IAE), Key World Energy Statistics 2013, Paris 2013, p. 6, available at: <http://www.iea.org/>

publications/freepublications/publication/KeyWorld2013.pdf (accessed 17.07.2014).

3 Sherry Stephenson, Addressing Local Content Requirements in a Sustainable Energy Trade Agreement ICTSD Paper, Geneva 2013, p. 3 Available at: http://www.ictsd.org/downloads/2013/06/addressing-local-content-requirements_opt.pdf (accessed 17.7.2014).

4 David Buchan, Why Europe's energy and climate policies are coming apart, Oxford Institute for Energy Studies Paper, Oxford 2013, p. 1. Available at: <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/07/SP-28.pdf> (accessed 17.7.2014); Inga Boie, Anne Held, Mario Ragwitz, Fabio Genoese, Renewables in the EU: Policy performance, drivers and barriers, DIA-Core Policy Brief, Karlsruhe, 2014, p. 1–2, 11, available at: <http://www.ceps.eu/book/renewables-eu-policy-performance-drivers-and-barriers> (accessed 17.7.2014).

5 Cf. the EU's public consultation platform on climate change negotiations at: http://ec.europa.eu/clima/policies/international_negotiations/future/index_en.htm (accessed 22.7.2014).

rules on the level of international trade regulation? The call for more domestic policy space implies that trade rules are too restrictive and impedingly do not allow the adoption of appropriate policies at home, such as local content requirements fostering transformation. Policy space in the field is normally discussed in these terms.⁶ Yet, it may also address policy space on the international level. The call for tighter rules in international law implies that existing disciplines are not sufficiently able to bring about effective and efficient transformation and the establishment of inter-continental grids enabling to use the potential of renewable energy sources (RES).⁷

Production and trade in energy amounts to an important part of public international law. Most of it traditionally relates to the extraction of oil and gas and the use of atomic energy. Major areas of it have been coined by energy.⁸ The rules are scattered in different quarters and chapters. None of the existing international legal frames, including, but not limited to, the WTO or the European Energy Charter, provide a sector based approach (oil, gas, electricity) to contemporary regulatory problems. In the law of the sea, the enclosure movement and the creation of the continental shelf regime in the 1950s was driven by off-shore exploitation of oil and gas reserves under newly claimed exclusive rights of coastal states. The status of deep-sea cables and transit equally forms part of the law of the sea.⁹ The rules in customary law on expropriation largely emerged in the context of nationalization of energy extraction, as well as dis-

ciplines on so-called state contracts regulating concessions granted to investors. In treaty law, investment protection rules and agreements were often motivated by the need to secure substantial sunk investment in energy exploration and extraction, given very high costs, foremost in the fields of hydropower and atomic energy.¹⁰ Oil and gas producers are organised in the Organization of the Petroleum Exporting Countries (OPEC) and engage in coordinating extraction and prices.¹¹ The Energy Charter (ECT), increasingly of world-wide application, regulates trade and investment in energy materials and products as well as energy equipment in line with WTO law.¹² The International Atomic Energy Agency (IAE) monitors nuclear energy production worldwide. The International Energy Agency (IEA) of the OECD is a main forum of research and inter-governmental discussions mainly among net energy importing countries. Given the negative externalities of oil and gas extraction and production, international environmental law addresses important issues such as the precautionary principle and liability for damages caused in extraction, in particular at sea. The UN Framework Convention on Climate Change (UNFCCC) has been, despite the absence of clearly defined goals and policies – an important impetus for the on-going transition to renewable energy production.¹³ Overall, public international law does not offer a single regime to address energy exploration, extraction/production and use, and the international energy regulation remains largely fragmented.¹⁴

6 See Rob Howse, *Securing Policy Space for Clean Energy under the SCM: Alternative Approaches*, in: *The E15 Initiative – Strengthening the Multilateral Trading System: Clean Energy and the Trade System Group: Proposals and Analysis*, ICTSD Paper, Geneva 2013, p. 50, available at: <http://www.ictsd.org/downloads/2014/01/e15-clean-energy-compilation.pdf> (accessed 17.7.2014).

7 Cf. International Electrotechnical Commission (IEC), *Grid Integration of large-capacity Renewable Energy sources and use of large-capacity Electrical Energy Storage*, White Paper, Geneva 2012, p. 14 ss, available at: <http://www.iec.ch/whitepaper/gridintegration/?ref=extfooter> (accessed 18.7.2014).

8 Carlos Cavalcanti, Carolina Lembo, Vera Thorstensen, *The Regulation of the International Energy Trade, Fuels and Electricity*, Sao Paulo 2013, p. III ff. Also available at: www.fiesp.com.br/arquivo-download/?id=112965, (accessed 18.7.2014).

9 Miso Murdic, *Rights of States Regarding Underwater Cables and Pipelines*, *Australian Resources & Energy Law Journal*, Vol. 29, No. 2, July 2010, Melbourne 2010, p. 236 ss, available at: http://www.academia.edu/328436/Rights_of_States_Regarding_Underwater_Cables_and_Pipelines (accessed on 24.7.2014).

10 Thomas L. Brewer, *The Shale Gas Revolution: Implications for Sustainable Development and International Trade*, ICTSD Issue Paper No. 8, Geneva 2014, p. 10.

11 Cf. regular OPEC - Monthly Oil Market Reports, available at: http://www.opec.org/opec_web/static_files_project/media/downloads/publications/MOMRJuly2014.pdf (accessed 31.7.2014).

12 The 2010 trade amendment was not ratified by all the parties to the ECT, and some of those countries apply it provisionally. It is not applied by Australia, Iceland, Japan, Norway, Russian Federation and Turkey, http://www.encharter.org/fileadmin/user_upload/document/Trade_Amendment_ratification_status.pdf (accessed 31.7.2014).

13 Padmashree Gehl Sampath, John Mugabe, John Barton, . Gehl Sampath, *Realizing the Potential of the UNFCCC Technology Mechanism: Perspectives on the Way Forward*, ICTSD Issue Paper No. 35, Geneva 2012, p. vii ss, available at: <http://www.ictsd.org/downloads/2012/05/realizing-the-potential-of-the-unfccc-technology-mechanism.pdf> (accessed 22.7.2014).

14 See generally Rafael Leal-Arcas, *Climate Change and International Trade*, Cheltenham: Edward Elgar Publishing 2013.

For many years, the relevance of the General Agreement on Tariffs and Trade (GATT) for energy was underestimated. Energy was perceived to be outside the scope of these rules, and oil and gas producing countries were largely absent from the Membership. Both have changed in recent decades, when major OPEC countries (except for Iran, Iraq, Algeria and Libya) joined the WTO.¹⁵ Today, it is well understood that energy, including electricity, falls under the disciplines of the GATT and its related agreements.¹⁶ The addition in 1995 of the General Agreement on Trade in Services (GATS),¹⁷ the Agreement on Trade Related Investment Measures (TRIMs),¹⁸ the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs)¹⁹ and the Government Procurement Agreement (GPA)²⁰ as well as a WTO Agreement on Trade Facilitation reached in 2013 considerably enlarged the body of law relevant to trade in energy. WTO rules thus play an important role in respect of a number of issues: tariffs on hardware such as photovoltaic equipment, electricity, oil and gas fall under Article II and XXVIII GATT, import and export restrictions on energy are dealt with under Article XI and XX GATT. Local content rules and government procurement are addressed by Article III GATT, the TRIMs Agreement, and the Agreement on Government Procurement (GPA). Taxation is subject to Article III and XX GATT Agreement. Transit is subject to Article V GATT Agreement. Trade remedies extend to energy (safeguards, subsidies and anti-dumping) and are subject to the disciplines of Article VI, XVI, XIX GATT, as well as to the Anti-Dumping Agreement (AD),²¹ the Agreement on Subsidies and Countervailing Measures (ASCM)²² and the Agreement on Safeguards (SG).²³ Biofuels partly fall under the Agreement on Agriculture. The sector of renewable energy is strongly based upon services, such as metering, scoping, scouting, engineering and maintenance of installations and finance. Technical standards, which are of crucial importance for safety as well as for achieving high productivity, fall under the Agreement on Technical Barriers to Trade (TBT).²⁴ In addition, the legal framework for electrical grids touches upon rules on transmission and distribution services (including transit), monopolies and state trading in Art. VI and Art. XVII, respectively, as well as Article XVIII GATS. Finally, renewable energy may touch upon intellectual property rights, transfer of technology and competition under the TRIPs Agreement.

This cursory survey indicates that renewable energies are largely covered and framed by existing WTO rules which need to be taken into account in shaping domestic regulations and measures addressing it and its relationship to conventional fossil fuel based or nuclear based energy production. Are these rules supporting or rather impeding the advent and proliferation of renewable energy? We first look into contemporary problems and then turn to the issues likely arising in the future.

II. Contemporary Problems

Renewable energy has been repeatedly subject to WTO dispute settlement and is likely to continue to do so. The industry is relatively new and dynamic, and production of equipment has been moving from small scale innovation to large scale production, putting smaller producers of hardware under pressure. China in particular emerged as a major player in the production of solar panels.²⁵ Large scale production, supported by cheap capital, has been dis-

- 15 OPEC Countries started joining the WTO in the 1980s, Craig Vangrasteck, *The History and Future of the World Trade Organization*, Geneva: WTO 2013, p. 134 ss.
- 16 Yulia Selivanova, *The WTO and Energy: WTO Rules and Agreements of Relevance to the Energy Sector*, ICTSD Issue Paper No. 1, Geneva 2007, available at: <http://www.ictsd.org/sites/default/files/research/2008/05/the20wto20and20energy.pdf> (accessed 24.07.2014). See also Thomas Cottier, Olga Nartova, Sadeq Z. Bigdeli (eds.), *International Trade Regulation and the Mitigation of Climate Change*, Cambridge: Cambridge University Press 2009, Rafael Leal-Arcas loc. cit. note 14.
- 17 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1B, General Agreement on Trade in Services (GATS).
- 18 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1A, Agreement on Trade Related Investment Measures (TRIMs Agreement).
- 19 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1C, Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs Agreement).
- 20 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 4(b), Government Procurement Agreement (GPA).
- 21 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1A, Agreement on Anti-Dumping (AD).
- 22 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1A, Agreement on Subsidies and Countervailing Measures (ASCM).
- 23 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1A, Agreement on Safeguards (SG).
- 24 Agreement Establishing the World Trade Organization of 15 April 1994, Annex 1A, Agreement on Technical Barriers to Trade (TBT).
- 25 Russell Flannery, *China's Growing Role In The Global Solar Power Industry*, 20.10.2013. Article available at: <http://www.forbes.com/sites/russellflannery/2013/10/20/chinas-growing-role-in-the-global-solar-power-industry/> (accessed on 24.7.2014).

placing producers in industrialised countries and rendered access to photovoltaic technology less expensive. Most of the cases so far have been brought under the GATT, the AD Agreement claiming unfair trade practices below cost. The United States complained against China for subsidizing wind energy equipment.²⁶ China complained against the United States reacting to the imposition of anti-dumping duties by the United States.²⁷ The EU complained against China for dumping solar panels.²⁸ China complained against the EU challenging the feed-in tariff programme.²⁹ The United States complained against India for violating the prohibition of local content requirements.³⁰ The majority of cases thus relate to anti-dumping and countervailing duties. Interestingly, safeguard measures have not been applied so far. A paper by ICTSD reported 11 cases, partly still in consultation, and partly settled, by the end of 2013.³¹ The most prominent case adjudicated by a panel and the Appellate Body relates to feed-in tariffs and local content requirements in *Canada – Certain Measures affecting the Renewable Energy Generation Sector*, and *Canada – Measures relating to the Feed-In Tariff Program*, complaint brought by the European Union and Japan respectively.³²

26 WT/DS419, *China – Measures concerning wind power equipment*, information available at: http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds419_e.htm (last accessed 21.07.2014 at 2 pm).

27 WT/DS471, *United States – Certain Methodologies and their Application to Anti-Dumping Proceedings Involving China*, information available at: http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds471_e.htm (last accessed 21.07.2014 at 2 pm).

28 Investigation on subsidies ongoing, MAHESH SUGATHAN, p. 35 (Annex Table A). Further information available at: <http://trade.ec.europa.eu/doclib/press/index.cfm?id=958> (last accessed 24.07.2014 at 10 am).

29 *European Union and certain Member States – Certain Measures Affecting the Renewable Energy Generation Sector* (WT/DS452), information available at: http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds452_e.htm (last accessed 21.07.2014 at 2 pm).

30 *India – Certain Measures Relating to Solar Cells and Solar Modules* (WT/DS456), information available at: http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds456_e.htm (accessed 21.07.2014).

31 Mahesh Sugatan loc. cit. note 1 p. 7, Annex Table A p. 33.

32 Hereinafter *Canada-FIT* case, Reports by the Panel (WT/DS412/R and WT/DS426/R, December 19, 2012); Reports of the Appellate Body (WT/DS 412/AB/R; WT/DS426/AB/R, May 6, 2013; for a comment see Rachel Liechti, Tobias Naef, Tetyana Payosova, *The Jurisprudence of the World Trade Organization in 2013*, *Revue Suisse de Droit International et Européen* (SZIER/RSDIE) 2/2014, p. 2 ff.

33 Mahesh Sugathan loc. cit. note 1 p. 19 ss.

34 Id. p. 23.

35 Id. p. 22.

1. Anti-Dumping Measures and Safeguards

The cases brought under anti-dumping and countervailing rules reflect endemic issues of trade remedies under these instruments. The problems encountered are not peculiar to renewable energy and its equipment, but of a general nature. Anti-dumping rules continue to offer a wide range of margin of manoeuvre to domestic law and action. As tariffs were gradually reduced, there has been an increased recourse to anti-dumping and countervailing measures to offset pressures on domestic industries from foreign and lower priced competition.³³ The proliferation of anti-dumping complaints relating to renewable energy reflects the changing structures and patterns of the industry. Most complaints can be understood to serve the purpose of winning time in a process of structural adjustment. While these measures can be understood from the point of view of protection of domestic labour and industry, they increase costs and made renewable energy equipment more expensive to investors and consumers. From the point of view of climate change and CO₂ emissions reduction, measures taken thus run counter to the goals of decarbonisation and the dissemination of renewable energy production. Renewable energy thus adds to the voices advocating strengthening these rules. From the point of view of environmental law, easy recourse to anti-dumping and countervailing duties is counterproductive.³⁴ It is not a case for more domestic policy space for national producers and governments. This is not the place to discuss issues and proposals relating to the strengthening of disciplines on anti-dumping and countervailing duties. We simply note that a renewable energy sector must be supportive of such an agenda.³⁵

Safeguard measures so far have not been used. They offer a more appropriate tool to address problems of structural adjustment in the industry than recourse to anti-dumping. They allow temporary surcharge tariffs and import restrictions with a view to orderly transitions for companies affected. Current rules offer ample policy space as measures found inconsistent do not affect past conduct. Governments thus are able to protect industries de facto up to three years until the matter is properly settled in WTO dispute settlement.

To the extent that the domestic production of renewable energy equipment is considered to be part of strategy interest and trade policy, WTO law offers

the option of deconsolidating tariffs, subject to compensation under Article XXVIII GATT.³⁶ This option, so far, has not been used. Instead, efforts are under way to re-launch negotiations on Environmental Goods and Services (EGS) seeking to further reduce tariff protection in the field.

2. Local Content Requirements

The second issue brought to dispute settlement so far relates to local content requirements.³⁷ The panel and the Appellate Body held in *Canada – FIT* that recourse to local content conditional to qualify for feed-in tariffs for renewable energy in the Province of Ontario is inconsistent with Article III of the GATT and the TRIMs Agreement.³⁸ The measures cannot be considered to form part of government procurement exemption from national treatment obligations under the TRIMs Agreement and Article III(8)(a) GATT as electricity generated was destined for commercial resale. The Appellate Body upheld the overall interpretation of the panel of Art. III:8(a). However, it disagreed on the reasoning and emphasized that the government procures electricity, whereas the product that is arguably treated less favourably is different – namely, the generation equipment – which is purchased directly by the generators. While the panel recognized these differences between the products, it found that a close relationship between the electricity and the generation equipment is sufficient for electricity procurement to fall under Art. III:8 GATT. The Appellate Body, however, concluded that electricity and gen-

eration equipment are not in a competitive relationship and thus procurement of electricity does not fall within the scope of Art. III:8 GATT, but violates Article III:4 GATT and Art 2.1. TRIMs Agreement.³⁹ In result, the law of the WTO is rather strict on local content, and we need to ask whether more policy space should be offered to Members in this context.

Despite existing WTO law, many countries repeatedly take recourse to such measures. The tool has been widely applied in the field of renewable energies, including industrialised countries and several States in the US.⁴⁰ A dispute between the United States and India also focuses on local content requirements.⁴¹ The time it takes to challenge and adjudicate such measures may be sufficient to protect and infant industry and to establish a viable industry even after the requirement will be eventually removed. From the point of view of decarbonisation, a local content requirement does not make sense as it increases costs for hardware and installations. Imported and competitive products are likely to contribute to more rapid deployment of the technology. It is fair to say that the extensive proliferation of solar panels in much of Europe has been mainly due to the combination of feed in tariffs and access to lower cost materials imported mainly from China.⁴² Recourse to local content requirements therefore is motivated by other reasons related to industrial policy or sometimes rent seeking protectionism induced by influential industries which is also reflected by the failure in the under the Doha Development Agenda to reduce tariffs in the context of environmentally friendly goods and services (EGS).⁴³ The idea of local content cannot be rec-

36 Thomas Cottier, Olga Nartova, Anirudh, The Potential of Tariff Policy for Climate Change Mitigation: Legal and Economic Analysis, *Journal of World Trade* 48:5 (2014).

37 Jan-Christoph Kuntze, Tom Moerenhout, *Local Content Requirements and the Renewable Energy Industry – A Good Match?*, ICTSD Paper, Geneva 2013, p. 6 ss., 21 ss, ss, available at: <http://www.ictsd.org/sites/default/files/research/2013/06/local-content-requirements-and-the-renewable-energy-industry-a-good-match.pdf> (accessed 24.7.2014).

38 *Canada – Certain Measures affecting the Renewable Energy Generation Sector, Canada – Measures relating to the Feed-in Tariff Program*, Reports by the Panel (WT/DS412/R and WT/DS426/R, December 19, 2012) para. 7.152; Reports of the Appellate Body (WT/DS 412/AB/R; WT/DS426/AB/R, May 6, 2013, paras 5.75-5.90).

39 Id. paras. 5.79, 5.85.

40 See Committee on Subsidies and Countervailing Duties, Questions posed by India to the United States under Article 25.8 of the Agreement on Subsidies and Countervailing Measures – State Level Renewable Energy Sector Subsidy Programmes with Local

Content Requirements, C/SCM/Q2/USA/59 (18 April 2013), available at: <http://www.wto.org.tw/SmartKMS/fileviewer?id=140982> (accessed 22.7.2014); for further indication on local content requirements in Brazil, China, France, India, Italy, Canada, South Africa, Spain, Turkey see Mahesh, loc. cit. note 1 p. 24.

41 *China – Anti-Dumping and Countervailing Duty Measures on Broiler Products from the United States*, (WT/DS427/R, August 2, 2013).

42 Mahesh Sugathan, loc. cit. note 1 p 17 (Table 3), 18 (Table 4).

43 See UNCTAD, *WTO Negotiations on Environmental Goods and Services: A Potential Contribution to the Millennium Development Goals*, Geneva 2009, (Thomas Cottier, Donah Baracol Pinhao); available at http://unctad.org/en/docs/ditcted20084_en.pdf (accessed 22.7.2014); see also Thomas Cottier, Donah Baracol Pinhao, *Environmental Goods and Services: The Environmental Area Initiative approach and climate change*, in: Thomas Cottier, Olga Nartova, Sadegh Z. Bigdeli (eds), loc. cit. note 15 p. 395. Current negotiations within the 2014 Geneva initiative are led on the basis of the APEC list, cf. René Vossenar, *The APEC List of Environmental Goods: An Analysis of the Outcome & Expected Impact*, ICTSD, Issues Paper No 18, Geneva 2013.

onced with the idea of lowering and eliminating tariffs on EGS in the pursuit of environmental goals.

In assessing the need for support of local industries and domestic policy space in the context of renewable energy, services should be primarily taken into account. Renewable energy production is as much based upon services as upon hardware. In fact, the service component encompassing scoping (for example for windy zones and areas with regular and strong solar exposure), engineering and maintenance are of paramount importance. In particular, maintenance of installations and grids is an activity which accords natural advantages to local producers and companies as their presence is inherently needed to manage the operation and maintenance of the installation.⁴⁴ It is interesting to observe that WTO disputes so far have not addressed service components of renewable energy production. Nor can it be observed in regulations which normally have been limited and focussing on hardware, such as solar panels. The GATS allows for tailor-made responses to the need of supporting domestic services and service providers and thus offers ample policy space under the current system. Countries member to the GPA⁴⁵ are obliged to pursue non-discriminatory policies but still may define criteria and conditions in tendering services which imply advantages to local providers of operation and maintenance services in the field of

renewable energies.⁴⁶ The emphasis therefore, at least in industrialised countries, should be placed upon the service sector.

Local content rules for hardware may nevertheless be justified for least developing countries in the process of building an industrial base. The issue is similar to working requirements in patent law. Thus, LDCs for example may prescribe that grass root technology products, such as mirror-based or PV-based solar stoves, should in fact be produced in the country in order to obtain government support or as precondition for tax incentives. As in patent law, the problem could best be approached on the basis of graduation and recourse to economic indicators, which draw the line between lawful local content requirements and illegal measures in the field. The law could define that countries below defined levels of GDP and Human Development Index are entitled to operate local content requirements in support of infant industries in the field.⁴⁷

3. Subsidization of Renewable Energy

The third issue brought to dispute settlement related to the question whether feed-in tariffs amount to a banned subsidy under the SCM Agreement and thus would offer yet another cause of action to challenge such schemes, or of local content requirements attached to them. By neither of the complainants, nor in any other case, was the feed-in tariff challenged as such. Most governments, including the Member States of the European Union, use the model extensively as a tool to promote renewable energy supplies.⁴⁸

The analysis of the SCM agreement was necessary in this case and could not be discharged under judicial economy because remedies under the SCM Agreement are not similar to those under GATT. An independent determination therefore was necessary in order to determine whether the measure amounts to a prohibited subsidy. Article 3(1)(b) SCM Agreement prohibits subsidies which are contingent, whether solely or as one of several other conditions, upon the use of domestic over imported products. The assessment of the issue of subsidization by means of offering feed-in tariffs higher than rates offered for conventional energy amounts to an intriguing problem. It is rooted in the fact that electricity is a highly complex and regulated sector within which

44 See also Sherry Stephenson loc. cit. note 3 p 7ss, 14ss.

45 Loc. cit. note 19; list of the members available at: http://www.wto.org/english/tratop_e/gproc_e/memobs_e.htm (last accessed on 22.7.2014).

46 Alan Herve, David Luff, Trade Law Implication of Procurement Practices in Sustainable Energy Goods and Services, ICTSD Paper Summary of "Trade Law Implications of Procurement Practices in Sustainable Energy Goods and Services", Geneva 2012, Available at: <http://www.ictsd.org/downloads/2012/12/summary-procurement-practices.pdf> (accessed 22.7.2014).

47 Thomas Cottier, Shaheezal Lalani, Michelangelo Temmerman, Use It or Lose It: Assessing the Compatibility of the Paris Convention and TRIPS Agreement with Respect to Local Working Requirements, 14 *Journal of International Economic Law* 437-471 (2014); Thomas Cottier, From Progressive Liberalization to Progressive Regulation in WTO Law, 9 *Journal of International Economic Law* 779-821 (2006).

48 Feed-in tariffs are the most common support scheme used in Europe: 24 states in 2012 used feed-in systems and 20 member states used them as main support instrument, Mario Ragwitz, Jenny Winkle, Corinna Klessmann, Malte Gephart, Gustav Resch, Recent developments of feed-in systems in the EU – A research paper for the International Feed-In Cooperation, Report commissioned by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Karlsruhe 2012, p. 3 ff. Available at: http://www.feed-in-cooperation.org/wDefault_7/download-files/research/101105_feed-in_evaluation_update-January-2012_draft_final_ISI.pdf. (accessed 23.7.2014).

market based comparators are difficult to apply. Governments essentially define the proper energy mix by means of setting appropriate rates and incentives. Based upon the evidence offered by the Parties in *Canada - FIT*, the majority of the panel concluded that the criterion of benefit accruing to an industry had not been demonstrated.⁴⁹ The Appellate Body took the matter even a step further and doubted whether conventional and renewable energy pertain to the same relevant market. The basis for comparative analysis and determination of benefit therefore does not exist. The Appellate Body ruling held:

In circumstances where the supply of electricity from different sources is blended and, for as long as the differences in costs for conventional and renewable electricity are so significant, markets for wind- and solar PV-generated electricity can only come into existence as a matter of government regulation. It is often the government's choice of supply-mix of electricity generation technologies that creates markets for wind- and solar PV-generated electricity. A government may choose the supply-mix by setting administered prices (based on the principles of cost recovery and reasonable margin) for technologies that would not otherwise be able to recover their costs on the spot market. Alternatively, a government may require that private distributors or the government itself buy part of their requirements of electricity from certain specified generation technologies. As we consider further below, in both instances, the definition of a certain supply-mix by the government cannot in and of itself be considered as conferring a benefit within the meaning of Article 1.1(b) of the SCM Agreement.⁵⁰

The finding of separate markets for conventional and renewable sources in this case reflects considerable policy space open to domestic law in regulating and promoting renewable energy. The finding is important in addressing not only feed-in tariffs, but also the prospects of differential taxation of fossil, nuclear and renewable energy discussed below. To the extent that fossil and renewable energy markets are considered to be part of different markets, different modes and rules on taxation may apply not subject to the straightjacket of Article III:2 GATT and need to be justified under Article XX(g) GATT.

The availability of cheaper fossil and nuclear energy, often strongly subsidized, will continue to call

for financial incentives in developing and proliferating renewable energies.⁵¹ The existing models of feed-in tariffs, which responded to the need of an infant industry, is likely to give way to models of differential taxation of energy on the basis of process and production methods (PPMs). Renewable energy will be taxed lower than fossil and nuclear based energy. This raises new questions of like products and compatibility with Article III:2 and Article XX GATT. Similar issues may arise in the context of services. Depending on the modalities, differential taxation is an option which can be defended under GATT Art. XX(g) in light of the importance for climate change mitigation. The challenge here is to bring about appropriate tools to document the source of energy by means of labels or tradable certificates of origin (COs) based upon which taxation will be assessed.⁵²

Differential taxation also raises issues of subsidization, comparable to feed-in tariffs. Tax reductions are revenues forgone and will be assessed under the SCM Agreement.⁵³ The measures will need to meet the tests of a financial contribution (revenue foregone otherwise due), benefit and adverse effect. Based upon existing case law, it is fair to say that measure can be designed in a manner avoiding these qualifications. Much depends upon the modalities of the measures taken both under GATT and the SCM Agreement, including the amount of the differential. The experience with *Canada - FIT* case suggests that future measures designed should take into account a comparison of return on invested capital both in conventional and in renewable energies. In the end of the day, it is a matter of bringing about incentives by fair and equal conditions of competition for renewable energies within the overall energy mix of a given system. The current disciplines of WTO law, while not framed for this kind of problem in the first place,

49 Loc. cit, note 38 para. 7.326.

50 Loc. cit, note 38 para. 5.175.

51 Cf. Sebastian Godinot, Why is Oettinger scared of fossil fuel subsidy figures?, Brussels 2013. Available at: <http://www.wwf.gr/crisis-watch/issues/25-issue-19-october-2013/media-web-october-2013/45-media-web-october-2013> (last accessed 23.7.2014).

52 Thomas Cottier, Ilaria Espa, Simon Hirsbrunner, Kateryna Holzer, Tetyana Paoysova, Differential Taxation of Electricity: Assessing the Compatibility with WTO Law, EU Law and the Swiss-EEC Free Trade Agreement, Bern 2014, p. 8 ss, 23 ss, 30 ss, available at: http://www.efv.admin.ch/e/downloads/finanzpolitik_grundlagen/els/Differential%20_Taxation_e.pdf (accessed 23.7.2014).

53 Id. p. 42 ss.

can be interpreted and applied accordingly. There is no need for additional policy space in order to operate differential taxation. The current disciplines are appropriate.

III. Challenges ahead

The focus on trade remedies and local content requirements in renewables, however, should not distract from the fact that major challenges lie ahead in coping with structural changes towards low carbon energy supplies. Main problems ahead relate to the structural changes of supply chains of vital electrical supplies in the overall system. The focus will in future debates turn to the legal regime of electrical grids.⁵⁴

Conventional energy supply has been mainly based upon domestic or imported fossil fuels (coal, oil and gas), hydropower and atomic energy. These large-scale operators have provided the base-load in the system, able to stabilise electrical networks. The advent of renewable energies, in particular solar and wind energy is changing the equation for three reasons.

Firstly, these forms of production, dependent upon climatic conditions, are more volatile and fluctuating. They cannot, on their own, guarantee a stable base-load of a system. In a de-carbonated economy, the base-load needs to be provided by hydropower, regular tidal and nuclear energy and it may be sup-

plemented by biomass (albeit the latter may contain CO₂ emissions). Reality sees a continued and even increasing reliance on coal-fired stations⁵⁵ – resulting in an increase of CO₂ emissions inconsistent with declared goals of lowering emissions with a view to combat climate change.

Secondly, a substantial increase of fluctuating renewables – solar, wind, tidal and improved hydropower capacities⁵⁶ – requires additional storage capacities.⁵⁷ At this time, and prior to the evolution of impending batteries, the main option is storage in hydropower reservoirs operated by pump stations. Energy produced but not consumed is used to pump water upstream which in return is used to generate electricity downstream when needed.⁵⁸

Thirdly, renewable electricity in larger scales and beyond household feed-in, needs to be produced under optimal climate conditions. In other words, the principle and law of comparative advantage enters the stage of electricity production which so far, has been mainly a matter of national networks and systems. While the world is accustomed to depend upon foreign oil and gas imported at varying costs, electricity has been produced mainly by local hydropower or domestic coal supplies in most countries. As a consequence, electrical grids have mainly had a national or perhaps regional focus. Transnational concepts have not been strongly developed except in regions defined by transit countries, such as Switzerland. Within the European Union, the development of a European wide continental grid amounts to one of the prime policy goals in the field.⁵⁹ It is a prerequisite of creating a single and competitive market.

Renewable energies will be deployed both locally and internationally. Photovoltaic electricity, and perhaps wind and waste based biomass are suitable for production and consumption off grids, combined with wood, oil and gas within local systems. Households may increasingly rely upon their own energy supply in autarky. This is of particular attraction to remote geographical areas, otherwise dependent on expensive grid connections.⁶⁰ Other means and uses, however, will depend upon larger networks and cannot be operated in isolation. This is mainly true for serving urban and industrial centres. Substantial increases of renewable energy in the production of electricity will depend upon large scale installations and long distance trade. As efficient solar, wind and tidal operations depend upon suitable locations under favourable climatic conditions, energy should be

54 For the technical background see International Electrotechnical Commission (IEC), Grid Integration of large-capacity Renewable Energy sources and use of large-capacity Electrical Energy Storage, available at <http://www.iec.ch/whitepaper/gridintegration/?ref=extfooter> (accessed 31.7.2014).

55 Id. p. 14 ss.

56 See International Energy Agency (IEA), Variability of Wind Power and Other Renewables: Management options and strategies, IEA Paper, Paris 2013, p. 12, available at: http://www.uwig.org/iea_report_on_variability.pdf (accessed 23.7.2014).

57 See International Electrotechnical Commission (IEC), Electrical Energy Storage, White Paper, Geneva 2011, p. 11 ss, available at: <http://www.iec.ch/whitepaper/pdf/iecWP-energystorage-LR-en.pdf> (accessed 23.7.2014).

58 International Energy Agency (IEA) loc. cit. note 56, p. 10 ss.

59 Inga Boie, Anne Held, Mario Ragwitz, Fabio Genoese, Renewables in the EU: Policy Performance, Drivers and Barriers, DIA-Core Policy Brief, Karlsruhe 2014, p. 11.

60 International Energy Agency – Renewable Energy Technology Deployment (IEA-RETD), Renewable Energies for Remote Areas and Islands (Remote), Final Report, Paris 2012, p. 13. Available at: <http://iea-retd.org/wp-content/uploads/2012/06/IEA-RETD-REMOTE.pdf> (accessed 23.7.2014).

produced where conditions are best suited. This in return, triggers enhanced trading of electricity beyond traditional borders of nation states or sub-federal entities.

Renewable electricity, like coal, gas and oil before, increasingly will become a matter of international trade. The main focus will be on the highways and roads, the means of communications. In the future, the main challenges for international trade regulation will be less on dealing with trade in hardware, such as solar panels, problems of dumping, subsidies and taxation, but the operation and interconnection of electrical grids in the international context. The structure of problems will be comparable to those encountered in telecommunications, entailing unbundling, market access, interconnection and harmonization of technical standards in the field. The advent of smart grids, taking recourse to information technology and possibly the Internet, will link electrical grids with the legal challenges encountered in internet governance.⁶¹ We may witness a convergence in coming decades, comparable to the current one in the field of telephones, radio and television. We thus shall witness comparable and complex regulatory challenges.

1. Towards a Global Grid

The establishment of long-distance transmission and distribution system is a corollary to renewable energies. International economic law will have to deal with the framework conditions for the creation and operation inter-continental grids. Technology increasingly allows for long-distant transportation of electricity without substantial losses any longer.⁶² Engineers and physicists consider a global network to amount to an impending possibility, enabling the linkage of remote production sites to centres of consumptions. In a paper published in 2013, the technical feasibility and potential of a global grid based on high-voltage direct current (HVDC) technology is sketched from a technical and scientific, engineering point of view.⁶³ Smartly managed by information technology and computer calculations, grids may be able to link different continents, creating a much wider network and pool of electricity. In other words: trade in electricity will eventually become global and a matter of world trade. A current project, for example, examines the feasibility of transporting hy-

dropower and thermal power generated electricity in Iceland into European grids via Scotland and Norway. One day, Iceland may also be linked to Canada and North American grid, thus establishing a transatlantic system of electrical supplies strongly relying upon renewable energy.

The global grid, of course, will be built bottom up. Within nations, grids will increase among provinces and sub-federal states. For example, electricity in India has largely remained a matter of states and interconnections between them still need to be built.⁶⁴ Regional integration spearheads the evolution among nations.⁶⁵ The RES directive of the European Union indicates the complexity of regulation required in order to create a single market in renewable energy, building upon the existing framework of liberalising electricity and energy within Europe.⁶⁶ Other regions, like Central America may follow suit. Transnational grids may be built and regulated by means of bilateral agreements. Finally, continental grids may be linked created, for example in a transatlantic context. Future negotiations within the Transatlantic Trade and Investment Partnership (TTIP) may entail work on linking North America and Europe via Greenland and Iceland addressing regulatory conver-

61 Cf. Mira Burri & Thomas Cottier eds., *Trade Governance in the Digital Age*, Cambridge: Cambridge University Press 2012; see also Joelle de Sépibus, *Climate Change and the Liberalisation of the European Power Industry: The Case for Smart Grids and Carbon Markets* (forthcoming 2015, mimeograph on file with author).

62 International Electrotechnical Commission (IEC) loc. cit. note 57 p. 58 ss.

63 Spyros Chatzivasileiadis, Damien Ernst, Göran Andersson, *The Global Grid*, Elsevier Journal of Renewable Energy 57 (2013) 372-383, 2013, p 372 ff. See also International Electrotechnical Commission (IEC), *Grid Integration of large-capacity Renewable Energy sources and use of large-capacity Electrical Energy Storage*, p69 ff; Angel A Bayod-Rujula, *Future development of the electricity systems with distributed generation*, Elsevier Journal of Energy 34 (2009) 377-383, 2009, p. 377 ss.

64 Global Energy Network Institute (GENI), *National Energy Grid India*, available at http://www.geni.org/globalenergy/library/national_energy_grid/india/index.shtml (accessed 31.7.2014).

65 Cf. Markus W. Gehring et al., *Climate Change and Sustainable Energy Measures in Regional Trade Agreements (RTAs)*, ICTSD Issue Paper No. 3, Geneva 2013, p. 4 ss, available at: <http://www.ictsd.org/themes/climate-and-energy/research/climate-change-and-sustainable-energy-measures-in-regional-trade> (accessed 23.7.2014).

66 Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, Official Journal L 140/16 June, 2009; cf. Hakan Nordström, *The Microcosm of Climate Change Negotiations: What Can the World Learn from the European Union?*, ICTSD Issue Paper No. 1, Geneva 2009, p5 ff., 7 ff., available at: <http://www.ictsd.org/downloads/2012/03/the-microcosm-of-climate-change-negotiations.pdf> (accessed 23.7.2014).

gence. No doubt, this will be a long term process. From the point of the law it is a matter of supporting these efforts by means of creating an appropriate framework and incentives. The vision of gradually building a global grid offers important opportunities for investment and development of remote areas in the South and the North. Solar energy can emerge as a main export, as much as hydro, wind and tidal energy. It offers new sources of income to remote regions. Mountain lakes can serve as reservoirs for stage of electricity produced abroad. Remote locations and long-distant trade also offer new and less risky options for nuclear energy as an effective means of decarbonizing electricity production.

At this stage, we are still far from realising the vision of a global grid, operating on the basis of comparative advantage and offering new large scale energy production of solar energy in deserts and southern countries, and relying upon wind and tidal energy in the Northern hemisphere. These prospects, however, induce to think about future legal requirements. How much policy space is needed, both on the domestic and international level? What kind of legal framework does it take to operate such a system in a stable manner? How to secure effective access and interconnection? How to secure transit? How to secure necessary safeguards, protecting from large scale collapse and interruptions? What does it take on the part of international law so that people will trust in intercontinental supply and grids?

It can be readily seen that problems of interconnection needs to be addressed, similar to those encountered in telecommunications. Legal and de facto monopolies of grid operators need to be balanced with market access rights and non-discriminatory treatment, possibly leading to disciplines in competition law and policy. A new type of reference paper may be called upon to regulate the operation of grid services in GATS schedules. Access rights along with transit rights become crucial. The vague and open disciplines of Article V of GATT are hardly sufficient.⁶⁷ International technical standards will be essential to secure interconnectivity. No longer will national standards, prone to segment markets, suffice. The TBT Agreement may need to reinforce reliance on, and presumptions for, international technical

standards of which deviation must be based on sound reasons, avoiding market segmentation and rent-seeking. Running and servicing global grid will require stable rights to provide appropriate services around the world and need to be addressed in regulating engineering, transmission and distribution services in the field, including mode 4 of GATS and thus the temporary residence of personnel of foreign service providers. Finally, the venture will require much research and development, and government support in doing so should be secured by non-actionable subsidies under the SCM Agreement of the WTO. Intellectual property needs to be able to deal with patents turning into de facto standards for the industry, and new applications of the doctrine of essential facilities will emerge, allowing all users to interconnect taking recourse to the patent by means of legal licenses subject to compensation.

2. Towards a Sectorial Agreement on Electricity

Trade in renewable energy thus goes way beyond the currently encountered issues of dumping, local content and subsidization. The expansion of regional grids and the creation of global grids, interconnecting different systems, will trigger a host of issues which need to be addressed in the future. Partly they may be addressed in the context of existing disciplines and case law. Partly, they will require new disciplines in international trade law. They may equally call for new rules in the field of investment protection given the size of capital required to bring global and regional grids to life and operation. To some extent, they may also be addressed outside the realm of WTO law.

Renewable energy lends support to the need of strengthening existing disciplines in the field of trade remedies applicable across the board and not peculiar to renewable energies. Making access to them more predictable and less distorting, equally applies to other sectors as well. The rules on subsidies, in particular the need carving out research and development, while curbing production subsidies equally are of a horizontal nature. They will support the proposition that the SCM Agreement should reintroduce the discipline on non-actionable subsidies in support of research and development, as well as small and mediums sized companies (SMEs). The same holds

67 See also Danae Azaria, *Energy Transit under the Energy Charter Treaty and the General Agreement on Tariffs and Trade*, *Hein Online*, 27 *J. Energy & Nat. Resources L.* 559, 565 ss (2009).

true for local content rules of least developing countries, or disciplines on government procurement. Differential taxation equally is a horizontal matter not specific to renewables.⁶⁸ It may also apply to other areas where taxes are used for policy purposes other than for fiscal reasons. Other issues may be more specific, such as rules on interconnections, or the need for enhanced international technical regulation and standards. Or, the classification of specific energy related services, as much as tariff reductions discussed above amount to specific negotiations of tariff and services schedules of Members.

Future regulations of renewable energy in international law therefore will partly be embedded in general rules, and partly in special rules. Special rules may be addressed in a sectorial approach, combining goods, services, IPRs, competition and investment with a view to creating overall the necessary framework to foster renewables and the deployment of international and intercontinental grids, preferably smart grids.⁶⁹ Special attention should be drawn to transfer of technology. Art. 66.2 of the TRIPs Agreement obliges industrialised countries to create incentives for transfer of technology to least developed countries. Renewable energy is an appropriate candidate to finally implement this provision in a meaningful manner, for example by offering tax rebates to investment in these countries, or to enter into tax sparing agreements in order to avoid double taxation of investing companies both in the home and host countries.

It is evident that these efforts will require enhanced disciplines in international economic law, and not less. Unless policies are pursued to limit renewables to segmented domestic markets, and thus higher costs and less efficiency in climate change mitigation, this is not a case for more policy space on the domestic level.

3. Informing the Debate on Global Governance

The need for enhanced disciplines in international economic law will, in return, stimulate the debate on appropriate governance structures. They need to be built commensurate with the need for global rules producing appropriately regional and public goods to which the legal framework for sustainable production of indispensable electrical power and energy se-

curity inevitably belong. Partly, these rules are and can be built in a regional context. The European Union is the leading example in this respect. Partly the rules and regulations will need to be addressed on the global level. That will pose main challenges. Yet, whatever the outcome, the need for climate change mitigation will not result in lesser, but more international disciplines structuring decision-making and implementation of the law in a world of mutual dependence on electricity as a main driver and contemporary and future civilization. It is a matter of developing appropriate governance structure which induce mutual trust and allows people to rely upon electricity produced abroad and shipped via transit to consumers.

Overall, the future of renewable energy in international law poses a host of complex general and specific issues. It is submitted that they should be addressed and coordinated in comprehensive sectorial negotiations within the World Trade Organization, building upon existing disciplines, in close cooperation with other international organizations.⁷⁰ These negotiations will feed into discussions on general disciplines, such as trade remedies. They will focus on specific issues relating to electricity and the operation of international grids, combining rules on goods, services, investment and intellectual property as applied to this sector, possibly resulting in a particular side agreement on trade in renewable energies. General rules and specific rules overall will provide the overall framework required to operate global smart grid structures in the future.

IV. Conclusions

Effective abatement of CO₂ emissions and climate change mitigation call for enhanced disciplines in international economic law in the field of renewable energy and electricity. From the point of view of environmental law and climate change, enhanced disciplines should apply to anti-dumping measures.

68 Thomas Cottier et al. loc. cit. note 52 p 49 ss.

69 See Franco Davoli, Matteo Repetto, Carlo Tornelli, Gianluigi Proserpio, Flavio Cucchiatti, Boosting energy efficiency through Smart Grids ITU Paper, Geneva 2012, p. 11 ss, available at: http://www.itu.int/dms_pub/itu-voth/4B/01/T4B010000050001PDFE.pdf (accessed 24.7.2014).

70 Yulia Selivanova, loc. cit. note 15 p. 4, 11 ss.

Clean energy adds additional arguments to reform anti-dumping and to shift it towards the law of unfair competition which also could include services currently absent from such disciplines. Rules on subsidies need to take into account the needs of research and development while limiting production subsidies substantially. Countervailing duties should be limited to constellations where strict requirements are complied with. Problems of structural adjustments of the industry should best be addressed by means of safeguard measures. They buy time for industry and workers without increasing long-term costs to consumers and the availability of competitive products on the market. The pace of proliferation of renewable energy technology should not be impaired by protectionism of national industries. Yet, tariff deconsolidation may be applied wherever protection is sought for reasons of strategic trade policy. Flanking disciplines should be strengthened in off-setting subsidies for fossil fuels. The rules on non-discrimination and subsidies are able to frame appropriately government support and differential taxation. More

policy space, however, should be granted to research and development by activating the disciplines of non-actionable subsidies. Policy space also may be developed for local content requirements for least developed countries, either by means of R&D or the concept of graduation. Enhanced disciplines, however, are needed for the implementation of obligations of transfer of technology to least developed countries.

New rules and disciplines will be required with a view to gradually creating continental grids and eventually a global grid for electricity, interconnecting national and regional systems sourcing renewables from most effective sources. This goal and vision is inherently linked to gradually building global governance structures and coordination. This vision does not exclude acting locally and bottom up. But rules should not encourage fragmentation and isolation. Existing grey areas and new legal challenges should be addressed in sectorial negotiations on renewable energies under the auspices of the WTO with a view to effectively address the common concern of global warming.