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Sabah`s green power ECoSystem

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SABAH's energy sector faces many challenges. The state's challenging geography, with its population dispersed across mountainous terrain, complicates energy infrastructure expansion.

Rural electrification remains incomplete, with coverage estimated at 90%-92% as of 2023, while there are also frequent power interruptions. According to the state's System Average Interruption Duration Index, power interruptions ranged between 189 and 332 minutes annually from 2017 to 2021.

All that could change in the near future, as the state addresses challenges in energy security and capitalises its on abundant renewable energy (RE) resources.

Findings from BIMB Securities Research reveal a promising outlook. The brokerage notes that the state's electricity reserve margin, currently at a modest 5%, is expected to rise to 22% by July 2025, citing Sabah's Deputy Chief Minister III Datuk Shahelmey Yahya.

This improvement is set to be driven by ongoing projects, including additional gas turbines, battery energy storage systems and increased electricity imports from Sarawak.

These will expand the state's installed capacity by 15%, reaching 1,717MW by mid-2025, and handle rising electricity demand, which is projected to grow at 4.8% annually over the next decade.

"Barring any unforeseen circumstances, we think the target of 22% reserve margin in the near term is achievable," BIMB Securities Research observes, highlighting the state's focus on enhancing energy reliability and security.

Generation challenges

Sabah's electricity landscape is dominated by independent power producers (IPPs), which contribute 73% of the state's electricity, with the remainder managed by Sabah Electricity Sdn Bhd. Ranhill Sabah Energy, a subsidiary of Ranhill Utilities Bhd, is the largest IPP, commanding a 36% share of the market through its combined-cycle gas turbine plants in Rugading.

BIMB Securities Research points out that Sabah aims to phase out diesel generators by 2030 and has rejected plans for coal-fired plants, showing its commitment to cleaner energy solutions. The integration of RE and upgrades to transmission systems, including the East-West Grid Link, are pivotal to overcoming these obstacles.

Sabah's RE potential is a key driver of its power market transformation. The state has vast RE resources, including solar, hydro, biomass, geothermal, wind and emerging technologies like Ocean Thermal Energy Conversion (OTEC).

BIMB Securities Research notes that Sabah receives the highest solar irradiance in Malaysia, with a potential capacity of 99.4GW. Utilising just 1% of idle land could generate 1,000MW, offering significant opportunities for growth.

In May 2024, the Energy Commission of Sabah (ECoS) launched the state's inaugural large-scale solar (LSS) bidding process, targeting 100MW of capacity by 2026. However, limitations in grid penetration and intermittency remain, requiring investment in battery storage and other technologies.

Hydropower is another promising sector, with potential exceeding 1,500MW from rivers and pumped storage systems. The Upper Padas hydroelectric project, developed in collaboration with Gamuda Bhd, is set to add 187.5MW to the state's capacity, with further projects underway along the Padas and Maligan rivers.

Further, BIMB Securities Research notes that Tawau's geothermal energy holds an estimated capacity of 100MW, with development plans progressing.

Meanwhile, Sabah boasts the country's largest bioenergy potential, estimated at 800MW, although feedstock availability and high connection costs pose challenges.

An emerging technology, OTEC represents a frontier for Sabah's RE ambitions. While feasibility studies are ongoing, high capital expenditure remains a barrier to large-scale implementation.

Nevertheless, OTEC offers secondary benefits such as desalinated water and green hydrogen, aligning with the state's broader sustainability goals.

BIMB Securities Research notes that the establishment of ECoS in January 2023 has been instrumental in driving the state's energy agenda.

ECoS oversees regulatory compliance, renewable energy development, and emerging technologies such as OTEC. The body also facilitates the implementation of legislative measures, including the Sabah RE Enactment 2024.

"ECoS has been mandated to oversee the development of OTEC as a future RE growth plan," BIMB Securities Research says, highlighting the organisation's pivotal role in Sabah's energy transformation.

It expects the development of industrial parks, including Kota Kinabalu Industrial Park and Sipitang Oil and Gas Industrial Park to further bolster Sabah's energy demand.

These projects, coupled with Petroliam Nasional Bhd's discovery of 6.8 trillion standard cu ft of gas along the west coast of Sabah, underscore the state's potential as a regional energy hub. However, infrastructure disparities between the west and east coasts of the state present logistical challenges.

The west coast benefits from pipeline systems, while the east coast relies on LNG-based pipelines. Bridging this divide is crucial to unlocking the state's full energy potential.

Bright future

In general, Sabah's strategic investments and focus on RE position it as a leader in Malaysia's clean energy transition. Initiatives such as LSS projects, hydropower development, and advanced technologies like OTEC signal the state's commitment to sustainability and energy security.

With increasing demand from industrial parks and a growing population, the state's energy sector is at a crossroads, presenting both challenges and opportunities.

As BIMB Securities Research points out: "Sabah is actively positioning itself to strengthen its energy sector, with a clear focus on expanding its RE capacity in the coming years."

This approach, combined with supportive policies and infrastructure upgrades, ensures that Sabah is well-equipped to meet its energy needs, while contributing to Malaysia's broader sustainability goals.

Overall, BIMB Securities Research maintains its "overweight" stance on Malaysia's power sector, premised on rising electricity demand from data centres, stable fossil fuel prices and the third-party access mechanism.

- Barring any unforeseen circumstances, Sabah's target of 22% reserve margin in the near term is achievable
- The state is actively positioning itself to strengthen its energy sector, with a clear focus on expanding its RE capacity