



Enabling a Sustainable Energy Future for Greece

The hydrogen era: The transition to a net zero economy

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δesfa at a crossroad of new routes & initiatives



δesfa's 10YDP - €500 M within the next 5-year period

1 HP Pipeline to Western Macedonia
Shareholders: δesfa

2 HP Pipeline to Western Greece
Shareholders: δesfa

3 Interconnector Greece – North Macedonia
Shareholders: δesfa -NER

4 Small Scale LNG Jetty & Truck Loading Station



5 FSRU Alexandroupolis:
Shareholders: Gastrade

6 Dioriga Gas
Shareholders: Motor Oil 100%

7 Interconnector Greece – Bulgaria (IGB):
Shareholders: DEPA, Edison, BEH

8 Trans Adriatic Pipeline (TAP)
Shareholders: BP, Socar, Snam, Fluxys, Enagás, Axpo

9 UGS South Kavala
Expression of interest to participate in the tender

Participations

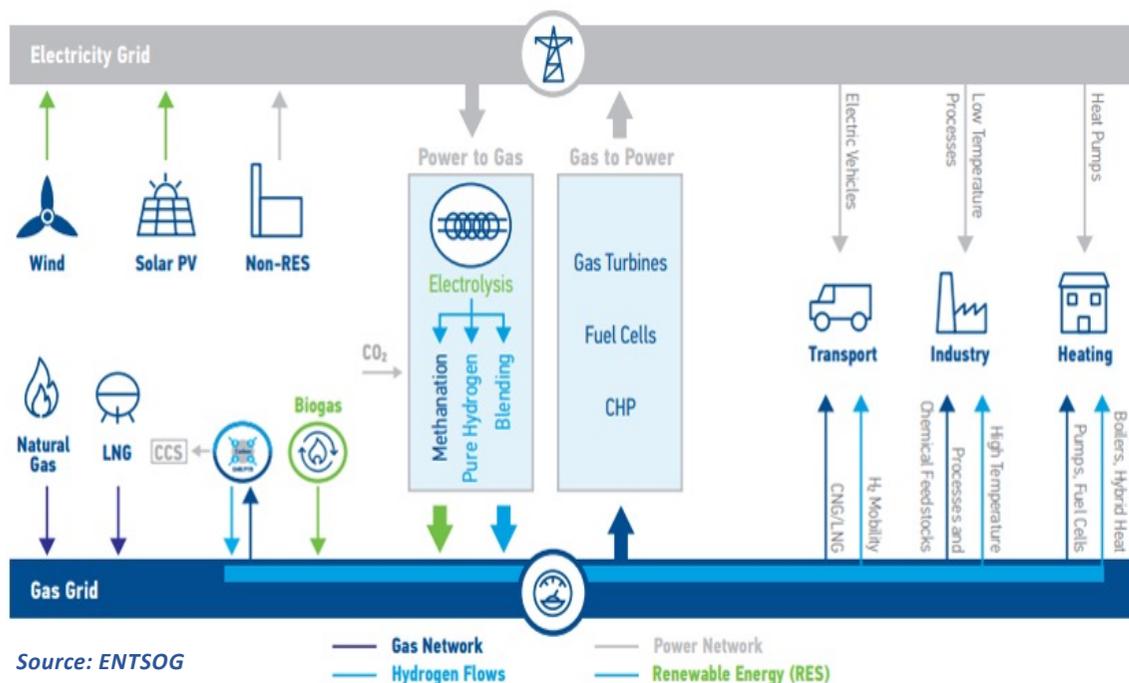
Other developers

Tender

A low-angle, upward-looking photograph of a dense bamboo forest. The bamboo stalks are tall, slender, and light-colored, creating a strong sense of verticality. Sunlight filters through the lush green canopy at the top, creating a bright, dappled light effect. A few larger, darker trees are interspersed among the bamboo. A semi-transparent blue rectangular box is overlaid in the center of the image, containing white text.

**Driving towards a Decarbonized Future:
Preparing The Network for Renewables**

Energy Transition will be based on green power and decarbonized gases



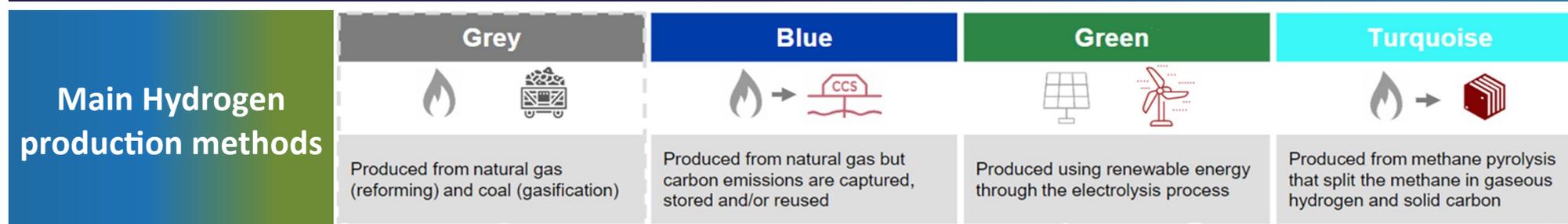
EU Green Deal: net zero by 2050

- The pathway to **net zero** requires **fast and sustainable development of both clean power production and new renewable gases technology** to gradually substitute today's fossil fuels.
- Decarbonization of the electricity supply remains a key element towards a carbon-free system, however, **molecules will still be needed for different parts of the value chain** (e.g. balancing and storage, intensive industry, long-distance transportation, residential thermal needs).
- **Hydrogen** will stand as a key renewable gas (along with **biomethane** and synthetic fuels) and play an important role in the energy transition, as it is a valuable energy source that can be **produced sustainably and distributed widely**.

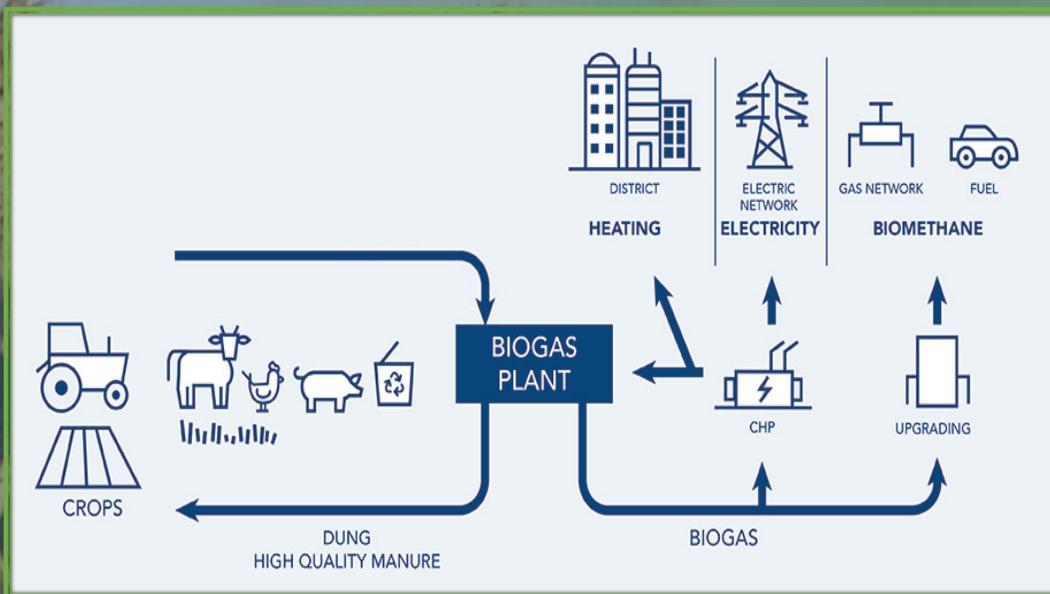
δesfa aims to become an essential driver of tomorrow's energy systems, promoting renewable gases and power & gas sector coupling

Hydrogen is gradually becoming a part of the clean-energy mix for a sustainable and affordable energy future

- Hydrogen is the **cleanest possible, totally non-polluting fuel**, that can be used to store, move, and deliver energy produced from other sources. It has **potential uses in various end-use sectors**, including industry, transport, power and distributed energy.
- Hydrogen is already used today** in specific sectors, most of it being produced directly from fossil fuels –natural gas, coal and oil, however the **rapid technological progress** in the field is leading to multiple other ways of producing it.
- Especially the **production of hydrogen from the water electrolysis using RES (green hydrogen)** is assumed to be the cleanest method by converting renewable energy to a storable and total carbon-free fuel.
- Existing natural gas infrastructure could transport blends of hydrogen**, providing a solid first step for the development of the market and connecting hydrogen production sites with potential demand **until dedicated (or repurposed) hydrogen pipelines are required**.



Biomethane is a fully renewable, flexible and efficient energy source, which is produced from biogas upgrading units.



Biomethane can contribute to **emission reduction** targets by **leveraging existing gas networks** and **increasing domestic methane production**.

This perspective would also have a **positive impact on the agri-food sector**, promoting an economic model based on sustainability and resource-friendliness, which at the same time **significantly strengthens local economies**.

Exchange of best practices between **desfa** and its shareholders:

- ✓ Preparation of pilot projects
- ✓ Cooperation with stakeholders in the country

Biomethane is produced in two stages:

1

Production of raw biogas - mainly through anaerobic digestion of biomass

2

Removing incompatible components (CO₂), a process also known as "upgrading".

Energy Transition: δesfa driving towards a decarbonized future for the Greek energy market



Through this initiatives, δesfa aims to:

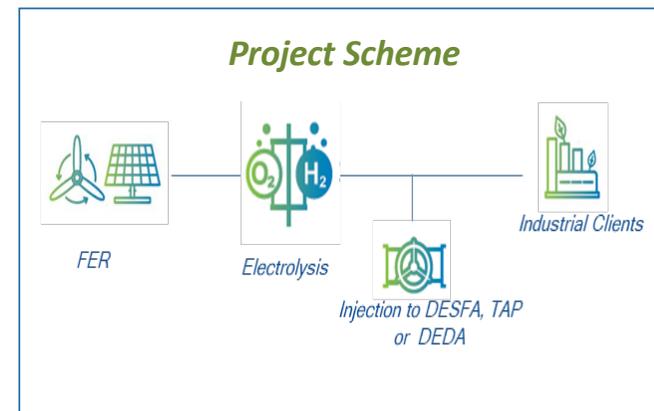
1. Contribute to the **design of national H2 strategy** and **engage in the discussion regarding the ongoing developments on an EU level**
2. **Define and promote δesfa's role in the context of the European and Greek Hydrogen strategy**
3. Assess the **readiness of our system's capability to accept hydrogen volumes**
4. **Identify and prioritize business opportunities over the next years**
5. **Identify and prepare pilot hydrogen and biomethane projects**

Desfa's IPCEI proposal: participation in the "White Dragon" cluster project



Rationale

- **West Macedonia**, the region with **most intensive use of lignite in the country**, is looking for new sustainable production model, with a **production of H2 from solar panels**
- White Dragon cluster project foresees **green GW-scale PV electricity production to fill the gap from the decommissioning of the lignite power plants**, while the **excess electricity will be used for the production of green H2**
- The **produced green H2 will be partly converted into dispatchable electricity and heat by HTFC**, and **partly transported towards large hydrogen consumers of the country**



...Project to support the kick-start of H2 in Greece

- **Preparation of existing infrastructure for hydrogen mixing & transport**
- **Development of hydrogen transport system**

Desfa's project

1st phase:

- Comprehensive assessment and gap analysis of the NGTS to accept and transport H2 blends.
- Injecting of excess H2 produced (White Dragon project) into the W. Macedonia pipeline - Quality control and reverse flow design to main transmission system.

2nd phase:

- Adaptation measures for H2 blending; possible temporal de-blending solutions for high capacities.
- Detailed market assessment for production, consumption and storage of H2 potential.
- Design of a dedicated hydrogen pipeline, based on the assessment results and in line with the regulatory framework.

3rd phase:

- Construction of dedicated H2 pipeline, connecting the industrial clusters of Athens, Corinth, Thessaloniki, Kavala fertilizer company and storage site; Potential interconnections to west and east Balkan.

The logo for DESFA, featuring the Greek letter delta followed by the lowercase letters 'esfa' in a bold, white, sans-serif font.

desfa

Thank you

www.desfa.gr