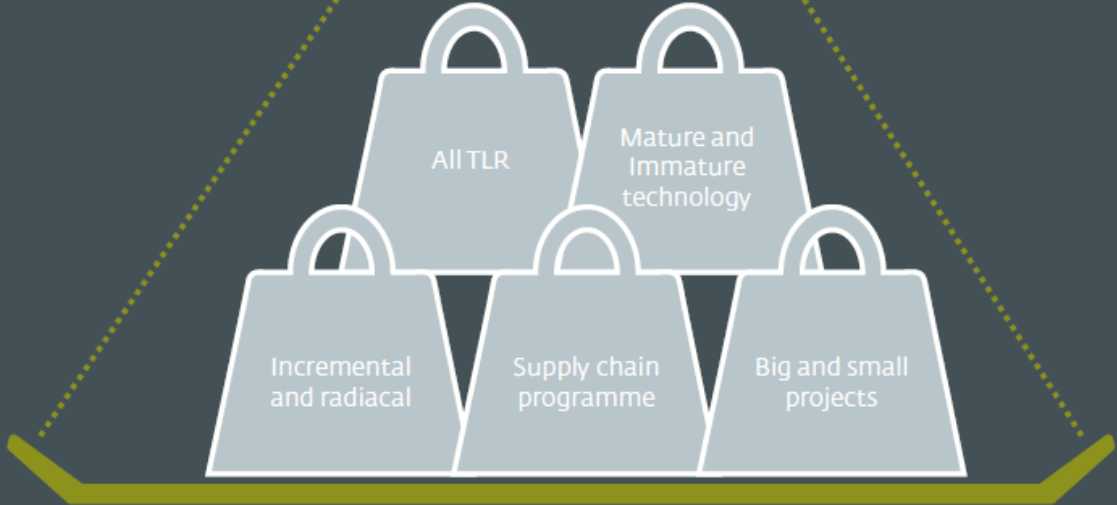
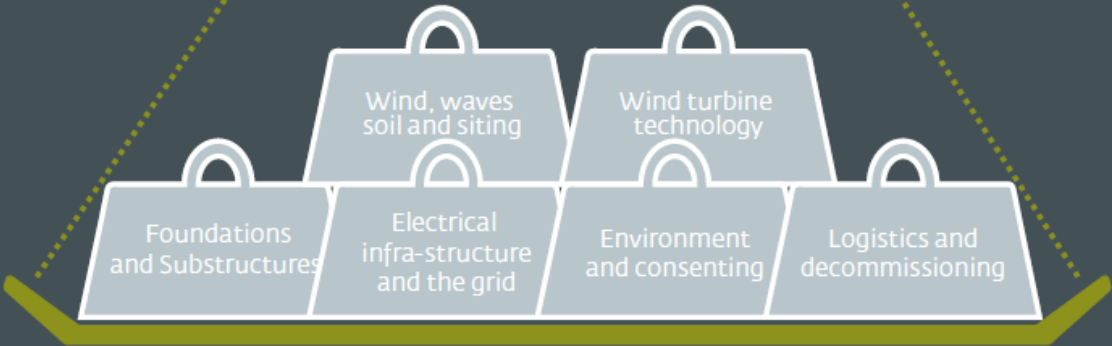


MEGAVIND ANNUAL RESEARCH AND INNOVATION AGENDA 2019

Christina Aabo, Ørsted Wind Power
Peter Hjuler Jensen, DTU Wind Energy

National strategy for research, development and demonstration



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AGENDA
2018



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MEGATRENDS

- A COMPETITIVE, INDUSTRIALISED AND GLOBAL INDUSTRY
- SUBSIDY-FREE WIND POWER AND TECHNOLOGY
- NEUTRAL TENDERS
- DIGITALISATION
- AN INTEGRATED AND DISTRIBUTED ENERGY SYSTEM
- ENERGY

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TRL level system



R&I RECOMENDATIONS



IMPROVED UNDERSTANDING OF THE UNDERLYING PHYSICS OF WIND ENERGY



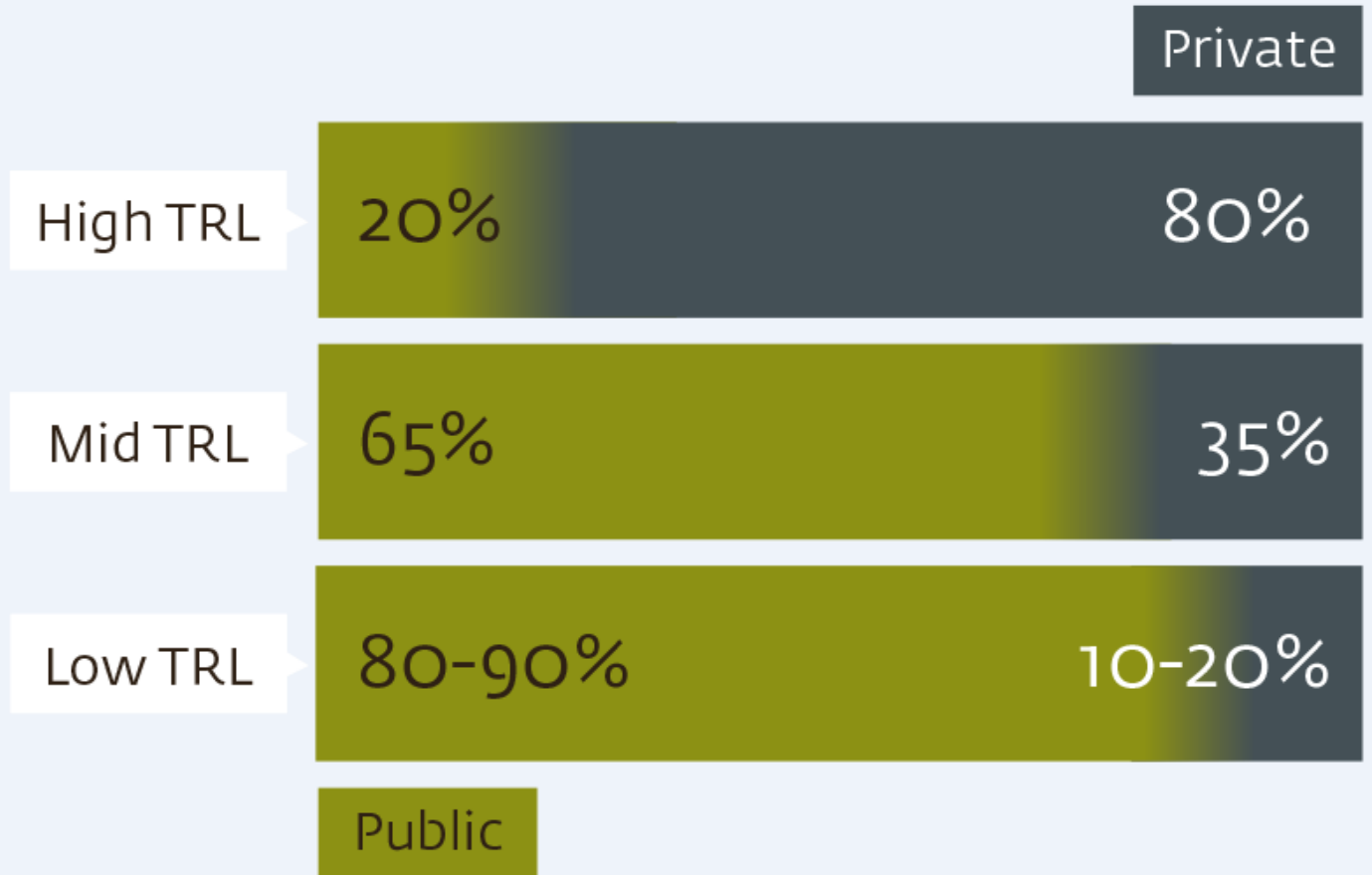
DEVELOPMENT, TEST AND DEMONSTRATION



WIND POWER PLANT LIFE CYCLE OPTIMISATION

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FUNDING MECHANISMS



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INNOVATION DRIVERS



SHORTEN TIME AND COST TO MARKET



REDUCE ENVIRONMENTAL AND SOCIETAL IMPACTS



INCREASE PERFORMANCE AND EFFICIENCY



INCREASE THE SYSTEM VALUE OF WIND POWER









DECREASE TECHNICAL AND FINANCIAL RISKS

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Research, development and demonstration themes

- What Megatrend(s)?
- Which Innovation Driver(s)?
- Incremental or radical innovation?
- High or low Technology Readiness Level (TRL) research?
- Short/long time and budget frame?
- Where in life cycle phase?

Any research, development or demonstration project should fit in the matrix below and address these questions

Research, development and demonstration themes	Onshore	Offshore	Floating
 1. Wind, waves, soil and siting			
 2. Wind turbine technology			
 3. Foundations & substructures			
 4. Electrical infrastructure & grid integration			
 5. Environment & consenting			
 6. Logistics & decommissioning			

Supported by human resources and test and demonstration facilities.

CONCLUSIONS 2019

- SUPPLY CHAIN
- RD&D TEST FACILITIES;
- COMPETENCES
- FUNDING
- GAME CHANGERS



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SUPPLY CHAIN – NEXT PRESENTATION

R&D TEST FACILITIES – LAST PRESENTATION

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COMPETENCES



- MORE “STEM” CANDIDATES
- MORE SKILLED WORKERS E.G. WELDERS, MECHANICS, INDUSTRY TECHNICIANS, ELECTRICIANS ETC
- SUPPORT GIRLS IN SCIENCE
- EASIER ACCESS FOR FOREIGN STUDENTS AND FOREIGN SKILLED EMPLOYEES
- IMPROVED COLLABORATION BETWEEN INDUSTRY AND UNIVERSITIES ON RELEVANT COURSES AND BETTER CONDITIONS FOR STUDENT INTERNSHIPS



FUNDING

BACK TO 2010 LEVEL
OF DKK 1 BILLION
TO ENERGY RD&D BY
2020

ALL TRL LEVELS
TO BE CONSIDERED



INDEPENDENT 20 September:

Offshore wind energy price plunges 30 per cent to a new record low

Power from new wind farms at sea will require no subsidies for the first time, government reveals

PARIS AGREEMENT TO KEEP
TEMPERATURE INCREASE BELOW
1.5°C

DENMARK TO REDUCE CO2
EMISSIONS BY 70% IN 2030

Renew Economy: “Saudi Arabia’s 400MW Dumat Al Jandal onshore wind farm has announced.. 1.99 US cents per kilowatt-hour (kWh)”.

GAME CHANGERS



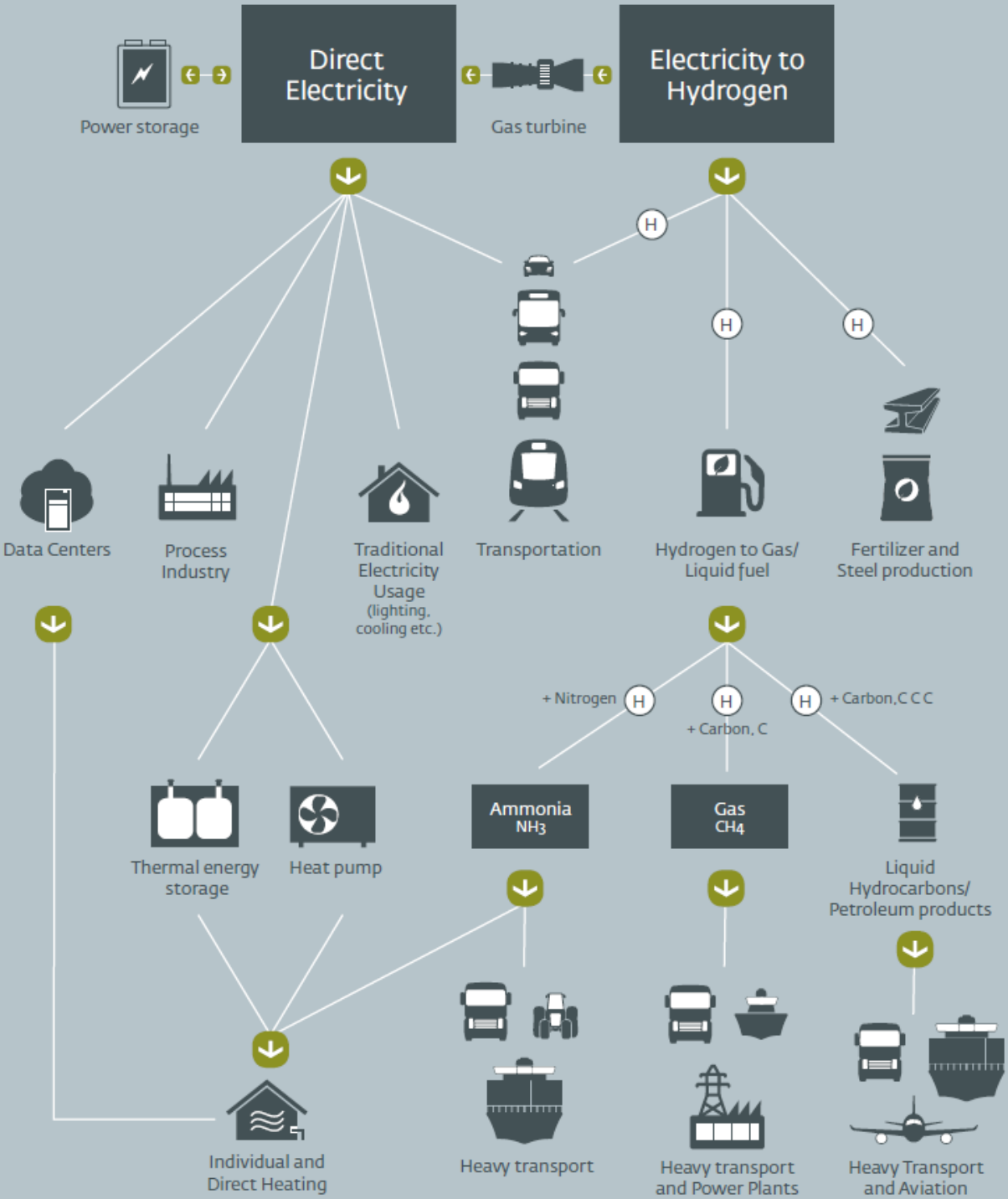
POWER-TO-X



FLOATING
SUBSTRUCTURES

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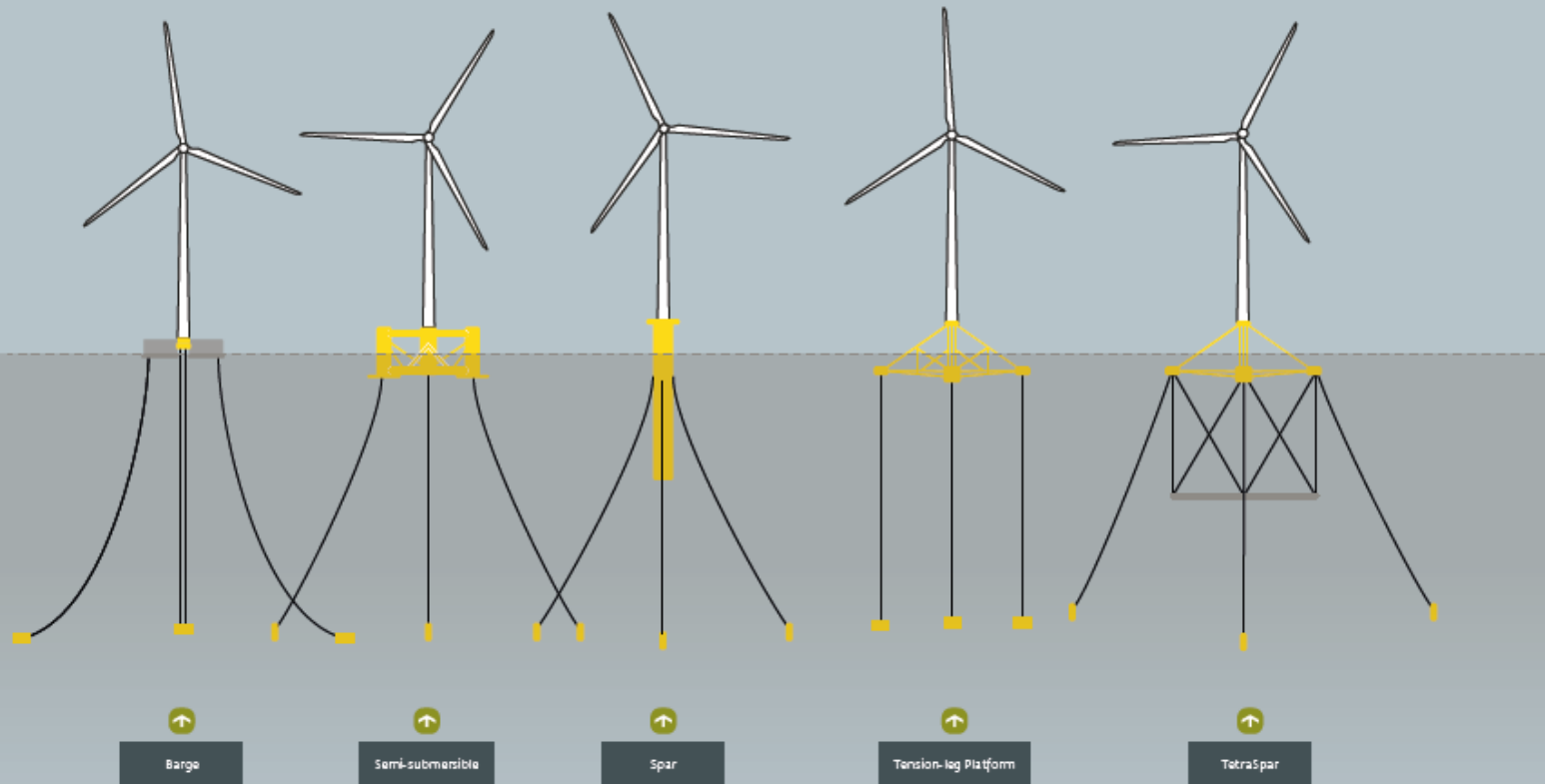
ELECTRIFICATION POWER-TO-X STORAGE



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FLOATING WIND POWER SYSTEMS

FLOATING WIND POWER SYSTEMS



DEDICATED RESEARCH
PROGRAMME AT
UNIVERSITIES FOR
FLOATING WIND POWER
SYSTEMS

Megavind Annual Agenda 2020

Peter Hjuler – DFFV & Christina Aabo - Ørsted

Possible topics:

- Market design and creation of the flexible energy system
- Circular economy and recycling of wind farm components
- Public acceptance



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THANK YOU

More information: <https://megavind.winddenmark.dk/>

Secretariat:

wind
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