Indonesia renewable energy storage

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The world stands at a pivotal point in the journey toward decarbonization--emissions need to reduce by half by 2030 and reduce steeply thereafter.1NGFS climate scenarios, Network for Greening the Financial System, June 2021; "REMIND-MAgPIE model," Potsdam Institute for Climate Impact Research, November 2023. This presents both immense challenges and significant opportunities.

Challenges include fostering global cooperation; strengthening climate policies; navigating technological transitions (including negative emissions technologies); overcoming infrastructure limitations; and securing substantial investments. In addition, a just transition is needed, one that includes reskilling workers and addressing socioeconomic disparities.

On the other hand, the transition to sustainability and clean energy presents a tremendous market opportunity, requiring unprecedented global investments of $8 trillion to $11 trillion annually to 2050 (Exhibit 1).2"The net-zero transition: What it would cost, what it would bring," McKinsey Global Institute, January 2022. Power generation, transportation, as well as land use, land-use change, and forestry (LULUCF) are three sectors at the forefront of this required transformation.

As the eighth-largest contributor to global greenhouse gas (GHG) emissions, Indonesia"s role in global decarbonization is increasingly critical. With historical trends indicating a potential doubling of its emissions by 2060 (versus a 2019 baseline), Indonesia"s commitment to reversing this trend is crucial (Exhibit 2).4Indonesia third biennial update report, United Nations Framework Convention on Climate Change (UNFCCC), 2021; "Decarbonization scenario explorer model--Indonesia," McKinsey, 2019.

Notably, the Just Energy Transition Partnership (JETP), established during the G20 Leaders" Summit in 2022, further signifies Indonesia"s commitment to delivering a just transition for the power sector.7"Indonesia"s Just Energy Transition Partnership," UNDP, December 5, 2023. Under JETP, Indonesia aims to cut carbon emissions to 250 million metric tons per year for its on-grid power sector by 2030, while simultaneously increasing its share of renewable energy generation to 44 percent.8Just Energy Transition Partnership Indonesia: Comprehensive investment and policy plan 2023, JETP Indonesia, November 21, 2023.

In this article, we offer ten strategic initiatives that could help to speed up green growth in Indonesia, each of which could realize significant emissions reductions while maximizing economic value, job creation, and environmental protection. These encompass a wide range of activities and investments, from accelerating renewable energy adoption to developing innovative technologies in CCS. Together, they have the potential to position Indonesia at the forefront of the global fight against climate change.

Indonesia"s energy sector, including end use electricity and the industry"s thermal energy consumption, transport, and buildings, accounts for around a third of national emissions, with remaining emissions primarily

coming from land use change (such as deforestation and peatland degradation), forestry, agriculture, and waste.10An energy sector roadmap to net-zero emissions in Indonesia, International Energy Agency, September 2022. The power sector, mainly fueled by coal, is responsible for around 40 percent of these energy sector emissions. With the country"s power demand expected to increase by 50 percent by 2030 and quintuple by 2060, the challenge is to manage this growth without a corresponding growth in emissions.

The government has implemented specific local content requirements for renewable energy projects.18"Ministerial regulation No. 05/M-IND/PER/2/2017," Tingkat Komponen Dalam Negeri, Ministry of Industry, 2017. These stipulate that projects must utilize a minimum percentage of domestic materials and labor, particularly for solar PV and BESS projects.

To effectively scale up its renewable energy sector and meet its ambitious goals, Indonesia"s decision makers could look to develop a multifaceted strategy encompassing policy incentives, investment, technology transfer, and international collaboration.19Indonesia energy transition outlook 2022, Institute for Essential Services Reform, December 2021. Possible priority actions could include:

In addition, the national grid will need to be adapted to handle the variability and decentralization of renewable energy sources, including developing and integrating energy storage technologies, as well as minimizing transmission and distribution losses.

The global transmission market, poised to reach $250 billion to $300 billion by 2030, is expanding rapidly, driven by factors that include rising energy demand, renewable energy integration, electrification of transport, and concerns over energy security.20"Singapore and Indonesia sign memorandum of understanding to strengthen cross-border electricity trade," Ministry of Trade and Industry Singapore, September 8, 2023. Within this dynamic environment, Indonesia could benefit from urgently enhancing its power grid, including by expanding interconnection and intra-island grids, thus linking clean energy resources with major demand centers such as Java and Bali.

Indonesia is also encouraging associated private investment in the electricity sector, with more than 60 percent of new capacity under RUPTL allocated to IPPs. The Indonesian government is working on improving the regulatory framework to facilitate these investments in the sector.22Indonesia--country commercial guide, International Trade Administration, December 5, 2023.

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