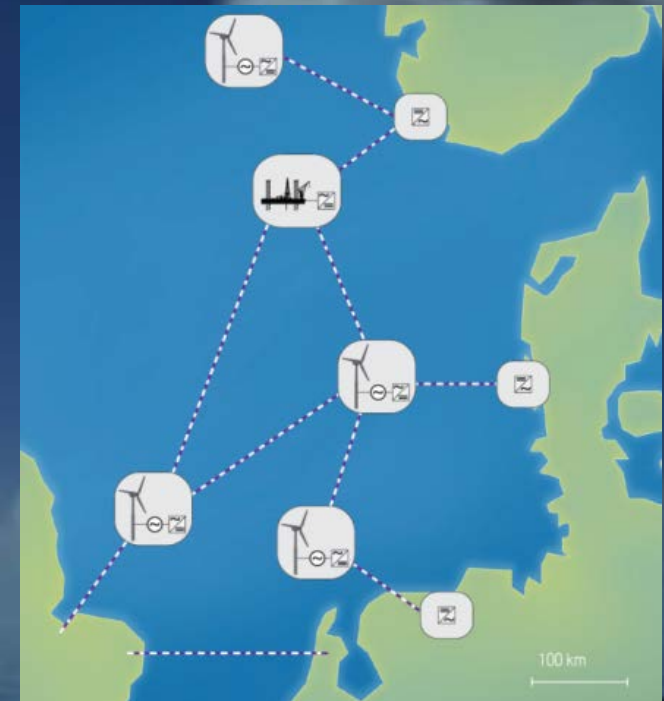


Industry meets Science 15 Juni 2017

# Havvind

## Nyheter fra det europeiske forsknings samarbeidet

**John Olav Giæver Tande**, Director NOWITECH  
Chief Scientist / Research Manager, SINTEF Energy Research  
[John.tande@sintef.no](mailto:John.tande@sintef.no)



# ETIPwind SRIA launched Sept. 2016



## Strategic research and innovation agenda 2016

September 2016



<https://etipwind.eu/files/reports/ETIPWind-SRIA-2016.pdf>

[etipwind.eu](https://etipwind.eu)

# Objectives of the SRIA 2016



Reduce costs



Facilitate system  
integration




Reinforce European  
technological  
leadership



Ensure first-class  
human resources


## 5 Pillars of research and innovation for wind energy

Grids systems,  
integration and  
infrastructure




Developing wind energy capabilities to fit in a grid with significant shares of renewable energy.

Operation and  
maintenance



More and further enhanced sensors enabling more reliable and efficient operation and maintenance of turbines, improving yields and optimising lifetime.

Industrialisation




Developing the value chain and facilitating the interaction between stakeholders notably through standardisation to achieve economies of scale and faster production.

Offshore  
balance of plant



Exploring new areas for offshore wind and making it competitive with conventional generation through the improvement of substructures and foundations, site access, offshore grid infrastructure, assembly and installation.

Next generation  
technologies



Consolidating the scientific base for wind research and enabling pioneering research to lead to breakthroughs.

From R&I to deployment

Adapting markets and policies for optimal integration of renewables, integrating wind turbines into their natural surroundings, ensuring public engagement and acceptance and deploying human resources.



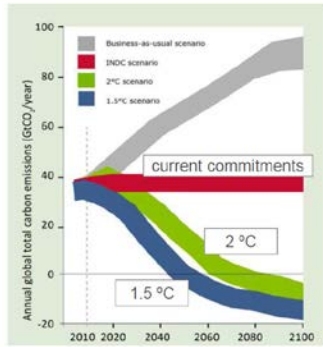
# NSEforum2017: Offshore wind is set to be big

COP21: A LEGALLY BINDING COMMITMENT TO HOLDING GLOBAL WARMING WELL BELOW 2 °C, PURSUING < 1.5 °C



Requires

- zero CO<sub>2</sub> emissions before 2050
- a 50% reduction in total energy demand in 2050 (relative to 2010)
- a full de-carbonization of the electricity supply as early as 2045



ECOFYS NAVIGANT

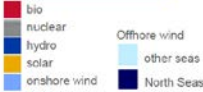
NORTH SEAS OFFSHORE WIND IS PIVOTAL TO REALIZE A 100% DECARBONIZATION OF THE ELECTRICITY SUPPLY

per country in 2045

Electricity demand

Onshore generation resource (wind, solar, hydro, bio, nuclear)

Required offshore wind capacity to meet annual electricity demand



ECOFYS NAVIGANT

230 GW OF OFFSHORE WIND IMPLIES 50-80 GW INTERCONNECTOR CAPACITY FOR FLEXIBILITY OPTIONS AND MARKETS TO FUNCTION

Sufficient interconnection capacity is essential to maintain operational security

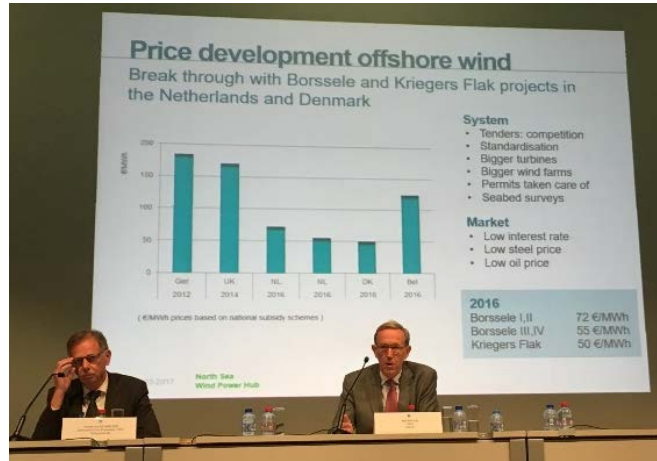
An increased roll-out of interconnector capacity requires a cost-benefit appraisal that goes beyond current economic triggers of operational cost savings

The onshore grid is an essential part of the North Sea grid too, and needs to cope with new flow patterns.

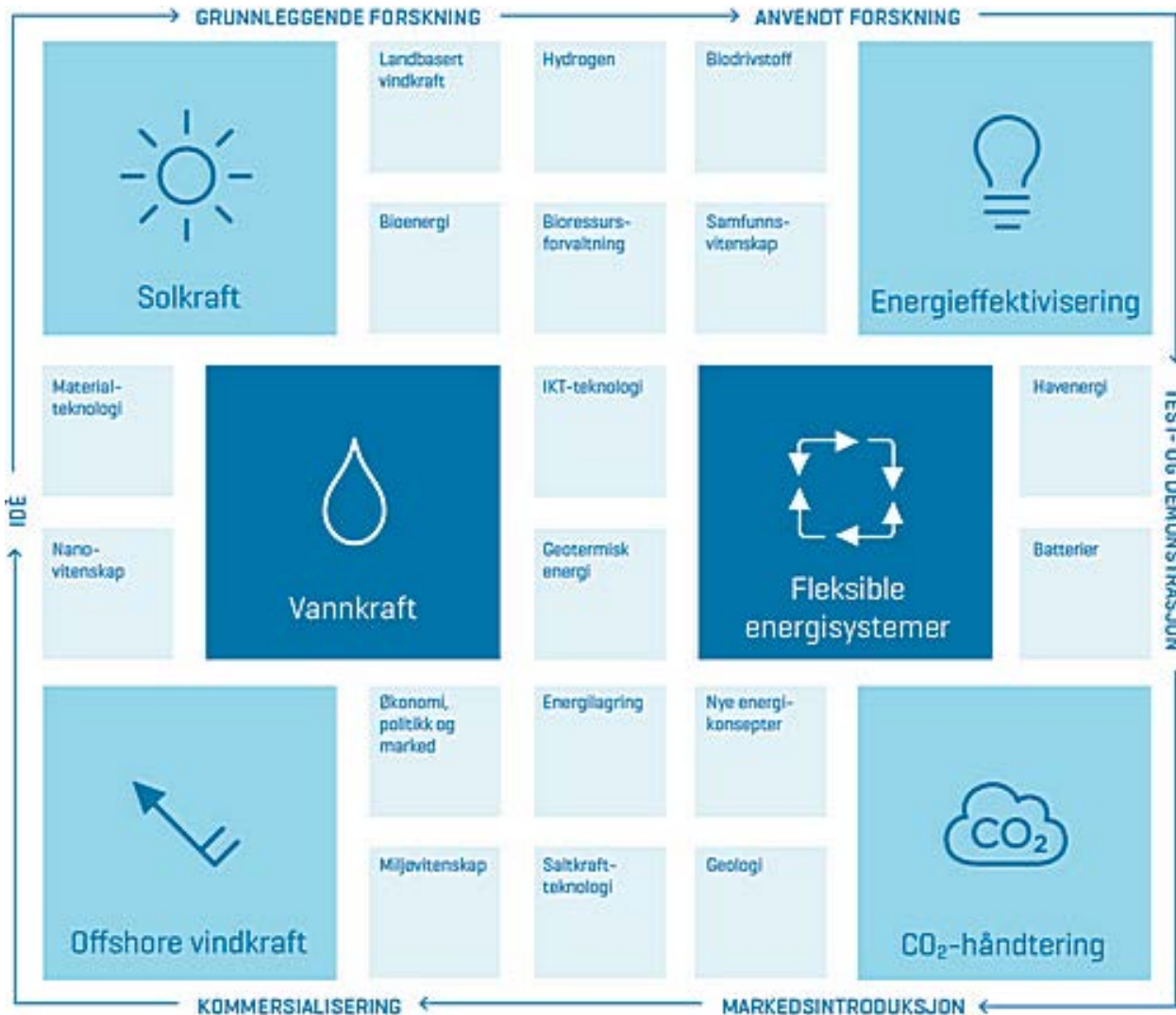


Based on Ecofys calculations, ENTSO-E, Electricity Highways

ECOFYS NAVIGANT



# Energi21 strategisk arbeidsmøte om Havvind 14. juni 2017



Energi21 skal nå revidere sin strategi, og har behov for å vurdere *om dagens satsingsområder med tilhørende strategiske FoU temaer fortsatt har relevans*. Som et ledd i dette arbeidet ønsker Energi21 innspill fra næringslivet og FoU /utdanningsmiljøene om verdiskapende muligheter i fremtidens energisystem og markeder med tilhørende teknologi- og kunnskapsbehov.

# Muligheter for norsk industri innen havvind

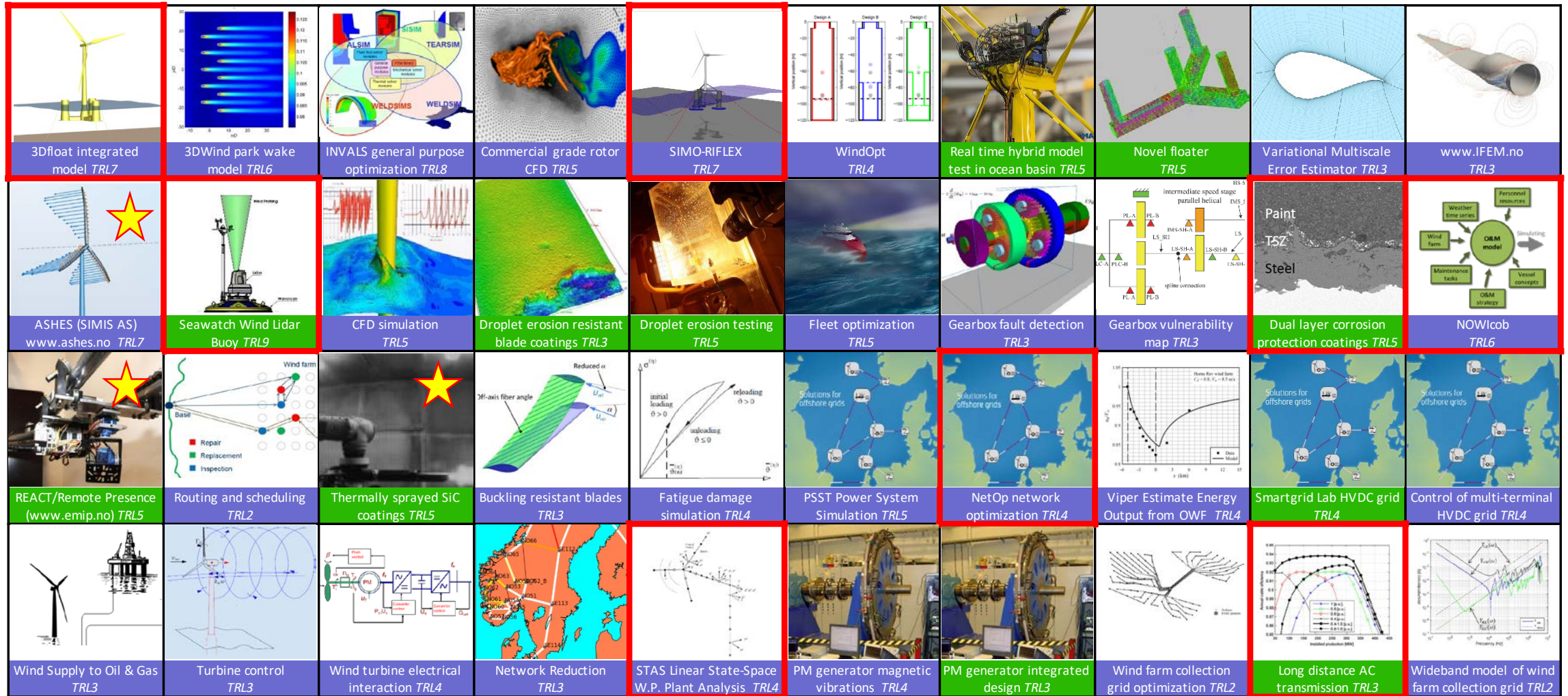


Seven areas, with opportunities for the Norwegian offshore supply chain have been identified:

- ✓ Project management
- ✓ Subsea cables
- ✓ Offshore substation structures
- ✓ Turbine foundations
- ✓ Maintenance and inspection services
- ✓ Vessels and equipment
- ✓ Installation equipment and support services



# 40 innovasjoner fra NOWITECH





# Potential value of innovations

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NPV: > 5000 MEUR\*

IMPELLO

\* Result from analysis carried out by Impello Management AS for a subset of innovations by NOWITECH. NPV is calculated as socio-economic value of applying the innovations to a share of new offshore wind farms expected in Europe until 2030.

# Make sure to be there!

[www.NOWITECH.no](http://www.NOWITECH.no)

**NOWITECH Final Event**  
**22-23 August 2017**

**EERA DeepWind'2018**  
**15th Deep Sea Offshore Wind R&D Conference**  
**Trondheim 17-19 January, Norway**



**NOWITECH**

Norwegian Research Centre for Offshore Wind Technology

**fem**  
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ENVIRONMENT-  
FRIENDLY ENERGY  
RESEARCH  
The Research Council of Norway