Science Meets Industry Bergen

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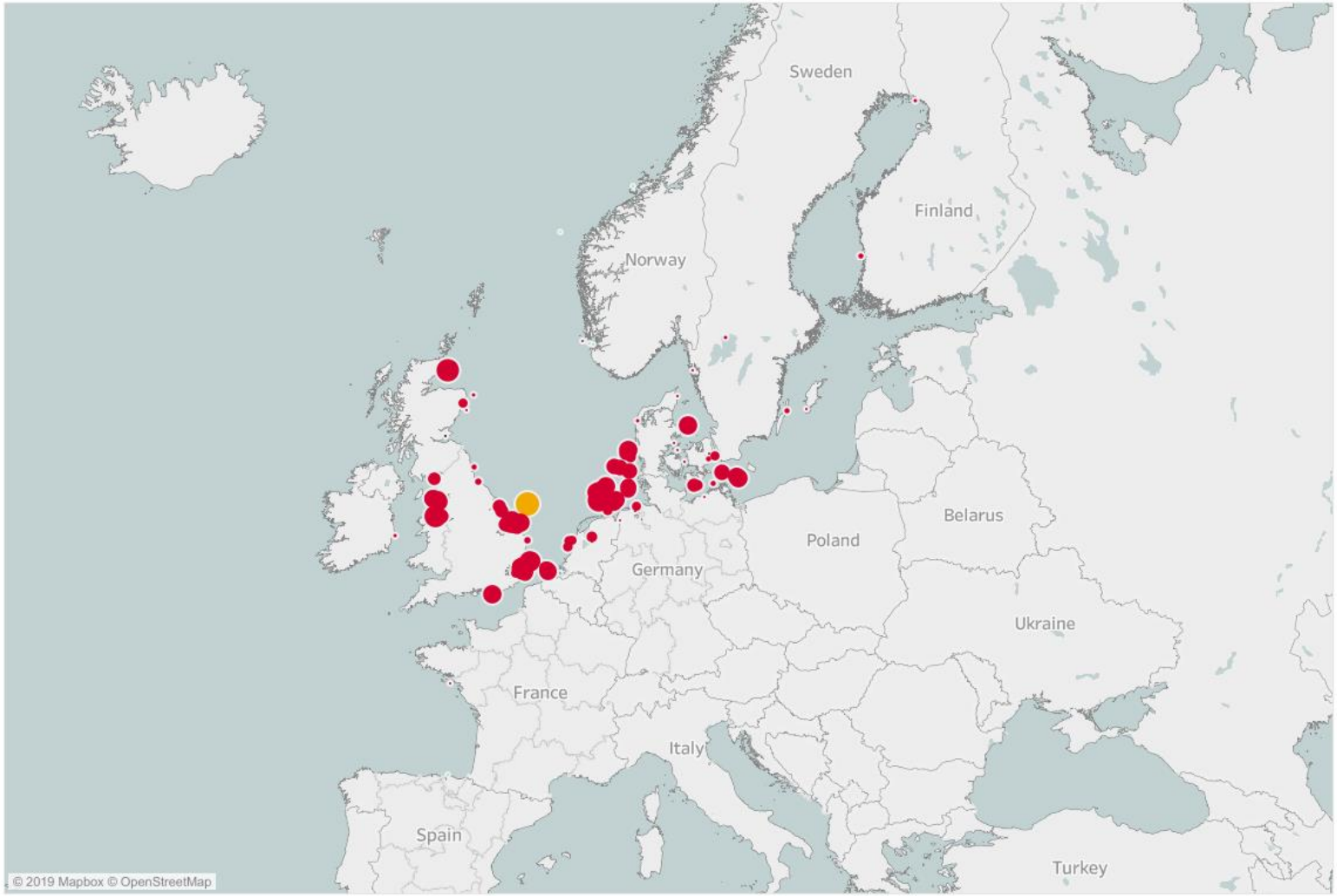

Total offshore capacity connected to the grid: 20,380 MW
Number of wind farms connected to the grid: 106 Wind Farms

Status
demonstration site
Online
Partially online
Test site

Cumulative capacity

Country	MW
UNITED KINGDOM	8,496
GERMANY	6,586
DENMARK	1,703
BELGIUM	1,556
NETHERLANDS	1,118
SWEDEN	192
FINLAND	71
IRELAND	25
SPAIN	10
NORWAY	2
FRANCE	2

Wind EUROPE

Last update: 10/07/2019

Offshore wind at UiB

- **The SDGs**

- **Competence at UiB**
  - Committed to “Climate and energy transition”
  - Background competence:
    - Meteorology – Oceanography – Physics – Mathematics – ICT – Law – Social Sciences
- **Societal needs**
  - Reform the energy industry – “Green shift”
  - Use the maritime industry
  - Create new competence
  - Utilize the available renewable energy resources

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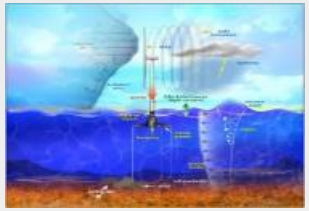
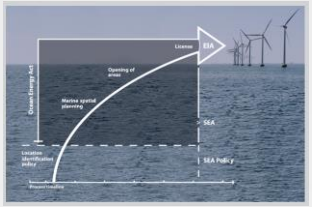
Bergen Offshore Wind Centre

Focus areas of Bergen Offshore Wind Centre



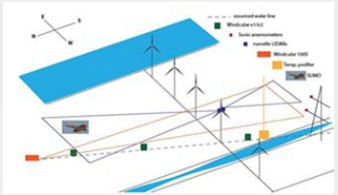
Wind resources

- **Resource mapping**
  - Map and understand wind at various spatial and time-scales.
  - Wind boundary layer over sea
  - Infrastructure for observations
  - Stability and turbulence evaluations
  - Establish detailed numerical models
- **Inside the wind farm**
  - Wake models and multiple wakes
  - Importance of stability on wake flow



Site evaluation

- **Environmental issues**
  - Mapping of ecology
  - Mapping of soil properties
  - Interaction wind, waves and current.
- **Planning issues**
  - Use of areas, combined use, conflict handling
  - Dynamic response of wind turbines
  - Turbine localization and cable routing
  - Sustainable finance
- **Law issues**
  - Jurisdiction, national / International laws.
  - Integration of offshore wind in the power market



Wind farm operations

- **Production forecasts**
  - Prognosis & Now-casting
- **Marine operations**
  - Operational windows
  - Optimum scheduling
- **Information handling**
  - Collection and analysis of «big data». Visualization and digitalization
  - Decision support systems

Courtesy of (2019):
Professor Finn Gunnar Nilsen

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