

Developing a new Offshore Wind R&D Agenda 2020-2030 together

WindDays 2018



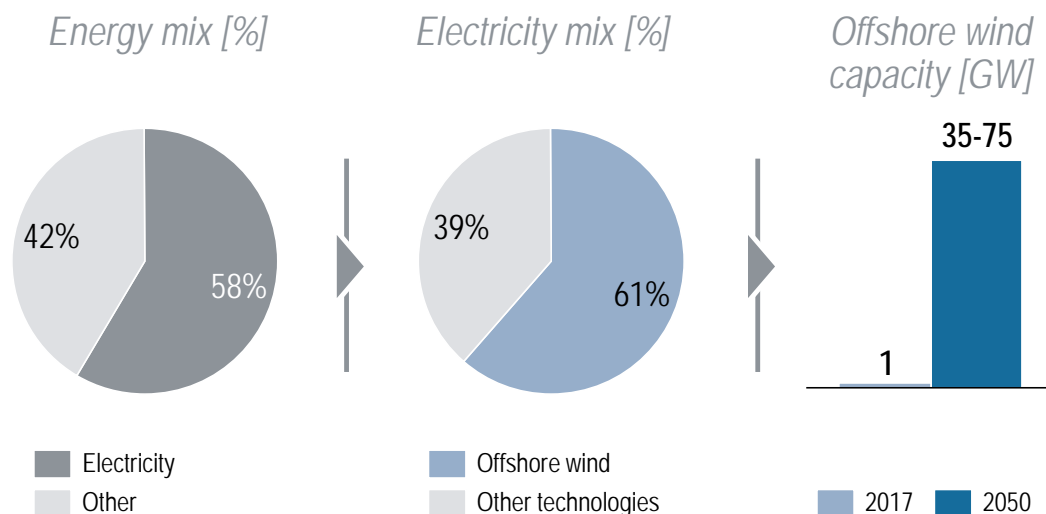
Rotterdam, June 13, 2018



The LCoE breakthrough will lead to large offshore wind capacity in the North Sea – Many tough challenges to be addressed requiring further technology development

Long term vision for offshore wind in Dutch part of North Sea - example

Offshore wind will probably be the largest source of electricity in the Netherlands in the year 2050

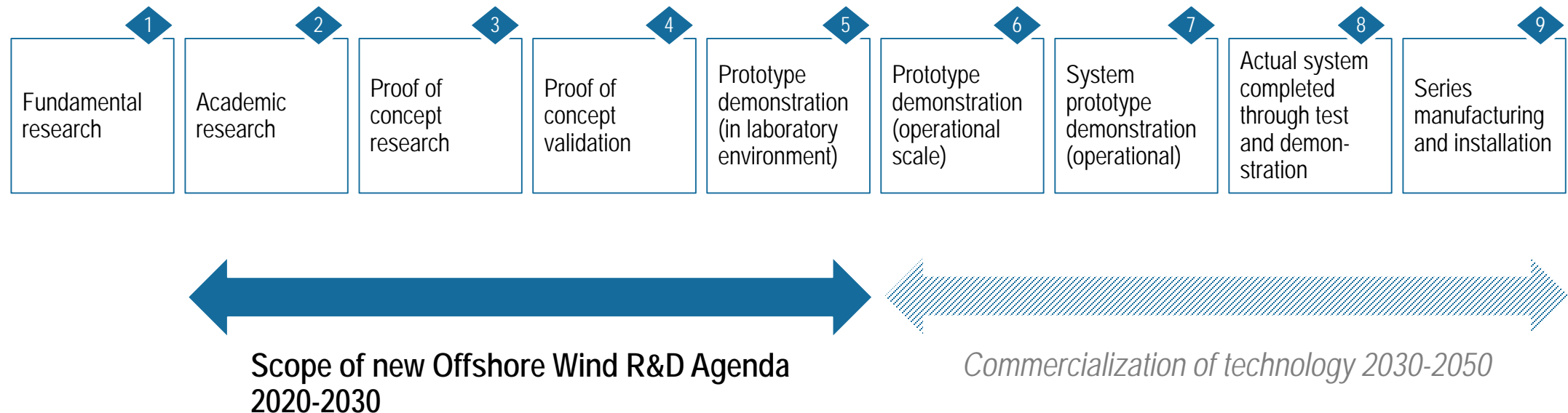


Challenges

- > PBL-ECN have assessed that between **35 and 75 GW** offshore wind must be installed, **covering 15-25% of the surface** of the Dutch part for the North Sea, to achieve the climate goal of 95% less CO₂ emission by 2050
- > Many **tough challenges** will have to be addressed to achieve this vision:
 - Further LCOE reduction
 - Reliable, low cost grid integration
 - Balancing of intermittency
 - Symbiosis with other users of the North Sea (fishing, transport, defense, oil & gas, tourism)
 - Positive environmental impact
 - ...
- > **Further scientific/technological** development will be necessary to address these challenges

We will develop a new agenda for R&D in TRL levels 2-5 in the 2020-2030 period –
To be commercialized in the 2030-2050 period

TRL levels¹⁾ to be covered

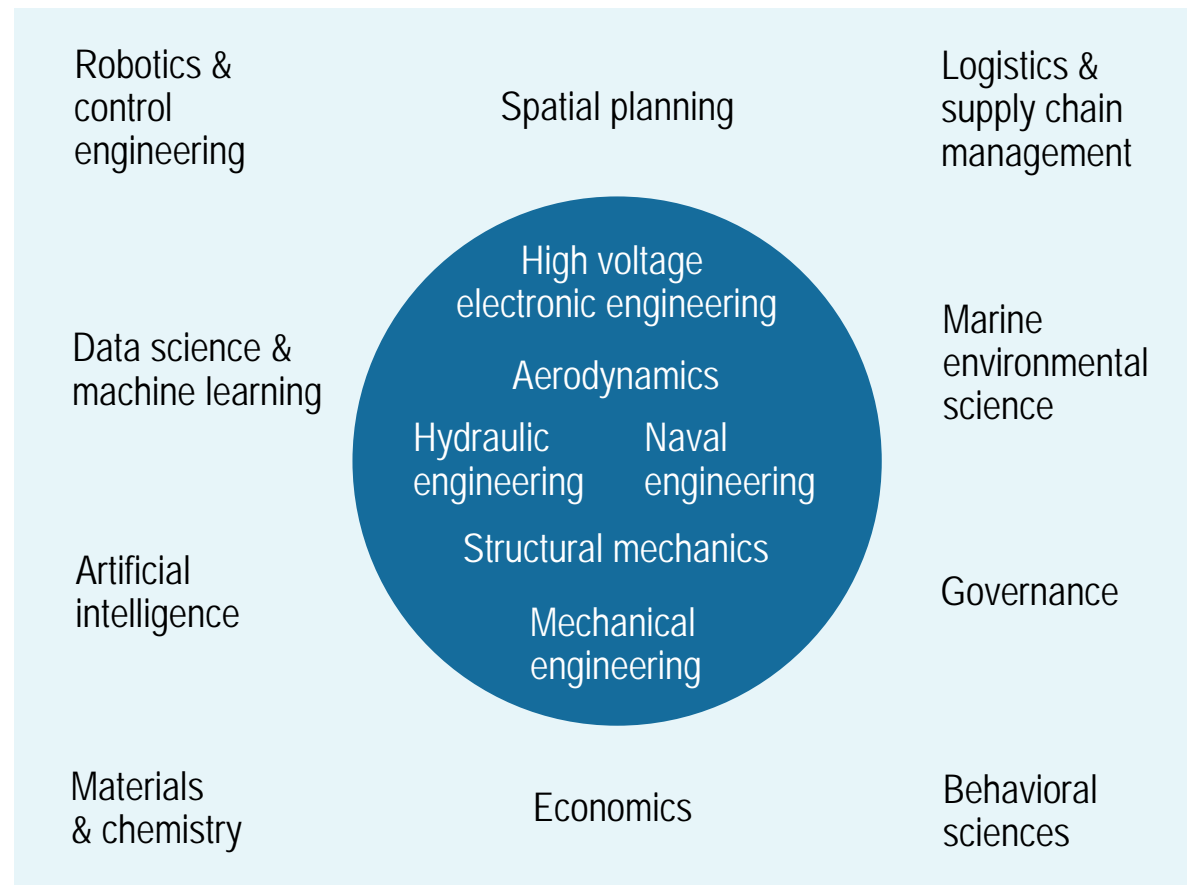


1) Technology readiness levels according to EU Commission

The agenda will define R&D in the scientific disciplines that can help to address offshore wind challenges up until the year 2050

Scientific disciplines to involve – examples

Illustrative



Comments

- > We will involve both the scientific disciplines that are directly related to offshore wind, as well as other disciplines that can provide valuable contributions to the offshore wind challenges until 2050
- > For instance: the R&D agenda will also include technology development necessary for integration of offshore wind into energy system, e.g. power-to-hydrogen electrolysis for storage and transport

Directly related to offshore wind
 Can provide a valuable contribution

Three steps will lead us from a vision for offshore wind in 2050 to a truly ambitious R&D agenda for the years 2020-2030

Overview of back casting process

R&D TOPICS 2020-30

3

R&D TOPICS: **Gaps with state-of-the-art in 2020** – derive necessary R&D 2020-2030



Offshore Wind
R&D Agenda 2020-2030

MILESTONES 2030

2

MILESTONES: **scientific/technological achievements** that should be accomplished by 2030 in order to reach one or more of the Beacons of 2050 and that are particularly challenging to achieve

VISION: BEACONS 2050

1

BEACONS: objectives for an **aspired state of offshore wind in 2050**, e.g.:

- > Capacity in the Netherlands [GW]
- > LCoE [EUR/MWh]
- > Impact on fish population [+ or - %]

Now we would like to ask your input for the Beacons 2050