



More power, same energy - all thanks to ORC technology

More power for the same energy has always seemed a Holy Grail. Now, with the use of heat exchangers from specialists EJ Bowman, ORC technology can provide a high-efficiency solution to turn waste heat into electricity. WIP has the story.

CHP enables anyone with a reciprocating engine powered Genset to provide heat and power from a single fuel source, but what if you can't use the hot water it produces?

The heating element of CHP is not always required due to local climatic conditions. Electricity however is always in demand and meeting that need has already started to create major energy supply problems.

In its latest *Outlook for Energy* report, the Exxon Mobil Corporation predicted global electricity demand will rise by more than 80% through 2030 - led by non-OECD nations, where demand will be up more than 150%. So, how can the heat recovery potential of CHP address the issue of generating more electrical power?

"In an ideal situation, there would be a way to take the waste heat from exhaust gases or industrial processes and use this free energy by-product to produce more electricity," comments Kevin Howell, Business Development Manager of EJ Bowman. "The good news is that this scenario is becoming a reality and offers enormous potential benefits to energy users."

Bowman is in the process of developing strategic partnerships with leading renewable energy specialists, developing its exhaust gas heat exchangers to work in conjunction ORC (Organic Rankine Cycle) turbine generator systems.

ORC turbine systems can be set up to run on waste heat from a variety of different sources, to create cost effective solutions for generating electricity. However, vital to the efficient performance of the system is efficient heat exchanger technology.

Although ORC is relatively new, it is receiving unprecedented interest due to

the additional electricity that can be generated with no extra fuel input costs. Several companies have now fully productionalised ORC equipment, bringing it within the reach of thousands of smaller scale processes where waste heat is produced as a by-product.

"There are a number of manufacturers who are developing their own solutions via differing technological avenues," comments Kevin Howell.

"With the ORC system becoming available in greater volume and therefore at lower cost, we believe a significant opportunity exists for many industrial and commercial customers to benefit from both lower energy costs and greater control over their electricity supply.

An ORC turbine process increases energy efficiency significantly for the same amount of fuel. This 'free' electricity can be used to power site equipment, reduce energy costs or gain independence from the grid or sell to it.

The advantage over solar and wind power is that ORC is predictable and measurable, enabling users to calculate the exact payback from their system.

An ORC Turbine Generator (Organic Rankine Cycle) is a closed cycle electrical power generation system driven by an external heat source. No internal combustion is needed; instead the ORC generator uses an organic working fluid with a lower boiling point than water to generate electrical power. 'Organic' is a chemical term for the refrigerant type



fluids commonly used in the closed cycle.

One of the processes uses waste heat from the exhaust gas to heat thermal oil, the energy from the oil is then transferred to a refrigerant or used to generate steam which is then used to drive a small turbine, which in turn drives a secondary alternator and the result is more electrical power,

"Historically, if the waste energy from the Gensets could not be utilised in a hot water circuit there wasn't any need for CHP," says Kevin Howell.

"Now using ORC this waste heat can be utilised to generate additional electrical output - the reason the Gensets are installed in the first place - with no extra fuel consumption or cost," he said.

"At Bowman, we believe that utilising waste heat to power ORC systems will radically change the power generation industry and we are delighted to provide heat exchangers that make the process possible."

Internet link

www.ejbowman.co.uk

WIP