

Debunking a myth behind secure, affordable, sustainable energy

By Lam Khee Poh

SINGAPORE ranks among the top countries in the world when it comes to grid sustainability. In fact, in the most recent *Global Energy Architecture Performance Index Report* published by the World Economic Forum, Singapore was placed 39th among a total of 127 countries on its ability to deliver secure, affordable, and sustainable energy. This puts us first among Asian countries, something we can be proud of. However, while we have made strong progress as a result of consistent investment and innovation, we must also constantly look forward to how we can maintain or even improve upon this position.

Too often, the process of building and maintaining a power grid is misunderstood. Power grids are commonly perceived to be one-time infrastructure investments, like a highway or a bridge, which are generally built once and meant to continue serving a monofunctional purpose throughout its life span. To approach this more accurately, we need to be thinking of grids as living “networks” that function as multi-directional and multi-dimensional channels, constantly expanding and adapting to the ways we live and work.

What does this mean? When we look at future trends and outlook for the energy market, we know a few things. Firstly, consumers and governments are looking to greener ways of consuming and producing energy. Secondly, grid operators have to make their grids ‘smarter’ to respond to rapidly changing technology and energy demands.

On both points, grid operators have to continue to invest and innovate to be equipped for the future. In the case of Singapore, our national grid operator, SP Group, has recently invested in The Mobility House to explore smart charging and vehicle-to-grid feasibility in Singapore. The aim is to boost Singapore’s electric mobility capabilities and enable our energy system to integrate more renewable energy and ultimately mitigate climate change.

In Vietnam, more than 80 solar plants had been put into operation and connected to the national grid at the end of 2019. The integration of grid-connected solar power projects was part of recommendations put to Vietnam Electricity to reduce reliance on coal for electricity production.

In Turkey, the city of Istanbul has been trialling a smart vertical axis wind turbine project to transform highways into renewable energy sources. Its early success has prompted interest from other cities such as Geneva, Madrid, Rotterdam and several cities in Germany.

It is important to keep in mind that such ideas can only be adopted if our grid has been upgraded to absorb new technologies and support the bi-directional flow of energy. Our nation must make sure that our own grid is always capable of taking advantage of and integrating the best concepts quickly and efficiently. We must also keep at top-of-mind the rise of the “prosumer” – individuals who will produce their own energy and at times, sell the excess back to the grid.

UNIFIED SMART ENERGY NETWORK

In making our grid smarter, there is some good work here at home. In a bid to increase efficiency and reduce dependency on the main grid, we have the first micro-grid on mainland Singapore at the Punggol SIT campus. The micro-grid integrates gas, electricity and thermal energy into a unified smart energy network that taps onto green energy sources to save energy and eliminate carbon emissions – equivalent to removing close to 2,000 vehicles off the roads. In Malaysia, the state power producer Tenaga Nasional Berhad (TNB) has been working on a Grid of the Future, which introduces automation and smart solutions with lower grid costs. Smart grids introduced will reduce blackout hours and give consumers more control over their energy bills. The Philippines’ power distributor, Manila Electric Co (Meralco), announced a shift to the development of its smart grid, with Advanced Metering Infrastructure (AMI) in 2017, as well as plans to implement smart metering that monitor consumption.

With the impact of Covid-19 causing economic headwinds, it is encouraging to see grid operators keeping up with their investments to enhance their grids. The public utility State Grid of China announced total investments of 24.7 billion yuan (\$5.03 billion) to accelerate adoption of digital technologies in its infrastructure. Singapore’s SP Group is executing its long-term renewal strategy to replace the ageing assets in our grid while concurrently enhancing it to meet future needs, an exercise which cost the group an estimated S\$1 billion last year alone.

We must persevere as our national needs and demands will inevitably continue to increase with time. We must also keep our eyes on the continued work in helping consumers and industries do their part to mitigate climate change by emphasising the importance of responsible production and consumption, one of the UN Sustainable Development Goals.

As far as we have come, we remain stewards of natural resources. So much more can and will be done. Singapore has the potential to contribute its insights and best practices to elevate the performance of grids across Asia. We must continue to invest in the regular maintenance and upgrading of our systems to ensure much more cost-effective and robust systems in the long run. This approach will ensure that Singapore’s grid can continue to innovate at a commensurate pace with the speed of change.

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