ETIP Wind

EUROPEAN TECHNOLOGY & INNOVATION PLATFORM ON **WIND ENERGY**

Industry meets Science
Seminar 21/6- 2016

John Olav Giæver Tande
ETIPwind Steering Committee

Director NOWITECH
Senior Scientist / Research Manager
SINTEF Energy Research
John.tande@sintef.no

What are ETIPs

European Technology and Innovation Platform's

"…European Technology Platforms are industry-led stakeholder forums recognised by the European Commission as key actors in driving innovation."

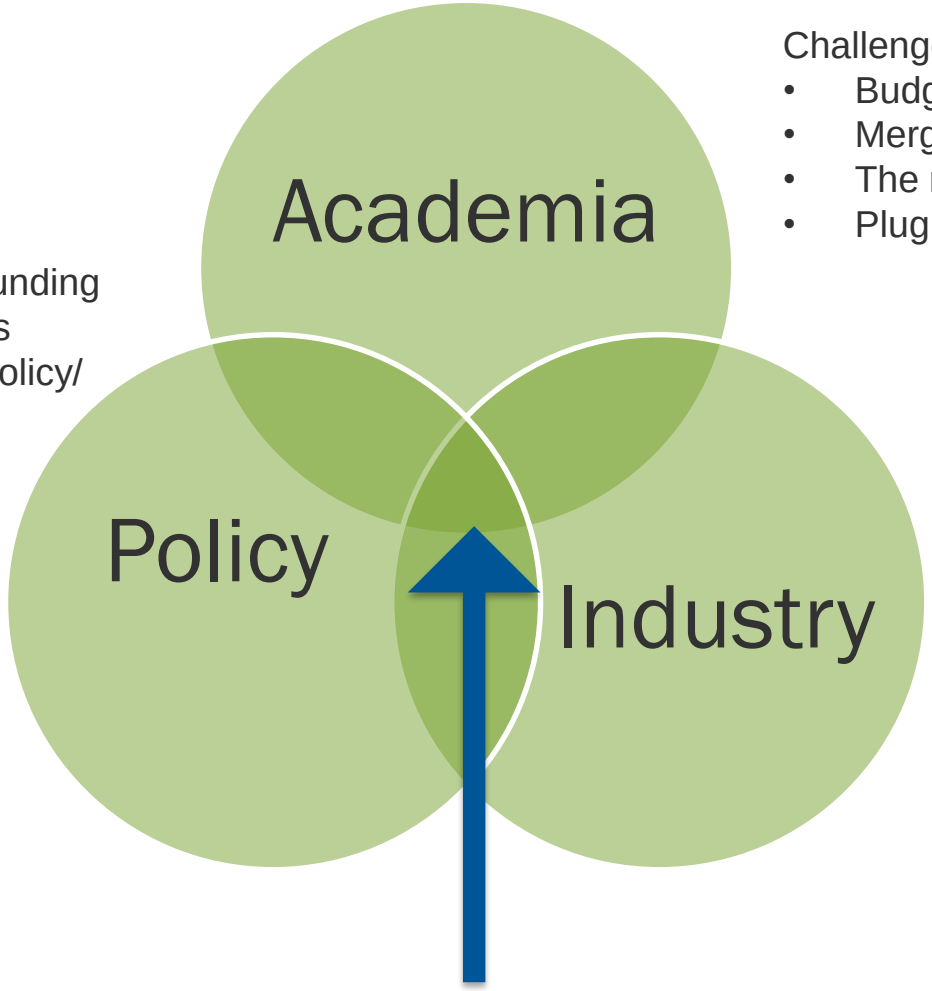
Estimated budget H2020 2018 – 2020, € 1,099.000.000 for non-nuclear low carbon energy research and innovation

What are ETIPs?

- Advanced Fossil Fuel Power Generation
- Bioenergy
- Biofuels
- Carbon Capture Utilisation and Storage
- Cogeneration of Heat and Power
- Concentrated Solar Power
- Electricity Storage in the Power Sector
- Energy Efficiency in the Cement Industry
- Energy Efficiency in the Iron and Steel Industry
- Energy Efficiency in the Pulp and Paper Industry
- Fuel Cells and Hydrogen
- Geothermal Power
- Heating and Cooling Technologies
- Hydropower
- Nuclear Fission Power
- Nuclear Fusion Power
- Ocean Energy
- Road Transport Efficiency
- Smart Electricity Grids
- Solar Photovoltaic
- Wind Energy

ETIP Wind - Driving the edge

Challenges:
- Qualifying funding programmes
- Qualifying policy/ legislation



Challenges
- Budget cuts
- Mergers and name changes
- The rise of mega consultants
- Plug and play demands with less resources

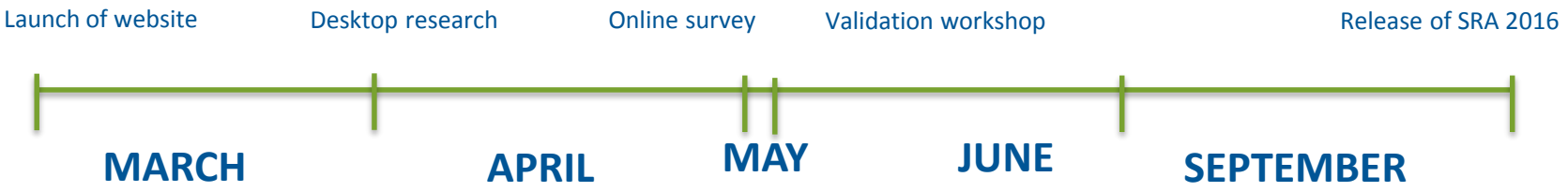
Challenges:
- Low energy prices
- Policy dissapearing/reversed
- Low Growth & EE = Energy demand down
- Time to market down
- Huge competition
- Dawn of PV

ETIPWind Work Programme 2016

Deliverables:

- Re-configure the Strategic Research Agenda from 2014 with reference to the strategic support program 2018 to 2020
- Open and constructive discussion with EU institutions
- Input to other research and innovation processes
- Workshop and events

Timeline



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Re-configure the Strategic Research Agenda from 2014

Strategic Research Agenda 2014

Strategic Research Agenda 2016

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Horizon2020 timeline

Calendar for adoptation of Work Programmes during Horizon 2020

2014	2015	2016	2017	2018	2019	2020
Strategic Programme						
Work Programme 1 (plus tentative information for 2016)		**Strategic Programme**				
		Work Programme 2 (plus tentative information for 2018)		**Strategic Programme**		
				Work Programme 3 (plus tentative information for 2020)		
						Work Programme 4

Nearly doubling of non-nuclear energy research funding (from € 3.8bn in FP7 + CIP to € 5.6bn in H2020).

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Assessing future research priorities

Methodology

Quantitative Analysis

- Review of conference presentations (published papers in conf proceedings)and posters
- 3 years 2013 to 2015
- Over 2,700 papers analysed

Qualitative analysis

- 25 Phone interviews with experts
- Public Online survey (102 answers from onshore and 127 answers from offshore)

Results are categorized and presented under 5 pillars and 28 categories following the structure of the 2014 SRA& MDS

Methodology- Sources of information

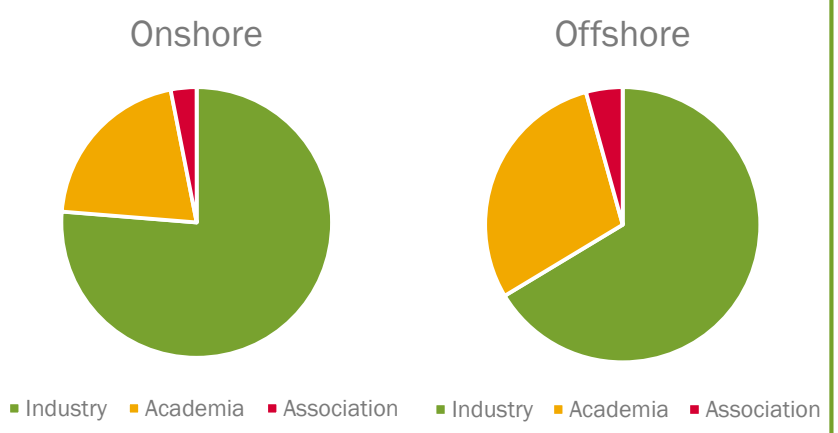
2 Experts interviewed:

Organization
ABB
GE
Enercon
VTT
Iberdrola
Senvion
DTU
Statkraft
Loughborough University
DONG
Vestas
DNV GL
EDF Energies Nouvelles
Aalborg university
FORWIND
Irishrail
Ponderaconsult

1 Events:

- WindEurope Annual conference
- WindEurope offshore conference (biannual)
- WindEurope technical workshops
- Wind Integration Workshop
- WinterWind
- DeepWind

3 Survey participants:



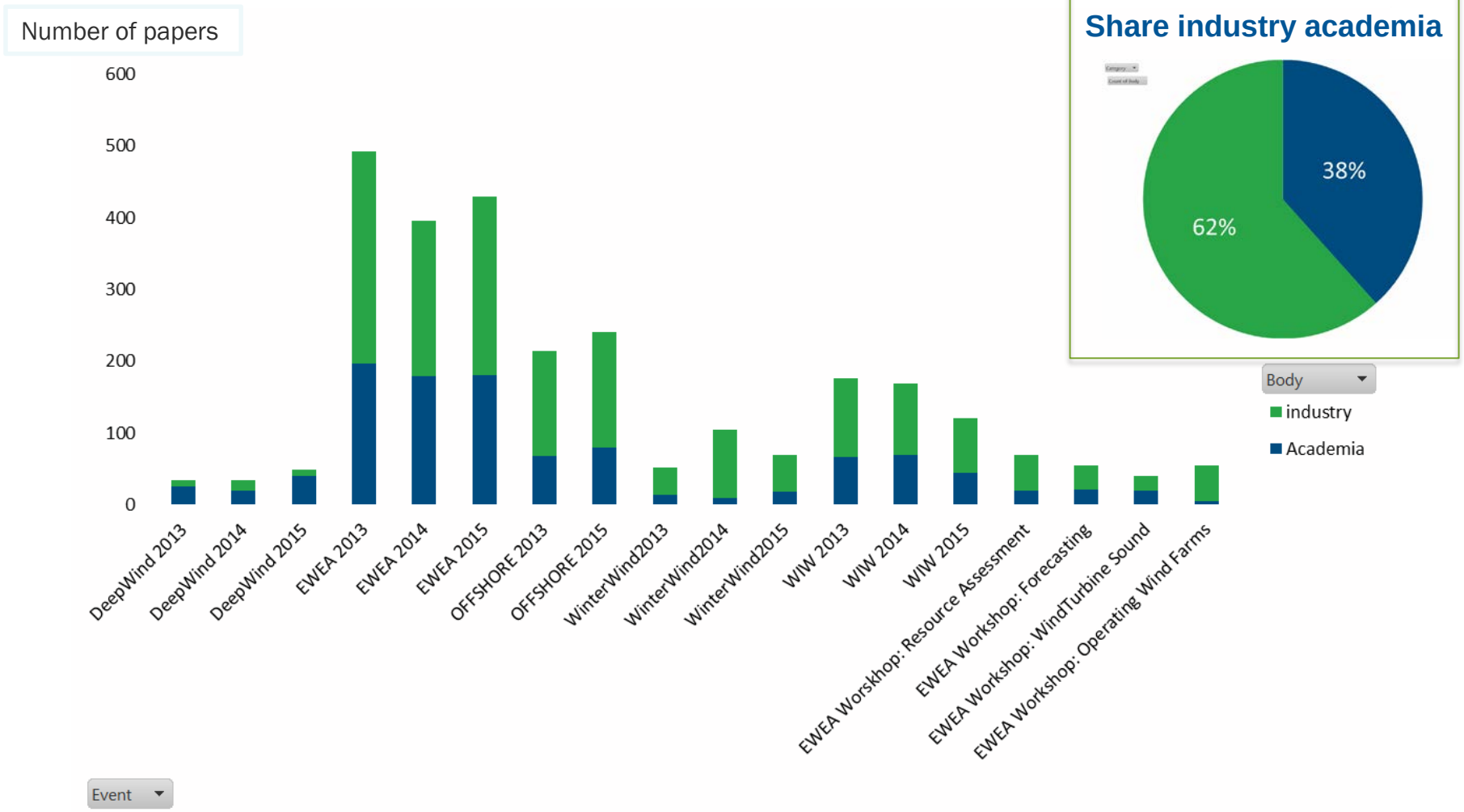
Structure the quantitative analysis

- 28 Sub-categories under 5 Pillars. About 120 R&I topics

Pillar		Sub-category
External condition: climate, waves and soil	1.1	Measurement systems
	1.2	Interaction climate-wind turbines
	1.3	Multi-scale modelling
	1.4	Wakes
	1.5	Forecasting
	1.6	Condition monitoring
	1.7	Standardization
Wind turbine systems	2.1	Wind turbine as a flow device
	2.2	Wind turbine as mechanical structures/materials
	2.3	Wind turbine as a grid connected electricity plant
	2.4	Wind turbine as a control system
	2.5	Innovative concepts along the value chain and integrated design
	2.6	Operation and maintenance (O&M)
	2.7	Standards and certification

Pillar		Sub-category
Wind energy integration	3.1	wind power capabilities for ancillary services provision
	3.2	Grid connection, transmission and operation
	3.3	grid management and power markets
Offshore technology	4.1	Sub-structures
	4.2	Logistics, assembly and decommissioning
	4.3	Electrical infrastructure
	4.4	Wind turbines
	4.5	Operation and maintenance
	4.6	External conditions
Market deployment strategy	5.1	Enabling market deployment
	5.2	Adapting policies
	5.3	Optimising administrative procedures
	5.4	Integrating wind to the natural environment
	5.5	Ensuring public acceptance of wind power

Sources of information- Quantitative analysis



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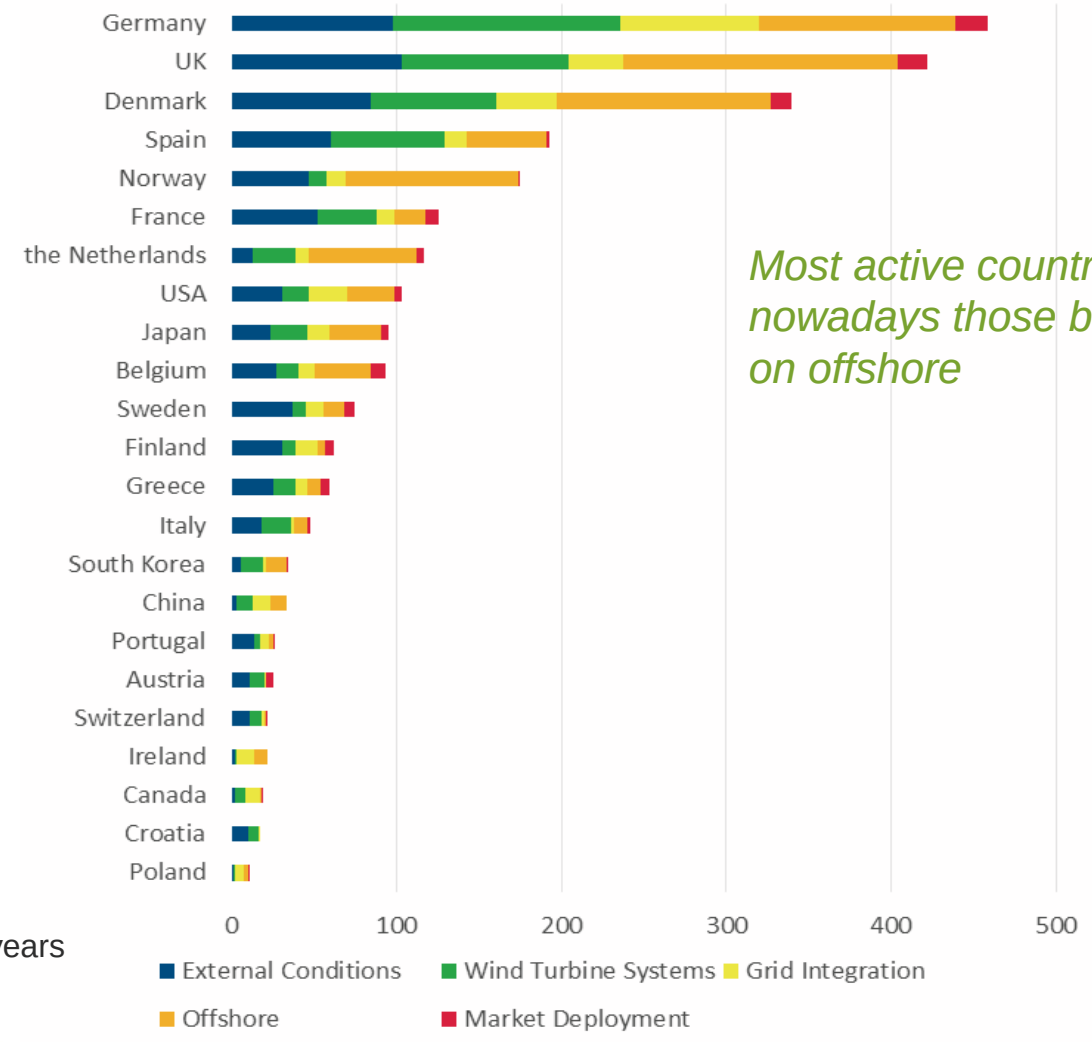
Research participation per country



Most active countries are nowadays those betting on offshore

*Accumulated for three years

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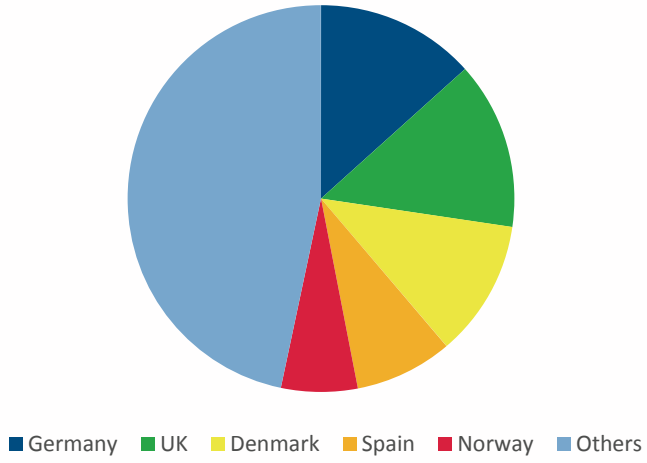
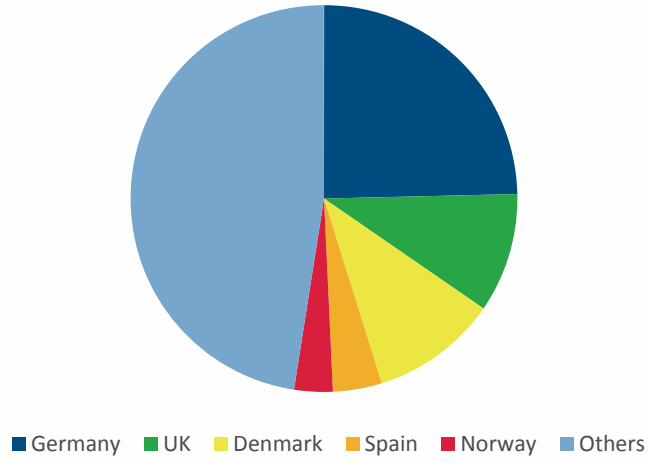
Research intensity per pillar, by country

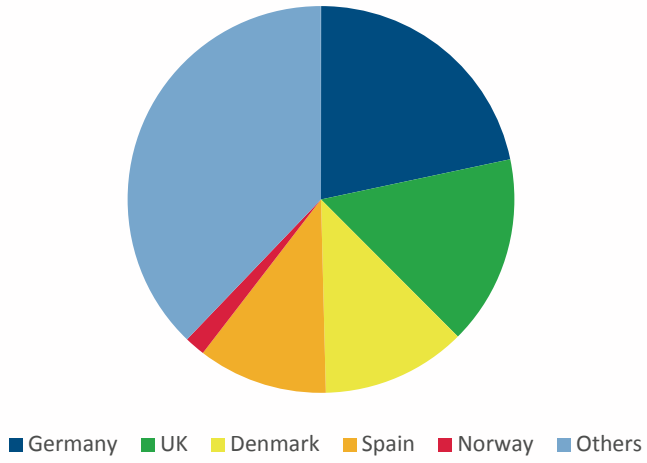
External Conditions



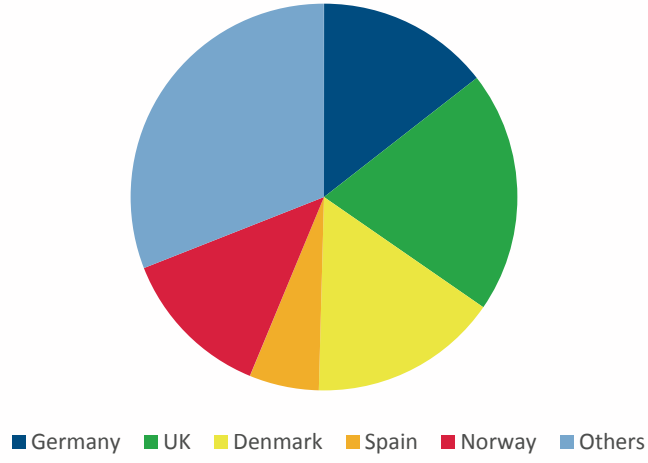
Wind Energy Integration



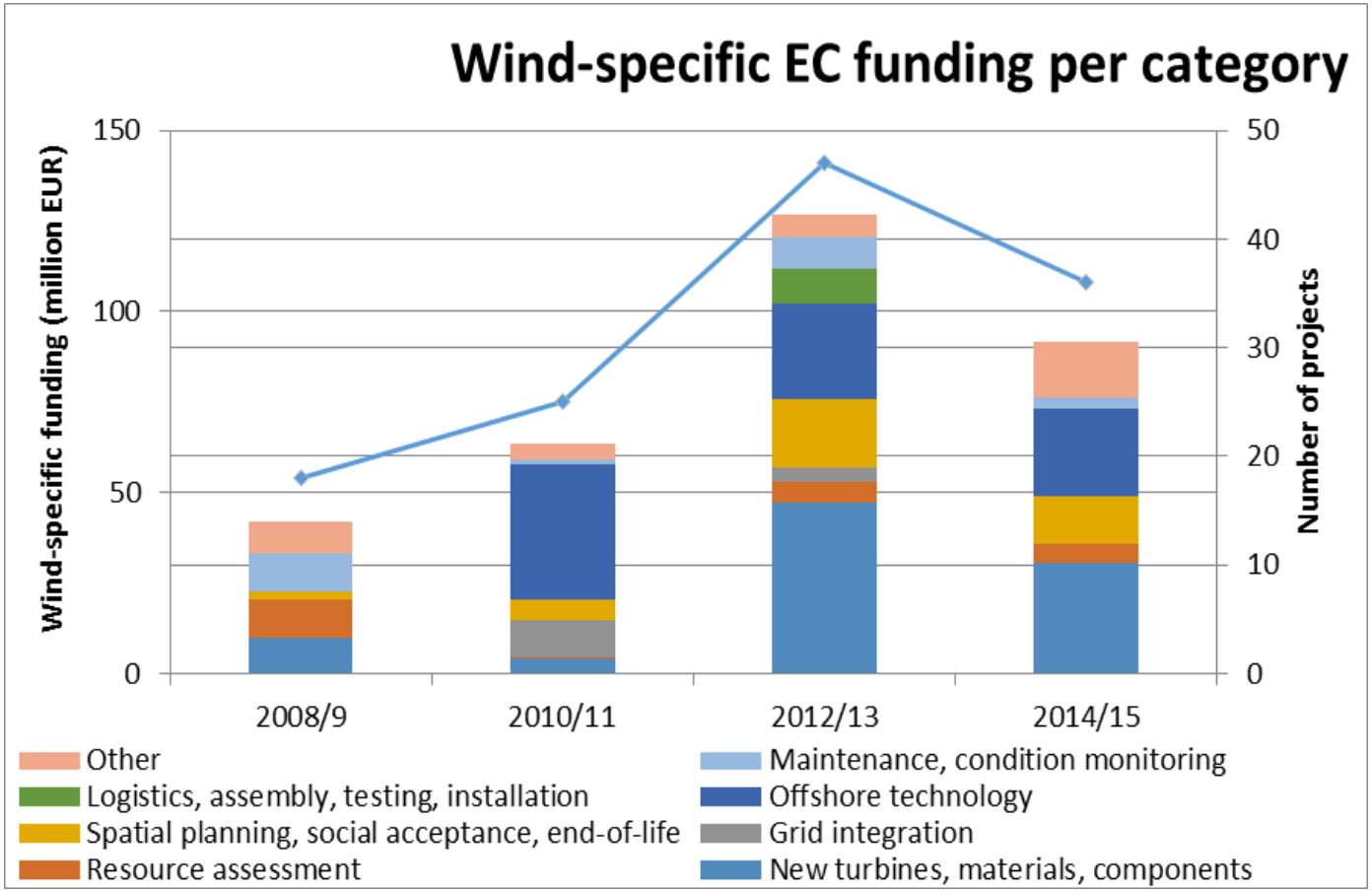
Wind Turbines Systems



Offshore systems



EC funding



- Most on turbine systems
- Very little on grid integration
- Growing on offshore and Market deployment
- Descreasing budget

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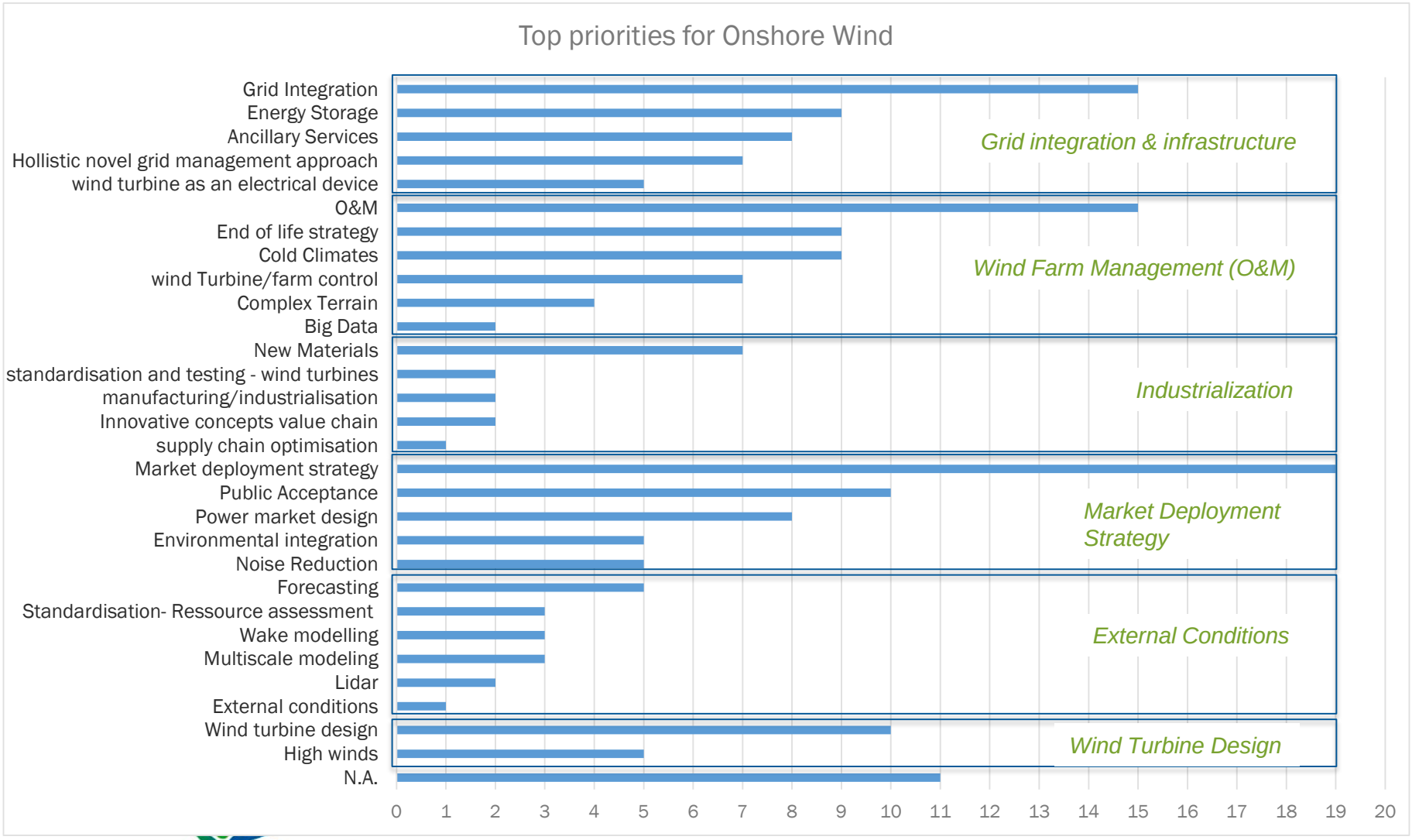
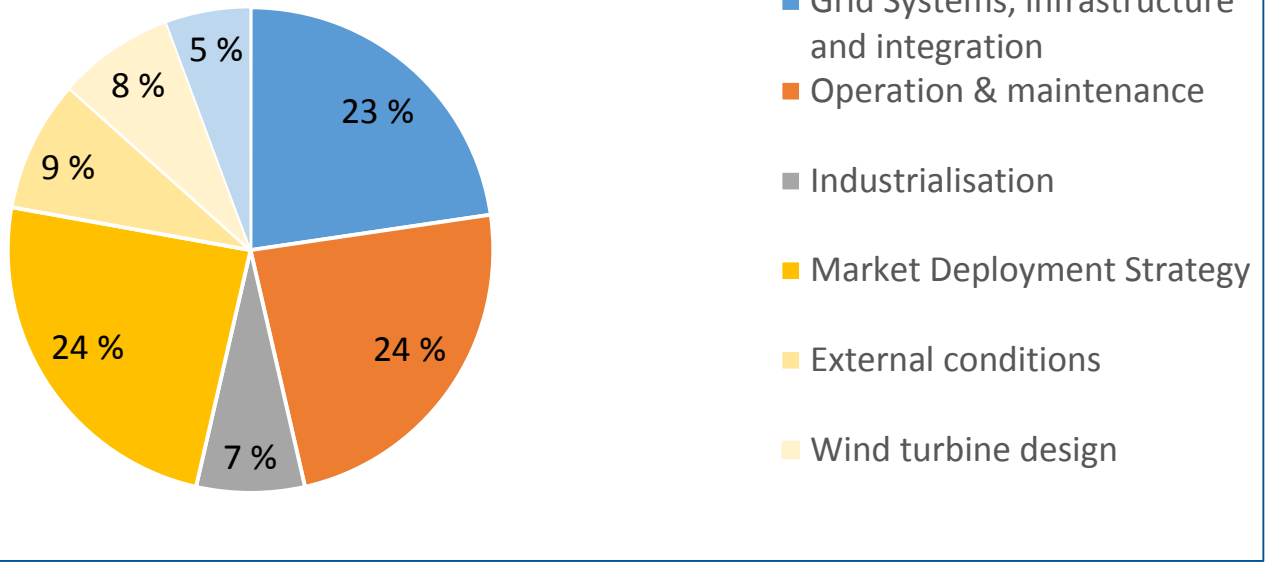
Onshore wind Survey- Identifying future trends

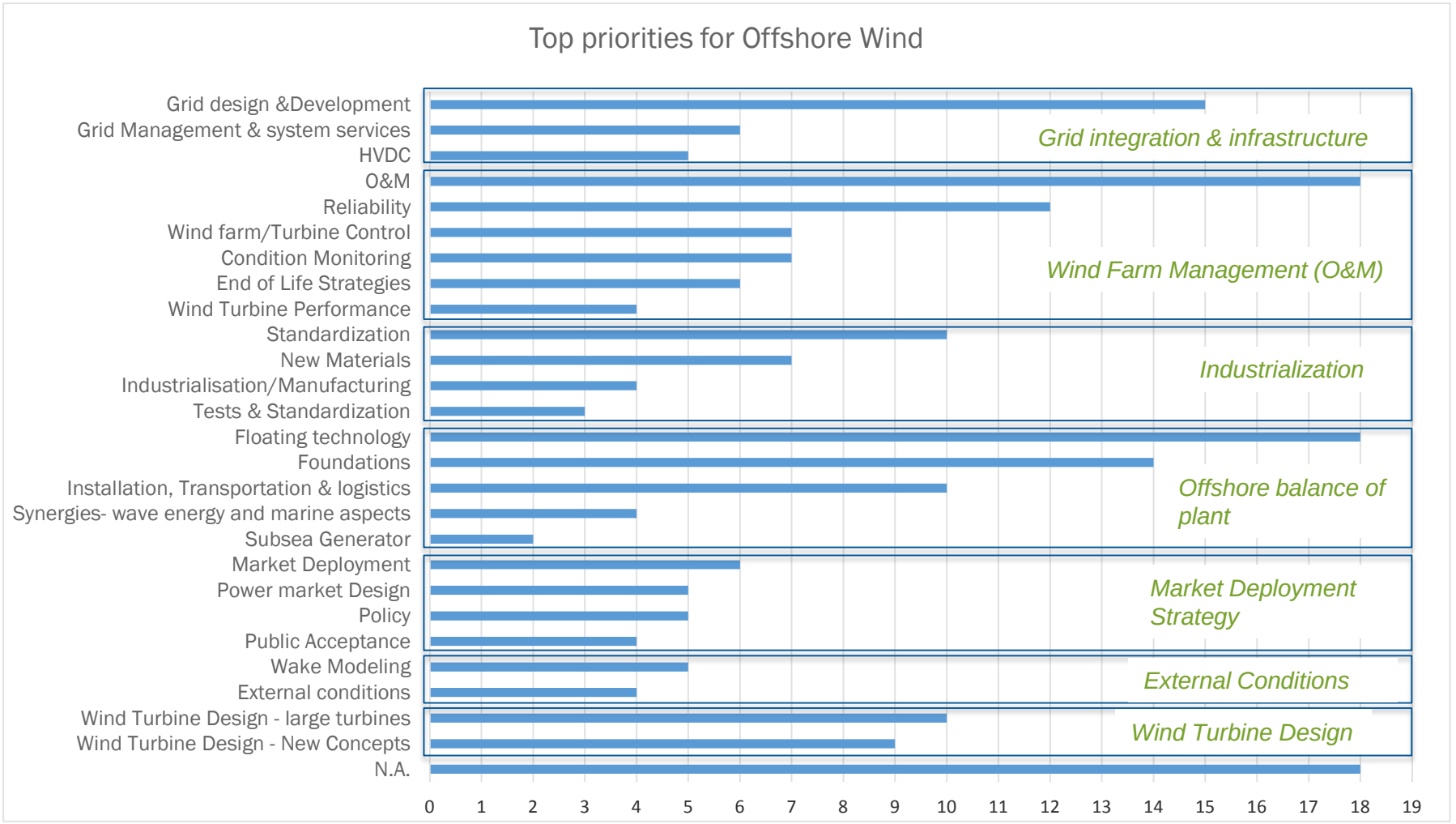


Onshore wind Survey- Identifying future trends



- Wind Farm Management (O&M) and Grid integration are seen as the main priority topic for R&I
- Market Deployment is essential to push R&I, but not a full R&I topic

Offshore wind Survey- Identifying future trends



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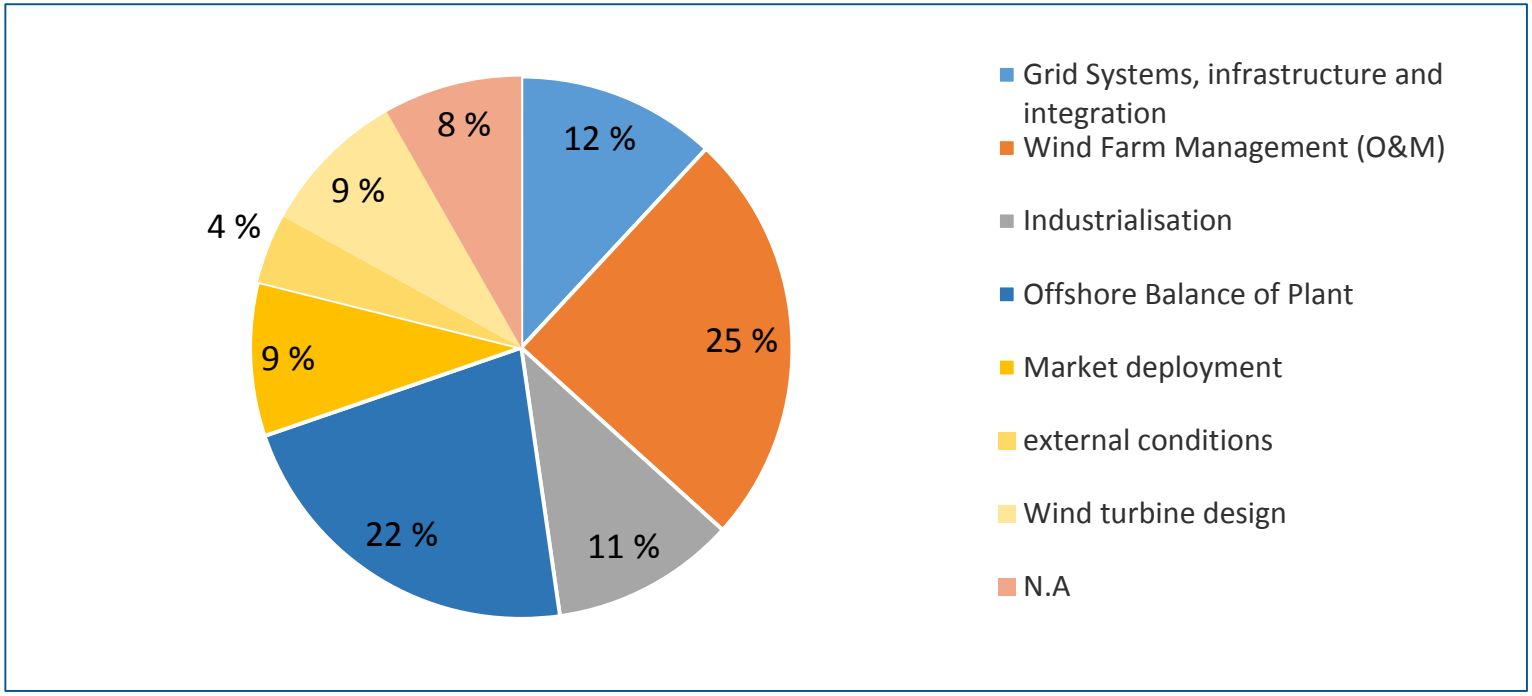
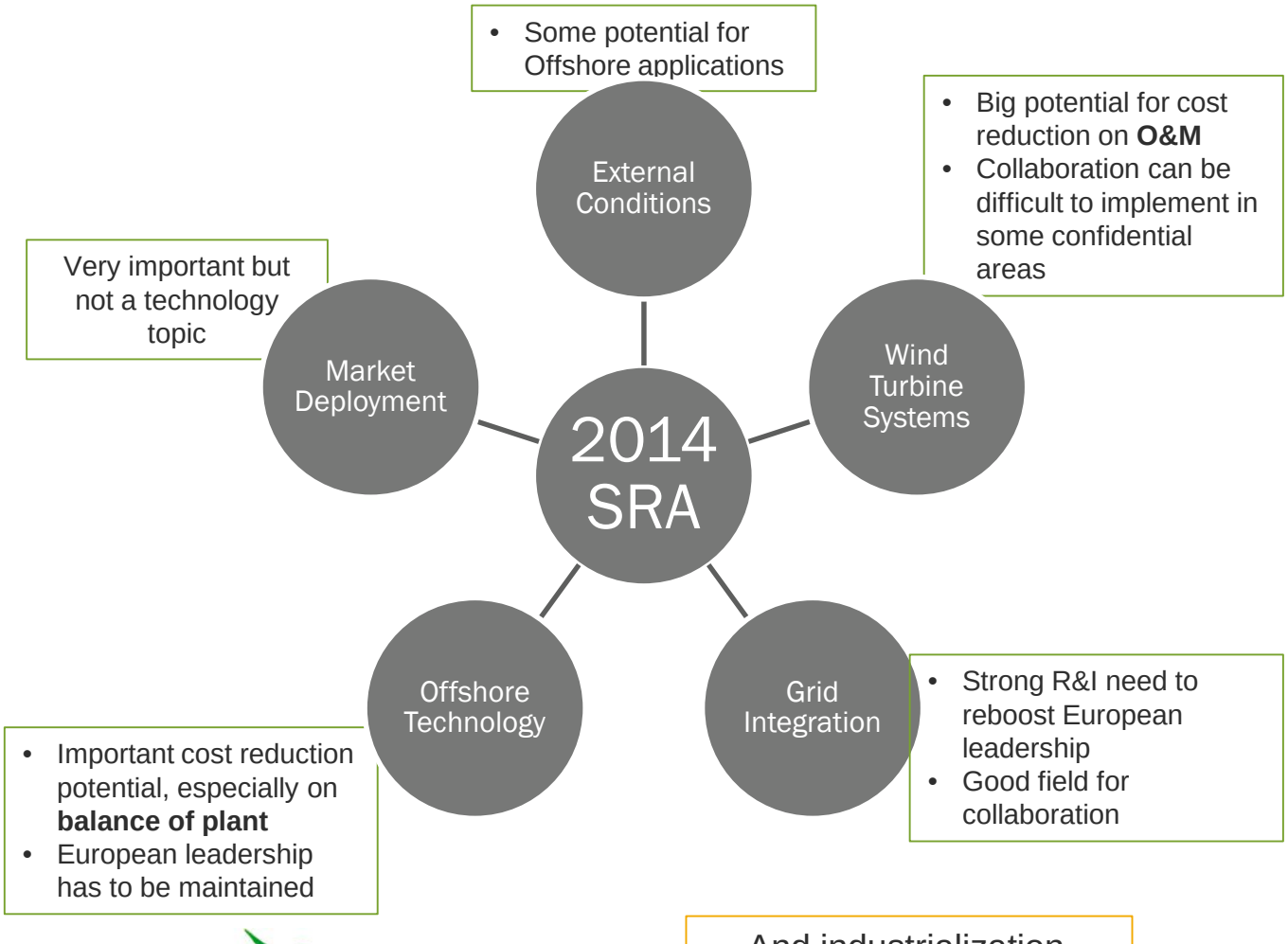
Offshore wind Survey- Identifying future trends



- O&M is still the main priority topic
- Offshore balance of plant triggers significant challenges
- Industrialization is a more important need compared to Onshore

Reconfiguring the SRA structure…



Goals

1. Reduce Costs
2. Facilitate System Integration
3. Reinforce technology leadership
4. Increase collaboration

… And industrialization has to be addressed

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Fine tuning the key priorities per pillar

Wind Farm Management (O&M)

- Wind Turbine/Farm Control
- Maintenance planning
- Conditioning monitoring
- Big data analysis
- Reliability
- End of life strategy (inc. lifetime extention)

Grid Systems, Integration and Infrastructure

- Ancillary Services
- Power Market design
- Energy Storage
- Holistic grid management approach
- Grid codes
- Grid design& deployment (inc. HVDC)

Industrialisation

- New materials
- Standardization of components, test methods, quality levels
- Manufacturing
- Supply Chain optimization
- Life Cycle, decommissioning

Offshore Balance of Plant

- Floating technology
- Industrialized foundations and towers
- Installation, transportation and logistics
- Offshore substations and cable

Conclusions (1/2)

Structure

- Existing SRA structure is not fully suited for today's situation. Generally, topics need to address both onshore and offshore
- Market deployment strategy is crucial but it is not included in technology research (policy)- it should be addressed separately.

Pillars

- **System integration**: insufficiently addressed. High priority for both onshore and offshore
- **Wind turbines systems**: less focus on turbine technology, more on Wind Plant management (O&M, reliability, end-of-life)
- **New category**: industrialization (Standards and test, new materials)
- **Offshore category**: most of the attention and increasing interest. More focus on balance of plant (foundation, logistics, weather interaction, floating technology)
- **External conditions** relevant, especially for offshore; crucial aspects to improve O&M

Conclusions (2/2)

Leading Countries

- In Europe, Germany, the United Kingdom and Denmark are (by far) the most active countries in wind R&I. NL and NO also very active in Offshore
- UK is (most active) leading Wind Offshore R&I. Worldwide, Europe has an important lead on Offshore, having almost all the installations.
- General feeling EU is leading in research. On grid integration, US leads developments on battery storage and Market Design.
- China fast increasing effort (fast market growth).

Research breakthrough

- Stakeholders consider that no major breakthrough has happened in the wind sector. Mostly incremental improvements drove R&I.

EC funding

- Important to lead progress. Significant changes needed to improve participation and effectiveness (faster from idea to results, flexibility, pre-qualification, IPR management challenging, etc.).

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PLATFORM ON **WIND ENERGY**

Thank you

ETIPWind mission statement here