

HEAT PUMP

What is the Market?

Heat pumps (HP) use electricity rather than fossil fuels to generate heat for both industrial and residential means. Although there are 24 million heat pumps currently installed in Europe, they have had a bad press due to their diminishing efficiency at temperature lifts above 30°C. In an evolving world of electrification & decarbonisation, it is crucial to improve HP system economics and performance to the point of realising a cost advantaged and economic swap out for a gas boiler for water heating or steam raising.

How is the FeTu device used?

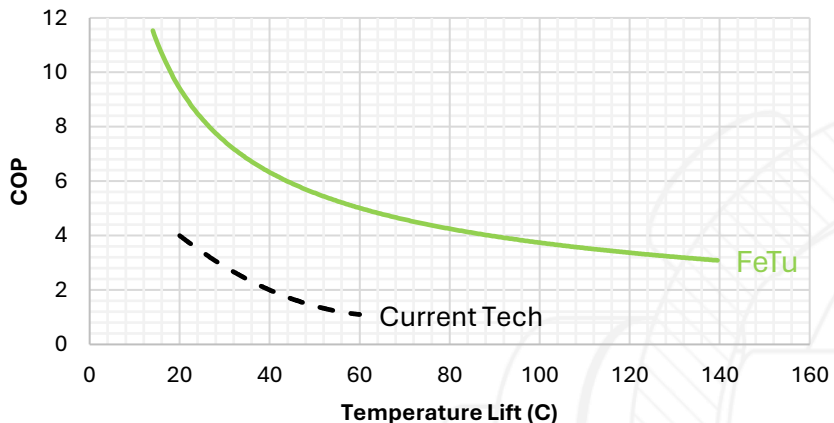
Utilising a FeTu machine as a **Compressor** within a vapour-compression cycle holds the highest heat pump efficiency, defined as Co-efficient Of Performance (COP). This thermodynamic cycle involves using input work to pressurising a fluid to high pressure and temperature and using this temperature to transfer heat to an external body.

Performance

High Temperature Heat Pumps, especially those achieving +100°C to raise steam are highly sought after. The difficulty with achieving high temperature is the larger Pressure Ratio thus Volume Ratio (VR) required in the Compressor. Typical VR of a Screw compressor is 5, and a Scroll is 3 therefore current systems need to multistage the compression to boost the temperature lift, which inherently amplifies efficiency losses. FeTu are not bound by such single stage VR limitations.

Below is a FeTu comparison to current HP state-of-the-art (SOA). An 80°C lift @ COP 4 does make for a system which is more cost effective to operate than a SOA gas boiler.

COP vs Temperature Lift



Company Overview



Who are FeTu?

Established 2016 by Jon Fenton: CEO, FeTu Ltd are an Innovation Driven Enterprise that has created a simple heat engine, a revolutionary 'green' energy device targeting carbon reduction across a broad range of energy systems and industries, with IP in the 'Global top 40' territories. Multi-award winning, most recently, the Institute of Physics (IOP) Business innovation award. This is a British brand who innovate, design and manufacture in-house using world class 5-axis CNC machine tools to exacting time & cost-effective quality standards.



What is the FeTu Technology?

The unique, patented, architecture of this new engine generation is pure of form and idealised by function, a simple, elegant, energy motor with ruthless class leading efficiency. Its unique 'continuous flow + positive displacement' functionality combines the benefits of both centrifugal & reciprocating piston engines. Cycling four fluid displacement chambers per revolution in a balanced, power dense & compact design.

The chambers collapse to zero volume (500:1), giving easy access to a wide range of Volume Ratios from 1:1 to 10:1, with incredibly high Volumetric Efficiency (+95%).

Internal parts have no contact other than 'frictionless' bearings. A double acting action means the dynamic internals have equal expose to suction & discharge zones, yielding a self cooling, low friction design of ultra-high thermo-mechanical efficiency (+95%).

100% recyclable, this power-dense unit is lightweight & scalable, with power-to-weight & power-to-size ratio beyond that of competitive fluid energy systems.

Use Cases?

FeTu have an established pedigree and extensive technical runtime data, in application as a gas Expander (Heat-to-Power) and, in reverse, as a gas Compressor (Heat Pump).