



Local Energy – Positive Impact

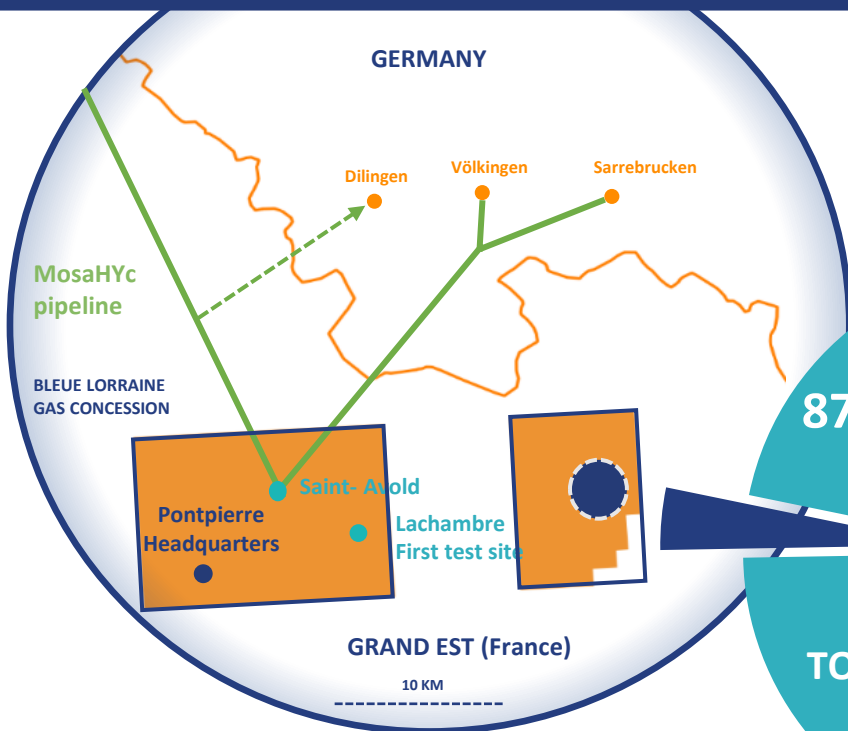
Hydrogen development strategy in Lorraine

March 7th 2024

Developing the leading negative carbon energy producer	> 3,5 Million tons of CO2eq emissions currently avoided annually*
Present on all key sustainable energies	Power – Gas – H2 - Heat
With a pan European footprint	Producing in 4 countries: France – Belgium – Norway – Bosnia C. 50 staff members in 5 locations
Trusted by Tier 1 Partners	World Class clients : Engie, EDF, Gazel... Strong financing partners: Rothschild AM, SocGen, BPI, ING Stable shareholders (Allianz, Amundi, Arbevel, HSBC...)
On track to achieve its FY26 objectives	On track to achieve over 100 M€ of revenues and 50 M€ of EBITDA by FY 2026

** 1,4 Million tons are certified - Sources: 2019 Ineris certification updated with a Global Warming Potential of 82,5 (AR6 – IPCC) and including the Béthune and Avion 7 site (FDE extrapolation), 2022 Polytechnic University Mons study*

FOCUS ON THE LORRAINE DEVELOPMENT...



■ Bleue Lorraine Concession (100% FDE) – valid until 2040

87 billions m³ of gas resources

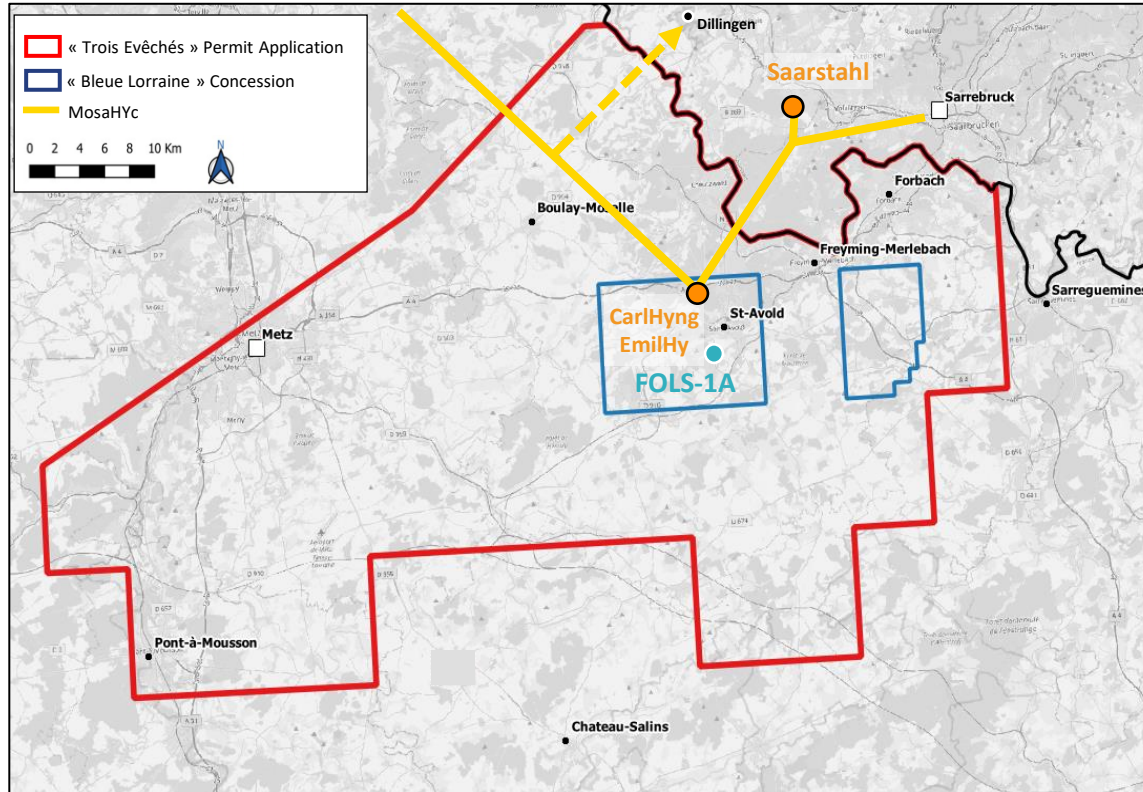
TO BE CONVERTED INTO LOW CARBON H2

Valorisation options

-  **H2** *Hydrogen*
-  **Gas**
-  **Power**
-  **Heat**
-  **CO₂ Storage**



1 – Certified Contingent Ressources (2C) Bleue Lorraine, and surrounding areas (MHA, 2018)



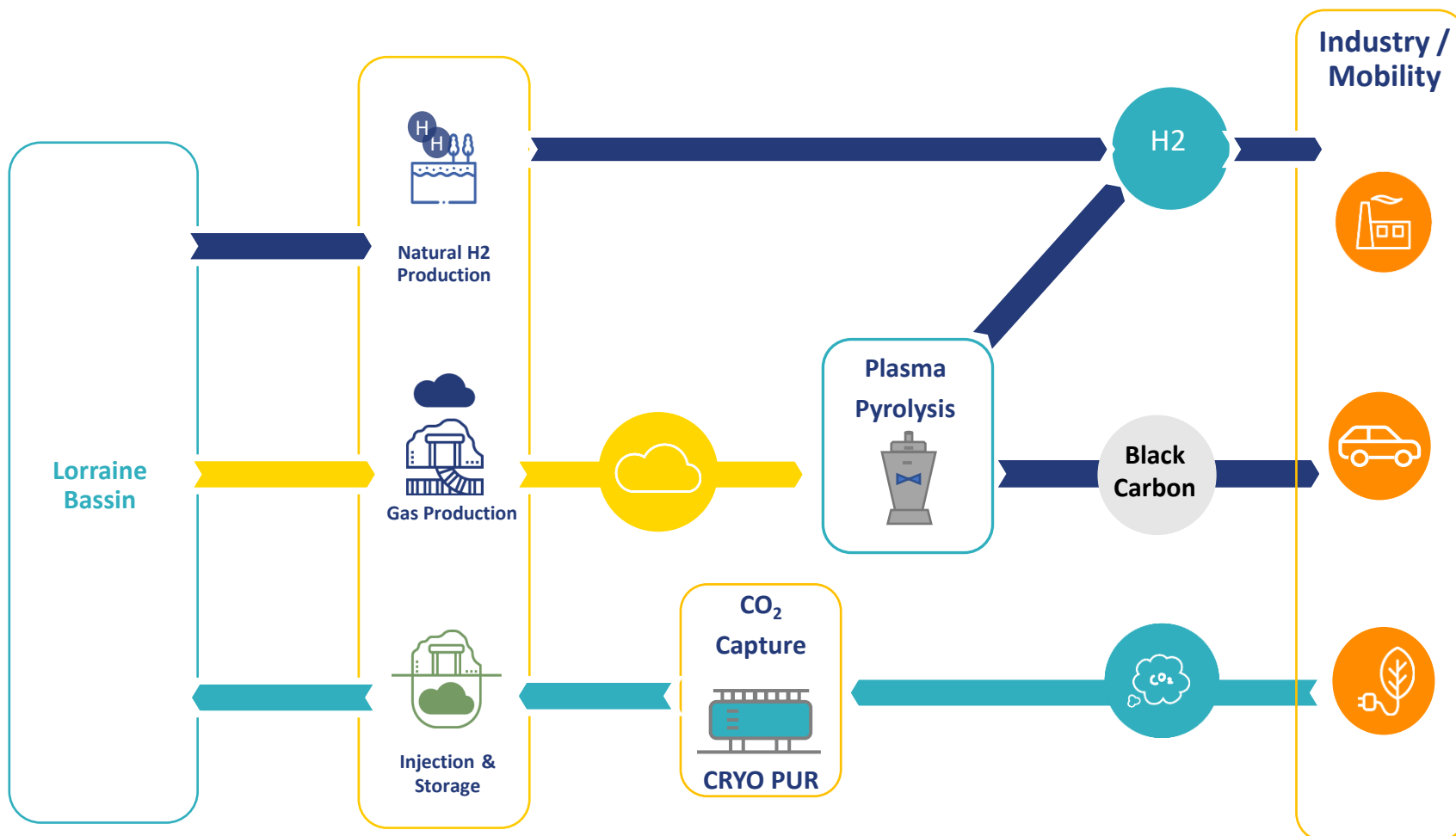
- ◆ Significant discovery made in Folschviller (FOLS-1A)
- ◆ Application for the « Trois Evêchés » permit (>2000 km²) submitted to secure the licence
 - Evaluation of potential
 - Pilot well
 - Production test and certification
- ◆ New consortium REGALOR II with planned appraisal program
 - FDE
 - Academic partners (universities, research labs)
 - Institutional partners (national surveys, research centers)
 - Industrial partners (listed companies, SME)

- ♦ Strategic location: **5 km away from the the MosaHYc** (Moselle Saar Hydrogen Conversion) pipeline
- ♦ Integrated into the Grande Region Hydrogen (GRH) initiative to **develop a hydrogen ecosystem in the Grande Région**, including Saarland (Germany), Lorraine (Grand Est) and the Grand Duchy of Luxembourg where large H2 consumers are operating
- ♦ Consumption of H2 (excluding grey H2) is estimated to reach **20 billion tons by 2030** representing a market in excess of EUR 60 billion according to EU commission

- ♦ Positioning black carbon as an **added value by-product**
- ♦ Market for black carbone is estimated to EUR 11 billion and includes the following industries* :
 - ♦ Tyres (67 %)
 - ♦ Rubber (25 %)
 - ♦ Paints, surface treatments, inks, etc. (8 %)

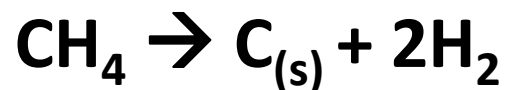
* Etude Enerka, 2019

A KEY PROJECT FOR THE REGION AND AN EXAMPLE FOR EUROPE



1st axis: Developing low carbon hydrogen

- ◆ 15 years of work - Nearly €50 million invested by FDE
- ◆ Important gas resources present in Lorraine coal: c. 87 billion m3 (2C)
- ◆ 42 production sites identified on the Bleue Lorraine concession granted in 2023
- ◆ Objective: **Replace imported energy with a low carbon H2 production**



Plasma Pyrolysis

- ◆ Technology under development
- ◆ Produces carbon **black/graphene** as by-product
- ◆ **No CO₂ production**
- ◆ Potentially competitive production cost compared to green H2

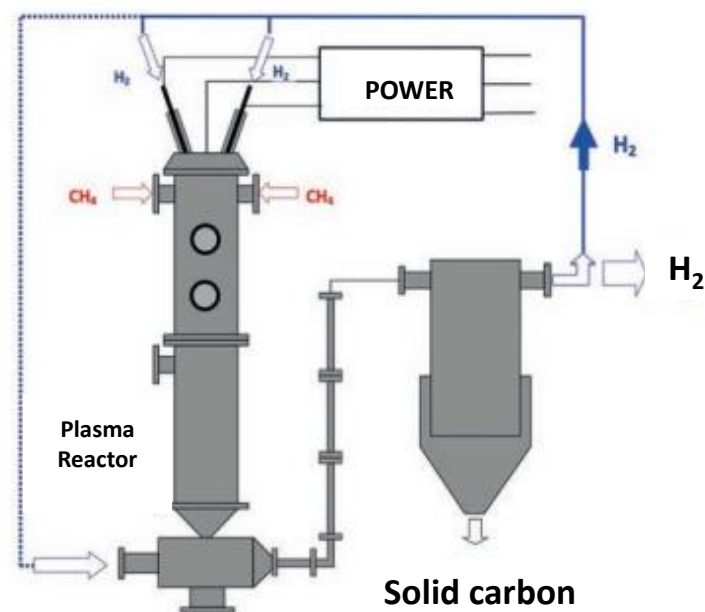


Illustration of a thermal plasma pyrolysis process

2nd axis: Developing natural hydrogen

- ◆ 6 years of work in partnership with the University of Lorraine and the CNRS and the support of the Region and the State (State-Region Pact) - Nearly €5 million invested by FDE
- ◆ Very high natural H₂ concentration: 6.8% measured at 808m depth, 15% measured at 1093m
- ◆ Objective: **Set up local production of natural hydrogen**

3rd axis: Developing CO₂ capture to decarbonize industries and combine with H₂

- ◆ 6 years of work in partnership with the University of Lorraine and the CNRS and the support of the Region and the State (State-Region Pact) - Nearly €5 million invested by FDE
- ◆ Significant CO₂ storage capacity demonstrated in the laboratory in Lorraine coal and possibility to enhance CBM
- ◆ Possibility to develop E-fuels

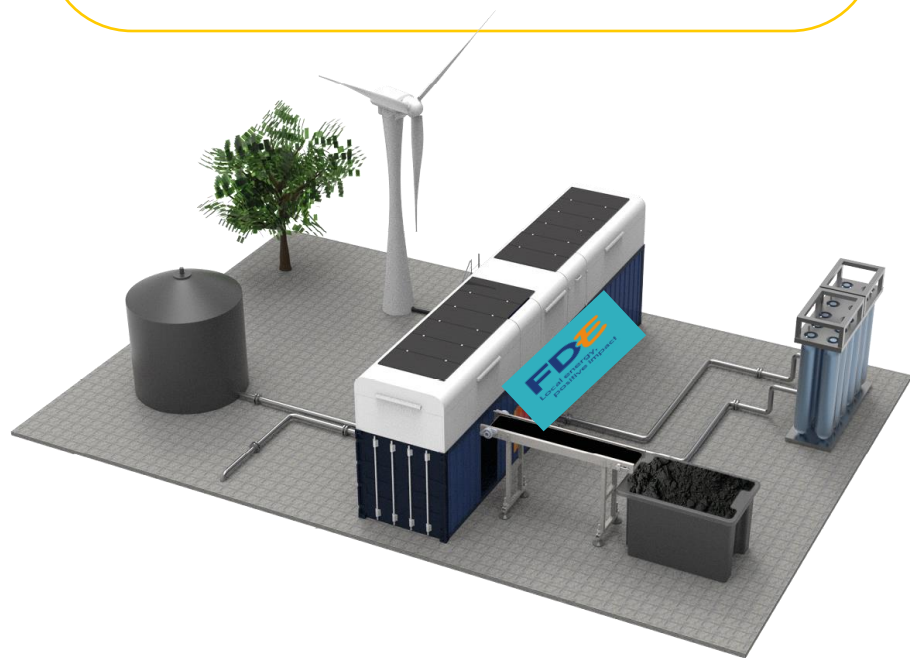
IMPLEMENTATION OF A UNIQUE CIRCULAR ECONOMY

PLASMA PYROLYSIS

- Production of black carbon – no CO₂ emission
- Within the existing regulatory framework**
- Modular approach / upscaling
- Opportunity to create additional value selling black carbon
- No competitor onshore Europe

Replicating the cogeneration business: Modular and replicable

- Limited exposure for FDE: each selected site meets economical criteria
- Industrial approach: standard module**
- Ability to replicate** during ramp-up phase

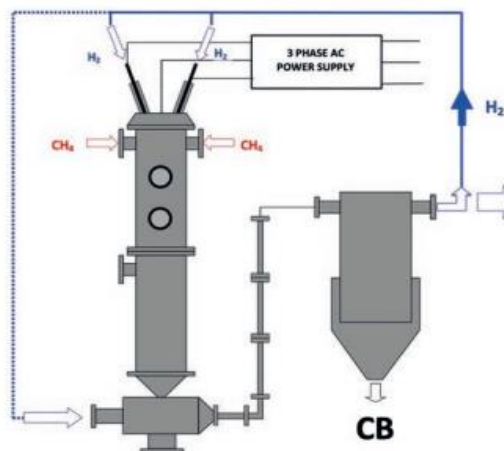




Total CAPEX
28 M€

OPEX AND LOCAL TAXES

2,3 M€ /year



ANNUAL PRODUCTION

680,000 kg H₂

ANNUAL REVENUES

4,2 M€

2,200 Ktons black carbon

2,6 M€

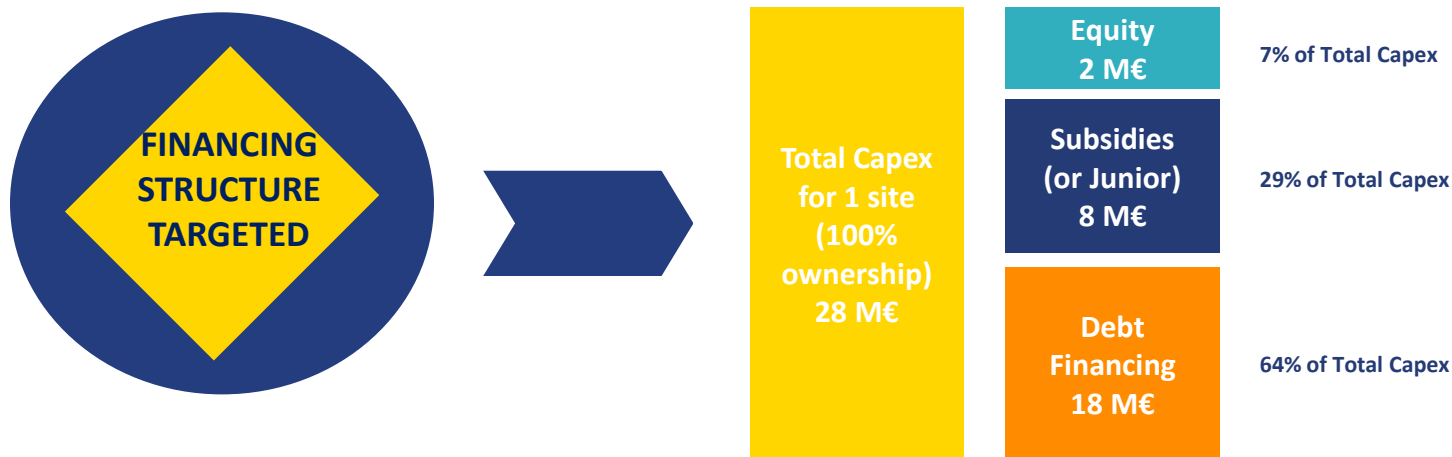
PAY-BACK

< 7 years

IRR

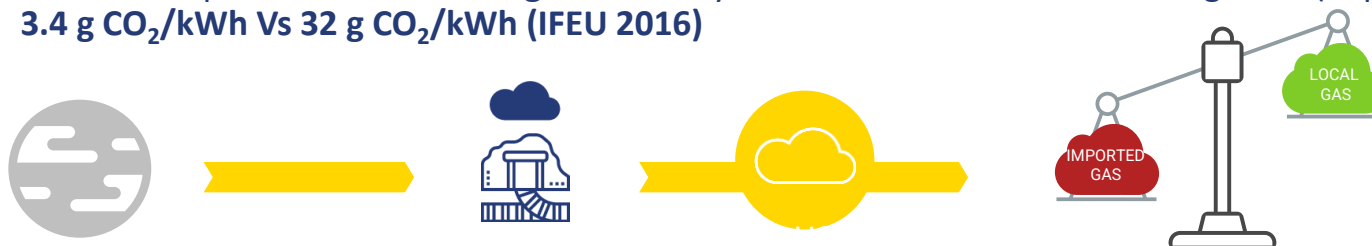
> 10%

Minimum 2 to 4 Sites to be installed each year during 14 years

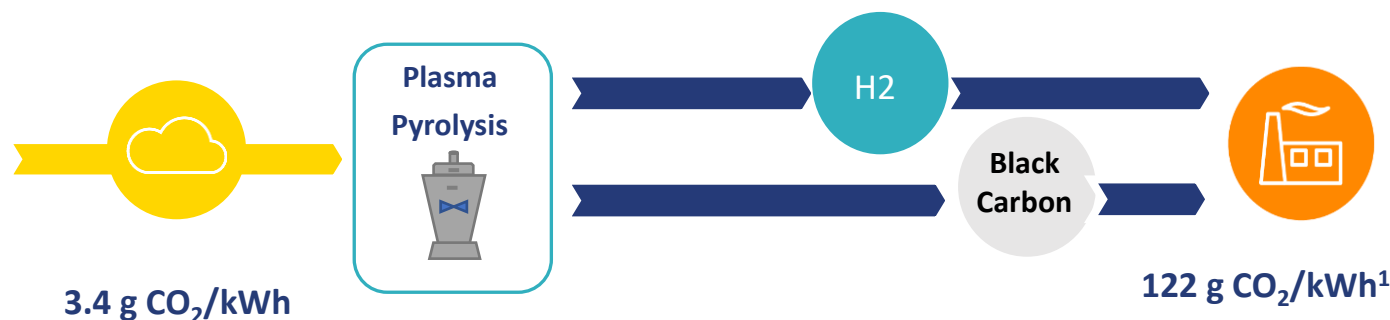


- ◆ **1 site total CAPEX requirements of c. 28 M€** (including gas access, construction, civil engineering, storage, transport, etc)
- ◆ Ring- fenced **project finance / offtake prepayment** for the decarbonated H2 production:
 - Gearing c. 65% => **c. 18 M€ debt**
 - Tenor 10 years+, depending on duration of the offtake
 - Current discussions with lending institutions: appetite for up to 100 M€
- ◆ Junior financing also available
- ◆ Subsidies, including European Commission Innovation Fund: can finance between 30% and 60% of the total budget related to H2 until 2027 => **c. 8 M€ minimum subsidies**
- ◆ Currently 100% asset ownership: partnership discussions with H2 technology providers and offtakers

- Carbon footprint of the **Lorraine gas** is already **10 times lower** than the average mix (importation): **3.4 g CO₂/kWh Vs 32 g CO₂/kWh (IFEU 2016)**



- Providing H₂ and black carbon to end consumers instead of natural gas will **divide by 2** the end user **carbon footprint** (122 g CO₂/kWh Vs 208 g CO₂/kWh¹)



¹ Assuming individual gas furnace, 50 km of transportation for H₂, and the following references for GES calculations
Sources:

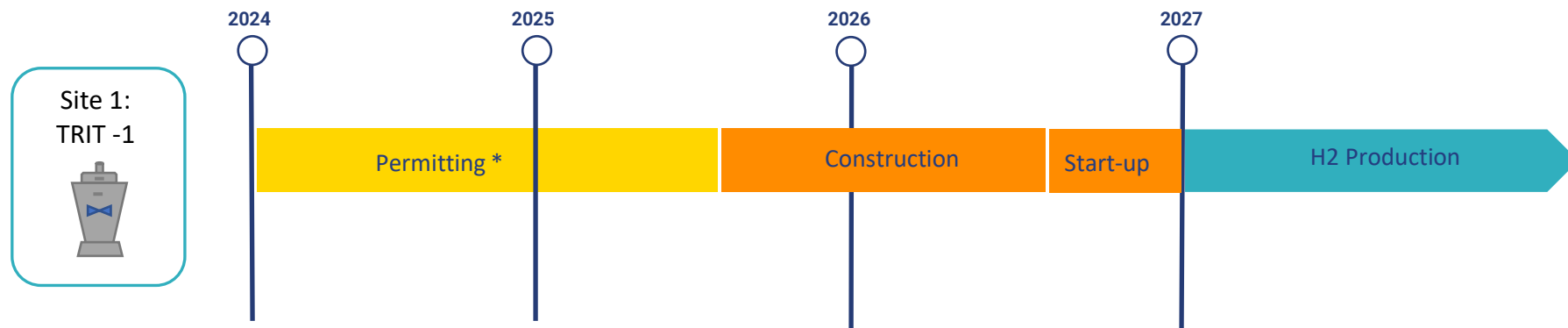
GRDF: Bilan carbone transport (distribution) gaz

GES Cycle de vie gaz naturel (<https://base-empreinte.ademe.fr/documentation/base-carbone?docLink=Gaz>)

GES pneus Source : Plan de vigilance Michelin 2020

<https://www.notre-environnement.gouv.fr/themes/climat/les-emissions-de-gaz-a-effet-de-serre-et-l-empreinte-carbone-ressources/article/les-emissions-de-gaz-a-effet-de-serre-du-secteur-des-transport>

ROADMAP TO H2 PRODUCTION



* Authorisations for Drilling / Re-entering wells:

- ✓ Conversion of these autorizations for the production lease requested (few months procedure) + ICPE autorisation (1 year procedure);
- ✓ New drilling/exploitation autorizations to be obtained (few months for preparation and 1 year procedure)

FY 2026 TARGETS

> 100 M€
annual revenues

EBITDA
> 50 M€

> 10 M
tons of CO₂_{eq}
emissions
avoided per
year



KEY CORPORATE INFORMATION (as of 6th of March 2024)

Listing	Euronext Paris
Share price	€42,15 / share
Shares outstanding	5,2 M
Market capitalisation	217 M€
Ticker	FDE



SELL SIDE COVERAGE

✓ BUY

Target Price: €67

November 2023

Analyst: simon.jouck@ha-ib.de



HAUCK & AUFHÄUSER
PRIVATBANK SEIT 1796

✓ BUY

Target Price: €72

November 2023

Analyst: vnikolova@midcapp.com



✓ BUY

Target Price: €65

November 2023

Analyst: anis.zgaya@oddo-bhf.com



ODDO BHF

✓ BUY

Hannam&Partners

Target Price: €129

November 2023

Analyst: anish@hannam.partners

FDE

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