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Combined-Cycle Power Plant - How It Works

Inner Workings of a Combined-Cycle Power Plant

A combined-cycle power plant uses both a gas and a steam turbine together to produce up to 50 percent more electricity from the same fuel than a traditional simple-cycle plant. The waste heat from the gas turbine is routed to the nearby steam turbine, which generates extra power.



GE Combined Cycle technology can reduce startup emissions of NOx and CO by 90 percent and provide a CO2 reduction of 19,000 tons per year. That's equivalent to taking 3,800 cars off the road.

How a Combined-Cycle Power Plant Produces Electricity

This is how a combined-cycle plant works to produce electricity and captures waste heat from the gas turbine to increase efficiency and electrical output.

1. Gas turbine burns fuel.
 - The gas turbine compresses air and mixes it with fuel that is heated to a very high temperature. The hot air-fuel mixture moves through the gas turbine blades, making them spin.
 - The fast-spinning turbine drives a generator that converts a portion of the spinning energy into electricity.
2. Heat recovery system captures exhaust.
 - A Heat Recovery Steam Generator (HRSG) captures exhaust heat from the gas turbine that would otherwise escape through the exhaust stack.
 - The HRSG creates steam from the gas turbine exhaust heat and delivers it to the steam turbine.
3. Steam turbine delivers additional electricity.
 - The steam turbine sends its energy to the generator drive shaft, where it is converted into additional electricity.

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