Trade in Sustainable Energy Services

Joachim Monkelbaan
October 2013

ICTSD
International Centre for Trade and Sustainable Development

Global Green Growth Institute

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Published by

International Centre for Trade and Sustainable Development (ICTSD)
International Environment House 2
7 Chemin de Balexert, 1219 Geneva, Switzerland
Tel: +41 22 917 8492 Fax: +41 22 917 8093
E-mail: ictsd@ictsd.ch Internet: www.ictsd.org

Publisher and Director: Ricardo Meléndez-Ortiz
Programme Manager: Ingrid Jegou
Senior Programme Officer: Joachim Monkelbaan

Acknowledgments

This paper is produced under the Sustainable Energy Trade Initiative (SETI) project of ICTSD's Global Platform on Climate Change, Trade and Sustainable Energy (Global Platform). ICTSD is grateful for the generous support provided to the project by the Ministry of Foreign Affairs of Denmark (Danida), by the Ministry of Foreign Affairs of Norway and by the Global Green Growth Institute. We also gratefully acknowledge support for the Global Platform from ICTSD's core and thematic donors including the UK Department for International Development (DFID); the Swedish International Development Cooperation Agency (SIDA); the Ministry of Foreign Affairs of Denmark (Danida); the Netherlands Directorate-General of Development Cooperation (DGIS); the Ministry for Foreign Affairs of Finland; The Ministry of Foreign Affairs of Norway. The Global Platform has also benefited from the support of the Inter American Development Bank (IADB); Oxfam Novib and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

ICTSD welcomes feedback on this document. These can be forwarded to Joachim Monkelbaan, jmonkelbaan@ictsd.ch

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Citation: Monkelbaan, Joachim; (2013); *Trade in Sustainable Energy Services*; International Centre for Trade and Sustainable Development, Geneva, Switzerland, www.ictsd.org

ISSN 2225-6679

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Abbreviations and Acronyms

APEC	Asia-Pacific Economic Cooperation
AR4	IPCC fourth assessment report
ASEAN	Association of Southeast Asian Nations
BRICs	Brazil, Russia, India and China
CCS	Carbon capture and storage
CDM	Clean Development Mechanism
CERs	Carbon credits
CFGS	Climate-friendly goods and services
CHP	Combined heat and power
CO_2	Carbon dioxide
CPC	Central Product Classification
CTE SS	Special Session of the Committee on Trade and Environment
CTS SS	Special Session of the Committee on Trade in Services
EGS	Environmental goods and services
EU	European Union
EuroStat	Statistical Office of the European Community
FTA	Free-trade agreement
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GE	General Electric Company
GGGI	Global Green Growth Institute
GPA	Government Procurement Agreement
GHG	Greenhouse gas
ICT	Information and communication technologies
ICTSD	International Centre for Trade and Sustainable Development
IEA	International Energy Agency

IET	International emissions trading
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
TISA	Trade in International Services Agreement
ITA	Information Technology Agreement
kWh	Kilowatt hours
LDC	Least-developed countries
MFN	Most-favoured nation
MOFCOM	Chinese Ministry of Commerce
OECD	Organisation for Economic Co-operation and Development
PIIE	Peterson Institute for International Economics
PTA	Preferential trade agreement
PV	Photovoltaic
R&DD	Research and development
RECs	Renewable energy credits or certificates
RGF	Really Good Friends of Services
SCM	Subsidies and Countervailing Measures Agreement
SEGS	Sustainable energy goods and services
SETA	Sustainable energy trade agreement
SETIs	Strategic energy trade initiatives
TPP	Trans-Pacific Partnership
TRIMS	Agreement on Trade Related Investment Measures
UN	United Nations
US	United States
W/120	GATS sectoral classification list
WTO	World Trade Organization

Foreword

Services related to sustainable energy will be crucial for the transition to a low-carbon economy. In fact, the global market for services related to sustainable energy is bigger than the market for related goods. It is staggering, then, that sustainable energy services are largely neglected in international deliberations. The purpose of this paper is to attract attention to this important topic, first by building an understanding of trade in services related to sustainable energy based on an attempt to identify these services and analyse specific commitments made by their main traders. The paper moves beyond such a static observation by considering the wider sustainable development concerns of sustainable energy services and suggests innovative ways forward.

The paper focuses on services in a key sector that was identified by the Intergovernmental Panel on Climate Change (IPCC): energy supply. In its analysis, the paper goes beyond the traditional General Agreement on Trade in Services (GATS) issues of market access and national treatment and points to a variety of domestic laws and regulations related to services that can be addressed in a sustainable energy trade agreement (SETA), including government procurement procedures.

To place sustainable energy services in the wider context of sustainable development, the paper explores 'win-win' outcomes for socioeconomic development and the environment, and it highlights opportunities for job creation within the renewable-energy sector.

Finally, the paper proposes specific services that could be included in sustainable energy trade initiatives (SETIs) and considers the legal and political aspects of doing this.

Tackling the challenges of climate change while enhancing global access to energy and energy security will require fundamental transformations of our economies and the ways we generate and use energy. Scaling up sustainable energy through a switch to cleaner, low-carbon technologies and transport fuels, as well as greater energy-efficiency[1] measures and renewable-energy generation could make a positive contribution toward achieving these goals. For international cooperation on sustainable energy to be effective, international regulatory frameworks will be necessary.

Efforts to scale up sustainable energy require generation costs to be as low as possible. This is difficult at present, given the relatively high capital costs associated with renewable-energy investments, the non-consideration of environmental and health externalities in fossil-fuel pricing, and the enormous levels of subsidies still granted to fossil fuels.

While incentives, such as feed-in tariffs and tax breaks help, lowering the costs of equipment and services used to produce sustainable power and reducing barriers to trade could also help facilitate the scale-up process, by enabling economies of scale and cost optimization for renewable-energy projects. Trade in sustainable energy goods can be hampered by tariffs, subsidies, and diverse or conflicting technical standards, as well as by lack of harmonization or mutual recognition efforts.

Domestic sustainable energy policies are also sometimes designed in a manner that restricts access to competitively priced goods and services for sustainable energy producers. This is because policymakers, in striving to lower the costs of sustainable energy production, often seek to promote the domestic manufacturing of renewable-energy equipment and the provision of services. In addition, the sustainable energy sector is seen by many policymakers as a potential engine for job creation. Balancing all of these objectives, however, may be difficult, and some policies could trigger trade disputes.

A number of trade disputes related to support for renewable energy is currently under way at the World Trade Organization (WTO). While these disputes can clarify existing rules, a more constructive

long-term effort would require a well-defined, coherent governance regime for sustainable energy and related goods and services, one that is supported by trade rules and robust markets. The current stalemate in the WTO Doha negotiations, particularly in efforts to liberalize environmental goods and services, is preventing action to address barriers to sustainable energy goods and services.

Even a successful conclusion of the Doha Round would still leave a number of trade-related rules pertaining to sustainable energy – such as subsidies – unclear, given the lack of a holistic perspective on energy in the Doha mandate. In such a scenario, SETIs in bilateral and regional trade arrangements may be a viable option. The agreement in Asia-Pacific Economic Cooperation (APEC) in 2012 to lower tariffs on a range of environmental goods (a major part of them related to sustainable energy) can be considered as a first step towards a SETI. Eventually, such an approach could include a SETA as a stand-alone initiative to address these barriers, enabling a trade policy-supported energy governance regime to advance climate change mitigation efforts and increase sustainable energy supply.

This agreement could be pursued initially as a plurilateral option, either within or outside the WTO framework and eventually be 'multilateralized.' It could serve to catalyse trade in sustainable energy goods and services while seeking to address the needs and concerns of participating developing countries, many of which may not be in a position to immediately undertake ambitious liberalization in sustainable energy goods and services. A SETA could also help clarify existing ambiguities in various trade rules and agreements as they pertain to sustainable energy and provide focalized governance through effective and operational provisions.

One of the objectives of the SETA project is to provide options for developing trade in sustainable energy goods and services (SEGS) that effectively contribute to sound environmental management, while preserving developing countries' ability to promote industry and economic development. The specific purpose of this paper is to identify the role that sustainable energy services could play in a SETA.

This paper builds on the results of recent International Centre for Trade and Sustainable Development (ICTSD) studies that analyse trade in climate-friendly goods and services[2]. Despite the significant economic and environmental benefits of liberalizing trade in sustainable energy goods and services, many obstacles remain to realizing such benefits. The benefits that ICTSD modeling has shown can result from non-tariff liberalization are much greater than the ones that come from tariff removal. As barriers to trade in services obviously are related with non-tariff barriers similar to the ones that restrict trade in goods (e.g. local content requirements, subsidies, and government procurement practices), it can be expected that removal of such barriers to trade in sustainable energy-related services will result in not only enhanced welfare and access to such services, but also dissemination of knowledge and skills.

This paper has been written by Joachim Monkelbaan of ICTSD. The paper is produced as part of a joint initiative of ICTSD's Global Platform on Climate Change, Trade and Sustainable Energy and the Global Green Growth Institute (GGGI). The concept of the research has been informed by ICTSD policy dialogues, in particular, a series of Geneva-based meetings on trade in climate-friendly services; dialogues with European Union (EU) institutions and the Chinese Ministry of Commerce (MOFCOM) in November 2012; and a round table with WTO Ambassadors in Geneva in January 2013.

Ricardo Meléndez-Ortiz
Chief Executive, ICTSD

Executive Summary

Although the size of sustainable energy services is bigger than the market for related goods, and such goods and services are often traded in tandem, services related to sustainable energy are largely neglected in international negotiations. Services related to sustainable energy should be a key component of SETIs and an eventual SETA. Including services in a SETA, however, poses a number of challenges.

The first of these challenges lies in identifying a reasonable set of sustainable energy-related services that could be subject to trade liberalization negotiations. Given that these services are spread across multiple sectors, identifying such services could be a daunting task. 'Complementary services of sustainable energy technologies' cut across multiple key mitigation sectors identified by the IPCC - i.e. energy supply, transport, buildings, and industry – and largely fall into the following Central Product Classification (CPC) groups: other professional, technical, and business services; construction services; and other environmental protection services.

Because some sustainable energy goods are indispensable for delivering these associated services, and vice versa, another challenge arises from the current disconnect between negotiations on environmental goods and negotiations on environmental services in the framework of the WTO. One incentive for including trade in sustainable energy services in a SETA is that this could both facilitate the diffusion of associated sustainable energy technologies and enable countries to easily obtain access to such services and the related knowledge transfers. This is significant, since some of the key services and capacities required for sustainable energy production and use are often unavailable in the countries hosting the projects.

The lack of progress in environmental services negotiations on the issue of classification is another challenge, because it weakens the incentive for WTO members to schedule meaningful commitments in supporting action on sustainable energy.

This paper attempts to respond to these challenges by identifying services that are directly linked to the diffusion of sustainable energy technologies (hereafter 'services complementary to sustainable energy technologies') and analysing specific commitments made by the major trading countries of these services. Subsequently, this paper suggests how the results of this analysis could be captured in a SETA.

After reviewing major trading countries' specific commitments to liberalize trade in these services, it becomes clear that only a handful of such countries has made commitments across all modes of supply. The principal modes of supply for the complementary services of sustainable energy technologies are 'commercial presence' (Mode 3) and 'movement of natural persons' (Mode 4). Yet, these modes of supply appear to be largely limited, as the majority of countries concerned have put specific as well as horizontal limitations on them. Members' commitments on 'cross-border supply' (Mode 1) across all three CPC groups are becoming increasingly important for the facilitation of trade in these services, as the provision of services through Mode 1 is increasing along with new channels of electronic supply. The majority of trading countries concerned, however, left this mode of supply unbound, as they considered it inapplicable, particularly in the case of construction services.

Services regulation has connections to many other issues in a SETA. Facilitating trade in 'services complementary to sustainable energy technologies' goes beyond the boundaries of the General Agreement on Trade in Services (GATS), as it is not limited to the issue of market access and national treatment. Domestic legislation, regulatory measures, and administrative rules could also affect trade in these services. In particular, because the public sector is the largest client in these sectors, regulations concerning government procurement could have a significant impact on trade in

these services. Addressing the issue of trade liberalization in complementary services of sustainable energy technologies in tandem with government procurement issues is crucial in the development of a SETA. The WTO Government Procurement Agreement (GPA) has just been renegotiated. The text now covers services. The key question is the extent to which a GPA party includes particular services within the scope of its market access offer[3]. Most GPA parties' market access coverage includes only procurement of services on a positive list; only the United States (US) uses a negative list approach in this context. Most or all parties cover services in the GPA with respect to another party only to the extent that the other party has provided reciprocal access to that service.

Bilateral, regional, and unilateral liberalization of services has advanced in the wake of the lack of progress on members' new commitments across the three CPC groups of services during the Doha Round. Most recently, the negotiations on a plurilateral 'Trade in International Services Agreement' (TISA) has gathered support. This paper shows how Doha Round commitments, unilateral and bilateral liberalization, industry support, and the ideas for a TISA could feed into a SETA and leverage the benefits of an enabling trade framework for sustainable energy development.

Energy plays a crucial role in realizing the wider promises embodied by a commitment to sustainable development. These promises include the mitigation of climate change, the prevention of water and air pollution and related health benefits, global access to modern forms of energy, the transfer of knowledge and technology, and increased employment opportunities due to the labour intensity of renewable forms of energy.

In order to realize such 'win-win' outcomes for socioeconomic development and the environment and to spur job creation in the field of sustainable energy, both domestic and international supportive frameworks must be conceived.

A SETA could provide for such a framework for the massive scale up of both goods and services related to sustainable energy, and focusing initially on services related to the construction and ICT sectors could provide a good starting point for such an agreement.

Chapter 1

Services and a sustainable energy trade agreement

With the need to scale up utilisation of renewable sources of energy as a mean to [address climate change][achieve sustainable development]becoming increasingly rapidly growing global demand for both energy and greenhouse gas (GHG)-reducing technologies, it is essential to make renewable energy[4] goods and services readily accessible. Given that cost remains one of the most prohibitive factors to large-scale adoption of renewable-energy technologies, cost-reduction measures should be given high priority.One logical approval is to liberalize market and investment regime in activities relating to rade in reneable energy services, thereby One logical approach is to liberalize market and investment regimes in activities relating to trade in renewable energy services, thereby insuring that consumers gain access to a wider selection of services at competitive prices. That may lead to further economic benefits, such as the growth of domestic renewable energy goods and services firms that may eventually export to the world market. Trade can also provide new incentives for innovation and investment in related climate-friendly technologies.

Considerable potential lies in the dissemination of sustainable energy good and services (SEGS) through the liberalization of trade. The World Bank, for example, calculated that removing tariff and non-tariff barriers to clean-energy technologies alone could result in a nearly 14 percent increase in their trade volume, and in the case of some energy-efficient products, the removal of trade barriers could increase trade by up to 60 percent (World Bank, 2007a). In this respect, trade should be seen only as a means to growth, green jobs, and mitigation of GHG emissions. Thus, carefully crafted trade policies should contribute to the massive and rapid deployment of more efficient, cleaner technologies that promote clean growth, energy security, and economic growth into the future.

One typical example of a non-tariff barrier to trade in sustainable energy goods is local content requirements. These are banned under Article III:4 of the General Agreement on Tariffs and Trade (GATT), Article 2 of the Agreement on Trade Related Investment Measures (TRIMs), and Articles 3 and 5 of the Subsidies and Countervailing Measures (SCM) Agreement. Similarly, some governments put localization requirements for sustainable energy services in place. Such localization requirements for services can include requirements to transfer technology and requirements to provide services using local facilities or infrastructure. Some country governments regard localization requirements as a desirable policy tool. But, services exporters can see them as protectionist; and, if a trade initiative would tackle them, this would motivate them to lobby their governments to participate.

Many political and technical difficulties remain with respect to the liberalization of environmental goods andservices within the Doha Round. In addition, policy measures relating torenewable energy is increasingly the topic of trade disputes.

Considering these factors, the time appears right to create global enabling frameworks for trade in SEGS, through sustainable energy trade initiative(SETIs) which eventually and eventually into a SETA[5]. In addition to reducing barriers to trade, a SETA could create clarity on what types of support governments can give their sustainable energy industries, transparency and predictability for businesses and investors, and an overall regulatory framework in support of the rapid scale up of sustainable energy.

A SETA could be conceived in many different forms, including, for example, a plurilateral agreement, such as the Information Technology Agreement (ITA), the GPA[6], or the TISA.

The objective of this paper is to promote innovative approaches to negotiating sustainable energy services in SETIs and

eventually a SETA. To lay a stable basis for such negotiations, the paper aims to identify the coverage and classification of services that are directly related and complementary to the diffusion of sustainable energy technologies, to analyse commitments made unilaterally and through international negotiations (including in preferential trade agreements (PTAs) so as to assess the degree of openness of the services market, and to propose ways to address these findings in SETIs and in a SETA. The wider implications for sustainable development will be considered as well.

To realise a successful diffusion of SEGS, understanding the synergies between trade in goods and services is crucial, as certain sustainable energy goods are indispensable for delivering associated services, and vice versa. For instance, an analysis of environmental goods associated with service contracts carried out by the Organisation for Economic Co-operation and Development (OECD) demonstrates that many of these environmental goods are used in the performance of environmental services (OECD, 2005)[7]. In addition, an empirical study shows that trade in sustainable energy technologies is often impeded by restrictions on trade in associated services (Steenblik and Kim, 2008). Furthermore, several empirical studies reveal that some of the key services required for sustainable energy options, ranging from energy efficiency projects to utility-scale wind power projects, are often unavailable in the host countries (Steenblik and Geloso Grosso, 2011; Sterk et al., 2007). Box 1, for example, describes the wide variety of services required in the creation of wind and solar power projects. Given the complexity and degree of specialization, local enterprises do not always have the competencies to provide the full range of such services.

Chapter 2

Scope and outline of this paper

Because many different services could relate to sustainable energy, this study narrows the scope of services that are subject to the analysis of the major trading countries and their specific commitments, and to capture the lessons that can be learned for a SETA.

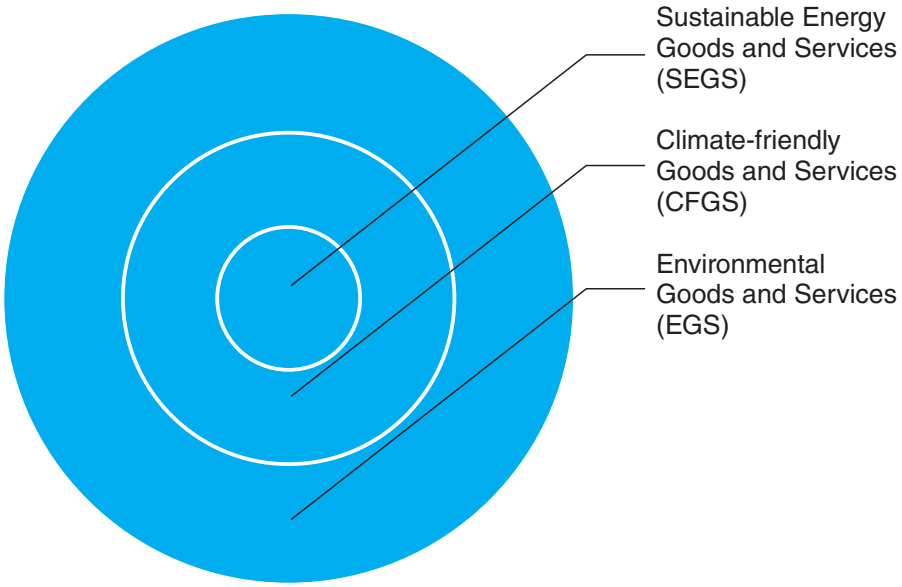
At the onset, , this study reviews negotiations related to (sustainable energy) services and how these negotiations have been challenged by classification issues. Second, the paper provides an overview of sustainable energy technologies and practices by exploring the energy supply sector, which was a key sector in the IPCC Fourth Assessment Report (AR4). This paper focuses on services that could directly influence the diffusion of sustainable energy technologies, known as 'complementary services of sustainable energy technologies.' Given the inseparable links between sustainable energy goods and services, it is important to highlight those services that are directly linked to sustainable energy technologies.

Third, based on the 'complementary services of sustainable energy technologies' discussed in the energy-supply sector, the study identifies corresponding services categories in terms of the United Nations (UN) CPC (version 2)[8]. The most important sustainable energy services, in particular, the ones related to solar and wind power projects, were composed by ICTSD based on consultations and surveys with solar and wind energy companies and industry associations.

Fourth, in analysing the major trading countries' specific commitments under GATS on the services concerned, this study further narrows the scope of services by focusing on services groups that most frequently appear across multiple economic sectors. Given the data limitations on trade in these services, the major trading countries of these services are identified at the CPC group level. The major trading countries' specific commitments are analysed at sectoral or sub-sectoral levels within each CPC group.

Finally, this study looks at the sustainable development aspects of trade in sustainable energy services and how the lessons learned can be used for crafting a SETA. This paper builds on earlier work by ICTSD on EGS and on climate-friendly goods and services[9] and presents a more specific focus on a more limited number of categories[10] of goods and services as displayed in the figure below:

Figure 1 : The relation between EGS, CGS, and SEGS



The different terms of EGS, climate-friendly goods and services (CFGS), and SEGS will be used throughout the paper (see figure 2 above for a depiction of how these acronyms relate to one another). While the terms 'environmental goods and services' and 'climate-friendly goods' are used throughout this paper, the topic of this paper is specifically on sustainable energy services

One limitation of this paper is that it is based mostly on the WTO GATS Schedules of Services Commitments. These Schedules date from two decades ago; they were finalized before the WTO even existed and have not been touched since except for telecom and financial services, and they mostly are different for newly acceded WTO members. This limits the representativeness of these data. In addition, environmental services were not a high priority in the 1990s and were not the focus of the Uruguay Round of trade negotiations. In sum, analysing these commitments, although it is the only source available for comparing WTO members, has severe limitations. To obviate these, the commitments in more recent RTAs will be examined.

Chapter 3

International negotiations on trade and the classification of sustainable energy services

As trade in goods and services related to sustainable energy remains under discussion in the Doha Round – for example, under EGS[11] – it is important to first understand the dynamics of these negotiations. The negotiations on EGS are taking place simultaneously in two different WTO forums: negotiations on environmental goods at the Special Session of the Committee on Trade and Environment (CTE SS) and negotiations on environmental services at the Special Session of the Committee on Trade in Services (CTS SS).

According to the chair of the CTE SS[12], one option to reconcile the two sets of negotiations is to draft textual elements cross-referencing the work in the CTS SS related to enhanced commitments on environmental services. Another possibility would be to associate enhanced commitments on environmental services with the environmental goods or an agreed set of environmental goods[13].

In any case, the progress of negotiations in both forums has been slow, as each forum is facing different challenges. The WTO set the request-offer approach for the negotiation of specific market access commitments in services. By 2008, 70 initial offers and 30 revised offers across all services sectors were submitted to the WTO, but since then, few offers have been received, and they are considered to be out of date by now.

According to Van der Marel and Miroudot, there are several reasons for the lack of domestic export interest and appetite for multilateral services liberalization in general:

1. Unilateral services reform before and after the Uruguay Round in most countries had reduced the incentive to lobby for further commitments. Service exporters perceive the current climate as relatively open. Services barriers are still higher, though, for a number of countries across sectors (transport services) and modes (temporary movement of labour), both for developing and developed economies.

2. It is difficult to reform services on a discriminatory basis. The nature of a services barrier makes it harder to distinguish between partner countries.

3. Increased mutual interdependence over the last several decades has made business interests think that a reversal of the current openness is unlikely.

4. Services liberalization will be dealt with in the Doha round only once agriculture and non-agricultural modalities are resolved. This may motivate the business community to wait and see what happens before starting an active lobby.

5. Developing countries' commitments are not as extensive, since most of these countries share small markets. They are, therefore, not of great interest to high-income countries, which lowers the incentive for developing countries to negotiate greater market access in GATS.

This underlines the need for innovative approaches to free up the flow in sustainable energy services. Such novel approaches are needed all the more, because the negotiating session on environmental goods has been struggling with identifying a list of goods that are of interest to the majority of WTO members. Meanwhile, the negotiations on environmental services are facing the challenge of updating the current GATS classification, as it does not reflect the rapidly evolving structure of the environmental services industry.

The biggest challenge of the GATS itself is that it provides for only positive list commitments based on the out-of-date nomenclature

of W/120[14]. The current classification (W/120) of environmental services, for example, focuses largely on infrastructural services despite the fact that 'non-infrastructural' services – such as air pollution control[15] or environmental consulting – have been emerging as important activities in recent years, primarily owing to increasingly demanding environmental regulations (Cossy, 2011; Cottier and Baracol-Pinhao, 2009; Nartova, 2009)[16]. As noted previously, during the Uruguay Round, there was an organized concept of either environmental services or energy services. In the last 10 or 15 years, the wider energy services business community has lobbied WTO members to obtain commitments on energy services as part of WTO accession packages, but those cover only a few markets and are focused on fossil-fuel based energy. The fact that these commitments exist demonstrates that it is possible to get WTO-compatible commitments that are not tied to W/120.

Several proposals on an updated classification are under examination by WTO members. Some members have based their proposals on the classification developed by the OECD/the Statistical Office of the European Community (EuroStat), which includes three categories of environmental services: pollution management, cleaner technologies, and resource management[17]. The EU proposed seven sub-sectors based on the environmental media (air, water, soil, waste, noise, etc.) to supplement the basic classification scheme in order to preserve the mutually exclusive character of the W/120 list.

Despite several proposals on the development of a more comprehensive classification system for environmental services, a 'dual use' problem – the overlap between certain environmental services and services classified within other sectors – presents a serious challenge. The fact that services related to sustainable energy are spread across multiple sectors classified in W/120 only heightens the issue of 'dual use.' Several proposals have been put forward to address this issue. The EU, for instance, proposed a 'cluster' approach, in which services used for environmental as well as other purposes (dual-use services) would be classified separately and be subject to a 'checklist' during the other sectoral negotiations. Canada supports the EU's 'cluster' approach, encouraging liberalization in all modes of delivery. In particular, Canada differentiates between the present list of environmental services (core services) and other related services (non-core or dual-use services) and stresses the importance of liberalizing both services at the sub-sectoral level. The proposals by the US and Switzerland are largely in line with the classification of 'core' versus 'non-core' services (Nartova, 2009).

Opinions, however, are divided as to whether an appropriate classification is a pre-requisite for scheduling meaningful commitments in supporting the development of sustainable energy use and production. For instance, Cossy (2011) argues that the absence of an appropriate classification does not prevent Members from negotiating on climate change-related services. What is more important, she stresses, is to ensure that each schedule is internally coherent by avoiding overlap among sectors and defining the scope of the commitments clearly and precisely[18].

In a recent note[19] to WTO members, the WTO Secretariat suggests several ways in which clean energy services can be classified. The Secretariat starts by confirming that in both W/120 and the CPC, there is no explicit reference to services related to renewable energy or energy efficiency and that the classification of energy-related services is neutral with respect to the energy source (sustainable energy services cannot be distinguished from services related to fossil fuels). The only explicit reference made to renewable energy is found in "engineering services for power projects" (CPC2 83324)[20].

According to the note, members may want to give further consideration to the classification of services associated with emerging technologies. Carbon capture and storage (CCS), for example, involves various services, such as the identification of a suitable geological formation or carbon dioxide (CO2) capture at the point of emission, transport to the reservoir, and storage on a long-term basis[21]. On the one hand, it could be considered that CCS involves several services classified in different sectors and sub-sectors of W/120, in particular in business and transport services. On the other

hand, some CCS-related services - or CCS altogether – might constitute "new" services, in which case they would at a minimum fall under a residual "other" category, because CPC and W/120 are deemed to be exhaustive (i.e. to include all services).

"Smart grids" is another emerging technology that may deserve further consideration from a classification point of view. The IEA defines a smart grid as "an electricity network that uses digital and other advanced technologies to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end-users[22]." Smart grids are expected to make an important contribution to the promotion of energy efficiency and to the promotion of renewable-energy sources by allowing consumers to make informed choices and to directly control and manage their individual electricity consumption. From a classification point of view, smart grids services are likely to cut across several W/120 sectors, including telecommunication and computer services, and perhaps also services incidental to energy distribution.

The GATS offers significant flexibility for specifying the scope of commitments in members' schedules[23]. All WTO members are subject to general obligations under the GATS, including most-favoured nation (MFN) treatment and transparency, which apply to all service sectors. The main GATS obligations, however, namely market access and national treatment, apply only in sectors where members undertake "specific commitments" listed in their national schedules. Members can select the sectors and modes of supply for which they are ready to undertake specific commitments, with various types of limitations for the purpose of meeting national policy objectives.

Members, therefore, are free to specify their commitments on the related services across different sectors in their schedules within the current structure of classification once they agree on the scope of services that support sustainable energy. For instance, members, in their schedules under 'engineering services,' could specify 'engineering services for power projects or industrial projects aimed at mitigating climate change through energy efficiency improvement'; 'building projects that aim at improving energy performance'; or 'transportation projects that are based on modal shifts from road transport to public transport only.'

Chapter 4

Services relevant to the diffusion of sustainable energy supply technologies

Sustainable energy cuts across almost all economic sectors, ranging from energy and transport to buildings and industry. As the previous chapter has shown, a variety of services across multiple sectors classified in W/120 appear to be related to such sustainable energy activities. For instance, telecommunication services are relevant to saving energy and improving energy efficiency in sectors, such as utilities, transport, and buildings, as smart information and communication technologies (ICT) applications are emerging as useful cornerstones for 'smart buildings,' 'smart grids,' 'smart transportation,' and 'smart industrial processes.' Research and development (R&D) services on natural sciences are related to a variety of sustainable energy technologies across almost all sectors, as technological innovation is an integral part of accelerating low-carbon development.

In an effort to narrow the scope of services in this study, this section discusses key sustainable energy technologies, along with the associated services that could be complementary to the diffusion of such technologies. For a further discussion of how a SETA can contribute to the diffusion of sustainable energy technologies, also see Brewer (2012), who emphasizes the link between technology diffusion and trade in services.

Making the energy supply sector more sustainable depends on the application of a wide range of available low- and zero-carbon technologies, including the widespread use of hydropower, bioenergy, and other renewables. Several different services can be linked to these sustainable energy options. For instance, pre-construction power plant services include 'technical testing and analysis services' for a feasibility study as well as services related to site selection.

Improving the efficiency of power plants through technologies, such as combined heat and power (CHP) would require both 'construction services for facilities' and 'engineering services for power projects' that optimize the environmental performance of energy facilities[24]. Engineering services for power projects would also be needed not only to build facilities that generate electrical power from various energy sources (e.g. nuclear energy, solar power, wind power, and geothermal power), but also to build so-called capture-ready new power plants (Gibbins et al., 2006)[25].

Most renewable energy power plants will likely require monitoring services once they are constructed, which will eventually reduce the operation and maintenance costs. The General Electric Company (GE), for instance, provides remote wind-turbine monitoring services to increase the reliability and capacity of wind farms (Steenblik and Geloso Grosso, 2010).

In order to promote the use of renewables, governments could require producers or distribution companies and retail suppliers to buy 'renewable energy credits or certificates (RECs),' which prove that a minimum share of the electricity generated or supplied to the retail consumer comes from renewable energy sources (Delimatsis and Mavromat, 2009). RECs are considered intangible financial assets, which could be traded in order to comply with the minimum obligatory quota related to renewables[26]. Trading in RECs, therefore, involves various intermediary financial services, such as brokerage, banking, and insurance services.

Smart grids could improve energy efficiency from both electricity generation and use by integrating both electricity and thermal storage technologies and reducing transmission and distribution losses (IEA, 2010). Successful application of smart grids, however, requires mod-

ifications in the design, operation, and deployment of electricity networks – a process that involves engineering services as well as services related to energy distribution.

The services involved in the technical testing and analysis of air are useful both for assessing the carbon-offset resulting from improved energy efficiency of power plants and for transporting CO2 for storage. In the latter case, this testing ensures that the possible rupture or leaking of pipelines will not lead to the accumulation of a dangerous level of CO2 in the air.

The importance and diversity of service transactions in the solar and wind power industry are suggested by the list of services below in Box 1, which are associated with solar and wind power projects. This list was developed by ICTSD based on consultations and surveys with solar and wind energy companies and industry associations. Negotiators may want to examine where these different services should be classified in W/120.

Table 6 shows the trade commitments key countries made under GATS on some of these specific services related to wind energy.

Providers of other services include both large energy and engineering companies that supply a wide range of vertically integrated products and services, solar and wind farm developers, and a large number of small firms that specialize in the provision of niche solar and wind energy services – such as small-scale solar photovoltaic (PV) installations of up to 3 kilowatt hours (kWh). Turbine manufacturers frequently participate in the wind power services market by providing services related to the after sale operation and maintenance of their turbines or by developing wind power facilities at which their turbines are installed. The German firm Siemens, for example, provides services, such as training, repair, and monitoring services in conjunction with the sale of its turbines, while the Japanese firm Mitsubishi supplies services, such as design, construction, and installation to its customers.

Box 1. Services involved in solar and wind power projects

- Assessment of solar and wind resources (i.e. potential for producing electricity);
- Site analysis;
- Project development;
- Real estate services;
- Project financing;
- Due diligences (technical, regulatory, financial, legal);
- Project licensing and legal services;
- Project engineering and design;
- Environmental impact analysis;
- Construction of solar and wind power facilities;
- Solar field quality and performance testing;
- Retail sale of solar panels, mirrors and wind turbines;
- Installation of equipment;
- Maintenance of equipment;
- Operation of solar and wind power facilities;
- Transmission, distribution and sale of electricity generated by solar and wind power.

Table 1 below shows how the different service categories related to the energy supply sector can be classified in UN CPC version 2. The services categories that appear the most frequently in the energy supply sector are 'other professional technical and business services [83]' and 'construction services [54]'. 'Telecommunication, broadcasting, and information supply services [84]' and 'Financial and related services [71]' also appear in the energy-supply sector.

Table 1: Key sectoral mitigation technologies, and corresponding services categories[27]

Sector	Key mitigation technologies and practices currently commercially available*	Corresponding Division in the CPC (ver.2)	Related services at UN CPC (ver.2) class and sub-class levels
Energy supply	Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power; earty appliations of carbon dioxid capture and storage (CCS) (e.g. storage of removed CO_2 from natural gas)	Construction services [54]	- General construction services of power plants [54262] - Site preparation services [543] - Installation services [546]
		Financial and related services [71]	- Financial services, expert investment banking, incurance services and pension services [711] - Services auxiliary to financial services other then to incurance and pencions [715] - Services auxiliary to incurance and pencions [716] - Services of holding financial assets [717]
		Other professional, technical and business services [83]	- Management consulting and management services; information technology services [831] - Engineering services for power projects [83324] - Surface surveying services [83421] - Composition and purity testing and analysis services [83441] - Other technical testing and analysis services; radiological inspection of welds [83449] - Other professional, technical and business services n.e.c. [839]]
		Telecommunications, broadcasting and information supply services [84]	- Privat network servies [8414] - Data transmission servies [8415] - Internet ommunication servies [842] - On-line content [843]
		Sewage and waste collection, treatment and disposal and oter environmental protection services [94]	- Hazardous waste treatment and disposal services [9432]

Chapter 5

Focusing on construction services and professional services as key to the diffusion of sustainable energy technologies

This chapter focuses on two services categories (CPC group level) that most frequently cut across multiple mitigation sectors: construction services and other professional services (also see Table 1 above). The major trading countries in these 'sustainable energy services' and their commitments on these services will be illustrated.

Because of the data limitations on trade in services at the sub-sectoral level, this paper uses data on major importers and exporters of services at the CPC group level and reviews their specific commitments on these services[28]. Some trade barriers to services at the group level are also discussed in the following section.

5.1 Other Professional, Technical, and Business Services

Engineering services is key among the category of 'other professional, technical, and business services' in effectivly electricity generation, transmission and distribution. Engineering services, which predominantly entail advisory, design, consulting, and project management functions, complement construction services. Many firms provide integrated packages of engineering and construction services together. As new channels of electronic supply continue to create new business opportunities and the international sourcing of engineering services becomes increasingly common, developing country exports of engineering services are on the rise (Cattaneo et al., 2010).

While developed countries have, historically, dominated the markets in many sustainable energy services, emerging markets are expected to provide 14-20 percent of the industry's estimated USD 1 trillion turnover in 2020 (Booz Allen Hamilton, 2006). While trade data on sustainable energy services at the national level is hard to come by, some existing data reveal that countries, such as Brazil, the Republic of Korea, the Russian Federation, and Singapore, are already large exporters of 'other professional, technical, and business services.' As an importer, Kazakhstan, in addition to the aforementioned emerging markets, appears to be a big player in this area (Table 2).

Table 2: Major exporters and importers of architectural, engineering, and other technical services (millions USD)

Exporters	Value	Importers	Value
European Union (27)	39.212	European Union (27)	25.169
Extra-European Union (27) exports	22.657	Extra-European Union (27) exports	10.331
India	7.360	India	2.746
United States	5.020	Canada	2.560
Canada	4.066	Brazil	1.708
Brazil	3.033	Russian Federation*	1.616
Norwey	2.144	Kazakhstan*	1.289
Russian Federation*	1.571	Singapore	977
Singapore	1.398	Norwey	579
Australia	955	Korea, Rep.	531
Korea, Rep.	253	Australia	370

Source: Cattaneo et al. (2010) derived from WTO (2007).

Most of the services included in this sector are provided in all four 'modes of supply' (please see Box 2 on the next page for an explanation of this term), although the predominant modes of supply are through 'commercial presence' (Mode 3) and 'movement of natural persons' (Mode 4) followed by 'cross-border trade' (Mode 1).

Box 2. Four Modes of services supply and examples of 'other professional, technical and business services'.

According to the GATS, service suppliers are either natural or legal persons. The modes of supply differ depending on the location of the service provider and the location of the service consumer. The GATS defines the four modes of supply in the trade in services as follows:

Cross-border supply (Mode 1):

Non-resident service suppliers deliver services cross-border into a client's territory. For example, a Norwegian engineer sends a design sketch of a 'capture-ready' power plant to a client in Brazil via the Internet.

Consumption abroad (Mode 2):

A service is supplied under mode 2 when consumers from one country make use of a service in another country. For example, nationals of country A have moved abroad to country B as tourists, students or patients to consume the respective service.

Commercial presence (Mode 3):

Foreign suppliers of services establish, operate, or expand their commercial presence in a client's territory, such as a branch, agency, or wholly owned subsidiary. For instance, a French architectural consulting firm opens an office in China to provide advisory services on building a smart energy efficient exhibition centre.

Movement of natural persons (Mode 4)

This involves the entry and temporary stay in a client's territory of foreign individuals to supply a service.

Source: Derived from Cattaneo, O. et al. (2010)

A review of the sectoral commitments made by nine key exporters and importers in this area (see Table 3) during the Uruguay Round shows that although all nine countries have scheduled commitments in this sector[29], only Australia has made full commitments across all sub-sectors. Seven of nine countries have excluded 'services incidental to energy distribution' from their commitments schedules[30]. Brazil, the EU, India, and Singapore have also excluded 'related scientific and technical consulting services' from their commitments schedules. Several countries have also not made any commitment on 'integrated engineering services' and 'technical testing and analysis services' (Table 3). Table 4 shows GATS commitments more specifically linked to the wind energy sector. It should again be noted that most of these schedules are out of date and should be placed in the context of 1993. Where the commitments are made in the revised offers under the Doha Round of services negotiation, these would not be bound.

Table 3: Sectoral commitments on other professional, technical, and business services [31]

Major Explorters/ importers	Architectural services	Engineering services	Integrated engineering services	Other business services;			
				c. Management consulting services	e. Technical testing and analysis services	j. Services incidental to energy distribution	m. Related scientific and technical consulting services
Australia (E/I)*	√	√	√	√	√	√	√
Brazil (E/I)	o	o	x	√	x	x	x
Canada (E/I)	o	o	o	o	√	x	o
EU ** (E/I)	o	o	o	o	o	x [o]	x
India (E/I)	x	o	x	x	o	x	x
Korea, Rep. (E/I)	o	√	√	√	o	x	√
Norwey (E/I)	√	√	√	√	√	x	√
Singapore (E/I)	√	o	x	√	x	x	x
United States (E/I)	o	o	o	√	x	√	√

Source: Derived from the WTO Services Data base on Members' Commitments Schedule and Initial Offers as well as Revised Offers (TN/S/O and TN/S/O rev.1)

Note: √ =Unrestricted commitment, x=No commitment, O=Limited commitment

[ ] = A new commitment included in the EU's 'revised offer' during the Doha Round.

** E/I=Major exporters as well as major importers*

*** Among the EC member states, Cyprus and Malta have not made any commitment on "other professional, technical and business services" group.*

Table 4: Snapshot of GATS commitments in services related to wind energy

	United States	European Union	China	India	Canada	Japan	Australia	Turkey	Brazil	Egypt
Certain related scientific and technical consulting services	◙	○	◙	○	◙	◙	●	○	○	○
Services incidental to energy distribution	●	○	○	○	○	○	●	○	○	○
Certain professional services, including engineering and integrated engineering services	●	◙	◙	◙	◙	●	●	●	◙	○
Distribution services, including commission agents, wholesale trade, and retail trade services that apply to fuels, related products, and brokerage of electricity	◙	◙	◙	○	◙	●	◙	○	◙	○
Maintenance and repair of equipment, except transport-related equipment	●	●	○	○	●	◙	○	○	○	○
Management consulting and related services	●	●	◙	○	◙	●	●	●	◙	○
Construction and related engineering services	◙	◙	◙	◙	◙	◙	◙	◙	◙	◙
Technical testing and analysis services	○	◙	◙	◙	●	○	○	○	○	○

● - *full commitments*

◙ - *partial commitments*

○ - *no commitments*

Most measures regarding the supply of services through the presence of natural persons (mode 4) are addressed in a member country's horizontal commitments. For the purposes of this table, a full commitment is any commitment that grants full market access or national treatment to foreign individuals or firms that provide renewable energy services through cross-border supply (mode 1), consumption aboard (mode 2), and commercial presence (mode 3).

Note: This table is intended as a snapshot of commitments in the listed categories and is in no way a comprehensive assessment of GATS commitment. In many cases, commitments apply to only part of the sector and specific limitations may be in place. For full details regarding commitments, see the GATS schedules of individual countries.

Source: Compiled by the U.S. International Trade Commission from individual countries' GATS Schedules of Specific Commitments.

Most of the major exporting and importing countries have scheduled commitments in all four modes, except for Brazil and India, which have both left Modes 1 and 2 largely unbound. Several EU member states have also left Mode 1 largely unbound across all sub-sectors; that number has recently increased, according to the revised offer the EU submitted to the WTO (Table 5). The importance of cross-border supply in this area is growing, however, as information communications and technology systems (ICT) (e.g. telecommunications and the internet) are increasingly being used for the transmission of architectural and engineering specifications, design plans for environmental projects, reports of specialist environmental consultants, environmental quality testing and analysis results, and computer modeling simulations. Among the key developed countries in this sector, Canada has made limited commitments on Mode 1 in almost all sub-sectors by requiring a commercial presence and residency for accreditation from certain service providers[32].

Table 5: Market access and national treatment limitations on Mode 1: other professional, technical, and business services

Major Explorters/ importers	Sub-sectors	Limitation
Market Access		
Canada	Architectural services	[Citizenship requirement for accreditation (architects)
	Engineering/ Integrated engineering services	Requirement of a commercial presence for accreditation (Engineers): [Requirement of a commercial presence for accreditation (consulting engineers)] Requirement of permanent residency for accreditation (engineers); ([Citizenship requirement for accreditation (engineers)])
	Other business services: c. Management consulting services	Permanent residency requirement for accreditation (Agrologists): [Citizenship requirement for accreditation (Professional administrators and certified management consultants or Professional corporation of administrators); Citizenship requirement for use of title (Industrial Relations Counselors)]
	Other business services: m. Related scientific and technical consulting services	Requirement of permanent residency and citizenship (Free miner); Requirement for a commercial presence, Permanent residency and citizenship for accreditation (Canadian corporation or a partnership of the foregoing Land surveyors); Citizenship requirement for accreditation (Subsurface surveying services, Professional technologist, Chemists)
EU	Architectural services	BE, [GR]CY, EL, IT, MT, PT, PL, SI: Unbound
	Engineering services	[GR]CY, EL, IT, MT, PT: Unbound
	Integrated engineering services	CY, EL, IT, MT, PT, PL[GR]: Unbound
	Other business services: e. Technical testing and analysis services	IT: Unbound for the profession of biologist and chemical analyst. CY, CZ, MT, PL, SK, SE: Unbound
	Other business services: j. Services incidental to energy distribution	All Member States except HU, LV, LT, SI; Unbound (HU, LV, LT, SI; Unbound)

Major Explorters/ importers	Sub-sectors	Limitation
Korea	Architectural services	Requirement of a commercial presence; Acquirement of Korean architectural license by passing an examination; Supply of services by foreign architects through joint contracts with architects licensed in Korea
National Treatment		
Canada	Architectural services	Residency requirement for accreditation (Architects; Landscape architects)
	Engineering services	Engineers: Residency requirement for accreditation (Engineers)
	Other business services: m. Related scientific and technical consulting services	Differential tax measures (Federal and sub-national treatment for expenditures of services performed in Canada related to the exploration and development of a mineral resource, petroleum or natural gas (Mineral and Petroleum Exploration and Development); Residency requirement for accreditation (Applied Science Technologist/ Technical); Residency requirement for accreditation (Cadastral surveying); Residency requirement for accreditation (Geoscientists, Land Surveyors; Requirement of training for accreditation (Land Surveyors))
EU	Architectural services	DE (Application of the national rules on fees and emoluments for all services which are performed from abroad); BE, [GR], CY, EL, IT, MT, PT, PL: Unbound
	Engineering services	AT, SI for planning services; [GR], CY, EL, IT, MT, PT: Unbound
	Integrated engineering services	AT, SI for planning services; CY, EL, IT, MT, PT, PL [GR]: Unbound
	Other business services: e. Technical testing and analysis services	IT: Unbound for the profession of biologist and chemical analyst. CY, CZ, MT, PL, SK, SE: Unbound
	Other business services: j. Services incidental to energy distribution	All Member States except HU, LV, LT, SI; Unbound

Source: Derived from the WTO Services Data base on Members' Commitments Schedule and Initial Offers as well as Revised Offers (TN/S/O and TN/S/O rev.1).EU member states: AT (Austria), BE (Belgium), CY (Cyprus), CZ (Czech Republic), DE (Denmark), EE (Estonia), EL (Greece), ES (Spain), FI (Finland), FR (France), HU (Hungary), IE (Ireland), IT (Italy), LT (Latvia), LT (Lithuania), LU (Luxembourg), MT (Malta), NL (Netherlands), PL (Poland), PT (Portugal), SE (Sweden), SI (Slovenia), SK (Slovak Republic), UK (United Kingdom).Note: Bold=Added in the revised offer submitted to the WTO (As of April 2011).

[Bold]=Removed from the revised offer submitted to the WTO (As of April 2011).

While majority of the countries surveyed made commitments primarly than Mode 3, these were often subject to conditions to market access. For instance, six of nine countries scheduled their commitments on 'engineering services' with market access limitations largely on Mode 3. The majority of market access limitations in 'architectural services' were also on Mode 3.Brazil and Canada restrict foreign architectural services suppliers from forming legal entities by specifying that the suppliers must 'join Brazilian service suppliers in a specific type of legal entity' and must 'take the form of a sole proprietorship or partnership.' India allows market access of foreign engineering services suppliers only through 'incorporation with a foreign equity ceiling of 51 percent.' Korea requires an 'economic needs test' for the establishment of a commercial presence. Specific limitations on Mode 3 that restrict market access are summarized in Table 6.

With regional to national treatment limitation, Canada has made a specific limitation, requiring non-resident firms to have both a 'higher percentage of practitioners in a partnership' in architectural services and 'residency and training for accreditation of certain service providers' in 'related scientific and technical consulting services' (e.g. Cadastral surveying, geoscientists, and land surveyors). Some EU member states – in particular, Estonia – in their revised offer have added their limitations on national treatment in most of the sub-sectors by requiring residency of 'at least one responsible person[33].' The majority of EU member states still have left 'services incidental to energy distribution' unbound, while only a few member states have left 'technical testing and analysis services' unbound (Table 6).

Table 6: Market access and national treatment limitations on Mode 3: other professional, technical, and business services

Major Explorters/ importers	Sub-sectors	Limitation
Market Access		
Brazil (E/I)	Architectural services	Foreign service suppliers must join Brazilian service suppliers in a specific type of legal entity (consorcio); the Brazilian partner shall maintain the leadership. The contract establishing the consorcio must clearly define its objective
	Engineering services	Same conditions as a Architectural services
Canada (E/I)	Architectural services	Commercial presence of architects must take the form of a sole proprietorship or partnership
	Other business services: m. Related scientific and technical consulting services	Permanent residency and citizenship requirement for a commercial presence for accreditation of subsurface surveying Services, Professional Technologist, Chemists
EU (E/I)	Architectural services	Restrictions on access of certain natural persons (ES: Access is restricted to natural persons. FR: Provision through SEL (anonym, à responsabilitė limitėe ou en commandite par actions) or SCP only. IT, PT: Access is restricted to natural persons. Professional associations. (no incorporation) among natural persons permitted. LV: Practice of 3 years in Latvia in the field of projecting and university degree required to receive the licence enabling to engage in business activity with full range of legal responsibility and rights to sign a project

Table 6: Market access and national treatment limitations on Mode 3: other professional, technical, and business services

Major Explorters/ importers	Sub-sectors	Limitation
EU (E/I)	Engineering services	ES: Access is restricted to natural persons. IT, PT: Access is restricted to natural persons. Professional association (no incorporation) among natural persons permitted.
	Integrated engineering services	ES: Access is restricted to natural persons. IT, PT: Access is restricted to natural persons. Professional association (no incorporation) among natural persons permitted.
	Other business services: e. Technical testing and analysis services	ES: Access for chemical analysis through natural persons only. IT: Access for the profession of biologist and chemical analyst through natural persons only. Professional association (no incorporation) among natural persons is permitted. PT: Access for the profession of biologist and chemical analyst through natural persons only. CY, CZ, MT, PL, SK, SE: Unbound
	Other business services: j. Services incidental to energy distribution	All Member States except HU, LV, LT, SI; Unbound (HU, LV, LT, SI; None)
	Other business services: m. Related scientific and technical consulting services	All Member States except ES, FR, IT, PT: None: ES: Access to profession of surveyors and geologists through natural persons only. FR: “Surveying”: Access through a SEL (anonyme, à responsabilité limitée ou en commandite par actions), SCP, SA and SARL only. IT: For certain exploration services activities related to mining (minerals, oil, gas, etc.), exclusive rights may exist. IT: Access to profession of surveyors and geologists through natural persons only. Professional association (no incorporation) among natural persons permitted. PT: Access restricted to natural persons.
India (E/ I)	Engineering services	Only through incorporation with a foreign equity ceiling of 51 per cent
	Other business services: e. Technical testing and analysis services	Only through incorporation with a foreign equity ceiling of 51 per cent
Korea, Rep. (E/ I)	Other business services: e. (Composition and purity testing and analysis services)	Requirement of economic needs test for the establishment of a commercial presence Main criteria: the number of and impact of existing domestic suppliers, protection of public health, safety and environment*
Singapore (E/ I)	Engineering services	Limited Corporations – Only registered Professional Engineers or allied professionals (registered Architects or Land Surveyors) shall be director of the corporations
United States (E/ I)	Architectural services	Two-thirds of the officers, partners, and/or directors of an architectural firm in Michigan must be licenced in Michigan as architects, professional engineers and/or land surveyors

Table 6: Market access and national treatment limitations on Mode 3: other professional, technical, and business services

Major Explorters/ importers	Sub-sectors	Limitation
National Treatment		
Canada	Architectural services	Non-resident firms are required to maintain a higher percentage of practitioners in a partnership
	Other business services: m. Related scientific and technical consulting services	Residency and training requirement for accreditation of cadastral surveying, geoscientists, land surveyors
EU	Architectural services	EE: None except that at least one responsible person (project manager or consultant) must be resident of Estonia
	Engineering services	EE: None except that at least one responsible person (project manager or consultant) must be resident of Estonia
	Integrated engineering services	EE: None except that at least one responsible person (project manager or consultant) must be resident of Estonia
	Other business services: e. Technical testing and analysis services	All Member States except CY, CZ, MT, PL, SK, SE: None (CY, CZ, MT, PL, SK, SE: Unbound)
	Other business services: j. Services incidental to energy distribution	All Member States except HU, LV, LT, SI: Unbound (HU, LV, LT, SI: None)
	Other business services: m. Related scientific and technical consulting services	All Member States except EE, FR: None: EE: None except that at least one responsible person (project manager or consultant) must be resident of Estonia. FR: "Exploration and prospection services" subject to authorization

Source: Derived from the WTO Services Data base on Members' Commitments Schedule and Initial Offers as well as Revised Offers (TN/S/O and TN/S/O rev.1).

Note: Bold=Addition from the revised initial offer submitted to the WTO (As of April 2011).

E/I=Major exporter as well as importer.

Most of the major trading countries have left Mode 4 unbound, and have indicated horizontally applicable limitations predominantly concerning 'restrictions on entry and temporary stay of various services providers,' including 'intra-corporate transferees,' 'contractual service suppliers,' 'business visitors,' 'services salespersons,' and 'independent professionals.' Other limitations, although fewer than those previously mentioned, include 'limited recognition of diplomas in third countries required to practice regulated professional services'; 'restrictions on foreign nationals' or foreign companies' acquisition of land and real-estate'; 'restrictions of foreign service providers on public monopolies'; and 'limited eligibility of foreign nationals for subsidies, including tax benefits[34].'

A few countries have put specific limitations on Mode 4. Canada, for instance, restricts market access by requiring 'permanent residency and citizenship for accreditation of certain types of services suppliers[35].' Several EU member states have also put specific limitations on market access concerning 'academic and professional qualification requirements and membership requirements of the relevant professional body in the home country for certain service providers[36].'

Canada has also placed limitations on national treatment, requiring residency for accreditation of landscape architects and other relevant service providers 'related to scientific and technical consulting services.' A few EU member states have limitations on national treatment as well, such as a 'residency requirement' for certain service providers in architectural and other business services. In the case of engineering and integrated engineering services, almost all member states require 'residency' for certain types of service providers.

In the case of engineering services, trade barriers are not limited to the issues of market access and national treatment (Cattaneo et al., 2010). Trade opportunities for engineering firms hinge largely on a variety of laws, regulations, and administrative rules at home and abroad that can have a substantial impact on firms' financial options and operation. For instance, national or sub-federal rules that limit engineering firms' legal entity or joint venture structure, e.g. arbitrary equity limitations, can create trade barriers for engineering firms by reducing their financing options. Their trade performance in the global market also depends on the quality of services, including professional, process, and product standards.

The engineering industry with a 3-4 percent profit margin typically requires a high demand for competitive financing typically through credit extension (Tulacz, 2008). Limited access to finance in many developing countries, however, often puts engineering firms at a competitive disadvantage. In addition, double taxation, excessive capital controls, and limits on foreign equity put financial limitations on engineering firms. Limited credit extension based on their physical assets rather than a series of variables, such as forward contracts, intellectual property, and probable returns on investment also imposes financial limitations on engineering firms. Tunisia, for instance, limits credit to 5 percent of the engineering firm's output, while 10 percent of the output is allowed for credit in other sectors, such as tourism and manufacturing (World Bank, 2007b).

Rules concerning public procurement also affect trade in engineering services. For instance, distorted administrative practices, such as a lack of publicly available information about project requirements and the bidding process, hamper the integrity and transparency of the procurement process, thereby negatively affecting engineering firms' performance. The GPA prohibits the use of measures discriminating against foreign providers and addresses various aspects of procurement procedures, including 'criteria for the qualification of suppliers and technical specifications of products and services; tendering procedures; and the provisions for transparency[37].'

Rules governing the nationality and residency requirements for service providers, as well as their qualification and recognition procedures, can also influence trade in services in this area. While professional qualification requirements are fundamental drivers in the service industry, arduous qualification requirements and licensing procedures can hamper the delivery of services (Cattaneo et al., 2010). Excessively restrictive visa fees or unpredictable and time-consuming work permit procedures can also create trade barriers to services in this area.

5.2 Construction Services

Construction services are involved with implementing various mitigation options across multiple sectors, including energy supply, transport, buildings, industry, and waste. The construction services sector is one of the major service sectors in most economies in terms of employment and value added. In 2005, global spending on construction exceeded USD 4 trillion, representing 9-10 percent of world gross domestic product (GDP) (Tulacz, 2005). The most important driver for the development of services in this sector, particularly in the developed world, is increased spending on infrastructure and non-residential development (Butkeviciene, 2005).

Transportation (25.6 percent), building (23.8 percent), and petroleum extraction (25.8 percent) making up three-fourths of the global construction market as of 2008 (ENR, 2008). The public sector is clearly the largest client segment for the construction sector. In many developing countries, almost 50 percent of construction expenditures are through government procurement (Mburu, 2008)[38].

While many developing countries largely remain importers of construction services, several emerging economies as well as economies in transition are quickly becoming successful exporters of these services. The EU, Japan, and the US appear to be major exporters in this sector, followed by countries such as China, India, Malaysia and Egypt. (Table 7).

Table 7: Major exporters and importers of construction services (million USD)

Exporters	Value	Importers	Value
European Union (25)	26.142	European Union (25)	18.743
Extra-European Union (25) exports	14.171	Extra-European Union (25) exports	7.957
Japan	7.224	Japan	4.765
United States	4.139	Russian Federation*	4.034
China	2.593	Kazakhstan*	1.941
Russian Federation*	2.209	China	1.619
Turkey	882	Azerbaijan*	1.499
India (estimated)	828	Angola	1.323
Malaysia	811	Malaysia	1.087
Singapore	566	United States	1.039
Egypt, Arab Rep.	503	India (estimated)	774

Source: Engman (2010) derived from WTO (2008).

The construction sector is characterized by a limited number of large international companies and a big number of local small- and medium-sized companies. In 2007, USD 310 billion of the USD 827 billion revenues generated by the top 225 international contractors represented exports (ENR, 2008). Fifty-one of the 225 companies were Chinese, and 23 were Turkish. Other countries, such as Brazil, China, Egypt, India, Israel, Kuwait, Lebanon, the former Yugoslav Republic of Macedonia, Mexico, Pakistan, the Russian Federation, Saudi Arabia, Serbia, Taiwan, and the United Arab Emirates have at least one and in some cases, three companies on the top 225 list (Engman, 2010).

Table 8 summarizes the sectoral commitments made by the major exporting and importing countries of construction services during the Uruguay Round[39]. A review of these sectoral commitments reveals that, excluding two non-WTO members (Azerbaijan and Kazakhstan), all nine countries in Table 8 have scheduled commitments in this sector[40], but none of them has made full commitments. India has excluded several sub-sectors from its commitments, and Egypt and Turkey have also made no commitments in one of the sub-sectors. Countries that have made commitments in this sector have, however placed limitations across all sub-sectors.

Table 8: Sectoral commitments on construction services

Major Explorters/ importers	General construction work for buildings	General construction work for engineering	Installation and assembly work	Oter: site investigation work
China (E/I)	o	o	o	o
EU ** (E/I)	o	o	o	o
Egypt, Arab Rep. (E)	x	o	o	o
India (E/I)	x	o	x	x
Japan (E/I)	o	o	o	o
Malaysia (E/I)	o	o	o	o
Singapore (E)	o	o	o	o
Turkey (E)	o	o	o	x
United States (E/I)	o	o	o	o

Source: Derived from the WTO Services Data base on Members' Commitments Schedule and Initial Offers as well as Revised Offers (TN/S/O and TN/S/O rev.1).

Note: X=No commitment, O=Limited commitment

E/I=Major exporter as well as importer

** Among the new EU member states, Cyprus, Hungary, and Malta have not submitted their commitments schedules on the construction services sector. Finland has made a partial commitment on this sector.*

Construction projects require local production, because they are highly intensive in both labour and materials. Such local characteristics of the construction business imply that 'commercial presence' (Mode 3) is the preferred mode of supply, which is complemented by 'temporary movement of natural persons' (Mode 4).

In general, restrictions on commercial presence are the most common barriers to trade in the construction service sector (Table 9). Limitations on market access take the form of limitations on foreign investment (e.g. ownership rules); the type of legal entity for a foreign company (e.g. mandatory local incorporation); the number of suppliers; and the value of transactions or assets. While Egypt, India, and Malaysia restrict the formation of legal entity and foreign capital equity, China restricts the types of construction projects that foreign-owned enterprises can carry out. The EU excludes rights for construction, maintenance, and management of highways and airports in certain member states. Restrictions on national treatment in Mode 3 include registration and authorization requirements; performance and technology transfer requirements; licensing, standards, and qualification; and nationality and residency requirements (WTO, 1998). China has also made a specific limitation in national treatment, lowering registered capital requirements for joint venture construction enterprises.

Limitations on the temporary movement of natural persons, which are often included in labour market regulations, can impede trade in construction services, given construction's intensive use of labour. These restrictions take different forms, ranging from 'bans and quotas' to 'economic needs tests' and 'residency requirements.' Such restrictions can result in, increasied operating costs, project delays and unpredictability of project execution project execution unpredictable. The significance of Mode 4 in the construction sector, however, depends largely on the entry strategy used, as the entry strategy of construction firms varies depending on the duration of projects (Gelosso Grosso et al., 2008). The pattern that has been evolving over the past two decades. seems to be one of market establishments aimed at a more permanent presence. Empirical evidence shows, however, that contractors facing high entry restrictions in the host market tend to resort to short-term rather than permanent entry (Chen, 2008). The major importing and exporting countries in this sector have also chosen to keep

Mode 4 unbound and rely on their horizontal commitments to provide access[41].

Differential treatment of subsidies, along with other incentive schemes that are often provided for export promotions, can also have a discriminatory effect on trade in construction services. Restrictions on the movement of capital equipment and building materials can negatively affect trade in construction services, as they may give rise to unnecessary costs for imports of construction machinery (Geloso Grosso et al., 2008).

A review of specific commitments and limitations by the major exporting and importing countries in this area reveals that, with the exception of Singapore and Turkey, all countries have left Mode 1 unbound. While Singapore has made full commitments in Mode 1, Turkey has placed extensive limitations on Mode 1 in both market access and national treatment[42].

Table 9: Market access and national treatment limitations on Mode 3: construction services

Major exporters/ Importers	Limitation
Market Access	
China	Restrictions on the types of construction projects by foreign-owned enterprises (1. Construction projects wholly financed by foreign investment and/ or grants. 2. Construction projects financed by loans of international financial institutions and awarded through international tendering according to the terms of loans. 3. Chinese-foreign jointly constructed projects with foreign investment equal to or more than 50 per cent; and Chinese-foreign jointly constructed projects with investment less than 50 per cent but technically difficult to be implemented by Chinese construction enterprises alone. 4. Chinese invested construction projects which are difficult to be implemented by Chinese construction enterprises alone can be jointly undertaken by Chinese and foreign construction enterprises with the approval of provincial government)
EU	Exclusive rights granted for construction, maintenance and management of highways and the airport in a few member states; Nationality condition for managers of the board of directors of construction companies supplying in the public sector.
Egypt, Arab Rep.	Restrictions on the formation of legal entity (only through joint venture); Restrictions of foreign capital equity (ceiling of 49 per cent of the total capital requirement for the project)
India	Restrictions on the formation of legal entity (Only through incorporation); Restrictions on foreign equity (ceiling of 51 per cent)

Table 9: Market access and national treatment limitations on Mode 3: construction services

Major exporters/ Importers	Limitation
Malaysia	Restrictions on the formation of legal entity (only through a representative office, regional office, or locally incorporated joint- venture corporation with Malaysian individuals or Malaysian-controlled corporations or both): Restrictions on foreign shareholding in the joint-venture (ceiling of 30 per cent)
Turkey	Approval requirement of establishing ordinary partnership under Civil Code (which is not legal entity) excluding the ordinary partnership formed for international tenders in Turkey by non-residents by the Ministry to which the Undersecretatiat of Treasury [and Foreign Trade (UTFT)] is attached.
National Treatment	
China	Differential treatment of registered capital requirements for joint venture construction enterprises: Joint venture construction enterprises have the obligation to undertake foreign-invested construction projects**

Source: Derived from the WTO Services Data base on Members' Commitments Schedule and Initial Offers as well as Revised Offers (TN/S/O and TN/S/O rev.1).

** Restrictions on the formation of legal entity existed until 2004, which needs to be verified (e.g. Only in the form of joint ventures, with foreign majority ownership). Within three years after China's accession to the WTO, wholly foreign-owned enterprises will be permitted should be 'had been permitted).*

*** This obligation doesn't apply once within three years after China's accession to the WTO.*

In terms of national treatment limitations, foreign nationals frequently have limited eligibility for subsidies, including tax benefits; limited recognition of services providers' qualifications from third countries; and restrictions on foreign nationals' acquisition of land and real estate. Restrictions on land and real estate use or ownership, along with other restrictions, can have a big impact on the provision of construction services, as these restrictions prevent property developers from acquiring real estate under construction until the completion of the project (Geloso Grosso, 2008).

Many types of domestic regulatory measures can affect trade in construction services if these measures are discriminatory or unnecessarily burdensome. For instance, building regulations and associated technical requirements, as well as regular inspection requirements for safety, are related to the provision of construction services. Rules on the temporary admission of construction equipment can also hinder the market entry of foreign companies (Geloso Grosso et al., 2008).

Regulations concerning the administration of construction permits can also affect trade in construction services. According to Engman (2010), administrative performance of construction permits tends to vary across countries in terms of the constructions' duration, procedure, and cost (Box 3). Opaque, expensive, and overly bureaucratic administrative processes of construction permits increase transaction costs and business risks, resulting in lower investment in new infrastructure and buildings.

Box 3. Discrepancy in administrative performance of construction permits in terms of its duration, procedure, and cost

China and the Russian Federation appear to have relatively expensive and bureaucratic processes. To get a construction permit in the RussianFederation takes, on average, 23 months to go through 54 procedures - the worst record among all the exporting markets- and costs 2,600 percent of Russian income per capita. In China, constructors must wait 11 months to go through 37 procedures at a cost of 700 percent of income per capita. The Indian administration is more rapid (224 days), but more expensive.

Source: Derived from Engman (2010)

Government procurement practices are also crucial to trade in construction services, given that the sector's largest client segment is the public sector. In Germany and the UK, for instance, government procurement accounts for about 35 percent of the share of construction activity; it accounts for almost 50 percent in the US (Kim, 2011).

Preferential treatment for local companies or minimum requirements for financial support that are favourable to local companies often hinder market entry for foreign providers, creating trade barriers. Excessively strict standards applied to government procurement also tend to exclude many of the small- and medium-sized enterprises from developing countries (Tulacz, G.J., 2000). Some foreign companies have experienced difficulty in entering the US market, as they are required to register and be licensed in each individual state, often with strict liability implications on equipment failure (Teljeur and Stern, 2002).

5.3 Commitments on Sustainable Energy Services in Preferential Trade Agreements

The fact that services liberalization at the multilateral level has been slow does not mean that there has been a similar standstill in other configurations (bilateral and regional trade agreements). In fact, countries generally take on more services commitments in regional trade agreements than at the multilateral level. This is commonly known as the `commitments gap.' Based on economic modelling, Van der Marel and Miroudot (2012) found that both economic and non-economic factors play a role, and they determined the magnitude of the commitments gap. Factors that affect the negotiations and the level of GATS-plus commitments are geography, market size, and the role of mid-skilled labour endowments.

Asymmetries between countries and the quality of governance are two strong political economy factors for the commitments gap. While these conclusions hold on average for all services sectors, construction and financial services (both crucial for sustainable energy) are characterized by different patterns of explanations compared with other services sectors.

The commitments gap is higher for North-North agreements, countries that are engaged in intra-industry trade and have a high GDP. Van der Marel and Miroudot think that a plurilateral negotiation, such as the current one on a TISA is more likely to succeed than the Doha round at the WTO[43]. One way to overcome opposition to further North-South commitments could be the identification of specific concerns and changing the views of governments and negotiators before realistically considering a deepening of multilateral services commitments.

There are some notable examples of liberalization and cooperation on sustainable energy services in specific PTAs. A few free-trade agreements (FTAs) address environmental and climate change-related services specifically:

- Article 275, para. 5 (a) of the EU-Colombia/Peru FTA recognizes the effects of climate change and gets the parties to consider actions to mitigate climate change by "facilitating the removal of trade and investment barriers to access to innovation,

development, and deployment of goods, services, and technologies that can contribute to mitigation or adaptation, taking into account the circumstances of developing countries."

- Article 34 (Cooperation on the environment and natural resources) of the EU-Mexico FTA notes the need to preserve the environment. Paragraph 2 of the article talks about cooperation between the parties in order to achieve this objective, including the promotion of training in human resources, launching joint research projects, and education.

- Article 13.6 of the EU-South Korea FTA reconfirms that the parties recognize sustainable development in all of its dimensions. Paragraph 2 of the article states in part, "The Parties shall strive to facilitate and promote trade and foreign direct investment in environmental goods and services, including environmental technologies, sustainable renewable energy, energy efficient products and services, and eco-labelled goods, including through addressing related non-tariff barriers."

- Article 8 of the India-Japan Agreement states that "Each Party shall endeavour to (…) encourage trade and dissemination of environmentally sound goods and services."

- In Article 9 of the Japan-Switzerland Agreement, the Parties agreed to "encourage trade and dissemination of environmental products and environment-related services in order to facilitate access to technologies and products that support environmental protection and development goals, such as improved sanitation, pollution prevention, sustainable promotion of renewable energy and climate-change-related goals."

With regard to services sectors, which are strongly linked with sustainable energy services (e.g. construction, financial, and 'other' services), more commitments have intensive been made in PTAs. In the Australia-ASEAN-New Zealand FTA for example, the financial services schedule shows more commitments under the 'Banking and Other financial services' sub-sector than those present in Australia's GATS schedule – especially with regard to market access. All of the differences affect Mode 3 (commercial presence) and some affect Mode 1 (cross-border supply). Other relevant FTAs that have progressed on these services are EU-CARIFORUM, EU-South Korea, India – Japan, and US-South Korea. These commitments are key since or previously mention access to financing is often a critical factor in facilitate investments in and establishment of energy projects.

Chapter 6

Sustainable Energy Services in the Wider Context of Sustainable Development

6.1 Introduction

Energy is central to achieving the interrelated economic, social, and environmental aims of sustainable development, and energy services play a crucial role in providing efficient access to energy in support of this endeavour. This chapter considers how sustainable energy can lead to win-win outcomes for both socioeconomic development and the environment. It also explores the importance of sustainable energy for job creation.

Developing countries are faced with the challenges of, on one hand, achieving more reliable, affordable[44], clean, and efficient access to energy, while, on the other hand, obtaining a greater share of the energy "business." The pursuit of these goals requires access to financial knowledge, expertise, technology, and managerial know-how that will allow developing countries to continuously improve their energy sector and benefit from their renewable energy resources.

Developing country energy producers are major importers of the traditional energy services, such as services related to oil and gas exploration, wells and pipelines building, and drilling services. However, developing countries have made few commitments in the energy sector in their GATS schedules, which despite the alleged lack of dinite certainty it engenders, nonetheless allow them to the flexibility to liberalize where this is deemed most consistent with domestic energy policy objectives and to seek important reciprocal concessions.

Only a limited number of developing countries have experience with structural reform in the energy sector; consequently, they have not developed the emerging energy services that usually emanate from the development of market-based, integrated energy systems and the introduction of competition. The design of effective domestic energy policies would be better promoted by understanding the experiences of those countries that have implemented reforms in their energy sectors and permitted the emergence of competitive energy markets. Additional emerging services include those related to GHG emissions reductions and trading of emission rights (see text box 4 below).

Box 4. Emerging energy services and emissions trading: opportunities for developing countries

The Kyoto Protocol allows countries to meet part of their commitments for emission reductions through reductions abroad using International emissions trading (IET), joint implementation, and the Clean Development Mechanism (CDM). The latter is the only vehicle for trading emission rights (called certified emission reductions) with developing countries (global trading). In fact, CDM projects are increasingly hosted in least developed countries (LDCs). In the EU ETS for instance, credits from CDM projects registered after 2012 can be used only if they originate from a defined list of LDCs, which does not include large emerging economies, such as China and India. The exclusion of such countries is intended to motivate them to reduce emissions in ways other than the generation of carbon credits (CERs) and thus step up their regulatory approaches to mitigating the effects of climate change.

Emissions trading may allow a lucrative service sector to develop in relation to the trading of emissions rights. The complexities involved in conducting, monitoring, verifying, and enforcing emissions trading schemes and in designing and implementing carbon credit projects allow considerable margin for the market development of various services activities. Emissions trading as a whole is expected to became one of the largest commodity markets in the world. The potential CDM market size is estimated to be in the range of USD 5 to 10 billion per annum financial flows to developing countries.

Services under the CDM facility would mainly consist of project-specific activities related to the design and implementation of projects (e.g. environmental and social impact assessments, packaging financing, development of carbon baselines, and seeking host government approval and permits); services related to the crediting mechanism (e.g. registration of the project for crediting by a CDM Executive Board, baselining and monitoring of net emissions, verification of emissions reduction by CDM operational entities, and sharing of credits and other project proceeds among investors); services activities aimed at ensuring that the projects favour sustainable development in the recipient country (e.g. search for government certification that projects promote sustainable development, indicators of technology transfer, and environmental and social impact assessments); and services that serve the emerging secondary market (e.g. trading, exchanges,and brokerage).

Most services involved are in fact complex activities with substantial expertise requirements that at present fall beyond the capacity of many developing countries. The risk of developing countries being passive recipients of financial flows rather than proactive architects in the design of the emissions market has some important implications in relation to the achievement of CDM objectives, namely providing cost-effective compliance options for developed countries and helping developing countries to achieve sustainable development. The equitable achievement of these dual objectives, however, is likely to depend heavily on how individual transactions are actually shaped. The services component becomes crucial for this purpose.

Sources: (Chatham House, 2012) (UNCTAD; UNDP; UNIDO, 2007) (Vrolijk, 2009)

6.2 Securing 'Win-Win' Outcomes

WTO liberalization in the area of environmental services in general has been widely advocated for more than a decade as a means of enhancing developing countries' access to private capital, technology, and management expertise and improving market access for exports of environmental services (Hoekman, Mattoo and English (eds), 2002). Many have argued that, by improving access to environmental know-how and technology, liberalization will lead to greater environmental protection, thereby providing a 'win-win' outcome for the economy and the environment (Andrew, 2000; OECD, 2000). Proposals for the liberalization of environmental services under the GATS framework have stimulated considerable public debate (Bisset et al 2003; WWF-CIEL, 2003; Tuerk, Ostrovsky and Speed, 2005).

The argument that trade liberalization in environmental services (and goods) will result in a 'win-win' outcome is open to a number of different interpretations, and the conclusions to be drawn from theoretical and empirical studies can vary according to how we define 'win-win.' In this paper it is assumed that 'win-win' outcomes occur where trade liberalization and/or changes in trade rules have positive economic, environmental, and social impacts. A combination of classical trade and welfare theory can be used to deduce, under idealized market conditions, that trade liberalization will lead to increased economic welfare and 'optimal' environmental quality. However, in imperfect market conditions, 'win-win' outcomes are not guaranteed. In real world situations, both losers and gainers should be expected. 'Win-win' outcomes may be potentially realizable, but whether this is achieved in practice may depend on the nature and extent of the flanking and other supporting measures that are taken.

Such flanking measures could come in the form of international support to build domestic regulatory capacity in developing countries. There are several reasons such support would be particularly effective for regulatory capacity related to the infrastructure sector. First, many developing countries around the world lack even the most basic infrastructure. Infrastructure is important, not just for the provision of basic services or for the economy, but it also allows the poorest communities in the world to gain access to modern forms of energy and greater possibilities for livelihood. Second, the infrastructure sector is heavily dependent on government actions and policies. And, third, opening up the infrastructural sustainable energy services sector in developing countries without appropriate domestic regulatory ministry in place could result in offers significant potential benefits in terms of investment, technology, and management expertise.

To realize these potential benefits requires an effective regulatory framework, which can control anti-competitive behaviour, safeguard the public interest, and contribute to social objectives in terms of poverty alleviation and equity. Where these regulatory frameworks are absent or ineffective, the gains will be less, the outcome for sustainable development more uncertain, and public opposition more intense. The GATS acknowledges the right of WTO members to enact regulations, and members have discretion to impose limitations on national treatment and market access. This means that sustained international support to build domestic regulatory capacity in developing countries is critical. While such support is needed to make progress in reaching agreement on international rules for the liberalization of trade in sustainable energy services in general, it is particularly important for such services related to infrastructure.

6.3 Sustainable Energy Services and Green Jobs

Employment is key to the social pillar of sustainable development. According to the International Labour Organization (ILO), the transformation to a greener economy could generate 15 to 60 million additional jobs globally over the next two decades and lift tens of millions of workers out of poverty[45].

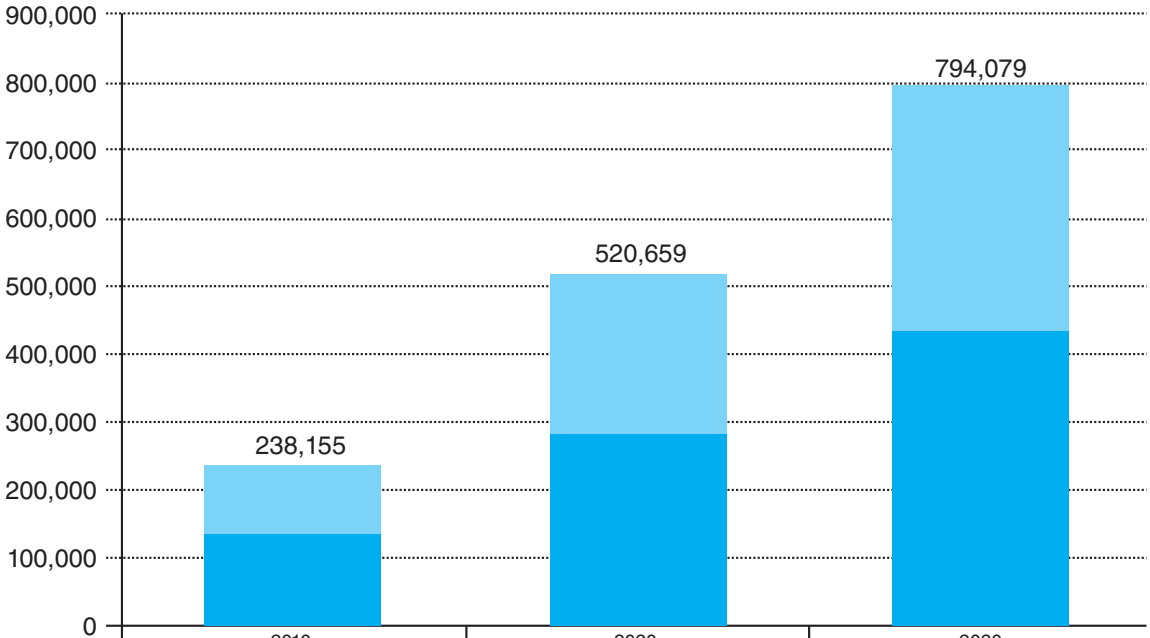
At least half of the global workforce – the equivalent of 1.5 billion people – will be

affected by the transition to a greener economy. While changes from the transition to more sustainable forms of energy will be felt throughout the economy, the energy sector is expected to play a central role.

Tens of millions of jobs have already been created by this transformation to a greener economy. The renewable energy sector in 2012, for example, employs close to 5 million workers, more than doubling the number of jobs from 2006-2010. Conversely, only 8 to 10 percent of the workforce in industrialized nations is employed in the industries that generate 70 to 80 percent of the world's CO_2 emissions[46]. Energy efficiency is another important source of green jobs, particularly in the construction industry, the sector hardest hit by the economic crisis. Figure 2 shows expected increase in employment in the EU's wind sector alone.

Net gains in 'green' employment between 0.5 to 2 percent of total employment are possible. In emerging economies and developing countries, the gains are likely to be higher than in industrialized countries, as the former can in some cases leapfrog to green technology in the course of replacing obsolete, resource-intensive infrastructure.

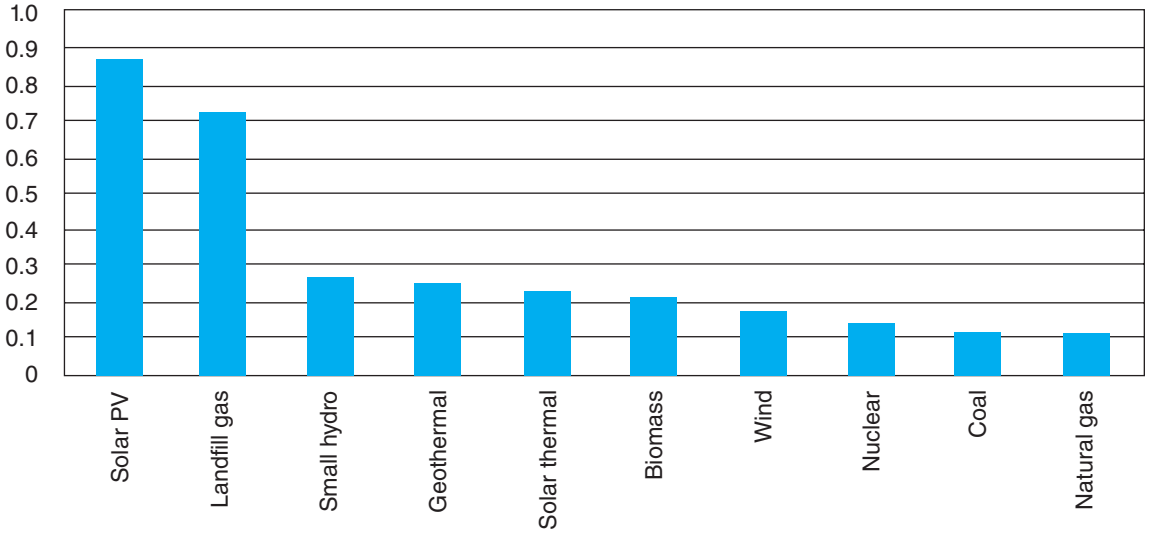
Figure 2: Contribution of the wind energy sector in the EU to direct and indirect employment forecast 2020 and 2030



	2010	2020	2030
Direct	135,863	289,255	441,155
Indirect	102,292	231,404	352,924
Total	238,155	520,659	794,079

Wei, Patadia, and Kammen (2010) show that all renewable energy technologies have higher labour intensity than fossil energy technologies (jobs per MWh), also see Figure 3 below, which shows that renewable energy generates more jobs than fossil fuels do. Projected investments of USD 630 billion by 2030 would translate into at least 20 million additional jobs in the renewable energy sector (ILO, 2008)[47].

Figure 3: Comparison of job-years across technologies (job-years/GWh)

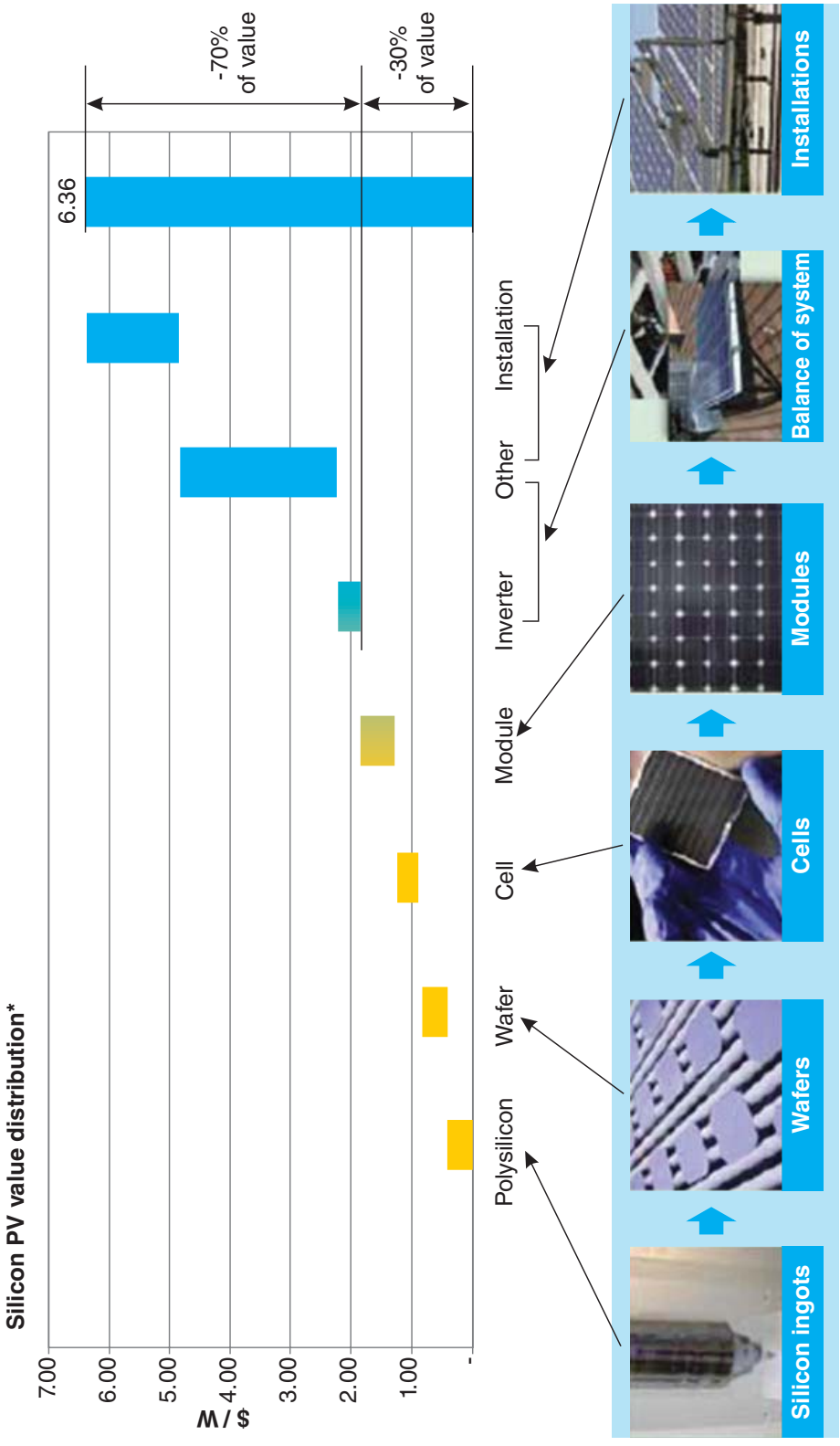


Source: Wei et al., 2010

The quality of the jobs in the renewable energy sector is another aspect of social and economic sustainability. Many essential jobs in the renewable energy industry require a skilled workforce. Industry surveys in Germany have suggested that, on average, renewable energy jobs are relatively high-skilled across both fuel-free and fuel-based technologies: 82 percent of employees in the industry have vocational qualifications, and almost 40 percent of these have a university degree, compared with an average for the whole industrial sector of 70 percent and 10 percent, respectively (IRENA, 2011)[48]. Evidence suggests that jobs in the renewable energy industry are equivalent to or better quality than those in the fossil-fuel industry (ILO, 2012)[49].

Finally, specialist service providers typically have access to the latest know-how and technology for protecting the environment. This access is good not only for job creation in communities in the vicinity of the service providers' operations, but also provides a conduit to importing developing countries for knowledge about sustainable energy. The most important method of knowledge transfer is often through trade and investment, and this effect is strengthened when the service provider employs local people.

Figure 4: The division of jobs and value along the supply chain of silicon PV



*Based on unsubsidized value chain analysis of U.S. silicon PV market. Roughly similar value distribution for thin film technologies.

Source: GTM Research prepared for Solar Energy Industries Association (USA), "U.S. Solar Energy Trade Association 2011: Trade Flaws and Domestic Content for Solar Energy-Related Goods and Services in the United States." August 2011; European Photovoltaic Industry Association and Greenpeace, "Solar Generation: Solar Electricity for Over One Billion People and Two Million Jobs by 2020" Sept 2006; EPIA Greenpeace. "Solar Generation 6: Solar Photovoltaic Electricity Empowering the World." 2011; Rutovitr, J. and Atharion, A., Institute for Sustainable Future, University of Technology Sydney. "Energy Sector Jobs to 2030: A Global Analysis" 2009; The Solar Foundation. "National Solar Jobs Census 2011." 2011.

Source: CEEW/NRDC

Box 5. How are jobs in the photovoltaic sector distributed throughout the supply chain?

While government policy in many countries is focusing on job creation in the manufacturing part of the value chain for sustainable energy (e.g. on the production of solar panels and wind turbines), in reality most jobs, by far, are created in other parts of the value chain (e.g. in the installation and maintenance of solar panels).

For every solar panel installed in Europe – even if produced in China – no less than 70 percent of the value-creation remains local. The EU solar industry provides employment to about 300,000 personnel, of whom 80 percent or more are employed in upstream (e.g. equipment manufacturers and raw material suppliers) and downstream (e.g. importers, distributors, engineers, system integrators, and installers). In fact, only 18 percent of jobs related to solar PV derive from manufacturing, as compared to 62 percent from installation.

This means that the majority of jobs in the solar industry are generated in the country where the solar power plant is sold, installed, and serviced. As the European side is delivering a large proportion of the supply chain before and after the manufacture of cells, a high number of jobs in the EU are depending on Chinese manufacturers.

Source of figures: Alliance for Affordable Solar Energy

Chapter 7

The Way Forward for Services in a SETA

7.1 Background

The importance of sustainable energy services to human well-being is stressed by the focus of these services in the UN's Sustainable Energy for All Initiative. Liberalization of sustainable energy services can contribute to the advancement of international development goals. To do so effectively requires policy coherence across a spectrum of trade liberalization areas within the WTO negotiations framework and between the various international bodies with policy responsibilities in this area. Trade reform in the area of sustainable energy services must be designed in a way that is consistent with, and contributes to, the wider goals of poverty reduction and sustainable development.

The realization of the potential benefits for sustainable development from sustainable energy services liberalization requires countries to give careful consideration to the potential economic, social, and environmental impacts of liberalization. This will allow for the identification of sectors and modes of supply where liberalization is conducive to the fulfilment of national development goals. Effective mitigation measures, which may include a regulatory institutional framework that can safeguard the public interest, are an important precondition for ensuring an outcome that contributes to sustainable development. As current institutional frameworks seem unable to foster the massive scale up of sustainable energy, thinking on innovative policy approaches is necessary.

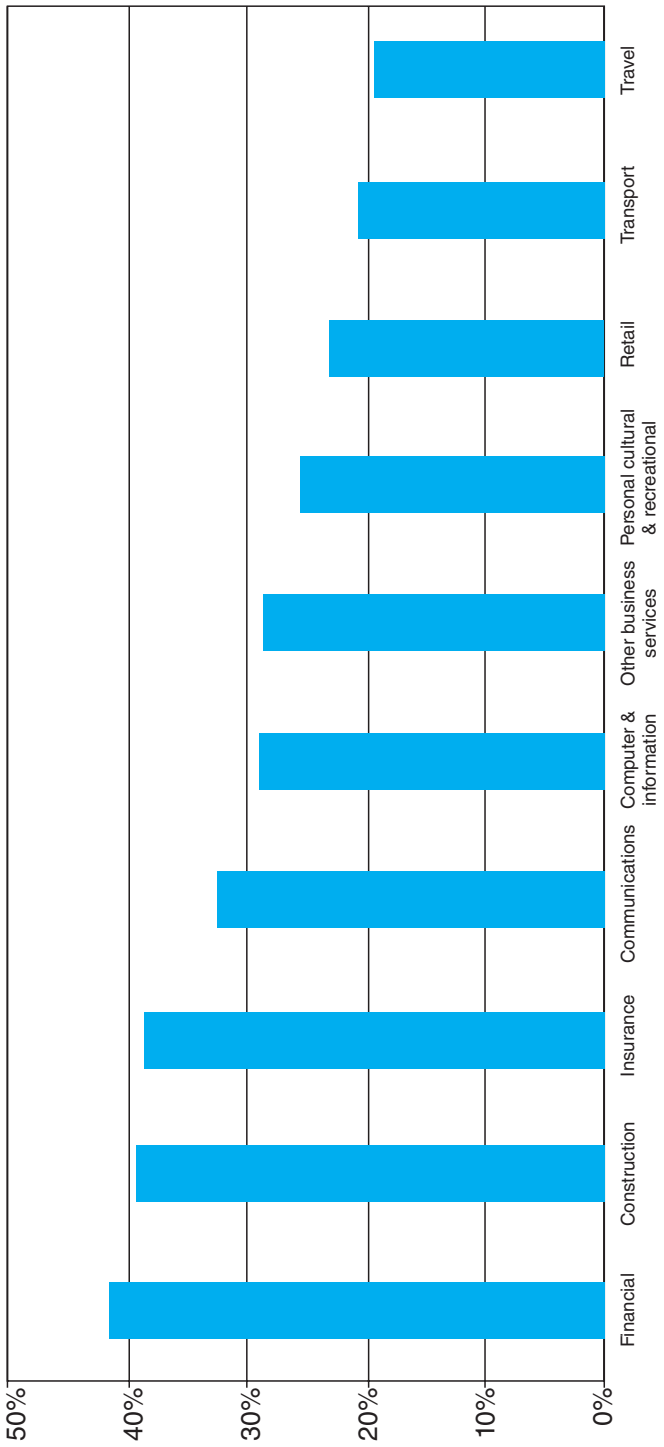
One way to craft trade policies that will contribute to the massive and rapid deployment of more efficient, cleaner technologies that promote climate change mitigation, clean growth, and energy security into the future would be through a SETA[50]. By spurring trade, a SETA can provide new incentives for innovation and investment in sustainable energy technologies.

7.2 Specific Services to Focus on in a SETA

Three highly concentrated sectors have a critical mass of countries that together make up 90 percent of trade in these services, and two of them, construction and ICT, are directly related to sustainable energy services. Emerging economies, like China and India, have high export competitiveness in these two sectors. In addition, big emerging countries, like China, are shifting manufacturing toward higher value-added products, emphasizing the tertiary sector, and searching for new market opportunities abroad. This means that, despite the general reluctance of emerging economies to a full opening of their domestic service markets, they could be willing to give concessions in these two sectors. Given this context, but mainly because these sectors are critical for the provision of sustainable energy services, the inclusion of sustainable energy services in a SETA should focus on the construction and ICT sectors[51].

As the costs of the existing trade barriers in these sectors are significant, reform would lead to important gains. Figure 5 represents the effects of services barriers translated into tariffs and shows that construction follows the financial industry as the most protected sector.

Figure 5: Trade restrictiveness in services trade (tariff ad valorem equivalents) by sector weighted by trade volumes



Source: European Centre for international Political Economy. (2012)

7.3 The Importance of Legal and Strategic Aspects of Services in a SETA

Experts on trade policy have identified possible scenarios with regard tothe creation of the SETA from a legal standpoint[52]. Such scenarios include both integrating the SETA into the WTO legal framework or leaving it outside of the WTO.

Some lessons could be learned from the on-going plurilateral negotiations on an TISA. The WTO allows countries to negotiate stand-alone agreements, such as TISA, if they represent a 'critical mass.' Based on this, the 27 countries representing 90 percent of services trade could unite to withdraw all or some of the current barriers constraining the services market[53].

In January 2013 WTO members involved in the TISA negotiations adopted a joint proposal by the EU and Australia that follows the GATS in terms of scheduling commitments, which would make it easier to attract countries that are not yet part of the plurilateral effort.

The EU-Australia proposal would obligate countries to open to foreign competition only those sectors that they specifically schedule on a so-called positive list. Note that according According to the GATS, improvements in market access for services apply on an MFN basis, subject to any relevant exemptions that participating members may have entered under Article II of GATS. For example, certain members maintained broad MFN exemptions based on reciprocity, or limited MFN exemptions, as regards financial services after the conclusion of the Second GATS Protocol, and to a lesser extent after the Fifth GATS Protocol.

But, it would obligate countries to adopt a 'negative list' approach to national treatment obligations, which means they are required to treat foreign competitors no less favourably than domestic ones, even in sectors not scheduled for market access in the plurilateral agreement. Using such a combination of positive and negative lists to schedule commitments has been labelled a 'hybrid' approach, and it was adopted late last year by the participants in the TISA initiative.

One key attraction of the negative list approach is that it automatically liberalizes all services unless the agreement provides otherwise. Many of the most dynamic and future-oriented services are new services that did not exist in the 1980s – such as sustainable energy services, or cloud computing, or e-payments. If the TISA is moving forward on anything other than a pure positive list approach, it is arguably be easier to attract interest, among these plurilateral participation to agree in specific SETI arrangements wherea negative list approach is similarly adopted.

In terms of the national treatment obligations, the EU-Australia approach would have countries extend unilateral concessions they make to all other signatories of the services plurilateral, preventing them from backing off those concessions, an obligation that Geneva negotiators refer to as 'ratchet.' It would also prohibit them from going back on national treatment commitments that exist under the current regime una a so-called standstill commitmenr. Many see the EU-Australia proposal as an attempt at a balance between getting ambitious commitments and staying within GATS because, like the GATS, it does not apply the ratchet and standstill mechanisms to market access commitments as some other members had proposed. Members ultimately backed the EU-Australia approach to ratchet and standstill commitments, because they believed it was easier to accept when applied only to national treatment rather than market access commitments.

Similarly, and given that less than one third of the WTO members have made services offers since 2006, negotiations on sustainable energy services could begin plurilaterally. The possibility of a plurilateral SETA that includes services might be most favourably suited to a 'critical mass', MFN-based approach. If the SETA were an optional, plurilateral MFN-based agreement within the WTO framework (an ITA-type agreement), it could be implemented through modifications to participating members' services schedules.

Nevertheless, it seems quite unlikely to arrive at a common agreement between the countries representing 90 percent of the market share in services to liberalize service trade. Countries

like China and India, which together accound formore than 12 percent of world trade, seem reluctant to enter into a trade-liberalizing agreement on services[54]. The WTO legal framework, however, sometimes allows its members to bargain outside of the formal negotiating rules. This flexibility could create an opportunity for a smaller group of countries with a large share of the services market, such as the Really Good Friends of Services (RGF), to negotiate a new WTO agreement on services on its own under a non-MFN basis.

If the SETA were developed as a preferential trade agreement (PTA), it would be excluded from MFN obligations in GATT 1994 and GATS. Therefore, the benefits conferred by such an agreement need not be extended to all non-participating members, which could increase the incentive to participate. If a SETA would be conceived as a 'GPA'-type agreement though, it would require the consensus of all WTO members

GATS Article V allows parties to enter into commercial agreements outside of the WTO framework. In this context, another initiative for the liberalization of services trade could be built following the example of the Trans-Pacific Partnership (TPP)[55]. Article V of GATS, similar to Article XXIV of the GATT, applies to economic integration agreements. Among other things, these agreements must have 'substantial sectoral coverage,' which is explained in the GATS as follows: "This condition is understood in terms of number of sectors, volume of trade affected and modes of supply. In order to meet this condition, agreements should not provide for the a priori exclusion of any mode of supply[56]." SETA would not qualify if it were limited to sustainable energy services, even if those services were spread among different sectors, due to the volume of trade affected (Kennedy, 2012).

However, according to Kennedy (2012), a SETA could qualify under Article XXIV of GATT 1994 and Article V of GATS if it were negotiated as part of a comprehensive FTA covering trade in goods (or a customs union) and trade in services. In that case, the enormous synergies between trade in goods and services related to sustainable energy would be captured. Such an agreement could be negotiated either as an amendment to an existing FTA or customs union, or as part of a new FTA or customs union. The modalities for such negotiations would necessarily require substantial coverage of trade in goods or substantial sectoral coverage in trade in services.

7.4 Political Feasibility of Inclusion of Sustainable Energy Services in a SETA

The European Union , the leading services exporter and world's largest services economy, can play a very important role in shaping the inclusion of sustainable energy services in a SETA. The EU represents one quarter of world trade in services and more than one third of trade within the RGF group[57].

Two main options seem possible for the liberalization of services: to craft an agreement outside of the WTO or to focus on sectoral agreements, such as the SETA.

Some arguments against the value of a plurilateral SETA are based on the lack of an incentive, especially for big emerging countries, to reform and join the agreement. This, however, is only partially correct, given that most of the commitments made in trade agreements in Mode 1, Mode 2, and Mode 3 are open to all parties. Even though countries engage in bilateral agreements, national law is commonly drafted such that preferential agreements are not conferred to a specific state. Mode 4 commitments that are closely linked to domestic regulations may result in liberalizing the Mode 4 market to certain countries that meet specific conditions therein. Thus, incentives exist for parties outside a plurilateral SETA, depending on whether the offensive and defensive interests of emerging countries are in Mode 3 or domestic regulations and Mode 4[58].

However, when assessing the feasibility of including sustainable energy services in the SETA, other points need to be prioritized and clarified, including opportunity costs of setting services free from the Doha Round and the probability of success. In addition, a plurilateral agreement on services could be quite fragile, since if just one major player remains in

standby mode, the prospect of an agreement under the WTO would be shattered. Finally, the trade-offs between the participants and non-participants must be addressed in such an agreement. These negotiations need to take place before drawing any final conclusions about the feasibility of this initiative.

For regulatory issues in Mode 3, significant unilateral, bilateral and regional liberalization already exists, so countries could simply bind the status quo. Mode 4 in general and services standards (e.g. construction codes) would be more difficult to liberalize from the beginning of a SETA.

The feasibility and size of the gains from sustainable energy services liberalization will depend to a significant extent on domestic political institutions and reforms, which strengthen the economic environment for private investment and involvement and support market competition. Regulation is required particularly in monopolistic markets to ensure that potential gains from services liberalization are maximized. Appropriate institutional and policy frameworks that take into account potential economic, environmental, and social impacts of liberalization are necessary precursors to good policies, but capacity building is often needed to support the establishment of such institutions.

Annexes I and II provide lists of questions for the consideration of negotiators and other stakeholders. These questions can raise awareness of the most relevant policy matters related to liberalization of trade in sustainable energy services.

Chapter 8

Key Findings

The sustainable services landscape: modes of supply and major trading countries

This study demonstrates that services related to sustainable energy technologies are spread over a number of CPC groups, such as 'other professional, technical, and business services'; 'construction services'; and 'other environmental protection services.'

In the insufficiency of concrete references and commitments in WTO Members' services schedules explicitly having energy services as a specific sector, this study is constrained to look primary at services related to sustainable energy in a context setting platform for analysis. The predominant modes of supply for sustainable energy services are Mode 3 and Mode 4, since providing services to construct and engineer power production projects, energy efficient buildings, or industrial plants and wastewater treatment plants requires the establishment of a commercial presence. The provision of such services also must be complemented by a range of relevant professional, technical, and business services, which are supplied by a temporary movement of qualified service providers.

The provision of services through Mode 1 is also increasing due to new channels of electronic supply, particularly in 'other professional, technical, and business services' and in 'environmental services' sectors. For this reason, ICT-related services will play an ever larger role. Therefore, WTO members' commitments on Mode 1 across all three CPC groups are becoming increasingly important in facilitating trade in sustainable energy services.

Across all three groups of services, the EU and the USA, of the 17 major trading countries, are the biggest exporters, followed by Japan and Canada. A few emerging economies as well as economies in transition are also becoming major exporters in some of these services sectors. They include India (other professional, technical and business services), China (construction services and energy goods and services), the Russian Federation (construction services), and Chinese Taipei (energy goods and services).

Commitments on trade in services related to sustainable energy and remaining barriers

An analysis of major trading countries' specific commitments on these services groups reveals that only a handful of the countries have made a full commitment. Australia, for instance, has made a full commitment across the selected sub-sectors of 'other professional, technical, and business services.' Canada and Chinese Taipei have done so on relevant 'environmental services.' None of the major trading countries has made a full commitment on relevant construction services.

Chapter 6

It appears that the principal modes of supply (Modes 3 and 4) for the complementary services of sustainable energy technologies are largely limited, as the majority of trading countries concerned have put specific as well as horizontal limitations on both modes across the three groups of services[59]. Among others, common specific limitations on Mode 3 take the form of:

- Restrictions on the formation of foreign companies' legal entity;
- Requirement of an 'economic needs test' for the establishment of a commercial presence;
- Restriction on foreign investment (e.g. foreign capital equity); and
- Nationality or residency requirements for accreditation of certain types of service providers (in terms of national treatment limitations).

Commonly seen forms of horizontal limitations on Mode 3 include:

- Restrictions on the acquisition of land and real estate; and
- Limited eligibility for subsidies, including tax benefits.

While the majority of trading countries concerned left Mode 4 unbound except as indicated in the horizontal commitments, most of them have put horizontal limitations on Mode 4. The most frequent forms of such limitations are restrictions on entry and temporary stay of various services providers, including 'intra-corporate transferees,' 'contractual service suppliers,' 'business visitors,' 'services salespersons,' and 'independent professionals.'

In terms of national treatment, the following limitations appeared frequently:

- Limited recognition of third-country diplomas required to practice regulated professional services;
- Restrictions on foreign nationals' or foreign companies' acquisition of land and real estate;
- Restrictions of foreign service providers on public monopolies; and
- Limited eligibility of foreign nationals for subsidies, including tax benefits.

The degree of commitments on Mode 1 appears to vary across the three groups of services. While the majority of trading countries considered Mode 1 inapplicable to construction services, and hence left it unbound, a few countries (Brazil, India, and a few EU member states) have left Mode 1 unbound in 'other professional, technical, and business services' and 'environmental services,' with the exclusion of 'sanitation and similar services' in the latter case.

Few countries appear to have offered new commitments across the three groups of services in their initial or revised offers during the Doha Round. The only new commitments made in the initial or revised offers are the EU's limited commitments on 'services incidental to energy distribution' and Australia's new commitments on 'other environmental services.'

Also, no discernible progress seems to have been made on horizontal limitations in the initial or revised offers. The review of the initial or revised offers in this area shows that the nature of horizontal limitations and where the modes of supply limitations lie remain largely the same. Notably, however, many countries that initially left Mode 1 unbound in the environmental services sector have since put limited commitments in their offers. Given the increasing importance of Mode 1 in providing complementary services of sustainable energy technologies, improved commitments, particularly on 'other professional, technical, and business services,' could help facilitate trade in these services. The complementary nature of Mode 3 and Mode 4 in supplying the interlinked services also deserves due consideration when addressing the limitations on these modes of supply.

Market access and national treatment on Mode 3 (investment restrictions), qualification and licensing requirements, and services standards (e.g. construction codes) would be the 'low hanging fruit' for a SETA. Investment restrictions in the form of foreign equity limits, legal form, and economic needs tests, are some of the elements which need to be revisited by colisy-makers in thie sector.

Examples of impediments to the temporary movement of service providers that need to be similarly re-examined are quotas, labour market tests, and limitations on the duration of stay for foreign providers. Discriminatory subsidies and taxes might also be important.

These are largely domestic regulatory issues where more progress has been achieved at the regional level (e.g. in the EU and NAFTA). For regulatory issues in Mode 3, significant unilateral, bilateral, and regional liberalization already exists, so countries could simply bind the status quo. Mode 4 in general and services standards (construction codes) would be more difficult to liberalize from the beginning of a SETA.

Since public procurement is an important driver for demand in a range of services related to sustainable energy, procurement regulation can have a significant impact on trade in these services. In addition to traditional government procurement, public-private partnerships – such as concessions and build-operate-transfer contracts – have also emerged to facilitate private participation in infrastructure and service development. Related practices may affect trade in these services as well.

The construction sector and related architecture and engineering services are characterized by the importance of building regulations and technical requirements. In addition, contractors for projects related to sustainable energy are dependent on bringing in technologically sophisticated equipment to the project site from other countries. Therefore, standards affecting the mobility of goods and technologies may be important, and the harmonization of standards may benefit trade and development in areas like energy efficiency[60].

While multilateral negotiations are clogged up in the Doha Round, there has been considerably more movement on services related to sustainable energy in PTAs, such as FTAs and the TISA.

Ways forward

The complementarity between trade in sustainable energy technologies and in services cannot be emphasized enough. A wide range of products and technologies are connected with the provision of services related to sustainable energy. Energy-efficiency programmes, for example, often utilize new electronic controls, energy-efficient boilers, and HVAC equipment. Across the spectrum of examples discussed in this paper, for projects in most developing countries, a great deal of technologically sophisticated equipment – e.g. turbines for power projects, centrifugal blowers for methane capture projects, electricity sub-meters for energy-efficiency projects, and electronic control equipment for many types of projects – must be imported, while many construction materials are procured locally. The general implication of studies for developing economies is that the potential benefits to simultaneously liberalizing trade in environmental services and in environmental goods are likely to be much greater than liberalizing trade in only one or the other[61].

Sustainable energy services should be viewed in the wider context of sustainable development. Effective domestic and international frameworks that support sustainable energy will be crucial for realizing the development benefits of access to sustainable energy for all. In particular, job creation can benefit from open trade in goods and services related to sustainable energy.

Against this background, there is a need to continue to pursue a variety of options for liberalisation of trade in environmental services more broadly and specifically on sustainable energy services.

First of all, in the context of the Doha Round, negotiations will continue on updating the GATS. While some see the GATS as limited to market access and national treatment, others consider it a flexible instrument in which there is scope for good outcomes for environmental services. Classification instruments do not determine the scope of the GATS. Nothing prevents WTO Members from making broad commitments or taking a "clustering approach" for commitments in energy-related services sectors. Also, there is opportunity in the GATS to address regulatory issues.

The GATS framework provides examples of options that could be explored to progress liberalisation of sustainable energy services. For instance, in financial services – an 'Understanding' was developed[62] which takes a negative list approach to commitments in the sector, which allowed Members who chose to adopt the Understanding to schedule limitations on specific commitments or sub-sectors. Arguably, sustainable energy services could be a good candidate for a similar approach which would allow for the incorporation of innovative kinds of sustainable energy services.

Another option could be an approach similar to the WTO telecommunications reference paper[63], which provides guidelines for a regulatory framework that Members should follow to support the transition of the telecommunications

sector to a competitive marketplace. Members who wish to adopt the reference paper make an additional commitment in their existing GATS schedule. Perhaps a similar approach could be developed for environmental services to address regulations related to sustainable energy services.

The limitation with these approaches is that they do not provide a framework for a massive scale-up of both goods and services related to sustainable energy envisaged by a Sustainable Energy Trade Agreement – the kind of scaling up that will have a significant impact on climate change. A SETA could provide an enabling framework that can address a broad set of issues in order to massively scale up both goods and services related to sustainable energy. Crafting such an agreement that includes services would require deeper consideration among stakeholders on the technical, legal, and political aspects of trade in services related to sustainable energy.

Useful lessons can be drawn here from the TISA negotiations. This raises the question 'what was necessary as a catalyst for action on TISA?' First, there needed to be a critical mass of like-minded countries. This group needs strong and commonly agreed objectives and identified benefits (supported by quantitative work). As is the case for any trade initiative, there needs to be a strong push from the business community (also see Hufbauer et al., 2012).

However, the TISA is mostly about market access and will probably not bring any new initiatives concerning regulation. Also, the TISA most probably will be outside of the WTO (at least in the first instance). Finally, following the TISA approach means excluding Brazil, Russia, India and China (BRICs) and other developing countries.

The relationship between the TISA (covering all services) and the proposed services within a SETA are difficult to predict at this point. Overlaps for example could exist, as they do between other PTAs. If the TISA is an Article V GATS PTS, its relationships with a SETA will be the same as the relationships other existing preferential agreements will have with the SETA and among themselves. Commitments do not need to be the same (often they are not, even for the same country). Other avenues for SETIs could be 'protocols' or 'annexes' to FTAs, similar to the annexes on sustainable development that were attached to some FTAs between the EU and some members of the Association of Southeast Asian Nations (ASEAN).

Based on these and other considerations in this paper, stakeholders in trade in sustainable energy services may want to discuss the following questions:

- Should the classification of renewable energy services and energy efficiency services be made more visible? What would be the best approach?
- Should it be left to each member wishing to undertake specific commitments on CCS, smart grid, and other rapidly evolving technologies to decide how to classify and define relevant services?
- Is it appropriate to apply CPC definitions elaborated in 1991 to novel technologies that emerged several years later? If not, what would be the options?
- More generally, have members encountered difficulties in classifying services associated with renewable energy or energy efficiency? If so, what are these and how could they be solved?
- What is the best way to appreciate the links between sustainable energy goods and services, and how can these linkages be taken into consideration when crafting trade policies?
- Can sustainable energy services progressively be liberalized through SETIs and a SETA, and if so, how? How can linkages with other agreements and initiatives be established?

Chapter 9

Concluding Remarks

The potential benefits of liberalizing trade in low-carbon technologies and services in tandem have been widely touted. To include sustainable energy services in a SETA, it is crucial to identify services that could be complementary to the diffusion of sustainable energy technologies and to understand the current level of market access for such services.

Specific commitments made under the GATS may have a stronger impact on regulatory competence than tariff bindings do in goods trade, creating favourable conditions for investment and access to technology when an adequate regulatory framework is provided (Cossy, 2011). The same would likely hold for commitments made in sustainable energy services in a SETA. Analysis of the major trading countries' specific commitments on the complementary services of sustainable energy technologies reveals that the principal modes of supply for these groups of services are heavily limited and little progress has been made in WTO members' initial or revised offers as of yet. Reviewing bilateral, regional, and unilateral liberalization commitments could ultimately be useful when considering the inclusion of services related to sustainable energy in a SETA.

In addition, several empirical studies reveal that some of the key services required for producing and using energy more sustainably – ranging from energy efficiency projects to utility-scale wind power projects – are often unavailable in host countries (Steenblik and Geloso Grosso, 2011; Sterk et al., 2007). Liberalizing trade in these services, therefore, might not only facilitate the diffusion of associated sustainable energy technologies, but also give countries ready access to such services. Although concerns have been raised that the 'complementary services of sustainable energy technologies' discussed in this paper might exacerbate the persistent problem of 'dual use' as the services cut across multiple sectors, a SETA should allow ample flexibility for specifying the scope of commitments in members' schedules. If members wish to increase the market access of sustainable energy services through plurilateral trade negotiations, they could specify their commitments on such services in their schedules within the current GATS structure of classification.

It should be kept in mind that facilitating trade in 'complementary services of sustainable energy technology' goes beyond the GATS, since trade barriers to these services are not limited to the issue of market access and national treatment. For instance, given that the public sector appears to be the largest client across all three groups of services, regulations concerning government procurement could have a significant impact on trade in these services. An empirical study shows how some of the existing practices and limited transparency in this area could create barriers to trade in environmental goods and associated services[64]. It goes without saying that certain government regulations (e.g. on government procurement and standards and qualifications for services providers) play an important role in the environmental goods and services market. Given the close links between the two, however, the issue of liberalizing trade in complementary services of sustainable energy technologies must be addressed in conjunction with discussions on the plurilateral agreement on government procurement in the WTO.

Furthermore, domestic laws, regulatory measures, and administrative rules all have the potential to affect trade in these services. Examples of this include domestic regulatory measures, such as financial thresholds, building regulations and associated technical requirements or regular inspection requirements for safety. In facilitating trade in complementary services of sustainable energy technologies, therefore, relevant regulatory measures as well as administrative rules must be addressed in tandem.

Chapter 7

Trade in services related to sustainable energy should respond to the demands of clients in developing countries. Those demands are being driven in some cases by tighter regulations and in others by corporate policy, especially the tenants of corporate social responsibility.

The benefits to the businesses that engage outside experts to carry out sustainable energy services are manifold. Outsourcing allows these businesses to concentrate on their core activities and to shift some of the liability of meeting environmental regulations to other companies. Often, it allows the facilities involved to be built to an optimal scale, which may be larger than that required for a single client. The resulting economies of scale allow costs of sustainable energy to be reduced, and, because several clients may be served, introduce greater flexibility into the contractual arrangements. Keeping an open door to imports of sustainable energy services and goods also helps ensure vigorous competition, which keeps down the price of goods and helps make their supply more reliable.

The main point of this paper, however, is that potential benefits of simultaneously liberalizing trade in sustainable energy goods and services are likely to be much greater than liberalizing trade in either one or the other. These benefits include, naturally, improving the environmental performance of local industries and thereby increase a country's attractiveness for foreign direct investment; increasing the availability of these services to benefit of the environment, the health of the population, and wider socioeconomic benefits; and reducing costs and spurring innovation. But, they also include increasing local capacity to produce goods and provide sustainable energy services — capacities that, with multilateral liberalization — can be translated into increased export opportunities[65].

Endnotes

1. According to the International Energy Agency (IEA), "[s]omething is more energy efficient if it delivers more services for the same energy input, or the same services for less energy input. For example, when a compact florescent light (CFL) bulb uses less energy than an incandescent bulb to produce the same amount of light, the CFL is considered to be more energy efficient". See IEA, *What is energy efficiency?*, at http://www.iea.org/efficiency/whatisee.asp.

2. In particular the paper *Facilitating Trade in Services Complementary to Climate-friendly Technologies* by Joy Aeree Kim (2011)

3. The text of the GPA, as amended, and the market access results of the negotiations are in GPA/113, http://docsonline.wto.org/imrd/directdoc.asp?DDFDocuments/t/PLURI/GPA/113.doc

4. Renewable energy sources include solar energy, wind power, geothermal energy, hydropower, biomass, and ocean energy.

5. More information on a SETA can be found at http://ictsd.org/i/publications/117557/

6. Also see Matthew Kennedy's paper 'Legal Options for a Sustainable Energy Trade Agreement: http://ictsd.org/i/publications/138050/

7. See Annex 5. A2 to Chapter 5. "Synergies between trade in environmental services and trade in environmental goods" in *Trade that Benefits the Environment and Development: Opening Markets for Environmental Goods and Services* (OECD, 2005).

8. Although neither the GATS sectoral classification list (W/120) nor the CPC is a compulsory instrument in the WTO, this paper uses trade data based on these two systems for relevant services sectors, owing to data limitations. There is no link between W/120 and CPC version 2. W/120 is based on the old 1991 CPC provisional. Moreover, the UN has not established a correspondence system between CPC provisional and CPC version 2. Hence, it is not possible to compare W/120 and CPC version 2 with any degree of certainty. There is no common understanding as to whether and to what extent CPC version 2 might offer guidance in addressing the inadequacies of W/120 and the CPC provisional, although CPC version 2 presents a more updated and more detailed classification of environmental services. All GATS and most positive list PTA commitments and offers are based on the old CPC provisional.

9. In particular, the paper *Facilitating Trade in Services Complementary to Climate-friendly Technologies* by Joy Aeree Kim (2011)

10. While EGS would typically include sewage, sanitation, and noise technologies, and climate-friendly goods can be related to the agriculture, forestry and waste sectors, the category of SEGS does not include them.

11. Paragraph 31 (iii) of the Doha Ministerial Declaration calls for the "reduction or, as appropriate, elimination of tariffs and non-tariff barriers on environmental goods and services."

12. TN/TE/20, 21 April 2011

13. JOB(07)193/Rev.1 (European Communities, United States, 6 December 2007), para. 3.

14. Also see footnote 6 above.

15. Air-pollution control is covered in W/120 under 'other services'

16. The W/120 classification list used for the negotiations dates from 1991. No WTO member has yet scheduled according to the W/120/Rev 1

17. 'Pollution management' group comprises activities that produce technology or services to treat or remove environment effects; 'cleaner technologies' comprise any activity that continuously improves, reduces, or eliminates the environmental impact of technologies, processes, or products; and 'resource management' group includes activities that prevent environmental damage to air, water, and/or soil.

18. One issue that is important in relation to the classification of environmental services is how to classify "new" activities, particularly in the sector undergoing significant technological development. The field of carbon capture and storage may be a case in point (Cossy, 2011).

19. JOB/SERV/94

20. The explanatory note describes this sector as covering "the application of physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems for electricity generation, transmission. and distribution projects. This subclass includes: (i) engineering services related to facilities that generate electrical power from coal and other fossil-fuel energy, such as oil and gas; nuclear energy; the energy in falling water; other energy, such as solar power, wind power, geothermal power including cogeneration facilities; (ii) engineering services related to overhead or underground electrical power transmission and distribution lines.

21. *Environmental Services - Overview of Classification Issues,* Informal Note by the Secretariat, JOB/SERV/84, 31 August 2011, Section F.

22. International Energy Agency, *Technology Roadmap - Smart Grids*, OECD/IEA, 2011, available at http://www.iea.org/papers/2011/smartgrids_roadmap.pdf.

23. The GATS is also flexible enough to accommodate sector-specific intentions. In the case of telecommunication services, for instance, members specified 'additional commitments' in their schedules, to reflect elements of the reference paper in Telecommunication sector which concerns a set of transparency requirements, competition disciplines, and institutional obligations concerning among others, the creation of an independent regulator in the sector (Adlung, 2009).

24. The EU and the US proposed this as 'energy-related services.'

25. According to IPCC 4th Assessment Report (2007), detailed reports on carbon capture and storage (CCS)-ready plant-design studies are not yet in the public domain.

26. While a debate on whether RECs are to be classified as 'goods' or 'services' is still ongoing, many argue that it should be considered as 'financial services,' as international trade applies to certificates, not the energy (Kim, 2011; Cottier and Baracol-Pinhao, 2011; and Delimatsis and Mavromati, 2011).

27. The classification of these services is based on the UN CPC version 2.

28. Overall, data on trade in services is very limited. Currently, readily available trade data on services are largely at the aggregated level (the sectoral level based on the W/120 classification or the CPC group level).

29. The EU's national schedule submitted during the Uruguay Round covers only 12 original member states. 15 new member states (Austria, Cyprus, Czech Republic, Estonia, Finland, Hungary, Latvia,

Lithuania, Malta, Poland, Slovak Republic, Slovenia, and Sweden) have submitted their individual schedules separately. The European Community certified in 2006 a new schedule of commitments that covers all 27 member states. Among the EU member states, Cyprus and Malta have not made any commitment on this group of services.

30. The EU in its 'revised offer' made a limited, yet new commitment in this sub-sector.

31. The classification of sub-sectors in all the tables is based on W/120.

32. According to Canada's revised offer, limitations on Mode 1 in architectural services and on Modes 1 and 2 in engineering and integrated engineering services were removed.

33. EU's initial and revised offers include commitments schedules of its 27 member states.

34. The review of the revised offers by nine major trading countries in this sector reveals thatthe nature of horizontal limitations and where the limitations lie in terms of modes of supply remain largely the same, although some countries clarified the criteria applied to relevant limitations or loosened the language to a limited extent. For instance, Canada has increased the minimum value of Canadian business that could be subject to foreign acquisition tp 'no less than CD 153 million (USD 157 million) to CD 250 million (USD 256 million). (TN/S/O; TN/S/O rev.1).

35. Canada removed 'residency requirement for accreditation of landscape architects' in its revised offer submitted to the WTO (TN/S/O; TN/S/O rev.1).

36. Overall, the number of EU member states that put specific limitations on Mode 4 has decreased in its revised offer (TN/S/O rev.1).

37. Under the GPA, market access has been committed only for those entities specifically listed in the GPA schedules.

38. The market share of constructions services by relevant sectors is as follows: power (5.5 percent); industrial (4.9 percent); water/sewer/waste (4.4 percent); and manufacturing (2.3 percent).

39. Data on the commitment schedules of Azerbaijan, Kazakhstan, and the Russian Federation is unavailable since they are not WTO members.

40. Among the new EU member states, Cyprus, Hungary, and Malta have not submitted their commitment schedules on this group of services. Finland has made a partial commitment on this group of services.

41. Restrictions on Mode 4 may arise from a country's overall immigration policy, or specific labour market conditions. Consequently, specific commitments under the GATS tend to be made at the 'horizontal' level (i.e. applied to all service sectors), with sector-specific qualifications. A review of horizontal commitments made by these countries shows that almost all countries have put horizontal market access limitations on Mode 4 by restricting the entry or temporary stay of service providers. Common examples of specific conditions for approval of entry of service providers include: labour market testing; residency requirements for intra-corporate transferees and a requirement that the foreign company employ specific numbers of local staff; authorization subject to non-availability of locals; authorization subject to performance requirements (employment creation, transfer of technology, or ongoing level of investment). There is a perceived need for special fast-track visa procedures – regardless of whether providers are based in developed or developing countries.

42. The market access limitations on Mode 1 concern 'approval requirements by the government of foreign specialists involved with engineering or architecture-related works and qualification

requirements of foreign engineers or architects (e.g. temporary member of the related Union of Chambers).' Turkey, however in its revised initial offer, removed this limitation..

43. Also see Hufbauer et al. (2012) for a discussion of the International Services Agreement.

44. According to the International Labour Organization, in much of Asia, Africa, and Latin America , the proportion of expenditure on energy by poor households is 3 times – and can be as much as 20 times – that of richer households.

45. http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_181836/lang--en/index.htm

46. Ibid.

47. http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/publication/wcms_098484.pdf

48. http://www.irena.org/DocumentDownloads/Publications/RenewableEnergyJobs.pdf

49. http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/publication/wcms_180914.pdf

50. More information on a SETA can be found at http://ictsd.org/i/publications/117557/.

51. The TISA from the European vantage point. Brussels: ECIPE

52. http://ictsd.org/downloads/2012/07/legal-options-for-a-sustainable-energy-trade-agreement.pdf

53. European Centre for International Political Economy. (2012). The International Services Agreement (TISA) - from the European vantage point. Brussels: ECIPE

54. European Centre for International Political Economy. (2012). The International Services Agreement (TISA)- from the European Vantage Point. Brussels: ECIPE

55. Idem

56. GATS, Article V:1(a) and footnote 1.

57. European Centre for International Political Economy. (2012). The International Services Agreement (TISA) - from the European Vantage Point. Brussels: ECIPE

58. European Centre for International Political Economy. (2012). The International Services Agreement (TISA) - from the European Vantage Point. Brussels: ECIPE

59. Many of the specific limitations on Mode 3 for environmental services were removed in the revised offers by countries such as Japan and Korea.

60. http://ictsd.org/downloads/2010/09/harmonising-energy-efficiency-ictsd.pdf

61. E.g. http://www.oecd.org/dataoecd/45/28/36422502.pdf

62. http://www.wto.org/english/tratop_e/serv_e/21-fin_e.htm

63. http://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_posturuguay_neg_e.htm

64. See Fleisse and Kim (2008) for detailed examples.

65. http://www.oecd.org/dataoecd/45/28/36422502.pdf

66. Committee on Specific Commitments, *Environmental Services – Overview of Classification Issues*, Informal Note by the Secretariat, JOB/SERV/84, 31 August 2011, paras. 27-29 and *Energy Services – Overview of Classification Issues*, Informal Note by the Secretariat, JOB/SERV/94, 5 March 2012, paras. 18-23.

67. Background Note on Environmental Services, S/C/W/320, para. 50.

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Annex I

Comments and Possible Questions for Negotiators' Consideration

Services relate to climate change policies in many ways. If we take into consideration any sector that comes into play, directly or indirectly, in the implementation of sustainable energy policies, the scope of potentially relevant services is extremely broad and could cut across nearly all sectors listed in W/120. Hence, one of the first challenges is to determine criteria to circumscribe and identify sustainable energy services that need to be focused on. Such criteria could relate to the implementation of technologies that reduce GHG emissions and facilitate the introduction of other climate mitigation measures. Alternatively, or better in addition, one might focus on services that will help address energy security and universal access to energy. These are, of course, only examples and negotiators may want to choose different criteria.

1. Question: what criteria should be used to circumscribe and identify "sustainable energy services"?

   Once criteria are agreed upon and relevant sustainable energy services are identified, it may be necessary to determine where these services are classified in W/120 and the CPC classifications. For instance, assuming that services associated with renewable energy technologies are considered to be "sustainable energy services," where should services related to the monitoring of wind power plants be classified? Similar questions were previously raised in relation to carbon capture and storage and smart grids[66], and could likely arise with respect to a number of services supplied in relation to new sustainable energy technologies.

2. Question: should it be left to each member wishing to undertake specific commitments on "sustainable energy services" to decide how to classify and define those services? Or, should members work toward a collectively agreed classification for such services?

   A number of services that are classified outside the environmental services sector, as defined in the W/120 and the CPC, may have an environmental end-use.However, as these services are not exclusively environmental, but may have various end-uses, they are classified under other generic items, for instance business and construction services[67]. For example, the CPC definitions for technical testing and analysis services or engineering services spell out environmental end-uses. Other services, such as management consulting services, may also have environmental end-uses, although the CPC definition is silent on them.

Source of figures: Alliance for Affordable Solar Energy

Annex II

Checklist for Sustainable Energy Services Negotiators

1. GATS-Related Issues	
a) Measures affecting cross-border supply (Mode 1)	1. Can non-resident suppliers of sustainable energy-related services serve the market on a cross-border basis (i.e. without an established presence)? Is it necessary to channel those transactions through intermediaries? 2. What types of sustainable energy services are allowed, or restricted, as regards cross-border supply? 3. Are there any restrictions on the electronic transmission of sustainable energy and related services by non-established foreign service providers? 4. Are consumer access or connection to Internet or other electronic networks available through monopoly or exclusively authorized providers? 5. Is the transfer of capital, payments and/or use of credit cards for such transactions permitted? Is it subject to authorization? 6. If entry is restricted, what are the reasons provided by the government? 7. Where and how clearly are such limits spelled out?
b) Measures governing commercial presence/ ownership (Mode 3)	Private participation 1. Is there a government monopoly in the sustainable energy services sector such that private investment is not permitted? If so, in which sub-sectors? 2. For sustainable energy infrastructure services, how is private participation allowed (concessions, BOTs, etc.)? 3. How is it regulated at the central and local levels? What are the procedures and criteria used? Is preference given to any particular enterprise or group of enterprises? Is it a transparent process? Foreign ownership 1. In which segments is foreign ownership allowed in the provision of environmental services? 2. When laws restrict foreign shareholdings in local sustainable energy companies, what is the maximum foreign equity permitted or the minimum local shareholding? Screening laws 1. Are proposed foreign investments in the sustainable energy sector subject to screening by a specialized authority in the host state? 2. Are there economic needs tests for approval of foreign investment? If so, in which sub-sectors? Are these tests transparent?

	3. Are there nationality or residency requirements for foreign establishment investment (e.g. to gain the right to practice sustainable energy-related professional services such as engineering)? 4. Which authorities are charged with the investment screening? 5. Which criteria apply in evaluating applications for approval? 6. Are investors offered rights of judicial review against unfavourable decisions by the screening authorities? Are clear administrative guidelines issued from which investors can reasonably predict the response of host state authorities to an investment proposal? Legal and joint venture requirements 1. Are sustainable energy firms required to establish locally through a particular legal form of establishment (i.e. subsidiary, branch, representative office)? 2. Are foreign established companies subject to specific performance requirements, including (i) licensing requirements and technology transfer rules; (ii) remittance and foreign exchange restrictions limiting external financial transfers; and (iii) local hiring and sourcing requirements? 3. Is entry of the foreign sustainable energy firm conditional on the substantial involvement of local participants in the ownership and management of the investment project (joint venture requirement)? 4. Is local control (e.g. 51% or more of the equity contribution) required over the (equity/contractual) joint venture? Does the law provide for progressive increase in control over the venture? 5. Are there requirements regarding the composition of the board of directors? 6. What is the prescribed legal form of the joint undertaking (general partnership, professional corporation or limited liability company)?
c) Measures relating to licensing	1. What laws and regulations discipline licensing of environmental activities? 2. What types of licenses and regimes apply in different segments? What is the rationale for such licensing? 3. Who issues and monitors licenses? 4. Are licenses automatic or not automatic? 5. Are licenses open ended or for a definite time? 6. What licensing procedures (e.g. application or bidding procedures) are applied? Under what circumstances are different procedures used? 7. What provisions apply to modification, termination and revocation of licenses?

d) Measures governing the movement of natural persons (Mode 4)	1. How are entry and work permits obtained? 2. Are there any restrictions on the movement of intra-corporate transferees? What about contractual service suppliers? For the latter, do the same restrictions apply to employees of firms and to independent professionals? 3. Do the restrictions apply to natural persons seeking long-term establishment or to individuals travelling for business purposes for short periods of time? 4. Is the entry of foreign experts subject to economic needs tests? Are such tests transparent? 5. Are there residency or nationality requirements with respect to certain categories of personnel employed by locally established sustainable energy related firms? 6. Are equivalent professional qualifications for sustainable energy support services obtained abroad recognized in the importing country? 7. Are there prior experience requirements or post qualification experience attached to the granting of visas?
e) Preferential liberalisation measures	1. Are there any preferential agreements affecting the supply of sustainable energy and support services? Which measures are subject to preferential treatment? Do preferential measures also apply to the movement of natural persons? 2. What conditions must foreign suppliers of sustainable energy support services fulfill to meet the requirements of existing mutual recognition agreements to which host country providers are parties? 3. Does the importing country maintain preferential access arrangements for developing countryservice providers?
2 Other Issues	
a) Government procurement	1. What procurement procedures are applied for sustainable energy services (e.g. tendering)? Under what circumstances are different procedures used? 2. How are intended procurements publicized? 3. Are there registration, residence or other requirements for potential suppliers? 4. Is procurement subject to (i) local content; (ii) technology transfer; (iii) local employment; (iv) investment or local presence in the importing country? 5. Do procuring entities grant price advantages to domesticallyowned companies over foreign companies? 6. Are there lists of approved suppliers? If so, what are the procedures for checking the capability of firms applying for inclusion on tenderers' lists? 7. What criteria are taken into account in the award of tenders? Are criteria for award of contracts made available in advance to potential suppliers? How are tenders received, registered and opened? 8. Are entities required to publish details of contracts awarded or notify unsuccessful tenderers? Are entities required to publish, or provide to unsuccessful bidders, pertinent reasons why their bid was rejected?

	9. What, if any, are the procedures available for parties, domestic and foreign, to lodge complaints against the award of a contract? 10. Does the procurement regime distinguish between the procurement of sustainable energy goods and services? If so, what rules apply in cases of joint procurement involving both goods and services
b) Regulatory measures	1. Which authorities are in charge of adopting and implementing regulation of environmental services? 2. Must the authorities follow detailed standards or rules in setting prices for sustainable energy utilities? What is the price mechanism used (e.g. price cap or cost plus)? 3. What measures (at which level) and mechanisms are in place to assure fulfilment of universal access to basic environmental services? In which subsectors?Are they objective and transparent? Are foreign service suppliers subject to different or additional conditions than domestic suppliers in relation to public service obligations? 4. Which regulations are in place to ensure sustainable energy service quality? Which technical standards apply? Are they transparent? Are alternative, more efficient ways to meet the standards been considered? 5. How is uncompetitive behaviour, such as abuse of monopoly power, addressed? 6. Are these institutions independent from the government? How is accountability ensured? 7. Are price changes phased in and the public informed about the reasons for the change? Are there any programmes in place to promote the participation of consumers and other stakeholders in regulation?
c) Temporary entry for services- relatedtools of the trade	1. Are there any restrictions on the temporary entry of service-related tools of the trade (e.g. construction equipment, technical and training material or engineering software and design tools)? 2. Do restrictions apply to the temporary intra-firm transfer of service-related equipment? 3. Do restrictions on services-related tools of the trade apply to contractual service suppliers? 4. Do customs procedures exist in the importing country allowing for duty-free temporary admission of services-related tools of the trade?
d) Other relevant measure	1. Are there subsidies for energy services providers? In which segments? 2. Are there international property rights (IPR) laws or regulations that may inhibit the transfer of sustainable energy technology?

(Source: Grosso, M. (2005) 'Managing Request –Offer Negotiations under the GATS: The Case of Environmental Services OECD Trade Policy Working Papers, No 11, OECD: Paris)