SSLNG PORTS INFRASTRUCTURE

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Poseidon Med II: SSLNG port Infrastructure
towards a new era for LNG bunkering in East Med

University of Nicosia, “UNESCO Auditorium”
October 18th 2018, Nicosia
Rogan Associates Consulting Engineers

... provides leading expertise in Harbour Master Planning, Harbour and Marina Design, Port Development, Port Strategy, Port & Sea Transportation, Coastal Engineering Studies, and Environmental Impact Studies,

... is specialized in Ports Systems and Port Strategy,

... advises clients from the public and private sector,

... has a broad Local and International Focus,

... has a dedicated team of Technical Experts,

... is based in Athens, Greece,

... offers over 40 years of combined senior Technical experience.
Rogan Associates Consulting Engineers

OUR GLOBAL EXPERIENCE
Malta LNG Regasification Terminal

Client: J&P - J&P Avax SA
Project value: 125,000,000 €

Detailed Construction Design of the Main Access Pier, the Central Loading Platform, the Breasting Dolphins, the Mooring Dolphins and the Walkway
Maritime and Industrial Area of Platiyali Astakos

Client: Astakos Terminal SA
Period: 2002 - 2006
Project value: 120,000,000 €

Project Management and Supervision
PORTS’ MISSION AND VISION

- Create economic and social values to achieve *sustainable growth*
- Enhance safety, efficiency and sustainability.
- Develop logistics chains and clusters, in both Europe and growth markets worldwide
The Importance of Maritime Transport

- Importance of Transport in the Development of the Economy
  - Trade has been the world’s main economic driver
  - Economic growth is impossible without trade growth.

- Importance of Maritime Transport
  - Only transport option
  - Cost-effective
  - High capacity

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Energy Consumption in kJ/t-km</th>
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<tbody>
<tr>
<td>Airplane</td>
<td>6900</td>
</tr>
<tr>
<td>Truck</td>
<td>2400</td>
</tr>
<tr>
<td>Train</td>
<td>410</td>
</tr>
<tr>
<td>Ship</td>
<td>79</td>
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Poseidon MED II aims to break the market based “chicken-and-egg Dilemma” with the holistic approach of all LNG Bunkering aspects.
## Table of activities

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<th>No</th>
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<td>DEPA</td>
<td>Coordination and Management</td>
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<td>2</td>
<td>HL</td>
<td>Dissemination</td>
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<td>3</td>
<td>DEPA &amp; DESFA</td>
<td>Social and Public Consultation – Awareness</td>
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<td>HL</td>
<td>Environmental, Safety &amp; Detailed Site Planning Studies</td>
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<td>7</td>
<td>RGN</td>
<td><strong>Updating of the Port’s Master Plans</strong></td>
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<td>8</td>
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<td><strong>Supporting (Baseline) Engineering Studies</strong></td>
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<td>9</td>
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<td><strong>Preliminary Engineering Design of Additional Port Infrastructure</strong></td>
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<td>11</td>
<td>RGN</td>
<td><strong>Final Construction Engineering Design of Additional Port Infrastructure</strong></td>
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<td>12</td>
<td>RGN</td>
<td><strong>Tender Documents</strong></td>
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<td>HL</td>
<td>Adaptation of Regulation and Implementation of a Regulatory Framework on LNG Bunkering</td>
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<td>Vessels Installations</td>
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<td>Pilot Case: Executive Design and Construction of an Innovative LNV Vessel</td>
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<td>Efficient LNG Supply Chain (Logistics) Activities</td>
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<td>OF</td>
<td>Sustainable LNG Pricing Patterns</td>
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Ongoing Activities (6 – 8)

Activity 6:
Environmental, Safety, & Detailed Site Planning Studies
Prepared & submitted Preliminary EIA

Activity 7:
Updating of the Port’s Master Plans
Conceptual Engineering Design of LNG Infrastructure
Submission of the Updated Master Plan to the relevant Commission (Ε.Σ.Α.Λ.) for approval.

Activity 9:
Preliminary Engineering Design of Additional Port Infrastructure

Activity 8:
Supporting (Baseline) Engineering Studies
Draft specifications for port surveys
Conduct wave & coastal studies

Activity 10:
Final Environmental and Social Impact Studies
Upcoming Activities (9 – 12)

Activity 9: Preliminary Engineering Design of Additional Port Infrastructure

Activity 10: Final Environmental Social Impact Studies

Activity 11: Final Construction Engineering Design of Additional Port Infrastructure

Activity 12: Tender Documents
### On the Designing of Sustainable Infrastructure

**Related Actions**
- Design & construction of berthing places for LNG carriers
- Quay wall, jetty, loading platform, breasting and mooring dolphins, catwalks.
- Revetment works
- Modification of land area
- Connection to local and national road networks

**Studies**
- Wave disturbance
- Geotechnical investigations
- Bathymetric & topographic surveys
- Economic Studies
- Traffic Impact Studies
- HAZID and HAZOP studies
- Navigational Simulations
- Environmental Social Impact Assessment
- Public Consultation
- Agencies and Authorities
“Sustainability Question: Is LNG the answer?”
Ports Infrastructure

Port of Patras

3 alternatives were examined
Ports Infrastructure

Port of Patras

- Master plan has been submitted
- HAZID study
- Site Visits, workshops, discussions
- Wave disturbance studies
- Maneuvering Simulation Study
- Bathymetric survey
- Preliminary Environmental Impact Study
- Preliminary Safety Study
- Conceptual design of port infrastructure
- Routes, discussions, Synergies with the City
- Multi Criteria Analysis
Ports Infrastructure

Port of Piraeus

- Addendum to Master plan has been submitted
- HAZID study
- Site Visits, workshops, discussions
- Wave disturbance studies
- Maneuvering Simulation Study
Ports Infrastructure

Port of Igoumenitsa

4 alternatives were examined
Ports Infrastructure

Port of Igoumenitsa

- Master plan has been submitted
- HAZID study
- Site Visits, workshops, discussions
- Wave disturbance studies
- Maneuvering Simulation Study
- Bathymetric survey
- Preliminary Environmental Impact Study
- Preliminary Safety Study
- Conceptual design of port infrastructure
- Routes, discussions, Synergies with the City
- Multi Criteria Analysis
Ports Infrastructure

Port of Heraklion
Port of Heraklion

3 alternatives were examined
Ports Infrastructure

Port of Heraklion

- Master plan has been submitted
- HAZID study
- Site Visits, workshops, discussions
- Wave disturbance studies
- Maneuvering Simulation Study
- Bathymetric survey
- Preliminary Environmental Impact Study
- Preliminary Safety Study
- Conceptual design of port infrastructure
- Routes, discussions, Synergies with the City
- Multi Criteria Analysis
Ports Infrastructure

Port of Limassol
Ports Infrastructure

Port of Limassol Terminal II
(Vassilikos)
Ports Infrastructure

Activity 8
• Bathymetric surveys were completed in the ports of Patras, Igoumenitsa and Limassol

Port of Igoumenitsa

Port of Patras
Ports Infrastructure

Activity 8
- Wave studies and Navigational Assessments were completed in all ports

Port of Patras

Port of Igoumenitsa
Thank You

Mr. Antonis Boutatis
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POSEIDON MED II
LNG BUNKERING PROJECT
sailing on the LNG era