



# Hydrogen and the role of synthetic fuels in power system flexibility

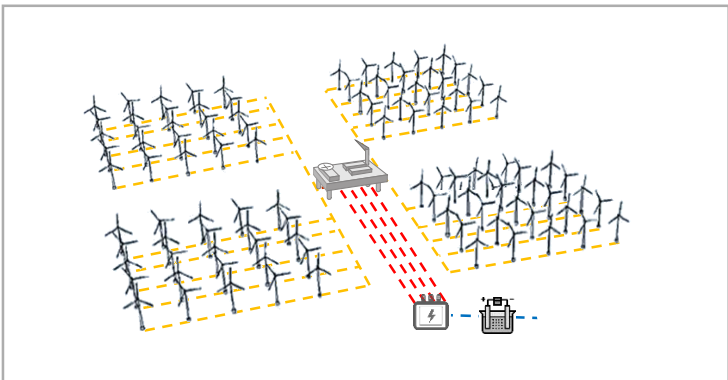
SGRE Segment: Emerging integrated hydrogen solutions

Henrik Bach Mortensen, Service Innovation - Demonstration & Piloting

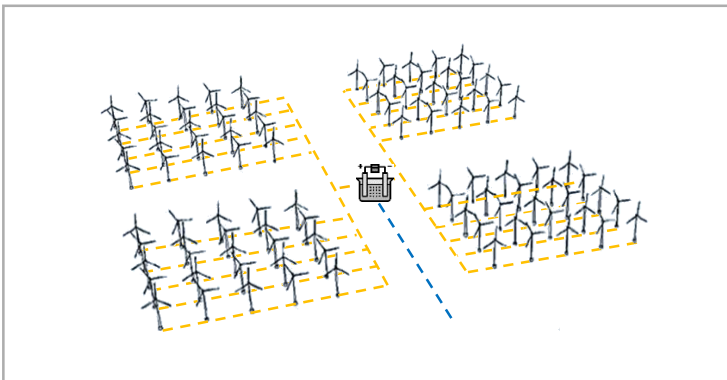
18.03.2021

# Offshore Wind will be needed – There are three ways to go from electron to molecule.

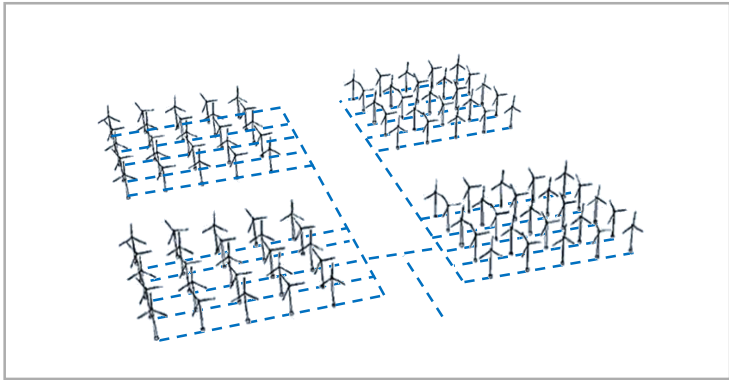
**Scenario I: Offshore kWh plant (as-is)**



**Scenario II: Offshore H<sub>2</sub> plant**



**Scenario III: Decentral Offshore H<sub>2</sub>**



--- kWh – 66KV    --- kWh – 220KV    --- H<sub>2</sub> – Hydrogen (Pipeline incl. auxiliary power)

Interview after CMD (28.08) highlighted SGRE's interest in decentral offshore H2 production.

BloombergNEF 29.08.2020

**Wind Turbine Behemoth Plans for Future by Getting Into Hydrogen**



Andreas Nauen, CEO, SGRE

Hydrogen could follow a similar trajectory (to offshore wind, ed.) if companies figure out an economical way to produce it. **If it takes off, hydrogen will change the whole energy landscape.**

*“We will be for the first time combining the two technologies. It is not to produce hydrogen in big quantities, but to test the combination of both.”*

## 13.01.21: SGRE and SEN announced plan to unlock new era of offshore green H<sub>2</sub> production

### What is it?

The companies are launching development projects leading to a fully integrated offshore wind-to-hydrogen solution.

Siemens Gamesa will adapt its development of the world's most powerful turbine, the SG14-222 DD offshore wind turbine, and Siemens Energy will develop a new electrolysis product for offshore use.

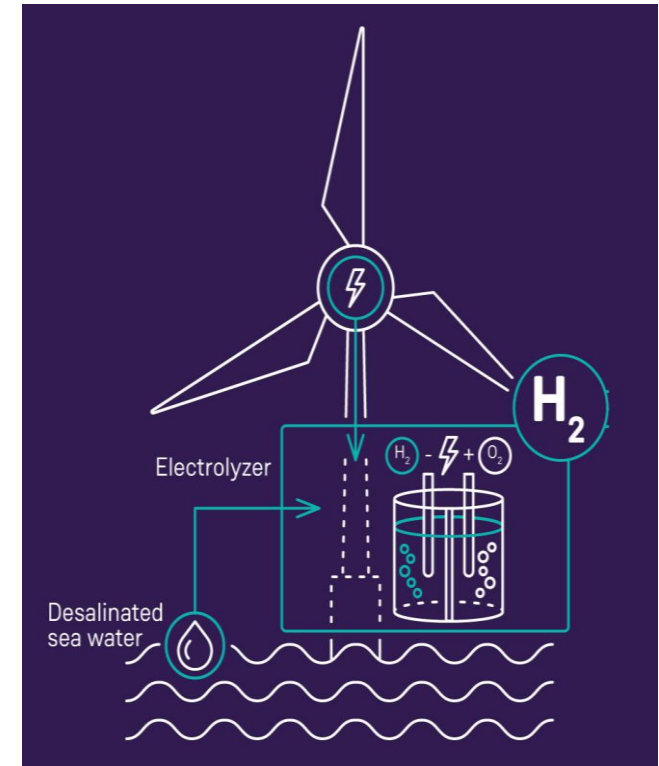
The long-term aim is to join the two developments from each company into an innovative solution that fully integrates an electrolyzer into an offshore wind turbine as a single synchronized system.

SGRE and SE target a total investment of **approximately EUR 120 million over the next five years** in the development of this solution (The development is part of the pending lighthouse project H2Mare, which is part of the German Federal Ministry of Education and Research's idea competition "Hydrogen Republic of Germany").

A full-scale offshore demonstration is expected by 2025/2026.

### What are we trying to achieve?

- Serves as **test bed** for making **large-scale, cost-efficient hydrogen production** a reality
- Will **prove feasibility** of reliable, effective implementation of modular offshore wind-to-hydrogen systems.



Picture from SGRE-SEN press Release 13.01.2021