1 Introduction: Setting the Horse Before the Cart to Preserve a Viable World

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1 The Key Message

2014 has been confirmed as the warmest year on record[1] whilst in its Fifth Assessment Report (AR5) the UN Intergovernmental Panel on Climate Change (IPCC) – the world's largest body of physical and social scientists dedicated to understanding the phenomenon – confirmed the unequivocal warming of the planet beyond its sustainability, and as a consequence of human activity. The main source of such warming – up to 80 per cent by some accounts – is emissions of so-called greenhouse gases (GHGs), most of which happen in the form of carbon dioxide (CO_2), stemming from energy use and supply. As a response, the international community has agreed to introduce remedial action and change course such that warming is kept at a safe 2° above normal. The twenty-first-century economy is energised to a very large extent by fossil fuels. But for the climate stabilisation goal to be reached, one-third of the world's oil, 50 per cent of its natural gas and up to 80 per cent of its coal reserves should remain *unburned*.[2] A dramatic scale-up of alternative sources of energy, as well as of massive energy efficient gains, is then imperative and most urgent. Towards resolving this predicament, the good news is that the low-carbon or carbon-neutral technologies currently on offer include a wide choice of mature innovations from

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[1] US National Oceanographic and Atmospheric Administration (NOAA), National Climatic Data Center, Global Analysis, Annual 2014, www.ncdc.noaa.gov/sotc/global/2014/13, accessed 2 February 2015.

[2] Mark Carney, Governor, Bank of England, quoted in 'Mark Carney: most fossil fuel reserves can't be burned', *Guardian*, 13 October 2014, www.theguardian.com/environment/2014/oct/13/mark-carney-fossil-fuel-reserves-burned-carbon-bubble. See also McGlade and Ekins (2015).

solar photovoltaic (PV) to geothermal and biomass, at commercially competitive terms or in grid parity vis-à-vis fossil fuels.[3] The bad news is that the policy frameworks that would enable such an effort in a globalised economy characterised by international fragmentation of production and services are lagging behind, and in many instances run against this purpose. This book is a proposal to set things right, through international cooperation, and establish rules and conditions for international trade and investment to support the fundamental transformation in energy markets so vitally called for. In doing so, the world will also avoid the waste of time and resources involved in the current legal, economic and political quarrelling around the evolution of the clean energy technologies sector[4].

2 The Context

Multiple dangers cloud the global outlook in this century's second decade, including slow growth, persistent and new geopolitical tensions and overwhelming evidence and consequences of climate change. Amidst these troubles, innovative policies that align environmental objectives with economic development and energy security hold tremendous appeal. A scale-up in the use of renewable energy (RE) is right up that alley. Progress is being made, but not at the speed and magnitude required. Stable sources of finance and sustained investment, on the one hand, and enabling, predictable, rules-based policy frameworks, on the other, are essential. The latter include the use of trade and investment policy to proactively stimulate the growth of the clean energy sector, as well as ensuring the rollback of trade barriers increasingly being erected, targeting the sector.

Many countries have embarked on proactive policies to expand the deployment of renewable and sustainable energy. According to REN21, by early 2013, energy RE support policies had been identified in 127 countries. The share of RE in the global power generation mix stood at 22 per cent in 2013 (8.5 per cent excluding large-hydro)[5] and is expected to account for nearly half of the global increase in power generation to

[3] The Investment bank Deutsche Bank has suggested that solar power systems will be at grid parity in up to 80 per cent of global markets by the end of 2017, see 'Solar at grid parity in most of the world by 2017', *REneweconomy*, 12 January 2015, http://reneweconomy.com.au/2015/solar-grid-parity-world-2017.

[4] A. Gosh and R. Meléndez-Ortiz, 'Want clean energy? Avoid trade disputes', *Business Standard*, April 14, 2013, www.business-standard.com/article/opinion/want-clean-energy-avoid-trade-disputes-113041500023_1.html.

[5] Renewable Energy Policy and Network for the 21st Century (REN21), *Renewables 2014: Global Status Report*, Paris, June 2014.

2040, overtaking coal as the leading source of electricity.[6] In countries like Germany, the share of renewable sources in the electricity mix grew from about 9.4 per cent in 2004[7] to 31 per cent during the first half of 2014 (27 per cent excluding hydro).[8] Global investment in renewables soared to US$ 310 billion in 2014.[9]

Yet, efforts to scale-up sustainable energy more rapidly and at the scale needed continue to be constrained by insufficiency and inadequacy in current international regulatory frameworks as well as new and unstable, competing and conflicting policies and measures introduced all over the planet, at national and sub-national levels, in an uncoordinated fashion among countries. In addition, countries, companies and communities with a stake in fossil fuels are in no hurry to change their ways. Indicative of this is how, despite falling prices, cost differentials between sustainable energy sources and fossil fuels continue to be exacerbated by massive subsidies to fossil-fuel use.[10]

In the twenty-first-century global economy, RE technologies are made up of packages of goods, services and embedded intangibles (such as software) that come together as a result of multiple transactions involving the providers of supply chains operating across several jurisdictions. In this manner, the goods, services and intellectual property (IP) involved in a wind energy park or a solar PV installation have usually crossed several borders, some times more than once. Any such equipment would generally also include locally produced components and services. An efficient functioning international market is essential for these value chains to deliver the final technologies.

Persistent barriers to global commerce, possible incentives and innovative policies to foster more rapid growth in RE, as well as the current rules governing such commerce, are the focus of this book. This includes – on the impediments side – tariffs (though seldom the most significant),

[6] International Energy Agency (IEA), *World Energy Outlook 2014*, Paris, November 2014 and 'International Energy Agency global outlook report points to continued strength of fossil fuels while low emissions nuclear and renewable energy grows', *ABC Rural*, 13 November 2014, www.abc.net.au/news/2014-11-14/international-energy-agency-global-outlook-2014/5889474.

[7] European Commission EuroStat, 'Energy from renewable sources,' http://ec.europa.eu/eurostat/statistics-explained/index.php/File:T_RENEWABLES_RES_E_2012.png.

[8] 'German power sector 27 percent non-hydro renewable in 2014', *Renewables International*, 3 July 2014, www.renewablesinternational.net/german-power-sector-27-percent-non-hydro-renewable-in-2014/150/537/80072/.

[9] Bloomberg New Energy Finance.

[10] According to the IEA *World Energy Outlook 2014*, global fossil fuel subsidies in 2013 amounted to US$ 548 billion. This figure does not reflect the costly impact of CO_2 emissions on global warming. It also does not reflect subsidy reform sparked by the dramatic fall in oil prices in the second half of 2014.

restrictive technical standards, local content requirements (LCRs), other so-called 'buy national' policies and restrictions on the many services necessary to deploy clean technologies and deliver clean energy. On the positive side, the growth of clean energy has been driven to large extent by policy. National governments and regions as well as local authorities have sponsored research, subsidised the development of new technologies and supported producers as well as consumers through loans, guarantees, feed-in tariffs (FITs) for electricity, tax breaks and a range of other tools and instruments. Ensuring that all such measures do not work against each other and rather support the delivery of social, private and public goods at the pace and scale required is essential for the survival of the planet.

The rationale for reducing barriers to sustainable energy goods and services (SEGS), and engendering non-trade distortive policy incentives, is straightforward and strong. Prices for SEGS would fall sharply, facilitating faster deployment at lower cost and making a significant contribution to the control of CO_2 emissions. Moreover, reducing the dependence on fluctuating oil and coal prices would greatly benefit energy security in developed and developing economies, particularly those that are net importers of fossil fuels. Net coal import dependency in India, for instance, rose from practically nothing in 1990 to nearly 23 per cent in 2012.[11] In comparison to fossil fuels that have exhibited a high degree of volatility, electricity prices generated from renewable sources, particularly solar PV, have shown a declining trend.

A shift to clean energy is also associated with multiple, additional sustainable development gains. Importantly, clean energy offers interesting opportunities for enhancing access to modern forms of energy, in particular in developing countries. This is associated with multiplier effects that it would be foolish not to recognise: with access to electricity, as opposed to traditional forms of heating and lighting such as wood, economic activity can be carried out once the sun has set. Children can study at night, and women will no longer have to spend hours collecting lumber and can use their time more productively. Air pollution would be dramatically reduced, including in homes as households could shift from burning wood or kerosene, with important health improvements as an immediate consequence.

[11] US Energy Information Administration (EIA), 'India is increasingly dependent on imported fossil fuels as demand continues to rise', August 14, 2014, www.eia.gov/todayinenergy/detail.cfm?id=17551.

3 Origins of the Sustainable Energy Trade Agreement (SETA) Concept

In 2011, three institutes, the Global Green Growth Institute (GGGI), the International Centre for Trade and Sustainable Development (ICTSD) and the Peterson Institute for International Economics (PIIE), entered into a research partnership for the purpose of examining salient trade policy issues and options related to the potential negotiation of a framework of rules and mutual obligations on trade and investment policies and an eventual agreement on the technologies, goods and services required for sustainable energy. This initiative evolved out of the fusion of two streams of work: on the one hand, ICTSD's undertaking since 2008 to generate a model sustainable energy agreement to be discussed and presented in the contexts of the WTO and the UN Framework Convention on Climate Change (UNFCCC) and, on the other, a proposal for a Sustainable Energy Free Trade Area (SEFTA) led by Michael Liebreich of Bloomberg New Energy Finance and made by the World Economic Forum (WEF) Global Agenda Council on Sustainable Energy, as part of the Forum's Global Redesign Initiative in 2010.[12] The result, a Sustainable Energy Trade Agreement (SETA), was first outlined in the ICTSD research paper, *Fostering Low Carbon Growth: The Case of a Sustainable Energy Trade Agreement*.[13] The initiative to promote a SETA was formally launched at, and underwritten by, the inaugural meeting of the Global Green Growth Forum (3GF), convened by the Prime Minister of Denmark, and the governments of Mexico and the Republic of Korea in October 2011.[14]

In this book, the SETA addresses a number of critical policy issues and tools, including the elimination of tariffs, the disciplining of non-tariff barriers (NTBs) and alignment and coherence concerning standards with respect to certain RE goods and services, as well as the documentation and eventual elimination of fossil-fuel subsidies. Its presumed modality would be a negotiation driven by a like-minded global coalition of countries, similar to the way that other successful endeavours have been initiated in the past, including the way in which the Information Technology Agreement (ITA) was achieved in the 1990s. The ITA, which recognised the urgency to act on a critical technology, was steered and put together by a geographically diverse group of twenty-nine countries and customs

[12] See 'Sustainable energy free trade area: global agenda council on sustainable energy', in Samans, Schwab and Malloch-Brown (2010).

[13] ICTSD, *Fostering Low Carbon Growth: The Case for a Sustainable Energy Trade Agreement*, International Centre for Trade and Sustainable Development, Geneva, 2011, 2011/12/fostering-low-carbon-growth-the-case-for-a-sustainable-energy-trade-agreement.pdf.

[14] 3GF, http://3gf.dk/en/issues/trade/ and 3GF, *Global Green Growth Forum, Report*, Ministry of Foreign Affairs of Denmark, Copenhagen, 2011.

unions at the WTO Singapore Ministerial Conference in December 1996. The number of participants has since grown to seventy, representing about 97 per cent of world trade in the information technology (IT) products that underpin the digitalisation of today's economy.

The SETA aims to bring countries together for the imperative of a fast and massive scale-up of innovation, deployment and use of the critical RE sources required to confront the challenges of mitigation of GHGs, energy security and energy access. It would provide a global framework for production and trade in the technologies required for sustainable energy, by ensuring robust markets for SEGS, and introducing international governance where particular gaps exist.

4 International Progress Towards the SETA Concept

The Momentum for a SETA

Since 2010, interest in a SETA has grown, spawning extensive discussion among various stakeholders including governments, academia, private firms and international organisations. Dialogue has led to the endorsement or inclusion of the SETA proposal at several high-level fora. In addition to an incremental understanding of the role of energy in climate change, and the ensuing urgency of reform of energy systems, in the context of the UNFCCC, this has also been facilitated by the global priority given to issues related to access to energy and energy security, as expressed by the UN's Sustainable Energy for All (SE4All) initiative and the 2012 Rio + 20 Conference, among others.

At the same time, recent trade tensions have contributed to creating a momentum for trade initiatives in the area of RE. The limits of existing trade rules are being tested as countries draft policies to promote the shift to a cleaner energy mix, often at the same time to trying to stimulate domestic economies and create jobs. Over the past few years this has led to an increase in energy-related spats among countries trading along the various supply chains of RE. An increasing number of these differences has been brought to the dispute settlement system of the WTO, notably regarding trade-distorting LCRs, as well as cases of alleged subsidisation and dumping of RE products.

Broad Support from Industry, Civil Society and Intergovernmental Organisations

Seeking to improve market access and transparency, as well as to clarify rules, the private sector has voiced its enthusiasm for the SETA's

potential to scale-up the production and application of sustainable energy. At the Business 20 (B20) Summit held in Mexico in June 2012, the Green Growth Task Force called for freer trade in green goods and services and endorsed the SETA as a meaningful vehicle to combat climate change while promoting economic growth and better access to energy.[15] As the Task Force explicitly acknowledged, 'the Sustainable Energy Trade Agreement (SETA), launched by a group of NGOs and research institutes and supported by a number of major corporations, shares many of these objectives'. This was followed by the launch of the 'Green Growth Action Alliance' (G2A2), a public–private partnership (PPP) with the objective of leveraging investment in green infrastructure projects, hosted by the World Economic Forum (WEF). The G2A2 put in place a working group on trade, which explicitly promoted the SETA.

Another example is the 'Friends of Rio + 20', an extraordinary coalition of business, scientists and civil society, which suggested practical actions to meet pressing sustainable development challenges. Among the coalition's recommendations, the SETA is highlighted as a significant multi-stakeholder collaboration that is capable of creating impact at scale.

More recently, the Alliance of the Sustainable Energy Trade Initiative (SETI Alliance) was launched in late 2012 during the Conference of the Parties of the UNFCCC in Doha. The Alliance is a PPP and a stakeholder support mechanism that works towards supporting and developing initiatives to promote a scale-up of innovation, production and deployment of SEGS through trade. Its wider aim is to contribute to climate change mitigation, to improve access to energy and enhance energy security. Among its members are companies from the wind and solar industries, as well as like-minded governments.

Among intergovernmental organisations, the UN Economic Commission for Latin America and the Caribbean (ECLAC), the Inter-American Development Bank (IADB), the United Nations Industrial Development Organization (UNIDO) and the International Renewable Energy Agency (IRENA) have all expressed interest in exploring the analytical concept of a SETA and its further dissemination.

Several private sector firms and research institutions such as Trina Solar, Vestas Wind Systems A/S, Siemens AG, Yingli Solar, Suzlon, Canadian Solar, Hanwha Solar, Grundfos, Danfoss, Solar Clarity, the Chinese, Danish and European Wind Energy Associations, the Organisation for Economic Cooperation and Development (OECD),

[15] The Business 20 Summit (B20) is an international forum that aims to foster dialogue between governments and the global business community. The B20's main objective is to provide leaders of the G20 with meaningful recommendations from the private sector.

the Governments of Denmark, Norway and the United Kingdom, Bloomberg New Energy Finance; the WEF, the World Resources Institute (WRI) and the MIT Energy Initiative are among members or key supporters of the initiative.

Governments are Taking Action on Trade Initiatives on Sustainable Energy

On the government side, notable progress has also been made on trade initiatives in the area of sustainable energy. Indeed, a few countries, notably in Europe and Latin America, as well as China, have expressed their explicit support for a SETA.

In 2012 the European Commission Trade Policy Committee and Foreign Affairs Council (Trade) adopted an options paper on 'Trade and green growth', which acknowledges SETA's value from a commercial, environmental and climate viewpoint. Subsequently, in 2013, EU Member States agreed in the European Council that '[f]urther progress is required towards liberalisation of trade in environmental goods and services as a positive contribution to moving towards a resource-efficient, greener and more competitive economy'.

China has also expressed concern over the inadequacy of existing frameworks and ensuing tensions, and has called for dialogue on sustainable energy trade. For example, in the context of the 2012 and 2013 3GF meetings in Copenhagen, the Chinese Vice Minister of the National Energy Administration, Liu Qi, called for trade initiatives in the field of RE.

In June 2013, US President Barack Obama stated in his Climate Action Plan that:

> The US will work with trading partners to launch negotiations at the World Trade Organization towards global free trade in environmental goods, including clean energy technologies such as solar, wind, hydro and geothermal. The US will build on the consensus it recently forged among the 21 Asia-Pacific Economic Cooperation (APEC) economies in this area. In 2011, APEC economies agreed to reduce tariffs to 5 per cent or less by 2015 on a negotiated list of 54 environmental goods. The APEC list will serve as a foundation for a global agreement in the WTO, with participating countries expanding the scope by adding products of interest. Over the next year, we will work toward securing participation of countries which account for 90 per cent of global trade in environmental goods, representing roughly $481 billion in annual environmental goods trade. We will also work in the Trade in Services Agreement negotiations towards achieving free trade in environmental services.

This statement appears to refer to a plurilateral approach similar to the SETA.

Intergovernmental Progress

An increasing number of positive developments at intergovernmental level towards a framework for trade in SEGS have followed this growing multi-stakeholder support.

Most notable is the commitment by the Asia-Pacific Economic Cooperation (APEC) to define a list of environmental goods (EGs) and to address related applied tariffs as well as NTBs. The APEC leaders agreed during their Honolulu summit in November 2011 to develop a common list of EG during 2012. Eventually, in Vladivostok in September 2012, they managed to define such a list, comprising fifty-four EGs. They also committed to reducing applied tariffs to 5 per cent or less by 2015, and to subsequently eliminating NTBs, including LCRs that distort environmental goods and services trade.[16] The agreement is ground-breaking in the field of *environmental* goods negotiations, particularly in contrast to over ten years of acrimonious talks under the Doha Development Round at the WTO. It also prompted many, from numerous advocates in think tanks and civil society to clean tech firms to the Director General of the WTO and President Barack Obama, to propose to build upon the Agreement and to take it to the WTO.

Following the APEC Agreement, discussions took place in Geneva among a group of countries self-defined as *friends* of environmental goods and services (EGS) on how to build upon it. Energy-related goods are at the heart of those discussions. At the time of writing this introduction, at the end of 2014, this has resulted in concrete moves. A group of forty-one WTO members[17], including the twenty-eight European Community countries, made a joint statement in Davos during the WEF Annual Meeting in January 2014 to announce their commitment to achieve global free trade in environmental goods and pledge to work together, and with other WTO Members, to prepare for negotiations in the area. Although not specific to sustainable energy, the APEC list of goods that would serve as a basis for this process includes many of the key goods in that area.[18] In July 2014 this same group of countries formally launched negotiations towards an Environmental Goods Agreement (EGA) 'within the WTO', seeking an ambitious outcome to be implemented on a 'most favoured nation' (MFN) principle[19].

[16] The full text of the APEC 2011 Leaders' Declaration is available on the APEC website.
[17] Australia; Canada; China; Costa Rica; the EU; Hong Kong, China; Japan; Korea; New Zealand; Norway; Singapore; Switzerland; Chinese Taipei; and the United States.
[18] '"Green goods" trade initiative kicks off in Davos', ICTSD, *Bridges Trade BioRes*, 28 January 2014, www.ictsd.org/bridges-news/biores/news/%E2%80%9Cgreen-goods%E2%80%9D-trade-initiative-kicks-off-in-davos.
[19] '"Green goods" trade talks kick off in Geneva', ICTSD, *Bridges Trade BioRes*, 10 July 2014, www.ictsd.org/bridges-news/bridges/news/green-goods-trade-talks-kick-off-in-geneva.

The negotiations, of a plurilateral nature (involving only a selection of WTO Members), are set from the outset to treat other WTO Members in a non-discriminatory manner, such that ensuing benefits in terms of tariff liberalisation (for instance) will automatically accrue to all.

The EGA Prospects of Advancing a SETA

ICTSD and its partners continue to advocate a result along the lines of the proposed SETA, and for an early harvest on energy to be linked to the climate change talks under the UN at its summit in Paris in December 2015. For the moment, the EGA talks have focused on reduction of tariffs at the border; however, most players agree that the inclusion of NTBs, and other aspects of trade policy, is desirable. Moreover, this emerging understanding would also include the notion advanced in the SETA concept that trade in services would be crucial to make the resulting more liberal frameworks effective in expanding the markets for clean energy technologies. An expansion of the negotiations with respect to thematic scope as well as to membership requires a better understanding of incentives for current EGA non-Members to join: both thematic scope and such incentives go hand in hand. Many of the current non-Members are rapidly developing policies to scale-up RE in their energy supply mix, and doing so successfully. It would make no sense for them to remain outside an enhanced EGA or an eventual purposeful SETA. Likewise, other negotiations at the regional and mega-regional level are now including provisions in a SETA-like direction. All these efforts will probably end up in convergence in a few years. The sooner they do, the better the world will be.

In most recent papers under this initiative we have argued along the following lines for the possibilities of the EGA to effectively contribute to the SETA objectives:

> The APEC list provides a reasonably good coverage of certain clean energy supply products particularly in the solar PV and wind-power sectors. The list also includes products that may contribute to enhancing access to clean energy, for example small-hydro, ocean, geothermal and biomass gas turbine generating sets. On the other hand, some clean energy sectors are not included. For example, equipment used in hydropower applications does not make the cut for the APEC list. While the list does include both clean energy equipment and parts – which may be useful for a value-chain approach to reducing costs – certain segments of value chains are missing. For example a range of downstream components used in solar PV systems, such as solar inverters, are also not included, perhaps because the relevant [Harmonized System] HS sub-heading includes products that are principally applied for other uses.