

# **Indonesia flexible direct current including wind solar storage and transmission**





## Overview

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How do we model Indonesia's future electricity system?

We modelled Indonesia's future electricity system using an hourly resolution of supply and demand, as demand increases tenfold and as Indonesia moves towards 100% renewable energy. Solar PV supplies most of the energy. Existing hydro, legacy fossil fuel plants and pumped hydro energy storage provided most of the balancing of supply and demand.

How does Indonesia's electricity system work?

Indonesia's electricity system can be powered predominantly by solar PV, complemented by geothermal and hydroelectric power. Off-river pumped hydro energy storage is identified as a major asset for balancing high solar energy penetration.

Will Indonesia's energy transition be a good idea?

Evidence suggests that Indonesia's energy transition should be well under way. The government has set a target to support renewable energy development in the New Energy and Renewable Energy Bill through increasing on-grid renewable capacity, converting diesel power generation to solar and expanding rooftop solar.

What is Indonesia's New electricity supply business plan (RUPTL)?

After much delay, the Indonesian government has finally unveiled its proposed new Electricity Supply Business Plan (RUPTL) for 2025–2034. The RUPTL serves as a roadmap shaping Indonesia's electricity sector over the next decade has targeting 69.5 gigawatts (GW) of new power capacity, with 76% from renewables - mainly solar, hydro, and wind.

Can interconnection help Indonesia achieve net zero emissions?

The role that increased interconnection among Indonesia's main islands could play in the long term is addressed in IEA's upcoming Energy Sector Roadmap



to Net Zero Emissions in Indonesia. A key barrier to accommodating variable renewables in the Indonesian power system is contractual inflexibility.

How will ruptl impact Indonesia's energy transition?

As Indonesia advances its energy transition, the RUPTL will play a pivotal role in shaping the future of its national power sector. However, to achieve its ambitious targets, Indonesia must overcome several challenges, especially in light of the previous RUPTL's underperformance in renewable energy deployment.



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### [100% Renewable Electricity in Indonesia](#)

Many techniques are available to solve this challenge, including energy storage (e.g., pumped hydro storage, batteries), flexible generation (e.g., legacy fossil fuel, hydro, ...

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### Frontiers

To address these challenges, the Flexible Direct Current Transmission System (VSC-HVDC) has emerged as a widely studied solution. The integration of energy storage power stations ...

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### [Ancillary Services via Flexible Photovoltaic/Wind Systems ...](#)

3) We simulate the action of solar/VRE regulation services (through the previously dimensioned solar and wind flexible fleet and implicit storage) to reduce current and future annual ...

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### [Executive summary - Enhancing Indonesia's Power System](#)

The role that increased interconnection among Indonesia's main islands could play in the long term is addressed in IEA's upcoming Energy Sector Roadmap to Net Zero Emissions in ...



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[\(PDF\) Flexible Transmission: A Comprehensive Review of ...](#)

The environmental impacts of flexible transmission, including renewable energy utilization and carbon emission reduction, are presented.

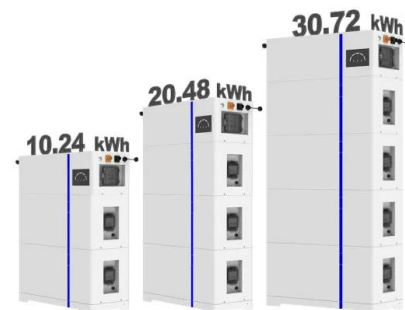
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[Flexible Transmission: A Comprehensive Review of ...](#)

The environmental impacts of flexible transmission, including renewable energy utilization and carbon emission reduction, are presented. Finally, market models required for ...

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## ESS



[Powering Indonesia's future: Key takeaways from the 2025-2034 ...](#)

The RUPTL serves as a roadmap shaping Indonesia's electricity sector over the next decade has targeting 69.5 gigawatts (GW) of new power capacity, with 76% from ...

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## [Optimal Integration of Renewable Energy, Energy ...](#)

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This paper examines the optimal integration of renewable energy (RE) sources, energy storage technologies, and linking Indonesia's islands ...

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## [Indonesia Unveils 2025-2034 Power Plan, Eyes ...](#)

Under the plan, state-owned electricity company PLN aims to add 69.5 gigawatts (GW) of new power capacity by 2034. Of that total, 42.6 GW ...

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## **Indonesia Surabaya Flexible Direct Current including Wind Solar Storage**

In this paper, a general power distribution system of buildings, namely, PEDF (photovoltaics, energy storage, direct current, flexibility), is proposed to provide an effective solution from the ...

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### **Home Energy Storage (Stackble system)**



#### **Product Introduction**

- Scalable from 10kWh to 50kWh
- Self-Consumption Optimization
- Integrated with Inverter to avoid the compatibility problem
- LFP battery, safest and long cycle life
- Stackable design, effortless installation
- Capable of High-Powered Emergency-Backup and Off-Grid Function

## [Indonesia Surabaya Flexible Direct Current including Wind Solar ...](#)

In this paper, a general power distribution system of buildings, namely, PEDF (photovoltaics, energy storage, direct current, flexibility), is proposed to provide an effective solution from the ...

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### [Indonesia plans to add 69.5 GW of New Green Energy by 2034](#)

Indonesia's Ministry of Energy and Mineral Resources has launched its 2025-2034 Electricity Supply Business Plan, aiming to add 69.5 GW of new power generation ...

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### [Research on the application of flexible direct-current transmission](#)

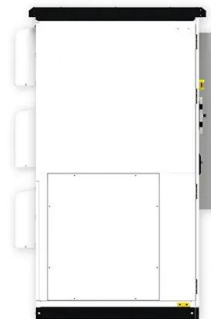
During these years, development of offshore wind power has become the hot and cutting-edge trend in China and the world. There has two common system-integrated ...

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### [Indonesia's 2025-2034 Electricity Supply Plan \(RUPTL\)](#)

Indonesia's new Rencana Umum Penyediaan Tenaga Listrik (RUPTL) 2025-2034 outlines an unprecedented expansion of the power system to meet growing demand and ...

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#### **LIQUID COOLING ENERGY STORAGE SYSTEM**

**EMS** real-time monitoring  
No container design  
flexible site layout



Cycle Life  
**≥8000**

Nominal Energy  
**200kwh**

IP Grade  
**IP55**

### [Indonesia Unveils 2025-2034 Power Plan. Eyes Expansion of ...](#)

Under the plan, state-owned electricity company PLN aims to add 69.5 gigawatts (GW) of new power capacity by 2034. Of that total, 42.6 GW (or roughly 61%) will come from ...

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### [Ancillary services via flexible PV/Wind systems and 'implicit' storage](#)

We show how the TSO can use the ancillary services provided by a flexible PV fleet (solar regulation) or PV/wind fleet (VRE regulation) together with a suitable under-forecast and ...

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### [Indonesia's expansion of clean power can spur growth and ...](#)

To accommodate the intermittent characteristics of variable renewable energy (solar and wind), PLN will build an end-to-end smart grid infrastructure and flexible generation ...

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### [Optimal energy storage configuration to support 100 % renewable ...](#)

The study integrates various components, including electricity supply and demand, transmission, renewable sources, and energy storage, while considering operational, build, ...

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### [Executive summary - Enhancing Indonesia's Power ...](#)

The role that increased interconnection among Indonesia's main islands could play in the long term is addressed in IEA's upcoming Energy Sector Roadmap ...

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## A 100% solar Indonesia in 2050

Overnight storage is a solved problem. Recently, a high-resolution analysis of a 100% solar electricity grid for Indonesia was conducted, including hour-by-hour matching over ...

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[Indonesia's expansion of clean power can spur growth ...](#)

To accommodate the intermittent characteristics of variable renewable energy (solar and wind), PLN will build an end-to-end smart grid ...

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## The world's first flexible direct current project put into operation by

According to the Beijing daily on July 26, Zhang Bei flexible dc grid pilot demonstration project is expected to completed by the end of commissioning. New energy to power the zhangjiakou, ...

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[Indonesia's new power development plan: Highlights from the ...](#)

Substantial development of new transmission and grid infrastructure including a massive surge in interconnectors between main islands to address the known mismatch ...

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### [A comprehensive review of flexible alternating current transmission](#)

This paper is a comprehensive reference for researchers interested in flexible AC alternating current transmission systems (FACTS) technologies. This study investigates ...

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### [Economic Analysis of Offshore Wind Power DC Transmission ...](#)

Flexible direct current (DC) transmission technology is adopted to offshore wind power transmission system because it is suitable for the scenario with long transmission distance and ...

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### [Powering Indonesia's future: Key takeaways from the ...](#)

The RUPTL serves as a roadmap shaping Indonesia's electricity sector over the next decade has targeting 69.5 gigawatts (GW) of new power ...

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### **A 100% solar Indonesia in 2050**

Indonesia has all the solar energy and pumped-hydro energy storage potential required to become a solar giant by mid-century. On current trends, Indonesia will be the ...

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