

An aerial view of an offshore wind farm in the ocean. Several white wind turbines with yellow bases are visible. A blue and white service vessel is moving across the water in the foreground, leaving a white wake. The sky is blue with some light clouds.

Community Advisory Group

Meeting #5 – 24 May 2021

We acknowledge the Traditional Owners of the lands on which we all meet today and pay our respect to their elders past, present and future.

In particular, we recognise the Gunaikurnai people as Traditional Owners of the area in which the Star of the South would be located.

Agenda

1. Welcome
 - New members and Secretariat
 - Apologies
2. Standing items and actions from previous meeting
 - Minutes
 - Declaration of potential conflicts
 - Previous questions taken on notice
3. What's happening on the project
4. What's happening in the community
5. Break
6. Focus on: Turbines
 - Overview
 - Group discussion and questions
7. Other items
 - Other questions or feedback
 - Suggestions for future agenda items

New members

- Nikki Jennings – filling in for Julianne Peavey while she is on sick leave
- Christine Legg – filling in for South Gippsland Shire Council while Rick Rutjens is on annual leave
- Allison Spence – new representative for Latrobe City Council
- Tony Cantwell – new representative for Committee for Gippsland

We also have a **new CAG Secretariat** - Susan McMillan, Community Relations Officer at Star of the South

- Key contact for members
- Meeting coordination, minutes and agenda
- Keeping you updated via phone, email, website and SMS alerts

Previous questions

- Which government department and minister is responsible for offshore wind regulations and decisions about fishing access?
- Will there be silt control done to prevent coverage of surrounding fishing grounds when the base sections are installed in seafloor?
- Is there any sort of "electromagnetic" pulse or "field" emitted from the undersea floor cabling?
- Are the tower positions exact? If a position is on a reef point can the tower be moved to protect the reef?
- Where will the construction/maintenance port be located?
- What is the RAP's jurisdiction? How far into the marine area does it go?

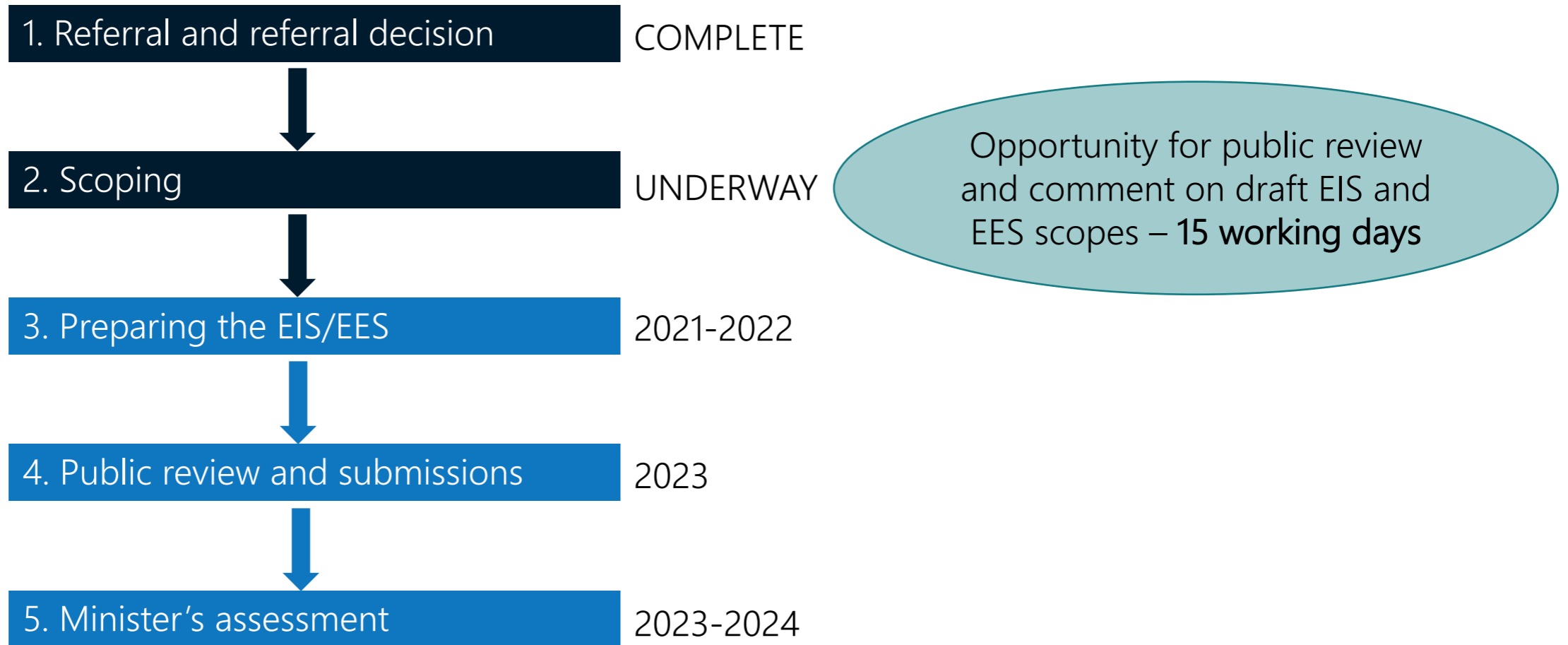
What's happening on the project

- Project update and community events in March-April
- Made submission to Renewable Energy Zone Development Plan Directions Paper
- Two new team members! – Susan and Stella
- EIS/EES scopes to be released by government for public review and comment and communicated by us
- [EIS/EES consultation plan](#) published online
- Continued engagement with landholders
- Continued environmental studies
- Lots of events and presentations!



Our focus continues to be environmental studies, ahead of starting our assessments this year

What's happening on the project – EIS/EES



We'll let people know when the draft scopes are released for comment

What's happening in the community

- Hot topics?
- Interest / questions / feedback about the project?
- Other projects, events and things happening locally?

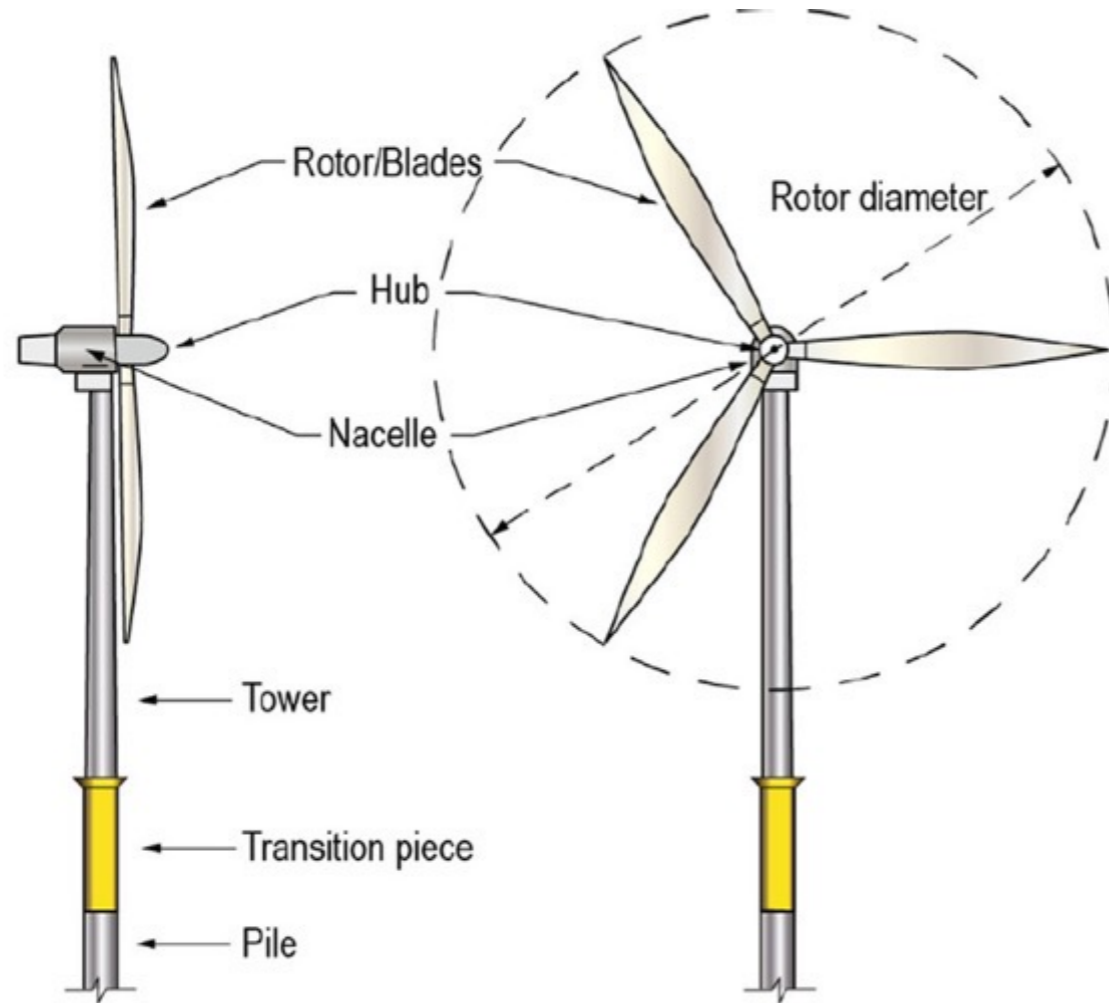
Would you like to give an update at the next meeting?



Focus on: Turbines

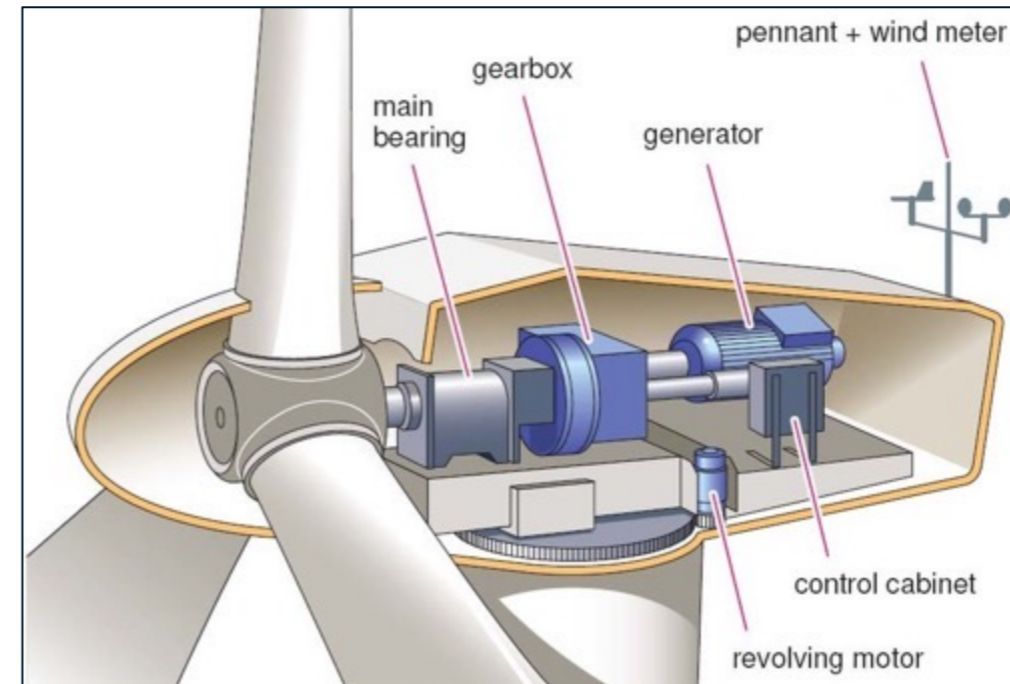


Components



Source: Research Gate

Inside a nacelle



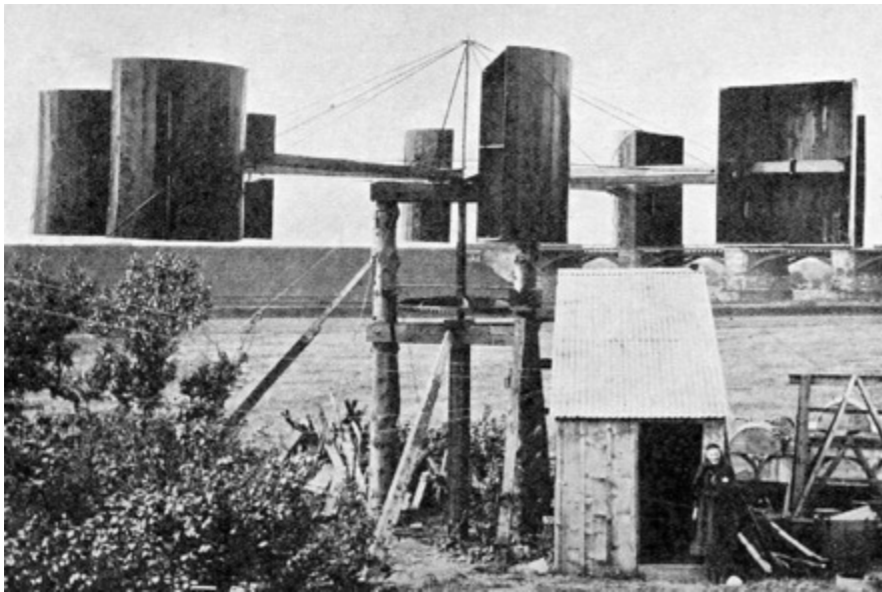
Source: Research Gate

Turbines capture the wind and convert kinetic energy into electricity

History of wind turbines

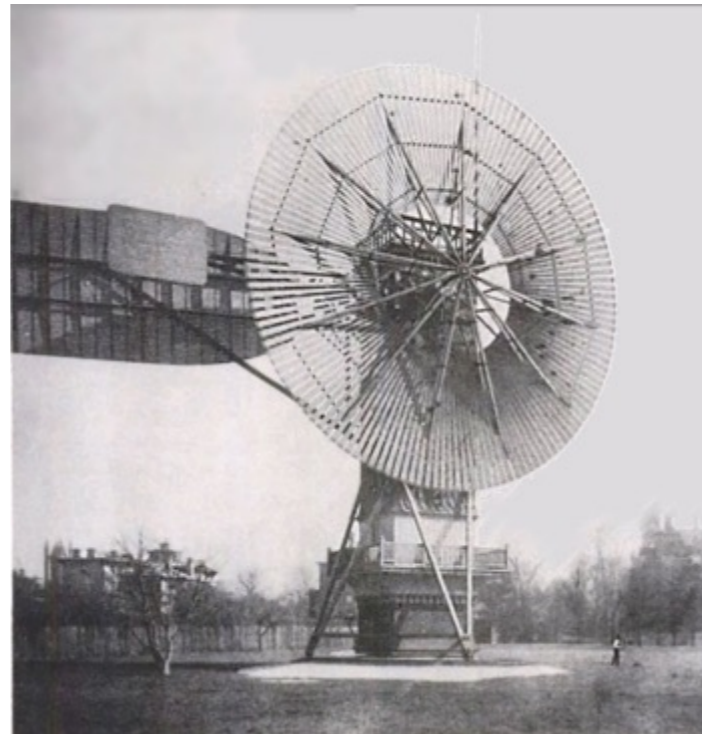
First power generating wind turbine

Scotland 1887



First automatically operated wind turbine

United States 1888



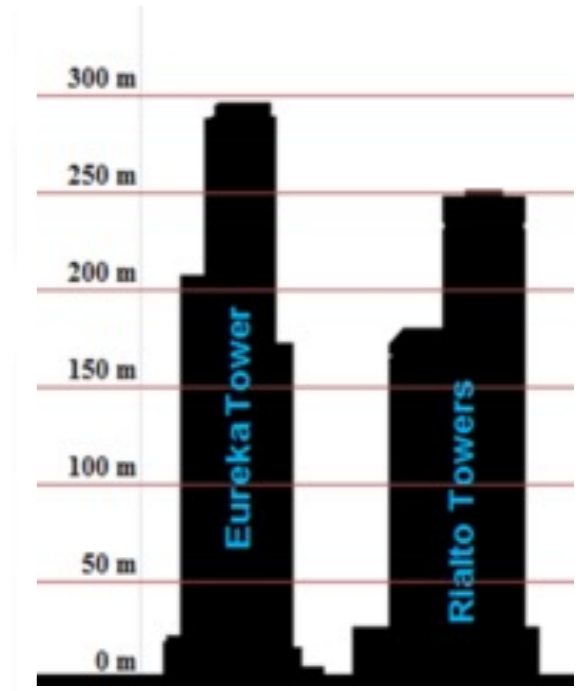
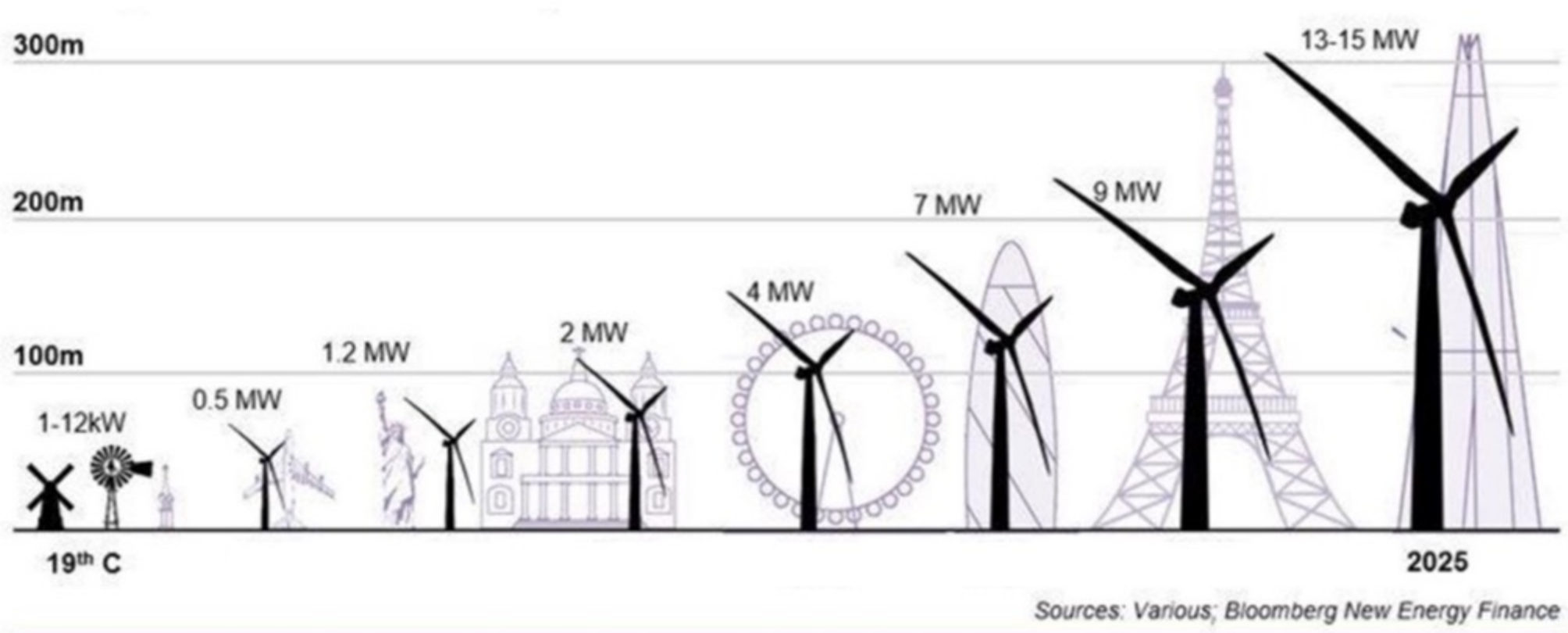
First three-bladed wind turbine

Denmark 1957



People have been harnessing the wind for different purposes for thousands of years

Evolution of wind turbine height and output



Turbines have grown in size tremendously over the past 30 years

The biggest offshore turbine and project (for now)

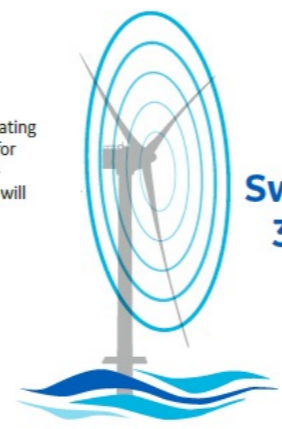
GE RENEWABLE ENERGY

Meet the Haliade-X 13 MW:

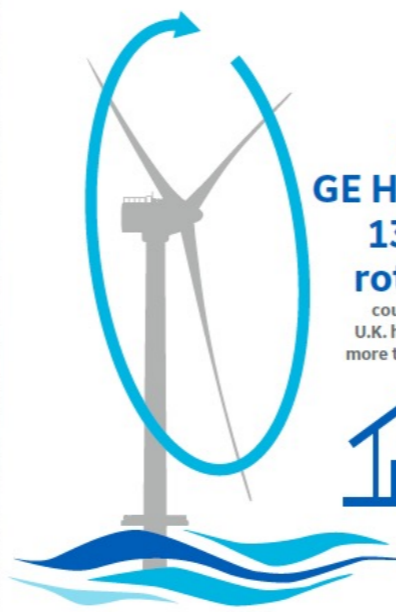
The Haliade-X 12 MW prototype in Rotterdam raised the bar for wind energy. It set a world record for generating enough energy in one day to power 30,000 Dutch households. Now GE received the first commercial order for 190 of the machines. They will power the first two phases of the Dogger Bank wind farm in the North Sea — expected to be the world's largest when completed. The prototype is performing so well that the machines will be rated even higher — at 13 MW. Here's how the Haliade-X is making waves.



* According to the U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator.



Swept area: **38,000 m²**



One GE Haliade-X 13 MW rotation could power a U.K. household for more than two days.



13 MW generation capacity



Height: 248 m
Blades: 107 m
Rotor: 220 m



About Dogger Bank Wind Farm

(130 km from the Yorkshire coast)

- Construction: Began in 2020
- Turbine installation: Scheduled to begin in 2023
- Phases: Three (Dogger Bank A, B and C)
- Scheduled completion (all phases): 2026
- Total expected generation capacity: 3.6 GW
- Households powered: Around 4.5 million
- Grid impact: 5% of the U.K.'s estimated power demand

New in 2020, this turbine is to be deployed in the UK from 2023

Selecting a turbine

Key considerations:

- Advice from manufacturers (availability, timing)
- Wind profile
- Seabed conditions
- Local environmental conditions
- Availability and capacity of local ports

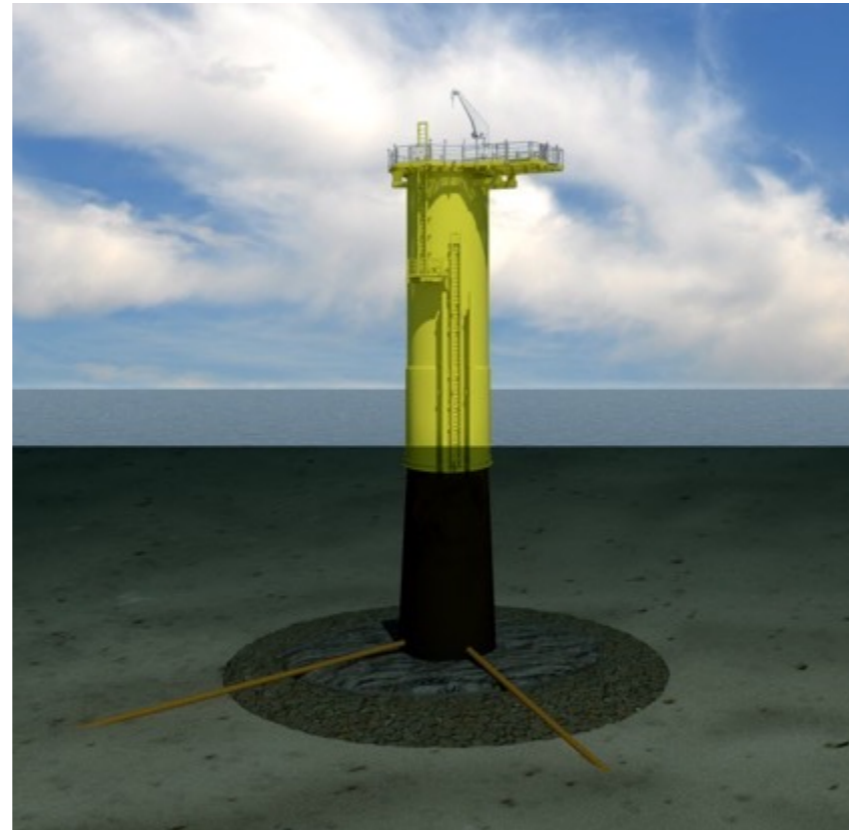


Our turbine selection will not be made until further information is available

Selecting a foundation

Key considerations:

- Seabed conditions
- Water depth
- Turbine type/size
- Manufacturing and installation capabilities
- Availability and capacity of local ports



Monopile



Suction bucket jacket

Source: Dong Energy

These are commonly used foundation types being considered for Star of the South

Designing the layout

Key considerations:

- Wind profile
- Optimum layout for lowest cost of energy
- Shipping and navigation
- Radar and aviation
- Local environmental conditions

Around 1km between turbines
and more between rows



Credit: Bel Air Aviation Denmark

The layout isn't finalised until a turbine is selected

Construction



Construction typically takes 3-5 years, depending on the project size

Construction



Purpose-built heavy lift vessels are used for construction

Operations and maintenance

- Remotely monitored from operations port
- Regular surveys
- Annual maintenance



Crew Transfer Vessel



Rotor blade technician from Altitec



Maintenance at Sheringham Shoal offshore wind farm in the UK

Project life span is now around 30 years (up from 20 years and increasing)

Ports

Key considerations:

- Sufficient water depths
- Proximity to the wind farm site
- Sufficient quay side facilities and availability
- Available hinterland for potential manufacturing, assembly and storage
- Provides regional jobs and investment opportunities



Veja Mate

Ports are critical for an offshore wind project

Decommissioning

- Decommissioning vs repowering
- The first offshore wind farm built in 1991 was decommissioned in 2017
- Decommissioning plans a requirement for project approval
- What happens to the parts?
 - More than 80% of turbines recyclable today
 - Manufacturers targeting zero waste by 2040



Vindeby decommissioning

Projects must commit to and plan for decommissioning during the planning phase

Resources

Want to learn more?

- How it all comes together at sea - <https://youtu.be/mDvS7tizetg>
- The world's biggest wind turbine - <https://youtu.be/anzrmuxh9dQ>
- Decommissioning Blyth offshore wind farm - <https://youtu.be/wz9YrYk172E>
- Global Wind Energy Council (GWEC) - <https://gwec.net>
- International Renewable Energy Agency (IRENA) - <https://www.irena.org>