An aerial, isometric-style rendering of a sustainable industrial and urban landscape. In the upper left, a large offshore wind farm with numerous white turbines is situated in the ocean. A yellow offshore supply vessel is nearby. A small airplane flies over the water. The coastline features a port with several ships, including a large cargo ship and a smaller tugboat. On the land, there's a green field with solar panels, a small airport with a runway and taxiway, and various industrial facilities with storage tanks and piping. A river flows through the landscape, bordered by lush green trees. To the right, a dense urban area with many white, modern-looking houses is visible. The overall scene depicts a harmonious integration of renewable energy, industry, and urban development.

Electrolysis GH2 Master Class UNAM School of Medicine Namibia

Siemens Energy
Hans Koopman
22 November 2023

Siemens Energy is an integrated energy technology company



Low- or zero-emission
power generation



Transport and storage
of energy

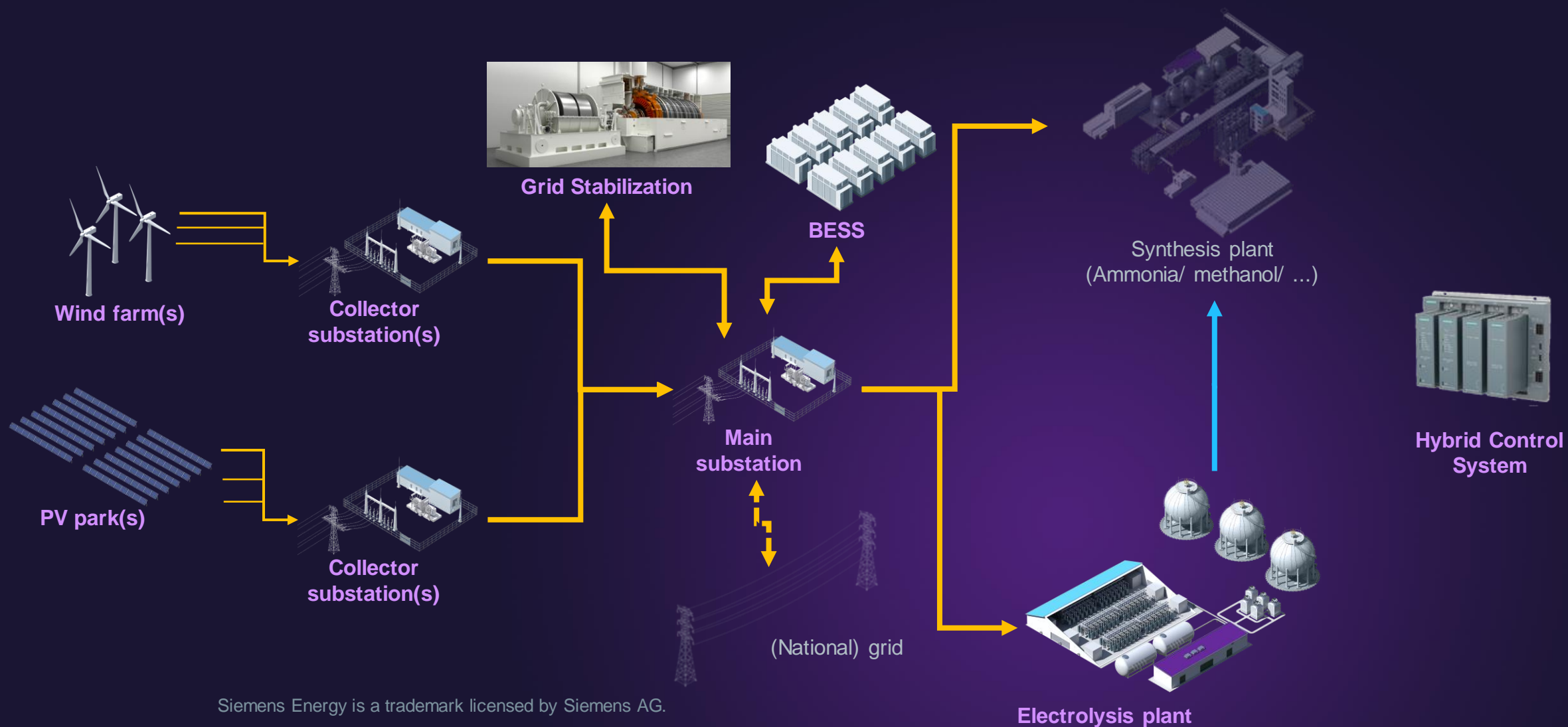


Reducing CO₂ footprint and energy
consumption in industrial processes
















We provide many essential products, solutions and services along the entire PtX value chain

SIEMENS
ENERGY



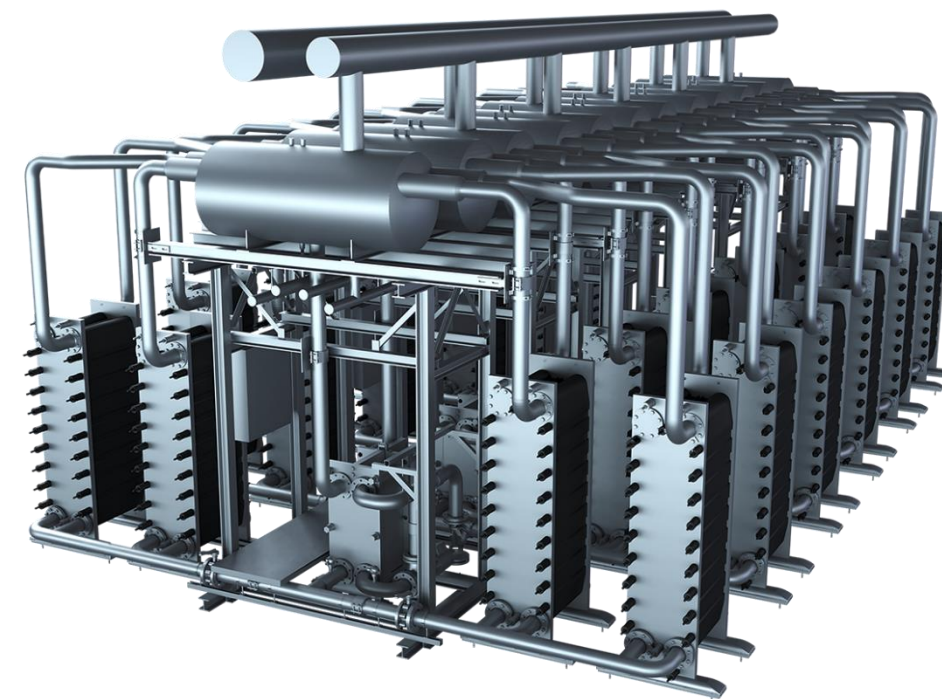
Silyzer 300

Fact Sheet

	Hydrogen production	335 kg/h
	Plant efficiency (HHV¹)	>75.5%
	Power demand	17.5 MW
	Start-up time	<1 min, enabled for PFRS ²
	Dynamics in range	10%/s in 0 – 100%
	Minimal load	40% single stack
	Dimension full stack array	15.0 x 7.5 x 3.7 m
	Dimension system plant	35.5 x 15.5 x 9.0 m
	Stack design lifetime	Optimized for 80 kOH ⁴
	Plant availability	~95%
	Demin water consumption	10 l/kg H ₂
	Dry gas quality³	99.9999%
	Delivery pressure	Customized

¹ Plant efficiency includes rectifier, transformer, transformer cooling and gas cooling

² Primary Frequency Response Service | ³ With DeOxo | ⁴ Operating Hours



Silyzer 300 production concept

Electrolyzer reference plant

- Pre-engineered basic design
- Integrated solution with strong partner approach
- Turn-key possible

Electrolysis System

- Minimize on-site installation
- Maximum of standardization by defined interfaces
- Build to print pre-engineered

Localized decentral packaging

- High quality by pre-assembling
- Transportable units
- Strong local content

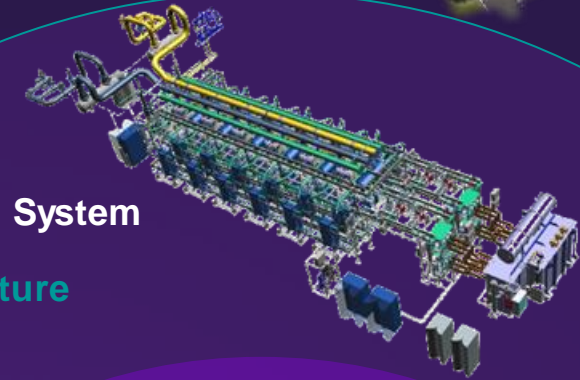
Cost efficient central stack factory

- High level of Automatization
- Large quantities and strong supply chain management
- Strong partner relation of key components

Reference Plants

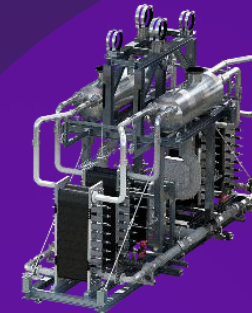


System

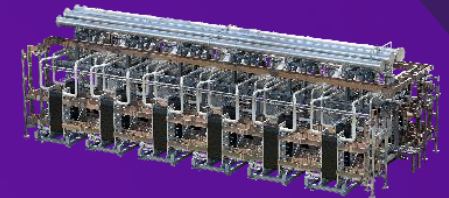


Scope Joint Venture

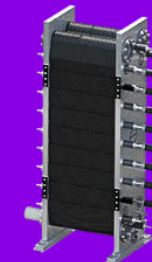
Group



Array



Stack



Siemens Energy

- Manufacture Electrolyzer Modules
- Ship modules, Gas separator, Heat Exchanger to Local Assembly Center

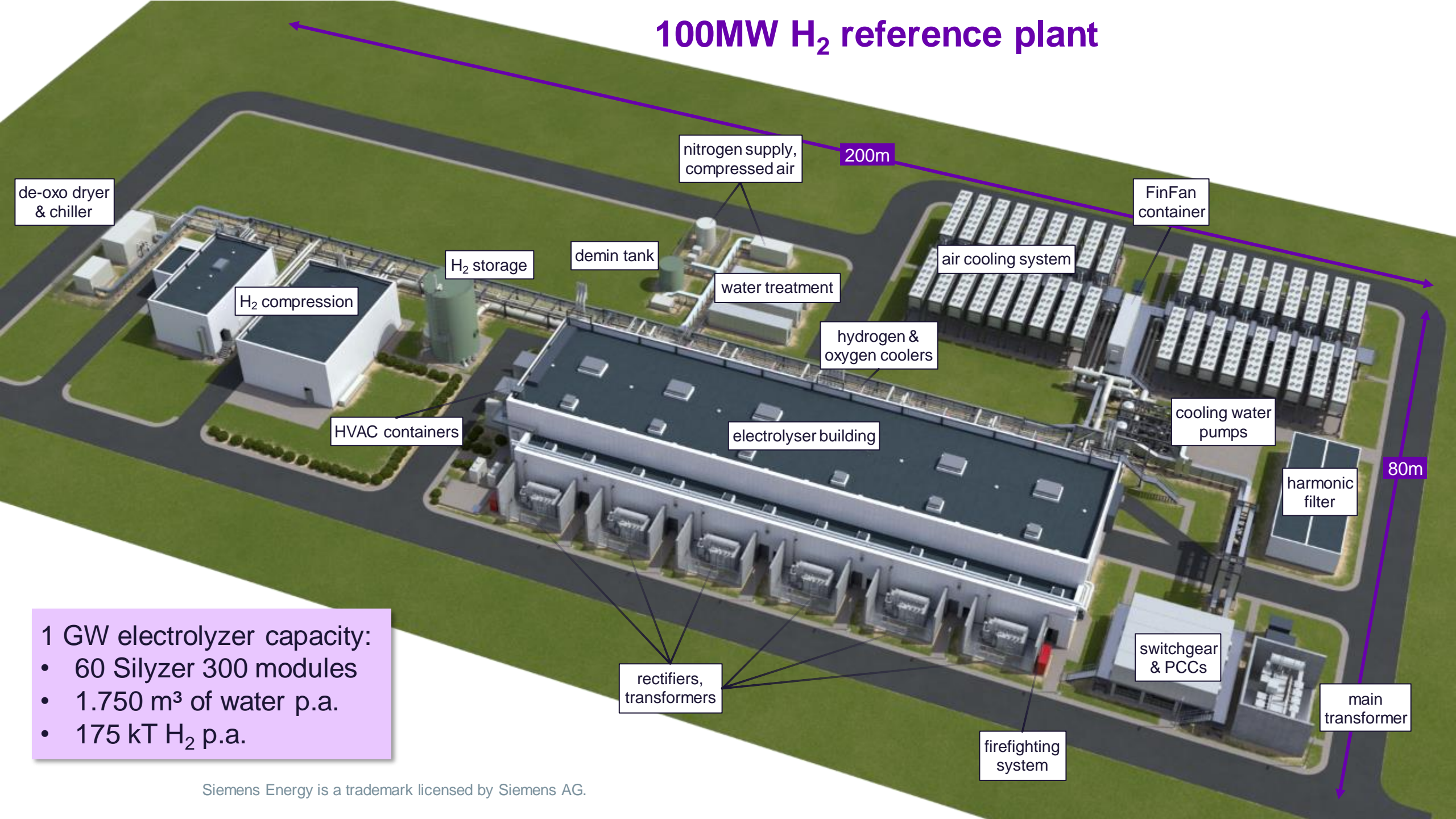


Local Assembly Center

- Source remaining components locally : Steel Structure, Valves, Piping, Couplings, Paints...
- Assemble it in group composed by 4 modules
- Assemble module groups in full array incl. header pipes



100MW H₂ reference plant



1 GW electrolyzer capacity:

- 60 Silyzer 300 modules
- 1.750 m³ of water p.a.
- 175 kT H₂ p.a.

Explore the potential of green hydrogen



**Green Hydrogen
Production Website**
[www.siemens-
energy.com/electrolyzer](http://www.siemens-energy.com/electrolyzer)



Haru Oni App
www.haruoni.com



**Haru Oni
Project Website**
[Haru Oni hydrogen plant
| 2021 | Siemens Energy
Global \(siemens-
energy.com\)](#)



ESD Website
[Energy System Design |
Power plant solutions |
Siemens Energy Global](#)



**Hybrid Power
Solutions Website**
[Hybrid power solutions |
Power plant solutions |
Siemens Energy Global](#)



Hydrogen Website
[Hydrogen | Future
Technologies | Siemens
Energy Global](#)