

LNG RECEIVING TERMINAL

Revythoussa Island – A strategic Asset in Mediterranean Sea

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Entry Points and Technical Capacities

SIDIROKASTRO



Technical Capacity:
10.800.000 Nm³/Day

KIPI

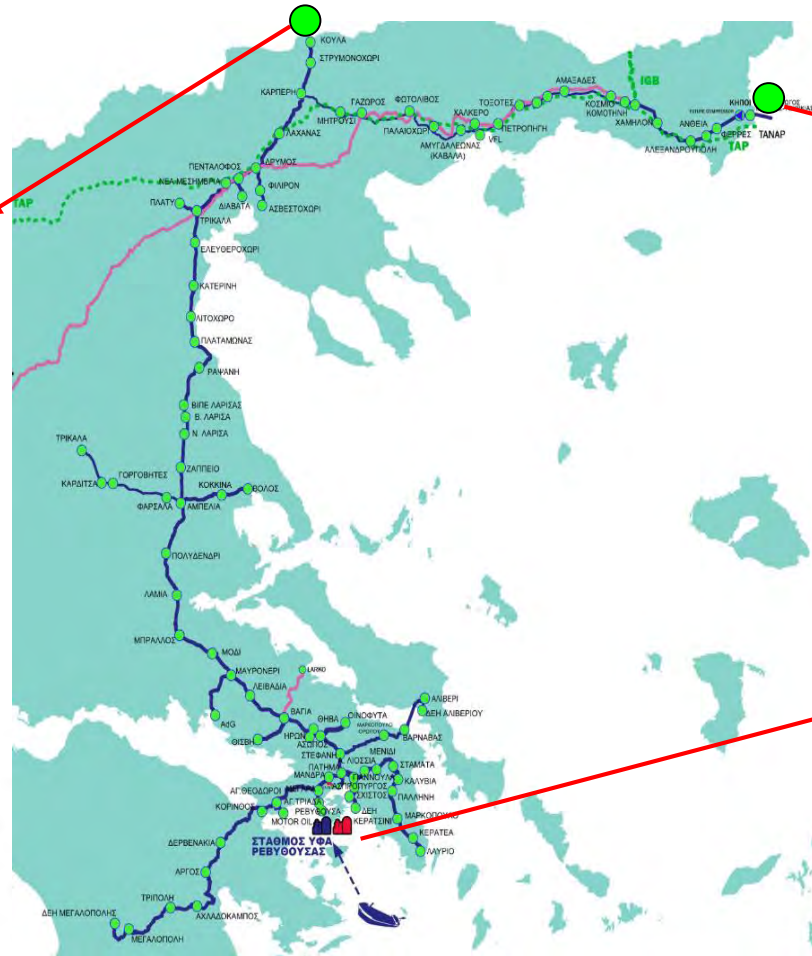


Technical Capacity:
4.300.000 Nm³/Day

AG. TRIADA (LNG)



Technical Capacity:
12.470.000 Nm³/Day



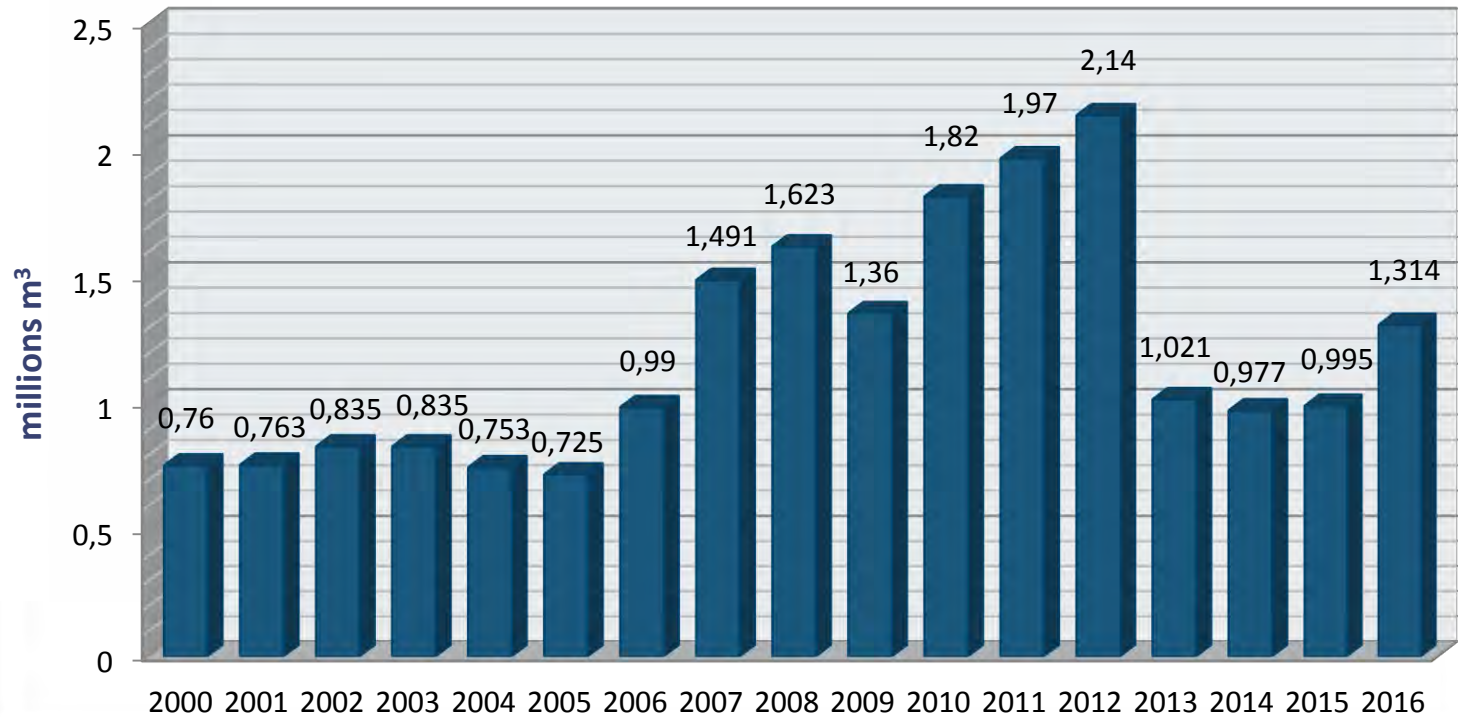
The role of the LNG Terminal

The Revythoussa LNG Terminal plays a key role in the everyday operation of the National Natural Gas System. Additionally it has played a key role in the opening up of the Greek Gas Market in 2010, but also in successfully dealing with the security of supply crises of 2009, 2012 and 2016-17 in the region



The role of the Revythoussa LNG Terminal is expected to be enhanced in the near future, as a gateway for diversified supply sources in the whole South-Eastern Europe region

LNG Received per Year

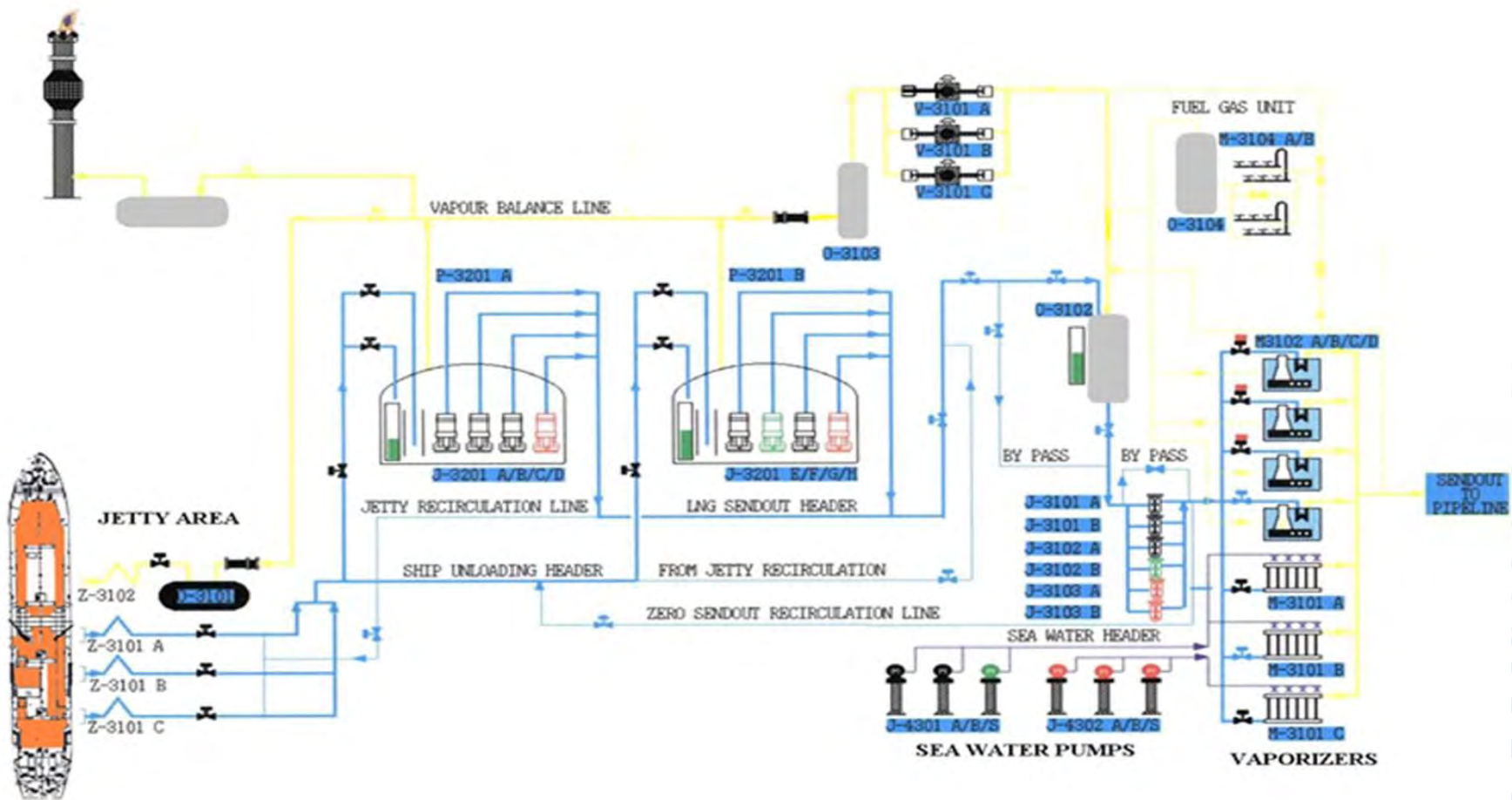


- ✓ **3/2/2000:** 1st LNG Carrier Unloading
- ✓ **June 2005:** 1st Terminal Upgrade Construction Works Start Up
- ✓ **September 2007:** 1st Terminal Upgrade Construction Works Commissioning
- ✓ **December 2016:** 441 LNG Cargoes has been received

Revythoussa LNG Terminal Main Processes

- ✓ LNG Unloading
- ✓ LNG Temporary Storage
- ✓ LNG Vaporization
- ✓ Boil-Off Gas Handling

Simplified Process Flow Diagram



Revythoussa LNG Terminal (existing Capacity)

Unloading Capacity:

7,250 m³ LNG / hour

Storage Capacity:

2 underground tanks of 65,000 m³ each LNG useful volume

Send Out Capacity:

1,000 m³ LNG/hour
(Sustained Maximum Send out Rate)

Approach and berth of LNG carriers:

25,000 m³ to 155,000 m³ (290 m length, 11.5 m draft)

High Efficiency CHP unit

for the power and thermal needs of the Terminal



Additional Services – Non Regulated

Existing Process for Additional services

Revythoussa jetty used for LNG vessel tanks:

- ✓ Inerting
- ✓ Gassing up
- ✓ Cool down and partial filling



Future Projects on Revythoussa Island

- ✓ 3d LNG Tank Construction, Capacity: **95,000 m³** LNG
- ✓ 2nd Terminal Upgrade:
 - **SMSR:** from **1,000** to **1,400 m³/h** LNG
 - **Peak:** from **1,250** to **1,650 m³/h** LNG
- ✓ Loading of LNG vessel - conventional size
- ✓ Loading of small scale LNG vessel
- ✓ Truck Loading



Increase of LNG terminal capacity

73%

Increase of Storage Capacity

40%

Increase of Send out Rate



Upgrade Marine Facilities



Project Completion
1st Sem 2018

	Storage Capacity m ³ LNG	Send out Rate (<u>SMSR</u> /peak) m ³ LNG/h	Ship Size Accepted (max)	Reloading of LNG Carriers m ³ LNG/h
Current status	130.000	<u>SMSR</u> : 1.000 peak: 1.250	Up to 180.000 m ³	Exceptionally possible
2 nd Upgrade	225.000	SMSR: 1.400 peak: 1.650	Up to 260.000 m ³ (Q-Max)	2.400

LNG Terminal Expansion Project 2nd Upgrade phase

- ✓ The mechanical completion is expected by the end of December 2017
- ✓ The commercial operation is expected in May 2018 (the LNG Terminal Station will shut down for two Months for the commissioning)



Gas transmission possibilities offered by new interconnections & Revythoussa increased capacity

- ✓ Revythoussa to Bulgaria via IP Kulata/Sidirokastro
- ✓ TAP to Bulgaria via IP Kulata/Sidirokastro
- ✓ Revythoussa to Bulgaria via IGB
- ✓ Revythoussa to Bulgaria via TAP and IGB
- ✓ Revythoussa to FYRoM

Sponsored by 3rd parties

- ✓ TAP to Bulgaria via IGB
- ✓ Alexandroupolis LNG to Bulgaria via NNGS and IGB

Revythoussa to BG via IP Kulata/Sidirokaastro

Year	Capacity in bcm/y (LF = 1)		Conditions
	Firm	Backhaul *	
2017 - mid 2018	0,36	3,5	-
from mid 2018	1,8	3,5	Commissioning of Revythoussa upgrade
future phase	4	3,5	C/S at Ambelia (Central Greece) C/S at Kipi (GR/TR border) or no flow from Turkey

* equal to forward flow (BG -> GR).

Additional to the firm capacity.



Revythoussa to BG via other routings

Reverse Flow to BG via NNGTS -
Komotini - **IGB**



Reverse Flow to BG via
NNGTS-TAP-IGB



Revythoussa to FYRoM



Common Feasibility study under preparation on the basis of the MoU of Oct. 2016

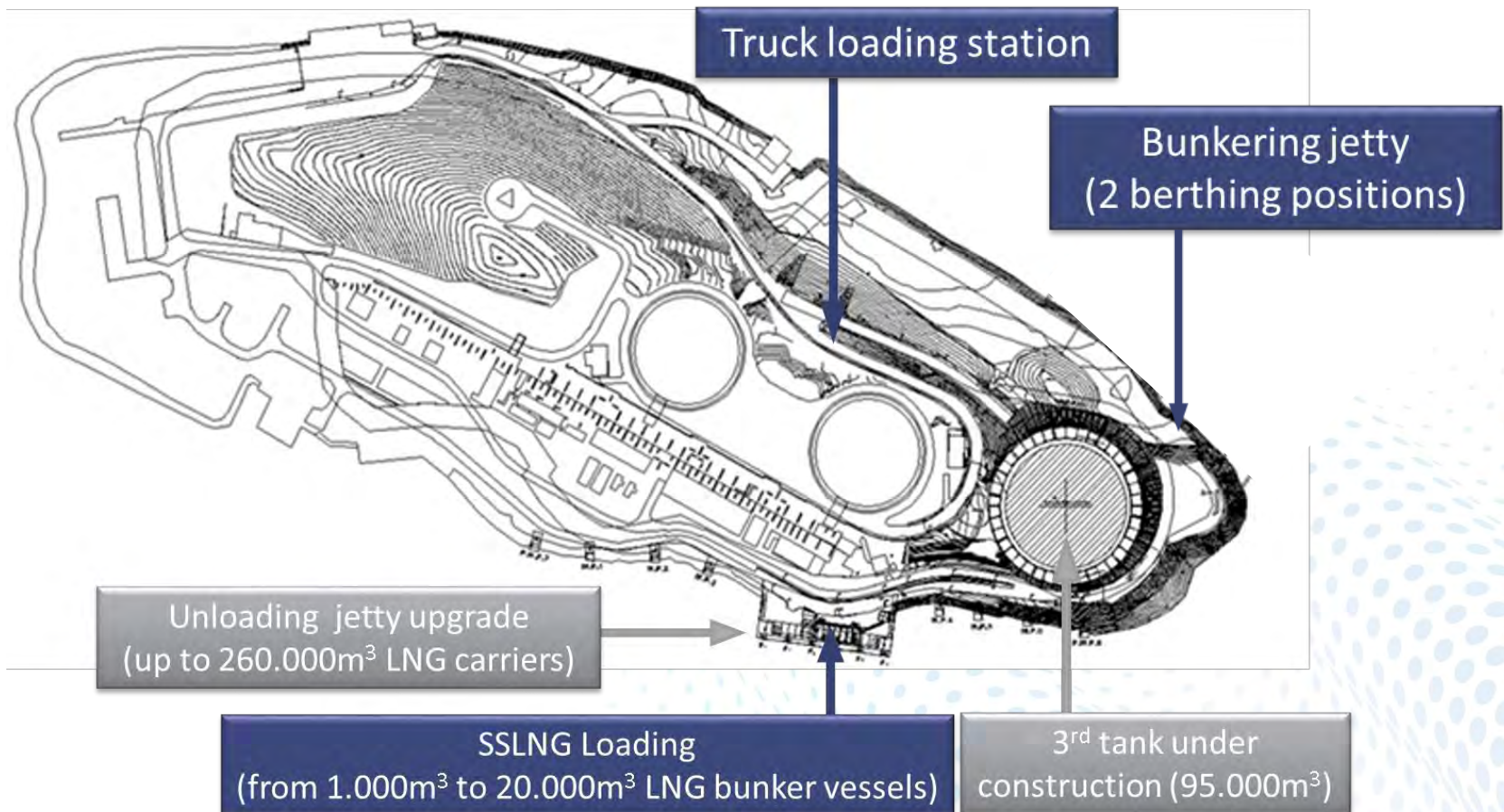
Possibility to supply countries further north

Conclusions on the possibilities offered by Revythoussa and the new / existing interconnections

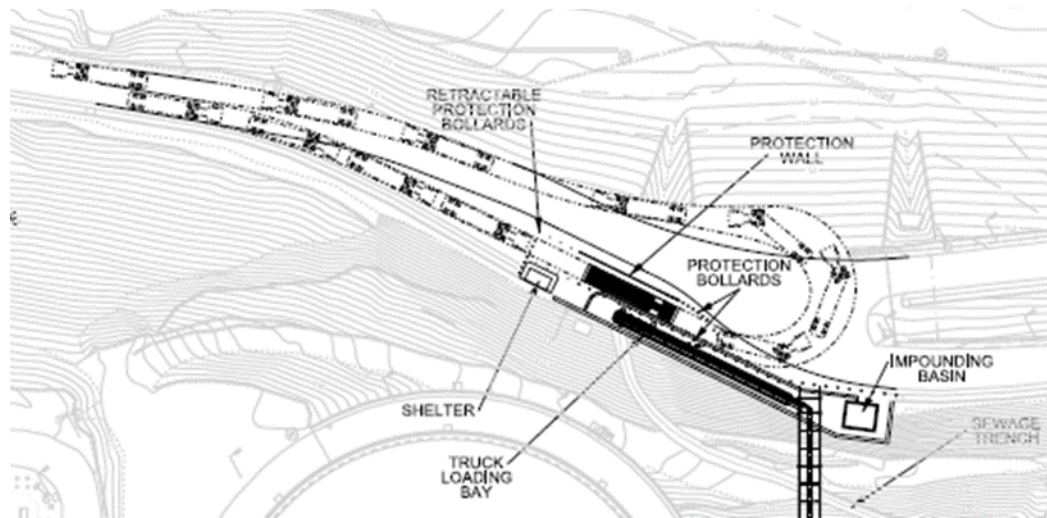
- ✓ Revythoussa LNG terminal, after the upgrade which is under construction, will have adequate free capacity, open to TPA, to serve the supply diversification needs of the whole Balkan region
- ✓ Decisions for new investments have to be coordinated along the transportation chain in order to make feasible the transportation to the destination market(s) and in order to optimize costs

Small scale LNG projects

1/3

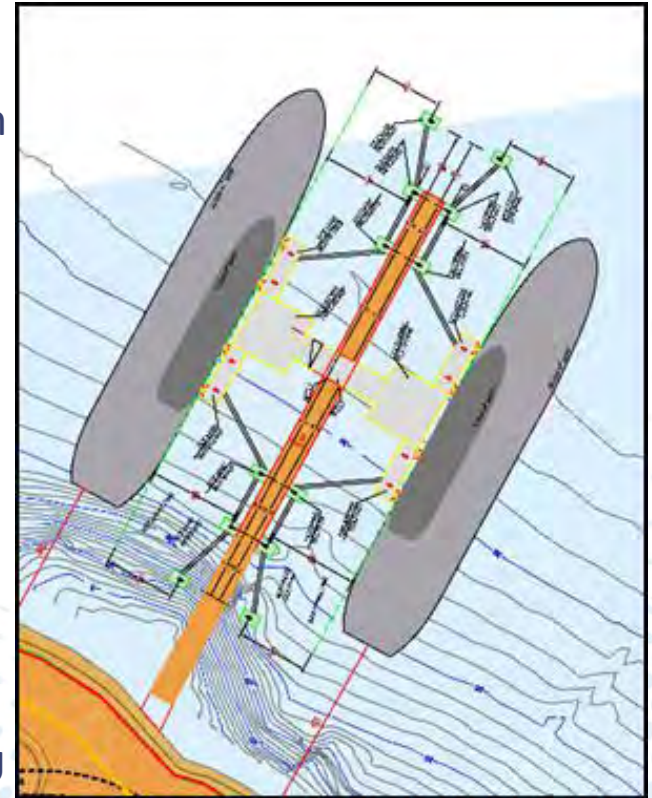


- ✓ **Truck loading station**
 - ✓ EPC tender to be issued in 2nd Q 2017
 - ✓ Single bay, loading capacity 100 m³/h



✓ Bunkering infrastructure

- ✓ Able to receive bunkering and feeder vessels with capacities from 1.000 to 20.000 m³
- ✓ Bunkering vessels will supply ships in the port of Piraeus
- ✓ Feeder vessels will supply satellite bunkering stations in Greece and in the SE region
- ✓ Basic design to be tendered in 2Q 2017
- ✓ Engineering is co-financed by Poseidon-Med II EU Action (50% grants)



Conclusions on the possibilities offered by Revythoussa and the new / existing interconnections

Revythoussa LNG terminal

- ✓ Enhancement of security of supply level in case of cut- off of the northern entry points
- ✓ Ability to accommodate almost all LNG vessels
- ✓ Key role in establishing Greece as a regional gas hub in conjunction with interconnection projects

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Thank you!



ΔΕΣΦΑ