

## ASEAN's soaring energy challenge

by Michael Richardson  
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Singapore's energy policy report in 2007 surveyed options for electricity generation and decided that for the time being natural gas, the cleanest fossil fuel, was the best bet.

Lack of space in a small, densely populated country made it difficult to deploy renewable energy technologies, such as wind and solar power farms. Sheltered Singapore had an average wind speed that was less than half the level required for efficient wind power generation. Not only were wind and solar power intermittent, they were also considerably more expensive than coal, oil or gas.

Solar costs, especially for photovoltaic panels that convert some of the sun's rays into energy, have fallen sharply in the past three years. Nonetheless, a recent study by the International Energy Agency reached the same conclusion as Singapore officials: the island-state has very low potential for harnessing renewable power.

Until better ways of generating constant supplies of base-load electricity are developed, this limits Singapore's options mainly to gas-fired or nuclear power if it wants to restrain or reduce carbon emissions blamed for climate change.

However, much of the rest of the world, including Singapore's ASEAN partners, have a much more generous smorgasbord of energy sources to choose from, although nearly all the renewable ones come at significantly higher financial cost than fossil fuel or nuclear power.

Still, those costs are coming down as technology improves, governments act to promote green power, and market competition increases.

Indeed, twin reports earlier this month by the United Nations Environment Programme and the Renewable Energy Policy Network for the 21<sup>st</sup> Century show that in 2009, for the second year in a row, both the US and Europe added more electricity



generating capacity from alternative sources, such as wind and solar, than conventional sources, like coal, gas and nuclear.

Globally, nearly 80 gigawatts (GW) of renewable capacity became available last year, including 31 GW of hydro-electric generating power and 48 GW of non-hydro capacity. This nearly matched the 83 GW of fossil fuel thermal capacity that was added. Fifty GW is roughly the output of 75 coal-fired plants.

By 2011 the world will, for the first time, add more capacity to the power supply from renewable than non-renewable sources. However, there is a significant difference between capacity and production. In 2009, renewable energy represented 25 per cent of electricity generating capacity but only 18 per cent of production.

As Singapore's energy policy report noted three years ago, one limitation of intermittent renewable energy, such as wind and solar, is that they either have to be fully backed up by other (base-load) power sources or require investments in energy storage to main reliability of power supply. When the share of intermittent electricity sources becomes substantial, higher levels of ready-to-use reserves are needed to guard against a dip in power output. This increases costs.

Nonetheless, the 27 nations in the European Union aim to be generating at least 20 per cent of their energy from renewable sources by 2020. The EU is in the midst of upgrading its electricity supply, transmission and distribution network to integrate rapidly rising wind and solar power generation.

Worldwide, in the last five years, the annual average rate of growth in wind power capacity was 27 per cent, in solar hot water 21 per cent, ethanol petrol additive production (mainly from corn and sugar) 20 per cent, and biodiesel production (mainly from Southeast Asian palm oil and European vegetable oil) 51 per cent.

Annual investment, both private and public, in renewable power capacity rose to around US\$100 billion in 2009, with Asia - led by China, South Korea and India - just behind Europe and surpassing the US for the first time.

Where is ASEAN in this race to tap, and profit from, renewable energy and the new jobs, skills and products it brings? The IAE working paper focuses on Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Although only six of the 10 ASEAN members, they accounted for more than 95 per cent of the region's energy demand in 2007.

A snapshot of that year shows the ASEAN-6 got their energy from fossil fuels (74 per cent); combustible biomass and waste, ranging from wood to agricultural residue and animal dung (22 per cent); geothermal power from underground heat (3 per cent); and hydro (1 per cent).

Renewable energy – mostly geothermal in the Philippines and Indonesia, and hydro more widely spread across the region – accounted for 15 per cent of electricity generation.

IAE researchers calculate that with the exception of Singapore, the other five ASEAN economies in their study have the potential to increase the current use of renewable electricity as much as 12 times by 2030. It would then amount to nearly double the total electricity consumption of the ASEAN-6 in 2007.

However, most of this potential in modern biomass, wind, geothermal and solar photovoltaic is still untapped. The region's report card, especially when compared with more dynamic Asian players, is hardly impressive.

The IAE researchers say that to unlock sufficient and well-targeted investment in renewable energy in Southeast Asia, it is essential to implement effective and coherent policies with a long-term strategic perspective.

Deterrents to investment include regulatory and administrative hurdles, fossil fuel subsidies, and lack of incentives to support the expansion of renewable technologies best suited to local conditions.

This is clearly a big challenge, but also a large opportunity, for the ASEAN Plan of Action for Energy Cooperation.

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