

**APEC ENERGY WORKING GROUP**

**THE ROLE OF NUCLEAR POWER IN THE ENERGY  
DEVELOPMENT OF THE APEC REGION**

**FRAMEWORK ENDORSED AT EWG27**

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The development of cleaner and more efficient energy technologies is at the center of efforts of modern societies to achieve a better combination between economic growth and environmental protection, and to deliver long-term energy security.

Clean and cost-effective energy technologies are the building blocks of a transformed energy system for APEC economies in the 21<sup>st</sup> century, but only if they can be made to perform at a level and a cost that society deems acceptable.

The latter is easily understandable when considering that the APEC region has a population of 2,400 million representing 39.6% of the total world population contributing 70% of global GDP, consuming nearly 60% of global energy demand while it produces only 40% of the total primary energy supply. At the 5<sup>th</sup> Energy Ministerial Meeting (EMM-5), Ministers reaffirmed that energy is essential for maintaining the Asia-Pacific region's economic growth and social development.

In this context it is expected that APEC energy demand will grow on average 2.1% annually for the next 20 years or so. This implies a growing dependency on oil imports, where it is expected that import dependency in the APEC region will reach 80% in 2020, from 60% today.

Greater energy demand will also present huge challenges in respect of environmental sustainability, particularly concerning carbon emissions and (urban) living conditions, a situation in which the better living standards that result from increased energy consumption may be adversely affected by deteriorating environmental conditions.

In view of this potential situation, not only future investments are required to secure a sustainable supply; it is also necessary that CO<sub>2</sub> emissions generated by increased energy production be curtailed by means of improved energy efficiency and the expansion of the use of less CO<sub>2</sub> intensive energy. In this context nuclear energy could have a significant role in the production of hydrogen, in support of the hydrogen economy which, in principle, is gaining wide support.

Under current conditions, nuclear power is generated in a number of APEC economies (see [Annex A](#)). Nuclear generation capacity has grown modestly in recent years, with the fastest increases occurring in northeast Asia which is home to most of the new plants under construction. Thus, nuclear power will continue to play a significant role in the region's power production for at least another two or three decades, as many economies currently operating nuclear reactors designed

and built in the 70's and 80's are actively pursuing life extension policies designed to increase the operating life of these reactors from 40 to 60 or more years.

At the beginning of the 21st century we face important challenges that may require increased nuclear power generating capacities, for example, evidence of global warming and the inevitable depletion of other natural resources, including fossil fuels. With this in mind, many countries that have deployed nuclear energy are actively cooperating in the development of innovative type reactor designs (such as those proposed for evaluation by the Generation IV International Forum (GIF)) with the aim of being competitive to build and operate, more efficient and safer than current plants, more proliferation resistant and designed for a longer operating life. In the long-term view, fusion energy can also be a feasible alternative, for which huge international joint venture is now under way.

At their last meeting in July 2002, APEC Energy Ministers directed the EWG to continue its efforts towards securing the long-term energy security of the region, which, among others, envisions the diversification of the energy mix and the intensified use of new and renewable energy technologies.

Taking into consideration that commitment, as well as taking into account that the EWG's Future Directions Strategic Plan for attaining economic growth, energy security and environmental protection can only be achieved through continued research, development and deployment of a broad range of energy technology options which the EWG need to keep exploring and analyzing, this proposal considers that under current prospects for getting a realistic energy supply diversification, non-emitting electric generation sources such as nuclear energy need to be considered in our discussion work, as they could play an important role in international environmental and energy policy agendas into the future.

Nuclear science and technology has contributed much to the 20th century society, as an important source of energy and through the utilisation of radiation in medicine, industry and other fields. It continues to act as a key energy source for those economies which consider it an appropriate response for securing a stable energy supply while reducing CO<sub>2</sub> emissions from the electricity sector.

Although there are within APEC some economies which do not consider nuclear power an option, due to safety concerns, advanced nuclear fuel cycle technologies could enhance the advantages provided by the use of nuclear power. Examples include security of energy supply and the optimization of financial resource allocation, enabling nuclear power to be regarded as an efficient and plentiful energy source for meeting growing world energy and electricity demand.

In the longer term, the combination of the objectives of coping with fossil fuel depletion and reducing the carbon intensity of economic growth and the fact that energy from renewable sources is yet to become a cost-effective alternative, provides an opportunity for a possible expansion in the use of nuclear power.

In view of this, some energy authorities in the APEC region believe that there is a need to consider and encourage greater research and development in the nuclear energy field as a major tool for supporting the current and future energy systems.

In this context, we propose to the EWG:

- ❖ To commence a scoping analysis about the role of nuclear power in those APEC economies where it is currently deployed, as is being undertaken by APERC for publication in 2004.
- ❖ To establish an ad hoc committee of interested economies to identify potential perspectives of nuclear power in the APEC region in the long term and identify ways of cooperation in the area of nuclear power.
- ❖ To identify work areas for communication with the public, recognizing that any nuclear power initiative needs the broad understanding and acceptance of the general public in order to alleviate public concerns about nuclear safety, the handling of radioactive waste, including spent fuel, and the decommissioning of nuclear facilities.
- ❖ To increase the level of public awareness and information in order to widen the scope of acceptance and utilisation of the nuclear option within interested APEC economies, through a larger diffusion of the understanding, experience, and knowledge of nuclear energy among member economies while recognizing concerns over its potential adverse impacts on human health and the environment.
- ❖ To promote wide adherence to international legal instruments and agreements which promote nuclear safety and security and nuclear non-proliferation, as well as to a responsible regime in the field of civil liability for nuclear damage such as the Vienna Convention of Civil Liability for Nuclear Damage.
- ❖ To create a capacity building effort within the framework of APEC energy cooperation through the establishment of an annual Nuclear Power Technology Training Program for interested economies, starting in 2004.

In implementing the framework, the EWG will seek to complement and value-add to the work undertaken in existing international nuclear organizations, for example, the NEA, IAEA and GIF. To achieve this, interested economies will identify and resolve, at an early stage, issues relevant to its effective implementation.

Making the best use of energy will remain a determinant factor for growth and prosperity for all APEC economies.

## Nuclear Energy Generation – APEC region

	Total Generating Capacity (MW(e))		Nuclear share of electricity generation	
	(2001)	(2002)	(2001)	(2002)
<b>Canada</b>	10,018	11,323	13	12.3
<b>People's Republic of China</b>	2,167	5,983	1	1.4
<b>Japan</b>	44,289	44,287	34	34.5
<b>Republic of Korea</b>	12,990	14,890	39	38.6
<b>Mexico</b>	1,360	1,360	3.7	4.1
<b>Russia</b>	20,793	20,793	15	16
<b>Chinese Taipei</b>	n/a	4,884	21	21
<b>United States</b>	97,860	98,230	20	20.3

Source: International Atomic Energy Agency and World Nuclear Association