



GIZ Energy Programme Indonesia/ASEAN

Strategic Theme: Power System Transformation

Purpose & Relevance

As an archipelago, Indonesia has more than 600 power grids, which brings a unique challenge in developing the various island grids. Distribution and transmission grid planning and operation are traditionally designed for power generation from dispatchable power plants, which are typically fossil fuel and hydro-based. Those planning and operation processes need to be adjusted to account for high shares of variable renewable energy – i.e. massive solar and wind power. Therefore, effective power system transformation is a key precondition when rapidly expanding renewable energy generation to get the energy transition underway.

Government Targets

Indonesia aims to reach net-zero emissions by 2060 or sooner. Specifically, the Government of Indonesia targets a 34.3% renewable energy (RE) share by 2034 under the National Electricity Plan (RUPTL), and 70% RE in the primary energy mix by 2045 under the National Development Plan (RPJPN). Indonesia has also entered into the Just Energy Transition Partnership (JETP), of which Germany holds the co-leadership. The power system transformation theme of the GIZ Energy Programme aligns its technical cooperation targets with national targets to enable more than 600 net-zero power systems in Indonesia by 2050.

Our Strategic Partners

Government Partners:

Ministry of Energy and Natural Resources (MEMR) as political partner:

- **Directorate General of Renewable Energy and Energy Conservation (DJ EBTKE)** as implementation partner, responsible for regulating the renewable energy expansion for the power system transformation.
- **Directorate General of Electricity (DJK)** elaborates power system-related regulations.

The 600 power systems in Indonesia are planned, transformed, and operated by the **State Electricity Company (PLN)**. Therefore, PLN is the key beneficiary of GIZ's technical assistance activities regarding power system transformation at national and sub-national levels.



- **PLN Head Office** – Power system planning and procurement processes for RE
- **PLN units (Wilayahs)** - Tailored power system analyses and long-term planning studies
- **PLN Education and Training Centres** – capacity development and training of trainers

Achievements

- **Strengthened system operation and regulatory foundations** through studies on Independent System Operator models and international ancillary service practices, providing actionable pathways for greater transparency, reliability, and future market reform.
- **Enabled large-scale integration of solar and storage** by delivering methodologies for BESS pricing, as well as practical PV quota tools for non-PLN areas to ensure fair, technically sound renewable expansion.
- **Supported long-term power system planning** with an in-depth assessment of the Sulawesi North–South interconnection and a comprehensive mapping of solar and wind investment potential across Sulawesi, informing grid and investment decisions.
- **Advanced hybrid renewable solutions** through pre-feasibility studies for hydro–solar hybridisation at two major reservoirs, confirming strong technical and economic viability for floating PV and opening pathways for scalable hybrid deployment.
- **Enhanced institutional capacity** via executive training on global solar and battery trends, equipping high-level ESDM officials with strategic insights for Indonesia's future power system planning.

On behalf of:

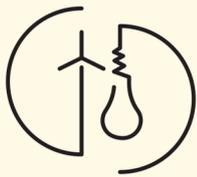


Implemented by:



In cooperation with:





Implementation Approach

The Energy Programme uses various approaches to achieve the strategic theme of Power System Transformation:

- Policy advisory for MEMR, specifically EBTKE and DJK, on RE expansion and power sector regulation
- Capacity development for MEMR and PLN, at both HQ and field level, on RE grid integration, power system operation and planning with high shares of RE
- Power system studies (operational analyses and long-term planning) on real power systems for PLN in Sulawesi, NTT and other target regions
- Integrated energy planning for selected cities/provinces/ islands

Outlook – What's Coming Next

- Strengthening regulatory foundations through improved RE procurement frameworks, updated grid connection code, and follow-up work on system operation and ancillary services.
- Preparing the grids for high vRE with flexibility pathways for Jamali, advanced vRE forecasting with PLN–BMKG, and techno-economic comparisons of PV+BESS versus gas peakers.
- Advancing major planning and project pipelines including Sulawesi interconnection work, PV siting tools, floating-PV development, and flexibilisation of coal power plants.
- Deepening capacity and investment readiness via new e-learning modules, high-level executive training, BESS and Agri-PV expert exchanges, and an investment mission to InterSolar Europe.



Our Mission

Germany supports Indonesia towards the transformation of more than 600 power systems of various sizes from central, fossil fuel-based power generation to decentralised, renewable energy-based power generation.



Projects & Funding

The GIZ Energy Programme Indonesia/ASEAN receives funding from the German Government, both the Federal Ministry for Economic Cooperation and Development (BMZ), and the Federal Ministry for Economic Affairs and Climate Action (BMWK) through its International Climate Initiative (IKI).

The following projects within the Programme support the theme of "Power System Transformation", contribute to enable net-zero power systems by 2050:

- **Green Energy / RE2Grid:** Christoph Luerssen, Implementation Manager (christoph.luerssen@giz.de); 5.5M EUR; 2024-2029, BMZ
- **Clean, Affordable, and Secure Energy for Southeast Asia (CASE) Indonesia:** Deni Gumilang, Implementation Manager (deni.gumilang@giz.de), 5.2M, 2020-2027, IKI
- **Sustainable Energy Transition in Indonesia (SETI):** Lisa Tinschert, Project Lead (lisa.tinschert@giz.de), Johannes Anhorn, Implementation Manager (johannes.anhorn@giz.de); 15M EUR, 2022-2028, IKI

The following project will contribute to enabling net-zero power systems by 2050:

- **Green Energy / FlexGen:** Christoph Luerssen, Implementation Manager, (christoph.luerssen@giz.de); 3M EUR; 2026-2029, BMZ

Contact Points

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GIZ Strategic Themes:



Industry Decarbonisation



Island Energy Solutions



Power System Transformation



Just Energy Transition



Sustainable Energy Finance