Siemens Heat Transfer Technology (hereafter Siemens) is a reputable OEM HRSG supplier, previously operating under the NEM brand name. We have provided the boilers behind many gas turbines, varying in size from 10 MW up to the largest machines, and for all kinds of fuels and applications. We offer a wide variety of boiler designs in order to be able to meet your specific requirements, focusing on the lowest total installed and/or operational costs. Since we can supply both horizontal and vertical boilers, we can optimize the boiler configuration to the smallest possible plot space available.

### HRSG installed base, by GT size

- **> 200 MW**: [Bar Chart]
- **150 - 200 MW**: [Bar Chart]
- **100 - 150 MW**: [Bar Chart]
- **50 - 100 MW**: [Bar Chart]
- **30 - 50 MW**: [Bar Chart]
- **0 - 30 MW**: [Bar Chart]
### Various designs to fit your purpose

<table>
<thead>
<tr>
<th>Type</th>
<th>Abbreviation</th>
<th>Gas Flow</th>
</tr>
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<tbody>
<tr>
<td>Horizontal Natural Circulation</td>
<td>HNC</td>
<td>HORIZONTAL</td>
</tr>
<tr>
<td>Horizontal Natural Circulation DrumPlus™</td>
<td>HNC+</td>
<td>HORIZONTAL</td>
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<tr>
<td>Horizontal Once Through Benson®</td>
<td>HOT</td>
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<tr>
<td>Vertical Natural Circulation</td>
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<tr>
<td>Vertical Once Through Benson®</td>
<td>VOT</td>
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<tr>
<td>Once Through Steam Generator</td>
<td>OTSG</td>
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<tr>
<td>Drum Type Steam Generator</td>
<td>DTSG</td>
<td>VERTICAL</td>
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</tbody>
</table>

### Horizontal Benson Once Through HRSGs

These HRSGs have a horizontal exhaust gas path with the heat exchanger tube bundles arranged vertically. The units are designed for natural circulation of the water-steam mixture in the evaporator tubes. A ‘once through’ design is also available.

The Siemens horizontal HRSG features a so-called ‘cold-casing’ design. The casing is completely internally insulated and lined with sheeting, allowing thermal growth.

This cold-casing design allows a fast gas turbine start-up and is more suitable for the high gas temperatures associated with modern gas turbines and/or supplementary firing.

**Abbreviation:** HNC  
**Gas Flow:** HORIZONTAL
Fast Start & Cycling Operations

Siemens is a worldwide provider of two types of Fast Start HRSG technologies: Benson® and DrumPlus™. Siemens’ HRSG Fast Start solutions offer a quick response to power demand, while maintaining the lifetime of any HRSG. This ability is of special importance in so-called spot markets and locations where the daily fluctuation in power is aggravated by power fluctuations of renewables.

Siemens’ Fast Start solutions allow unrestricted gas turbine ramp-up which results in remarkable flexibility, reduced start-up costs, quick delivery to the grid and significantly lower CO and NOₓ emissions during start-up.

DrumPlus™

The HP drum in our DrumPlus™ requires a thin wall and minimal nozzle sizes are minimized. As a result, peak stresses are significantly reduced. This provides optimal flexibility for the future, as there is sufficient design margin for more demanding operations.

With Siemens’ revolutionary DrumPlus™ Fast Start technology, no gas turbine start-up holds are required. The drum’s thin wall allows unrestricted ramp-up of the gas turbine. The minimized thickness is a result of the small drum diameter. A key aspect is the external location of the water/steam-separators, allowing an optimal separator design without the limits set by the confined space in the drum.

Our unique know-how has allowed us to develop a game-changing new design: the DrumPlus™, a drum-type Fast Start HRSG. This patented boiler technology is available for single-, double- and triple-pressure HRSGs. Two DrumPlus™ HRSGs were officially inaugurated at NRG’s Flex Plant™ 10, El Segundo, California in September 2013. This Fast Start boiler technology is the first of its kind in commercial operation, allowing the gas turbine to reach 150MW in a time span of just ten minutes!
Delivery concepts and site construction

We can supply our HRSGs in all kinds of prefabricated concepts, which enable you to optimize the total installed costs. They can be delivered in the form of small parts due to transport limitations, or even complete pre-erected units (‘plug & play’ design) in order to minimize construction site costs/risks, whether for onshore or offshore applications.

Waste Heat Recovery Units

The Waste Heat Recovery Unit (WHRU) range by Siemens offers an efficient method of recovering thermal energy from the waste heat of gas turbine exhaust gases.

This method allows a significant increase in the efficiency of the turbine train, and a decrease in both fuel demand and pollution.

Siemens is able to supply the entire scope for your gas turbine train, therefore bringing the total number of parties required for project realization back to only one.

Siemens’ WHRU solution can also be applied to gas turbines from any other supplier, in a range from 10 to 70 MW.

Fast construction

The pre-assembled WHRU modules can easily be stacked and can be constructed in a short total time span of less than eight weeks. No inside welding activities are required in order to realize construction.

Highly configurable

The Siemens WHRU modular design provides great flexibility. The standardized configurable modules mean the design can be easily optimized to suit any customer requirement.

Designed for flexibility

The WHRU’s pressure parts module is classified as ‘engineered to order’ which means that the design is calculated and fabricated specifically for each project and customer need. In this process, we rely on our intensive and comprehensive experience in heat transfer technology.

Serving the market

The standardized design fits every type of gas turbine from any supplier, ranging from 10 to 70 MW. It is therefore in perfect harmony with, but not limited to, the existing Siemens gas turbine portfolio.
A selection of HRSG reference projects
Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.