

Energy Trade and Investment Taskforce Workshop Report on 'Survey of Climate Change Policies and Other Approaches to Reducing Greenhouse Gas Emissions in the APEC Region'

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Executive Summary

The overall strategic objective of the Energy Trade and Investment Taskforce (the Taskforce) is to improve the transparency, flexibility and efficient operation of APEC energy markets. The Energy Trade and Investment Action Plan outlined the impact climate change policies and approaches have on energy trade and investment within the region. As a result of this, and in response to the APEC Leaders 2009 declaration, the Taskforce held a workshop in Tokyo on 10 March 2010 to share information on climate change policies and approaches to reduce greenhouse gas emissions, and to report on the potential role of agreements on the reduction of greenhouse gas emissions in the energy sector within APEC. It is significant that APEC Leaders also recognised that responding to climate change through a transition to green economies offers opportunities for growth, and that a key thrust in APEC's sustainable growth strategy is the APEC Environmental Goods and Services Work Programme. A Discussion Paper was prepared to inform the workshop discussion.

This first report of the APEC EWG taskforce on Energy Trade and investment focuses on enhancing APEC member economies understanding of policies affecting energy trade and investment including environmental goods and services, by analysing the climate change policy instruments and approaches and their relationship to energy trade and investment.

The Workshop Report provides an initial exploration of the issues impacting on trade and investment in EGS and also seeks to identify options for further progress in this area. It aims to capture and analyse the outcomes of the workshop, concentrating on the relationship between climate change policies and other approaches to reducing greenhouse gas emissions within the region, and the implications for energy trade and investment. The specific elements of the Workshop Report are:

- + **Part 1: Workshop Summary.** The workshop summary records the key points raised in workshop including, the strength of diversity, carbon emission reduction targets, clean energy sources, standards and labelling, consumer information, carbon pricing, post implementation reviews and access to quality data.
- + **Part 2: Analysis of Climate Change Policy Instruments and Approaches.** This section of the report highlights the key policy instruments (market based policies, fiscal policy instruments, informative measures, legislative controls and bi-lateral/multi-lateral agreements) utilised by APEC member economies to enable further understanding of what policy instruments are available to them, and assist them in developing policy approaches that are suitable for their economy specific context.
- + **Part 3: Enablers of Climate Change Policy Instruments and Approaches within APEC.** Expanding on discussion from the Workshop, this section outlines the enablers for further promulgation of the technologies, policies and approaches which reduce green house gas emissions in member economies; and the role of the Taskforce in assisting these enablers. The identified enablers include, measuring effectiveness, facilitating information sharing on energy trade and products, research and development and fostering stronger links between industry and government policy.

- + **Part 4: Energy Trade and Investment in Environmental Goods and Services.** This section of the report draws on the APEC Leaders 2009 declaration and focuses on highlighting the barriers and incentives to energy trade and investment in EGS within the APEC region that were identified in the workshop and through research. Including, consistency of standards and testing procedures, consumer focused information, high initial capital cost, carbon pricing and reforming energy subsidies.
- + **Part 5: Way Ahead.** Outlines the suggestions for the Taskforce for promoting energy trade and investment within the APEC region.

Introduction

The Taskforce Workshop focused on discussing the questions posed in the Discussion Paper on the incentives, barriers and enablers to energy trade and investment within the region. The questions highlighted the relationships between climate change policies and approaches, and energy trade and investment. The Workshop Report (the report) analyses the outcomes of the workshop, with a focus on the issues, barriers, incentives and enablers of energy trade and investment and how the Taskforce could address these issues.

Aim

Responding to the APEC 2009 Leaders Declaration for the implementation of growth strategies that supports more balanced growth in the region and sustains our environment, this report aims to analyse the relationship between climate change policies and other approaches to reducing greenhouse gas emissions within member economies, and the implications for energy trade and investment with a particular emphasis on environmental goods and services.

Objectives

The objectives of the report are to:

- + Analyse the climate change policy instruments and approaches and their relationship to energy trade and investment within member economies.
- + Outline the barriers and incentives to energy trade and investment including environmental goods and services as discussed in the Taskforce workshop in Tokyo on 10 March 2010.
- + Based on this analysis provide the Taskforce and APEC economies with approaches, further directions and issues for consideration, for enhancing energy trade and investment within the member economies.

Scope

The report focuses on enhancing APEC member economies understanding of policies affecting energy trade and investment including environmental goods and services, by analysing the climate change policy instruments and approaches and their relationship to energy trade and investment.

This report draws from, and seeks to build upon, the extensive work already undertaken in this field with a view to developing new ideas and concepts for member's consideration around this issue.

Noting that this issues is of considerable importance to APEC Leaders as states in the APEC 2009 Leaders Declaration, which was the main driver for the Workshop.

In doing so, it does not seek to duplicate work already undertaken by member economy and APEC agencies.

The report contains information from economies that have responded to the *Climate Change Policies and Other Approaches to Reducing Greenhouse Gas Emissions in APEC Economies* survey, the The Taskforce workshop discussion on 10 March 2010 in Tokyo, and information that is publicly available. In doing so, it does not duplicate the information contained in the Discussion Paper.

Methodology

The approach undertaken to develop this report is to leverage off the extensive work already commenced by the Energy Working Group (EWG) on energy trade and investment, including concepts from the desktop literature review. In developing this report, a four step methodology was employed. The first was the circulation of a **survey** to all member economies. This provided the basis for the **Discussion Paper** circulated to member economies. Subsequent to the completion of the Discussion Paper additional survey information was obtained from member economies and incorporated into this report.

The Discussion Paper focused on outlining the climate change policies and other approaches to reducing greenhouse gas emissions by APEC economies. The paper highlighted the key policy trends within responding APEC economies, the impact those policies have on regional trade and investment and the effectiveness of the measures. It identified the trends within non-APEC economies (including India, Brazil and the European Union) and it outlined the issues for consideration for the economies to consider in the workshop in Tokyo, with a specific focus on the relationship between climate change policies and energy trade and investment within the region, including environmental goods and services.

The **Energy Trade and Investment Taskforce Workshop** on 10 March 2010 in Tokyo discussed the questions posed in the Discussion Paper on the incentives, barriers and enablers to energy trade and investment within the region. The questions highlighted the relationships between climate change policies and approaches, and energy trade and investment.

This **Workshop Report** captures and analyses the outcomes of the workshop, concentrating on the relationship between climate change policies and other approaches to reducing greenhouse gas emissions within the region, and the implications for energy trade and investment. The specific elements of the Workshop Report are:

- + **Part 1: Workshop Summary:** This section of the report summarises the key issues outlined by members during the Taskforce Workshop on 10 March 2010 in Tokyo.
- + **Part 2: Analysis of Climate Change Policy Instruments and Approaches:** This section of the report analyses the specific climate change policy instruments and approaches being undertaken by the economies (as identified in the surveys). The analysis is based on the policy instruments as a means to compare and contrast the methods being undertaken by member economies. The focus of this section will be on the similarities and possibility for further integration between economies.
- + **Part 3: Enablers of Climate Change Policy Instruments and Approaches within APEC:** This section will outline the enablers for further promulgation of the technologies, policies and approaches which reduce greenhouse gas emissions in member economies; and the role of the Taskforce in assisting these enablers.

- + **Part 4: Energy Trade and Investment in Environmental Goods and Services:** This section of the report will focus on highlighting the barriers and incentives to energy trade and investment in EGS within the APEC region that were identified in the workshop and through research. It will also outline possible issues for consideration for the Taskforce to assist in enhancing energy trade and investment within the APEC region.
- + **Part 5: Way Ahead:** This section will build on the previous elements of the report, specifically focusing on approaches and issues for consideration for the Taskforce for enhancing energy trade and investment within the APEC region through.

Part 1: Summary of Workshop Discussion

This section of the report summarises the key issues discussed by members during the Taskforce Workshop on 10 March 2010 in Tokyo. This section does **not comment** on the outcomes of the workshop, but provides a record of major themes that emerged during discussion. Some of the implications of these issues are explored in further detail later in the report.

Strength of Diversity

The Workshop discussion highlighted the diversity of approaches to reducing greenhouse gas emissions undertaken by member economies. This reaffirms that the range of practices and technologies potentially available for achieving greenhouse gas emissions reduction is broad and diverse. This diversity is beneficial for member economies as their continued focus on sustainable economic growth - as stated in the APEC Leaders 2009 Declaration - must be approached via different mechanisms to suit individual circumstances.

Furthermore, the International Energy Agency (IEA) has stated that the current growth model and demand for energy is clearly unsustainable and that a new paradigm is needed to transition to a low carbon global economy. The variety of potential greenhouse gas reduction approaches available to the economies will allow them to develop a framework for transitioning to a low carbon economy that is suitable to their individual needs.

Carbon Emission Reductions Targets

During the Workshop it was noted that economies desired an understanding of whether each economy has a formalised carbon emission reduction target, and if so what that target is. This information was seen as being useful in forming the basis of further discussion around ways of achieving the APEC Leaders 2009 Declaration, which outlined the APEC-wide aspirational target of reducing energy intensity by at least 25 percent by 2030 (with 2005 as the base year). The table below outlines the member economies carbon emission reduction targets to 2020.

Table 1: Carbon Emission Reduction Targets

<u>Economy</u>	<u>Carbon Emission Reduction Targets</u>
Australia	5-15% reduction from 2000 levels by 2020
Canada	17% reduction from 2005 levels by 2020
People's Republic of China	40-45% below 2005 levels by 2020
Indonesia	26% by 2020
Japan	25% below 1990 levels by 2020
Republic of Korea	30% by 2020
Mexico	30% below 1990 levels by 2020
New Zealand	10-20% below 1990 levels by 2020
Russian Federation	15-25% below 1990 levels by 2020
Singapore	16% below BAU levels in 2020
The United States	17% reduction from 2005 levels by 2020

The importance of the Copenhagen Accords was also mentioned in the Workshop. The Copenhagen Accord is not legally binding, and commits Annex 1 Parties to implement individually or jointly the quantified economy-wide emissions targets for 2020. Non-Annex 1 Parties to the Convention will implement mitigation actions in the context of sustainable development. Least developed economies and Small Island developing States may undertake actions voluntarily and on the basis of support. The Workshop highlighted the importance of further discussion for member economies around carbon emission reductions targets in accordance with the Copenhagen Accords and the APEC Leaders 2009 Declaration.

Clean Energy Sources

It was highlighted in the workshop that the Discussion Paper did not raise the important issue of clean energy sources. Natural gas is a source of energy that has a growing trend in the APEC region and should be an area of further consideration for the Taskforce. It was identified in the workshop that natural gas has not been a focus area for the EWG. Although natural gas requires high-levels of initial investment, it will

predominate as the cleanest style of fuel for the foreseeable future, and a combination of renewable energy sources and natural gas could reduce CO2 emissions by 75% of current levels within the region. As previously noted, natural gas requires substantial capital investment, however the Workshop discussion highlighted that the same hardware used for coal plants can also be utilised for natural gas. This could reduce some of the initial cost and is worth exploring more extensively.

Nuclear power was also discussed as a clean energy technology worth exploring in more detail. Considerable growth of nuclear energy utilisation in the APEC region is projected to 2030, on the basis of economic and environmental advantages. The environmental advantages include the technology's relatively low greenhouse gas emissions throughout its supply chain¹. The main impediment to nuclear expansion is low public acceptance of nuclear energy due to safety issues. However, it was noted that several economies are exploring the possibility of nuclear energy, and the Taskforce and EWG might consider discussing the region specific pros and cons of nuclear power in more detail in the future.

Standards and Labelling

The inconsistency of standards and labelling within the region was identified as a barrier to energy trade and investment. The lack of conformity and information about testing procedures and standards was significant; however it was noted that the Energy Standards Information System (ESIS) website could help on this issue. Harmonisation of standards will help boost trade and investment in EGS and the Asia Pacific Energy Research Centre (APEREC) was invited to cooperate in this area. This issue is discussed in further detail in *Part 4: Energy Trade and Investment Environmental Goods and Services*.

It was also noted that standards are traditionally very Euro-centric, with Standards committees dominated by large companies. This can potentially disadvantage smaller economies and companies. Further deliberation around evolving standards to satisfy the needs of the region deserves consideration in order to ensure that standards are suitable for all member economies and smaller companies.

Consumer Information

The workshop discussion also highlighted the lack of information for consumers about clean energy products and technology. The lack of information and marketing of environmental goods doesn't allow consumers to make effective green choices. Information about the benefits of these products requires an explanation in layman's terms, to give consumers confidence in their purchases and limit resistance to such products. This issue is discussed in more detail in *Part 4: Energy Trade and Investment Environmental Goods and Services*.

Carbon Pricing

The question of carbon pricing as a useful incentive to promote trade and investment in EGS was posed during the workshop. The lack of a price on carbon was discussed as a key barrier for the APEC region, particularly due to the lack of consistency between member economies around this issue. It was also

¹ APEC Energy Demand and Supply Outlook 4th Edition, Asia Pacific Energy Research Centre, 2009, pg 90

noted that developing such markets needed to be based on cost-reflective pricing. The issue of carbon pricing as a barrier to energy trade and investment is further discussed in *Part 4: Energy Trade and Investment Environmental Goods and Services*.

Post-Implementation Reviews

The workshop discussion highlighted the usefulness of sharing information on policies and projects undertaken by member economies to reduce greenhouse gas (GHG) emissions; what worked, what didn't work etc. It was suggested that some form of post implementation review be undertaken for certain projects and the results and lessons learnt be shared with other members.

It was also noted that EGEEC had already commenced a piece of work which analysed the underlying business models for successful policies within member economies. The results of this study could be used to assist members in applying the most beneficial and effective policy to meet their specific needs.

Access to Quality Data

Measuring the effectiveness of certain policy initiatives was highlighted as a key enabler to energy trade and investment (measuring effectiveness is discussed further in *Part 3: Enablers of Climate Change Policy Instruments and Approaches within APEC*). However in order to measure effectiveness correctly, quality, reliable data was essential. Capacity building activities could be undertaken to assist member economies with more consistent and effective data collection.

Part 2: Climate Change Policy Instruments and Approaches

As noted in Section One, APEC members represent a diverse mix of economies. This diversity provides for a variety of different approaches and responses to mitigate the effects of green house gas emissions. Even so, as a result of these diverse contexts and policy approaches, policy uncertainty can establish itself within the region. Policy uncertainty has been identified as the main barrier to energy trade and investment, and this section attempts to provide an understanding of the policy instruments available to member economies.

This section of the report outlines the specific climate change policy instruments being utilised by the economies (as identified in the surveys). It will assist member economies conceptualise and simplify their discussion around potential policy approaches for reducing greenhouse gas emissions. And it will provide members with clarity and understanding around the policy instruments available for implementation, noting that it is still too early to quantify the effects of the specific policy approaches being undertaken by economies.

Taxonomy of Policy Instruments and Approaches

The taxonomy table below outlines the key policy instruments utilised by APEC member economies. As stated above, the purpose of the taxonomy table is to enable member economies to further understand the policy instruments that are available to them, and assist them in developing policy approaches that are suitable for their economy specific context. The following policy instruments are included in the taxonomy table below.

Market Based Policies

Market-based instruments are policy instruments that use price or other economic variables to provide incentives for polluters to reduce harmful emissions. They seek to address the market failure of negative environmental externalities, either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services.

Fiscal Policy Instruments

Fiscal policy is the use of government expenditure and revenue collection to influence the economy. Fiscal policy instruments for environmental and natural resource management take many forms, but are often identified as selective taxes and fees, capital subsidies, grants, tax exemptions and tariffs.

Informative Measures

Informative measures attempt to educate public consumption patterns towards making more informed, greener choices. They also incorporate government funded research and development, education and training and environmental labelling schemes.

Legislative Controls

Legislative controls refer to legislation, laws or controls passed by governments to reduce the level of emissions within their economy. Examples include technical standard setting, prohibition of harmful substances and emission limits.

Bi-lateral/Multi-lateral Agreements

Bi-lateral/Multi-lateral Agreements are arrangements entered into by economies to formalise a sharing relationship on climate change based information, technology etc.

Table 2: Taxonomy of Policy Instruments

POLICY INSTRUMENT	STRENGTHS	WEAKNESSES	EXAMPLE UNDERTAKEN BY MEMBER ECONOMY
<p>Market Based (Renewable Portfolio Standards (RPS), carbon pollution reduction schemes, emissions trading schemes, carbon pricing etc)</p>	<ul style="list-style-type: none"> + Market based approaches allow for robust economic growth into the future even as global emissions fall + Allow economic growth to continue within sustainability thresholds + Domestic economic cost of reducing emissions is relatively small + provide certainty that environmental outcomes will be achieved because they are underpinned by binding common law agreements that work in conjunction with regulation 	<ul style="list-style-type: none"> + Institutional constraints such as the ability to regulate access to natural resources will limit the extent to which market based policy tools can be used. 	<ul style="list-style-type: none"> + New Zealand Emissions Trading scheme. + The Western Climate Initiative (WCI) is centred on a cap-and-trade program.

<p>Fiscal Instruments (selective taxes and fees, capital subsidies, grants, tax exemptions, tariffs etc)</p>	<p>+ Fiscal instruments are designed to provide more positive financial incentives to promote more favourable forms of production and consumption</p>	<p>+ Certain fiscal instruments can develop artificial market structures</p>	<ul style="list-style-type: none"> + Zero tariff to equipment used in research and development that prevents pollution. + Electricity Efficiency Programme – provides subsidies for efficient electrical products such as light bulbs and electric motors. Subsidies are also available to improve efficient use of electricity in commercial buildings. + Ministry of Energy and Mineral Resources Regulation No.31: Renewable Energy Power Purchasing Price with Small and Medium Scale – determines a purchasing price formula for renewable electricity produced if interconnected to low and medium voltage. + Environmental considerations incorporated in the fuels tax structure including incentives to neutralise polluting fuel use and contribute to the sustainability of the monitoring programs of air quality. + Federal tax credit of 2.1% per kilowatt-hour for renewable electricity production.
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<p>Informative Measures (government funded research and development, education and training, environmental labelling schemes)</p>	<ul style="list-style-type: none"> + Promotes collaboration and encourages innovation; + Powerful persuasive mechanisms for diffusion of knowledge; + Environmental labelling schemes attempt to control consumption patterns by encouraging consumers to use products and services that are less harmful to the environment. 	<ul style="list-style-type: none"> + Many established channels act quite slowly (e.g. university degree programs) Workforce training policies fragmented and underdeveloped compared with education. + Issue of whether standards and labels can differentiate between otherwise like products on the basis of process and production methods (that is, based on characteristics of the production method of a good which are not incorporated into the final product). + Standards and labelling schemes may act as a market access barrier for developing economies because these economies may not have the technical or financial capacity to adapt their methods of production to those required in the importing economies. 	<ul style="list-style-type: none"> + Research and development activities of innovative technologies such as carbon capture and storage and deployment of existing advanced technologies such as photovoltaic power generation + Vehicle Fuel Economy Labelling – allows consumers to make a more informed choice when purchasing a vehicle and to place and appropriate value on the fuel economy. + The Clean Energy Information Platform – will establish an online platform for MEF economies to exchange technical resources, policy experiences and the infrastructure to coordinate various activities in deploying clean energy technologies, and share this information with the world.

<p>Legislative controls (technical standard setting, prohibition of harmful substances, emission limits, etc)</p>	<p>+ Potential for deep and lasting impacts</p>	<p>+ Consensus of standards development can be slow: often leads to compromise among competing private interests with limited public-interest input</p>	<p>+ Mandatory standards that will reduce the carbon dioxide emissions from the automotive sector.</p> <p>+ Carbon Audit Guidelines for buildings to facilitate building owners/managers to measure GHG emission performance and pursue emissions reduction measures.</p> <p>+ Law for the use of Renewable Energy and the Financing of Energy Transition – gradual process of diversification away from fossil fuel energy sources for electricity generation.</p>
<p>Bi-lateral/Multi-lateral agreements</p>	<p>+ Enhances international engagement and alignment on environmental issues</p>	<p>+ Agreements can be to the detriment of others due to exclusiveness etc.</p>	<p>+ Hong Kong China signed with the Energy Administration of the People’s Republic of China the Memorandum of Understanding on energy cooperation in August 2008 to enable the power generation sector to raise the share of natural gas in domestic electricity generation.</p> <p>+ Asia Pacific Partnership – is a public-private partnership to promote economic development, reduce poverty and accelerate the development and</p>

			deployment of cleaner, more efficient technologies to address increasing energy needs and the associated issue of air pollution, energy security and climate change.
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Implications and Analysis of Policy Instruments

Although initial assessment may indicate that APEC member economies differ in their approaches to mitigating the effects of GHG on the environment; closer analysis of the policy instruments indicates otherwise. APEC member economies climate change mitigation approaches all fall under the policy instrument categories outlined above. Although the approaches themselves may vary, the policy instruments remain the same. By analysing these methods in terms of policy instruments the possibility for less uncertainty and further integration within the region become more apparent.

The following table analyses the policy instruments in terms of emissions reduction effectiveness and cost effectiveness and provides a high-level overview of the policy instruments and their application.

Table 3: Analysis of Policy Instruments

Low	
Medium	
High	

<u>Policy Instrument</u>	<u>Attribute</u>		<u>Issues for consideration</u>
	<u>Emission Reduction Effectiveness</u>	<u>Cost-effectiveness*</u>	
Market Based Policy			Although relatively cost effective per carbon emission avoided, market based policies can be costly and technical to implement
Fiscal Instruments			If properly structured can stimulate environmentally favourable methods of consumption and production
Informative Measures			Mandatory programs are more effective than voluntary ones.

			Best applied in combination with other policy instrument and regular updates.
Legislative Controls			Can be restrictive on industry
Bi-lateral/Multi-lateral agreements			Success relies on combination with other measures and periodic evaluation of agreements.

*this is related to specific societal costs per carbon emission avoided

Market Based Policies

Market based instruments are *regulations that encourage behaviour through market signals rather than through explicit directives regarding pollution control levels or methods*². Market based policy instruments are cost effective and often provide dynamic incentives for technology innovation and diffusion. Market based instruments (if designed and implemented correctly) equalise the incremental amount that firms spend to reduce pollution³ as opposed to the application of uniform emissions standards which can discriminate smaller firms or economies. Market based instruments have the potential to provide powerful incentives for companies to adopt cheaper and more effective pollution control technologies.

Market based policy instruments can be considered within four major categories: pollution charges, tradeable permits, market barrier reduction and government subsidy reduction. The use of such market based approaches represents a developing trend within the member economies in the form of increasing support and deliberation by governments. Further consideration could be given to promoting market based policies by the Taskforce. Specifically as rights and obligations established under such policies can often be tradeable and can increase energy trade and investment options. Increasing the opportunity for energy trade within the region by encouraging the adoption of market based policy instruments, will allow for robust economic growth into the future, even as global emissions fall.

Fiscal Instruments

Fiscal instruments such as energy subsidies are beneficial to economies when aimed at promoting cleaner and more efficient technologies. The most common economic instrument used by member economies is energy subsidies. Energy subsidies are defined as, *any government action that influences energy market outcomes by lowering the cost of energy production, raising the price received by energy producers or*

² Market-Based Environmental Policies, Robert N. Stavins Discussion Paper 98-26, March 1998, <http://qed.econ.queensu.ca/pub/faculty/garvie/eer/stavins.pdf> pg 1

³ Market-Based Environmental Policies, Robert N. Stavins Discussion Paper 98-26, March 1998, <http://qed.econ.queensu.ca/pub/faculty/garvie/eer/stavins.pdf> pg 3

lowering the price paid by energy consumers⁴. The following table outlines the main types of energy subsidies.

Table 4: Main Types of Energy Subsidies

<u>Government Intervention</u>	<u>Example</u>	<u>How the Subsidy usually works</u>		
		Lowers Cost of Production	Raises Price to Producer	Lowers Price to Consumer
Direct Financial transfer	Grants to Producers	✓		
	Grants to consumers			✓
	Low interest of preferential loans	✓		
Preferential tax treatment	Rebates or exemptions on royalties, sales, taxes, producers levies and tariffs	✓		
	Tax credit	✓		✓
	Accelerated depreciation allowances on energy-supply equipment	✓		
Trade restrictions	Quotas, technical restrictions and trade embargoes		✓	
Energy-related services provided directly by government at less than full cost	Direct investment in energy infrastructure	✓		
	Public research and development	✓		
	Liability insurance and facility decommissioning costs	✓		

⁴ Reforming Energy Subsidies – opportunities to contribute to the climate change agenda, United Nations Environment Programme Division of Technology, Industry and Economics, 2008, pg 8

Regulation of the energy sector	Demand guarantees and mandated deployment rates	✓	✓	
	Price controls		✓	✓
	Market-access restrictions		✓	

Economic instruments can promote efficient, competitive energy markets and applying subsidies to renewable energy technologies will assist economies in the pursuit of sustainable development whilst reducing emissions. The use of economic instruments to facilitate efficient products is one of the most used policy instruments within the APEC region. These economic instruments are designed to provide more positive financial incentives to promote more favourable forms of production and consumption. They also assist in improving poor households' access to modern forms of energy⁵. This is an effective short term solution, but economies will need to provide additional incentives to energy generators in a regulated market.

Informative Measures

Informative measures such as environmental labelling schemes attempt to control consumption patterns by encouraging consumers to use products and services that are less harmful to the environment. Environmental labelling is growing in importance within member economies and work needs to continue on the harmonisation of labelling schemes throughout the region.

Informative measures such as government funded research and development and education and training are used both within individual member economies and between economies, e.g. certain economies providing funding for research and development within other economies. Sustained government support for informative measures within the region will continue to promote collaboration and encourage innovation. Informative measures are powerful persuasive mechanisms for the diffusion of knowledge within the region.

Legislative Controls

Legislative controls such as technical standard setting, like labelling, have been growing in importance within the region. Member economies have identified the importance of synchronisation when setting technical standards as they can create barriers to market access for developing economy producers. To avoid the imposition of standards difficult to comply with, developing member economies should be involved in the process of setting environmental standards, and should be provided with assistance by developed economies to build capacity to conform to such standards. Harmonisation in technical standard setting throughout the APEC region has the potential for deep and lasting positive impacts on the environment.

⁵ Reforming Energy Subsidies – opportunities to contribute to the climate change agenda, United Nations Environment Programme Division of Technology, Industry and Economics, 2008, pg 2

Bi-Lateral/Multi-lateral Agreements

Bilateral and multilateral agreements are an effective tool for enhancing international engagement and alignment on environmental issues. Within the APEC context, such agreements promote collaboration and information sharing around energy trade and investment.

Summary

Part 2 of the report attempts to provide member economies with a high-level understanding of the policy instruments to enable them to conceptualise and simplify their discussion around potential policy approaches for reducing greenhouse gas emissions.

Part 3: Enablers of Policy Instruments and Approaches

Expanding on discussion from the Workshop, this section outlines the enablers for further promulgation of the technologies, policies and approaches which reduce green house gas emissions in member economies; and the role of the Taskforce in assisting these enablers.

The purpose of this section is to promote the uptake of renewable energy technologies and approaches, by identifying some practical measures which member economies can use to assist them to reduce GHG emissions and increase the opportunities for energy trade and investment including EGS.

Measuring Effectiveness

As outlined in the workshop, measuring effectiveness of policies and approaches to reduce GHG emissions will enable APEC members to identify what has and has not been successful in regards to improving energy efficiency. Being able to clearly identify which policies are effective in reducing GHG emissions will facilitate confidence in these policy approaches and encourage other economies to explore similar options. Successfully measuring policy effectiveness will also assist in removing policy uncertainty by increasing confidence in their application.

It is worth noting that in terms of quantitative assessment, the effectiveness of policy instruments cannot be measured accurately as a standalone entity. The assessment of the effectiveness of renewable deployment technologies and approaches must also consider the entire policy framework into which the specific policy instrument is inserted, rather than focusing on which specific policy instrument functions best⁶. It is acknowledged that member economies have divergent policy frameworks to suit their individual circumstances, and therefore deployment of certain policy approaches cannot be solely determined on their individual assessment of effectiveness.

If successfully communicated within the APEC cooperation, the information gathered from measuring effectiveness can be used by all economies to help assist them identify what policy instruments will be suitable for their specific circumstances.

⁶ Deploying Renewables – Principles for Effective Policies, International Energy Agency, OECD/IEA 2008, pg 92.

To ensure measuring effectiveness is done accurately, quality, reliable data is essential. As is the use of common measurement techniques to ensure information is transferable to all member economies. The Taskforce could assist in encouraging members to measure policy effectiveness by focusing on capacity building exercises and improvements in the area of data.

Facilitating Information Sharing on Energy Trade and Products

As stated in the previous section *Measuring Effectiveness*, information sharing is a key facilitator for encouraging APEC to reduce their GHG emission as a cooperative entity and as a result increase their options for energy trade and investment.

The APEC Environmental Goods and Services Work Programme states that..."joint research, development, deployment and transfer of low and zero emission technologies will be crucial in our shared efforts to address climate change⁷." This statement reaffirms the importance of information sharing. In order for the region to improve their energy trade and investment capability, consistent collaboration must be encouraged.

The Taskforce can act as a conduit to continued information sharing by encouraging forums, discussion and workshops to promote continual information sharing on energy trade and investment.

Research and Development

Research and development (R&D) activity is defined as, *the systematic investigation or experimentation involving the innovation or technical risk, the outcomes of which is new knowledge, with or without a specific practical application, or new or improved products, processes, materials, devices or services. R&D Activity extends to modifications to existing products/processes and ceases when work is no longer experimented⁸.*

The APEC EGS Work Program Framework highlights the importance of R&D for both goods and services. It refers to developing new and better EGS through innovative R&D which address not only trade in EGS, but also environment and development (i.e. rural development, job creation and applied technology). APEC economies can share ideas and best practices on innovation and R&D programmes that spur the development of EGS.⁹ Encouraging research and development is an important building block for developing future options for reducing growth in long term energy consumption and emissions and is a goal endorsed by APEC Leaders.

APEC governments have a role to play in providing public sector R&D, as previously mentioned, policies that encourage investment in R&D tend to result in higher rates of technology adoption and transfer. R&D enables further promulgation of the technologies, policies and approaches which reduce GHG and increase energy trade and investment.

⁷ APEC Environmental Goods and Services Work Program, <<http://egs.apec.org/apecegs-news/250-apec-environmental-goods-and-services-work-program>>

⁸ APEC Energy Security and Sustainable Development through efficiency and diversity – economic issues in technology R&D, adoption and transfer, Abare research report 07.12, Lindsay Hogan, Robert Curtotti, Angelica Austin, 2007, pg 89

⁹ APEC Environmental Goods and Services Work Program, <<http://egs.apec.org/apecegs-news/250-apec-environmental-goods-and-services-work-program>>

Further discussion (facilitated by the Taskforce) on what research and development activities are currently being undertaken within the region will promote collaboration and information sharing, and will allow economies to share information on best practice research initiatives.

Fostering Stronger Links between Industry Investment and Government Policy

Attracting industry investment is a strong enabler for the proliferation of policies and approaches which reduce green house gas emissions. In order to foster stronger links between industry investment and government policy, a business enabling environment needs to be created.

Mechanisms to enhance energy technology transfer and adoption already exist within the APEC forum. The EWG facilitates linkages between government officials, financial sector representatives and energy business representatives. The EWG engaged with the private sector principally through the EWG Business Network (EBN), a consortium of business representatives which regularly provided advice and commercial views on the issues considered by EWG members. While the EBN has been dormant for a period of time, there is potential for this group to be reinvigorated through playing a key role in providing advice on the challenges and issues involved in mobilising the investment requirements for the APEC energy sector over coming decades, including on promoting the development of EGS in the region.

The Taskforce might wish to consider how it can best leverage the views and opinions of industry in order to better understand the dynamics, barriers and challenges involved in developing a competitive EGS sector in the transition to a green and low carbon regional economy.

Part 4: Energy Trade and Investment in Environmental Goods and Services

At the 17th APEC Economic Leaders Meeting , Singapore, 14-15 November 2009, Leaders stated that they will put in place a comprehensive long-term growth strategy that supports more balanced growth within and across economies; achieves greater inclusiveness in our societies; sustains our environment; and seeks to raise our growth potential through innovation and a knowledge based economy.

Furthermore, APEC Leaders stated that a key thrust of APEC's sustainable growth agenda is the APEC Environmental Goods and Services (EGS) Work Program. The EGS Work Program will develop and implement a set of concrete actions to support sustainable growth in the region, advance work to increase utilisation and dissemination of EGS, reduce existing barriers and refrain from introducing new barriers to trade and investment in EGS, and enhance capabilities of economies to develop their EGS sectors.

In response, the EWG's Energy Trade and Investment Task Force has assessed the climate change policies to reduce greenhouse gas emissions in the APEC region, with a view to promoting the uptake and development of trade and investment in EGS. While this survey is a first step in advancing APEC Leaders

2009 instructions, it is anticipated that the results will identify further opportunities for information sharing and capacity building in the region's EGS sector.

The Task Force anticipates the survey results will be reported to the 9th APEC Energy Ministers Meeting in Japan in June 2010. It is hoped that APEC Energy Ministers will provide further instructions and directives on the forward work program of the Task Force in promoting growth, trade and investment opportunities in the region's EGS sector.

Energy trade and investment in environmental goods and services is a priority for APEC Leaders, and as stated above, is a key thrust in APEC's sustainable growth agenda is the APEC EGS Programme Framework, which was endorsed by Ministers at the 2008 APEC Ministerial Meeting. The objectives of the Framework are to support the development of the EGS sector in APEC and to provide a coherent setting for the work under way in various APEC bodies. APEC Leaders have also affirmed that *"an open global trade and investment system is central to our clean development objectives and market opening in the World Trade Organization (WTO) would advance our climate and energy security goals."*¹⁰

This section of the report will focus on highlighting the barriers and incentives to energy trade and investment in EGS within the APEC region that were identified in the workshop and through research. It will also outline possible issues for consideration for the Taskforce to assist in enhancing energy trade and investment within the APEC region. Noting that under the EGS Work Program, extensive work is being done to increase utilisation and dissemination of EGS including; reducing existing barriers and refraining from introducing new barriers to trade and investment in EGS, and enhancing capabilities of economies to develop their EGS sectors¹¹.

Consistency of Standards and Testing Procedures

As previously mentioned in *Part 1: Workshop Summary*, the inconsistency of standards within the region has been highlighted as a barrier to energy trade and investment. Since appliances are internationally traded, having to retest a product for export to different economies represents a significant burden.

The first priority for alignment should be test procedures as this facilitates the ability to manufacture and sell products across different markets, and also allows a consistent comparison of energy performance and energy efficiency. Consistency and alignment of standards between APEC member economies will produce the following benefits:

- + **Benefit to Regulators.** Alignment allows regulators in individual economies to avoid reinventing the wheel and to benefit from best practices. Adoption of well-established test procedures considerably reduces program costs.
- + **Benefit to Manufacturers and Suppliers.** Product testing and registration impose significant transaction costs for manufacturers and suppliers who are selling to multiple markets. Alignment of test procedures and processes avoids multiplying this burden when products are crossing

¹⁰ APEC Environmental Goods and Services Work Program, EGS for a sustainable economy, APEC, <<http://egs.apec.org/apecegs-news/250-apec-environmental-goods-and-services-work-program>>

¹¹ APEC Environmental Goods and Services Work Program, <<http://egs.apec.org/apecegs-news/250-apec-environmental-goods-and-services-work-program>>

international borders since it can eliminate the need for multiple testing, therefore, suppliers would be able to “test once and sell anywhere.”

- + **Benefits to Consumers.** By reducing the transactions costs to suppliers, alignment lowers the end cost of product. In addition, for many developing economies, alignment to an international standard will improve the overall quality of products by reducing the number of untested or poor quality sub-standard products in the market.

However, one of the barriers to developing new standards is cost, which can hinder the development of consistent standards throughout the region. The problem of resources and high cost can be addressed in two ways:

- + economies can work together to develop truly international test procedures so that all economies can less expensively adopt these test procedures; and
- + economies can “benchmark” their labelling tiers and minimum energy performance standard (MEPS) levels with other economies, which mean that each economy can rely on results of its predecessors to reduce its costs for independent market assessments and feasibility studies¹².

The above outlines the importance of alignment and consistency of standards and testing procedures to encourage energy trade and investment within the region. Therefore the Taskforce needs to consider how it can encourage the development of consistent standards and testing procedures throughout the region.

The Taskforce could consider chairing a workshop of member economies to discuss the development and application of synchronisation in test procedures throughout the region. This would harness the effective work already undertaken by the EWG and other APEC working groups, and encourage continued discussion on this issue.

Consumer Focused Information

As previously mentioned in *Part 1: Workshop Summary*, the lack of information for consumers on the positive effects of energy saving products is one of the largest barriers to energy trade and investment. It was identified in the Workshop that there is a lack of consumer focused information on products to assist consumers in making ‘greener’ choices.

In order to increase the promulgation of consumer focused information on energy saving products, the Taskforce could assist in identifying what information is currently being disseminated about EGS to the consumer by member economies. The Taskforce could consider developing another survey (to be distributed to member economies) to identify what information is currently available to consumers. Once this information has been identified, a follow on workshop could be convened to ascertain what consumer focused information has been encouraging consumers to purchase more energy efficient products.

It was noted in the Workshop that existing information on energy efficient products is far too technical and does not provide the consumer with adequate information to inform their decision making. The Taskforce

¹² A Strategic Vision for International Cooperation on Energy Standards and Labeling, June 2006, pg 32

could consider undertaking some market based research in regards to identifying what are the underlying drivers and tipping points for getting people to take action (from a consumption perspective) when it comes to energy efficiency. Identifying what consumers respond to and what their needs and wants are, will assist in identifying the most effective information required to encourage consumers to purchase energy efficient products. Increasing demand for such products will also encourage increased investment in the sector.

High Initial Capital Cost

Technology choice is affected by market structure. Under a liberalised market environment, whether competition is retail or wholesale, generators are essentially required to produce electricity at a relatively low cost compared with competitors. In such a market environment, advanced technologies (such as renewable energy technologies) are often outside of the generators' choice due to higher initial capital investment requirements¹³. This leads to under investment in energy efficient technologies as high initial capital investment may not be easily recovered when the retail price of electricity needs to be maintained at a competitive level.

In regulated markets electricity costs do not reflect the true cost of generation. Electricity prices are often regulated to maintain prices at an affordable level for residential customers. Rises in energy costs are not always directly passed onto the consumer through higher retail prices in order to ensure affordability and control inflationary pressures. With low electricity retail prices compared to the true cost of generation, generators have little incentive to invest in advanced technologies. Low electricity retail prices will not generate a high enough rate of return to cover initial investment¹⁴.

Particularly in developing APEC economies, energy generators cannot easily adopt advanced technologies due to a lack of financial resources.¹⁵ This can hamper energy trade and investment in renewables as developing economies are priced out of the market. The Taskforce (in possible partnership with APERC) could consider identifying how the Clean Development Mechanism (CDM) could assist developing economies overcome the high initial cost of energy efficient technologies. The CDM was launched in 2001 and was designed as an international market mechanism that engages developing economies. It is designed to function as an incentive mechanism to promote emission reduction projects in developing economies.¹⁶ CDM works by capping emissions by rich economies, forcing them to buy permits from less developed economies to enable them to emit greenhouse gases. This capital can be used to assist developing economies generate the appropriate funds to invest in energy efficient technologies. The Taskforce could focus on identifying how the capital generated by the CDM can assist in the deployment and installation of advanced technologies to enhance energy trade and investment within the region.

¹³ Energy Efficiency in the APEC Region, *Energy Efficiency Investment in the Power Sector: Barriers and Facilitators*, 2008, pg 59

¹⁴ Asia Pacific Economic Cooperation Energy Working Group Expert Working Group on New and Renewable Energy Technologies, 1998

¹⁵ Energy Efficiency Investment in the Power Sector: Barriers and Facilitators, Investment Barriers and Facilitators APERC 2008, pg 62

¹⁶ Global Greenhouse Warming, *Clean Development Mechanism* < <http://www.global-greenhouse-warming.com/cleandevlopmentmechanism.html>>

Carbon Pricing

As the majority of the APEC region's energy consumption is derived from fossil fuels, a carbon tax would increase the cost of producing goods that use energy (or energy-intensive materials) as an input to production. These increases in production costs could negatively affect industries that either compete in export markets with producers not similarly affected, or face competition in the domestic market from imports from such unaffected producers¹⁷.

However, not pricing carbon carries substantial economic risks as a barrier to energy trade and investment. It may lock the region out of the emerging carbon markets, limiting both foreign investment in member economies clean technologies and plantations. Insulating the region from a carbon price, may hinder the development of new clean industries, and increases future dependence on imported technology and expertise. Not pricing carbon will also fail to preserve the competitiveness of member economies coal exports which will be subject to the emissions policies and taxes of importing economies¹⁸.

To reduce greenhouse gas emissions and mitigate the damaging effects of climate change, a combination of measures, of which carbon pricing is one, should be adopted. Carbon pricing is an important aspect for promoting the triple objectives of improving energy efficiency, protecting the environment and ensuring investment for infrastructure of energy supply¹⁹.

Carbon pricing is an important and contentious issue for member economies due to the regions heavy reliance on fossil fuels, and their commitment to sustainable development. However, carbon pricing is an important aspect that could enhance energy trade and investment in renewables within the region. Therefore carbon pricing needs to be discussed further by the economies. The Taskforce (with possible partnership from APERC) could play a facilitating role for member economies by encouraging further discussion and research into the effects of carbon pricing within the region, and whether it is a plausible option for economies to consider.

Reforming Energy Subsidies

Government policies regarding energy production and consumption currently tend to steer markets along conventional supply paths, and to form market barriers to the introduction of renewable energy technologies. In many cases, governments provide direct or indirect subsidies which encourage fossil fuel production and consumption and discourage alternative energy choices. In the APEC context, energy policies commonly include subsidies, import tariffs, taxes and levies²⁰. Reforming energy subsidies which distort market choices, combined with energy pricing which incorporate the full social and environmental costs of various technologies, could help create a level playing field on which all potential energy options could be judged on their merits.

¹⁷ Competitiveness and Carbon Pricing – border adjustments for greenhouse policies, *The Australia Institute*, Hugh Saddler, Frank Muller and Clara Cuevas, Discussion Paper Number 86 April 2006, pg 7.

¹⁸ Competitiveness and Carbon Pricing – border adjustments for greenhouse policies, *The Australia Institute*, Hugh Saddler, Frank Muller and Clara Cuevas, Discussion Paper Number 86 April 2006, pg 9.

¹⁹ Asia Pacific Energy Research Centre, APEC Energy Pricing Practices, Implications for Energy Efficiency, The Environment and Supply Infrastructure, < <http://www.ieej.or.jp/aperc/final/pricing.pdf>> pg 1

²⁰ <http://www.ieej.or.jp/aperc/final/pricing.pdf>

However it is noted that in some APEC economies, electricity retail prices are often regulated through subsidies to guarantee affordable energy prices for their customers. For example a rise in input energy costs may not be reflected in the retail prices within some economies in order to ensure affordability and control inflationary pressures²¹.

The importance of energy pricing has not gone unnoticed within APEC, as in 1996 APEC Energy Ministers adopted 14 Non-Binding Energy Policy Principles to be considered by economies in the formulation of energy policies. Principle 5 specifically addressed the importance of energy pricing for APEC member economies. It stated that economies should *consider reducing energy subsidies progressively and promote implementation of pricing practices which reflect the economic cost of supplying and using energy across the full energy cycle, having regard to environmental costs*²².

The APEC Leaders statement 2009 also stated that “...we commit to rationalise and phase out over the medium term fossil fuel subsidies that encourage wasteful consumption, while recognising the importance of providing those in need with essential energy services. We will also take steps to facilitate the diffusion of climate-friendly technologies, including through economic and technical cooperation (ECOTECH) and capacity building activities.”

Reaffirming the diversity of APEC member economies, it is not possible to apply a uniform energy pricing approach to each economy in the APEC region. However, encouraging capable economies to reduce energy subsidies on fossil fuel based energy production will remove the market barriers to investment in renewable energy technologies. This will facilitate increased energy trade and investment in clean technologies. The Taskforce could assist in facilitating this process by increasing research into energy pricing, (building upon the existing APEC Energy Pricing Database) and conduct a possible survey of current energy pricing policies to allow member economies to identify possible areas eligible for reform.

Part 5. Conclusion and Way Ahead

Responding to the APEC 2009 Leaders Declaration, this report has analysed the relationships between climate change policies and other approaches to reducing greenhouse gas emissions within member economies, and the implications for energy trade and investment with a particular emphasis on environmental goods and services.

An important initial step is for this report to contribute to informing contemporary policy dialogue around the issues of climate change policies, energy trade and investment and environmental goods and services to advance the development of balanced and sustainable growth within the region. This report, the first of the APEC EWG Energy Trade and Investment Taskforce, aims to lay the foundations for further work in exploring the opportunities and challenges to be addressed in advancing EGS trade and investment.

²¹ Energy Efficiency Investment in the Power Sector: Barriers and Facilitators, Investment Barriers and Facilitators APERC 2008, pg 60

²² <<http://www.ieej.or.jp/aperc/final/pricing.pdf>>

The report makes the following suggestions for the Taskforce for promoting energy trade and investment within the APEC region. Taskforce members may wish to consider these issues in actioning APEC Leader's directives including APEC energy minister's directive to be provided in June 2010.

- ① *Suggestion 1: Further research could be undertaken on the implications of market based policies.*
- ① *Suggestion 2: Focus on gathering quality data in order to assist measuring effectiveness.*
- ① *Suggestion 3: Focus on capacity building exercises and improvements in the area of data collection.*
- ① *Suggestion 4: Further discussion (facilitated by the Taskforce) on what research and development activities are currently being undertaken within the region.*
- ① *Suggestion 5: Promote continual information sharing on energy trade and investment issues in the region, particularly on the EGS sector.*
- ① *Suggestion 6: Promote further discussions with industry partners in partnership with the EWG.*
- ① *Suggestion 7: Encourage the development of consistent standards and testing procedures that promotes EGS trade and investment and the development of a competitive EGS sector throughout the region.*
- ① *Suggestion 8: Consider chairing a workshop of member economies to discuss the development and application of synchronisation in test procedures throughout the region.*
- ① *Suggestion 9: Consider developing another survey (to be distributed to member economies) to identify what information is currently available to consumers. Once this information has been identified, a follow on workshop could be convened to ascertain what consumer focused information has been encouraging consumers to purchase more energy efficient products etc.*
- ① *Suggestion 10: Consider undertaking market based research to identify what the underlying drivers and tipping points are for encouraging consumer interest in energy efficiency and purchase of energy efficient products and services.*
- ① *Suggestion 11: Focus on outlining how capital generated by the CDM can assist in the deployment and installation of advanced technologies to enhance energy trade and investment within the region.*
- ① *Suggestion 12: Encourage further discussion and research into the effects of carbon pricing within the region.*
- ① *Suggestion 13: Conduct a possible survey of current energy pricing policies to allow member economies to identify possible areas eligible for subsidy reform.*