Stock image of high voltage power grid

When the Dahanu Thermal Power Station needed to retrofit a new energy efficient ventilation solution to the Turbine Generator Hall, the smart choice for ventilation came down to just one product. EcoPower® from Edmonds®.

Retrofitting the existing motorised exhaust fans with EcoPower hybrid ventilation technology significantly reduced energy consumption and maintenance, improving reliability, all without compromising building ventilation.

Installing EcoPower EP600 delivered tangible benefits to the project by:

- Reducing fan energy consumption by over 97 %
- Maintaining ventilation rates throughout the building
- Achieving a maximum energy consumption of 116W per unit, typically consuming 90 – 100W
- Only true hybrid ventilation device offering integrated controls and fully automatic operation via the building automation system
- Minimising noise and vibration levels
- EC motor ensures control and energy efficient performance

To find out more, visit edmonds.com.au or contact us on 1300 858 674

EDMONDS®
Technologies for a Sustainable Future

CSR

EcoPower®

True Hybrid™ Ventilation

ABOUT THE PROJECT

The multi-award winning Dahanu Thermal Power Station is a 500MW coal fired power station located on the west coast of India, approximately 100 kilometres north of Mumbai. Since opening in 1996, the power station has taken active steps to reduce its environmental impact including installing the country's tallest chimney (275m tall) fitted with electrostatic precipitators to improve air quality, achieving ISO 9000 and ISO 14001 accreditation, and implementing energy conservation measures across the plant.

The Challenge

As part of its energy conservation measures, the plant operator Reliance Energy undertook an upgrade of the exhaust ventilation system in the Turbine Generator Hall by replacing the existing electric axial exhaust fans installed in 1996 with Edmonds EcoPower® EP600 hybrid ventilators. The original electric axial exhaust fans were unreliable, requiring frequent maintenance and consumed excessive amounts of electricity.

Reliance Energy also recognised the benefit of a hybrid type ventilator that "can work consistently for a long time with or without a power supply".

A challenge for this project was that the generator hall roof had existing penetrations for the original exhaust fans. Custom transition pieces were constructed to ensure weather proofing and eliminate the need for new penetrations, or sealing of the existing openings.

WHAT THE DESIGN ENGINEERS SAID

"Our main objective was the conservation of energy by replacing the existing electric roof exhausters in the TG Hall with hybrid type ventilators and reduce our auxiliary power consumption. To increase the reliability of operation and reduce maintenance, we installed the EcoPower EP600 hybrid ventilator which can work consistently for long periods of time, even without power."

Key Outcomes for this Project

The installation of the new EcoPower® EP600 ventilators had a significant impact on energy consumption whilst maintaining ventilation rates within the building. Comparison of the newly installed systems shows energy reductions of over 97% compared to the existing motorised ventilators, whilst maintaining required air flow rates.

	Electric Axial Exhaust Fans	EcoPower EP600
Design Power	3,700 W	116 W
Phases	3 phase	Single Phase
Design Flow (motorised)	6,000 m^3/hr	4,000 m^3/hr
Design Flow (natural ventilation mode)	N/A	1,220 m^3/hr
Actual Power	3,700 W	93 W
Actual Flow (motorised)	6,000 m^3/hr	6,183 m^3/hr
Actual Flow (natural ventilation mode)	N/A	3,324 m^3/hr

True Hybrid Technology delivers the best of both worlds by optimising the ventilation process

Pure natural ventilation depends on two distinct processes to provide airflow through a space; 1) Natural convection, where warm air from inside the space rises, exiting through openings at high level and drawing fresh cool air in through opening at low level, or 2) By wind induced ventilation where wind pressure on the building forces air through openings by a combination of positive (pushing) pressure at low level and negative (suction) pressure at high level. Both processes rely on favourable climatic conditions, moderate ambient temperatures (cooler outside than inside) and natural breezes from the right direction.

When nature can't provide the right conditions, designers turn to mechanical ventilation to solve the problem. EcoPower provides the best of both solutions in a hybrid ventilation solution.

REDUCE ENERGY CONSUMPTION BY 97%

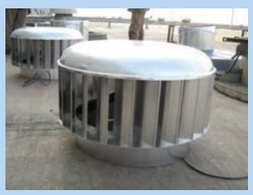
Minimise NOISE & VIBRATION Levels

IMPROVE WORKER COMFORT

PAYBACK PERIOD OF 9 MONTHS

EASY TO HANDLE AND INSTALL

Max. energy consumption of 116W typically consuming 90–100W

OLD AXIAL EXHAUSTER	NEW HYBRID VENTILATOR (ECOPOWER EP600)
	
	
	

Up to 97% lower operating costs versus traditional mechanical ventilators

Capable of operating unhindered in natural mode, or in both natural and energy efficient mechanical modes simultaneously, EcoPower® EP600 can boost flow rates 3 – 5 times higher than what is achieved via natural ventilation only mode under normal ambient conditions. Operational costs are up to 97% lower than directly equivalent traditional fan assisted ventilators.

Ventilation can be achieved using either wind, a natural energy source, or mechanical means.

Smart Controls automatically adjusts operation mode for improved performance and energy efficiency

Key to the success of EcoPower EP600 is in its ability to shift seamlessly from natural ventilation mode to mechanical mode, ensuring that internal conditions are maintained continuously.

When outside temperatures and wind conditions permit, the EcoPower EP600 turbines operate like a normal roof mounted ventilator. If the external temperature gets too high (reducing the effect of stack driven ventilation), or the wind speed falls (reducing wind induced ventilation) the high efficiency EC motor mounted directly in the turbine engages to boost airflow.

In mechanical mode, the units typically consume between 90W and 100W per ventilator.

WHAT THE PLANT OPERATORS SAID

"Unlike previous hybrid mechanical / wind vents, EcoPower has no motor and fan blade in the ventilator throat. Any obstruction in the throat of the vent will reduce vent performance by 40% or greater. Furthermore, axial fans in the throat of the vent can produce significant amounts of noise. As the bearing system of the motor becomes the bearing system of the ventilator, the vent can be free spinning under wind load or power activated as conditions require with no loss in performance. The EC motor ensures that the best energy efficiency features available are factored into the product design."

1300 858 674
www.edmonds.com.au

CSR Edmonds.
PO Box 231, Seven Hills, NSW 1730, Australia

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