

# AGL Energy Limited, Australia Barker Inlet Power Station

## CASE STUDY



### A step ahead Down Under – AGL Energy Limited invests in fast-start balancing capacity

With plenty of wind and sun, South Australia has become a forerunner in renewable energy. A high share of renewables needs, however, to be balanced by flexible power generation. To improve its energy reliability, AGL Energy Limited, one of Australia's leading integrated energy companies, turned to Wärtsilä for dispatchable power. In addition to reliability, Wärtsilä's fast-starting high-efficiency reciprocating engines provide superior value to AGL's portfolio in the changing Australian energy market.

AGL is Australia's largest private owner and operator of renewable energy assets and the country's biggest developer of the firming capacity needed to support renewables. Barker Inlet Power Station (BIPS) will play an important role in the utility's portfolio, as the plant's main task will be to ensure reliability in the

renewable-heavy South Australian power system and to balance the stochastic production of the renewables. The Wärtsilä engine generating sets can reach full output in a matter of minutes, providing the fast-start capability needed to rapidly respond to the fluctuations inherent to solar and wind power.

**“South Australia has a high penetration of renewables. That is how we see the rest of the market developing. This flexible power plant is a real proof of how Wärtsilä's reciprocating engines can help enable a high penetration of renewables, while contributing to reliability.”**

*Suraj Narayan,  
Sales Director, Australia & Oceania,  
Wärtsilä Energy Business*

## KEY DATA

**CUSTOMER:** AGL Energy Limited

**TYPE:** Wärtsilä 50DF flexible power plant

**OPERATING MODE:** Dispatchable fast-start and high-efficiency gas power generation to balance variable renewable generation

**GENSETS:** 12 x Wärtsilä 50DF

**TOTAL OUTPUT:** 211 MW

**FUEL:** Dual-fuel (DF) – primarily operating on natural gas, capable of liquid fuel operation

**SCOPE:** EPC with 10-year maintenance services agreement

**DELIVERY:** December 2019

We develop and deliver solutions and services to help our customers maximise performance and profitability throughout the asset lifecycle.

Being fuel-efficient, the reciprocating engines at BIPS are both cost-saving and environmentally sound: the new power plant requires 28% less fuel than its predecessor turbine plant and reduces greenhouse gas emissions by 35-50%. The engines have low sensitivity to ambient temperature and can produce full power, even at 40 degrees Celsius. The engines' negligible water consumption and their low fuel gas pressure create further operational cost savings.

As a multi-unit plant, BIPS offers high operational flexibility and high efficiency also at part load. Even if one of the twelve engines was unavailable due to maintenance, greater than 90% of the plant capacity would still be readily available. To match load requirements, any number of engines can be dispatched and run at high efficiency.

Continuous starts and stops, which characterise the operating mode of renewable-balancing generation, do not affect the maintenance intervals of BIPS's reciprocating engines. Their fast start-up capability makes the plant optimal as balancing capacity, but also provides increased revenue to AGL.

### A REVENUE-ADDING PART OF THE ENERGY MIX

To align the dispatch interval and settlement interval, Australia's National Electricity Market (NEM) will switch into a five-minute settlement regime in July 2022. The settlement period for the electricity spot price will then change from 30 to five minutes. While leading to a more efficient market, the switch also enables a more reliable power system, where investments in fast-response technologies are encouraged to back up renewable energy production. The fast-starting reciprocating engines of the BIPS are ideally suited for this new market structure.

BIPS was delivered on an engineering, procurement and construction (EPC) basis. The delivery also comes with a 10-year maintenance services agreement. Safety requirements are high in Australia and were a top priority at the construction

of BIPS. Through close cooperation between Wärtsilä, its subcontractor and AGL, the construction project saw record-high safety numbers: over one million working hours without a single Lost-Time-Incident (LTI).

BIPS is the first utility-scale reciprocating engine power plant in Australia's National Electricity Market (NEM). It is also the first gas-fired generation capacity added to the NEM in many years. For Wärtsilä, the plant is an important step on the path towards a 100% renewable energy future.

| THE CHALLENGE                                                                                   | WÄRTSILÄ'S SOLUTION                                                                                     | BENEFITS                                                                                                                               |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Need for reliability in South Australia due to high share of renewable energy sources.          | Multi-unit Wärtsilä 50DF power plant with high operational flexibility.                                 | Fast-starting and efficient power production to balance renewable energy and ensure energy reliability.                                |
| Need for profitable and environmentally friendly generation capacity to replace old technology. | High-efficiency engines with low sensitivity to ambient temperature, with negligible water consumption. | Lower operating and lifecycle costs (even at part load) secured with a 10-year maintenance services agreement. Lower carbon footprint. |
| Need to meet new market rules of five-minute settlement regime.                                 | Ultra-flexible reciprocating engines, capable of reaching full load within a few minutes.               | Maximising revenue with power plant capable of being dispatched exactly as needed.                                                     |

