HYDROGEN FUEL CELLS

MOVING US TOWARD A CARBON-FREE SOCIETY

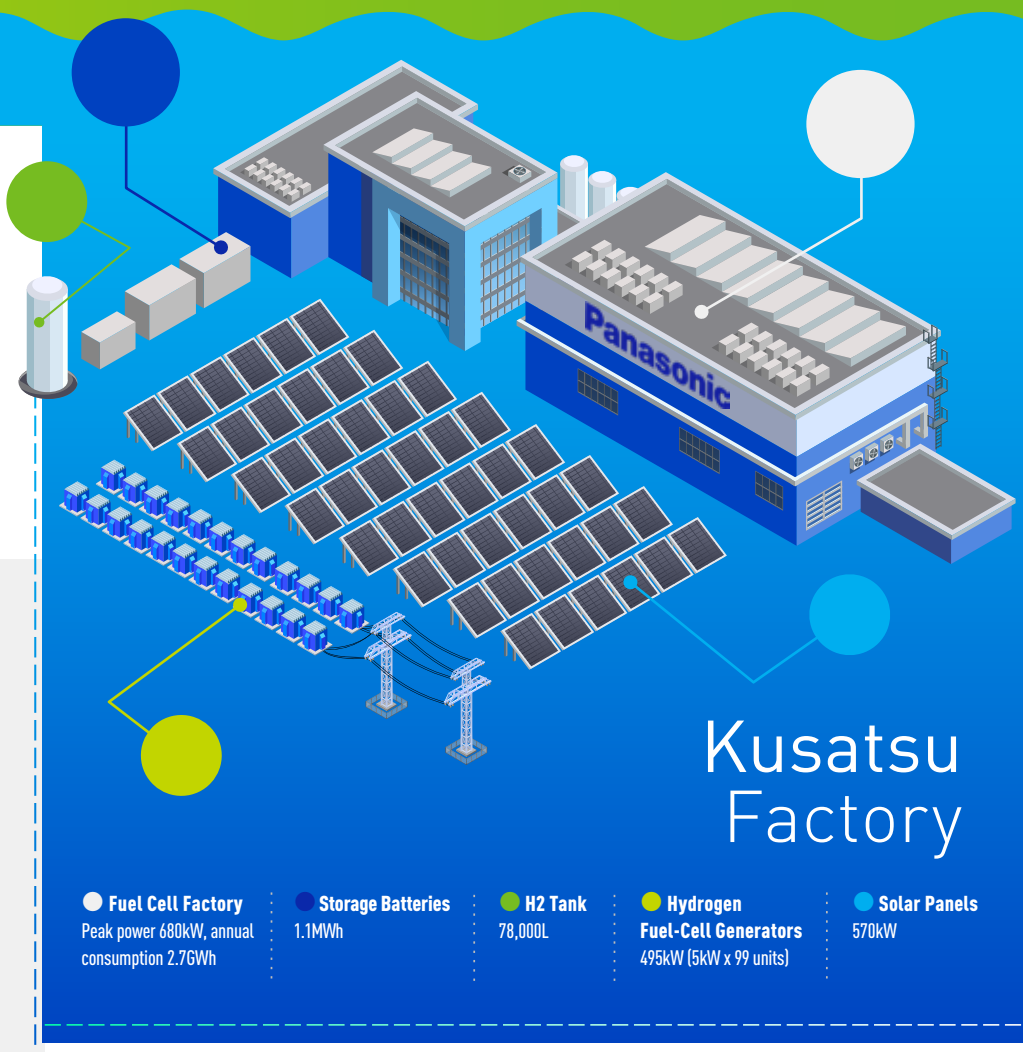
Many companies are committed to reach carbon neutrality.
Panasonic is dedicated to helping make this progress happen.

THE POWER OF HYDROGEN FUEL CELLS

Can produce the highest proportion of electricity of any combined heat-and-power technology

Only byproduct generated is water

Reduces dependence on centrally generated power, while saving carbon emissions and potential electricity costs



Kusatsu Factory

Fuel Cell Factory	Storage Batteries	H2 Tank	Hydrogen Fuel-Cell Generators	Solar Panels
Peak power 680kW, annual consumption 2.7GWh	1.1MWh	78,000L	495kW (5kW x 99 units)	570kW

Demonstrating THE FIRST 100% RENEWABLE ENERGY FACTORY

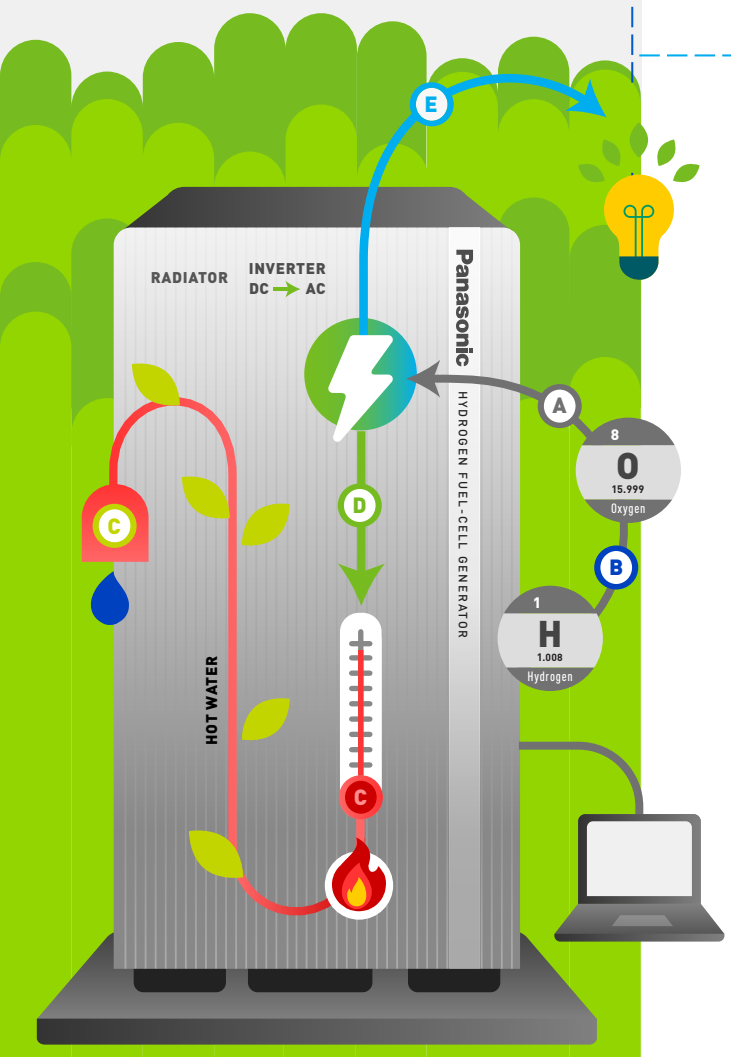
At its Kusatsu site, Panasonic is creating a demonstration of its 100% renewable solution leveraging full-scale use of hydrogen.

ABOUT THE PANASONIC SOLUTION

1. The Panasonic solution uses an in-house power generation system combining pure hydrogen fuel-cell generators, solar panels and storage batteries.
2. Using lithium-ion battery storage enables adequate energy management in response to power demand and effective use of surplus power generated during days when the factory is not in operation.
3. The hydrogen fuel cells are key to compensate for the shortcomings of solar panels and batteries to provide distributed and adjustable power.

BENEFITS OF THE PANASONIC SOLUTION

1. Zero-emission, stable power.
2. Backup power supply in the event of an unplanned disruption in service.
3. This system supplies power used throughout the fuel cell factory. Panasonic will develop and verify technologies related to the optimal power supply and demand management based on integrated control of the power generators and the storage battery system.



HYDROGEN FUEL-CELL GENERATOR

WHAT DOES A HYDROGEN FUEL CELL DO?

Hydrogen fuel cells convert hydrogen gas and oxygen into water, turning chemical energy into electrical energy.

How does it work?

- **A** Oxygen is readily available in the atmosphere, so it's only necessary to supply the fuel cell with hydrogen.
- **B** To turn hydrogen and oxygen into electricity, every fuel cell needs three components: an anode, a cathode and an electrolyte membrane.
- **C** Heat generated from the fuel cell converts into hot water for use.
- **D** When pressurized hydrogen enters the fuel cell at the anode, the platinum-containing anode catalyst separates it into protons and electrons.
- **E** The protons travel through the electrolyte membrane towards the cathode, where electrons are diverted to an external circuit that generates an electrical current.

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