



Strategic dilemmas in the development of Israel's gas industry

Presented by Dr. Amit Mor and Shimon Seroussi

***Hydrocarbons Exploration & Production in the
East Mediterranean and the Adriatic Sea,
IENE, Athens, April 26-27, 2012***



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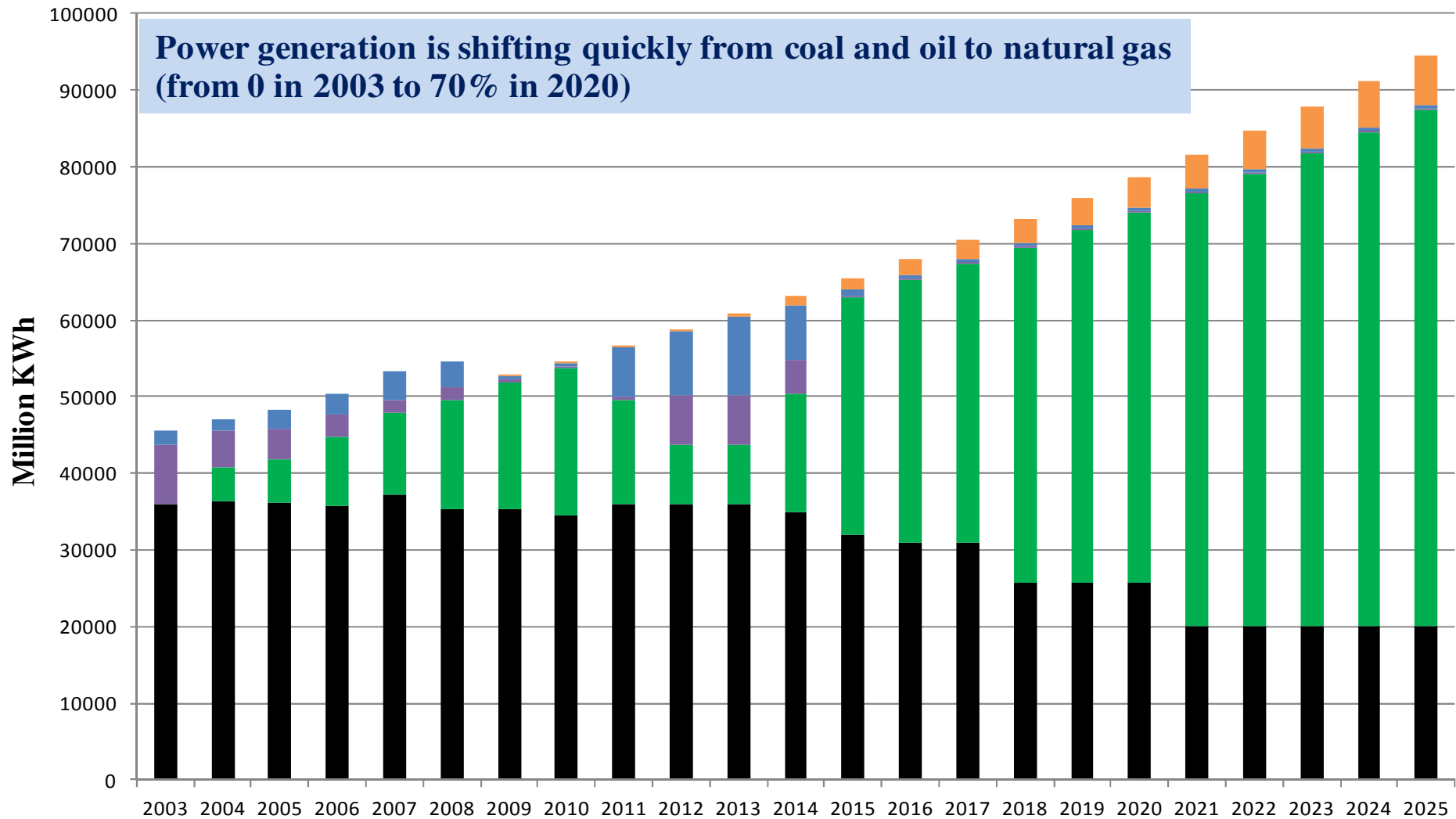
Israel country facts (2011)

- Area – 22,000 sq km
- Population – 7.9 million
- GDP – \$230 billion
- GDP/capita - \$30,000
- GDP growth rate – 4.5% (2011)
- **Investment in R&D – 4.2% of GDP – the highest rate in the world**
- Energy consumption – 24 MTOE
- Installed power capacity – 14 GW



Electricity demand forecast by type of fuel 2003-2025

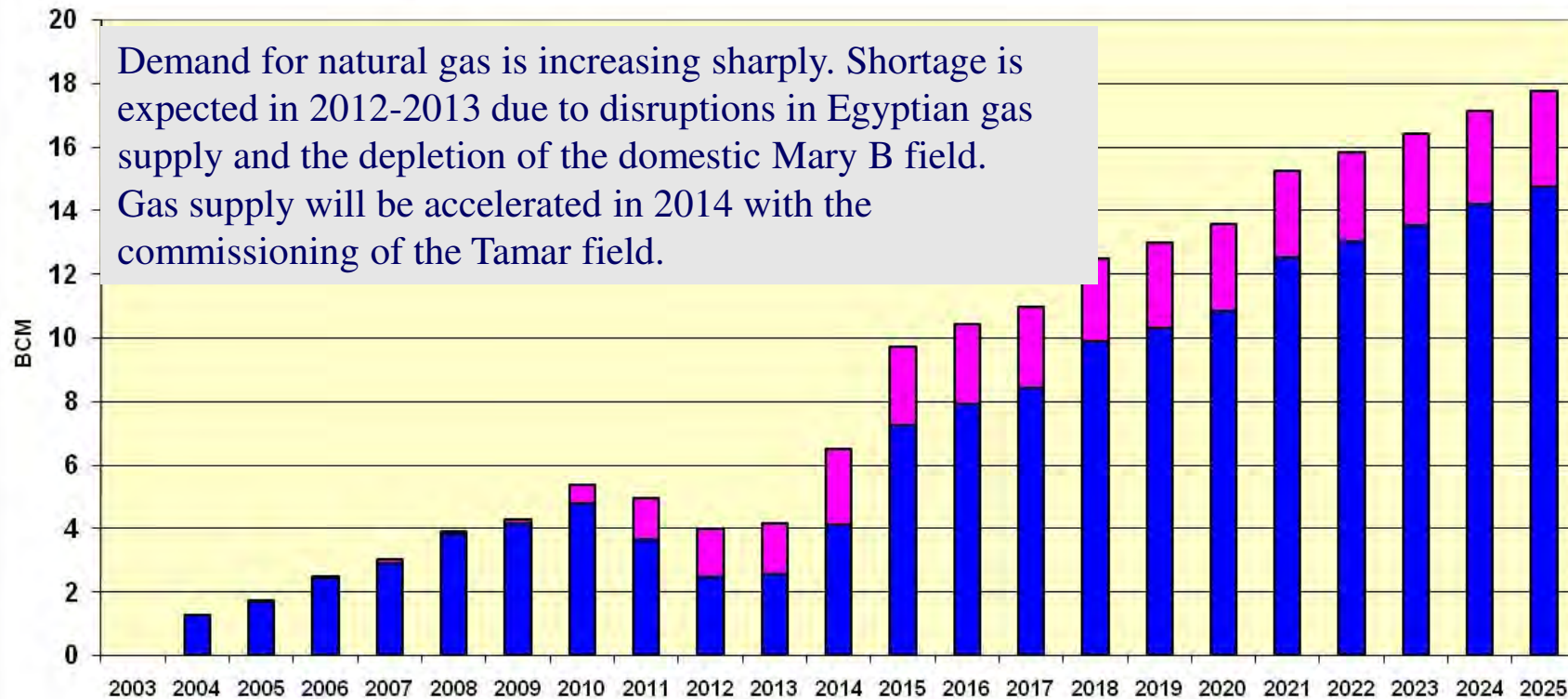
No Egyptian gas scenario 2011-2013, Million Kwh



Source: Eco Energy Ltd.

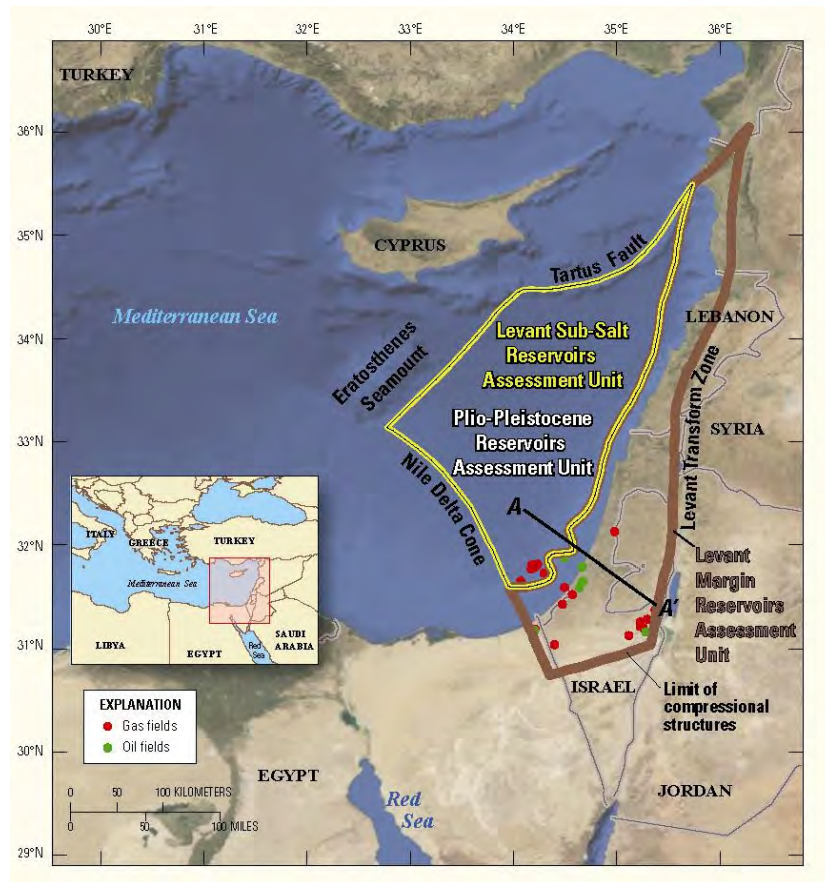
■ Coal ■ Natural gas ■ Heavy fuel oil ■ Gasoil ■ Renewables

Chart 1: Natural Gas Demand in Israel 2003-2025
Egyptian gas not available scenario 2011-2013, BCM/yr



Source: Eco Energy Ltd.

■ Electricity Generation ■ Industry & other



USGS REPORT 2010 LEVANT BASIN UNDISCOVERED RESERVES

**122 Tcf Natural Gas
+ 1.7 Billion barrels Oil
= *716 Billion \$***

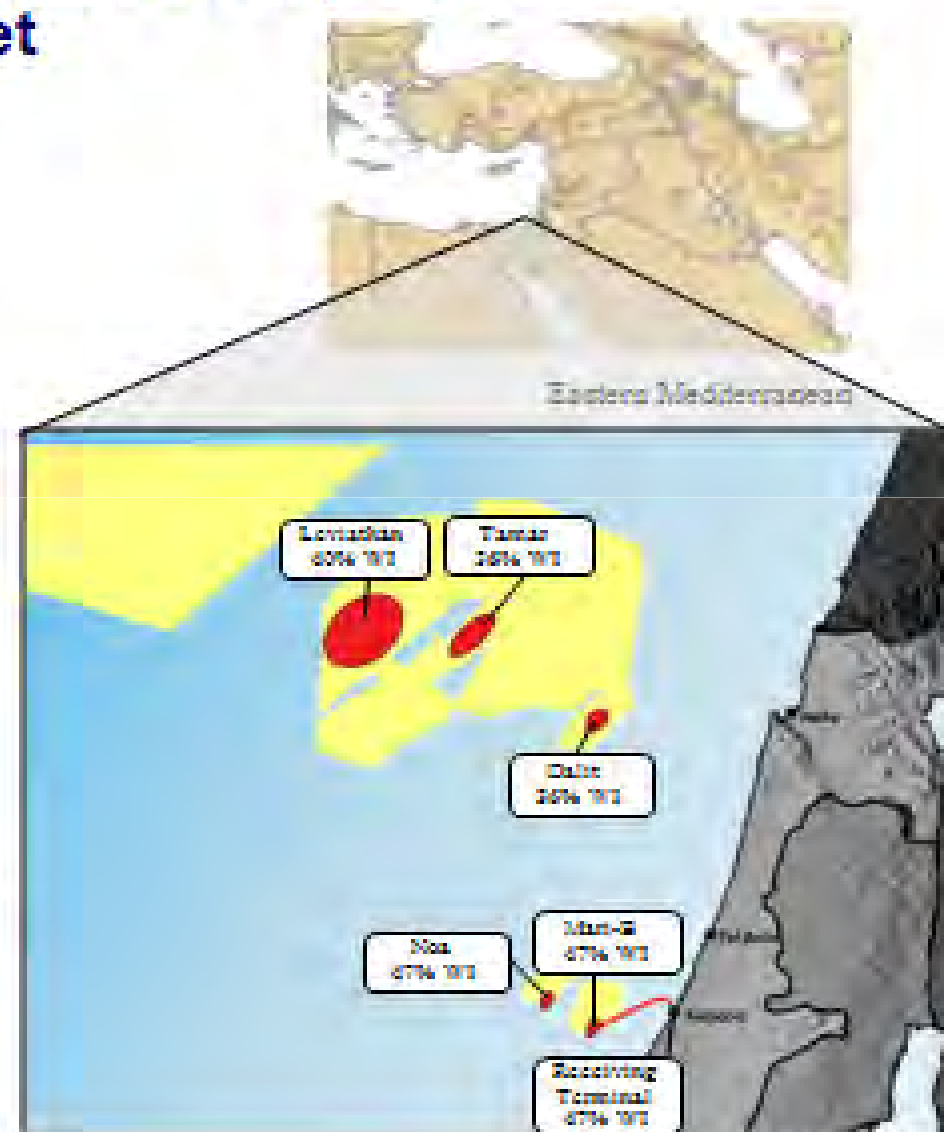
Levant Basin Dollar Values

122 Trillion Cubic Feet Natural Gas	122,000,000,000,000
Price per 1000 Cubic Feet (6/22)	\$4.79
Convert Trillion Cubic Ft	122,000,000,000
Total \$ Value - Natural Gas	\$584,380,000,000.00
1.7 Billion Barrels of Oil	1,700,000,000
Price per Barrel Oil (6/22)	\$77.87
Total \$ Value - Oil	\$132,379,000,000.00
TOTAL VALUE - LEVANT BASIN	\$716,759,000,000.00

**Royalties: 12.5 %
State Take: 35 - 40%**

Significant recent natural gas discoveries offshore Israel by Noble Energy and its Israeli partners totaling 27 trillion cubic feet

- ▶ Noble Energy came to Israel in the late '90s
- ▶ Noa discovered in 1999, Mari-B in 2000
- ▶ Andromeda drilled in 2001, Hanna in 2003, each dry holes
- ▶ Acquired more permits and licenses in 2006-2008, conducted additional seismic surveys
- ▶ Tamar and Dalit discovered in 2009
- ▶ Leviathan discovered in 2010
- ▶ Leviathan appraisal, Tamar development drilling, continued exploration in 2011



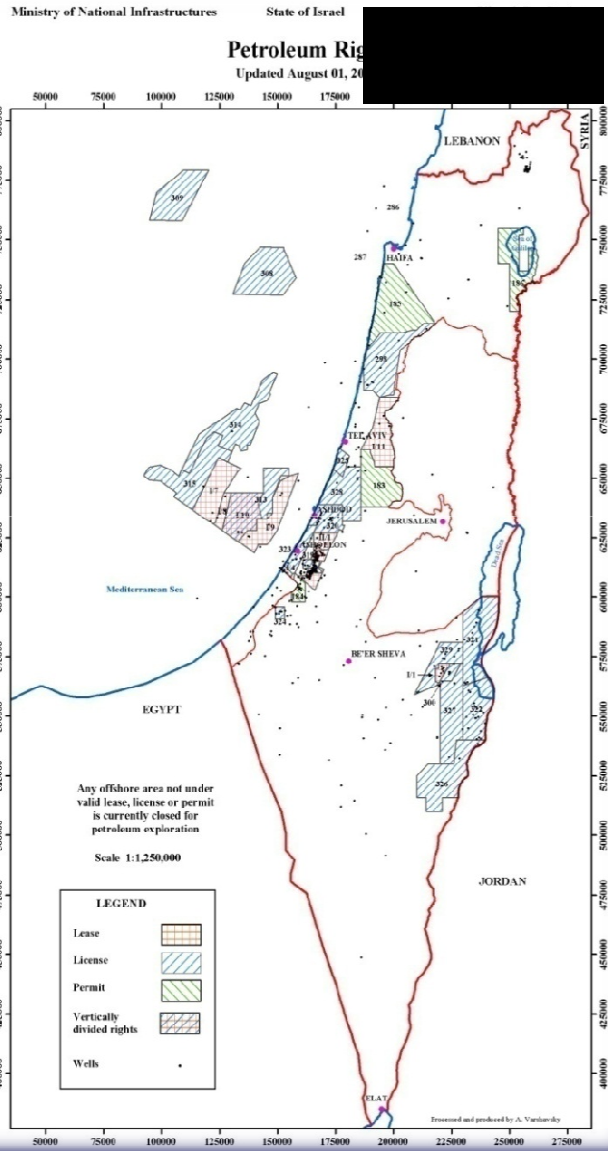
ne noble energy



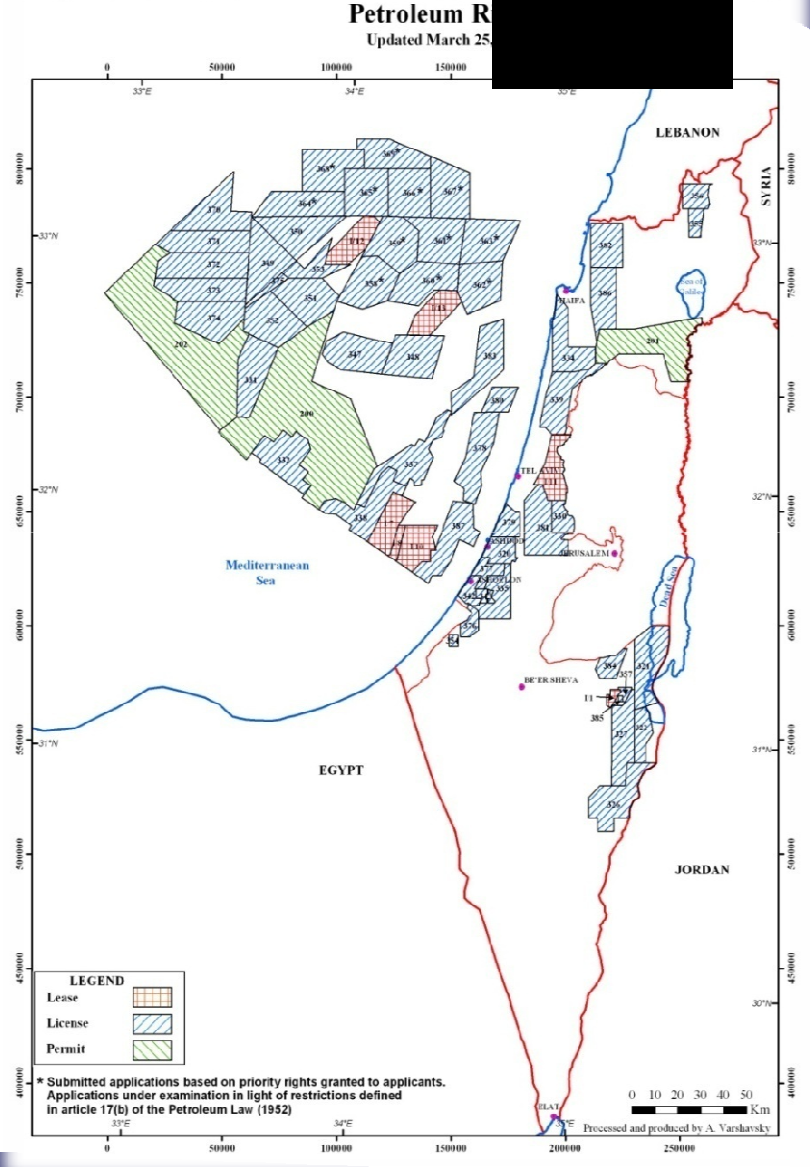
Marie B production platform



Exploration rights map



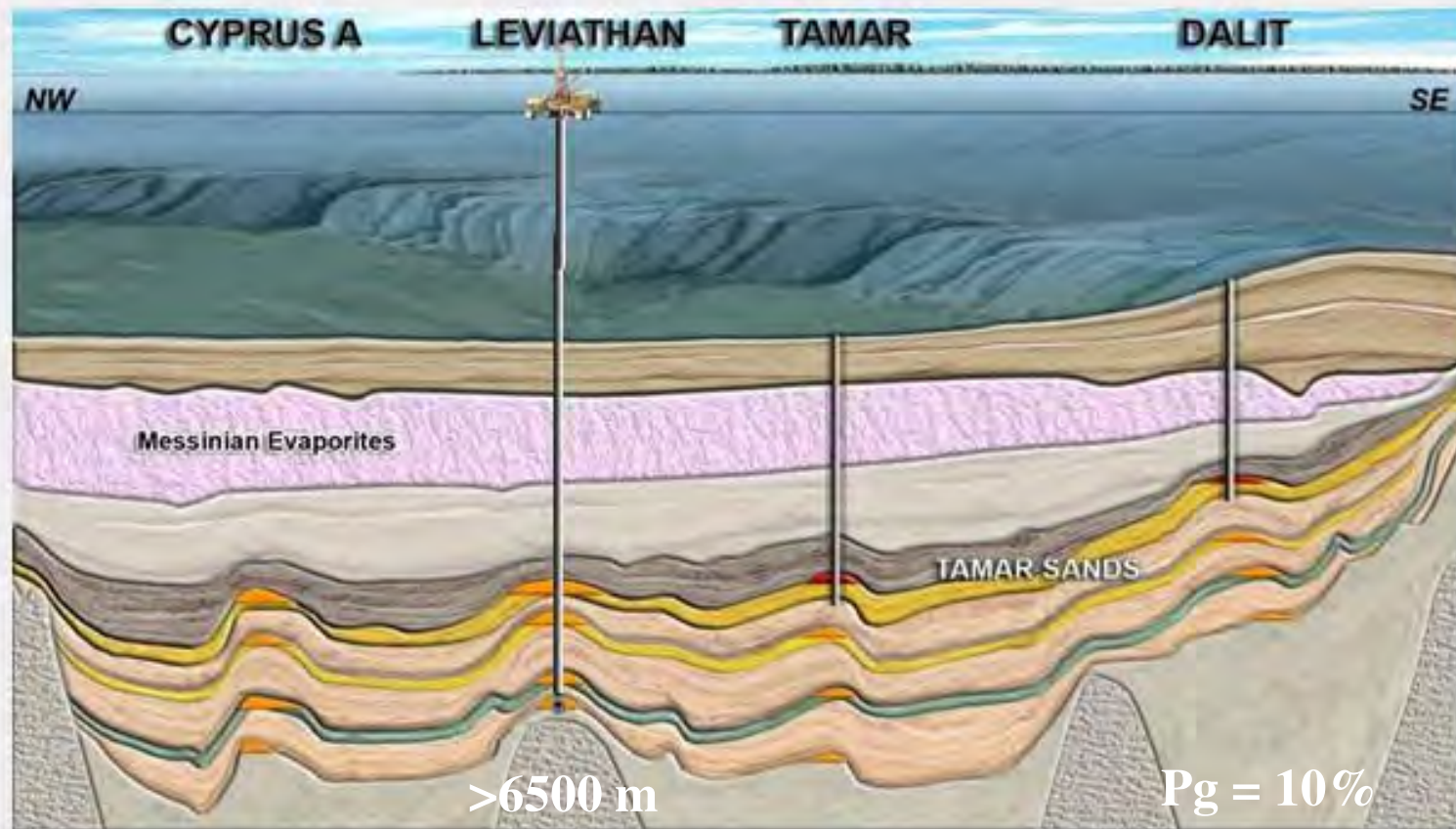
Ministry of National Infrastructures State of Israel Oil and Gas Section



Likelihood for oil discoveries???

Multiple Opportunities in Levantine Basin

High-risk deeper potential



The Tamar Project

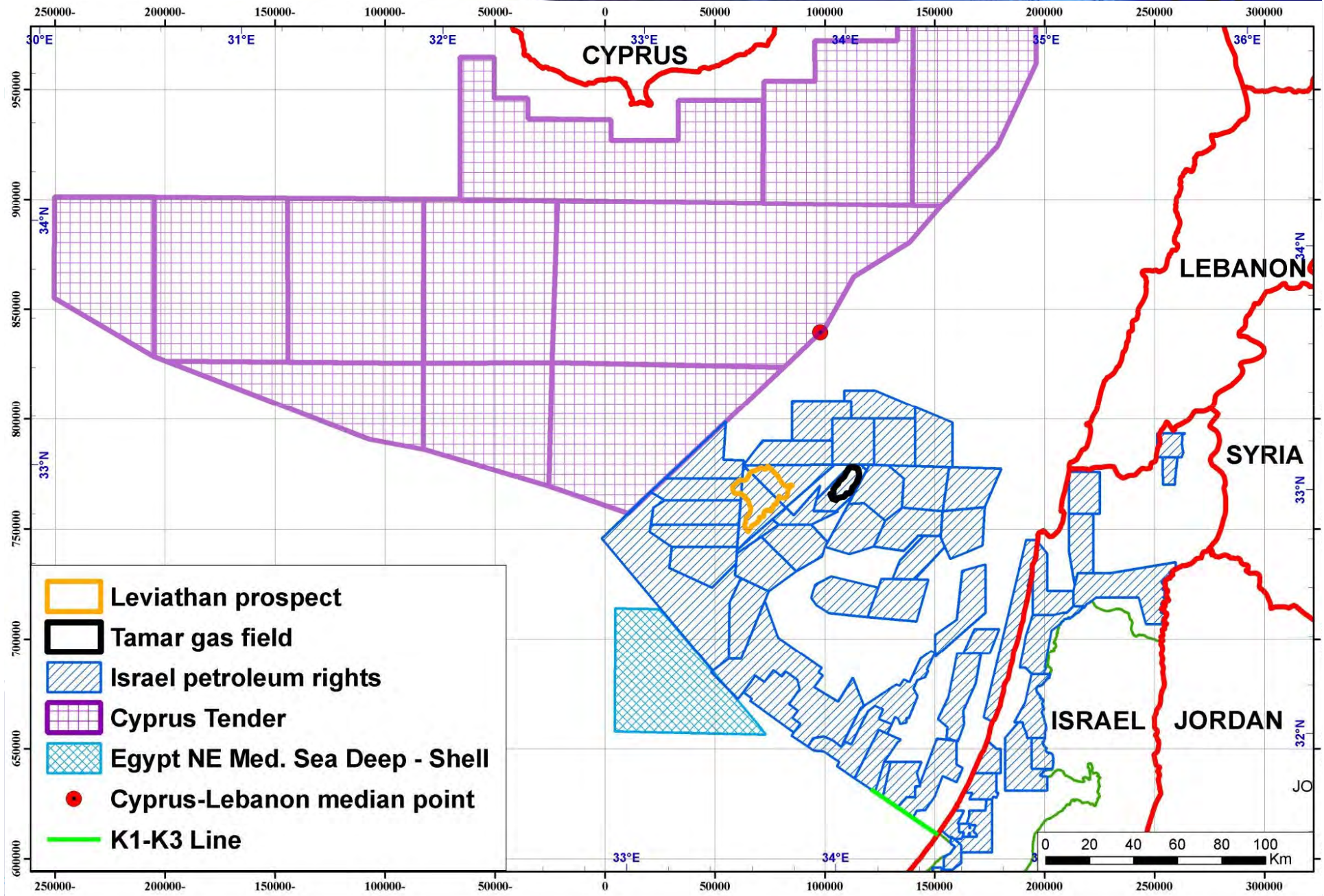
- Drill 5 wells to ~ 5000 m
- Install subsea development @ 1700 m
- Install 150 km of dual 16" pipelines
- Build and transport Tamar platform
- Install Tamar platform near Mari-B

The Tamar deposit of ~9 TCF could supply Israel gas requirements for ~15 years.

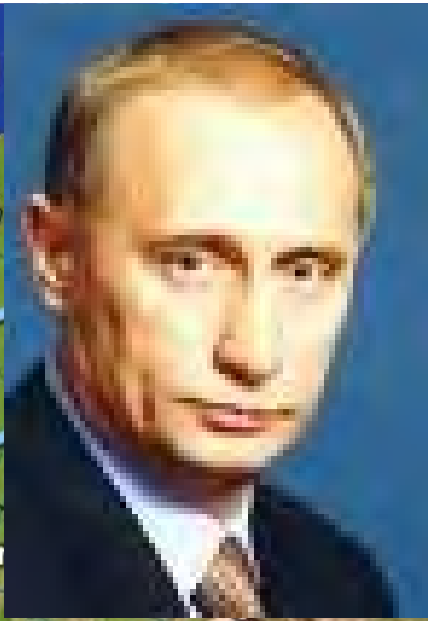
Further exploration will take place by Noble Energy and other companies.

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energy

Israel's Maritime borders

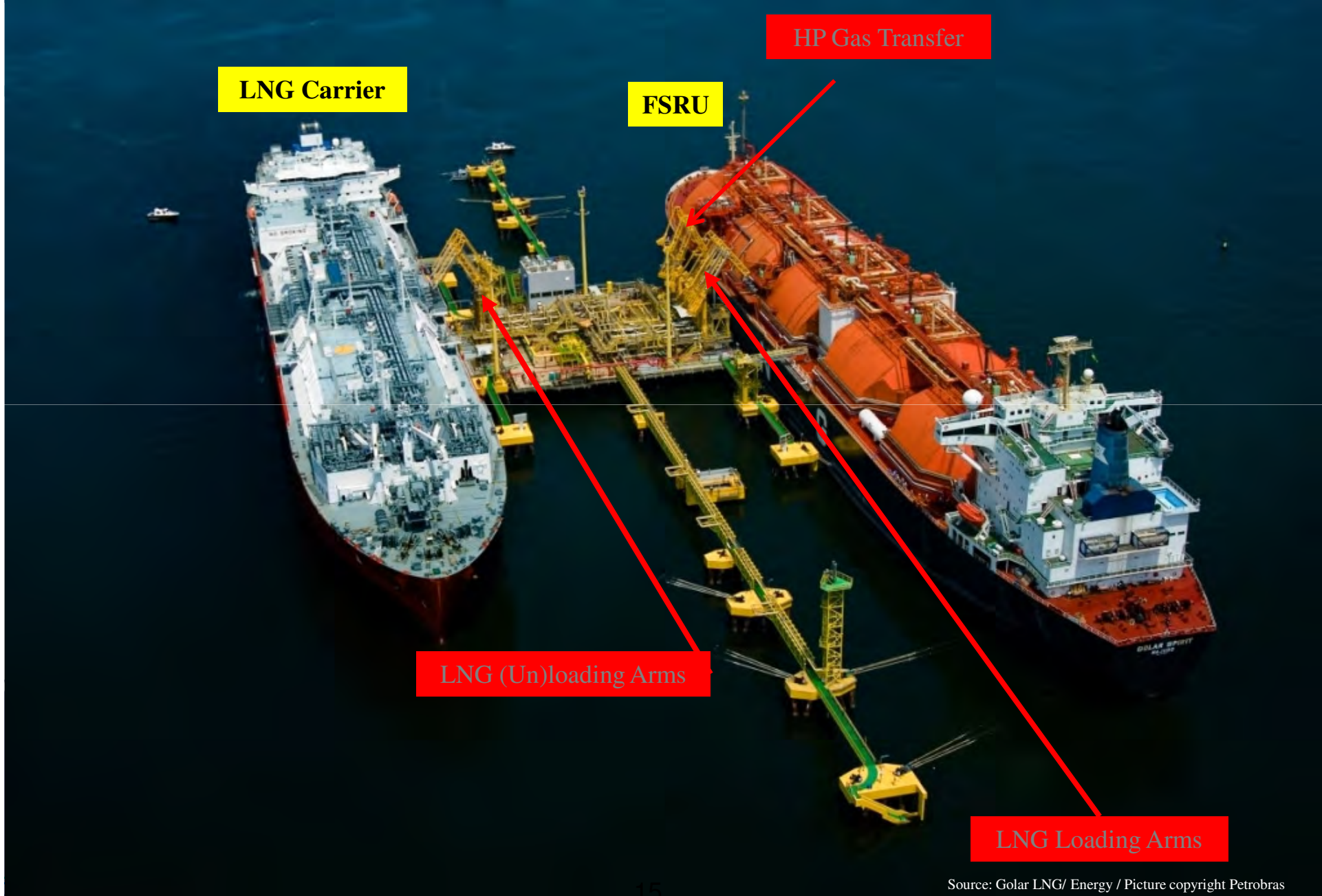


MAIN CURRENT AXES OF GAS SUPPLY SYSTEM





1st Conversion – Golar Spirit (Brazil) – 2 MTA



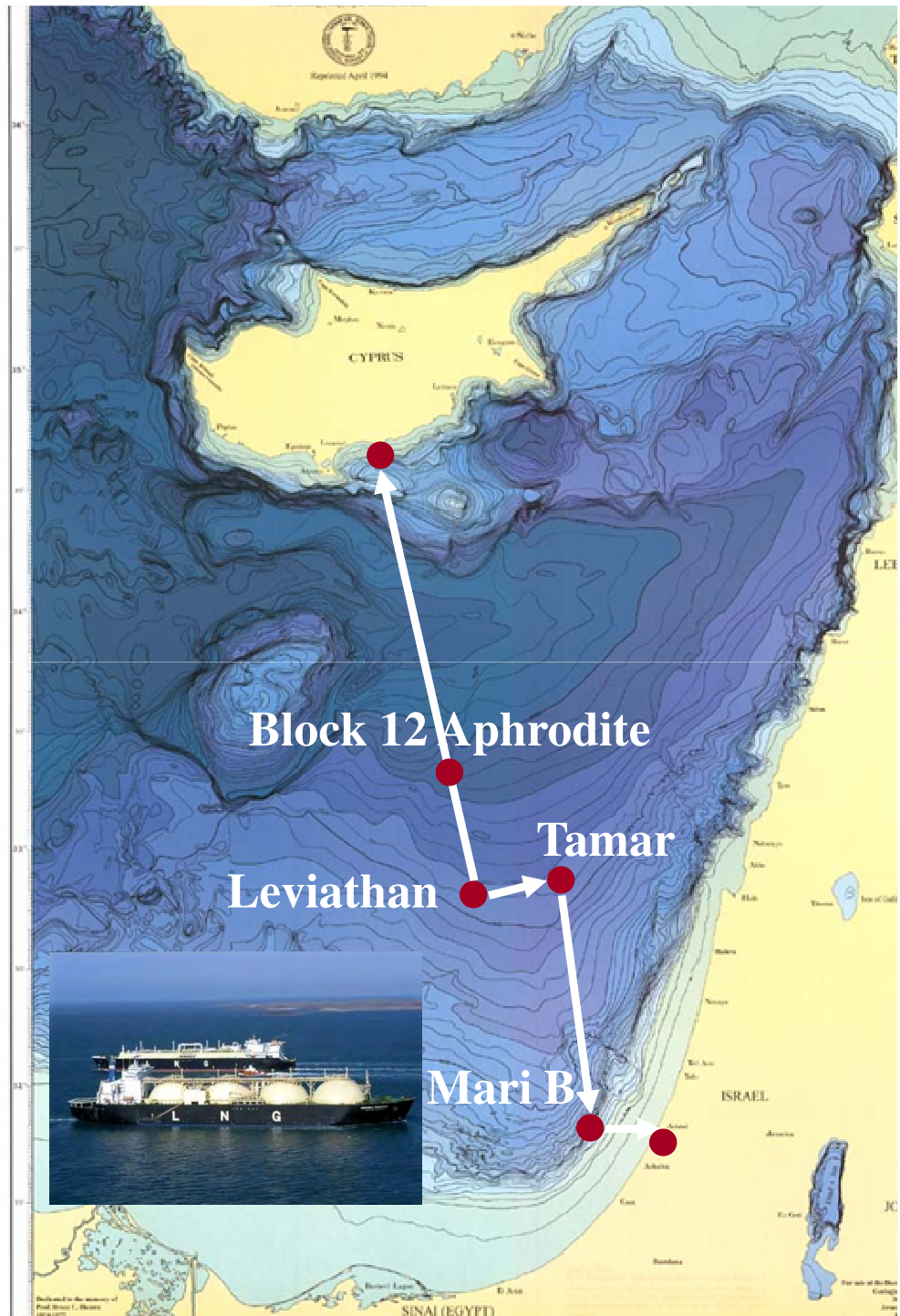


Natural Gas export options:

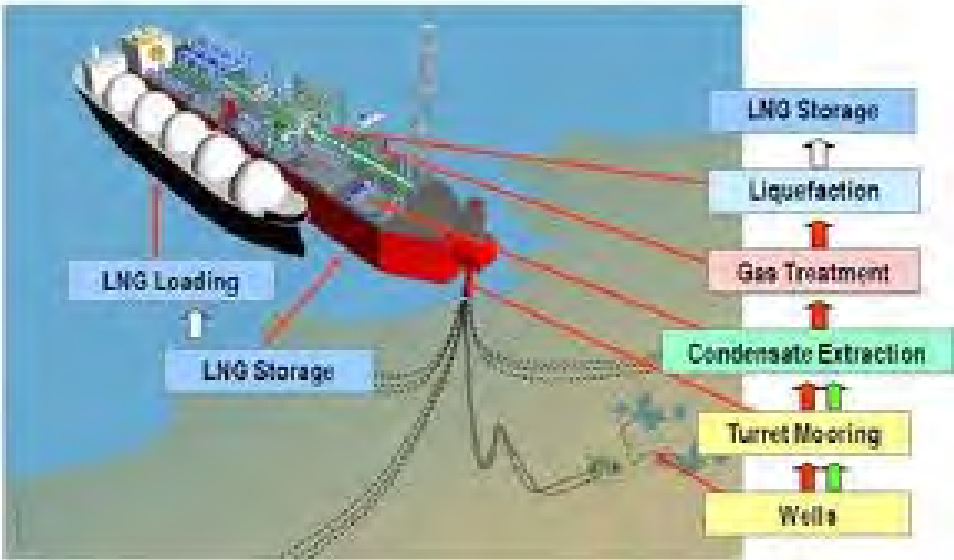
- LNG plant in Ashkelon or Eilat
- FLNG
- Production of GTL, methanol, fertilizers & petrochemicals

Leviathan-Vasilikos (Cyprus) Pipeline (initial estimates)

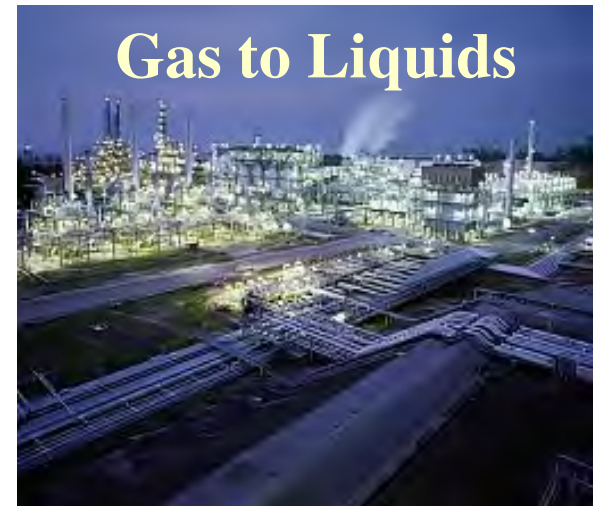
- ✓ Leviathan is located ~200 km from Vasilikos
- ✓ Pipeline crosses water depth of more than 2 km
- ✓ Pipeline & Development cost – \$3.5 billion
- ✓ LNG plant cost \$8-12 billion



Floating LNG



Other Natural gas export options



IEI Oil Shale in-situ technology



- Reserves of 400 billion tons of oil shales
- Containing ~250 billion Barrels of oil
- Technology is being developed by IEI





The Clean Transportation Vision



Plug-in electric cars Will be introduced in 2012





Arava Power 5 MW PV plant in Ketora
First solar plant in Israel, June 2011





Issues for consideration:

- **Energy security - Gas infrastructure**
- **Transparent exploration licensing**
- **Reserves for domestic consumption / export policy**
- **Taxation Policy**
- **Sovereign national fund / Dutch disease**





Natural gas & renewable energy to enhance energy and environmental security



Thank You