

Potential Policies and Areas of Cooperation on Green Technology and Green Energy between ASEAN and Canada

This article discusses the energy needs of ASEAN, as well as potential policies and areas of cooperation between ASEAN and Canada regarding green technology and green energy. **Green technology** is defined as technology whose use is intended to mitigate or reverse the effects of human activity on the environment, and **green energy** is defined as natural energetic processes that can be harnessed with little pollution, such as anaerobic digestion, geothermal power, wind power, small-scale hydropower, solar energy, biomass power, tidal power, wave power and some forms of nuclear power.

ASEAN Technology and Energy Needs – with the increasing importance of building and strengthening the ASEAN Community, it is crucial to understand the regional technology and energy needs because along with rapid growth comes increasing technology and energy usage. The following items outline the direction ASEAN is pursuing in regard to technology and energy:

1. Bali Declaration on ASEAN Community in a Global Community of Nations “Bali Concord III:” The Bali Concord III reaffirms ASCC’s purposes and principles for sustainable development, environment, and climate change, with an emphasis on balancing economic growth, social development and environmental sustainability for the attainment of the Millennium Development Goals (MDGs).
2. ASEAN Socio-Cultural Community (ASCC) Blueprint: As outlined in the ASCC Blueprint, ASEAN is pursuing a more environmentally friendly community by 1) facilitating access to applied science and technology; 2) ensuring environmental sustainability; 3) addressing global environmental issues; 4) promoting sustainable development through environmental education and public participation; 5) promoting environmentally sound technology; 6) promoting quality living standards in ASEAN cities and urban areas; 7) harmonizing environmental policies and databases; and 8) responding to climate change and addressing its impacts.
3. Initiative for ASEAN Integration (IAI) Strategic Framework and IAI Work Plan 2 (2009–2015): Similar to actions outlined in the ASCC Blueprint, the IAI Strategic Framework and IAI Work Plan 2 provide specific actions aimed at narrowing the development gap among ASEAN Member States including the use, development and distribution of energy resources and technologies.
4. ASEAN Plan of Action for Energy Cooperation (APAEC) 2010 – 2015: The APAE was developed by the ASEAN Center for Energy (ACE) and aims to enhance energy security, accessibility and sustainability for the ASEAN region by 1) the ASEAN Power Grid; 2) the Trans-ASEAN Gas Pipeline; 3) Coal and Clean Coal Technology; 4) Renewable Energy; 5) Energy Efficiency and Conservation; 6) Regional Energy Policy and Planning; and 7) Civilian Nuclear Energy.

Current Status of ASEAN Green Technology and Green Energy – over the past decades, ASEAN Member States have been increasing its green technology and green energy awareness and activity. The following items briefly describe the green technology and energy that is currently available within ASEAN:

1. Natural gas is available in Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam. These ASEAN Member States have made considerable efforts to develop the natural gas industry. Most ASEAN power plants now use natural gas to generate power, with about 60% in Myanmar and Singapore, and 70-75% in Malaysia and Thailand. ASEAN’s proven gas reserves (at current usage rates) are expected to last for 50 years, and up to about 130 years, if the probable reserves are added.¹ Competition for natural gas is already growing as the demand continues to accelerate. Meanwhile traditional gas suppliers to the world market (including some ASEAN Member States) have recently imposed policies biased towards domestic consumption and conservation of natural gas for higher-value use.²
2. ASEAN Power Grid (APG): With this technology, the power supplied through the APG is produced through a mix of oil, gas, coal, hydro, geothermal and other renewable energy sources. It currently provides energy access to roughly 66% of ASEAN citizens. The underlying goal of this project is to encourage interconnection projects, first on cross-border bilateral terms, then gradually expand to sub-regional basis and, finally to a totally integrated Southeast Asian power grid system.²
3. Trans-ASEAN Gas Pipeline (TAGP): In combination with the APG interconnection projects, the Trans-ASEAN Gas Pipeline aims to interconnect the gas pipeline infrastructure of ASEAN Member States and to enable gas to be transported across the borders of the Member States. The TAGP is projected to develop a regional gas pipeline by 2020, linking both existing and planned gas pipeline networks in the ASEAN Member States.²
4. Coal and Clean Coal Technology: Due to the increasing demand for fuel electricity generation and the industrial sector, coal is expected to be the fastest growing energy source between the years 2005 – 2030

among ASEAN Member States. ASEAN promotes and encourages the use of clean coal technology and trade for regional energy security, however is still in the process of further developing its technologies.²

5. Renewable Energy (including geothermal, solar, wind, tidal and wave energy) is expected to grow at a rate of 9.1% among ASEAN Member States by 2030. The target established in the ASEAN Plan of Action for Energy Cooperation (APAEC) 2004 – 2009 to increase renewable energy by 10% was met, and the APAEC 2010 – 2015 aims not only to increase renewable energy by 15%, but also to reduce the impact of energy usage in the ASEAN region. Among ASEAN Member States, hydropower and bio-fuels are the major areas of focus for renewable energy.²
6. Civilian Nuclear Energy has been discussed among ASEAN high officials since 2007, where the leaders agreed to explore nuclear as an alternative source of energy and stressed the need that this source should be sustainable, safe and environmentally friendly. In order to move toward nuclear energy, ASEAN will facilitate the sharing of information by public discussion on nuclear energy, human resource development and training, regulatory framework, emergency preparedness response plans, cooperation among nuclear energy agencies and investment in research and development (R&D) on nuclear energy.²

Canada's International Role in Green Technology and Green Energy – Canada is internationally recognized as a leading nation in green technology and green energy. The following items briefly demonstrate the role leadership role Canada has taken in the fields of green technology and energy:

1. Office of Energy Research and Development, Canada: The OERD is Canada's leading organization on energy efficiency and alternative fuel information. It also offers grants and incentives and other resources, including workshops for professionals, statistics and analysis, awards and hundreds of free publications in order to strengthen and expand Canada's commitment to energy efficiency. Among the many programs hosted by OERD, ecoENERGY is one the largest and well-known, it has thus invested nearly 5 billion US Dollars in energy projects. ecoENERGY programs focus on innovation initiative, technology initiative, aboriginal and Northern Communities programs, renewable power, equilibrium communities, retrofit homes, energy efficiency, and biofuels. Within these topics are several projects that have been carried out to meet the help Canadians use energy more efficiently, boost renewable energy supplies and develop cleaner energy technologies.³
2. International Energy Agency: Canada is among the one of the 28 members of IEA that works to ensure reliable, affordable and clean energy for its members and beyond. The IEA's focus has recently expanded to include hosting global dialogues on energy, providing authoritative and unbiased research, statistics, analysis and recommendation on energy. Members of the IEA also work closely with non-member countries and organizations, such as International Energy Forum (IEF), Organization of the Petroleum Exporting Countries (OPEC), Joint Organisations Data Initiative (JODI), and the International Renewable Energy Agency (IRENA).⁴
3. Multi-sector Industry: Not only does Canada's public sector play a leading international role in green technology and green energy, but both the private and non-profit sectors promote the development of green technology and green energy in Canada. For example, BluEarth Inc. is a private company leading renewable energy projects across the entire North American continent, and SDTC or Sustainable Development Technology Canada is a nonprofit that has funding over 21 rounds of projects totaling over 2.1 billion US Dollars.⁵

Recommendations for ASEAN's Future Energy Policy – as ASEAN continues to pursue the “open to all options energy mix,” it is important for ASEAN to research and investigate energy options. Furthermore in order to make those options available to ASEAN Member States, it must provide efficient funding and develop effective policy. In the 3rd ASEAN Energy Outlook, the overall energy mix within ASEAN decreased between 1995 and 2007. To reverse this trend, the following items offer recommendations for developing effective green technology and green energy policy for ASEAN:

1. Outline Policy Goals: In his keynote speech at the 8th Gas Information Exchange (GASEX 2004), former Secretary-General of ASEAN H.E. Ong Keng Yon discussed three major recommendations for ASEAN's future energy policy: 1) ASEAN must invest more on energy infrastructures; 2) ASEAN must reduce its dependence on imported energy, particularly oil; and 3) ASEAN must carry out more cross-border trade in energy.¹ In partnership with its policy goals, it is important for ASEAN to create policy that is enforced and obeyed by all Member States, therefore ASEAN should continue to promote private-sector involvement and implement policies and reforms that are required to create a more responsive and enabling environment.¹ In addition, as outlined in the ASEAN Plan of Action for Energy Cooperation 2010-2015, an annual report should be

conducted on green technology and green energy development, and presented for review at the ASEAN Ministers on Energy Meeting (AMEM) in order to monitor its progress.²

2. Research and Development (R&D): The ASEAN Secretariat is planning to carry out a major study on regional electricity trading, "aimed to promote greater understanding on the concept of electricity trading in ASEAN, its challenges, opportunities and options, as well as guide the formulation of common policy for regional power interconnection and trade."¹
3. Develop a Budget: Energy infrastructure investment for ASEAN is predicted to cost 100 billion US Dollars to meet the increasing electricity demand, and 7 billion US Dollars for the gas pipeline networks.¹ In order to carry out these projects, ASEAN must continue to adjust the budget accordingly and finance the projects wisely. As outlined in the ASEAN Plan of Action for Energy Cooperation 2010-2015, ASEAN must continue to build and strengthen partnerships within the region and with dialogue partners to successfully complete the green technology and green energy projects in ASEAN.²
4. Policy Implementation: After creating policy for ASEAN's future green technology and green energy, it is important for the ASEAN Member States to be held accountable for upholding the policy. The ASEAN Ministers on Energy Meeting (AMEM) is currently responsible for tracking the progress of implementation of the energy projects in the areas of 1) renewable energy; 2) power interconnection; 3) research, development and engineering; 4) human resources management and development; 5) geothermal energy; 6) rural and urban electrification; 7) Electric Power Information Centre; 8) use of combined cycle power plants; and 9) deregulation and reform of power utilities. Continuing this concept will help foster effective energy policy in ASEAN.⁶

Partnership Recommendations for Future Cooperation Between ASEAN and Canada on Green Technology and Green Energy – Canada has been a longstanding dialogue partner to ASEAN since 1977, however has seldom cooperated with ASEAN on green technology and green energy. To encourage increased activity between ASEAN and Canada on green technology and green energy, the following items discuss potential policies and areas of cooperation on green technology and green energy.

1. High Level Energy Dialogue (HLED): Canada and the EU conduct high level dialogues with three key areas of interest: 1) facilitating the deployment of carbon dioxide capture and storage (CCS); 2) sustainable development of bioenergy and second-generation biofuels; and 3) the promotion of renewable energies. Discussing these specific topics allows the two bodies identify areas of cooperation and joint commitments. These high level dialogue meetings take place roughly every 12-18 months.⁷ ASEAN and Canada currently do not hold HLED meetings, however could benefit both partners by calling together similar dialogue meetings to discuss mutual energy interests.
2. The Renewable Energy Mission to India took place in New Delhi on August 8-12, 2011. Sponsored by the Canadian Trade Commissioner Service, the *Renewable Energy India 2011 Expo* facilitated research and business partnership opportunities in India for Canadian companies, who showcased their innovative technologies to senior representatives from both the private and public cleantech sector in India.⁸ A similar mission to ASEAN Member Countries may increase awareness, partnership and common interests between ASEAN and Canada on green energy and green technology. This would allow business partners, researchers and policy makers to interact with one-another, which may not happen otherwise.
3. The Agreement for Scientific & Technological Cooperation between the European Union and Canada facilitates cooperation "in fields of common interest where the Parties are supporting research and development activities to advance science and/or technology relevant to those fields of interest." This policy allows, Canadians to participate in the European Union's Framework Program and Europeans from EU Member States to participate in Canadian federal programs.⁹ If ASEAN and Canada were to adopt a similar agreement, the direct exchange of research and development on green technology and green energy would be mutually beneficial.
4. ASEAN Environmentally Sustainable Cities Program (ESC) is an initiative funded by the Japan-ASEAN Integration Fund (JAIF), which promotes and recognizes environmentally sustainable cities across ASEAN that serve as examples of an alternative model of urban development, capable of securing economic, social and ecological progress in a sustainable and inclusive way.¹⁰ Similar to Japan, Canada has several internationally recognized "green cities" that can be potential partners for leading "green cities" among ASEAN Member States.
5. Renewable Energy Support Programme for ASEAN (ASEAN-RESP) is jointly implemented by the German Development Cooperation (GIZ) and the ASEAN Center for Energy (ACE), which contributes to improved preconditions for the use of renewable energy in the ASEAN region. This project is implemented by creating

and building networks within the ASEAN renewable energy sector, offering support and advice on renewable energy policy and framework conditions, as well as capacity building and training for practitioners in the sector.¹¹ If Canada and ASEAN encourage longstanding partnership between their green technology and green energy sectors, it is important to develop strong networks. A project similar to ASEAN-RESP can aid in initiating and deepening the current ASEAN-Canada energy networks.

6. ASEAN+3 Clean Development Mechanism (CDM) was proposed in 2007 by the Ministry of Knowledge Economy from the Government of Korea. The project focuses on promoting cooperation between Korea and ASEAN, developing more candidate CDM projects, and providing credible resources to develop candidate project cooperation.¹² A similar approach to project cooperation between ASEAN and Canada can increase resource availability and green technology and green energy project development.
7. EC – ASEAN Green Independent Power Procedures Network is coordinated by the Institute of Industrial Production (IIP Germany) and was established to link researchers, industry representatives, policy makers and NGOs from Europe and Southeast Asia. The main objective is to contribute to increase the power sector's efficiency and competition.¹³ Linking researchers, industry representatives, policy makers and NGOs from Canada with those from ASEAN Member States will widen ASEAN's "green network" with its dialogue partners.
8. Dewata Minihydro Project: (Switzerland): In 2002, H.E. the Ambassador of Switzerland inaugurated the Dewata Minihydro Plant in Java, Indonesia. The Dewata project is a bold example of foreign direct investment paired with research that makes a significant and lasting impact. This plant was built with investment funds from Switzerland, and has helped to substitute more than 90% of diesel fuel usage in the Dewata Tea Estate with minihydro power technology.¹⁴ Encouraging such specific and intentional projects to take place throughout ASEAN can lead to a much "greener" ASEAN in the future.
9. ASEAN Environmental Education Action Plan (AEEAP): the AEEAP adopted the theme *Environmental Education for Sustainable Development*, which outlines ASEAN's path toward a clean and green ASEAN including citizens who are environmentally literate through environmental education and public participation efforts. This plan emphasizes the step toward green policy mainly through the development of regional "sustainable/green school" policy, guidelines and frameworks.¹⁵ Canada may act as a mentor for ASEAN's environmental education and awareness policy. Projects, funding and policy writing on green technology and green energy are a few way that Canada could involve itself in this action plan.
10. Information for Commercialization of Renewables in ASEAN (ICRA) / Promotion of Renewable Energy Sources in Southeast Asia (PRESSEA): The ICRA project was a joint collaboration between ASEAN and the EU to collect and disseminate information that is of significant importance to the public and private sectors involved in renewable energy in Southeast Asia and the European Union. The project was completed in 2002 and was followed by another project, Information for Commercialization of Renewables in ASEAN - ICRA." This project focuses on strengthening information networking, international cooperation, and institutional framework, especially in Cambodia, Laos and Myanmar.¹⁶ If Canada was able to join the network or create a new collaboration, the base of international resources and information sharing would increase at the advantage of all partners.
11. Canadian Mission to Asia Clean Energy Forum took place at the Asian Development Bank (ADB) in Manila, Philippines on June 20-24, 2011. Sponsored by both the Canadian private and public sectors, the *Asia Clean Energy Forum* was used to promote best practices in clean energy policy and regulation, financing and investment, innovative business models and energy access. The major focus was to offer an opportunity for Canadian companies to discover valuable insights on clean energy projects and programs.¹² This forum, and others with similar objectives should be scheduled in order to encourage private and public sector involvement in green technology and green energy matters.

As demonstrated in this article there many potential policies and areas of cooperation between ASEAN and Canada regarding green technology and green energy. Among the top priorities for ASEAN's green technology and green energy, the most critical include sustainability, accessibility and connectivity. As an international leader in the green technology and green energy industry, Canada exemplifies itself as a potential partner to ASEAN's priorities. Major areas of cooperation and policy include energy and technology networking, green technology and green energy policy development as well as public awareness and environmental education programs. Developing and fostering these potential partnerships on green technology and green energy, would not only encourage international environmental responsibility, but would also help in strengthening the friendship and partnership between ASEAN and Canada as a whole.

Notes:

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