Gas exchange development in Greece - Update

16th Energy Community Gas Forum

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The role of a “gas TSO” in the future energy landscape
DESFA counts 14 years of successful operation

- Established in March 2007, DESFA owns & operates the **Greek Natural Gas System (NNGS)**, which consists of the **National Natural Gas Transmission System** & the **LNG Terminal** in the islet of Revithoussa.

- DESFA has been certified as an **Ownership Unbundled Operator** under the 3rd **EU Energy Package**, following the completion of a privatization process on December 20th of 2018.

- DESFA operates, maintains & develops the Greek Natural Gas System in a safe, reliable and economically efficient way, offering:
  1) **Regulated Third Party Access services** in a transparent and non-discriminatory way &
  2) **A range of highly specialized services** to a number of national and international clients
The National Natural Gas System

<table>
<thead>
<tr>
<th>Feature</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-pressure pipelines</td>
<td>1,466 km</td>
</tr>
<tr>
<td>Dispatch Centres</td>
<td>4</td>
</tr>
<tr>
<td>Interconnections</td>
<td>53</td>
</tr>
<tr>
<td>Metering &amp; Regulation Stations</td>
<td>2</td>
</tr>
<tr>
<td>Operation &amp; Maintenance Centres</td>
<td>6</td>
</tr>
<tr>
<td>Compressor station</td>
<td>1</td>
</tr>
<tr>
<td>Exit points connected to distr. systems</td>
<td>22</td>
</tr>
</tbody>
</table>

The Greek NNGS is a “new”, high quality network which continues to develop in order to reach new areas and users, as well as to establish new interconnections with other Systems.
The growth and liberalization of the Greek natural gas market

The volume of NG imports and number of Users have been steadily increasing in recent years.

DESFA's customers include: Wholesale Suppliers | Power Producers | Big Industrial Consumers | Retailers | NG Traders
Greek natural gas market evolution

Increasing Natural Gas Demand

Natural Gas Demand Evolution 2018-21 [TWh]

- Domestic
- Exports
- 2021 2HY Projection

NG Domestic Demand Breakdown 2021 [TWh & %]

- Power Producers
- Big Industries
- Distribution Networks

Diversity of Supply Sources

2021 HY Supply Sources

- Kipi [TR]: 6%
- Sidiokastro [BG]: 45%
- Nea Mesimvria [TAP]: 18%
- Aghia Triada [LNG]: 31%

Increasing Market Liquidity at the VTP

VTP Trades vs Imports [TWh]

- Imports
- VTP Trades
- Churn Ratio

2021 HY Supply Sources

- 2018: 52.5
- 2019: 57.4
- 2020: 63.1
- 2021: 33.8

NG Domestic Demand Breakdown 2021:

- Power Producers: 20.4, 60%
- Big Industries: 7.6, 23%
- Distribution Networks: 5.8, 17%
DESFA’s Ten-Year Development Plan 2021-2030

48 projects of high added value

€540 million total budget

Large scale investments which confirm the key role of natural gas infrastructure in the energy transition, contributing to the implementation of the National Plan for Energy and Climate & the Just Transition Development Plan of lignite areas
Energy Transition will be based on green power and decarbonized gases

- 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 syngas) and play an important role in the energy transition, as it is a valuable energy source that can be produced sustainably and distributed widely.

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

EU Green Deal: net zero by 2050

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Source: Figure 5: Hybrid Energy System, ENTSOG, 2019.
Energy Transition: DESFA driving towards a decarbonized future for the Greek energy market

Through this initiatives, we aim 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 DESFA 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

Preparation of our current and future infrastructure to accept hydrogen volumes

Long term strategy study for renewable gases (to be incorporated for the first time in our Development Study)

Participation in the national hydrogen committee for the preparation of the Greek Hydrogen strategy

Participation in all the relevant discussions for EU legislative amendments (taxonomy, TEN-E, costs for hydrogen infrastructure)

Participation in the White Dragon project (IPCEI candidate)

Cooperation with relevant EU associations (Hydrogen Europe, European Hydrogen backbone, ENTSOG, GIE, Gas for Climate, etc.)
DESFA’s focus on renewable gases

- Participation in IPCEI proposal for the White Dragon cluster project
- Developing cooperation with the main energy companies for H2 projects
- Assessment of the current network regarding H2 readiness
- Updating our specifications for the expansions of the network (H2 fully compatible)
- Training Center (N. Mesimvria) to be used as an R&D center for hydrogen facilities testing
- Participation in a R&D for pyrolysis (with CERTH)
Wholesale gas market development
DESFA at a crossroad of new routes and initiatives: Regional demand patterns & strategic geographical location

**Participations**
- **W. Macedonia**: 4
- **W. Greece**: 2
- **Italy**: 4
- **Bulgaria**: 2
- **Albania**: 5
- **N. Macedonia**: 8
- **Trans Adriatic Pipeline (TAP)**: Shareholders: BP, Socar, Snam, Fluxys, Enagás, Axpo

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

**Interconnector Greece – North Macedonia**
Shareholders: DESFA

**FSRU Alexandroupolis:**
Shareholders: Gastrade

**Dioriga Gas**
Shareholders: Motor Oil 100%

**Small Scale LNG Jetty & Truck Loading Station**

**Existing lines**

**Projected lines**

**Entry points**

**Tender**
- **UGS South Kavala**
  Expression of interest to participate in the tender
Regulatory reforms, infrastructure developments, business initiatives

**DESFA Gas Hub Feasibility Study**
- **3rd rev. NC:** Foundations of the entry/exit system
- **3rd rev. NC:** Firm reverse flow capability at BG/GR IP

**Interconnection Agreement with BG**

**2015**

**2016**

**2017**

**2018**
- **4th rev. NC:** Full entry/exit system (VTP, Bal Platform, Paper Traders)
- **DESFA participation in HENEx**

**Revythoussa LNG terminal capacity expansion**
- **HENEx NG Market feasibility study**

**2019**

**2020**
- **5th / 6th rev. NC:** New capacity products / new access regime in Revithoussa
- **Completion of HENEx NG Market feasibility study**
VTP over-the-counter and balancing trades

- 65% (3-year average) of the quantities entering the system are traded before exiting.
- Traded quantities for operational balancing represent a very small percentage of the total trading volume (in line with mature trading/balancing systems at EU level).
Products:
- Within-day (D) and day-ahead (D+1, D+2, D+3)

Trading mechanisms:
- Auctions, continuous trading + registration of OTC trades

Clearing mechanism:
- Central Counter Party (CCP) through EnExClear

Entities allowed:
- Physical and paper traders (having a contract with DESFA - Users of the NNGTS)

Prices:
- Within-day spot index
- Day-ahead spot index
- Balancing gas marginal prices

Actions completed:
- Full documentation sent to NRA Mid-June 2021
- 1st stakeholder workshop 12 July 2021
- End of public consultation 21 Sep 2021

Next steps Q4 2021:
- Approval of regulatory documents
- Users’ training/certification/workshops
- Dry-runs
- Go-live

Next step: A spot gas market by DESFA and Hellenic Energy Exchange
Thank you for your attention!