The Syama Gold Mine in Mali needed to increase its power-generation capacity while simultaneously cutting fuel costs and ensuring compatibility with plans for large-scale renewables integration. Wärtsilä Modular Block – a prefabricated, modular, configurable and expandable enclosure for sustainable power generation – fit the bill perfectly.

The mine is the world’s first fully automated underground gold mine. The site’s owner, Resolute Mining Limited, aims to be a leader in mining innovation and, by investing in future-proof solutions, make its Malian operations more environmentally friendly. The move to modernise the off-grid power generation capacity to meet rising demand provided the perfect opportunity to deploy a more reliable and efficient solution that would not only deliver significant cost savings, but also dramatically reduce CO₂ emissions. Wärtsilä partnered with Aggreko Power Solutions to provide four Wärtsilä Modular Block enclosures, each equipped with a high-efficiency, medium-speed Wärtsilä 32 engine. The total output of the solution is 40 MW.

“We are committed to utilising advanced technologies and innovative techniques to achieve smarter and more sustainable mining operations. The Wärtsilä Modular Block solution is fully in line with this philosophy.”

John Welborn, Chief Executive Officer and Managing Director, Resolute Mining Limited

“Weärtsilä Modular Block allows the customer to choose between ownership and rental of the power plant, whichever suits his business model best, and because of its redeployability it is an ideal solution for mining operations.”

Stephane Le Corre, Strategy and Commercial Development Director, Aggreko Power Solutions
INCREASED CAPACITY FROM A RELIABLE, EFFICIENT AND FUTURE-PROOF SOLUTION

Because the current diesel generators can no longer meet the mine’s power demands for the coming years, Resolute will replace them with four Wärtsilä Modular Blocks, each with a Wärtsilä 32 engine. The solution provides a total of 40 MW of power and is more efficient and has lower lifecycle costs than the high-speed technology traditionally used in the mining sector. The very high efficiency and superior instant load of Wärtsilä engines make them ideal for isolated power systems. In addition, the modules are quick to install and dismantle if and when they need to be relocated. The Wärtsilä Modular Block also enables new business models such as power-as-a-service and rentals, a sector that is now moving towards gas and longer contracts.

The Wärtsilä Modular Block enables significant cost savings. The current cost of producing power at the Syama mine ranges from EUR 0.18/kWh to EUR 0.22/kWh dependent on diesel prices. By using Wärtsilä medium-speed engines, the mine saves up to EUR 1.5M in fuel costs per month, significantly increase its long-term profitability.

EASY INTEGRATION WITH RENEWABLE ENERGY AND STORAGE SYSTEMS

This future-proof solution can meet any increase in demand by accommodating future renewable energy sources – in this case, solar power and battery storage. When complete, the new hybrid solution, for which Wärtsilä’s engines will generate over half of the power, will help to enhance Resolute’s environmental performance by reducing carbon emissions by around 20%. The solution is ideal for providing grid stability and balancing when integrating renewable energy sources to the system. Thanks to its modular design, the solution can be expanded by simply adding more enclosures.

THE CHALLENGE
- Flexibility to cope with future changes in power demand
- Ensure a reliable and efficient way to increase off-grid power generation that can integrate easily with upcoming renewable power sources
- Reduce carbon emissions and contribute to more sustainable mining operations

WÄRTSILÄ’S SOLUTION
- The highly-prefabricated solution enables new business models for medium and long-term rentals without large upfront investments
- Four Wärtsilä Modular Block enclosures, each with a high-efficiency, medium-speed Wärtsilä 32 engine
- The solution is based on proven engine technology with millions of running hours in various applications, including mining

BENEFITS
- The Wärtsilä Modular Block solution enables investment flexibility via rentals
- Substantial fuel savings improve the mine’s long-term profitability
- Significant reductions in carbon emissions
- New units can be quickly added as required, making this a future-proof solution
- Medium-speed engine technology is more efficient and has lower lifecycle costs than high-speed technology
- Enables fast-track project implementation and on-site cost savings

For more information, visit wartsila.com/energy/solutions-by-industry/mining-and-cement