PETRONAS
Progress starts with a CLICK

Lessons from the Texas energy crisis: Developing the resilience of ASEAN's energy systems

by **Team Energy Asia** — April 22, 2021 in **Energy Efficiency**, **Energy Usage**

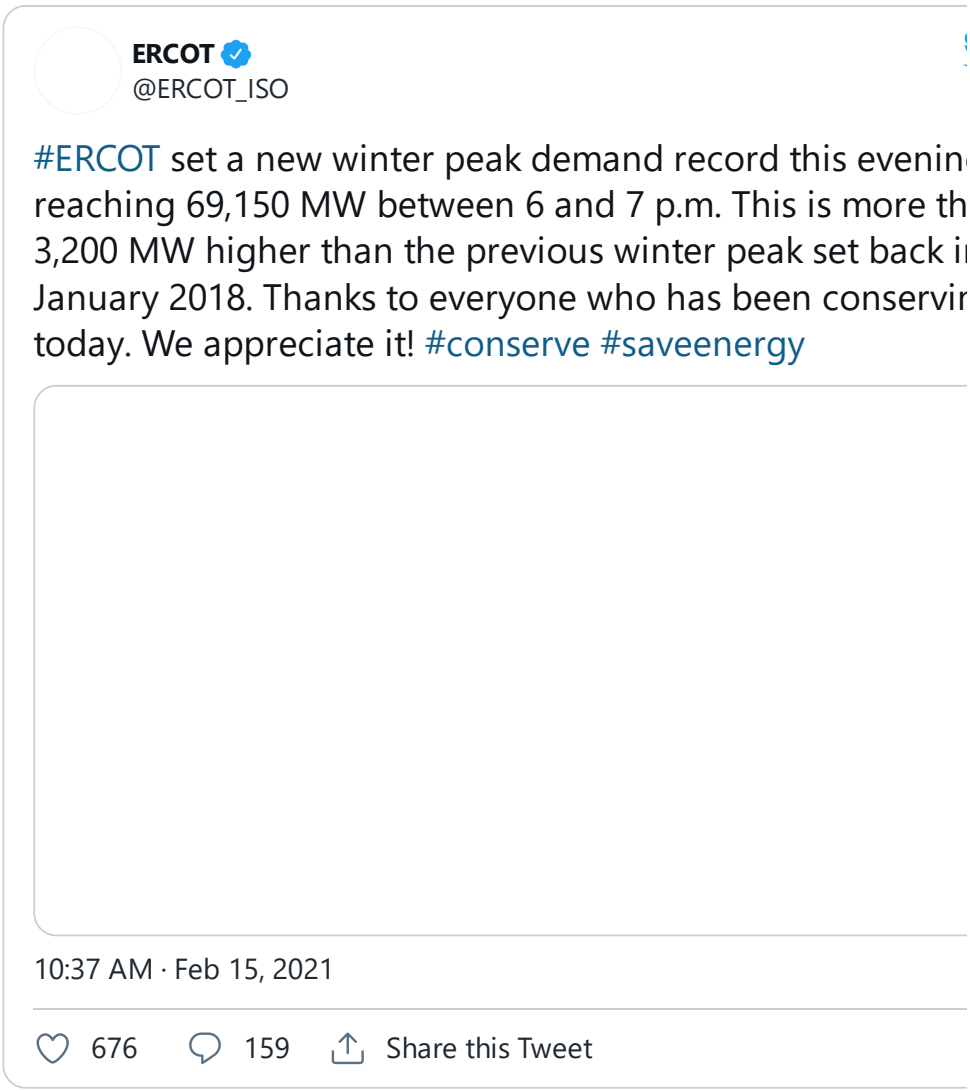
Share on Facebook Share on Twitter

By Sandy Gwee

Earlier this year, we saw headlines emerging from the Texas energy crisis: millions were left in the dark, with little or no power following a winter storm that began on 13 February.

As temperatures dipped, residents looked to plug in their heaters, resulting in a new winter peak demand record. At the same time, energy sources were left at a standstill due to the freezing weather.

All these factors led to massive power outages that lasted for days at a time.



The energy crisis serves as a stark reminder that unprecedented weather patterns around the world are becoming increasingly common, and that investments in strengthening the resilience and responsiveness of energy systems are nothing short of a necessity.

Despite being halfway around the world, Southeast Asia can take learnings from the Texas energy crisis, particularly in relation to the role of distributed energy resources

(DERs), renewable energies, and ASEAN grid inter-connectivity in building resilient energy systems.

DERs may have helped

During the unprecedented winter storms, power shutdowns equivalent to about 46,000 megawatts of power – enough to power seven million homes – were taken off the grid in Texas at one point of the **energy crisis**.

As the crisis exposed vulnerabilities of centralized power generation and grids, the DER system has emerged as one solution that may have helped keep the lights on.

DERs refer to devices that generate power near the point of use or within a community, instead of centralized generation sources from large-scale power plants that are connected to the grid.

DERs are a strategic consideration that deliver community benefits and business value. They are also an economically viable solution that provide energy access to remote areas, integrate more renewable energies, and improve grid reliability enhanced by energy storage.

Since 2000, more than 45 million people are still without electricity in **ASEAN**. For instance, a frontier market such as Myanmar has an underdeveloped grid network and less than 40% of Myanmar's population has access to **electricity** as of 2019. Therein lies significant growth potential for off-grid and microgrid solutions to fulfil energy requirements in the country within a reasonable time horizon, while the national grid is being planned and built over time.

More developed markets such as Thailand and Vietnam have also recognized many benefits of DERs, including the increased adoption of renewable energy.

Thailand has set a goal of 10 gigawatts of distributed solar power to be achieved by 2037, and has launched a net-metering scheme to encourage residential and small-scale rooftop solar power installation of up to 10 kilowatts. The household rooftop scheme starts at 100 megawatts per year from **2019 to 2027** and will increase solar power generation to 1,000 megawatts from 2028 onwards.

Vietnam uses a feed-in-tariff (FiT) scheme to promote rooftop solar power adoption in its effort to reach its one gigawatt rooftop **solar power target by 2025**. The FiT scheme covers a broader range of consumers, unlike the case of Thailand, mainly to address excess power demand and overcome severe grid constraints.

The integration of well-designed DERs, in the energy mix, can improve energy resilience and reliability.

The role of renewable energies in addressing energy security and climate change

Renewable energy sources have been blamed in part for the blackouts in Texas. Critics pointed to how wind turbines – which generate 24% of Texas' energy – froze due to the extreme cold temperatures.

However, data from Texas makes it clear that renewable energy failures have played only a small part in the crisis. In fact, about half of Texas' energy supply is attributed to gas-fired power; the curtailment of gas feedstocks was a result of frozen gas systems from the wellheads to transmission pipelines.

In times of crises, whether as a result of climate change or a pandemic, the supply chains of wide-ranging goods and services have been disrupted.

To strengthen the resilience of the energy supply chain, ASEAN can speed up the deployment of a diverse mix of energy sources consisting of domestically harnessed resources such as solar power, wind power, waste-to-energy, and right-sized hydropower to reduce over-reliance on energy imports and improve energy security.

The ASEAN power market is gradually transitioning to integrate more renewable energies and decentralizing to meet the rising energy demand, which has an average growth rate of 6% per year. It is imperative that ASEAN governments accelerate renewable energy investment to deliver the 23% renewable energy target share of total primary **energy supply by 2025**.

Thailand and the Philippines have targeted almost half of their energy mix to consist of renewable energies and hydropower, while Myanmar is expected to maintain more than half of its energy mix to comprise mainly hydropower and some renewable energies by 2030.

In the same vein, as recently announced in its Green Plan, Singapore will also be gradually shifting from a fossil-fuel intensive to low-carbon economy.

The severity of climate change is obvious as seen in the Texas energy crisis, and huge opportunities exist for ASEAN countries to speed up the adoption of low-carbon pathways which address climate change.

In Singapore, Nanyang Technological University is developing the country's first virtual power plant (VPP), a digital platform that coordinates DERs – such as solar power installations and energy storage systems – across different locations nationwide.

The VPP will enable an efficient integration of renewable energy into the energy system, and bring about a host of other benefits including flexibility, scalability, and improved grid resilience.

Merits of cross-border grid interconnectivity

Another critical takeaway from the Texas energy crisis is the importance of integrated or interconnected energy systems, even in the case of national self-sufficiency or energy independence.

ASEAN is set to see energy demand grow by 70% in **the next two decades**, and is gradually progressing on the ASEAN Power Grid (APG), an initiative to construct a regional power connection that interconnects and integrates power systems for the 10 ASEAN member states. An interconnected grid in ASEAN means that one state or country will be able draw on power from another.

The APG project is expected to enhance electricity trade across borders to meet the rising demand and improve access to **energy services in the region**.

According to the International Energy Agency, the establishment of grid connectivity and multilateral power trading would allow ASEAN member states to tap into the potential benefits of an integrated power system, including reduced costs and an increased ability to integrate a wider range of renewable energy resources.

ASEAN should expedite the APG project as a way to manage local energy imbalances and improve power project economics where excess power can be exported.

A pilot project to strengthen the regional grid architecture was announced last year; Laos, Thailand, Malaysia, and Singapore announced their commitment to initiate cross-border power trade of up to 100 megawatts under the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project.

Subsequently, Singapore announced plans to import 100 megawatts of renewable energy from Malaysia for two years.

With a myriad of efforts, ASEAN is clearly transitioning and progressing in its efforts to shape a more sustainable and resilient energy future.

The latest crisis in Texas has further shone the spotlight on the integral role of DERs and renewable energy to ensure a sustainable energy future and energy security.

Within ASEAN, interconnectivity and multilateral partnerships have the potential to act as a catalyst to each country's approach in future-proofing their energy transition as well as building a well-coordinated and cost-effective regional power market.

Sandy Gwee is Principal Consultant, Nomura Research Institute Singapore.

Tags: energy

Trending | Latest

Tenaga Nasional to Spearhead 'Game-changers' in Power Generation

JULY 9, 2020

Electric Cars Are a Bright Spot Amid an Industry Hammered by COVID-19

JULY 2, 2020

Could India Blockade the Strait of Malacca?

JULY 10, 2020

Millions in Hin Leong Oil Tied Up in Lawsuits

JULY 8, 2020