Indonesia energy storage systems

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Renewable energy is gaining ground across the globe as countries seek to reduce their CO2 emissions. In 2023, more than 30% of the world"s energy came from renewable sources, the first time that threshold has been broken.

As part of its contribution toward achieving net zero, Indonesia has set a target to increase its share of renewables to 23% of the national energy mix by 2025. By 2022, however, the installed capacity for renewables was only 12.3% according to Climate Transparency -- falling far short of its goal.

Additionally, PLN, the state power utility, has worked hard to ensure electrification to all parts of Indonesia, and many of its coal-fired assets are relatively young. While PLN is responsible for implementing emissions reductions, it must also consider the implications of adding renewables to a fully functioning grid, and at the same time still ensuring a reliable energy supply. This is further complicated as neither the grid nor storage infrastructure is ready for significantly more renewable capacity to come online.

Despite these challenges, Indonesia"s government is implementing policies aimed at attracting investors, and the country has enormous potential to increase its mix of renewables through its abundant sources of solar and wind energy.

The future expectations of how energy will evolve will also change the investment case. For example, an investor looking at the energy evolution in Europe and the United States, where the use of coal-fired power is decreasing, could reasonably assume that the same would happen across other markets committed to energy transition. This immediately makes renewable energy a more attractive investment in that country. In other words, credible commitments to energy transition become self-fulfilling prophecies when interpreted by rational investors.

However, the need to store energy has implications for the traded energy markets, because an excess of power results in pricing volatility, which works against renewables -- solar power in particular sells into the system during periods of excess supply, which is also when pricing is at its lowest. At a certain critical level of supply, this can neutralize the economics around the lower cost of production for asset owners and investors.

These challenges change the economics of production at a system-wide level. One solution is to load the cost of storage onto renewables pricing (by calculating a levelized cost of storage), but to do so would flip the relative attractiveness of renewables compared with fossil fuels.

Other projects that are immediately investible will have similar characteristics -- guaranteed offtake (which could also be with utility scale buyers), a realistic approach to transmission and distribution, and low financing costs. The use of government or international development money could be deployed as equity (or, better still,

off balance sheet as guarantees) to reduce risk in the projects and financing costs.

While there are challenges to impairments, this does not change the marginal economics of new capacity, where it is clear there is no longer a case for building new fossil fuel generation. New capacity should all be renewable.

Infrastructure is the biggest operational impediment to a faster, cost-saving transition to renewables, and should be the focus of policy-led investment. By moving to a well-connected, high capacity, multi-directional grid, Indonesia can prepare for a future of renewables. That means crowding in private investments, which in turn means creating business cases for public-private partnership deals. Investing in storage is also a prerequisite.

Money needs to be spent on generation capacity, but it does not need to be state or development money. Government money is better spent on infrastructure, while its balance sheets should focus on how to best reduce the risk in generation projects. Guaranteed offtake agreements, credit guarantees, cross-currency guarantees (to allow projects to be funded in foreign currencies rather than in IDR, thus reducing interest rates), or creating innovative capital market funding solutions can all accelerate the transition without breaking budgets.

Indonesia’s state-owned utility and battery producer have launched a 5MW battery energy storage system (BESS) pilot project as it seeks to move away from diesel-generated power.

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