

GE FlexEfficiency* 50 Combined Cycle Power Plant

fact sheet

Product Snapshot

The FlexEfficiency 50 Combined Cycle Power Plant is GE's latest innovation in gas turbine technology, engineered to deliver cleaner, more efficient energy onto the power grid and into our homes. The first product in GE's new FlexEfficiency portfolio, the FlexEfficiency 50 plant will enable the integration of more renewable resources onto the power grid by combining flexibility and efficiency to rapidly ramp up when the wind is not blowing or the sun is not shining, and to efficiently ramp down when they are available.

Enabling Renewables

Demand for renewable energy is growing. As additional renewable sources join the grid, reliable power generation and stress on the grid both become larger issues. GE's new natural gas-driven plant can accelerate the widespread adoption of renewable power generation around the world. Its flexible, jet engine-based technology addresses variability, reliability, and the need for lower fuel use and operating costs. The FlexEfficiency 50 plant does this while simultaneously helping utilities take advantage of the growing trend to use abundant, cleaner-burning natural gas for power generation.

Product Attributes

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| <p>Efficiency</p> | <p>The FlexEfficiency 50 plant is rated at 510 megawatts with greater than 61% efficiency, significantly reducing the amount of fuel needed to create power. The plant:</p> <ul style="list-style-type: none"> • Provides greater than 61% base load efficiency and maintains highly-efficient operations even when ramped down • Can be integrated with a concentrated solar power field to achieve more than 70% efficiency • Has a 10% smaller footprint than existing combined cycle power plants with equivalent output • Offers a cleaner, simpler design that enables easier maintenance and increases reliability |
| <p>Flexibility</p> | <p>Flexibility refers to a power plant's ability to respond to varying grid demands. Key flexibility attributes of the FlexEfficiency 50 plant are:</p> <ul style="list-style-type: none"> • Achieves a ramp-rate of more than 50 megawatts per minute, twice the ramp-rate of today's industry benchmarks • Allows the plant to turn down to 40% of its load while maintaining emissions guarantees • Starts in less than 30 minutes |
| <p>FlexEfficiency</p> | <p>FlexEfficiency is the powerful combination of efficiency and operational flexibility. GE believes owners and operators can generate electricity more cost-effectively if they include flexibility and efficiency considerations in their evaluation models, and has termed this concept "FlexEfficiency." FlexEfficiency is defined as profitable annual MWhr's divided by annual fuel consumption. In the way that a car's actual fuel efficiency is the combination of its highway and city fuel efficiencies, FlexEfficiency represents a power plant's efficiency over a variety of operating conditions.</p> |



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| <p>Combined Cycle Plant</p> | <p>A combined cycle plant uses gas and steam turbines working in tandem to make efficient use of fuel. The FlexEfficiency 50 plant includes a highly flexible and efficient gas turbine that generates both electricity and heat. The electricity is fed onto the power grid, and the heat, which is typically wasted in other power plants, is used to create steam. That steam is used to drive a highly efficient steam turbine that creates additional electricity to feed onto the grid. The efficiency of combined cycle plants ultimately creates cleaner energy.</p> |
| <p>Economic and Environmental Benefits</p> | <p>The plant delivers significant cost-savings for the customer and reduction of plant emissions when compared to GE's current technologies. A typical plant that varies its output depending on conditions will achieve these benefits:</p> <ul style="list-style-type: none"> • Savings of approximately \$2.6 million dollars per year under a typical operating profile of 4,500 hours per year at a natural gas price of about \$10 per million btu • Annual fuel savings of 6.4 million cubic meters of natural gas, equivalent to the annual natural gas consumption of more than 4,000 EU households • Annual CO₂ emissions reduction of more than 12,700 metric tons, equivalent to removing more than 6,000 cars from EU roads. Each plant also avoids 10 metric tons of NO_x annually <p>The technology is ecomagination certified, which is a rigorous third-party certification recognizing the plant's environmental and economic benefits to customers.</p> |
| <p>Manufacturing</p> | <p>GE has invested more than \$500 million in R&D to develop the FlexEfficiency 50 plant. The launch follows GE's recent announcements of the world's most efficient wind turbine, the highest reported efficiency for thin film solar, and \$11 billion in acquisitions that strengthened a portfolio supporting natural gas and power transmission.</p> <p>The FlexEfficiency 50 plant is the first product in GE's new FlexEfficiency portfolio, and part of GE's ecomagination commitment to drive clean energy technology through innovation and R&D investment.</p> |
| <p>Testing</p> | <p>The gas turbine for the FlexEfficiency 50 plant will be tested in GE's full-speed, full-load testing facility.</p> <ul style="list-style-type: none"> • GE is investing \$170 million to create the testing facility. • The gas turbine will be tested at full capacity in a variety of real-world power plant conditions prior to commercial operation. • The plant can be tested beyond normal operating parameters because the facility is not connected to the power grid. |



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