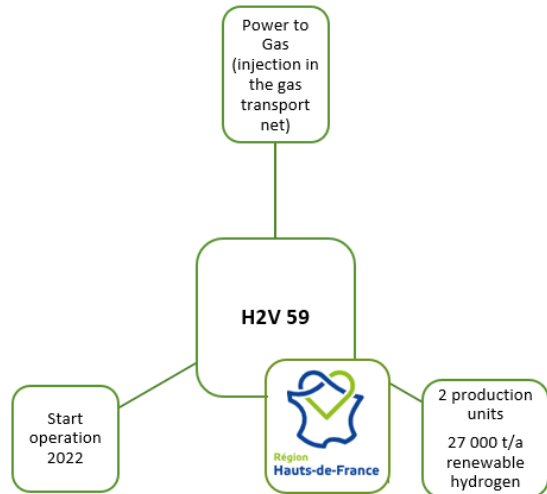
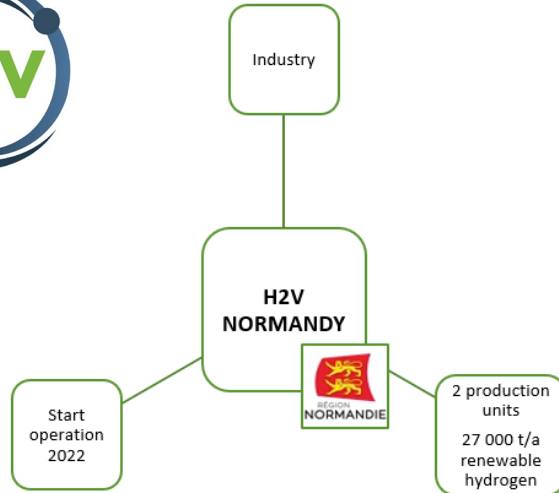




Hydrogen
Europe

H2V NORMANDY & H2V59

H2V Normandy/H2V59 – General project idea

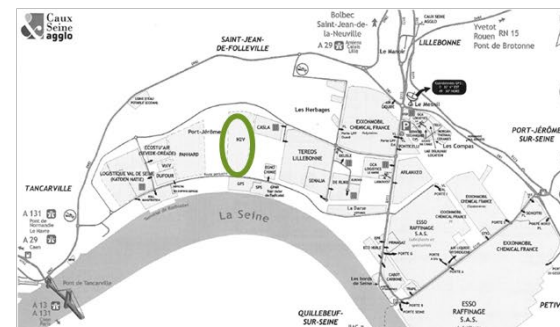


- **The goal of H2V NORMANDY** is to provide green hydrogen to industries already consuming fossil-based hydrogen in their processes. The replacement of one by the other would allow these manufacturers to reduce their greenhouse gas emissions .H2V NORMANDY will also supply green hydrogen for future industrial applications and mobility.
- **The goal of H2V59** is to inject hydrogen produced by H2V59 into the natural gas transmission network. Given the current gas flow at the injection point, the hydrogen injected with represent less than 2% of the natural gas transported in this network and will not negatively impact the current natural gas users. With H2V59 there is proportionally less CO2 released into the atmosphere during the combustion of the mixture.
- **Description of each plant :** Alkaline electrolysis under pressure: 200MW
H2 compression: 100 bar - Water treatment: 90 M3 / h
- **TRL 7-8**
- **Level of Innovation:**
 1. Scale
 2. Amount CO2 abatement
 3. Industrial interfaces
 4. Energy management

H2V Normandy/H2V59 – Project location



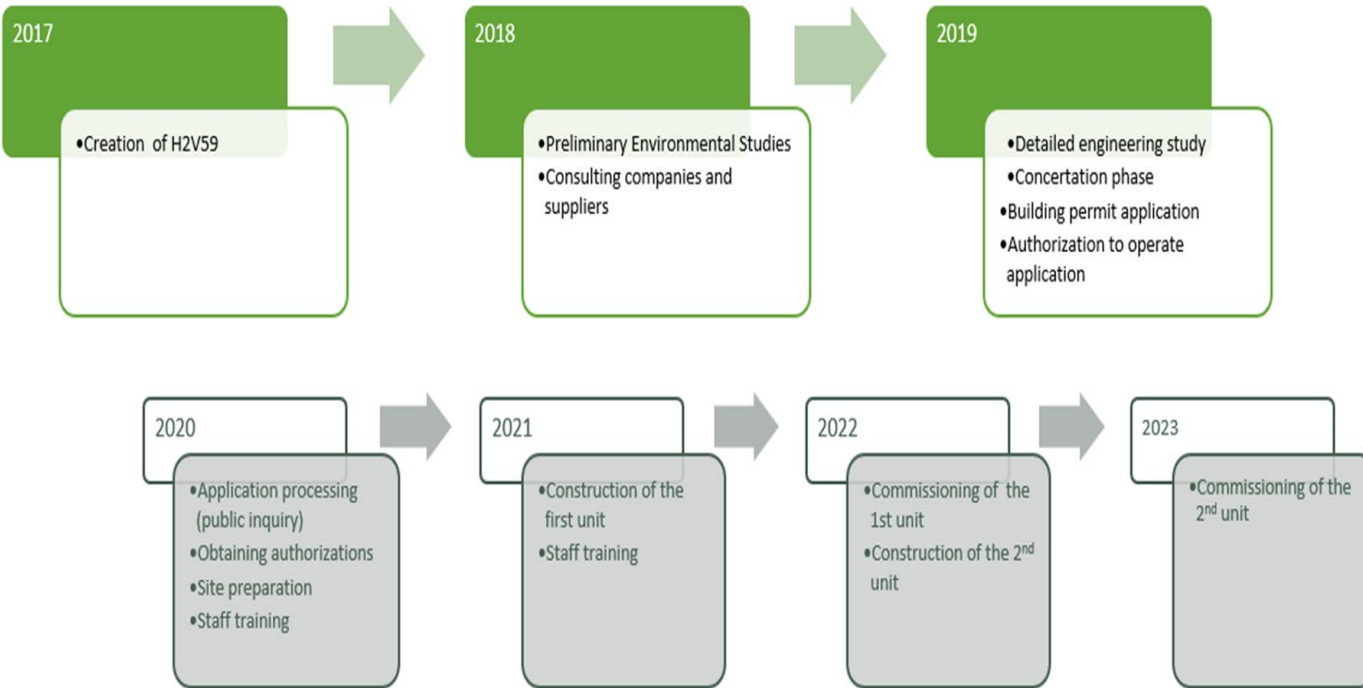
The land identified for the project is located in the Normandy region, in the department of Seine-Maritime, in the municipality of Saint-Jean-de-Folleville, between Rouen and Le Havre. The owner is the Agglomeration Community Caux Seine Agglo. **The site is at the heart of the Port Jérôme industrial zone.** The promise of sale of this land was signed by H2V INDUSTRY and the agglomeration of Caux Valley Seine in June 2018.



The land identified for the project is located in the region of Hauts-de-France, in the Nord department, in the town of Loon-Plage, near Dunkerque and Grande-Synthe. The owner is the Grand Port Maritime Dunkirk (GPMO).



H2V Normandy/H2V59 – Budget and maturity



H2V Normandy

❖ Eligible cost: 280M€

- Capex: 240 M€
- Opex: estimated 40M€ (10-year net present value of extra power cost vs. clean SMR natural gas cost)

H2V 59

❖ Eligible cost: 300M€

- Capex: 240 M€
- Opex: estimated 60M€ (10-year net present value of extra power cost vs. clean natural gas cost)

The image shows two horizontal banners for public consultation (concertation) on the H2V project. Both banners feature the H2V logo and the Aie (Agence Intercommunale de l'Énergie) logo.

Left Banner (H2V Normandy):

- Text: "Concertation sur le projet d'usine de production d'hydrogène vert et son raccordement électrique à Saint-Jean-de-Folleville"
- Text: "INFORMEZ-VOUS... DONNEZ VOTRE AVIS SUR LE PROJET, VOTRE AVIS COMPTE !"
- Text: "DU 16 SEPTEMBRE AU 20 NOVEMBRE 2019"
- Text: "h2vnormandy-concertation.net"

Right Banner (H2V59):

- Text: "Concertation sur le projet d'usine de production d'hydrogène vert et son raccordement électrique à Loon-plage"
- Text: "INFORMEZ-VOUS... DONNEZ VOTRE AVIS SUR LE PROJET, VOTRE AVIS COMPTE !"
- Text: "DU 16 SEPTEMBRE AU 20 NOVEMBRE 2019"
- Text: "h2v59-concertation.net"

H2V Normandy/H2V59 – Impact



H2V NORMANDY



❖ CO2 saving:

- Each ton green H2 replaces SMR produced H2 thus saves 10tCO2
- Over the lifetime this project will save around 5,5Mt CO2

❖ CO2 abatement cost 50€/tCO2

This project address the 1st of the 4 near-term opportunities to boost hydrogen on the path towards its clean, widespread use, as identified by the International Energy Agency in its June 2019 report: The Future of Hydrogen:

“Make industrial ports the nerve centres for scaling up the use of clean hydrogen. Today, much of the refining and chemicals production that uses hydrogen based on fossil fuels is already concentrated in coastal industrial zones around the world [.]”

For western Europe alone this objective represents more than 7 Mio t H2 or 50 to 70GW of clean hydrogen production facilities

H2V 59



❖ CO2 saving:

- Each ton green H2 replaces 39MWh (HHV) natural gas thus saves 7,22tCO2
- Over the lifetime this project will save around 4Mt CO2

❖ CO2 abatement cost 75€/tCO2

This project address the 2nd of the 4 near-term opportunities to boost hydrogen on the path towards its clean, widespread use, as identified by the International Energy Agency in its June 2019 report: The Future of Hydrogen:

“Build on existing infrastructure, such as millions of kilometres of natural gas pipelines. Introducing clean hydrogen to replace just 5% of the volume of countries’ natural gas supplies would significantly boost demand for hydrogen and drive down costs.”

For EU alone this objective represents around 25 bcm clean H2 or 15 to 25GW of clean hydrogen production facilities