

Hilli - FLNG

**196 MW**



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# Hilli FLNG

## First John Cockerill HRSG maritime application for mobile gas compression station

### Context of the Project

Golar LNG, a Norwegian owner of vessels dedicated to the transport of natural gas, placed an order with Black & Veatch (B&V) for the conversion of a ship, the Hilli, into a mobile gas compression station. This concept is called FLNG (Floating Liquefied Natural Gas). Traditionally, natural gas is liquefied onshore before being transported. FLNG enables to be independent of specific onshore gas compression facilities as vessels can directly liquefy gas on board. Gas can therefore be delivered faster to its final destination.

### The Contract

In November 2014, B&V placed an order with John Cockerill Energy for the design and supply of four boilers dedicated to the FLNG application. The contract also includes an option for the conversion of two other ships.

Four gas turbines are located under the main deck of the Hilli whereas the HRSGs are installed on the upper deck. In order to make an optimal use of the limited space available on board, the boilers are designed with a vertical configuration. The John Cockerill HRSGs will produce the necessary steam for two steam turbines (30 MW each), along with the steam required for the liquefaction process.

The Hilli project also requires a modularization of the boilers. John Cockerill Energy will deliver entirely prefabricated boiler modules, that will be assembled on board. The boilers are therefore designed in two main parts, of which the larger weights approximately 240 tons. It should also be noted that for reasons of pitching and rolling, these boilers are designed with assisted circulation rather than with natural circulation, which is more usually the case for larger boilers installed in electric power plants.

The communication and commercial negotiations with Black & Veatch were handled by the American teams of John Cockerill

Energy whereas the technical proposal was drawn and followed up by John Cockerill Energy in Belgium, specializing in the vertical technology of boilers. This teaming approach continued during the project execution phase as John Cockerill's Belgian teams were in charge of the engineering and purchasing and the American teams provided the project management and transportation. John Cockerill Energy also associated with maritime experts and was DNV (Det Norske Veritas) certified.

**This order illustrates the know-how of John Cockerill Energy and its capacity to design projects for new applications. It also demonstrates the great potential of John Cockerill Energy's teams in Europe and the United States.**

### Gas Turbines

- 1 GE LM2500
- Fuel: natural gas

### Heat Recovery Steam Generators

- 4 John Cockerill vertical HRSGs
- Installed on a ship
- DNV certified with by-pass diverter
- Assisted circulation

### Performances

Gas	C°	t/h	
Inlet	524.4	305.6	
Outlet	192.3	305.6	
Steam	°C	BarA	t/h
HP	398.9	45.3	39.1

### Schedule

Contract Award	November 2014
Start (first) boiler erection	January 2016
1 <sup>st</sup> HRSG ready for PAC	May 2017
Full Commercial Operation	May 2017



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