



Shaping the new era of renewable gases towards the decarbonization of our network

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1st Hydrogen & Green Gases Forum

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DESFA is expected to progressively develop the pipeline infrastructure to connect to the H2 backbone

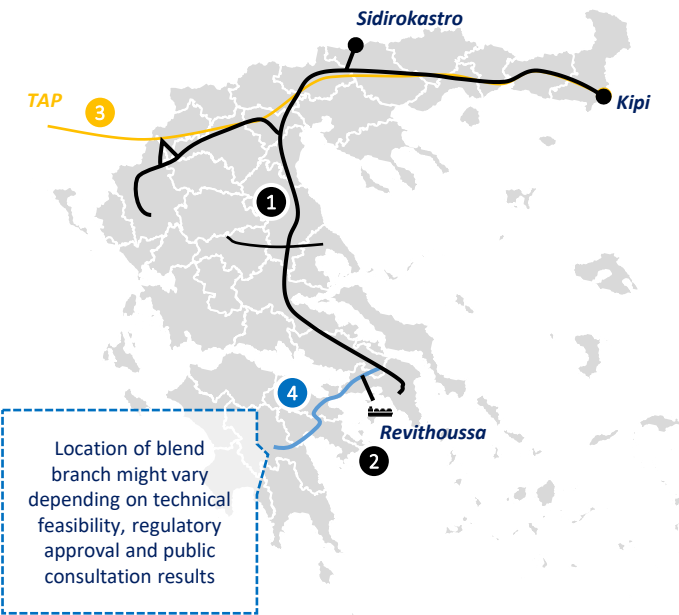


INDICATIVE

Network evolution

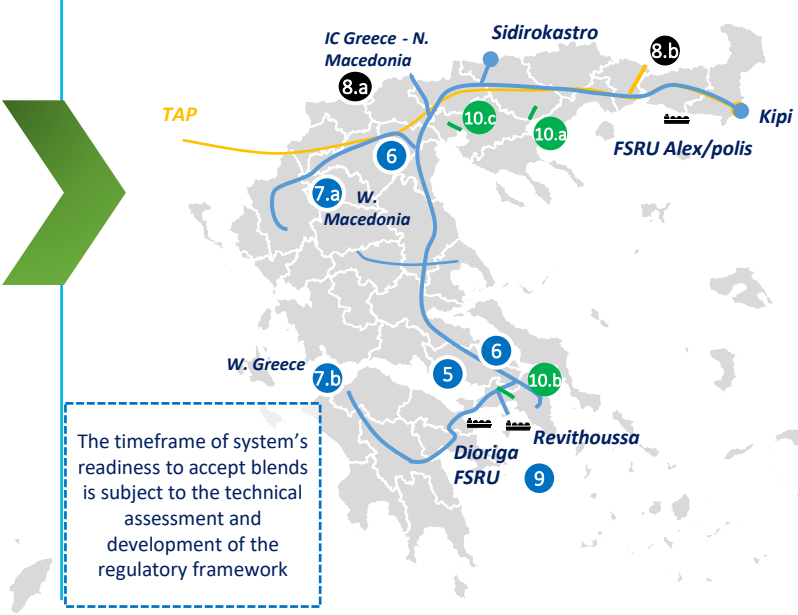
Natural Gas with blend pilot

- 1 NG pipeline to serve power gen. and final consumption
- 2 LNG terminal active in Revithoussa
- 3 TAP connection for NG with other European networks
- 4 Potential blend-ready branch



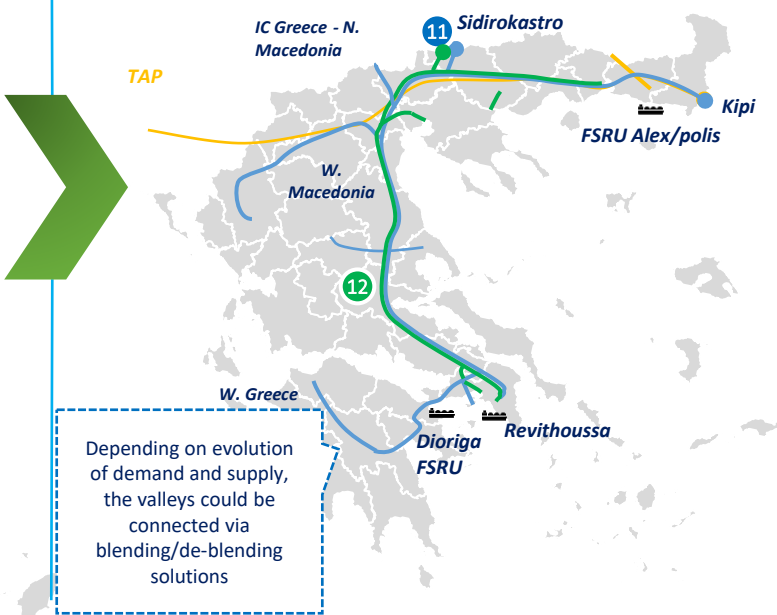
Blending and H2 valleys

- 5 Main pipeline capacity increase with parallel blend (100% H2 ready)
- 6 Distributed Injection ports for blending
- 7 W. Macedonia (a) and W. Greece (b) NG branch (H2 ready)²
- 8 NG exit points in N. Macedonia (a) and IGB (b)
- 9 FSRU in Dioriga
- 10 Local H2 valleys in Kavala (a), Elefsina (b) and Thessaloniki (c)



Dual system parallel

- 11 Hydrogen blending also for Export
- 12 Conversion of parallel pipeline to H2



Notes: ¹Total potential distance between RES and industrial sites
Source: Google maps; Strategy& analysis



Assessing the H2 Readiness of our network

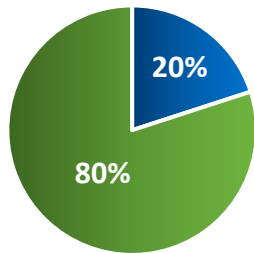


DESFA in cooperation with SNAM analyzed the readiness of the existing network to accommodate H₂ blends up to 10%. The study included gap analysis and cost estimation for the necessary modifications.



1,466 km

High Pressure Pipeline



- desfa pipeline network capable to transport 100% H2 without derating or testing
- is suitable for up to 10% blends (due to material grades; blends ≥ 10% H2 require the application of ASME B 31.12)



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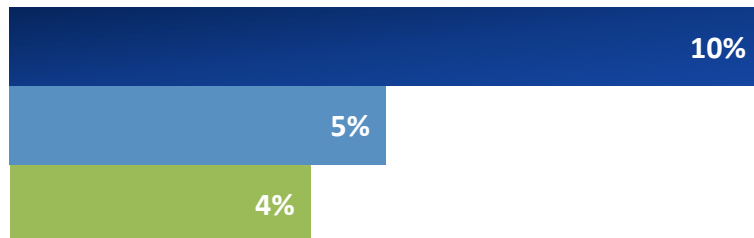
Metering & Regulating Stations

- Metering Station materials suitable for blends up to 10% H2.
- Gas Chromatographs & Flow Measurement Equipment require replacement (depending on brand & model).



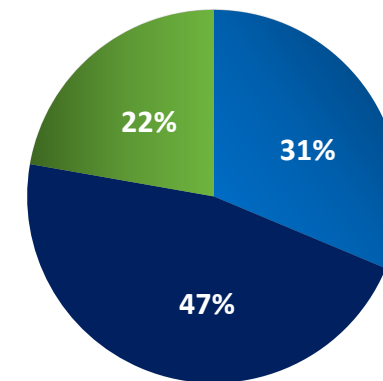
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Compression Station



- Functionality of Turbines and Compressors
- Material compatibility (Turbines)
- Material compatibility (Compressors)

€35M⁽¹⁾



- Compressor Station
- Pipeline & BVSS
- Metering Stations

(1) The cost does not include any operational works for equipment replacement on a live pipeline

Getting H2 ready

Following the H2 readiness assessment certain important actions need to be implemented:

Collaboration with OEMs
for detailed analysis

Participation in HORIZON and other
Innovation projects

Detailed feasibility study for inclusion
of additional operational costs

Assessment of technical feasibility of
blending for DSO and other final users

Additional engineering studies for DESFA
existing infrastructures (incl. testing)

Road Map for H2 readiness $\geq 10\%$

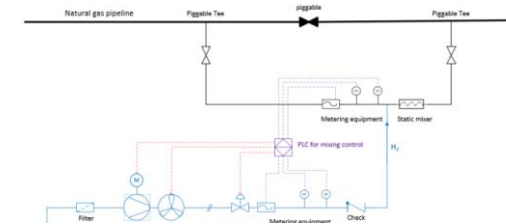


Feasibility studies – H2 Injection

Project partner: ILF engineering

☐ Studies on the injection of Green H2 & high purity produced H2 into NNGS

➤ Injection Station Design / Injection point selection

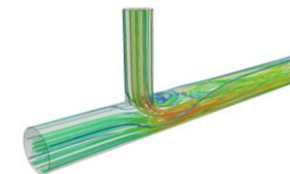


Flow Simulation Model – H2NG blend

Project partner: National Technical University of Athens

☐ Development of a H2 flow simulation model scenario

➤ Evaluation of H2 concentration levels & homogenization



Building the first 100% H2-ready pipeline in Greece & one of the first at an EU level



- All the new pipelines that we are constructing are already **fully H2 certified**, while all new **Compressors Stations** are designed to accept up to **20% blending** of H2 in natural gas.
- The **High-Pressure Pipeline to West Macedonia**, that is currently under construction by DESFA, will be the **1st pipeline in Greece and one of the first in Europe** which will be compatible with the transport of hydrogen by up to 100%.



Creation of an integrated hydrogen ecosystem & attraction of green investments to the areas



Positioning the regions at the heart of Greece's new, green energy system



Forming key parts of DESFA's planning for the gradual development of the Greek H2 network



DESFA's initiatives, participations & ongoing projects for building up the Greek & regional H2 value Chain and acting as an enabler of a more sustainable energy future



DESFA's steps towards the concrete implementation of the Biomethane value chain in Greece



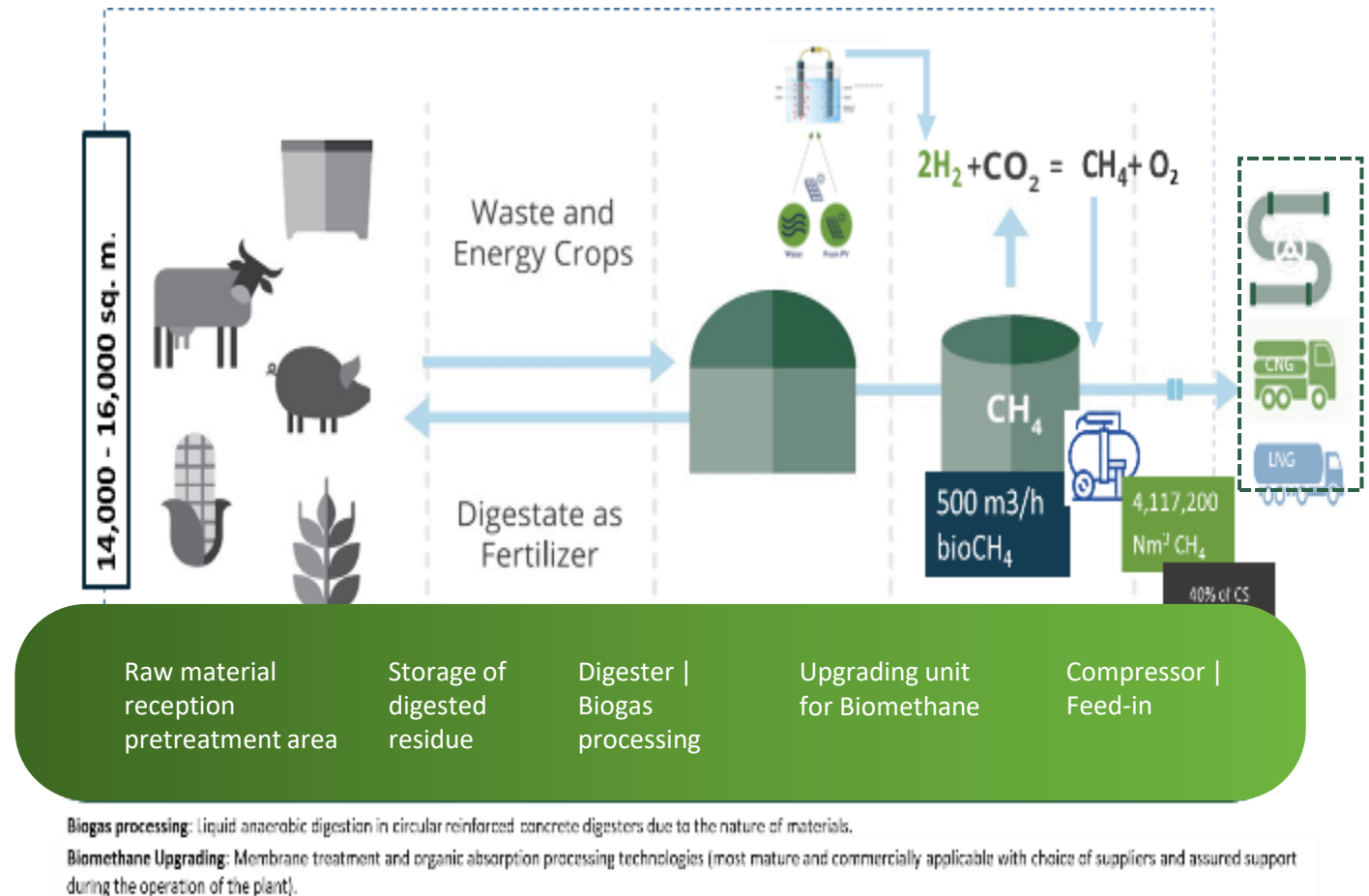
DESFA is assessing the opportunity to develop a biomethane pilot project for its own consumption purposes, namely, to cover the operating gas needs for our, existing & new, compressor stations.

Why Biomethane?

- ✓ At the epicenter of the **REPowerEU Plan** & **green energy transition**; already mature market in other EU countries
- ✓ Epitome of **circular economy**
- ✓ **Domestically produced gas** contributing to enhanced security of supply

Opening the Greek Biomethane Market

- ✓ **Cooperation Agreement** with major players with significant know-how in the Greek market, such as **Ergoplanning & Polyeco** for the **development of a Biomethane Pilot Project**
- ✓ Support for the **development of the necessary regulatory framework in Greece**





Thank you