Development Prospects of the Hellenic NG Market

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Structure

• EU framework
• International framework
• Size of Hellenic NG Market
• Share of DSO’s
• Projection of NG Demand
• Existing and Development of NG Infrastructure
• Prospects Development of NG market in Mainland and Island Greece
Framework of EU Targets

Natural Gas (NG) is characterized as bridge fuel towards a low carbon economy but accounts only 8% of the total energy consumption in the residential and commercial sectors in Greece.

Natural gas, as sustainable energy can help Greece to achieve reduction of GHG emissions and the EU targets (4% reduction of GHG emissions compared to 2005 levels up to 2020).

For Greece the final energy consumption discussed to be 19Mtoe of national final energy consumption, for year 2030.
Framework of International Maritime Organization

All vessels that operate outside Emission Control Areas (ECAs) will be required to use fuel oil with a maximum sulfur content of 0.5%. Beginning January 1, 2020

Up to 2050 shipping industry must to comply to net zero CO₂ emission targets

Ship-owners and operators have various options to meet the IMO sulfur cap requirements. These options include the use of compliant low sulfur fuels or alternative fuels such as liquified natural gas (LNG), liquefied petroleum gas (LPG), compressed natural gas (CNG), biofuel, solar power or fuel cells. SOx also can be controlled by using an alternative technology such as an exhaust gas cleaning system
Size of Hellenic NG market

Hellenic NG Demand 2010 -2017

Source RAE

<table>
<thead>
<tr>
<th>Year</th>
<th>Power Generation</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>15,7</td>
<td>10</td>
</tr>
<tr>
<td>2011</td>
<td>17,3</td>
<td>13,9</td>
</tr>
<tr>
<td>2012</td>
<td>15,1</td>
<td>17,3</td>
</tr>
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<td>2013</td>
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<tr>
<td>2014</td>
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<td>14,4</td>
</tr>
<tr>
<td>2015</td>
<td>14,5</td>
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<tr>
<td>2016</td>
<td>30,5</td>
<td>17,8</td>
</tr>
<tr>
<td>2017</td>
<td>35,8</td>
<td>17,8</td>
</tr>
</tbody>
</table>
Share of Hellenic DSOs

• In 2017 NG consumption in Households was increased (59%) (3.64 TWh to 5.34 TWh), and in Commercial sector was reduced by (57%) (from 2.12 TWh to 0.91 TWh).

• In Industrial sector was increased by 20% (3.48 TWh to 4.16 TWh)

Source RAE
Projection of Total Hellenic NG Demand

NG DEMAND 2019 - 2028

Source DESFA
Existing NG Distribution Infrastructure Mainland Greece

**Attiki**
- 5 City Gates
- 325 km MP network (19 bar)
- 3.200 km LP Network (4 bar)
- 106.000 End Customer
- 52/58 Municipalities are connected

**Thessalia**
- 7 City Gates
- 70 km MP network (19 bar)
- 857 km LP Network (4 bar)
- 92.000 end Customer
- 3 Remoted area supplied by (CNG)
- 11 Municipalities are connected

**Thessaloniki**
- 2 City Gates
- 131 km MP network (19 bar)
- 1.128 km LP Network (4 bar)
- 222.000 end Customer
- 3 Remoted area supplied by (CNG)
- 13 Municipalities are connected

**Rest of Greece***
- 10 City Gates
- 322 km MP network (19 bar)
- 186 km LP Network (4 bar)
- 700 end Customer
- 11 Municipalities are connected

* Sterea Ellada, Central Macedonia, East Macedonia and Korinthos

Source RAE
Development NG Distribution Infrastructure
Mainland Greece 2019-2023

**Attiki**
- 586,242 km new network
- 74,669 new end Customer
- 114,9 mil € Investments

**Thessalia**
- 138,9 km new Network
- 119,000 end Customer
- 10 new remote area will be supplied by CNG
- 36,3 mil € Investments

**Thessaloniki**
- 162,7 km new Network
- 276,000 end Customer
- 10 new remote area will be supplied by CNG
- 51,2 mil € Investments

**Rest of Greece** *
- Assignment of basic engineering study for NG supply in 13 New Municipality (CNG and SSLNG)
- Run Pilot program for new End Customer Connection
- 227,3 mil € Investments

* Sterea Ellada, Central Macedonia, East Macedonia and Korinthos

Source RAE
Development Prospects NG market in Mainland Greece

Supply Remote Areas from the existing NG network through CNG (Mother - Daughter station)

In this case, the NG operator receives the service of compression of natural gas in an installation gas compressor and carries compressed natural gas by a third party in order to the intended Remote Network to be a virtual extension of the existing Network.
Development Prospects NG market in Mainland and Island Greece

Supply Remote Areas from the existing NG network through Small Scale LNG
Development Prospects NG market in Mainland and Island Greece

Up to Sept 2021 DESFA is going to Build Pilot Station Loading LNG, on Revithoussa Terminal LNG Station

- Truck loading capacity up to 50 m$^3$ with supply loading capacity 100 m$^3$/h
- LNG metering system with bridge gauge

Source DESFA
Most of the islands in Greece today are powered by stand-alone electric power generation systems mainly by local thermal power stations, which operate on fuel oil, heavy fuel oil and light diesel, and the power plants RES.

- Nineteen (19) 'small' stand-alone systems have a peak demand of up to 10 MW.
- Eleven (11) medium-sized stand-alone systems have a peak demand of 10 MW to 100 MW.
- Two (2) "large" autonomous systems have a peak demand of over 100 MW, namely Crete and Rhodes.
Development Prospects NG market in Mainland and Island Greece

- Supply Remote Areas from the existing NG network through CNG in mainland Greece

- Supply Remote Areas from the existing NG network through SSLNG in mainland Greece and island Greece

- Installation of refueling LNG plant for vessel in island Greece under the request of IMO

Source RAE
Thank you

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