



Havgul going offshore – challenges and opportunities

German Norwegian Offshore Wind Energy
Conference

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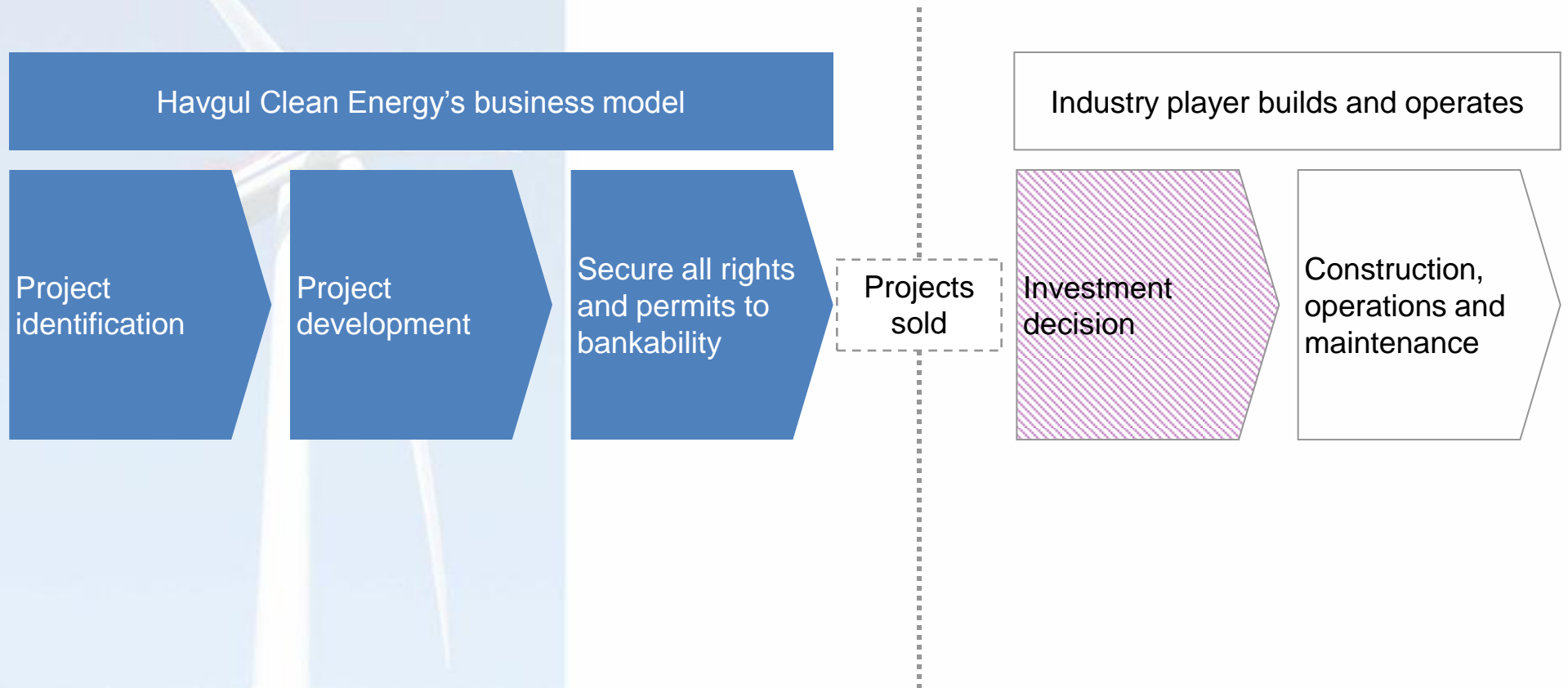
CEO, Havgul Clean Energy AS

Havgul Clean Energy in brief

Description

- Independent wind power project developer
- Established in 2007 - founders with extensive experience from wind power development and energy business in general
- Owned by founders and Sustainable Technologies Fund
- Goal to develop a highly profitable pipeline of on- and offshore wind power projects in Norway and Sweden and markets outside home markets
- Core markets are Norway and Sweden, but also projects in Romania and the US

HCE develops projects until all rights and permits are secured

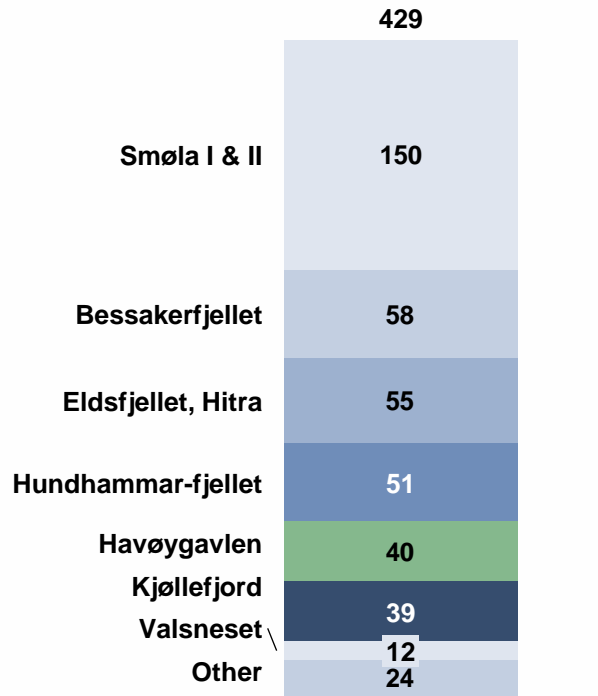


Strong project development track record¹

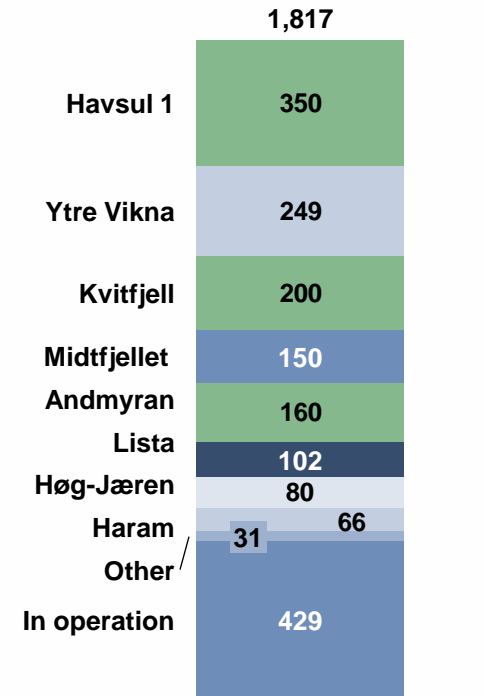
Prior projects



Current installed capacity (MW)



Permitted projects (MW)



 HEC developed projects¹

Note: 1) Developed and owned (wholly or partly) by founders of Havgul Clean Energy
Source: NVE

Havsul I – the first approved offshore project in Norway

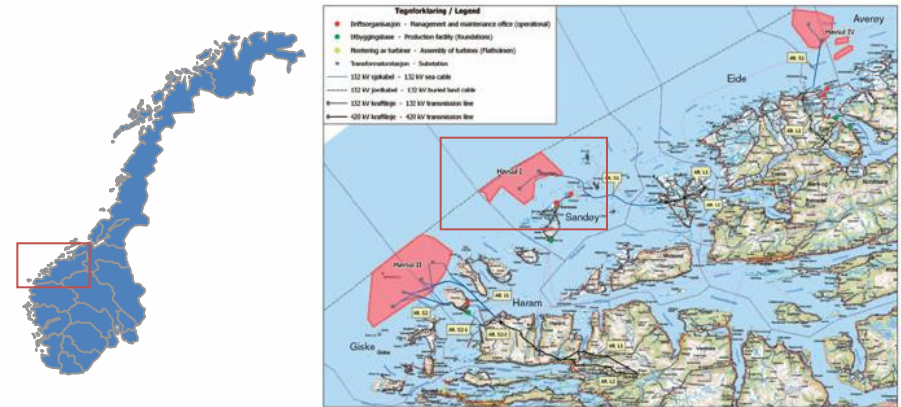
Description

- Havsul I is the first large offshore wind park approved in Norway
- The development of the Havsul project was initiated in 2004
- The project was owned by Havgul AS, where Havgul Clean Energy's founders held the majority of the shares
- In June, 2009 the project was sold to Vestavind Offshore AS, which is owned by 6 utility companies located on the west coast of Norway
- Final license provided in September, 2009

Key facts

- | | |
|--------------------|--------|
| • Km ² | 62 |
| • Installed effect | 350 MW |
| • No of turbines | 78 |
| • Production | 1 TWh |

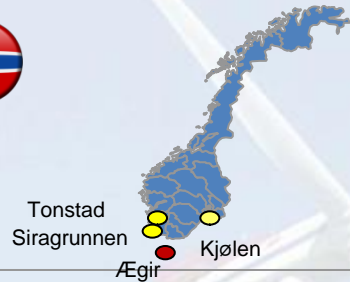
Location



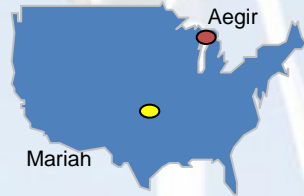
- The Havsul I project is situated off the coast of Møre and Romsdal county in Mid Norway
- The area has stable and strong wind conditions
- The feed in grid capacity in the region where the Havsul projects are planned is very favorably
- The new 132 kV cable to the Ormen Lange project at Nyhamna in Aukra municipality will create sufficient new feed in capacity

Projects under development

Country and projects



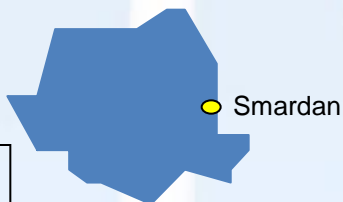
- Siragrunnen (offshore), 200 MW, 100% owned
- Tonstad, 200 MW, 100% owned
- Kjølen, 120 MW, 100% owned
- Ægir, (offshore), 1000MW , a former Oceanwind project



- Mariah, located in Texas, 2250 – 10 000 MW, in collaboration with Alpha Wind Energy (45% ownership) and local developer (10% ownership)
- Aegir (offshore), Lake Michigan, 1 000 MW, in collaboration with local developer Steve Warner



- Stora Pölsan (offshore), 300MW, in collaboration with Göteborg Energi
- Kölingared, 100 MW, 100% owned



- Smardan, 200 MW, project under development in collaboration with Alpha Wind Energy (45% ownership) and local developer (10% ownership)

● Under development
● Under evaluation

Perspectives on offshore wind

- **High growth unmaturing industry**
- **Europe in pole position led by Germany and UK**
- **Vast potential with low conflicts**
- **Scalability like no other "new" renewable energy source**
- **Opportunity for Norway to take a leading position**
- **Need for attractive support schemes and business environment**

Siragrunnen Vindpark

Norway

Sweden

USA

Romania



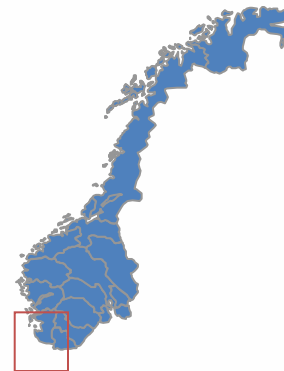
Description

- Siragrunnen is an offshore wind project located south of Stavanger
- Siragrunnen AS was established as a separate project company in 2007 and is 100% owned by Havgul
- Application and EIS study was sent to NVE in April, 2008
- Project is estimated to receive construction permission during 2012, at the time when Havgul seeks to exit the project

Key numbers

- | | |
|--------------------|-----------------|
| • Km ² | 35 |
| • Installed effect | 200 MW |
| • No of turbines | 40 |
| • Production | Approx. 780 GWh |

Location



- Located on the south west coast of Norway, south of Stavanger, on the border of the two counties Rogaland and Vest Agder
- Close to the shore – around 1 km – good wind conditions
- Close to the central grid, with sufficient feed in capacity
- The location has minimum visual conflict with public interests and is close to industry clusters for construction and operation
- Siragrunnen Vindpark will contribute significantly to strengthening the regional power balance

Project Ægir / North Sea

Norway

Sweden

USA

Romania



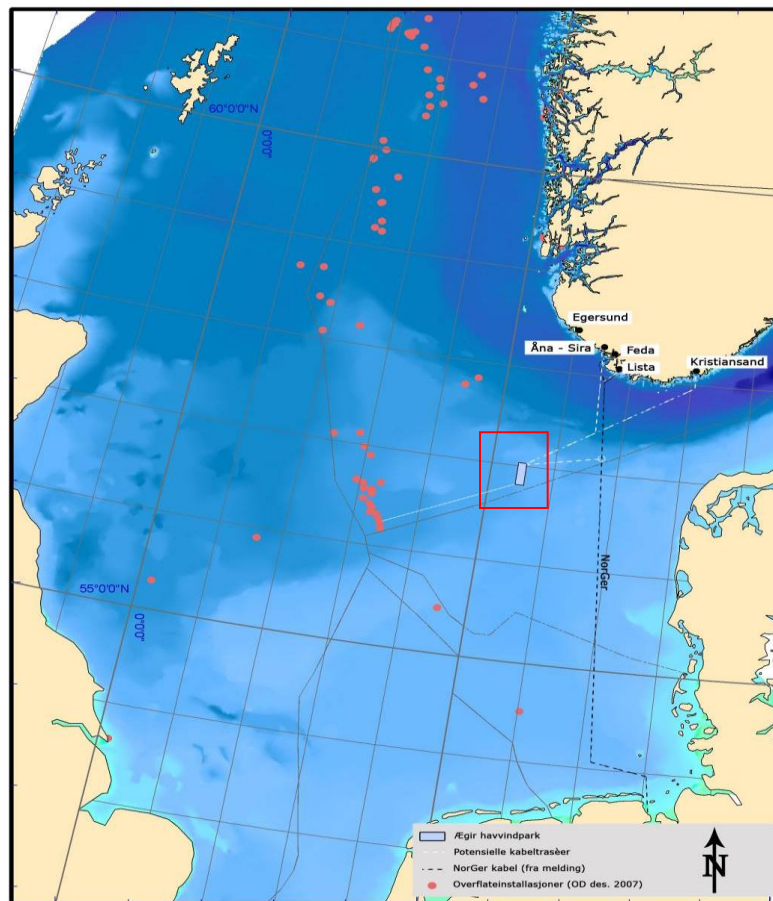
Description

- HCE is planning an offshore windpark in the southern part of the North Sea, approx 160 km south west of Lista. (project so far developed by Oceanwind).
- The park will have an installed capacity of 1.000 MW and a yearly production of more than 4 TWh.
- Waterdepths between 50 and 63 meters.
- Very good wind conditions of around 11 m/s
- Relevant grid access locations to land are Lista, Kristiansand, Åna-Sira and Fedaa.
- Other options are connection to the NorGer or NordLink sub-sea cables as well as supply to the Ekofisk installations .

Key figures

- | | |
|----------------------|-----------------|
| • Wind | Approx. 11 m/s, |
| • Installed capacity | 1000 MW |
| • Production | Approx. 4 TWh |

Location



Stora Pølsan

Norway

Sweden

USA

Romania



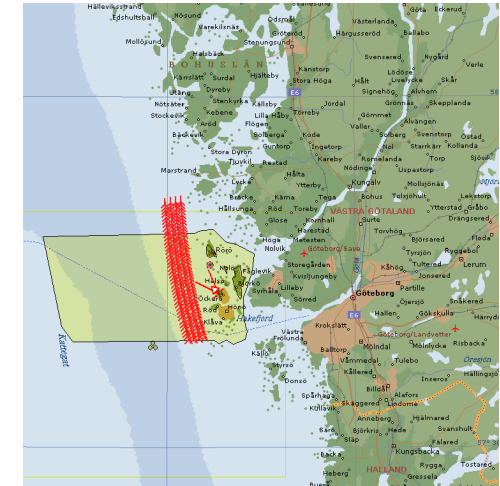
Description

- Stora Pølsan is an early stage offshore wind power project under evaluation
- The project will be developed in cooperation with Göteborg Energi AB

Key figures

- Km² 97 km²
- Installed capacity 300 - 500 MW

Location



- The project is located in Kattegat west of Göteborg
- The minimum distance to nearest settlement is about 3 km
- Grid capacity is not a limit for the further process
- According to initial wind data, the wind conditions are excellent

Project Aegir / Lake Michigan

Norway

Sweden

USA

Romania



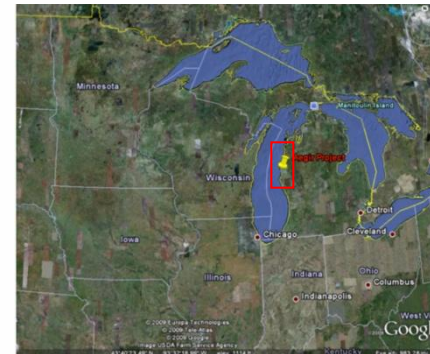
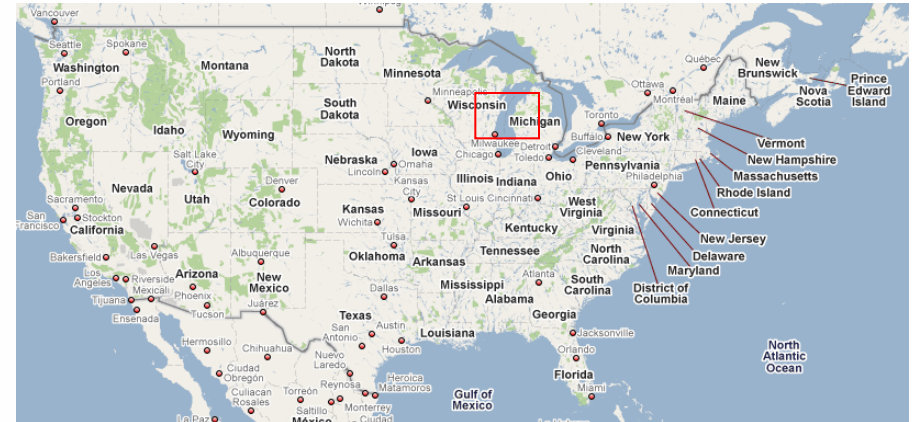
Description

- The Aegir project is an early stage offshore wind farm project in Lake Michigan
- The project is developed by Scandia Wind Offshore, LLC, a joint venture company owned by HCE and local developers
- There are strong political drivers towards offshore in Michigan and many studies are being performed
- There are few developers active today in Lake Michigan
- The offshore project is possibly faster time-to-market vs. onshore due to fewer land lease issues
- Located close to the large pumped-storage power plant in Ludington

Key figures

- | | |
|----------------------|--------------|
| • Km ² | 253 |
| • Installed capacity | 1000 MW |
| • No of turbines | 200 turbines |
| • Production | 3 355 GWh |

Location



Preliminary layout

- The Aegir Project is located in Lake Michigan west of Mason and Oceana counties in Michigan

Summing up

- **Market for optimists and enthusiasts**
- **Change in attitude with Authorities**
- **Export supply industry along the coast**
- **Creating lots of new jobs**
- **Opportunities for collaboration with German supply industry**