

Solar puts LNG in the shade

Damon Evans
SINGAPORE

THAILAND'S imports of liquefied natural gas (LNG) are poised to increase dramatically as its domestic reserves wane. But the potentially rapid rise of solar power generation could help displace future demand for LNG.

A new diversified renewable energy push, announced by the Thai government in October, could offset up to 19% of new LNG needed for power generation, according to analysis from Hong Kong-based energy specialists AWR Lloyd. The nation's increasing gas dependency, the third highest in Asia, already sees it importing 2 million tonnes per year (t/y) of high-cost LNG, with volumes expected to rise to between 16 million and 32 million t/y by 2023.

Thailand aims to double the intake capacity of its sole import terminal, Map Ta Phut, to 10 million t/y by 2017. It is also considering a string of floating regasification units.

But renewable capacity totalling 16 gigawatts (GW) – or about 10% of today's national power demand – could be on grid by 2022, which could realistically remove 6 million t/y of LNG demand, based on AWR Lloyd's most optimistic scenario.

In 2013, 65% of Thailand's power was generated by natural gas. It imported 14% of its total gas demand from neighbouring Myanmar (Burma) via pipelines, with LNG imports accounting for a further 4.5% of demand.

Yet with its domestic gas production set to peak and other more common supply sources, such as coal or nuclear out of the question due to environmental barriers, LNG is the only source that can be expanded for power generation. And unless other sources of gas or energy are shored up, Thailand will be reliant on LNG imports for between 33-62% of overall supply by 2023, the consultancy said. AWR Lloyd's added that this, if not managed, will also have significant implications for Thai electricity prices.

Based on an LNG price of \$16 per million British thermal units (Btu), the total cost of energy for electricity will climb by \$17 billion or 45% by 2023. Thailand will also be exposed to volatile oil prices, which are linked to imported gas pricing. But solar offers a solution.

Based on the long-run cost of power, Thailand's solar-generated power is at or below parity with LNG prices of \$16 million to \$17 million/Btu for marginal demand, data from AWR Lloyd's shows. Although it will not fully offset LNG demand, solar will help erode marginal supply needs.

However, Jack Kneeland, managing director of AWR Lloyds added: "Until solar power and batteries in combination become cheap enough to compete with LNG, the effect on overall power supply demand is unlikely to be a real game changer."

Adding an incremental kilowatt-hour (kWh) of solar versus one of LNG does not cost the consumer any more money, assuming all else remains the same, he said. And Kneeland says it is realistic to presume that solar alone could replace the need for 2.5 million t/y of LNG by 2022.

As demand rises, and with other resource options relatively limited, marginal new power supply is expected to come from LNG at 5-6 baht/kWh (\$0.15-\$0.18/kWh).

Rapidly falling system costs and an impressive track record of development around the world, could increase the competitiveness of solar further, while even if spot LNG prices remain at their present lows, the cost of LNG-fired power is unlikely to fall below 5 baht/kWh, added

Kneeland. And a sweeping new plan designed to boost Thai renewable energy, announced on the 22 October by Prime Minister Prayuth Chanocha, should see interest in solar re-accelerate. By 2022 solar could produce 5% of power demand, while total renewables could provide some 13% of the nation's total needs, according to AWR Lloyd forecasts.

Thailand also has existing 2022 Alternative Energy Development Plan (AEDP) targets for other renewable energy sources that include 1.8 gigawatts (GW) from wind, biomass (4.8GW), biogas (3.6GW), waste (0.4GW), and small-scale hydro (0.3GW). These targets could also be revisited in future.

The Thai authorities hope, by 2022, to generate 25% of the country's electricity from renewables. This is certainly ambitious, but given the price volatility of fuels, it is definitely needed as a future hedge, said Gary Zieff, senior vice-president of business development at Annex Power.

Under the latest scheme, Thailand will move its 2022 solar target of 3.8GW of capacity forward to 2016. Hitting that goal would involve adding at least 2GW of capacity within 2015, which may not be realistic. Nevertheless, even with possible delays, the move heralds a new era for Thai solar. Zieff said that given the incentives on offer, a significant amount of capacity should be put in place.

Time to diversify

The projects will have a feed-in tariff of 5.66 baht/kWh, which would offer returns of up to 14.2% for equity investors, data from Macquarie Research shows.

Thailand already has the region-leading renewables scheme with more biomass and solar capacity than all other southeast Asian countries combined. It is vying with the Philippines in developing the first regional large-scale wind-power industry

A number of factors have spurred the government's renewed push to diversify fuel supply, including supply security concerns, dwindling domestic reserves, and environmental objections to coal-fired projects. These have combined to make renewable power generation options a natural beneficiary.

Solar economics will gradually transform the country's electricity landscape, although the power sector is unlikely to witness the upheaval experienced by European utilities, AWR Lloyds said.

Still, the attractiveness of the 2015 solar rollout will not remove the need for LNG infrastructure in Thailand. Gas-fired power plants will still be needed to meet demand during peak demand periods, as solar cannot be turned on and off at will. This would be even more striking in 2022 if the solar power rollout does take place, said AWR Lloyd. However, the use of batteries on solar farms, which could become commercially viable in the coming years, could flatten peaks later on in the day. While biomass power plants, which operate at around 70% capacity utilisation, would continue to produce more power than solar, and do provide base load power.

Yet as renewables develop further, the risks to large-scale capital expenditure – Thai-state energy player PTT and its offshoot PTT Exploration & Production are investing in LNG projects – is increasing.

But Thailand's actual and planned LNG spending is in its very early stages and is coordinated in parallel with national power development plans. Solar at this juncture can only replace marginal LNG supply, making the risks manageable, analysts at Macquarie Research said. ●

