Siemens presents new DC grid connection for offshore wind farms

Higher cost efficiency in Wind Power Transmission
Siemens Energy Management is leading in offshore grid access

To date Siemens has commissioned

13 offshore grid connections with a total output of …

6 gigawatts (GW)

Another 2 offshore grid connections for a total of nearly

1.5 gigawatts have been ordered
Cost reduction is the key to ensure future competitiveness of offshore wind power

The entire system needs to be tackled by cost reduction

**Goal: reduction to < 10 euro cts/kWh by 2020 (FID*)**

**Turbines**
- Reduced part costs
- Higher electricity yield
- Industrialization

**BoP/Foundations**
- Standard-design
- Industrial manufacturing
- Scales of production

**Grid connection**
- Reduced complexity
- Smaller platforms
- Innovations

**Operation & Service**
- Durable parts
- Less maintenance
- Higher availability

* Final Investment Decision
Higher cost efficiency in Wind Power Transmission

Siemens Grid Access using Diode Rectifier Units (SGA-DRU)
For significant cost savings in the grid access part we need a paradigm shift!

Current Solution

New Solution
The most important levers for reducing costs in DC technology

1. Fully encapsulated HV equipment
   - Reduction of required space
   - Simplified auxiliary equipment

2. Passive and robust power electronics
   - No complex control system
   - High lifetime, low O&M costs
   - 1200 MW power rating
   - Low losses

3. Modular Diode Rectifier Unit
   - Flexible offshore installation options:
     e.g. central or distributed
Siemens Grid Access Solution is based on the Diode Rectifier Unit

Key features of the Modular Diode Rectifier Unit

- Encapsulated, rugged equipment
- Bio degradable and flame retardant insulation
- Simple and robust power electronics
- Small platform with easy transport and installation
- High reliability, minimal maintenance
- No offshore DC converter as single point of failure
- Flexible offshore installation options due to modular rectifier concept
Size and weight reduction means:

- Local value add: Opportunity for local manufacturer (e.g. shipyards) due to smaller size
- Increased offshore installation flexibility (opportunity of decentral or central platforms)
- Less environmental impact due to fewer and smaller offshore buildings

80% lower topside volume

65% lower topside weight
Increased transmission capacity and reduced losses offer:

- Lower costs per kWh of generated energy
- Less environmental impact due to less cable corridors
- Even higher transmission capacities > 1200 MW feasible

30% higher transmission capacity

20% fewer transmission losses
Shortened installation time provides:

- Higher flexibility for implementation
- Earlier return of investment

20% shorter installation time
Benefits of the new grid connection SGA-DRU:

- **80%** lower topside volume
- **20%** fewer transmission losses
- **65%** lower topside weight
- **20%** shorter installation time
- **30%** higher transmission capacity
- **30%** lower costs
Thank you for your attention!