

## APPLICATIONS

The economy of natural ventilation combined with the reliable high extraction rates of a highly efficient powered ventilator make **ecopower**® ideal in a wide range of applications including:

### School classrooms

The **ecopower**® energy efficient hybrid ventilator was originally designed for classroom applications. When ducted to the ceiling it allows natural ventilation of a classroom during the day to meet air quality standards (AS1668.2). The powered mode can then be activated by a timer later in the day to purge the room of heat build up and allow replacement by cooler night air. The cooler air settles into structures, providing thermal storage and helping to neutralise heat build up the following day. This results in more comfortable classrooms, reduced air-conditioning load and lower energy costs.

The low operating noise of **ecopower**® ensures it will not impact residents living close to schools, even during late evening.

### Factories and storage facilities

**ecopower**® provides reliable ventilation that can be controlled by a range of inputs to ensure the comfort and safety of personnel within these facilities. The sensor control feature allows the **ecopower**® to provide high performance

natural ventilation which is power-boosted when certain conditions exist, such as higher temperatures or gas concentration levels.

### Ventilation shafts on multistorey buildings

Noisy and relatively inefficient 3 phase powered ventilators have traditionally been used in these applications. **ecopower**® offers a high efficiency option with lower running costs and reduced environmental impact, along with lower operating noise levels.

### Auditoriums and indoor sports facilities

**ecopower**® allows energy free wind driven operation during periods of lower ventilation demand with the option to switch to power mode and significantly increase the rate of extraction during high usage periods.



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# ecopower®

## A REVOLUTION IN VENTILATION



Clean, fresh air. You'd think it would be something we all have the right to expect in our homes and work places and yet so often this isn't the case. Inadequate ventilation can lead to the build up of heat, moisture and even potentially harmful chemicals in the air that we breathe inside our buildings every day.

The revolutionary **ecopower**® from Edmonds is a hybrid roof vent developed to ensure a constant supply of fresh air with minimum energy use. It combines natural ventilation with a computer controlled, high efficiency electric motor in a single unit to ensure consistent air quality and guaranteed performance when you need it.



## ecopower® – TRUE HYBRID VENTILATION

The **ecopower**® can operate in either natural or power mode alone or in both simultaneously.

The natural ventilation mode functions through two processes. The first allows hot air to escape as a result of 'stack effect' buoyancy pressure. Hot air in the building rises and is released through the vent to be replaced by cooler ambient air.

The second process results from the wind driving the impeller unit, thereby creating flow through centrifugal suction.

The efficient power mode allows natural flow rates to be boosted by powering the Electronic Commutating (EC) motor to drive the impeller.

This provides on demand response to boost flow rates during periods of low wind speed or special ventilation needs.

In power mode, **ecopower**® has a flow rate 3-5 times greater

than the equivalent size natural ventilator operating at average Australian capital city wind speeds.

What makes the **ecopower**® revolutionary is its patented design. The **ecopower**® design allows the wind turbine itself to be used as a centrifugal impeller, no separate fan is required when running in powered mode. The motor is installed in a direct drive configuration to the impeller, ensuring minimum flow obstruction for maximum air movement. It also results in lower maintenance costs.

The bearing system of the motor functions as the bearing system of the ventilator. This means that the vent can be free spinning under wind load or power activated as conditions require.

The motor can be activated by a simple manual switch or operation can be controlled by any digital measure, such as temperature, humidity, gas concentration level etc.

### Benefits of ecopower®

**ecopower**® offers customers the following unique benefits:

- High efficiency ventilation at all times
- Low energy costs
- Significantly lower noise levels than axial fan vents
- Advanced German EC motor technology
- Edmonds vertical vane vent technology for higher performance\*
- Light weight
- Single-phase power and low voltage (selected models) for easy electrical installation

\* Flow coefficient tests performed under AS4740:2000 by Edmonds.



## AWARD WINNING DESIGN

The unique design of the **ecopower**® combines a number of innovative features to ensure its incredible efficiency.

### Open throat

Unique among hybrid vents, **ecopower**® has **no separate axial fan in the throat** allowing unparalleled airflow. Research using AS4740:2000 (Performance of Natural Ventilators) has shown clearly that any obstruction in the throat of a natural ventilator will greatly decrease vent performance. The level of flow reduction can be 40% or greater. Also, axial fans located in the throat of wind vents can produce significant noise levels.

### Dual bearing function

The direct drive centrifugal design means the bearing system of the motor functions as the bearing system of the ventilator. This means that the vent can be free spinning

under wind load or power activated as conditions require.

### Electronic Commutation motor

The use of an innovative Electronic Commutation (EC) motor ensures that the best energy efficiency features available are factored into the product design and also results in low maintenance.

### Intelligent speed control

The **EP900** model incorporates intelligent speed control. This allows a simple sensor to be connected for full feedback control of the motor. This can in turn be connected to a computer for ease of programming.

## PERFORMANCE

The **ecopower**® has been developed to provide the highest levels of performance. When compared with similar sized axial roof fans, **ecopower**® has demonstrated extraordinary energy efficiency under power load, requiring up to 76%

less power to maintain the same extraction rate.

The **ecopower**® also operates at a new level of quietness running at levels up to 14.5dB(A) lower than traditional mechanical axial fans.

Product	Exhaust Rate [m³/hr]	Power [W]	Noise @ 3m [dB(A)]
300mm, 2p, 1Φ - Axial fan	2160	160	55
EP400	2400	68*	46
<b>Improvement</b>		<b>63% lower</b>	<b>9 dB(A) lower</b>
450mm, 4p, 1Φ - Axial fan	4280	480	60
EP600	4280	116*	49
<b>Improvement</b>		<b>76% lower</b>	<b>11dB(A) lower</b>
630mm, 6p, 3Φ - Axial fan	9000	1000	60
EP900	10000	260*	45.5
<b>Improvement</b>		<b>76% lower</b>	<b>14.5dB(A) lower</b>

\*Power consumption can be reduced by up to 20% by prevailing winds of 30km/hr when in powered mode.

## ENERGY SAVINGS

The example below demonstrates the running cost savings and CO<sub>2</sub> emission reductions available in a typical 10 unit installation compared to mechanical axial vents. In this example energy and greenhouse gas reductions of 75% are achieved, this equates to a \$1,763 annual energy saving and an annual greenhouse gas emissions reduction of 12.3

tonnes based on the use of coal fired electricity.

The **ecopower**® not only uses less power in powered mode, but can also run for a shorter period due to the availability of continuous ventilation in natural mode. This allows for similar air change rates over a 24 hour period compared to the mechanical unit, which must run for a longer period.

Product	Number of Units	Exhaust Rate	Run Time	Annual Energy Consumption [kWh]	Annual Energy Cost @ 10c/kWh	CO <sub>2</sub> emissions @700g/kWh [tonnes]
EP600	10	Same	8hrs power 16hrs natural	3387	\$338.70	2.4
Standard Mechanical Axial Roof Fan Unit	10	Same	12hrs on 12hrs off (no ventilation)	21024	\$2102.40	14.7