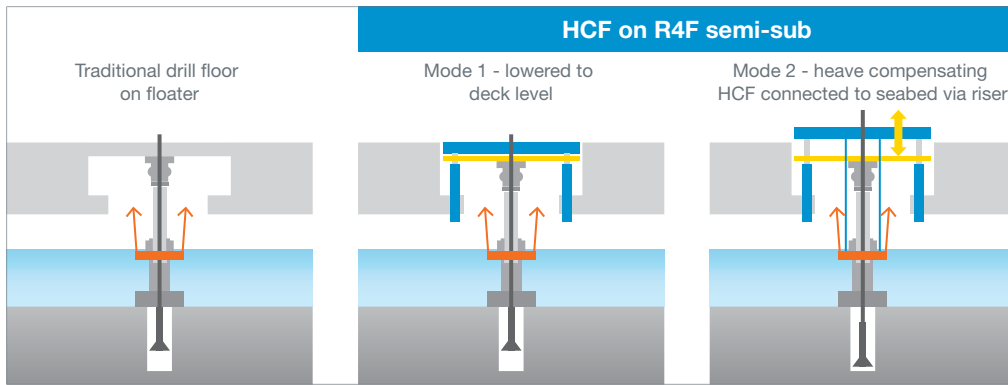


# Rig for the Future



- High efficiency robotic drilling system
- Unique heave compensated drill floor
- Fully hands off deck handling
- Hybrid power system with external connection
- 40% less people on board
- 25% lower cost per well
- Up to 86% less emissions per well





## Intro

As oil and gas will be part of the energy mix for the coming years, the challenge for the drilling industry is to produce the required oil and gas with the smallest amount of emissions per delivered well. The Harsh Environment Semi-Submersible Drilling Rig is a part of the solution to that challenge.

Besides an energy storage system for peak shaving and spinning reserve, a drilling system with an active-passive heave compensation and a heave compensated drill floor is installed. The systems consume very low power, expand the weather window (enabling running completions in harsh weather) and enable managed pressure drilling operations. Wells are delivered in fewer days and emissions per well are reduced by 30-40%.

To reduce the emissions even further, the rig is outfitted with capabilities to receive external power from a (shore hydro powered) production platform or from floating wind turbines. The floating wind turbines utilise the semi's mooring spread, reducing cost and mobilisation time.

The combination of less energy consumption, less days per well and external power provides a total reduction of 86% emissions per well, making this the greenest HE semi.

The semi's large deck space and smaller POB require fewer PSVs and helicopter rides, further reducing the emissions.

## Robotic, high efficiency drilling system

The Dual Multi Purpose Tower is based on the robotic drilling system Huisman has delivered previously. The system consists of a welded box girder type load bearing structure with a hoist on either side. One hoist is situated above the well centre in the drill floor in the center of the semi-sub and the other above the offline standbuilding centre. As there is no lattice type derrick structure around the hoists, large objects can be skidded directly to the well centre, improving handling safety and efficiency.

The system is outfitted with a number of multi functional manipulators which, when fitted with the associated tools, can act as pipe handling system, iron roughneck, manriding basket, hoist system etc., providing enormous flexibility, quick mob-demob and offline maintenance. Huisman high power modular topdrive with independent load path and the Huisman Iron Roughneck are fitted.

## Unique heave compensated drill floor

The drill floor is hoistable, similar to those on the Huisman-designed Noble Globetrotter drillsips. The drill floor on the harsh environment semi is supported by heave compensation cylinders. With this system a tubular string can be heave compensated during connections, enabling MPD from floaters in harsh environments and ability to run delicate completion strings in the winter season. This decreases the time the unit has to wait for better weather conditions and increases the unit efficiency.

## Fully hands off deck handling

Besides the fully robotic, unmanned, drill floor and fully hands-off stand building, also the pipe, riser and cuttings handling on the deck and transfer to the PSV is fully hands off, increasing safety, speed and workability. Tubulars will be strapped and drifted on the beach and transported to the rig in containers. Nobody touches the pipe from the beach into the well. The on board crew can be smaller.

## Hybrid power system with external connection

The unit includes a high efficiency, electric DC-bus system with energy storage to store regenerated energy for later usage. The electrical system is designed such that it can receive external electrical power, reducing the need for running the onboard diesel generators. The rig can be powered by hydro electrical power from a nearby platform or from floating wind turbines.