



Futureproof and flexible energy for Indonesian island

📍 Indonesia

Indonesia is one of Asia's fastest-growing economies in terms of energy consumption. With a steadily growing population of nearly 270 million and an increasing urbanisation, there is a significant need for a reliable and secure power supply throughout the archipelago. In recent years, the country has successfully increased its installed capacity and invested in infrastructure to both improve the reliability and efficiency of the main grids and increase the electrification of the small grids.

In 2016, PT PLN, a valued customer of ours, ordered a 135 MW Flexicycle™ power plant from Wärtsilä, to provide power to the grid in Lombok - an island located east of Bali and west of Sumbawa in the West Nusa Tenggara province of Indonesia.

Reliable and cost-efficient energy

The Lombok power plant, delivered in 2019, is powered by 13 Wärtsilä 34DF engines capable of running on light fuel oil and liquified natural gas. When gas supply is uncertain or prices fluctuate, the plant can seamlessly switch between fuels - even during operation - while maintaining high output. Wärtsilä gas engines reach over 50% electrical efficiency, which translates into considerable fuel cost savings compared to other technologies.

Built in consortium with PT Pembangunan Perumahan (Persero) Tbk (PT PP), one of Indonesia's largest construction contractors, the Lombok plant is the country's first Flexicycle power plant. It operates in two dispatch modes, with 50% of its capacity being baseload, while the other half supports frequency control for the island.

In addition to the power plant's primary functions, the Wärtsilä engines have effectively balanced the intermittency caused by solar power in Lombok's power system. The island hosts four 5 MWp solar PV installations that operate without energy storage support. The engine power plant's flexibility enables PT PLN to expand PV capacity without the need to add energy storage but rather leveraging the existing Wärtsilä's extensive installed base in Indonesia. The ability to integrate more renewables into the existing system will continue to reduce the system's levelised cost of electricity (LCOE) and CO2 emissions, thus helping PT PLN to achieve their net zero targets while saving costs in electricity production.

The plant initially operated in flexible baseload mode. Recently, more renewables have been integrated, and the plan is to further increase the share of solar PV in the generation mix. In connection to this change, the Wärtsilä power plant control system has been adjusted

Challenge	Solution	Benefit
<ul style="list-style-type: none">Integrating more renewable energy into the already existing installed baseFrequency controlNeed for operational and fuel flexibility	<ul style="list-style-type: none">135 MW Flexicycle power plant operating on 13 x W20V34DF dual-fuel engines operating on liquified natural gas and light fuel oilEngines capable of balancing renewable intermittency5-year O&M agreement, extended by 30 months	<ul style="list-style-type: none">Supporting PT PLN to achieve net zero emission targetReduced cost of electricity generationShowcasing how engines can enable renewable integration with existing installed base.Reliable, affordable and more sustainable electricity for the people of Lombok Island.

to allow the plant to operate as a balancer - ensuring safe and reliable renewable integration.

As Lombok's main power plant, it generates reliable, affordable, and more sustainable electricity for the people of Lombok.

Serving customers all the way

The initial 5-year Operation and Maintenance (O&M) agreement, signed between Wärtsilä and PT PLN in 2019, was extended in 2025 with a new 30-month agreement. Signed with PT PLN Nusantara Power Services, the agreement covers the entire 138 MW power plant operating with 13 Wärtsilä 34DF engines. Supplying about 60 percent of Lombok island's grid, the plant's efficient and reliable operation is critical. Wärtsilä takes full responsibility for operating and maintaining the plant, guaranteeing performance, reliable, safe and efficient operations, cost predictability, and maximised return on investment.

Wärtsilä has had a longstanding and healthy partnership with PT PLN, underscoring our commitment to Indonesia's energy sector. Wärtsilä Energy has a significant presence in the country, with over 5.5 GW of installed capacity. Currently, we manage at least 25 installations with a combined capacity of nearly two gigawatts, delivering comprehensive services through

our Lifecycle solution agreements and Parts Predict. With all engine models already present in the country, Wärtsilä is well-positioned to meet Indonesia's energy needs and drive forward its energy transition.

"This 135 MW power plant is essential for the island of Lombok and its people. Partnering with Wärtsilä was a great decision as we can rest assured knowing the power plant is running smoothly, delivering reliable and affordable power while reducing emissions. The engine power plant helps stabilise the system during low inertia periods, which enables the integration of more renewable energy. Not only does this increase grid reliability, but it also leads to lower CO2 emissions."

Mr. Sudjarwo
General Manager, PT PLN (Persero)



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