Leading the offshore revolution

Niels Steenberg, Executive General Manager of Siemens Gamesa Offshore for Asia-Pacific

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Agenda

1 Siemens Gamesa Renewable Energy

2 Our offshore business

3 Our presence in Australia & New Zealand

4 Offshore product portfolio

5 Wind turbine innovation

6 Important consideration for new market development

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Three business units strongly positioned in the market

Onshore

102 GW

installed since 1979

The **technological partner of choice** for onshore wind power project.

Offshore

19.4 GW

installed since 1991

Most experienced offshore wind company with the most reliable product portfolio in the market.

Service

84.2 GW

maintained

Commitment beyond the supply of the wind turbine **to reach the profitability goals.**

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Siemens Gamesa Offshore key facts[1]

+19.4 GW
Globally Installed

~6,000
Employees

~€2.8 bn[2]
Annual Revenue

~2.8 GW
Order Entry[2]

~€10.5 bn
Order Book

True **global**, modern and scalable **footprint**

Excellence in project **execution**

+1,500
Offshore Direct Drive turbines installed

1 As of Q3 FY22 (June 30, 2022) | **2** Last 12 months ending June 30, 2022

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Our contribution to clean energy so far

More than 4,000 offshore wind turbines installed in Denmark, the UK, Germany, Norway, Sweden, Finland, The Netherlands, Belgium, China, Taiwan, The United States

+19.4 GW
installed base

~22 million avg. EU households
served annually

Accumulated since 1991

~330 billion kWh
of clean energy generated

~280 million tons
of CO_2 emissions avoided compared to coal

~43 million hectares mature forest
absorb the same amount of CO_2 in 1 year

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The offshore wind turbine manufacturer with the longest, most extensive history in the industry

World's first offshore project

4.95 MW
Vindeby, DK

First power plant-sized project

630 MW
London Array, UK

First large-scale offshore DD project

574 MW
Race Bank, UK

First subsidy-free offshore project

1.54 GW
Hollandse Kust Zuid, NL

1991 | 2011 | 2018 | 2022

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Siemens Gamesa Renewable Energy Australia and New Zealand References
1,311 MW Under Operation and 176 MW under construction

PROJECTS REFERENCES

- **Snowtown 2 Wind Farm**, SA: 80 x SWT-3.0-108 and 10 x SWT-3.0-101, 270MW Customer: Trustpower, Commissioned 2014
- **Hornsdale 1**, SA: 30 x SWT-3.2-113, 96MW, Customer: Neoen, Commissioned: 2016
- **Hornsdale 2**, SA: 30 x SWT-3.2-113, 96MW, Customer: Neoen, Commissioned 2017
- **Hornsdale 3**, SA: 35 x SWT-3.2-113, 112MW, Customer: Neoen. Commissioned 2017
- **Bulgana Wind Farm**, VIC: 56 x SG 3.65-132, 204MW. Customer: Neoen, Commissioning 2019
- **Te Uku, Mill Creek and West Wind**, NZ: 116 x SWT-2.3 MW, 267MW. Customer: Meridian Energy, Commissioned 2011
- **Badgingarra Wind Farm**, WA: 37 x SWT-3.6-130, 133MW. Customer : APA Group, Commissioning 2019
- **Waipipi Wind Farm**, NZ: 31 x 4.3MW,133.3MW. Customer: Commissioning 2020, Tilt Renewables
- **Harapaki Wind Farm,** NZ: 41 x 4.3MW, 176.3MW. Customer: Meridian Energy, under construction


Snowtown II, SA


Hornsdale I,II & II ,SA


Badgingarra, WA


Bulgana, VIC


Mill Creek, NZ


West Wind, NZ


Te Uku, NZ


Waipipi, NZ

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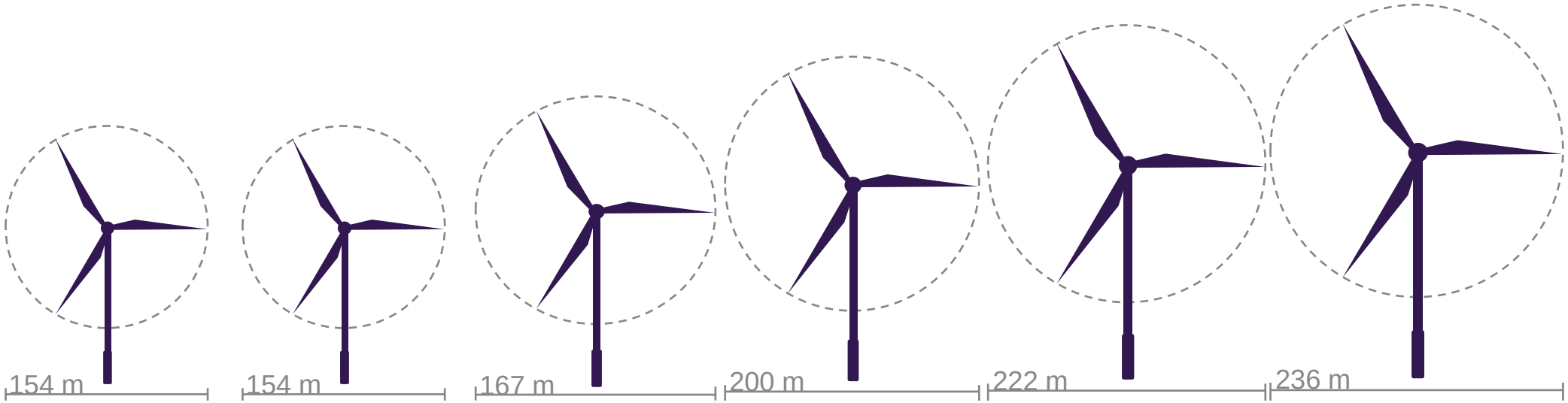
Generations of Offshore Direct Drive



	SWT-6.0-154	SWT-7.0-154	SG 8.0-167 DD	SG 11.0-200 DD	SG 14-222 DD	SG 14-236 DD
IEC Class	I, S	I, S	I, S	I, S	I, S	I, S
Nominal Power	6 MW	7 MW	8 MW	11 MW	14 MW	14 MW
Blade length	75 m	75 m	81.4 m	97 m	108 m	115 m

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The SG 14-236 DD offshore wind turbine provides more power with bigger blades

SG 14-236 DD	
IEC class	I, S
Nominal power	14 MW
Rotor diameter	236 m
Blade length	115 m
Swept area	43,500 m^2
Hub height	Site-specific
Power regulation	Pitch-regulated, variable speed

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RecyclableBlade is a pioneering offshore blade solution that enables blade materials to be recovered and recycled

The first blades have been produced in early 2021 and are planned to be installed on projects from 2022.

The industrialized setup for the RecyclableBlade production is planned for 2022, with production capacity continuously increasing until fully ready for bigger offshore projects in 2024.

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The recycling process for our pioneering RecyclableBlade is simple and fast

Decommission

Disassemble and transport.

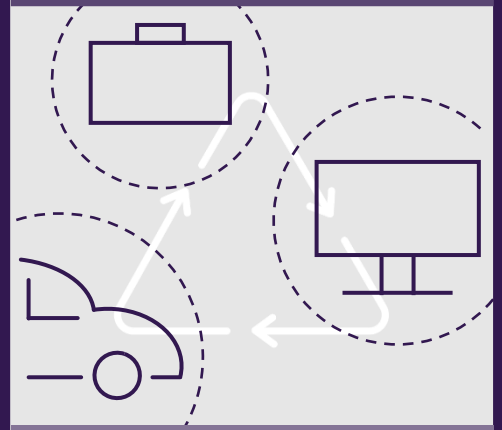
Immerse in mild acidic solution

Resin dissolves in mild acidic solution at elevated temperature after a few hours.

Reclaim separated components

Filter and coagulate resin + rinse and dry glass fiber etc.

Reuse



Glass fiber, resin, wood and metal can now be reused in other industries.

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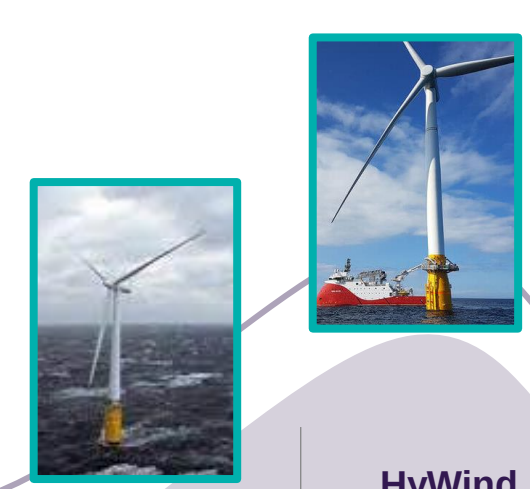
Floating experience

SGRE has been involved in Floating Offshore Wind since the beginning

SGRE in the driver seat to further industrialize floating offshore wind, leveraging strongest OEM experience worldwide



HyWind Demo (2.3MW)

Steel spar type
SWP 2.3-83
Water depth: 220m

First MW size FOWT

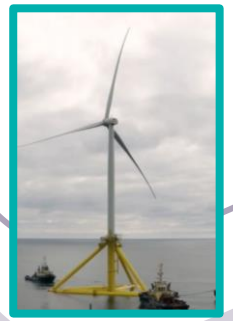
2009

HyWind Scotland (30MW)

Steel spar type
SG 6.0-154 DD
Water depth: 90-120m

First floating windfarm

2017



TetraSpar demo (3.6MW)

Spar type floater
SG 3.6-130 DD
Water depth: 200m

Fully instrumented

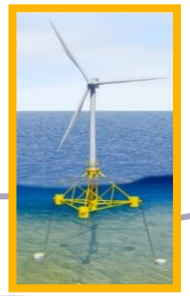
2021

Hywind Tampen (88MW)

Spar type floater
SG 8.0-167 DD
Water depth: 260 – 300m

Powering O&G platforms

2022



Provence Grand Large (24MW)

TLP type floater
SG 8.0-154 DD
Water depth: 100m

First demo in France

2023

US floater demo

Semi-sub floater

UK floater demo

Semi-sub floater

2023-24

In Operation | Soon to be installed | In design phase

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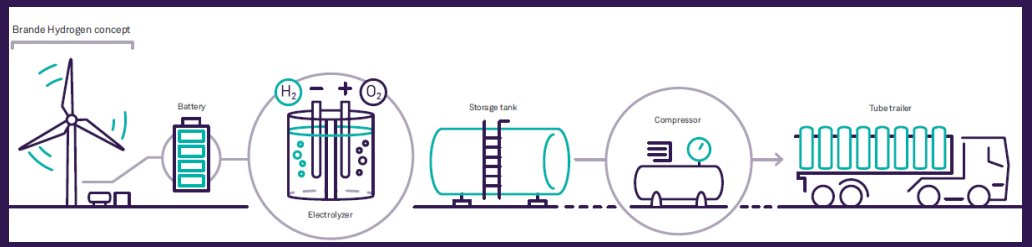
Hydrogen test site running …

- Integrates an electrolyzer into an existing wind project, providing sound benefits to existing assets:

3 MW onshore turbine **400 kW** electrolyzer in Brande

H_2 output to be used to **fuel 50 – 70 Copenhagen taxis**



… and new concept in development

- Benefits from offshore wind condition
- Direct transmission of wind power to H_2 reducing transmission losses
- Flexibility due to modularization

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Wind turbine

Modified 14-MW wind turbine to produce H_2 at turbine level

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Electrolyzer

Plug & play containerized solution on a platform located at sea level

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Hydrogen experience

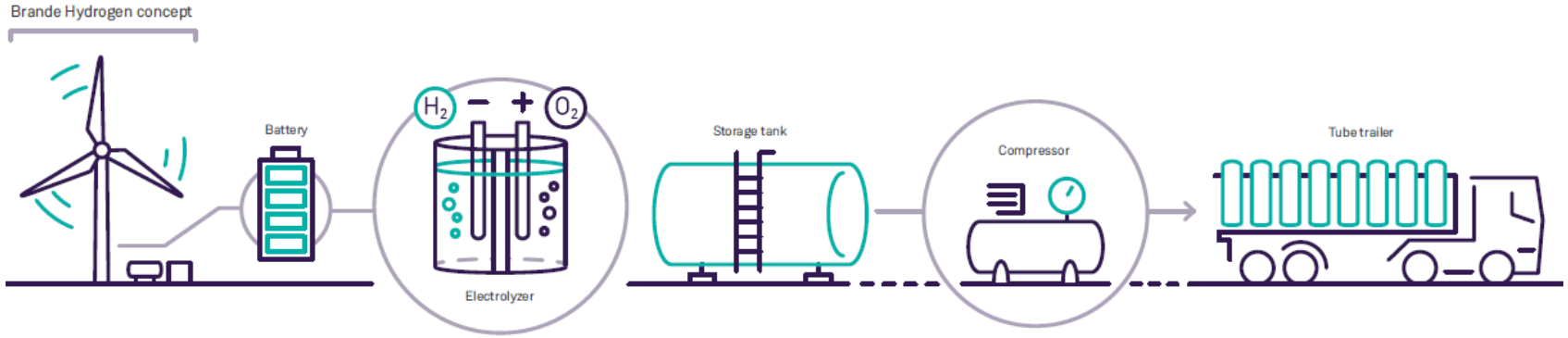
3 MW onshore turbine
400 kW electrolyzer

H_2 output to be used to
fuel 50 – 70 Copenhagen taxis

Brande Hydrogen test site as use case for hydrogen production in the near term

Integrates an electrolyzer into an existing wind project, providing sound benefits to existing assets:

1. Adds a new value stream by enabling the generation of green hydrogen
2. Optimization by integration of wind turbine/battery/ electrolyzer independent of grid requirements (island mode)
3. Makes the plant **flexible**, allowing the assets to contribute even more to the energy transition



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Revolutionizing offshore wind-to-hydrogen systems

- Announcement in January 2021 to launch development projects leading to a fully integrated offshore wind-to-hydrogen solution
- Companies target a total investment of approximately € 120 million
- Benefits:

Enables more and better wind sites to be utilized using island mode

Maximizes amount of wind power that is converted to green H_2 by reducing transmission losses

Reduces costs further by modularization

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Wind turbine

Modified 14-MW wind turbine to produce H_2 at turbine level

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Electrolyzer

Plug & play container-ized solution on a plat-form located at sea level

Preliminary visualization

Preliminary visualization

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Policy makers are decisive in supporting the build-up of new markets to ensure stability and visibility for the industry to mature

- **Stable legislative and regulatory frameworks** to ensure industry build-up and outlook
- Development of sites and zones is **a long-term exercise**
- Substantial **commitments with long-term visibility** to support maturing the supply chain
- **Support mechanisms needed for early stage projects**
- Local **co-investment and funding** to attract and initiate infrastructure investments
- **Harbors with adjacent infrastructure** for potential manufacturing facilities
- Balancing **local content requirement** and LCoE aspirations/potential

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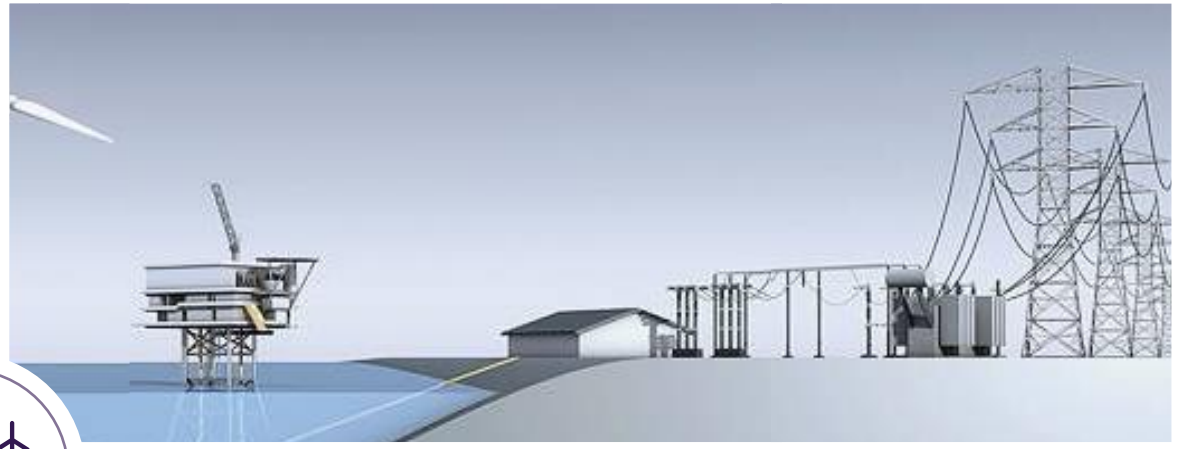
Readiness of local infrastructure and supply chain



Adapted infrastructure and supply chain are key drivers in reducing risks and optimizing costs

- Harbor infrastructure (space, loading capacity)
- Grid infrastructure (onshore and offshore)
- Industry specific vessel supply (installation jackups, service CTV)

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Localization tends to happen stepwise in new regions

Always localized in new regions

Next step for localization

Final step for localization

Incremental localization to follow industry maturation

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Thank you!

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