



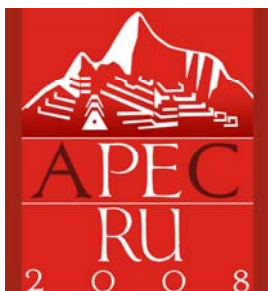
**Asia-Pacific  
Economic Cooperation**

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**2008/ASCC/009**

## **Climate Change and Security Issues in APEC**

Purpose: Information  
Submitted by: Mexico



**APEC Study Centres Consortium Conference  
Piura, Peru  
19-21 June 2008**



# Climate Change and Security Issues in APEC

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## INTRODUCTION

Despite the targets in the Kyoto Protocol, greenhouse gas emissions (GHG) from countries forming the Organization for Economic Cooperation and Development (OECD) are increasing as well as those from developing countries. The United States (US) remains a major contributor to this situation. Brazil, China, India, Mexico and South Africa account for 1/4th of global emissions, which is not remarkable given that they have more than 1/3rd of the global population. However, in terms of emission intensity (tones of CO<sub>2</sub> equiv. per GDP), these countries are amongst the top 20 emitting countries. By 2025, GHG emissions in China, India, Mexico and Brazil are expected to increase to 118%, 70%, 124% and 68% respectively (ESMAP, 2006).

Accounting for around 60% of world energy demand, the APEC region is a net energy importer since its aggregate annual consumption of energy exceeds annual domestic production. Energy imports to APEC economies are projected to increase by approximately 92% between 2000 and 2020 as domestic supplies fail to keep pace with expanding energy demands which are being driven by economic growth, industrialization and urbanization. According to the Energy Working Group's (EWG) projection, demand for energy in the APEC region will continue to increase for the foreseeable future (EWG, 2008).

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Projections from the Organization of the Petroleum Exporting Countries (OPEC) and the International Energy Agency (IEA) indicate a need for investment of US\$20 trillion between 2005-2030 in all energy sectors world-wide and, in particular for investment in oil and gas of US\$6 trillion. The capital expenditure on oil and gas of US\$200 billion per year includes the expansion of oil and gas supply capacity as well as the modernization of existing upstream and downstream facilities. The energy sector in APEC economies faces significant challenges in mobilizing the private capital and international financial resources required to fund the estimated US\$3.4 trillion to US\$4.4 trillion in energy investment needed over the next 20 years (International Energy Agency, 2006).

Investigating the most general meaning of security, Abbot *et al.* (2006) offer an overview of four groups of factors identified as the root causes of conflict and insecurity in today's world and the likely determinants of future conflict: a) climate change; b) competition over resources; c) marginalization of the majority world; and d) global militarization. The authors argue that current security policies are self-defeating in the long-term, and propose a new approach named *sustainable security*, that rather aims to cooperatively resolve the root causes of those threats using the most effective means available (p. 3).

The climate change impacts are impacting directly the trade and investment flows in the APEC community, as well as the security of the region. ¿How does APEC deal with these new challenges?

In order to address this research question, this paper looks at the possibility to mitigate climate change impacts through energy efficiency measures. It presents firstly the importance of energy security and therefore of energy efficiency, synthesizing briefly the energy efficiency measures assessed and/ or recommended by the recent Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007a); then it looks at (a) APEC policies on climate change and energy efficiency undertaken on a general level, (b) the Energy Working Group performance, and other APEC Working Groups related activities. Finally, some recommendations to include specific energy efficiency topics in the agenda of the AWGs and some conclusions are presented as well.

## **I. CLIMATE CHANGE AND ENERGY EFFICIENCY**

### **I.1 Global Energy Issues and Energy Efficiency**

Global energy issues can be characterised as energy security, energy and development, energy and environment, and energy poverty. Energy security is the desire of each country to have a continuous and reliable source of energy to meet national demand. Energy and development looks at how energy can be harnessed to meet development needs. Energy and environment is the need to ensure that energy supply, distribution and use have as low an impact on the environment as possible (Dernbach, 2007). Energy poverty refers to the fact that 1.6 billion people worldwide do not have access to electricity and 2.4 billion lacks access to modern fuels for cooking and heating.

A common solution to all these problems is enhancing energy efficiency and energy conservation (cf. IPCC, 2007b: 13). This is widely seen as the most immediate response, with the development of alternative and renewable sources being, at best, a medium-term alternative. But improving energy efficiency implies influencing the diverse uses of energy and actors involved, from governments to consumers, from industry to transportation and buildings, from design of products and equipment to the design of networks and infrastructures. The necessary actions imply a mix of regulations, technology, economic incentives, communication and the promotion of good practices. (Seidel, 2003). Many ambitious national policies and programmes have been developed, but, paradoxically, it is only recently that the need for regional and, even more so, international collaboration and commitment has been emphasised.

Energy efficiency involves doing the same amount of work, or producing the same amount of goods or services, with less energy. Energy conservation involves using less energy regardless of whether energy efficiency has changed (Klessman *et al.*, 2007). Dernbach (2007) argues that energy efficiency and conservation are not simply two more options that can be employed to address climate change; they are the most equitable and sustainable options. Three normative principles recognized by international law create a pref-

erence for energy efficiency and conservation. These are developed country leadership, equity for developing and vulnerable countries, and the right to promote sustainable development. These principles are stated in the United Nations Framework on Climate Change (UNFCCC, 1992). IPCC FAR argues that energy efficiency is also good for poorer countries because it leads to savings since efficiency is cheaper than creating new supply, releasing scarce resources for other uses supports energy security and increased access to energy services, less energy poverty, improved environmental quality and human health and has a positive effect on employment by creating new business (IPCC, 2007a: 58 and 6.9).

While all available options will need to be used to address climate change, efficiency and conservation are different in kind from the other options; they reduce the demand for fossil fuels, the fastest growing source of greenhouse gas emissions, and can be implemented right away. As IPCC points out, there is an obvious need for “immediate short-term action.” (IPCC, 2007a: 47).

## **I.2. Energy policy recommendations from IPCC-AR4**

This section reviews some of the recent recommendations of the Fourth Assessment Report of the Inter-governmental Panel on Climate Change (IPCC, 2007a). It states that emissions trading schemes, energy efficiency, and rapid development of renewable energy are needed to combat the world’s looming environmental problems. While the previous IPCC reports offered grim predictions for the world if climate change is not addressed immediately, the newest report concludes that the technological capabilities currently exist in order to address future problems. However, developing them on a scale large enough to have an impact will take much stronger political will. The report states that global GHG emissions increased have 70% between 1970 and 2004, with the largest growth coming from the energy supply sector. The report recommends setting a target for global emissions reductions; encourage energy conservation and energy efficient lifestyles; and promote renewable energy (Ibíd.).

Significantly, there is no stand-alone chapter on energy efficiency and conservation, and the report does not distinguish in any sustained way between the responsibilities of devel-

oped and developing countries. The section below sums up the key governance ideas presented in the report.

The Assessment points out that bottom up studies show that there is considerable potential in enhancing energy efficiency in different sectors but that these options are not always feasible because of contextual barriers (IPCC, 2007b). The Table below attempts to list the recommendations in the different chapters of the report.

<b>Table 1. Energy efficiency options recommended by IPCC FAR</b>	
<b>Chapter</b>	<b>Energy efficiency options</b>
Energy supply (4.3, 4.4)	Improved supply and distribution efficiency
Transport (5.4)	Fuel efficient vehicles
Buildings (6.5)	Efficient lighting and daylighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves for developing countries, improved insulation; passive and active solar design; for heating and cooling; shell retrofit incl. insulation;
Industry (7.5)	More efficient end-use electrical equipment; heat and power recovery; efficient motors; process technology; iron and steel (smelt reduction, near net shape casting, scrap pre-heating, dry coke quenching); non-ferrous (inert anodes, efficient cell designs); chemicals (membrane separation, refinery gas); cement (pre-calciner kiln, roller mill, fluidized bed kiln); glass (cullet preheating, oxyfuel furnace); pulp and paper (efficient pulping; efficient drying, shoe press, condebelt drying); food (efficient drying, membranes)
Agriculture (8.4)	Energy efficiency (e.g. in water pumps)
Waste Management (10.4)	Waste incineration with energy Recovery; composting of organic waste; controlled waste Water treatment; recycling and waste minimization.
Source: Building further on Table SPM 3; Table 6.2; Table TS 7.5 of IPCC, 2007a	

The source includes a table that focuses on the success factors of governance instruments in the building sector (Table 6.6), and another on generic effectiveness of different instruments (13.1). The information from these tables is combined in the Table 2 below. However, information from the other chapters reveals that the success of the application of instruments depends on design of the instrument, the sector in which it is to be applied as well as the context. For example, improved efficiency in light duty vehicles may not pene-

trate the market because consumers often want big cars even if prices go up (IPCC, 2007a: chapter 5); although the current high price of fuel is making a dent on consumer choices for big cars according to newspaper reports. In the aviation sector, however, this might be different.

Table 2. Effectiveness of instruments				
Well designed instrument	Examples from building sector	Env-effectiveness	Cost-effectiveness	Other
Regulation & compliance	Appliance standards	High	High	Popular in countries with weak markets; Compliance needs to be strong; Continuous updating needed
	Building codes	High	Medium	
	Public procurement	High	High/Medium	
	Energy efficiency obligations	High	High	
	DSM	High	High	
	Mandatory audits	High, but variable	Medium	
Taxes & charges	Taxes	Low	Low	High, if set high enough to induce behaviour change; Often politically unpopular
	Exemptions	High	High	
Tradeable permits/ flexible mechanisms		Low in building sector	Low in building sector	Requires well functioning market and legal institutions; Equity depends on initial distribution
Voluntary agreements/ codes	Building codes	Medium/ high	Medium	Politically popular; often requires significant administrative staff
	Energy efficiency certificates	Medium	Medium	
	Labelling/ certification	Medium/High	High	
Subsidies & incentives	Capital subsidies/ loans	High	Low	Popular with recipients; difficult to phase out; potential resistance from vested interests; risk of free-riders; may induce pioneering investments
R&D	N/a			Requires many decisions; Depends on research capacity and funding
Education/ in-	General in-	Low/medium	High	More applicable in res-

formation	formation			identical than commercial sector; applied best in combination with other measures
	Detailed billing	Medium	Medium	Applied best in combinations with other measures
Energy performance contracting (ESCO)		High	Medium	No need for public spending or market intervention; co-benefit of improved competitiveness
Source: Based on combining information in Table 6.6 and Table 13.1 of IPCC 2007a.				

Finally, the IPCC report focuses in international aspects. In general, the report lists emission targets and trading; sectoral agreements; coordinated policies and measures; cooperation on R&D; development oriented activities; financial mechanisms and capacity building in Table 13.3 and there is considerable text on technology transfer in the different chapters. The legally binding options are likely to be more successful if there are non-compliance mechanisms and inclusion of greater numbers of sectors/ countries. The policy approaches are likely to be less successful but may be more politically feasible. Development oriented mechanisms may not directly contribute to reducing emissions; but energy efficiency is very compatible with development challenges for poor countries. While technology transfer is potentially very interesting, capital financing is often a bottleneck (IPCC, 2007a: 58) and although the flexible mechanisms could play a role, they are playing a limited role in terms of technology transfer.

Throughout the text of IPCC (2007a) the message is to be found that energy efficiency is a no-regrets option, very cheap and good for rich and poor countries. The problem is developing the right incentive structure that is appropriate for specific contexts.

## II. ASSESSMENT OF APEC GOVERNANCE ON ENERGY IN THE CONTEXT OF CLIMATE CHANGE

### II.1. Background: APEC and Sustainability

The Leaders' Declaration in Bogor, Indonesia, in 1994, expressed the commitment of the APEC Community to promote sustainable development: "We set our vision for the community of Asia-Pacific economies based on recognition of the growing interdependence of our economically diverse region, which comprises developed, newly industrializing and developing economies. The approach will be coherent and comprehensive, embracing the three pillars of sustainable growth, equitable development, and national stability."<sup>†</sup>

In Osaka, Japan, in 1995, readers were reminded that at Blake Island APEC established the vision of a community of Asia-Pacific economies, and at Bogor set a number of specific goals and objectives, including:

- Free and open trade and investment in the Asia-Pacific no later than 2010 in the case of industrialized economies and 2020 in the case of developing economies,
- Expansion and acceleration of trade and investment facilitation programs, and
- Intensified development cooperation to attain sustainable growth, equitable development, and national stability.

In the same Declaration the environment as a topic is directly addressed: "Our ambitious attempt to promote wide-ranging regional cooperation and foster the spirit of community in the Asia-Pacific will doubtless encounter numerous new challenges and incur new responsibilities despite, or perhaps because of, our economic growth. The Asia-Pacific region's fast-expanding population and rapid economic growth are forecast to sharply increase the demand for food and energy and the pressures on the environment. We are agreed on the need to put these interrelated, wide-ranging issues on our long-term agenda

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<sup>†</sup> APEC leaders declarations as well as references to APEC groups are available at [www.apec.org](http://www.apec.org)

and consult further on ways to initiate joint action so as to ensure the region's economic prosperity is sustainable.”

Among the 11 APEC Working Groups, one is explicitly dedicated to the conservation activities, the Marine Resource Conservation Working Group (MRCWG). Other Working Groups in areas related to the environment also consider in their aims the principles of sustainability and environmental protection: for example, one of the four policy goals of the Tourism Working Group (TWG) is sustainable management of tourism outcomes and impacts. The Energy Working Group (EWG) seeks to maximize the energy sector's contribution to the region's economic and social well being, while mitigating the environmental effects of energy supply and use. Two of the five aims of the Fisheries Working Group (FWG) are: the conservation and sustainable use of fisheries resources, and the sustainable development of aquaculture and habitat preservation. The Industrial Science and Technology Working Group's (ISTWG) objective is to fulfill the APEC vision for the 21st century, being *a* dynamic and prosperous Asia-Pacific region built on the development and application of industrial science and technology that improves the quality of life while safeguarding the natural environment and achieving sustainable development. In its first ISTWG Medium-Term Work Plan (MTWP), the issues/themes identified for future work include: science, technology, and innovation to meet the environmental challenge. The Transportation Working Group (TPTWG) aims to achieve liberalization of transportation services and works to enhance the safety of APEC Transport Systems in order to encourage economic development in the Asia-Pacific region. The TPTWG is organized into three Steering Committees, the second of them covering: safe and environmentally friendly transportation systems (including new technologies) (APEC, 2008).

## **II.2. APEC Climate Change Pact**

In their 2007 Sidney Declaration, APEC leaders expressed their commitment to the belief that the following principles must underpin an equitable and effective post-2012 international climate-change arrangement based on UNFCCC principles.<sup>‡</sup> These include:

- *Comprehensiveness*: concerted international action is needed with all economies contributing to shared global goals in ways that are equitable, and environmentally and economically effective.
- *Respect for different domestic circumstances and capacities*: Future arrangements need to reflect differences in economic and social conditions among economies, as well as their common but differentiated responsibilities and respective capabilities.
- *Flexibility*. Future arrangements should have the flexibility to recognize diverse approaches, and supports practical actions and international cooperation across a broad range of areas related to climate change.
- *The important role for low and zero emissions energy sources and technologies*. Continued cooperation, including joint research, development, deployment and transfer of low and zero emission technologies for their cleaner use, particularly coal, will be essential. It is also important to enhance energy efficiency and diversify energy sources and supplies, including renewable energy.
- *The importance of forests and land use*. Sustainable forest management and land use practices play a key role in the carbon cycle and need to be addressed in the post-2012 international climate change arrangement.
- *Promoting open trade and investment*. The introduction of barriers to trade and investment while searching for climate change and energy security policies must be avoided, as open trade, investment and environmental policies are essential to disseminating low emissions products, technologies and best practices.

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<sup>‡</sup> Some of the APEC members are part to the Asia-Pacific Partnership on Clean Development and Climate (AP6): US, Japan, China, India, South Korea and Australia. NAFTA members have created the North American Energy Working Group to address this issue collectively (North American Energy Working Group, 2006) .

- *Support for effective adaptation strategies.* Adaptation to climate change is a priority for development strategies, and needs the continued and full support of the international community.

### II.2.1 APEC Action Agenda

APEC has established the following set of actions and initiatives on climate change, energy security and clean development that represents a further contribution to the reduction of global greenhouse gas emissions, in line with the objectives and principles of the UNFCCC.

#### *a) Energy efficiency*

Improving energy efficiency is a cost-effective way to enhance energy security and address greenhouse gas emissions while promoting economic growth and development. Without prejudice to commitments in other fora, the member economies:

- Agree to work towards achieving an APEC-wide regional aspirational goal of a reduction in energy intensity of at least 25 per cent by 2030 (as compared with 2005).
- Encourage all APEC economies to set individual goals and action plans for improving energy efficiency, taking into account this aspirational goal, and reflecting the individual circumstances of different economies.
- Agree to facilitate and review progress through the voluntary APEC Energy Peer Review Mechanism, as established by APEC Energy Ministers in May 2007, with a report back to APEC Leaders in 2010.

#### *b) Forests*

Forests play a crucial role in the carbon cycle. Continued action is required to encourage afforestation and reforestation and to reduce deforestation, forest degradation and forest fires, including by promoting sustainable forest management, combating illegal logging and addressing the underlying economic and social drivers. In this regard, APEC has agreed to

work to achieve the regional goal of increasing forest cover in the APEC region by at least 20 million hectares of all types of forests by 2020, and to establish the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation to enhance capacity building and strengthen information sharing in the forestry sector, among other actions.

*c) Low emissions technology and innovation*

Joint research, development, deployment and transfer of low and zero emission technologies will be essential to APEC's joint efforts to address climate change. APEC is to establish the Asia-Pacific Network for Energy Technology (APNet) to strengthen collaboration on energy research in the region. Participation in the Network will be open to all research bodies in the APEC region.. APNet is to be inaugurated at a major energy research conference in 2008.

*d) Alternative and low carbon energy uses*

Increased use carbon energy sources will require coherent policy and regulatory settings, for which APEC intends to promote policies that advance the deployment of low and zero emission energy uses, through co-operative work in the APEC Energy Working Group. It also supports the development of criteria for performance-based biodiesel standards through the work of the APEC Biofuels Task Force and the Asia Pacific Partnership on Clean Development and Climate (APPCDC 2008), which work to advance key new clean technologies.

*e) Energy security*

APEC underscores the importance of affordable and secure supplies of energy which are central to economic growth and sustainable development, and is committed to continuing efforts to address long-term energy needs in the region.

*f) Trade in environmental goods and services*

An open global trade and investment system is central to clean development objectives and market opening in the World Trade Organisation (WTO) would advance APEC's climate

and energy security goals. APEC supports the liberalisation of trade in environmental goods and services.

*g) Civil aviation transport*

There are opportunities for cooperation to address the issue of aviation emissions, and APEC supports the work of the International Civil Aviation Organization (ICAO), and the promotion of practical joint measures that address greenhouse gas emissions from this sector.

*h) Policy analysis capability*

APEC recognizes the need for improved dialogue and policy and technical cooperation, and thus endorses the value of exchanging views on effective and coherent policy instruments for promoting energy efficiency and addressing greenhouse gas emissions, and has agreed to share views and expertise on approaches to assessing the economic and social implications of climate change policies.

*i) Marine and coastal resources*

Sustainable marine and coastal resources are an integral part of the carbon cycle, and APEC welcomes the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security which is aimed at enhancing the conservation of marine biological resources.

*j) Promoting a co-benefit approach*

APEC supports an approach to addressing global environmental challenges that simultaneously promotes sustainable development

### **II.3 APEC Working Groups**

This section presents the main activities connected to energy efficiency and proposes some recommendations for further action based on the IPCC AR4 assessment. Only two of the 11 AWG do not specify any action regarding climate change related energy issues (the

Health WG and the Fisheries WG). Being the most important for the APEC Energy Policies, the EWG is analyzed separately.

### II.3.1 Energy Working Group (EWG)

Within APEC, an Energy Working Group has been established whose goals are to identify and assess best practices, benchmarks and indicators for assessing efficiency improvements. It has set up the Energy Standards Information System (ESIS) which is a state of the art information system on the energy standards for appliances and equipment. It aims to link experts within the APEC economies to promote a community of practice on minimum energy standards; testing, and labelling (Ivanova and Angeles 2006: 112).

APEC energy cooperation is now conducted under the framework of the Energy Security Initiative (ESI), in 2000 to prepare the region for energy supply disruptions and their impact on APEC economic development. The ESI includes short-term measures such as the Monthly Oil Data Initiative, maritime security, Real-Time Emergency Information Sharing, and Oil Supply Emergency Response. It also includes long-term responses to Energy Investment, Natural Gas Trade, Nuclear Power, Energy Efficiency, Renewable Energy, Hydrogen, Methane Hydrates, and Clean Fossil Energy. JODI is a collaborative oil information collection program undertaken by APEC, OPEC, IEA, IEF, and UNEP.

Noting that cooperation and partnership are essential to addressing energy security and environmental challenges that extend beyond the sphere of any single economy or the APEC economies as a group, the EWG is now further strengthening collaboration with other international energy fora on a broad range of energy issues, including maritime energy transport security, emergency preparedness, energy efficiency, clean energy technology, etc. Currently, IEA, Renewable Energy & Energy Efficiency Partnership (REEEP) and the Energy Charter Secretariat have been granted guest status in EWG (Osterkonn, 2007). Also, an APEC Energy Trade and Investment Study is currently under way to identify all existing barriers to energy trade and investment in the region.

At its meeting in Iquitos, Peru, the EWG endorsed the APEC Peer Review Mechanism on Energy Efficiency (PREE). The key objectives of PREE are to promote information sharing among APEC members on energy efficiency performances as well as on policies and measures for improving energy efficiency; and to explore how energy efficiency goals on an overall and/or sectoral basis and action plans could be effectively formulated and improved in each APEC economy under review. New Zealand and Chile have volunteered to undergo the peer review at EWG37 which will be held in the first half of 2009.

The 8th APEC Energy Ministers Meeting (EMM8) was held in Darwin, Australia on May 27-30, 2007. The discussion focused on improving energy efficiency and support for the development and deployment of cleaner and more efficient energy technologies. We recommend including in the work of the EWG the following activities waste incineration with energy recovery; composting of organic waste; controlled waste water treatment; recycling and waste minimization. Apparently these topics are not being addressed by APEC yet.

### II.3. 2 Other Working Groups

*a) The Transportation Working Group (TPTWG)* aims to achieve liberalization of transportation services and works to enhance the safety of APEC Transport Systems in order to encourage economic development in the Asia-Pacific region. The TPTWG works to achieve a balance between trade and security issues related to regional transport systems operations. The Group's efforts are focused on facilitation of domestic policy regulations, development of intermodal supply chain and secure transport activity, including building the capacity of all stakeholders to help them reach the eventual goal of free and open trade and investment in the APEC region. At the same time, parallel measures are being undertaken by economies to strengthen security in all transportation namely land, sea and air transport.

A taskforce was established to identify practical measures to limit aviation greenhouse gas emissions (instructions of APEC Leaders in Sydney in 2007). Seminar on Gas emis-

sions held on September 2007 in Singapore. The 2nd APEC Seminar on Practical Measures to Manage Aviation Emissions held in Malaysia in 2008. Our recommendation for the TPTW is to include activities on research, design and implementation of hybrid vehicles in the member economies.

The Agricultural Technical Cooperation Working Group (ATCWG) aims to improve economic development and social welfare in the APEC region by promoting agricultural technical cooperation between APEC Member Economies. The Group meets to enhance the capacity of agriculture and its related industries; to propose APEC funded projects and to share information and experiences in the areas of agriculture, biotechnology, animal and biogenetic resource management.

According to the terms of reference of the working group, the ATCWG focuses on, but is not limited to, the following areas:

- Conservation and Utilization of Plant and Animal Genetic Resources
- Research, Development and Extension of Agricultural Biotechnology
- Production, Processing, Marketing, Distribution and Consumption of Agricultural Products
- Plant and Animal Quarantine and Pest Management
- Cooperative Development of Agricultural Finance System
- Agricultural Technology Transfer and Training
- Sustainable Agriculture and Related Environmental Issues.

In 2008 the ATCWG took on board new priorities, related to the energy efficiency : bio-ouels were identified as priorities. The Sub-group on Research, Development and Extension of Agricultural Biotechnology (RDEAB) will hold back-to-back meetings with the APEC High Level Policy Dialogue on Agricultural Biotechnology (HLPDAB).

A recommendation for the ATCWG is to focus on the energy efficiency of the technologies directly applies in agricultural activities, for example, water pumps, desalination plants, etc.

*b) The Small and Medium Enterprises Working Group's (SMEWG)* main objective is to encourage the development of small and medium enterprises. The SME sector creates most of the employment in the Asia-Pacific region and is the backbone of regional economic growth.

Established in February 1995, the Ad Hoc Policy Level Group on SMEs' (PLGSME) objective was to assist SMEs improve their competitiveness and to facilitate a more open trade and investment environment. Originally set up for two years, its term was extended in 1996 and again in 1998. In 2000, this group was renamed the SMEWG and granted permanent status. The SMEWG provides the foundation for other APEC fora to incorporate SME considerations into their mandates and activities.

In the last years this WG is focusing more on the sustainability. For the upcoming 15th Ministerial Meeting to be held in Peru on August 2008, the policy theme will be "Sustainable Local Development" and will include: Sustainable and Responsible Environmental Management, Corporate Social Responsibility (CSR) and Innovation Management.

It will be recommendable to the SMEWG adopt actions to inform the SMEs on the possibilities to undertake voluntary agreements for GHG emissions reduction and energy efficiency. The group could seek financial and technical assistance for these activities.

*c) The Industrial Science and Technology Working Group's (ISTWG)* objective is to fulfill the APEC vision for the 21st century, which is to be a dynamic and prosperous Asia-Pacific region built on the development and application of industrial science and technology that improves the quality of life while safeguarding the natural environment and achieving sustainable development (Ivanova *et al.*, 2006).

Six key priorities were adopted as part of the ISTWG action agenda in 1998: improved availability of information; improved human resources development; improved business climate; contribution to sustainable development; enhanced policy dialogue and review; and facilitation of networks and partnership.

Some of the goals of the 2008 Work Plan are: the better quality of life and a cleaner environment; a safe and secure society, emphasizing the importance of measures for infectious diseases and natural disasters; enhanced international science and technology (S&T) networks; an improved level of connection between research and innovation, involving and encouraging the potential of SMEs; and strengthened technological cooperation

Some of the important events 2008 are the 7<sup>th</sup> APEC Biotechnology Conference Symposium of the APEC Climate Center for Climate Information Services to Society and the Training Course on "Human Capacity Building for Natural Hazard Mitigation in Cities & Coastal Regions.

The recommendation for ISTWG is to attend more specific areas, such as: recovery; efficient motors; process technology; iron and steel, non-ferrous; chemicals; cement; glass; pulp and paper; food.

*d) The Marine Resources Conservation Working Group (MRCWG)* addresses marine and coastal sustainable economic development concerns and activities in the Asia-Pacific region by providing marine resources conservation economic and technical expertise. Such expertise is critical, given that economic activities from marine and coastal resources take up a significant share of APEC Member economies' GDP. In an acknowledgement of the importance of this area, the 2008 APEC Senior Officials ranked the protection of marine and coastal resources highly in the 2008-2009 ECOTECH priorities.

Established in 1990, the Marine Resource Conservation Working Group (MRCWG) aims to promote initiatives in the Asia-Pacific region which facilitate balanced and inte-

grated regional as well as national policies and programs that led to the sustainability of marine and coastal environment. These initiatives strive to achieve efficient use of shared marine resources in support of the APEC vision of free and open trade and investment.

It seems to be the WG most related to climate change mitigation through the programs on: hazard mitigation - through increasing coordination, expansion and maintenance of multi-hazard capabilities for disaster reduction at the domestic, regional and international levels, and post-natural disaster rehabilitation and planning - through increased coordination with related APEC fora and established warning systems and the development of integrated plans and income-generating programs for coastal zone rehabilitation.

- 21<sup>st</sup> Annual Meeting was held April 2008, in Piura, Peru.
- Three of the six potential projects discussed, are related to the climate change:
  - ▶ Peru's proposal to develop indices to examine the impact of Climate Change on marine resources in the Pacific Basin;
  - ▶ Indonesia's capacity building initiative to share best practices on how small islands could adapt and mitigate the impact of a rise in sea level due to climate change; and
  - ▶ Chinese Taipei's initiative to host the 10th Roundtable Meeting to share experiences and develop strategies against the negative impact of climate change marine and chemical pollution.

The recommendation to this WG is to adopt as a priority the waste control, recycling and minimization in coastal zones, included the water treatment.

*e) The Telecommunications and Information Working Group (TEL)* aims to improve telecommunications and information infrastructure in the Asia-Pacific region by developing and implementing appropriate telecommunications and information policies, including relevant human resource and development cooperation strategies. This is reflected in the

TEL's expanded vision of promoting the transition from an Asia-Pacific Information Infrastructure into the Asia-Pacific Information Society.

The TEL's priorities are set by both Telecommunications and Information Ministers and Leaders and currently focus on reducing the digital divide, next generation networks and technologies, e-government, mutual recognition arrangements, regulatory reform, capacity building, protecting information and communications infrastructure and cybersecurity, advancing the Asia Pacific Information Society.

For our study of most importance are the works towards creating sustainable markets through both convergent and new technologies and the huge role in all phases of emergency preparedness, early warning and disaster mitigation, rescue and relief operations, delivery of humanitarian assistance and recovery efforts.

As recommendations we suggest that the TEL could disseminate information and organize workshops on best practices of energy efficiency policies; new technologies for SMEs; residential energy efficiency.

*f) The Human Resources Development Working Group (HRDWG)* conducts work programs to develop human resources on issues ranging from education to labor to capacity building. The goal of human resources development in APEC is to promote the well-being of all people in the region through economic growth and development.

The group derives its mandate from tasking from APEC Leaders and Ministers as well as its Education Ministers. The HRDWG conducts its work program through three networks

- Capacity Building Network (CBN)
- Education Network (EDNET)
- Labor and Social Protection Network (LSPN)

Among its priorities, the HRDWG addresses quality basic education; improved labor market information and analysis; enhancing skills in key sectors; lifelong learning; improved curricula, teaching methods and instructional materials; mobility; and enhanced quality, productivity, efficiency of the labor force.

It is highly recommendable that the HRDWG use the CBN and the Education Network EDNET to create climate change mitigation & adaptation and energy efficiency attitudes.

*g) The Tourism Working Group (TWG)* was formed in 1991 when it was recognized that the tourism industry was of growing importance in promoting economic growth and social development in the Asia-Pacific region.

The APEC Tourism Charter, endorsed at the 1st Tourism Ministerial Meeting in Korea in 2000, constitutes the basis for APEC tourism cooperation. The Charter reflects a collective commitment to improve the economic, cultural, social and environmental well-being of APEC Member Economies through tourism. The Charter recognizes the significant contribution tourism makes to APEC economies. It establishes four key policy goals and an agreed process for realizing these aims.

Goal No.1: removal of impediments to tourism business and investment (chaired by Thailand);

Goal No.2: increase mobility of visitors and demand for tourism goods and services (chaired by Indonesia),

Goal No.3: sustainable management of tourism outcomes and impacts (chaired by New Zealand), and

Goal No.4: enhance recognition and understanding of tourism as a vehicle for economic and social development (chaired by Australia).

The 5th Tourism Ministerial Meeting was held in Lima, Peru 9-11 April 2008. Under the theme, "*Towards Responsible Tourism in the Asia-Pacific Region,*" the meeting focused on ensuring continuous sustainable growth in the tourism industry in order to contribute

and generate income and employment to local communities, as well as to promote the conservation and preservation of our environment, including social and cultural aspects. The 32nd Tourism Working Group Meeting meeting agreed on several issues, being the most important the endorsement of developing future capacity-building projects in the area of Tourism:

- Improvement of management capacities of communitarian thermal resources for improving living conditions
- Use of clean technologies and the application of social-environmental quality standards in lodging and tourist development projects
- Best Practices in Corporate Social Responsibility for Tourism in APEC Economies

The meeting endorsed *The Pachacamac Declaration* which highlighted support for joint strategies to guide responsible tourism in the region, preserving the ecosystem while minimizing environmental impact and, hence, producing more benefits to local communities. These projects show the commitment of the TWG with the sustainable practices and clean technologies.

### **III. CONCLUSIONS AND RECOMMENDATIONS**

This paper set out to understand the significance of energy efficiency in climate change mitigation and the importance of these policies in APEC; as well as to collate, as far as possible, the recommendations with respect to energy efficiency in the recent IPCC report; and briefly discuss the climate change and energy actions of APEC and its Working Groups with a specific emphasis on energy efficiency.

Several conclusions can be drawn from this analysis. First, energy efficiency is important because (a) it addresses all four energy challenges, namely energy security, energy poverty (access issues), the relevant developmental and environmental challenges; and (b)

it is equitable, sustainable, relatively cheap, and almost immediately available and hence a no-regrets options for rich and poor alike.

Second, the IPCC report emphasises (a) that there is a large number of energy efficiency options in the energy supply, transport, building, industry, agriculture and waste management sectors ranging from low sophistication options (e.g. insulation in buildings) to very advanced options (e.g. improving fuel efficiency in cars) and offers something to countries in different states of development. (b) There is a range of policy instruments available ranging from relatively cheap instruments like education and information and regulation to more expensive subsidy options; from voluntary agreements to compulsory instruments like standards. These too offer a range of options for countries with different institutional and economic contexts. These should be made a part of the APEC agenda.

Third, the APEC region has a major stake in global responses to the challenges of climate change, energy security and clean development. Economic growth and technology development are indispensable elements of a future approach. The scale of these challenges demands new and innovative forms of international co-operation.

Fourth, a quick survey of the APEC energy governance framework reveals that there is no real common, coherent framework. Although some of the instruments suggested by IPCC are more or less in discussion within the Working Groups, it is obvious that much more could be done to address these issues.

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