

Keynote Address
By Mr. Anand Panyarachun
Chairman, Council of Trustees, Thailand Environment Institute
Former Prime Minister of Thailand
The Three E's: Electricity, Energy and Environment
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Distinguished Guests, Participants, Ladies and Gentlemen

It gives me great pleasure to address today what is certainly the most impressive group of global electricity supply leaders ever assembled in Thailand. And I hope that your presence here reflects a strong interest in Thailand. Although the current economic outlook is not as bright as it once was, we are working hard to restructure our economy, restore our faith and rebuild a business climate which will once again be conducive to growth in the near future.

Today, I shall share with you my views and vision on the reconciliation of electricity, energy and the environment in the 21st century. Before I continue with my speech, I would like to take this moment to congratulate the host organization, the Electricity Generating Authority of Thailand, better known as "EGAT", for their tremendous effort and hard work in producing the exceptional turnout for this meeting. Somehow, I do not feel at all a stranger in this place, even though I cannot really proclaim to be an electrician or an environmentalist. However, during the past decade I have been associated with several organizations both in the public and private sectors that significantly influence the power industry. Besides the Prime Minister, my affiliation with two distinguished organizations, the Thailand Development Research Institute and the Thailand Environment Institute, has significantly amplified my interest in the development of sustainable energy. As businessmen, several of our investments are in industries which use electricity as a major resource component, and also in the electricity supply industry, itself, a power producer. Therefore, what I am going to present today will be the emerging key issues as I see them and the need to enhance the balance among a handful of concerns that all begin with the letter "E", **Electricity, Energy, Economy, Efficiency, Equity and the Environment.**

Electricity: An important Fuel for Economic Development and Quality of Life

Faced with the fragility of today's regional or perhaps even global economic situation, current energy security problems and conversation challenges become even more critical. Electricity has played a central role in fueling the country's social and economic development during the last two decades.

During the period from 1984 to 1996, power generation capacity increased by an average of 9.5 per cent per annum from 5,848MW in 1984 to 19,142MW in 1996. Thailand's economy has grown very rapidly and has developed International competitiveness based on an abundance of natural resources, inexpensive labor and a strong local market. Electricity was a key ingredient for assisting the country achieve this economic growth and prosperity. Electrification also enhanced the quality of life. Through electrification, living standards have risen and more social comforts have appeared. Figures from the Provincial Electricity Authority indicate that, presently, as much as 98 per cent of 64,457 villages in Thailand have access to electricity from the national grid. With electricity, people have transformed their lives through increased domestic comforts, industrial competitiveness, job creation and revenues. Even so, electricity consumption per capita in Thailand remains far less than in industrialized societies.

Energy production and consumption, in fact, poses many threats to human health and environmental resources. Thailand's energy related environmental problems are not confined to power facilities which burn fossil fuels. The legacy of environmental impacts resulting from conventional electricity technologies of thermal power plants and hydropower, although not devastating, still await an environmental clean-up and proper management.

Competing energy sources have their own strengths and weaknesses in terms of environmental and society consequences. No single option ensures total environmental protection. Obtaining massive hydropower required large amounts of land which more often than not was in conflict with land utilization for other purposes, such as agriculture and forest conservation. The displacement of local populations has also been a major, critical issue associated with the creation of large dams and reservoirs. However, from the point of view of sustainable resources, hydropower remains one of the best options. Energy generation by means of thermal power generates wide ranging environmental impacts that are of global, regional, and local concern. The emission of greenhouse gases is creating global consequences leading to climate change and ozone depletion. More regional and local effects are seen in acid rain which damages agricultural flora and fauna, and in air pollution. Other dire effects include land and water contaminated by process wastes.

Electricity: Essential Goods in a New Era of Borderless Power Markets

Energy plays an important role in achieving economic goals or development within a wide range of energy and economic strategies in each country in the region. Some countries promote their economy by importing energy, while others accelerate economic growth by exporting energy. Trade of energy resources in the region is one of the key factors which is beneficial for all the countries involved. However, some conflicts do arise which need to be addressed in this borderless power market.

Following the deregulation of the power sector in 1992, plans to privatize state-owned power utilities has been proceeding and is ongoing. To promote

private participation and competition in electricity generation in Thailand, three forms of private participation are emerging. EGAT established subsidiary companies, allowing both small power producers (SPPs) and independent power producers (IPPs) to participate in supplying electricity. National energy policy also encourages power investment and electricity imports from the neighboring countries of Lao PDR, Myanmar and Malaysia. Several agreements have been established with these countries and a number of power projects are in different stages of preparation.

Over a 25 year period, starting from 1998, Thailand will buy almost 95 per cent of the electricity generated by power facilities in Lao PDR. In fact, a memorandum of understanding has been established between Thailand and the Lao PDR by which Thailand will purchase power from and make huge power investments in Lao PDR. Negotiations are currently in the early stages between Thailand and power authorities in Southern China and in Myanmar, where several existing and potential hydropower resources are expected to generate energy for export to Thailand. These new players and new sources of electricity also generate new concerns and issues regarding the rights of local people in relation to natural resources and the environment which are being utilized to support the production of electricity for export to other areas, other countries and other users.

Experience shows that significant structural and ecological consequences are often borne by the local people. Their environment bears a disproportionate share of pollution and destruction. The 900MW Nam Thuen II hydropower project in Lao PDR was delayed for over two years due to environmental issues. Environmentalists and resistance groups voiced their concerns to the World Bank and the Thai government, calling for a reconsideration of the plan to purchase power from this project. The Nam Thuen II dam will flood 450 square kilometers of pristine forest, uprooting and displacing various local tribes from their home in the Nakai Plateau.

Early this year, the Thai government requested my assistance to chair the National Committee attempting to settle the conflict and dispute over the Yandana Gas Pipeline Project from Myanmar to western Thailand. This project was controversial for environmental and political reasons. The primary cause of the vocal resistance to the gas pipeline project was human rights issues in Myanmar and partial placement of the gas pipeline through a reserved forest in western Thailand. Security was another issue. In the context of trans-boundary import and export of electricity and energy resources such as natural gas, the issue is no longer national but has become an International affair. Arguments had been put forth that the country which creates the electricity demand should share the responsibility to ensure the proper power development in the source country, and that environmental safety and social justice should be high priorities.

Through this involvement, I found that predicting environmental impact was no longer the biggest constraint to project implementation. Nor was the design of buffers to protect and heal the environment. Rather, failure to analyze strategic alternatives has been found to be, by far, the most significant

constraint in gaining public acceptance. Project justification is not clearly perceived by the local stakeholders. No forceful explanation about why the pipeline right-of-way could not have been rerouted to avoid all conservation natural resources was presented. The project proponent failed to adequately assure the public and the resistance groups that the most environmentally and socially friendly options had been selected.

The Yandana Gas Pipeline episode is a good example of the need for a comprehensive energy sector plan that includes alternative energy policies, plans and strategies or project types, taking into account their costs and benefits, particularly the environmental and social impacts. Analysis of pertinent alternatives will prevent high impact projects from getting on the priority list. After projects are ranked, based on the lowest environmental cost, project specific assessments can be performed. By employing this strategic planning on a sector wide level, the public consultation process at the stage of project specific assessment becomes more manageable with minimal conflict. If stakeholders have participated in the selection of environmental criteria and procedures, short-listed projects, based on the agreed upon criteria, are likely to be widely accepted by civil society.

Electricity Recession: Time to Reassess Energy and Economic Strategies

Today, we gather here in the midst of a regional economic disaster. The Thai energy sector is suffering from falling demand and a market surplus. Costs are rising due to the burden of currency depreciation and unproductive generating capacity. To survive this crisis, the power industry will need to increase internal efficiency through material saving, maintenance and personnel management. I can assure you that an increase in the price of electricity is not the solution. Rather, costs should be reduced and business strategy refocused. At the end of the 1998 fiscal year, electricity demand was down 0.5 per cent from the previous year. Peak power demand slipped by 2.3 per cent to 14,180MW. If the situation continues and there is no further delay in IPP projects, EGAT will reduce the capacity of its power plants by at least 4,800MW in the year 2001. Having suspended purchases of power from neighboring countries, shelved some of its own projects, and delayed commercial operations for most of the IPP and SPP power projects, EGAT anticipates that in 2001, the Authority's energy reserves will be at a high level of 60.66 per cent of total capacity.

Conventional approaches to energy have focused mainly on increasing energy supply to meet energy demand, but it is now becoming clear that a new approach is needed in order to meet social, economic and environmental objectives. We can turn this economic recession into an opportunity to improve efficiency and increase the profitability of existing power facilities. We can optimize resource utilization, reduce waste and adopt more advanced electric technologies favorable to the environment. The economic crisis aside, long term savings, monetarily and environmentally, could be very real. Much can also be done with extending the life of existing power plants for five years or longer. More efficient, less damaging use of resources can be

achieved through initiatives such as the implementation of the Environmental Management System ISO14000. The use of economic instruments, clean technology and pollution control measures still holds great promise. We can pursue a sustainable energy development approach and be optimistic that the economy will regain its momentum in the not too distant future. We will be ready to provide the energy necessary for the recovery process, and we will respond to economic and social aspirations with efficiency and sustainability.

The concept of sustainable development is well known and is now shaping World business and the global economy. The principles of sustainable development promise to be major issues for economic and social policies as we enter the 21st century. What does sustainable development mean for energy? I am certain that most of you in the power industry have great interest in the principle of sustainable energy. Without referring to one specific technology or another, I would like to urge you to continue and even intensify your efforts toward a more energy-efficient future.

The power plants of the next century should be green, a color representing the concept of sustainable energy production and consumption. An environmentally, efficient supply of electricity should incorporate these efforts; 1) maximizing energy efficiency and minimizing losses in the production and transmission of electricity to users; 2) minimizing environmental impacts associated with energy production by using cleaner fuels and applying appropriate management and equipment control; 3) maximizing or possibly replacing the use of fossil fuels with non-fossil and renewable energy resources when technically feasible and economically justifiable.

Demand side management (DSM) must be incorporated into supply options in long term power development plans. In this context, recognition and commendation are in order for Thailand's DSM efforts, which are regarded as one of eight success stories among 100 projects supported by the Global Environment Facility (GEF). Thailand was the winner of the ASEAN AWARD. Thai DSM efforts officially began in 1993. The measure has been implemented in all energy sectors; residential, commercial and industrial, using various measures and technologies suitable to the region and culture.

Environmentally Friendly Energy Options for the 21st Century

The electricity industry is at the cross-roads of energy options. We are faced with pressing priorities such as power sector restructuring, energy security and scarce resources, limitations of capital investments and diminishing environmental quality. In arriving at decisions, there must be a real balance, a trade off between energy supply and use, economy and the environment, and social goals. We will survive unfavourable past economic and environmental experiences, and we will not give up our quest for sustainable energy development.

You will agree with me that in order to achieve energy security, it is not appropriate either to exclude altogether any specific energy resources, or to rely excessively on one or the other. However, renewable sources such as

hydropower, solar, wind, geothermal and biomass should be used as much as possible through energy technology development and cost reductions. With appropriate policies and new technology, we can anticipate positive global environmental benefits as high as 10 to 20 per cent for fossil fuel replacement. Renewable technologies are beginning to prove on a significant scale, the distinct advantages that make them attractive and cost effective.

At any rate, conventional electricity generation from fossil fuels is expected to continue to supply the bulk of the electricity demand for many years to come. Linked with this, **global climate change**, is the premier global environmental challenge of the 21st century. The Kyoto Protocol requirement is unprecedented in the scope of responsibility placed upon both developed and developing countries. It has been recognized as the most complex and important International environmental convention ever signed, both for its global industrial implications and for International relations. Energy policy and options for the next century are now becoming a global matter.

To realize a sustainable society, it is necessary to use all available energy resources effectively and in a proper manner to derive full advantages and to counterbalance disadvantages. First choice resources would be clean, renewable energy such as hydropower, solar, geothermal, wind power and the transformation of industrial and agricultural waste into fuel. Discontinuing the use of fossil-based fuels such as coal, lignite, oil and natural gas for the production of electricity is simply not feasible as fossil fuels still offer economical advantages. However, the sustainable development strategy focuses on increasing the efficiency of combustion technologies and investments in pollution reduction equipment in all cases where there is significant potential for progress.

Another option is nuclear energy, the world's third largest source of electricity generation after hydropower and coal. Use of nuclear power could have major environmental benefits. Nuclear plants are very compact and have modest land requirements. They do not normally emit carbon dioxide, greenhouse gases, or any other pollutants into the atmosphere. The supply of nuclear fuel is abundant. However, concerns have been expressed about nuclear safety, stemming largely from the accidents at Three Mile Island in 1979 and Chernobyl in 1986. We may, therefore, have to prepare for a critical situation arising in a few decades ahead. We will be forced by the dangers of global warming to drastically reduce the use of fossil fuels and we will have no alternatives in sight. In such circumstances, nuclear fission could be the only alternative for partial alleviation of the situation. This goal, however, cannot be achieved by isolated individual efforts and would require the concerted efforts of the International community. Action to improve the acceptance of nuclear power by the general public or by local communities is essential. The public's perception of the environmental consequences in this matter is crucial. But the present negative view is subject to change only through proven safety technology and public education. Nuclear power is perceived as extremely dangerous. However, global climate change which is now

threatening the survival of mankind is actually being caused largely by burning fossil fuels.

Conclusion

There is no doubt that we have reached the point where energy and the environment are inseparable. All future plans and actions must recognize and integrate this reality. By learning from previous success stories and mistakes, and by having the courage to sincerely forge a more sustainable path, the relationship between energy and the environment will become more compatible.

I believe that electric utilities will continue to have a significant role and responsibility in defining this new relationship as we enter the 21st century through the reconciliation of short and long term needs of economic growth and efficiency, environmental quality and social well-being. Progress will inevitably include strategies for eco-efficiency, efficiency in both supply and demand, and fossil fuel efficiency for limiting greenhouse gas emissions. Renewable technologies such as hydroelectricity, use of biomass and geothermal power are likely to expand rapidly. Their costs will continue to decline with technological progress and mass production. Furthermore, the door to nuclear energy must be kept open. However, unless the problem of nuclear waste treatment is completely solved, we must recognize that concern will supersede any progress for maximizing the environmental benefits of this alternative.

Throughout the decision-making process, we must not forget that any initiative in the public realm will involve interest from many diverse stakeholders. We must have the courage to acknowledge these voices through the incorporation of a sincere participatory approach to resolving potential conflict. We must educate, communicate and demonstrate leadership in this regard.

Above all, we must strive towards a more sustainable future.