ASEAN Energy Cooperation: An Opportunity for Regional Sustainable Energy Development

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Introduction

Energy security has been a critical issue for all countries and an impetus for transnational and regional cooperation to seek ways to secure an adequate and stable energy supply. In our world today, success has been translated into economic power. And energy is a vital factor in driving economies. As fossil fuels are the primary source for energy supply, countries are faced with consequences of environmental degradations as a result of the hydrocarbon combustion and long-term challenges of availability. Today, countries are coming together to combat energy insecurities by pooling, sharing, and interconnecting resources. Transnational sustainable energy development should also be on the agenda to ensure long-term energy security, economic development, and environmental health.

The growing economies of developing countries have called for new investments in energy production and infrastructure development. This is an opportunity to shape the energy policies of these countries to follow a more sustainable path. The ASEAN Energy Cooperation is a promising alliance that can be used to achieve regional or transnational sustainable energy development. (The Association of Southeast Asia Nations (ASEAN), was founded in 1967 to foster political and economic cooperation and mutual assistance among its 10 members: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.) This paper explores the weaknesses of the present enactment of the ASEAN Energy Cooperation, and suggests viable alternatives for developing a sustainable, efficient, and clean energy supply, particularly concerning electricity, in the hopes of achieving long-term economic progress.

ASEAN Cooperation for Energy

As the East Asia Tigers are emerging as rapidly growing dynamic industrial manufacturers for the world, their projected growth has led to a higher demand for energy. The ASEAN 2020 Vision adopted in 1997 by the heads of state at the 2nd ASEAN Informal summit held in Kuala Lumpur envisioned an energy-interconnected South East Asia through the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline Projects. These ventures call for regional cooperation in pooling and maximizing efficient utilization of energy resources. Currently, it is estimated that the ten countries of ASEAN have a total of 22 billion barrels of oil, 227 trillion cubic feet of natural gas, 46 billion tons of coal, 234 gigawatts of hydropower and 20 gigawatts of geothermal capacity (AMEM, 2004). (Please see Figure 1 for a map of the energy resources of ASEAN.)

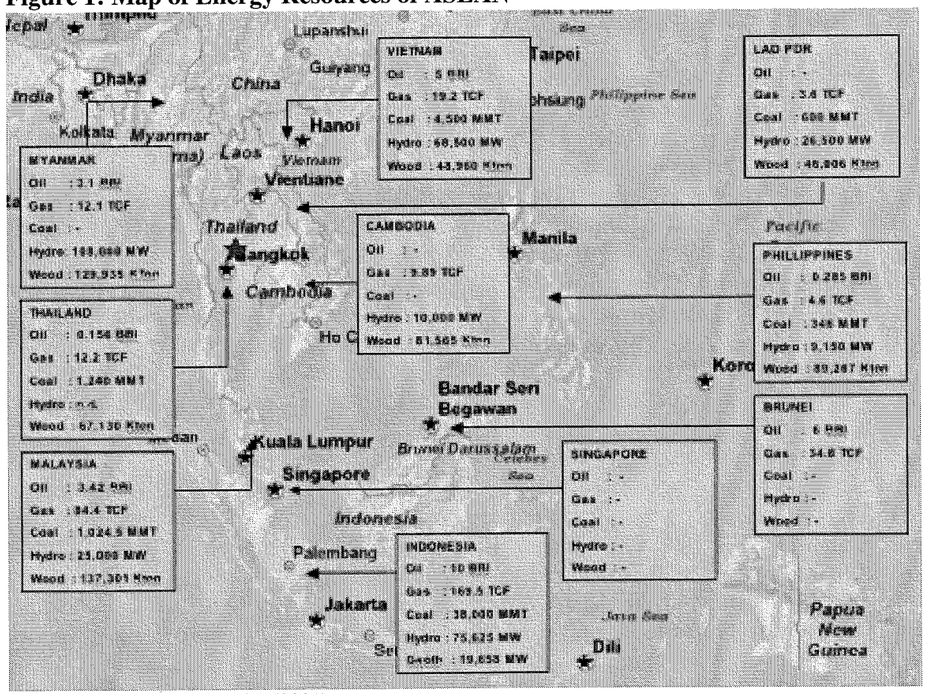
In addition to a secure regional energy network, the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline Projects stimulate the ASEAN economy and promote a win-win

economic relationship between the countries through energy trading (EGAT, 2003). These projects are carried out through the ASEAN Plan of Action for Energy Cooperation that is overseen by the ASEAN Center for Energy (ACE), the central intergovernmental organization responsible for initiating, coordinating and facilitating collective activities on energy.

ASEAN Power Grid

The Power Grid is interconnected through a cooperative agreement among the power utilities/authorities of the ten countries. The aim is to pursue optimum use of energy resources. (Please see Figure 2 for the ASEAN Power Grid Map.) Although it is a regional grid, agreements are made bilaterally between the countries. The Heads of ASEAN Power Utilities/Authorities (HAPUA), a specialist organization under ACE, oversees the implementation of the Power Grid.

Figure 1: Map of Energy Resources of ASEAN



Source: Adaptation from ACE (2001)

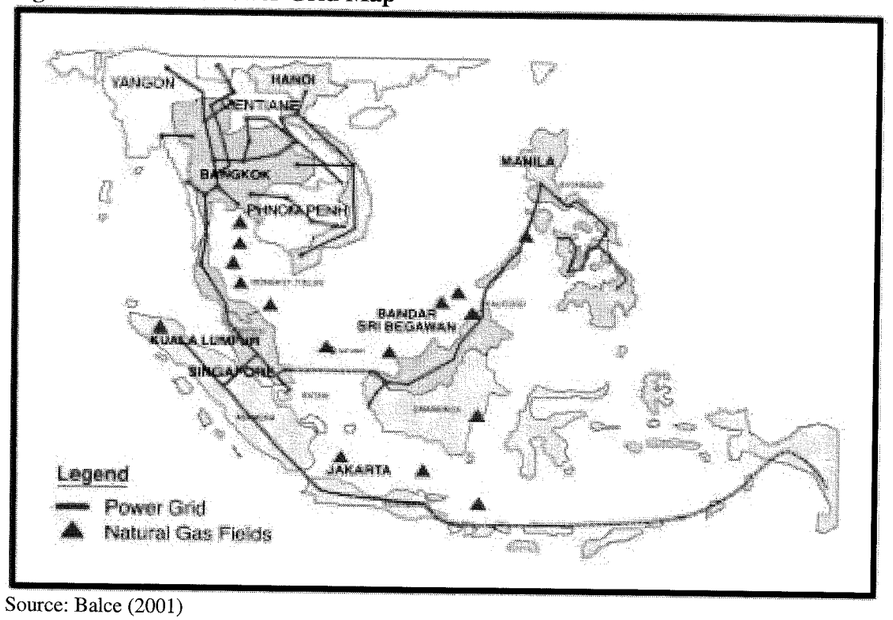
The ASEAN Power Grid also adds strength to the regional economic integration. "Interconnected networks can provide countries with abundant natural resources but with little requirement for electric demand to generate income from their surplus power. In contrary, countries with high power demands can meet their electricity shortfalls with

power imports from neighboring countries at reasonable price" (Yong, 2004). Thus, the building of new electrical plants to meet demand can be substituted by transferring power to countries instead. This reduction in building will also benefit the environment, public health, and livelihoods of people (EGAT, 2003).

However, the generation might be more intense in certain areas and thus, impacts on the environment and people living around the parameters might be more severe. Nevertheless, unnecessary and ineffective plants will be reduced and thus, make the Power Grid more efficient and cost saving.

Table 1 shows the amount of electricity demand forecasted in 2020 in South East Asia, which is more than double the electricity consumption today (Ryder, 2003). As this calls for major investments in additional energy production and cross-border infrastructures, high-capital investments will be needed which no single government can fund on its own (AMEM, 2004). It is estimated that a total of US$ 100 billion is required to fund the necessary infrastructure and institutions to meet the 2020 energy demand (Yong, 2004).

Figure 2: ASEAN Power Grid Map



Source: Balce (2001)

Thus, the private sector will be encouraged to embark on these projects. With the trend of liberalization of the power supply industry in most of the countries, this will be more viable as well. It is also said that the ASEAN Power Grid will result in cheaper electricity

for all ASEAN countries, ensure sustainability of energy resources and contribute to energy efficiency (Yong, 2004).

Table 1: Preliminary Estimates of Electricity Demand of ASEAN in 2020

Country	Electricity Demand (MW)
Brunei Darussalam	957
Cambodia	1,205
Indonesia	64,225
Lao PDR	818
Malaysia	39,202
Myanmar	N/A
Philippines	32,445
Singapore	11,370
Thailand	49,975
Vietnam	32,376
TOTAL	232,573

Source: Adaptation from Balce (2001)

Diagnosis of the challenges faced by ASEAN

Although the ASEAN Plan of Action for Energy Cooperation claims to be committed to sustainable development, there are certain concerns and weaknesses that should be examined regarding the increased energy generation to meet 2020 demands. As this is the turning point of the establishment of a regional energy system, it is vital to be aware of the obstacles and challenges so policies can be implemented to counteract and lead ASEAN towards a more sustainable path.

Implication of Greater Energy Needed

The ASEAN Power Grid focuses on the need to cater to the forecasted demand rather than to promote more efficient energy usage. Even though part of the ASEAN 2020 Vision was to "promote cooperation in energy efficiency and conservation, as well as the development of new and renewable energy resources" (AMEM, 2004), a lot less resources have been allocated to energy efficiency and renewable energy projects in contrast to energy interconnecting projects. The level of importance of efficiency and renewables are secondary to that of securing and interconnecting energy supplies. I believe this is due to the lucrative economic gains from the energy trade that have overshadowed other issues in the process.

One of the key selling points of the ASEAN Power Grid is the strengthening of the region's economy through a win-win approach. Certain resource-endowed countries will exploit this opportunity to maximize monetary gains and the more industrialized countries would benefit from cost savings from the "cheaper" electricity. For example, Indonesia is planning to avail the electricity market opportunities by mobilizing its gas and coal resources.

Opportunistic Vision

Because the ASEAN countries are all developing, with the exception of Singapore, economic development is given priority and is done as rapidly as possible. For this reason, countries might be driven to develop and exploit their resources in return for short to medium term gains. Most of the power generating authorities and companies in South East Asia are entirely or partially state owned, so the power trade can be a lucrative source of short to medium term national income. Power importers might also want to take advantage of the lower electricity costs without having to invest too much in new renewable or efficient technologies. Hypothetically, as some economists might say, once the peak of the environmental Kuznets curve (Kuznets made the proposition when an economy is primarily agricultural, it has a low level of income inequality. Then, during early industrialization, income inequality increases over time. At some critical point it starts to decrease again.) is reached, the countries might have the monetary resources to fund energy efficient and renewable energy technologies, but by then, it might already be too late.

Exclusion of social and environmental costs

The estimated US$100 billion needed to build infrastructures and institutions for the Power Grid to meet the 2020 demand are misleading. The cost benefit analysis does not account for social and environmental costs, as it is too complex to calculate (Ryder, 2003). Claims that the electricity costs from the Power Grid will be cheaper might therefore be distorted as well. This leaves a burden on those who are directly affected including local governments, aid agencies, and the communities to assume the costs of any social or environmental degradation.

Lack of Commitment to Sustainable Energy Technologies and Projects

Although the ASEAN Energy Cooperation calls for the promotion of new and renewable energy resources, the countries have not been aggressive in developing alternatives to conventional sources of energy. Renewable energy resources may be defined as sources that capture their energy from on-going natural processes such as sunshine, wind, flowing water, biological processes, and geothermal heat flows. In the Plan of Action, the Power Grid also acknowledges the potential of renewable energy sources to be part of the Grid, but not too much has been done. Several countries have set self-targets but most seem to be facing challenges in meeting targets or setting unusually low targets. For example, in 2001, Malaysia set to have renewable energy make up 5% of the total national energy to be generated by 2005, but it is currently far below the target (How, 2005). Indonesia has set a meager 2.4% target of energy supplies from renewable sources by 2025 (DTE, 2005). Thailand has set 2011 as the target date to achieve 8% of the total national energy consumption to be generated from renewables but so far it is far from this target (Greacen, 2005). One of the successes is the Philippines where it wants to double its capacity for renewable energy from the current level of 37% of total energy consumption (4,500 MW) to 60% (9,000 MW) by 2013 (Business Day, 2004).

Currently, ASEAN's demand for renewable energy is estimated to be just 68mm tons of oil equivalent (mm TOE) or only about 1.8% of total energy demand (Business Day, 2004). However in 2020, it is estimated that the demand for renewable energy in South East Asia will rise to 74 mm TOE or 1.2% of the total. Budgets allocated by the ASEAN Energy Cooperation to investments in renewable sources from 2001 to 2020 totaled about $15.44 billion or barely 2% of all investments in the power sector (Business Day, 2004).

To exemplify the gravity of the depletion of two fossil fuel energy resources in the South East Asia Region and the need to invest in renewable energy technology, please see Table 2 below.

Table 2: Life Expectancy of Reserves (2001)

Country	Oil Reserves (MTOE)	Reserve Life Reserve/Production or *Consumption (Years)	Gas Reserve (MTOE)	Reserve Life Reserve/Production or *Consumption (Years
Brunei Darussalam	196.00	25	343.90	40
Cambodia	0.00	0	0.00	0
Indonesia	1,372.00	20	4,136.72	73
Laos	0.00	0	0.00	0
Malaysia	478.80	13	2,103.25	66
Myanmar	28.00	51	300.75	209
Philippines	39.90	*30	114.63	*32
Singapore	0.00	0	0.00	0
Thailand	21.84	6	304.02	22
Vietnam	364.00	46	623.00	941
TOTAL	2,500.54	*22	7,926.27	68

Source: ACE (2001) *Projected Consumption

Dominance of stronger economies

Generation of additional power has been allocated mostly to the less developed ASEAN countries not only because they have the natural resources, but also because of less stringent humanitarian and environmental laws. Because of its strategic location, Thailand has been an ardent supporter of the Power Grid and also a driver for countries like Myanmar and Laos to build hydroelectric dams. In the future Thailand's Electricity Generating Authority of Thailand (EGAT) will be the main buyer of hydroelectricity from the neighboring countries and will act as the middleman, selling power to the other countries in the south. EGAT currently produces a surplus of power within Thailand and does not plan to increase capacity either by building power plants at home or purchasing power from neighboring countries until 2009 (Ryder, 2003).

Power generation from fossil fuels or hydro also does not come without social and environmental problems. Thus, outsourcing power generation to another country might be a way to avoid local resistance within democratic countries. In the past, the power generating facilities in Thailand or even the construction of the Thai-Malaysian gas pipes have been met with a lot of resistance from NGOs, civil society and environmentalists.

Implementation of Policies and Programs

The ASEAN Plan of Action for Energy Cooperation has a rather impressive and comprehensive plan laid out which revolves around the idea of sustainable development. The programs under the Plan of Action are 1) ASEAN Power Grid 2) Trans-ASEAN Gas Pipeline 3) Coal 4) Energy Efficiency and Conservation 5) Renewable Energy 6) Regional Energy Policy and Planning. However, reality is a far cry from the programs' goals. Even though there are projects that have progressed under the Plan of Action, much more still can be done.

Strategies

As the economies of ASEAN are developing and demands for energy are bound to increase, the region is vulnerable to increased pollution and environmental degradations, and depleting non-renewable energy resources. The ASEAN Power Grid encourages countries to seek short-term benefits through exploitations of their non-renewable natural resources. Given that economic development holds the highest priority in these countries, elaborating on pollution and environmental degradations would not gain as much attention or commitment as energy security would. Since energy security determines economic success, the only way to ensure long-term economic growth is through sustainable energy development. Bobby Julian, Finance Director of Preferred Energy Investment, a Manila-base NGO that promotes renewable energy, said "In order to enjoy real energy security, it is better for the countries to diversify their sources of energy. Governments should not see renewable energy as a contradiction to their national energy policies but a complementary source." I believe this outlook is being more accepted by certain governments, but more policies and commitments to support sustainable energy development are necessary to promote energy efficiency and renewable energy development. Given geographic and climatic conditions of the nations in South East Asia, there is huge potential for renewable energy development from solar, wind, agricultural bi-products which can be used as biomass and so on. These following six strategies are aimed at providing viable ways to help ASEAN implement a sustainable, efficient, and renewable energy development.

***Strategy 1*: Establishment of the ASEAN Sustainable Energy Development Program**

Currently, the ASEAN Plan of Action for Energy Cooperation states that it gives a great importance to the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline (AMEM, 2004). Since sustainable energy development is also vital for the energy security of this region, it should be given the same importance and recognition as well. Rather than having the Energy Efficiency and Renewable Energy Program, these two programs will placed under the ASEAN Sustainable Energy Development Program (ASED) and still

continue to function as they are. Even though this might be seen as a categorizing and labeling issue, I believe it is important in order to show the commitment the region gives to the program. The ASED will bring forward the concerns raised in the Brundtland Report that the increase and improvement of energy efficiency "should be the cutting edge of national energy policies for sustainable development" and the shift of the current energy towards renewable energy resources (WCED, 1987).

The ASED Program will have a task force that will coordinate the two programs under its wing with the other programs and projects in the Plan of Action to ensure that all opportunities where sustainable energy development can be incorporated are explored. This would include working with the ASEAN Power Grid Program to guarantee the promotion of renewable energy in the grid. The task force would also work with the Regional Energy Policy and Planning Program to include energy efficiency schemes and renewable energy development into the recommended policies. In addition, the ASED will focus on policy formulation and institutional framework to overcome common barriers to promote energy efficiency and conservation and the development of renewable energy technologies. As a central source of information, the ASED will also be able to share and disseminate information on sustainable energy development and technologies.

It is also ideal to group the two programs under ASED because small-scale private sector involvements for both are high and very crucial. Internal resources and costs can be shared by maintaining these contacts and coordinating projects with the private sector. Currently, in the Plan of Action, the private sector is not included as a means of promoting renewables and efforts seem to focus only at the national level. Although national development in renewables is important too, in reality, the private sector is the most active in developing renewables and should be included in the plan.

Within the ASED, there should also be an investment task force that will coordinate and look for opportunities for funding to support sustainable energy development. Examples of these investors and lenders would be the World Bank, GEF, CDM, private sector, foundations, donors, government subsidies and so on.

***Strategy 2*: ASEAN Sustainable Energy Development Agreement**

The ASEAN countries, I believe, understand that sooner or later, they will have to engage in sustainable energy development. However, since there are still non-renewable resources available, there is a lack of urgency to do so. On the contrary, since the energy sector is going to grow as a result of the ASEAN 2020 Vision and the Power Grid, its is vital that sustainable energy development policies are embedded into the expansion. In order to call for regional commitment, the countries should engage in binding national commitments towards sustainable energy development.

In the past, countries have not been too committed to renewable targets. Thus, more stringent targets and deadlines are needed to move the region towards a sustainable energy path. The ASEAN Sustainable Energy Development Agreement would be a

vehicle for the countries in the region to collectively pledge to this commitment. There are actually two other similar international agreements. These are the Energy Charter Treaty and the UN Global Energy Charter for Sustainable Development. Currently, however, ASEAN has only engaged with both of them through observer status.

With a regional agreement, the requirements and language would be better able to cater the ASEAN countries. A clear definition of what constitutes sustainable energy development, renewable energy, and energy efficiency should be included in the agreement to minimize confusion for the ASEAN members. In addition to calling for a commitment to developing sustainable energy, the agreement should require countries to share related information and technology. . The agreement should also urge countries to level the playing field in the energy sector for non-conventional power as well as remove existing constraints for the entrance of renewable energy into the power grid. A pledge to provide incentives and rewards to encourage energy efficiency and renewable energy development would help drive the sector forward.

In addition to the ASEAN Sustainable Energy Agreement, a protocol should be in place to facilitate the technical requirements of the agreement. Below is a list of possible items that should be included, along with a set deadline:

1) Target percentage of renewable energy sources at the regional and national level.
2) Target percentage of renewable energy sources to contribute to the ASEAN Power Grid energy mix.
3) Target percentage of energy efficiency at the national level.

At the micro level, national energy efficiency targets could be achieved by enforcing certain businesses, institutions or domiciles to achieve specified minimum levels of efficiency. Businesses should not be penalized but offered rewards and incentives such as tax breaks or discounts in electricity fees to encourage them to achieve the set objectives.

Although the ASEAN Sustainable Energy Development Agreement might be rather ambitious, a collective push is needed to get the countries to invest in sustainable energy development. If formal targets and deadlines collectively bind the countries, there will be more impetus to meet the targets and achieve higher levels of energy security.

***Strategy 3*: Goodwill Tariffs and Green Energy Fund**

Goodwill Tariffs

To reflect the social and environmental costs of power generation, a Goodwill Tariff could be placed upon the import price of the electricity at a national level. This Goodwill Tariff is actually a mitigation tax that will be allocated to a central fund monitored by a specialized taskforce in the HAPUA. The fund will then be allocated back to the generating countries to be used to offset the social and environmental issues resulting from generating electricity. This "Goodwill" Tariff is based on the assumption that countries will be willing to compensate for the adverse local, regional and global impacts.

Determining the amount of the tariff would however be a challenge as it is often difficult to put a monetary value on social and environmental costs. A way of monitoring how the fund is used should be in place to ensure that the funds are being used effectively for mitigation.

Green Energy Fund

One of the major obstacles of renewable technology development is the lack of financial mechanisms to provide funds for these projects. The Green Energy Tax would tax annually or bi-annually whatever proportion of conventional non-renewable power generation consumed, minus energy consumption from renewables at the national level. The Green Energy Fund, which will be monitored by the ASED, will then be used to fund green energy technologies. Thus, the countries would eventually benefit from the tax. This mechanism will help ensure funds for renewable energy development and also encourage renewable power generation at the same time.

The ASEAN Power Grid system is still in the development process and thus, tariffs and taxation schemes like these could be embedded into the system. True costs should be reflected and conventional energy sources should be gradually lowered or phased out.

***Strategy 4*: Involvement of Global Environment Facility and Clean Development Mechanisms**

Both the Clean Development Mechanism (CDM) and the Global Environment Facility (GEF) can be utilized for funding for the implementations of the ASED. CDM projects cover end-use energy efficiency, supply-side efficiency improvements, fuel switching, and renewable energy projects (AEBF, 2002). The GEF is also a strong supporter of developing countries to contribute to the overall objective of the United Nations Framework Convention on Climate Change. It also supports projects that reduce or avoid greenhouse gas emissions that cover renewable energy, energy efficiency and sustainable transportation (GEF, 2005). Even though these two mechanisms are aimed at ultimately reducing climate change where as the ASED's objectives are focused on securing sufficient growth of energy supplies to meet ASEAN's long term goals, the CDM and GEF supports energy efficiency and renewable energy development projects. Thus both could be viable funding sources.

***Strategy 5*: Strengthening NGOs for Efficient and Renewable Energy**

Non-governmental organizations play an important role in monitoring and advocating change. However, there are hardly any NGOs monitoring ACE and very few NGOs specializing in monitoring and advocating energy related issues and activities nationally and transnationally in South East Asia. Along with the establishment of the ASEAN Power Grid, there should also be trans-ASEAN NGOs as well. NGOs can be a pivotal force in gaining public support for and pressuring the government to engage in sustainable energy development. . NGOs could aid grass root efforts and encourage businesses to develop efficient and renewable energy by sharing ideas and pointing out the benefits that could arise. Existing energy NGOs in Indonesia, Malaysia, Thailand and

the Philippines should create a network among the NGOs in the ASEAN countries and work together to support efficient and renewable energy development. A regional meeting should be held by existing NGOs in order to educate other NGOs on energy issues in South East Asia. Such a meeting would strengthen the groups through capacity building and networking. Funds could be raised from donations from green or environmentally conscious businesses or donors.

The private sector also plays an important role in sustainable energy development because they are the forces that engage in energy efficient practices or invest in renewable energy development. There are quite a few "green" companies in South East Asia such Bangchak Petroleum Company in Thailand, which operates on good social and environmental governance. A network among similar companies could be initiated across South East Asia to promote sustainable practices such as setting voluntary energy efficiency targets and so on. Companies could gain good public relations in return for engaging in corporate social responsibility activities and spreading awareness of sustainable energy development.

***Strategy 6*: Role of Education and Media**

The power of education and the media can win public support for sustainable energy development in general as well as the ASED. If people could obtain the same services as they do now by using less electricity, they would save money. Thus, I believe, the general public would support national energy efficiency if they were educated as to how to conserve energy and realize the resulting benefits. The media can help in this endeavor by disseminating the pertinent information. An example of a nationwide effort to show the importance of energy conservation was exercised in Thailand in June 2005. The whole country was called to turn off all their lights and electrical appliances at the same time for five minutes on a certain day in order to demonstrate how much energy can be saved. A graph of the massive drop in energy consumption was shown live on TV a few minutes later and in newspapers the next day. Although this campaign was well received and many people cooperated, the government failed to continue campaigns for energy saving after that day. This illustrates, however, the importance of education and media in the support for and the success of sustainable energy development.

Leadership

In order to advocate the ASED, the ASEAN Sustainable Energy Development Treaty, the Goodwill Tariffs and the Green Energy Fund, a certain member in ASEAN is needed to take the lead. The Philippines and Thailand seem to be the best candidates for such a leadership role because of their commitment to renewables and/or their involvement in the ASEAN Energy Cooperation and ASEAN Power Grid. Thailand's intense involvement in developing ASEAN Power Grid and its strategic location however appears to out shine the Philippines in leading such changes. Thailand also has a track record of engaging in several sustainable development projects led by the King of Thailand. Thus the idea of sustainable development is not new to them.

By proposing and leading such strategies, the Thai government would gain a better public relations image. Many are skeptical of their ardent support for the ASEAN Power Grid as they will be the main buyers of hydroelectricity produced in the north and the sole middleman in selling electricity to the south.

Conclusion

By moving towards sustainable energy development, the economies of ASEAN can be certain of the path ahead of them - long-term economic development, competitiveness in the world arena, a secure and stable energy source, and a cleaner and healthier region. The ASEAN 2020 Vision of energy demand and the establishment of the Power Grid provide an opportunity for the region to structure the energy sector in such a way that supports sustainable development. This energy expansion comes at an era where there are technologies available to support sustainable energy development and the region should take full advantage of it.

Although there is currently no single silver bullet that can solve all energy problems, through the energy interconnection projects, the diversification of energy sources to include a larger portion of renewables, and the fostering of energy efficiency practices and technologies will help strengthen the energy security of South East Asia. Through a collective approach towards sustainable energy development, this region will be able to achieve its ASEAN 2020 Vision goals and beyond while achieving sustainable development.

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