



OECD Expert Workshop on

**Optimising Global Value Chains for
Environmental Goods and Services**

8 June 2016

Summary of the Workshop

The workshop was organised by Geraldine Ang, Andrew Prag, Dirk Röttgers, Ronald Steenblik, Cristina Tebar Less, and Robert Youngman. Administrative assistance was provided by Stéphanie Lincourt and Dominique Haleva. Various people, including Geraldine Ang, Pralhad Burli, Andrew Prag, and Ronald Steenblik, were involved in writing up this summary. Przemyslaw Kowalski provided helpful comments. We are grateful to the Japanese Ministry of Finance for supporting the Environment Directorate's work on topics relating to green finance and investment.

The workshop was held under Chatham House Rule, which reads "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed" (Chatham House, 2016, Chatham House Rule; retrieved 31 August 2016 from <https://www.chathamhouse.org/about/chatham-house-rule>).

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OECD EXPERT WORKSHOP ON “OPTIMISING GLOBAL VALUE CHAINS FOR ENVIRONMENTAL GOODS AND SERVICES”

Paris, 8 June 2016

Summary of the Workshop

The workshop on “Optimising Global Value Chains for Environmental Goods and Services”, which took place at the OECD’s Headquarters in Paris on 8 June 2016, gathered more than 90 participants, including delegates from 21 countries, and more than 20 private-sector representatives of investment firms, utilities and business associations. The aim of the workshop was to facilitate a dialogue between OECD delegates and private-sector representatives involved in different parts of value chains for environmental goods and services (including renewable energy). The workshop was organised jointly by staff from three directorates: Environment, Financial and Enterprise Affairs, and Trade and Agriculture. The workshop was held back-to-back with a meeting of the Joint Working Part on Trade and Environment (JWPTE), resulting in high attendance by delegates to that group. Delegates of the Investment Committee and the Working Party on Climate, Investment and Development (WPCID) were also in attendance.

Introductory remarks were provided by Ms. Rachel Bae, Senior Counsellor, Trade and Agriculture Directorate, who began by highlighting the fragmented and globalised nature of investment, production and trade in sectors such as solar photovoltaic (PV) and wind energy. In the context of global value chains (GVCs), such fragmentation and globalisation creates opportunities for firms and countries wishing to enter an industry. However, it also requires countries to think differently about the ripple effects of their policies across the value-chain segments.

The first part of the workshop examined GVCs for environmental goods and services (EGS) in general. The second part focussed on the particular case of renewable electricity equipment.

PART I. Global Value Chains for Environmental Goods and Services

The workshop’s first speaker, Dr. Kowalski (OECD Trade and Agriculture Directorate), opened with the question, “What is really new with GVCs?”. Citing work by the economist Richard Baldwin, he observed that the history of globalisation in recent years could be described as involving two great “unbundlings”. First, separation of production and consumption across international borders, connected by traditional trade and, second, separation of production segments themselves across international borders. The second unbundling in particular was spurred by reductions in information and communications technology (ICT) and in co-ordination costs. One consequence is that firms in developed countries are now able to combine high-tech know-how with lower-wage labour to produce at lower costs.

“What, then, are the economic effects of GVC participation at the country level?”, he asked next. First, providing value-added products that are then processed by other countries (or selling intermediates used by other countries in their exports) contributes directly to the country’s value added (i.e. its GDP). OECD analysis, which combines inter-country input-output data with employment data, suggests that this way of exporting intermediate products that are themselves subsequently exported is more productive than just exporting final products.

The impact of sourcing foreign inputs is less straightforward, but econometric analysis by the OECD shows that sourcing foreign inputs boosts several economic performance indicators, including domestic per-capita value added derived from exports, and contributes directly to employment. A country’s domestic

value added in exports also depends on establishing strong domestic-demand linkages, underscoring the importance of not neglecting domestic reform, and nurturing skills development.

Dr Kowalski next asked what the drivers of GVC participation are likely to be. There are three key types of determinants of GVC participation: (i) structural, (ii) trade; and (iii) investment. Participation also seems to be positively correlated with access to reliable electricity supply, R&D spending, and access to loans, education and training. In developing countries, the policy areas with the highest estimated impact on sourcing foreign inputs are trade facilitation and logistics performance, intellectual property protection, and the quality of infrastructure and of institutions.

The general implications of Professor Baldwin's second unbundling are quite clear. GVCs have made it possible to join globally competitive production processes through specialising in certain segments of the chain. Nevertheless, GVC production processes involve complex, multidimensional flows of material and intellectual inputs that need to be co-ordinated across borders. Today's products are more exposed to potential changes in communication and fragmentation costs, and many of these costs accrue before the border is reached. Firms involved with GVCs also have to manage different regulations, optimise logistics and supporting services, and ensure that their intellectual property is protected.

Turning to environmental goods and services (EGS), Dr. Kowalski noted several interesting characteristics that are being revealed by the ongoing work of the JWPTE. First, important parts of the EGS market are relatively new, and overall the market is growing fast. Second, the state plays a significant role as a consumer, regulator and investor, especially in R&D related to environmental technologies. Otherwise, there is considerable variability among the different market segments. Some segments, such as the wind-turbine industry, benefit from geographical proximity to end-user markets, especially for the supply of large-scale components. Some market segments (e.g., for wind turbines, solar photovoltaic modules) are characterised by high degrees of vertical integration, while others (e.g., for monitoring instruments) are not. And, contrary to popular belief, only some segments are capital and knowledge-intensive.

Mapping GVCs for EGS

This session discussed the key findings of the aforementioned OECD work on global value chains for environmental goods and services (GVCs for EGS), and was introduced by a presentation by Ronald Steenblik (OECD Trade and Agriculture Directorate). It was chaired and moderated by Mr. Vangelis Vitalis, New Zealand Ambassador to the World Trade Organization.

Mr. Steenblik explained that the detailed product coverage of the term "environmental goods and services" was a fluid one, but that there was general agreement that it encompassed various goods and services used for pollution prevention and control, the production of renewable energy, the conservation and management of natural resources, and environmental monitoring.

GVCs seem to be as much a feature of most EGS markets as they are for other goods and services, and the preoccupation of governments is accordingly no different: how to encourage greater participation by developing countries and small and medium-sized enterprises (SMEs) in GVCs for EGS. Preliminary research for the JWPTE suggests that opportunities are greatest for goods and services in large markets that are not dominated by vertically integrated suppliers, and that are growing quickly. The countries witnessing particularly fast growth in their domestic markets are those that are tightening their environmental regulations. Because of high transport costs, suppliers geographically proximate to those markets will be at an advantage. However, there are many small-scale goods (such as filters, and intermediate components of larger goods) that can be shipped easily over long distances. That technological change is happening rapidly can cut both ways. On the one hand, it favours suppliers from

technologically advanced countries; on the other, it means that a company with an innovative product can gain market share quickly.

Government policies clearly play a big role in shaping the markets for EGS. Some policies, such as feed-in tariffs for electricity generated by renewable-energy plants, and “green government procurement” policies, “pull in” goods and services to a country, from both domestic and foreign sources. However, local-content requirements connected with government-procurement, or attached to incentives, raise the cost of meeting environmental objectives, and distort trade and investment. In particular, an LCR that is imposed on an industry that governs its vertical relations through long-term contracts will lack the flexibility to adjust quickly, thereby imposing considerable costs.

Mr. Steenblik concluded that we know a lot about the downstream structure of the EGS industry, and who produces the raw materials that end up in environmental goods, but not much about the in-between stages of production, nor about the contractual arrangements between producers of final products and their intermediate suppliers. This remains an issue for further research.

In partial answer to this question, the workshop heard a presentation by a representative of a major supplier of sealing devices. Sealing devices play an important role in minimising losses of natural resources, such as water and energy, and in preventing pollution. According to the presenter, probably 90% of seals that his company manufacturers are designed to buyer-specific specifications, and the average number of orders for any one specific seal is two.

Kicking off the question-and-answers session, the first discussant underscored the dynamic nature of the wind-energy sector in the past three years, which has seen big changes in the rankings of the top players. The solar industry has also exhibited considerable dynamism. As a result of declining costs, some a result of learning by doing, solar photovoltaic (PV) panels are competing now with fossil-based energy. In short: GVCs are difficult to map because the technologies, commercial relationships, and policies are changing constantly.

Another speaker underscored that local-content requirements are a key issue for exporters headquartered in his country. However, inadequate enforcement of intellectual property rights (IPR) is also a problem. As a result, the latest, most sophisticated technologies are being withheld from certain export markets out of fear of IPR infringement.

One speaker observed that disasters, such as the tidal wave and nuclear-power-plant accident that disrupted supply chains in eastern Japan in March 2011, revealed the importance of global value chains, and their vulnerability. One lesson for multinational enterprises is that they need to constantly assess the resilience of their supply chains to such ruptures.

Another point was made that, when discussing the effects of policies, trade facilitation measures can be vital, especially for SMEs. Among non-tariff barriers (NTBs), custom procedures and rules of origin are especially important. For sectors that require short-term services, Mode 4 barriers to the movement of natural persons can also adversely affect trade.

An expert in traceability in supply chains commented that many GVCs are long, and few corporate officers have any knowledge about what takes place along them more than one segment upstream. Companies just hope that nothing goes wrong. Trade secrets are valuable to companies, however, so it should not be surprising that we do not have full transparency. Still, to know what you sell, you have to know what you buy. And “buy” is mainly what many modern companies do. Some still call themselves manufacturers, but in reality they are traders! They do the marketing and the packaging, etc. But their main motivation for getting to know their supply chains is to squeeze out cost reductions.

This intervention prompted an observation on the difficulty of separately identifying embodied services in production. Some companies have outsourced services, in some cases employing foreign firms, while others have vertically integrated into service provision.

A representative of an industry association then noted the conundrum of data. Companies need improved data flows to monitor the functionality of their equipment. But they are challenged by localisation requirements on data storage and by their need to protect secrecy. He asserted also that companies are not very good at utilising regional trade agreements (RTAs). For instance, only 40% of Danish companies use tariffs available under RTAs. He speculated that the reasons for this could be that: (i) rules of origin are difficult for companies to apply; (ii) people sitting on corporate boards are not interested in logistics; and (iii) small companies do not have the capacity to make full use of free-trade agreements.

Finally, a delegate linked with GVCs and environmental regulations asked whether environmental costs play a role in the configuration of GVCs for EGS. What is the relationship between regulatory issues and the costs of co-ordinating supply across borders? Do environmental services used in connection with environmental goods require tailored policy responses, or should we address them through general trade policy?

The Chair of the session, besides summarising these various points, asked: Is the EGS industry more productive in generating value added than other industries? If it is not, why not? Whether the intensity of trade and investment barriers was greater for EGS than for other products remained an open question, and was the subject of Part II.

What are the key trade and investment barriers to optimising value chains for EGS?

This session addressed some of the key trade and investment barriers to optimising value chains for EGS. Mr. Peter Brun, industry expert, kicked off the session by presenting the list of outstanding trade and investment barriers: these of course included import tariffs, various non-tariff barriers (such as local content requirements and discriminatory Government procurement, restrictive standards and certification requirements, and weak IPR regulation), but also restrictions on trade in services, and trade-defence measures. And, of course, political risk, and inadequate enforcement of the rule of law could also deter investment. The presenter observed an increase in green protectionism over the last decade, both in terms of formal and informal NTBs. These were increasing the cost of building wind turbines, for example, which are typically comprised of some 9 000 separate components. Using the example of solar PV modules, he underscored that much trade is two-way, with exports of capital equipment for solar-cell fabrication flowing in one direction, and finished solar modules in the other. The locations in which value is generated are, consequently, globally distributed.

The speaker suggested that what policy makers often do not appreciate, because of their preoccupation with manufactured products, is the amount of value addition that is “naturally local”. This is generated in large part by numerous services such as construction, testing, sales, and servicing and maintenance. Moreover, LCRs are often designed in ways that ignore the economics of production. The volume of annual production that is sufficient to reap economies of scale varies considerably by component, and can reach 2 000 units in the case of wind-turbine generators.

A representative of the wind-energy industry echoed the point that many of the products and services used in wind farms are naturally supplied locally, unlike some manufacturing inputs, so policy design needs to be careful of interfering with the value chain. He mentioned also that the wind industry is committed to sharply reducing the levelised costs of wind-generated electric power over the next decade, to EUR 80 per MWh by 2025.

One delegate asked whether there are any examples of the successful use of LCRs or of trade remedies. An expert from the renewable-energy industry responded that the answer depends on a number of factors, particularly the size of the domestic market. But one always has to ask what one's measure of success is — success for the protected domestic industry, or success for the global industry and its consumers? And would there have been as much investment in the industry in the absence of the LCR? Another said that if there *were* many good examples of LCRs, then Brazil would currently be a thriving economy.

The discussion on the use of trade remedies (unilateral, country-specific actions to insulate their industries from the adverse effects of alleged dumping or of unfair subsidisation) was more divided, with some countries underscoring the necessity and legality of such remedies, with others arguing that just because the remedies were legal did not automatically mean that they were always a wise instrument to wield.

Thereafter followed a discussion of the effect of the Paris Agreement¹ on the demand for environmental goods and services. One participant noted that some appear to regard the Paris Agreement as providing a license to ignore any obligation to respect intellectual-property-rights. The speaker asserted that this was a mistaken view and that, in any case, a lot of technology transfer is already occurring through foreign direct investment and joint ventures.

PART II. The Case of Renewable Energy (and lessons learned from other sectors)

The rest of the workshop discussed key policy drivers and barriers to trade and investment in one of the most important EGS segments: renewable energy in the power sector.

Fragmentation in renewable energy investment and financing

Mr. Adrian Blundell-Wignall, OECD Special Advisor to the Secretary-General on Financial Markets and Director for Financial and Enterprise Affairs, presented as an “avant-premiere” key findings from the new *OECD Business and Finance Outlook 2016* chapter on “Fragmentation in clean energy investment and financing”. The full outlook was formally launched on the following day. The chapter on fragmentation discusses key trends in renewable-energy financing (especially for wind energy in Europe) and identifies policy misalignments and market barriers constraining investment in renewable electricity. Some of these barriers threaten to fragment renewable-energy value chains, including barriers that were discussed later in the afternoon: the use of local-content requirements (LCRs) in solar and wind energy; outstanding misalignments between specific climate policies and broader investment conditions; and fragmented electricity markets and networks.

In the discussion, private-sector participants stressed the need for better data availability, and highlighted challenges posed by existing electricity market design, such as stagnating energy demand (particularly in Europe) and the need for adequate and stable remuneration. In addition to this focus on “demand-pull” policies, a delegate highlighted the role of multilateral development banks in providing a financing “push” to increase the supply of financing for renewable-energy projects in non-OECD countries. An industry participant highlighted the need to consider the impact of corruption and anti-corruption rules on investment in renewable energy.

¹ This is the agreement, within the framework of the United Nations Framework Convention on Climate Change (UNFCCC), which sets out an international plan for addressing the mitigation of greenhouse-gas emissions, adaptation to climate change, and the financing of the transition. The Agreement was negotiated by representatives of 195 countries at the 21st Conference of the Parties of the UNFCCC in Paris in December 2015.

The use of local-content requirements and trade remedies in solar and wind energy

During this afternoon session, participants had animated discussions and diverging views on two outstanding barriers to international trade and investment in solar and wind energy: local-content requirements and trade remedies.

Ms. Geraldine Ang, Policy Analyst, Directorate for Financial and Enterprise Affairs and Environment Directorate, presented key findings from the OECD report [*Overcoming Barriers to International Investment in Clean Energy*](#), including the increasing use of LCRs in solar and wind energy in OECD and emerging economies since 2010, and their negative impacts on international investment flows in solar and wind energy. The OECD Secretariat and an industry expert also reminded participants that most value-addition potential lies in downstream activities of the solar PV and wind-energy value chains, rather than midstream manufacturing.

Most industry participants and delegates strongly opposed the use of LCRs, reiterating comments made during the morning sessions. They stressed that LCRs are detrimental to international trade and investment in solar and wind energy, as they can increase the cost and reduce the choice and quality of inputs, diminish competitive pressure on local suppliers to innovate, and facilitate the formation of local monopolies and cartels. One delegate raised serious concerns about LCRs which are prohibited under WTO rules. Another delegate reminded that LCRs can adversely affect overseas operations of domestic companies, not just foreign manufacturers and domestic downstream firms.

Participants shared lessons learned across countries on the use of LCRs and alternative ways to support domestic manufacturers. One participant defended the use of LCRs (e.g. to support wind-energy investment), based on certain pre-conditions, country-specific contexts and appropriate policy design. The participant highlighted the need for LCRs to be progressive, with clear objectives, deadlines and rules. He also acknowledged the importance of market competition, including through a competitive process of buying energy such as auctions. Other important lessons include the importance of avoiding import tariff barriers for manufacturers and of setting incentives for LCRs (such as preferential access to financing). The participant acknowledged that there are flexible alternatives to LCRs.

Industry experts at the session noted that it is necessary for policymakers and industry participants to understand the specific risks and benefits of each type of LCR. They reminded participants that the lack of clear and transparent policies affects perceptions about LCRs and limits investment in solar and wind energy. A participant suggested that removing LCRs would help create a competitive environment and gradually wean project developers from subsidies. A delegate stressed the need for policy makers to be creative when dealing with pressures to promote local content by using alternative measures such as free trade agreements (FTAs) and providing preferential access to finance.

The discussion on the proliferation of unilateral **trade remedies** in solar and wind energy, which are authorised under the WTO against dumping or actionable subsidies, led to the most animated discussions and polarised views during the afternoon sessions. A participant pointed out that trade remedies have affected around 75% of trade in renewable energy. Several private participants and one delegate emphasised the detrimental impacts on trade and investment of trade remedies, while another reminded participants that trade remedies authorised under WTO rules are a necessary option for addressing dumping and other unfair trade practices. Another delegate noted that the existence of WTO rules does not necessarily mean that they are fair, and asserted that many anti-dumping and countervailing duty actions have been used in protectionist ways.

Barriers to renewable energy investment within the broader investment environment

This session, which was chaired by Mr. Anthony Cox, OECD Environment Deputy Director, discussed key policy drivers and barriers to renewable-energy investment, beyond trade-related measures. In particular, it focussed on: the effects of specific incentive schemes for renewable electricity deployment, such as feed-in tariffs and competitive tenders, and of other climate policies such as carbon prices; and the importance of aligning broader business conditions to encourage investment in renewable-energy projects.

Several speakers highlighted the trend away from administratively fixed feed-in tariffs (FiTs) and towards competitive auctions, which can be seen across OECD countries as well as in several emerging economies. One expert noted the recent rapid decline in long-term contract prices for new renewables-based power to be commissioned in the next three years. This decline is largely driven by record-low prices in auctions. Another industry expert recounted that, initially, banks invested in renewable-energy projects in France because of the feed-in tariffs, while now they invest in renewables *despite* the country's (low) FiTs.

A few participants noted that fixed FiTs can have repercussions for public budgets (if taxpayer-financed), consumer bills (if financed by rate-payers) and grid absorption capacity, while tenders tend to keep grid capacity issues under control because the total volume of capacity additions is known in advance. An industry expert suggested that the effectiveness of tenders depends on structural features of the market, such as the degree of competition among prospective bidders, as well as the level of technological development reached by the country. Another private-sector participant emphasised that the increasing use of tenders and the declining role of FiTs will introduce a new risk for project developers: price risk.

A few participants also highlighted the importance of setting a stronger carbon price, while acknowledging that current carbon price levels in Europe are too low to drive a switch from fossil fuels to renewable energy. The current design of most electricity markets, which were designed to optimise the operation of conventional electric-power technologies, was also seen as a constraint.

Most industry participants concurred on the need for regulatory and policy certainty, the lack of which they identified as one of the key barriers to investment. In addition to retroactive changes to FiTs, several industry participants pointed to policy impediments within the broader business environment, especially: difficulties in gaining access to land; inadequate investor protection in respect of such issues as intellectual property rights; regulatory restrictions on foreign investment, such as minimum equity requirements; and the complexity of permitting procedures. A private-sector participant also noted that if governments provided certainty on land and grid connection, this would lead to further reductions in renewable-energy prices. An industry participant suggested that some types of barriers can actually be beneficial in structuring markets, by keeping out less-serious investors, whereas other barriers (e.g., the design of tenders and the dominance of state-owned players in some countries) present more substantial impediments to investment. Project developers often enter new markets for strategic reasons, and so may be willing to accept a lower return on equity. A few participants noted that the risk premium differs greatly among countries.

The OECD Secretariat noted that key inputs from the discussion will be reflected in the ongoing OECD empirical research on *Enabling Investment and Innovation in Renewable Energy* (2017, forthcoming).²

² More information on the research project is available [here](#).

Implications of the evolving competitive landscape in electricity markets on renewable investment

This session explored how the changing competitive landscape of the electricity sector has implications for investments in renewable energy, such as the evolving role of incumbent utilities (including state-owned enterprises (SoEs)) and the emergence of new business models.

The session was chaired by Mrs Ana Novik, Head of Investment Division at the OECD. Mr. Andrew Prag, Policy Analyst at the OECD, and a representative from the IEA Secretariat introduced the session by highlighting two related issues: (i) that, even when liberalised, most electricity markets remain highly concentrated, often with high levels of state ownership; and (ii) that current wholesale electricity markets are not delivering the prices necessary to provide adequate returns on investment. These factors make for a challenging investment environment for both incumbent utilities and independent project developers.

The discussion was framed around two questions. First, in what ways do existing wholesale electricity markets, combined with renewable-energy support measures, favour or disfavour different business models, including those of incumbent utilities? Second, does state ownership in the electricity generation sector have implications for investment in renewables, including with respect to the influence of foreign state-owned companies making overseas investments?

One speaker highlighted the ways that current wholesale electricity market designs are suboptimal, especially when combined with renewable-energy support measures that lead to greater deployment of renewable energy than the market would have delivered unaided. Meanwhile, energy demand in many OECD countries has declined due to factors such as deindustrialization, decoupling from growth, and efficiency gains. The decreasing demand is putting downward pressure on wholesale prices, exacerbating the price effects caused by the increasing penetration of renewables. The speaker suggested that renewable-energy policies need to be more market-oriented, with markets themselves offering more frequent pricing and better balancing for renewable energy.

Another speaker presented analysis relating to the investment outlook for certain utilities, both under current market conditions and under scenarios whereby stringency of climate policy would be increased to be in line with meeting the political target to maintain the average global air temperature to no more than 2°C above the pre-industrial level. The analysis pointed to the difficult situation currently faced by utilities due to low market prices and the “zombie power market and zombie carbon market” in Europe. The speaker highlighted that conventional utilities have begun separating their fossil-fuel power-generation assets from their renewable-energy business. In a 2°C-constrained world, a carbon price (in Europe) of around EUR 45 per tonne of CO₂-equivalent would increase the share of natural-gas-fired generation, and would also lead to reduced need for out-of-market support for renewable energy.

A representative of a major private-sector electric utility highlighted the organisation’s renewed strategy away from fossil fuels and towards a greater reliance on renewable energy, energy efficiency and innovation. In the ensuing discussion, participants debated the implications of existing market designs for all power-sector investments, not just in renewable energy. The role of capacity markets was discussed, including the need for increased regional co-ordination for improved flexibility. Several participants pointed out that, given the urgency of deploying low-carbon power generating capacity for climate-change reasons, renewable-energy support measures will remain necessary for the foreseeable future, but that they should be designed so that they can be easily integrated into electricity markets.

Participants’ opinions regarding the influence of state-owned enterprises (SoEs) on renewable-energy investments indicated that additional research is needed in this area. While some suggested that, globally, SoEs represent an important share of power generating capacity and are therefore crucial for future

investment needs, others highlighted the declining market power exercised by SoEs, particularly in Europe. However, participants agreed that SoEs play a larger role in emerging countries.

Conclusion

In summing up the day's discussions, Mr. Joseph Ferrante (Senior Advisor for Trade and Economics in the U.S. Environmental Protection Agency, and Co-chair of the Joint Working Party on Trade and Environment (JWPTE)) noted that it would be impossible to provide a comprehensive overview of what had been a very rich, and sometimes intense, discussion.

He noted, first, that the topic of the workshop was an important one for the various OECD bodies represented at the meeting. Since 1999 the JWPTE itself has produced at least 20 working papers or publications related to trade in environmental goods and services, anticipating many of the issues discussed during the day. The first paper produced for the OECD Trade and Environment Working Paper Series, in 2005, for example, was titled "Synergies between Trade in Environmental Services and Trade in Environmental Goods". The JWPTE, the Investment Committee and the WPCID have also undertaken work on local-content requirements, and the role of trade and investment in facilitating greater penetration of renewable energy in electricity markets. The OECD will continue to do work in this area, and the knowledge gained from the day's dialogue will form an important input to that work.

Among the take-away points he mentioned were:

- Taking a global value-chain perspective on trade and investment in EGS can provide new insights; certainly if we do not take such a perspective we risk making bad policy.
- However, characterising those GVCs is not an easy task. For one, the structure of the industry is constantly changing, even in industries that are relatively concentrated or vertically integrated. For another, policies and the involvement of governments is also constantly changing.
- Clearly, there are government policies that stimulate consumption, trade and investment in EGS — feed-in tariffs in the case of renewable electricity generation is one clear example — and these remain popular. As was heard in the afternoon, the nature of these is changing, however, with an increasing trend towards competitive bidding
- Even when the policies involved are seen as positive, frequent changes and policy uncertainty create their own problems.
- There are other policies that are creating barriers, however. Among the most discussed at the workshop are local-content requirements. Unfortunately, these persist despite their illegality under WTO subsidy and investment rules.
- Trade remedies are perhaps the most controversial policies, which perhaps comes as no surprise: it splits the industry between clear winners and clear losers, depending on whether one is upstream or downstream of the intervention.
- There was a lot of discussion also on optimal policies for stimulating investment in renewable-energy-based electricity generation. The observation was made, for example, that SOEs involved in the electricity market often enjoy preferential financing, such as credit from state-owned banks at below market rates; favourable rate-of-return and dividend requirements; derogation from accounting laws; favourable treatment in public procurement; and even favourable regulatory treatment. While clearly these are issues for investment in competing

providers of electricity, including independent producers using renewable energy, there are by extension also important implications of such treatment of SOEs for trade in energy-related goods and services.

Much research remains to be done, however, to better understand the nature of GVCs for environmental goods and services, and how policies interact with and shape them. Such research should also help point to new opportunities for firms and countries hoping to become more involved in these value chains. Work by the OECD over the coming year will attempt to start filling these information gaps.

**Optimising Global Value Chains for Environmental Goods and Services
OECD EXPERT WORKSHOP AGENDA**

PART I : Global Value Chains (GVCs) for Environmental Goods and Services	
8:30	Registration
9:00	Introduction and scene-setting: GVCs and the need to integrate trade and investment policy <i>Speaker:</i> Rachel Bae, Senior Counsellor, Trade and Agriculture Directorate, OECD
9:15	Keynote presentation: “How do GVCs change our understanding of international trade and investment in environmental goods and services (EGS)?” <i>Speaker:</i> Przemyslaw Kowalski, OECD Trade and Agriculture Directorate
9:30	Session 1: “Mapping GVCs for EGS” This session will discuss key findings from current OECD work about the nature of global value chains for environmental goods and services, including exploring the economic and policy determinants shaping GVCs. <i>Chair and moderator:</i> Vangelis Vitalis, New Zealand Ambassador to the World Trade Organization <i>Introductory speaker:</i> Ronald Steenblik, OECD Trade and Agriculture Directorate <i>Questions for discussion:</i> <ul style="list-style-type: none"> ▪ What do we know about the nature of GVCs for EGS? ▪ What seem to be the economic and policy determinants that are shaping them?
11:00	Session 2: “What are the key trade and investment barriers to optimising value chains for EGS?” <i>Chair and moderator:</i> Peter Brun, Managing Director, SETI Alliance (Alliance of the Sustainable Energy Trade Initiative) <i>Introductory speakers:</i> John Morton, Product Line Director for John Crane, and Chairman of the European Sealing Association
PART II: The case of renewable energy (and lessons learned from other EGS sectors)	
12:15	<i>Avant-première of the OECD Business and Finance Outlook 2016 chapter on “Clean Energy Investment and Financing”</i> This session will present, in <i>avant-première</i> , the chapter on “Clean Energy Investment and Financing” of the 2016 edition of the <i>OECD Business and Finance Outlook</i> , which will be launched on 9 June at the OECD. The chapter reviews recent trends in renewable-electricity investment and financing and identifies policy misalignments and market barriers constraining investment in renewable electricity, with a focus on fragmentation issues. <i>Chair and moderator:</i> Adrian Blundell-Wignall, Director for Financial and Enterprise Affairs, OECD <i>Presentation:</i> Geraldine Ang, Andrew Prag, Raffaele Della Croce, OECD
13:00	LUNCH AND NETWORKING

14:00	<p>Session 3: “Trade and investment barriers: the case of local-content requirements in solar and wind energy, and lessons learned from other sectors”</p> <p>This session will discuss the rise of barriers to international trade and investment in solar and wind energy since 2008, especially local-content requirements, as well as trade remedies. Participants will share lessons on the impacts of local-content requirements in solar and wind energy and explore alternatives to support domestic manufacturing, drawing on lessons learned from other sectors.</p> <p><i>Chair and Moderator:</i> Adrian Blundell-Wignall, OECD Director for Financial and Enterprise Affairs</p> <p><i>Introduction:</i> Geraldine Ang, OECD</p> <p><i>Questions for discussion and speakers:</i></p> <ul style="list-style-type: none"> ▪ What are the impacts of local-content requirements on trade and investment in solar and wind energy? ▪ What are lessons learned across countries on the use of LCRs and alternatives to support domestic manufacturers? <p><i>Speakers:</i> Steve Sawyer, Secretary General, Global Wind Energy Association (GWEC) Mauricio T. Tolmasquim, President, EPE, Brazil (via conference call) Peter Brun, SETI Alliance Georgina Grenon, expert in renewable energy and innovation</p> <ul style="list-style-type: none"> ▪ What are other trade and investment barriers we should be concerned about, such as trade remedies? <p><i>Speaker:</i> Jonas Kasteng, National Board of Trade, Sweden</p> <ul style="list-style-type: none"> ▪ Are there lessons that can be learned from the experiences of other EGS sectors? <p><i>Speaker:</i> Ronald Steenblik, Special Counsellor, OECD Directorate for Trade and Agriculture</p>
15:15	<p>COFFEE BREAK</p>
15:30	<p>Session 4: “Barriers to renewable energy investment within the regulatory and policy framework and the broader investment environment”</p> <p>This session will discuss how barriers within domestic policy frameworks and the broader business environment affect investment in renewable energy.</p> <p><i>Chair and moderator:</i> Anthony Cox, OECD Environment Deputy Director</p> <p><i>Introduction:</i> Geraldine Ang and Dirk Röttgers, OECD</p> <p><i>Questions for discussion :</i></p> <ul style="list-style-type: none"> ▪ What is the role of renewables investment incentive schemes such as feed-in tariffs and public tenders? ▪ What are key policy impediments to renewable energy investment within the broader investment environment, e.g. linked to policy and regulatory uncertainty, as well as market or regulatory rigidities, unsupportive investment policy, or access to financing? ▪ What is the impact of the business environment on the effectiveness of climate policies such as incentive schemes and carbon price? <p><i>Speakers:</i> Heymi Bahar, Policy Analyst, International Energy Agency (IEA) Ranjan Moulik, Head of Power & Renewables, Global Infrastructure & Projects, Natixis Fernando Lasheras García, Director, Iberdrola Alexis Gazzo, Partner, Cleantech & Sustainability, Ernst & Young Pierre Tardieu, Deputy Director, Public Affairs, Wind Europe Jean-Pascal Pham-Ba, Secretary General, The Terrawatt Initiative</p>