



ESTABLISHING THE NATURAL GAS MARKET OF CYPRUS

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Connecting Europe Facility



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Current Market Conditions

- Cyprus has an energy isolated market (no interconnected capacity)
- High Dependency on Liquid Fuels (Power Gen)
- 3 Main Conventional Power Stations Owned by EAC, Total 1478MW
- Dual fuel (LF & NG) generation capacity 830MW at VPS
- Increasing Renewable Penetration (Solar, Wind)
- NG Market Regulation under CERA
- Cyprus Law - Harmonised with EU Directive 2009/73/EC
- Derogations may apply due to Isolation & Emergent Market
- Possible monopolistic operation for early years

3 Main Development Pillars for the Domestic NG Market

1. Development of the NG (LNG) receiving/import facilities: The LNG Import Terminal Project
2. Secure the necessary LNG supply quantities for the domestic demand
3. Development of the pipeline network to connect all potential NG consumers (priority to the Power Sector and large industrial facilities)

1. LNG IMPORT TERMINAL PROJECT

Cyprus' LNG Import Terminal: A Project of Common Interest

- Multiple benefits to the Republic of Cyprus
 - Ends Energy Isolation
 - Diversification of Energy Sources
 - Strengthening of Security of Supply
 - Reduction of cost of Energy (with consequential multi-layered benefits)
 - Major Environmental positive impact

- An EU PCI that enhances regional cooperation



1. LNG IMPORT TERMINAL PROJECT

Awarded Contractor:

Consortium of JV China Petroleum Pipeline Engineering Co Ltd. and METRON S.A., with Hudong-Zhonghua Shipbuilding Co. Ltd and Wilhelmsen Ship Management Limited



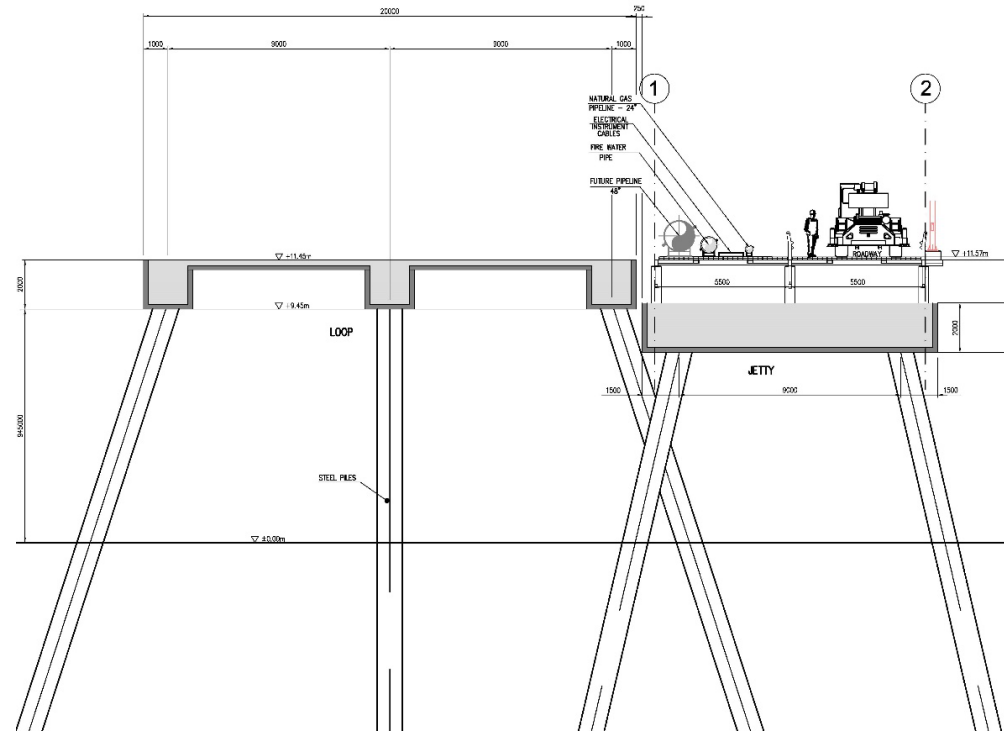
CHINA PETROLEUM PIPELINE ENGINEERING CO., LTD.



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1. LNG IMPORT TERMINAL PROJECT – TECHNICAL DESCRIPTION

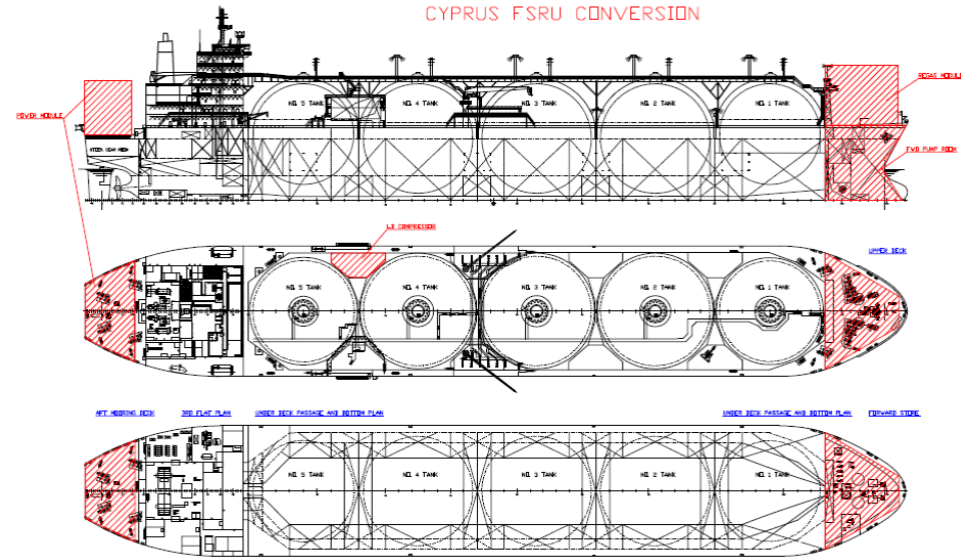
- Jetty Construction on piles, an
- FSRU based on conversion of the “GALEA” LNGC (currently owned by Shell Tankers (Singapore) Private Ltd)
- Conversion Works at the Shipyard in China
- FSRU will be classed as both LNGC and FSRU.
- Onshore pipe works with onshore gas facilities
- Implementation Timeframe: **24 months from commencement of works**



1. LNG IMPORT TERMINAL PROJECT— TECHNICAL DESCRIPTION

- Vessel Description and Conversion Works:

- Year and Place of Build: 2002, NSMW – Mitsubishi Heavy Industries
- Classification Society Lloyds Register
- Containment System: Moss Rosenberg (spherical tanks)
- 5 Tanks with overall LNG storage capacity of 136,141 m³ (at normal filling level)
- Dimensions: Overall Length 290m, Breadth moulded 46m, Depth moulded 25.5m
- Propulsion: Steam, Dual Fuel
- Redundancy Philosophy on Equipment: N+1
- Power Generation: DFDE Gen Sets will be installed
- BOG Handling: GCU Installation and BOG Compressor



1. LNG IMPORT TERMINAL PROJECT – TECHNICAL DESCRIPTION

- After conversion from LNGC to FSRU the vessel will be equipped with a state-of-the-art regasification modular unit delivered by Wärtsilä.
- The Terminal will be capable of receiving LNG from LNG carriers ranging in size from 120,000m³ to 217,000m³ (Q-FLEX)



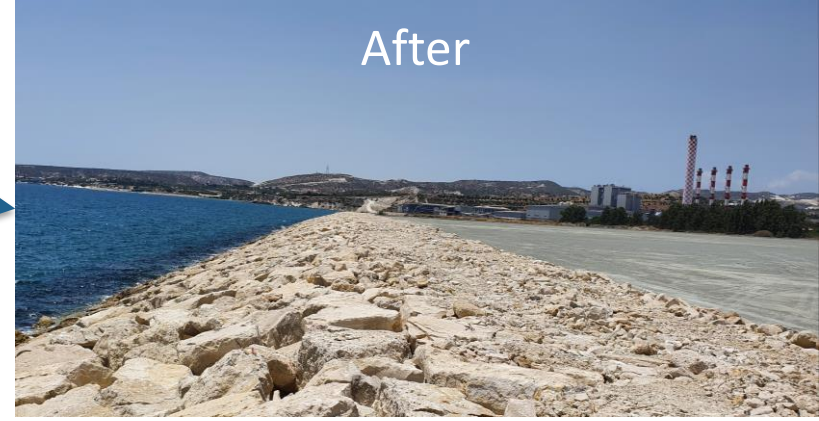
1. LNG IMPORT TERMINAL PROJECT – FINANCIAL PROPOSAL & FINANCING

- **Awarded Proposal:**
 - CAPEX **€314 mil.**
 - Annual OPEX **€10.52 mil.**
- Secured **Grant by Connecting Europe Facility** (CEF) for **40% of the CAPEX, up to €101mil.**
- EAC has acquired 30% of ETYFA shares (EAC equity participation **€43mil.**)
- ETYFA secured Loan Facilities from EIB and EBRD:
 - EIB, up to **€150mil.**
 - EBRD, up to **€80mil.**



1. LNG IMPORT TERMINAL PROJECT – COMMENCEMENT OF WORKS

- Site Establishment – Phosphogypsum Lagoon Remediation Works (2019-2020)



1. LNG IMPORT TERMINAL PROJECT – COMMENCEMENT OF WORKS

- Site Establishment – Phosphogypsum Lagoon Remediation Works (2019-2020)



2. LNG SUPPLY

- **2 Stages Process:** EoI (prequalification) & RfP
- Participants were asked to express interest in supplying LNG through SPA and/or MSAs
- SPA **short to mid term** duration (3-5 years)
- Cyprus' LNG Demand will be allotted between SPA and MSAs
 - SPA will cover **base load Quantities**
 - MSAs will be used for **supplementary cargos**
- RfP stage expected for end Q1 2021

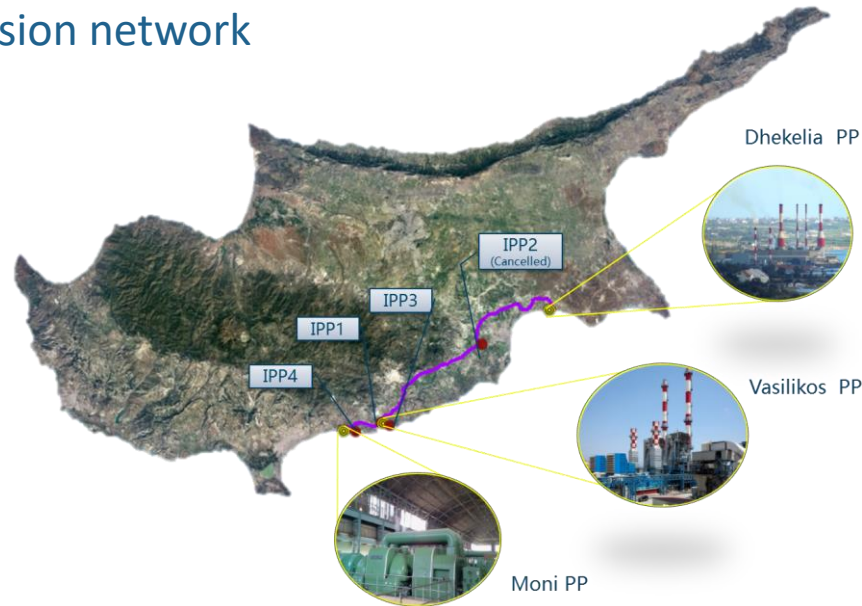
2. LNG SUPPLY

25 EoIs Received: Evaluation Concluded for both SPA and MSAs processes

- Gunvor International B.V. Amsterdam
- Naturgy LNG Marketing Limited
- Centrica LNG Company Limited
- Endesa Energia S.A.
- Cheniere Marketing International LLP
- Equinor ASA
- Novatek Gas & Power Asia Pte Ltd
- Shell International Trading Middle East Ltd
- Enel Global Trading
- Eni Trading & Shipping S.p.A.
- Total Gas & Power Asia Private Ltd
- Osaka Gas Kabushiki Gaisha
- Powerglobe LLC
- Repsol LNG Holding S.A.
- Petronas LNG Ltd
- BP Gas Marketing Limited
- Vitol SA
- B.B. Energy (ASIA) Pte Ltd
- Mytilineos S.A.
- Uniper Global Commodities SE
- Marubeni Corporation
- SONATRACH and Public Gas Corporation (DEPA) S.A.
- Eni SpA (Gas & LNG Marketing and Power)
- Glencore Energy UK Ltd
- Mitsui & Co. Ltd

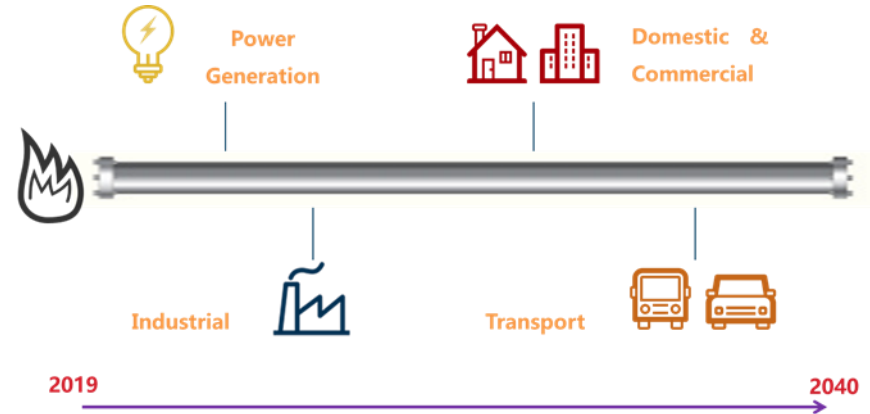
3. NG PIPELINE NETWORK

- NG Pipeline Network Development
 - Preliminary Design and Feasibility Study Completed
 - Phase A' and B' – Power Generation supply and development of backbone transmission network



3. NG PIPELINE NETWORK

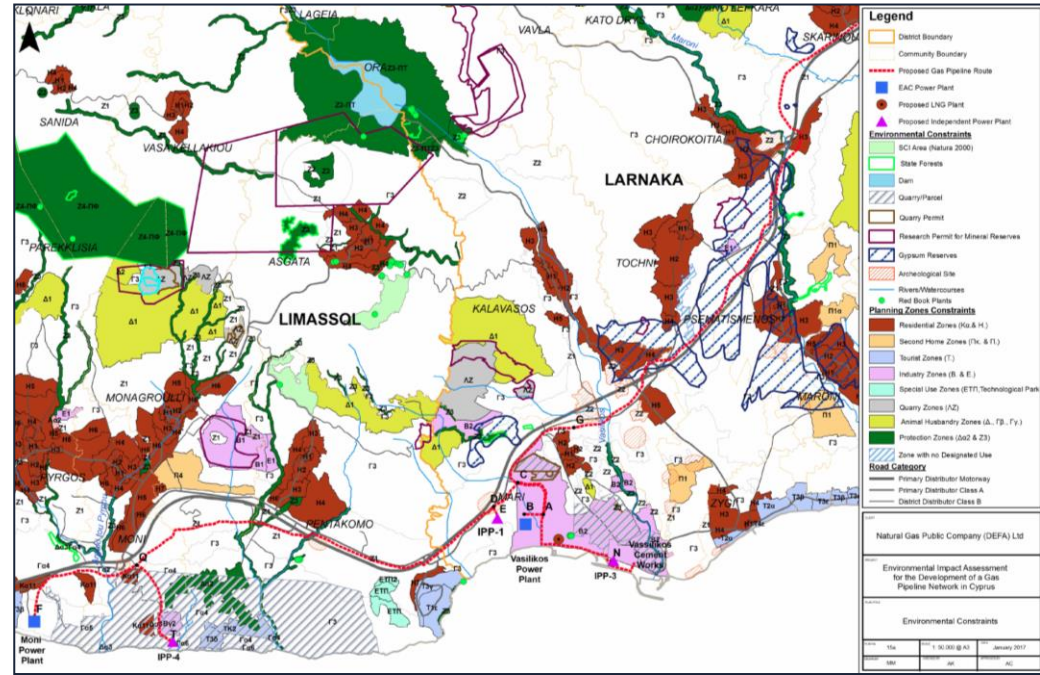
- NG Pipeline Network:
 - Phase A: ≈5 km
 - Phase B: ≈70km
 - €10m. Grant EU Co-Financed under EEPR
 - DEFA appointed GNFe for Engineering Consultancy Services for the NG Pipeline Network Development in 2010
 - Feasibility Study completed in 2012
 - Revised in 2016-2017



3. NG PIPELINE NETWORK

NG Pipeline Network:

- Route: Selected trying to minimise impact and avoiding all environmental/social/other constraints
- Design Extract/Example: follows highway passing through town planning zones (avoiding housing/touristic zones, etc.)



4. OTHER PROJECTS/AREAS OF FOCUS

- **Projects and Sectors under Study/Evaluation**

- Bunkering: DEFA is engaged in discussions for participation in BlueHUBS Project



Bunkering Vessels at Ports of Piraeus & Limassol

- Cargo Capacity: 3.000 (m3)
- Length: 80.00 – 90.00 (m)
- Beam: 14.00 – 15.00 (m)
- Depth: 7.50 – 8.50 (m)
- Design draft: 4.00 – 4.50 (m)
- Scantling draft: 5.00 – 5.50 (m)
- Service Speed: 9 – 12 (Knots)



Mobile LCNG Stations & LNG Trucks at Port of Limassol

- Two Mobile LCNG Stations of indicative Capacity of 60 m3 each
- Three LNG Tanker Trucks of indicative Capacity of 50 m3 each



Mobile LCNG Stations & LNG Trucks at Port of Heraklion

- One Mobile LCNG Station of indicative Capacity of 200 m3
- Five LNG Tanker Trucks of indicative Capacity of 50 m3 each

4. OTHER PROJECTS/AREAS OF FOCUS

Industry, Road Transport and other uses

- DEFA through its participation in “CYnergy” Project has analysed the potential and assessed the requirements of these sectors. Studies have been prepared that provide a good basis for further consideration and development
- “CYnergy” Project:
 - Holistic Approach for NG Market development and penetration of use of NG to Energy and Transport sectors
 - Total Proposal Cost ≈€7,5m – **CEF EU Co-financing ≈€4,5m (60%)**





Thank You!

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