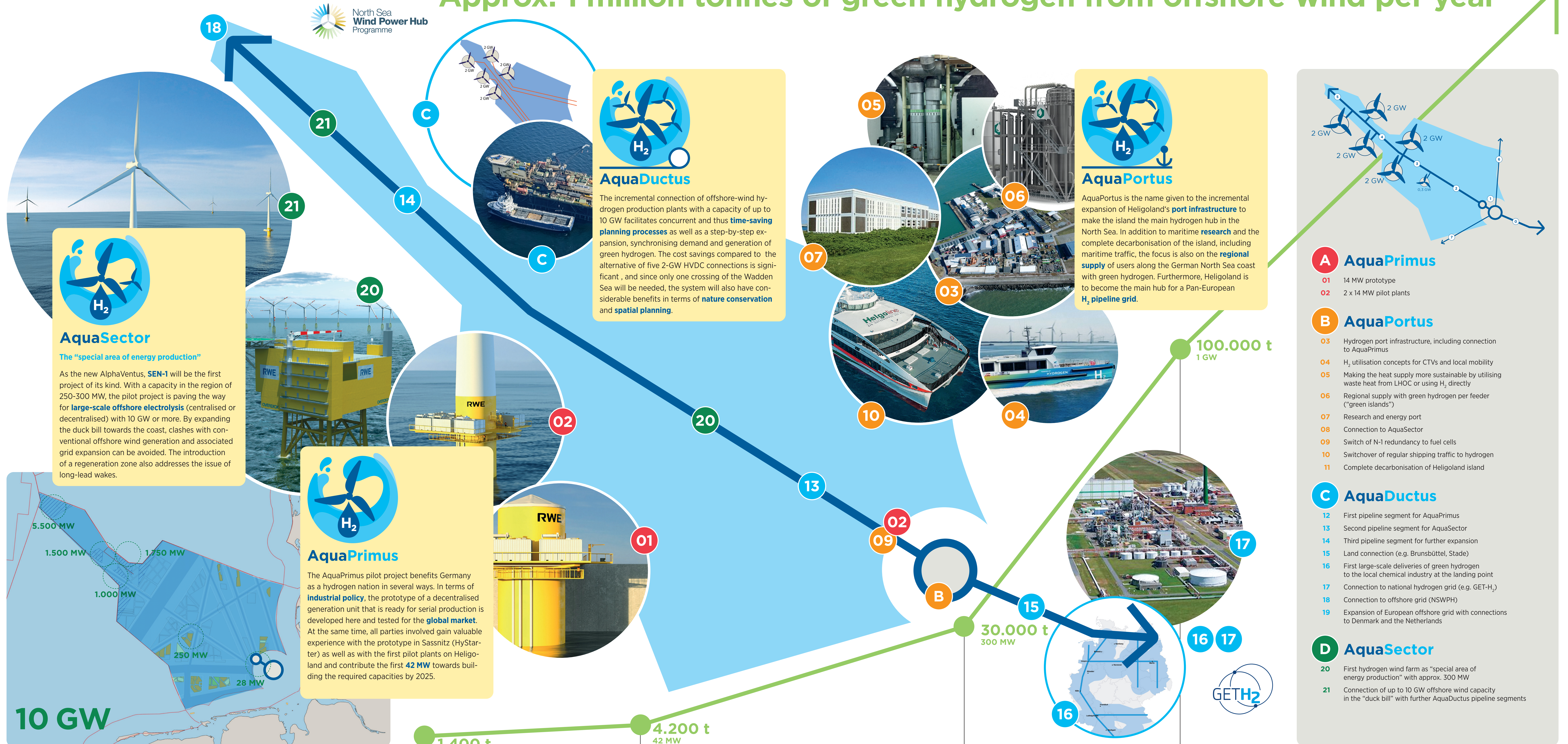


Approx. 1 million tonnes of green hydrogen from offshore wind per year



AquaSector
The "special area of energy production"

As the new AlphaVentus, SEN-1 will be the first project of its kind. With a capacity in the region of 250-300 MW, the pilot project is paving the way for large-scale offshore electrolysis (centralised or decentralised) with 10 GW or more. By expanding the duck bill towards the coast, clashes with conventional offshore wind generation and associated grid expansion can be avoided. The introduction of a regeneration zone also addresses the issue of long-lead wakes.

AquaPrimus

The AquaPrimus pilot project benefits Germany as a hydrogen nation in several ways. In terms of industrial policy, the prototype of a decentralised generation unit that is ready for serial production is developed here and tested for the global market. At the same time, all parties involved gain valuable experience with the prototype in Sassnitz (HyStarter) as well as with the first pilot plants on Helgoland and contribute the first 42 MW towards building the required capacities by 2025.

AquaDuctus

The incremental connection of offshore-wind hydrogen production plants with a capacity of up to 10 GW facilitates concurrent and thus time-saving planning processes as well as a step-by-step expansion, synchronising demand and generation of green hydrogen. The cost savings compared to the alternative of five 2-GW HVDC connections is significant, and since only one crossing of the Wadden Sea will be needed, the system will also have considerable benefits in terms of nature conservation and spatial planning.

AquaPortus

AquaPortus is the name given to the incremental expansion of Helgoland's port infrastructure to make the island the main hydrogen hub in the North Sea. In addition to maritime research and the complete decarbonisation of the island, including maritime traffic, the focus is also on the regional supply of users along the German North Sea coast with green hydrogen. Furthermore, Helgoland is to become the main hub for a Pan-European H₂ pipeline grid.

- A AquaPrimus**
 - 01 14 MW prototype
 - 02 2 x 14 MW pilot plants
- B AquaPortus**
 - 03 Hydrogen port infrastructure, including connection to AquaPrimus
 - 04 H₂ utilisation concepts for CTVs and local mobility
 - 05 Making the heat supply more sustainable by utilising waste heat from LHOC or using H₂ directly
 - 06 Regional supply with green hydrogen per feeder ("green islands")
 - 07 Research and energy port
 - 08 Connection to AquaSector
 - 09 Switch of N-1 redundancy to fuel cells
 - 10 Switchover of regular shipping traffic to hydrogen
 - 11 Complete decarbonisation of Helgoland island
- C AquaDuctus**
 - 12 First pipeline segment for AquaPrimus
 - 13 Second pipeline segment for AquaSector
 - 14 Third pipeline segment for further expansion
 - 15 Land connection (e.g. Brunsbüttel, Stade)
 - 16 First large-scale deliveries of green hydrogen to the local chemical industry at the landing point
 - 17 Connection to national hydrogen grid (e.g. GET-H₂)
 - 18 Connection to offshore grid (NSWPH)
 - 19 Expansion of European offshore grid with connections to Denmark and the Netherlands
- D AquaSector**
 - 20 First hydrogen wind farm as "special area of energy production" with approx. 300 MW
 - 21 Connection of up to 10 GW offshore wind capacity in the "duck bill" with further AquaDuctus pipeline segments

2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031-2033 | 2034-2037

<p>Foundation of the AquaVentus initiative</p> <p>Foundation of the AquaDuctus project development company</p> <p>Foundation of the AquaPrimus consortium</p>	<p>Feasibility studies for AquaDuctus</p> <p>Feasibility studies for AquaPrimus</p> <p>Feasibility studies for AquaPortus</p>	<p>Investment decision for AquaPrimus prototype</p> <p>Approval process for AquaDuctus</p> <p>AquaSector (SEN-1) is put out for tender by the German Federal Maritime and Hydrographic Agency (BSH)</p> <p>Set-up of the Hydrogen Research Cluster Helgoland</p>	<p>AquaPrimus prototype is built</p> <p>Investment decision for AquaPrimus pilot plants</p> <p>Award of contract for AquaSector and start of project implementation</p> <p>Start of AquaPortus infrastructure implementation</p>	<p>Foundation of the AquaDuctus operating company or transition to regulated asset</p> <p>The first AquaPrimus pipeline segment is laid</p> <p>Approval process for AquaDuctus land connection</p>	<p>Implementation of AquaPrimus pilot plants (2x14 MW)</p> <p>Connection of AquaPrimus to AquaPortus</p> <p>Start of regional LHOC supply by feeders</p> <p>Investment decision for AquaSector</p> <p>Further tendering processes of H₂ areas by the BSH</p>	<p>Investment decision for AquaDuctus</p> <p>Partial switchover of heating supply on Helgoland</p> <p>Start of transition of island mobility and maritime traffic to hydrogen</p>	<p>Start of AquaSector implementation</p> <p>Further expansion of port infrastructure</p>	<p>AquaSector is built</p> <p>Connection to AquaPortus via second pipeline segment</p> <p>Regional LHOC supply is intensified</p> <p>Complete switchover of heat supply</p> <p>Complete decarbonisation of Helgoland island</p>	<p>Further pipeline segment to connect first gigawatt capacities in the duck bill</p> <p>Land connection of pipeline</p> <p>Connection of the ChemCoast cluster (Brunsbüttel/Stade) with first large-scale consumers of green hydrogen</p>	<p>Future connection of a total of 10 GW offshore potential</p> <p>Land-side integration into a European hydrogen grid (e.g. GET-H₂)</p> <p>Offshore-side connection to the North Sea Wind Power Hub and a European offshore hydrogen grid</p> <p>Cross-links to hubs in Denmark and the Netherlands</p>
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