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.

- We are a highly experienced boiler OEM with the widest variety of installed boiler designs worldwide.
- We offer horizontal and vertical boilers for a gas turbine range from 10 MW up to the largest machines.
- Our fast start solutions provide savings for your plant on both fuel costs and emissions.
- For brown field application, we can design the boiler with a minimum downtime for your existing plant, minimizing the modifications required at the site.
- Siemens minimizes the environmental footprint and contributes to long-term profitable and sustainable business.
- Siemens is present all around the world. We are a financially solid partner capable of helping you to develop your projects.
- Siemens can optimize the boiler design to perfectly suit the gas or steam turbine (or both).
Various designs to fit your purpose

<table>
<thead>
<tr>
<th>Type</th>
<th>Abbreviation</th>
<th>Gas Flow</th>
</tr>
</thead>
<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>
<td>HORIZONTAL</td>
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<tr>
<td>Vertical Natural Circulation</td>
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<tr>
<td>Vertical Once Through Benson®</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!
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.
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.

Siemens Heat Transfer Technology
Stadhouderslaan 900
2382 BL Zoeterwoude
The Netherlands

Telephone +31 71 579 2444
E-mail info.htt.energy@siemens.com
Website www.Siemens.com/htt