

> Why solid oxide fuel cells?

Because they generate efficient, low-emission electricity

Fuel Cells: The solution for co-generation

Co-generation products, as their name implies, produce heat for space heating and hot water, as well as electricity that can be used on-site and fed back into the electricity grid. Distributed generation sources include photovoltaic cells (solar) and micro-wind turbines. These technologies are highly visible and well known; however they depend on weather conditions and cannot provide stable electricity all year round.

There are also several types of co-generation products being developed, based on a range of technologies including Stirling engines and internal combustion engines. These technologies often have low electrical efficiencies and are constrained by the large amount of heat they produce.

Ceramic Fuel Cells' products are a dependable source for generating efficient, low-emission electricity for small-scale co-generation applications. Using widely available natural gas and renewable fuels, these fuel cells generate residential scale electricity, utilising high efficiencies, and an appropriate amount of heat for small scale applications. They can be used in many different markets, from domestic electricity generation, to remote area power supplies, as well as auxiliary power units.

The issues with low temperature fuel cells

- > Lower electrical efficiencies (up to 40%) when using natural gas as a primary fuel.
- > Often use expensive precious metals (such as platinum) to improve performance.
- > Need a relatively pure supply of hydrogen as a fuel, which adds complexity and cost.
- > Can be rapidly thermally cycled, making them better suited for stop/start applications.

As an alternative, Solid Oxide Fuel Cells offer the following benefits:

- > Operate at a higher temperature, eliminating the need for precious metals.
- > Operate on a number of different hydrocarbon fuels, chiefly natural gas.
- > Better suited for continuous operation.
- > Produce the highest electrical efficiency (up to 60%).
- > Can use heat recovery technologies for a total system efficiency of up to 85 per cent.
- > Near zero emissions and quiet operation, with low maintenance requirements compared to existing generation technologies.

Most importantly...

Ceramic Fuel Cells' products deliver the most efficient source of electricity for small scale co-generation applications with a focus on maximising electrical output.

With SOFC powered co-generation units, the heat generated from the fuel cells can be integrated with heat exchangers to preheat water and maximise the overall system efficiency.

Because Ceramic Fuel Cells' products can be connected to a regular natural gas network, the fuel cells do not need a separate hydrogen infrastructure for operation. This includes equipment to create hydrogen gas and deliver this pure hydrogen to the customer.