

East Med gas Export options

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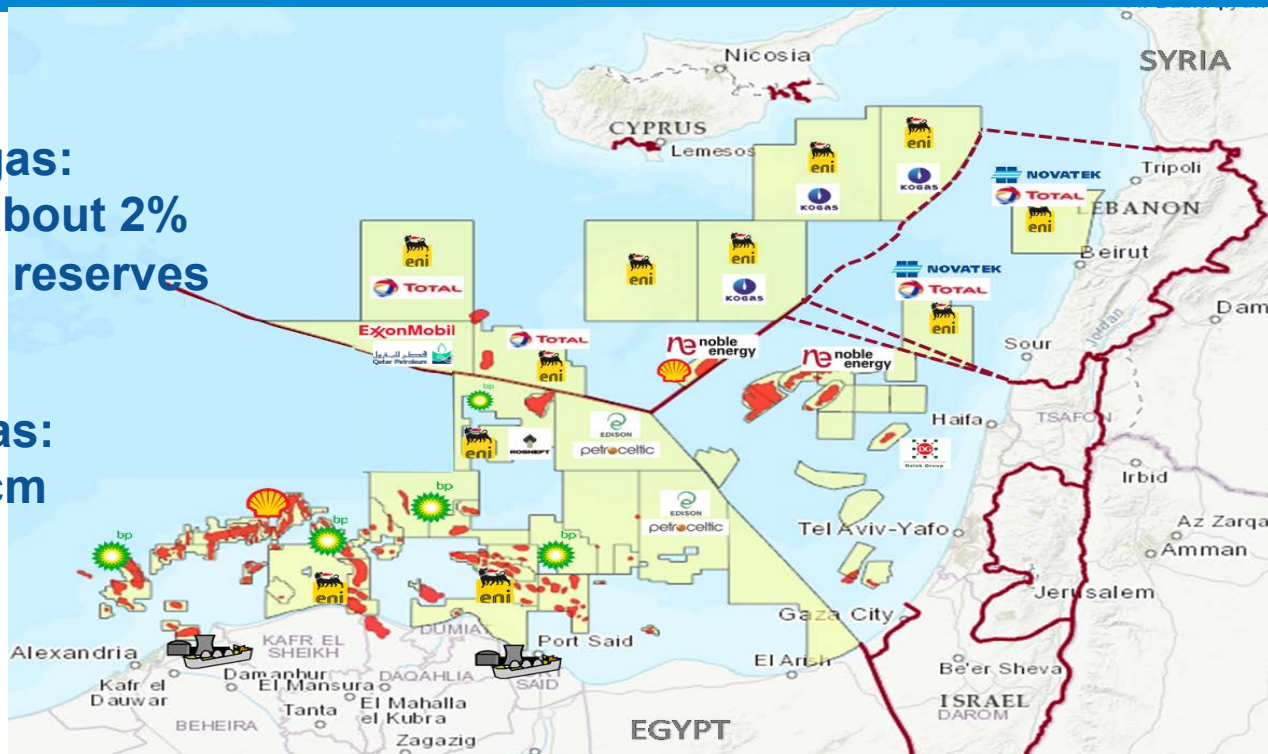
Overview

- **The main export options for East Med gas to global markets are:**
- **Pipelines**
- **Land-based LNG**
- **FLNG**
- **There are also regional options, to countries around the East Med**
- **But challenging global energy markets and prices make East Med gas exports difficult**

East Med exploration blocks

Discovered gas:
4000 bcm – about 2%
of global gas reserves

Yet-to-find gas:
2800-8500 bcm



Global energy markets

- The world has an abundance of fossil fuels and with the relentless penetration of renewables the competition to secure markets is intense
- The EU has strengthened its climate targets to 2030 – promoting renewable sources and affecting fossil fuels
- Renewables make more than 26% of global electricity and are growing
- Demand for fossil fuels expected to peak around 2030 – expensive gas could accelerate penetration of renewable energy sources and lead to a faster transition
- These are leading to low gas prices and tough competition
- Global markets driven by commercial factors, low risk, quick returns

Challenging global oil&gas markets

- Oil prices have found a new range with Brent at \$60-\$65/b
- Gas prices are low, forecast to converge to an average of \$7-\$7.50/mmbtu in southeast Asia and \$6-\$6.50/mmbtu in Europe by mid-2020s
- These prices are likely to remain in the longer term – they pose major challenges to East Med gas exports
- East Med gas expensive to produce and with limited infrastructure in place, taking it to markets is costly
- There is also a need to reduce regional geopolitical risks
- LNG projects require multi-billion dollar investments, the returns of which require decades to realise

Energy transition

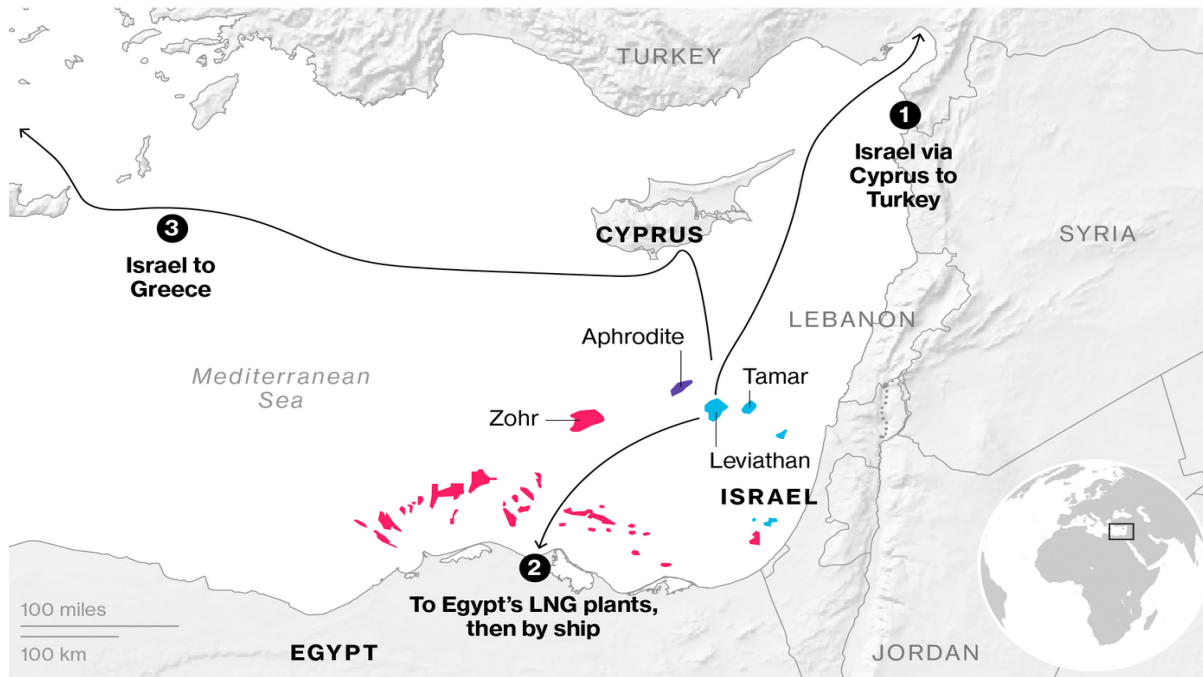
- Rise of renewables and shift to clean energy are progressing rapidly. Approaching 2030 challenges to fossil fuels use are multiplying
- EU new climate targets are demanding. By 2030, 32% of primary energy from renewables. Energy efficiency to reach 32.5%. Carbon emissions reduction to reach 40% compared to 1990 levels – to be raised to 50%+. EU to become carbon-neutral by 2050 – European Green Deal
- Will have dramatic impact on the use of fossil fuels as we approach 2030 and after - already leading to a glut of resources and low prices
- In the US, if the Democrats win the presidential elections they are proposing drastic changes – US Green Deal - that could shake the energy industry worldwide.

East Med gas export options

Routes to Europe

Possible gas pipelines from the East Mediterranean

■ Cyprus field ■ Egypt field ■ Israel field ① Pipeline ordered most to least likely



Egypt's gas surplus

- Egypt became self-sufficient in October – plethora of small discoveries – now producing 75 bcm/yr and growing
- As part of IMF loan it is eliminating subsidies - down from \$22bn in 2010 to \$3.2bn now – and to zero by 2020
- Higher fuel/energy prices leading to more efficient use of energy
- So far in 2019 electricity consumption declined close to 4%, generating supply surplus – mothballing new power plants
- Increase in primary energy consumption was 2.1% in 2018, in comparison to 3.2% in previous 10 years – still declining
- Increase in gas consumption halved in 2018 compared to 2017 – still slowing down

Egypt's LNG exports

- **Success of Egypt's energy reforms bringing increase in energy consumption under control – freeing gas for export**
- **Zohr production capacity about to hit 33 bcm/yr. But ENI has just announced it will reduce output from Zohr to avoid a supply glut**
- **Idku operating at 90% capacity – with gas mostly from the Simian and offshore Sapphire gas-fields – not from the gas grid**
- **Petroleum Minister says Idku and Damietta to be fully utilised next year**
- **Idku manager said it is technically possible to add a third train, but no decision has been taken and it is some time away**
- **Negotiations to export Aphrodite gas to Idku for liquefaction and export – intergovernmental agreement in place – challenging**

Cyprus – LNG export prospects

- ExxonMobil interested in reviving the idea of LNG exports from Vasilikos – but needs more gas and conducive global markets
- New drilling round planned in 2020/2021 – 7 to 9 wells – appraisal of Aphrodite, Calypso and Glafkos
- Seismic data show promising discovery potential in ExxonMobil's block 10 and adjacent blocks 6, 7, 8, 9 and 11
- Drilling success by ExxonMobil's in block 10 can transform Cyprus' fortunes – provided discoveries >15tcf and markets are favourable
- Could accommodate Israeli gas – but price may be a problem
- But Turkey disputes pose a challenge

LNG plant at Vasilikos



3 trains – 5 million tonnes each

Timing: late 2020s

East Med gas pipeline

- A few words about the (in)famous East Med gas pipeline
- Considered a strategic project for exporting East Med gas to Europe to wean it from Russian gas
- Supported politically by Israel, Cyprus, Greece, EU and US
- But it is too expensive - it will cost \$8+ billion to construct
- To become commercially viable, gas prices in Europe will need to exceed \$8/mmbtu – this is highly unlikely

Political support is not enough to make this viable

Israel-Turkey gas pipeline

- A thaw in the relationship in 2015/2016 revived the idea of a gas pipeline from Israel to Turkey
- About 500km long, costing \$2bn – could be viable
- Has to pass through Cyprus EEZ – needs solution of Cyprus problem
- But relationship between Netanyahu-Erdogan deteriorated badly after the June 2016 Mavi Marmara incident, recovered in 2018, but now in disrepair
- When the two go, the pipeline may come back

Cyprus-Turkey gas pipeline

- Without the Cyprus problem in the way, this could have been an option
- About 500km long, costing \$2bn – 10 bcm/yr could be viable
- Turkey looking to diversify gas supplies
- Long-term contracts for 75% of Turkey's gas imports come up for renewal between 2021-2025 – offer an opportunity
- Interestingly, Turkey's foreign minister Cavutoglu said in June: in the East Med "we will learn to share" the gas and then there will be no problem
- A chance that Cyprus problem negotiations may restart

FLNG

- **If other export options do not materialise, FLNG may be the last option left – depending on gas prices**
- **Ideal for Leviathan, Aphrodite, Calypso, Glafkos**
- **Noble considered this as one of the options for Leviathan**
- **FLNG previously considered in 2014 by Woodside for Leviathan and in 2013 by Gazprom for Tamar – lost in the process of gas regulation and policy reviews**

Implications for East Med gas exports

- Apart from Egypt's LNG exports, East Med aspirations to export gas to Europe and global markets are facing the headwinds of low prices and climate change
- Monetising East Med gas is not in our hands, but to global markets - but we can easily mess it up
- Exports need to be expedited - as time passes, the likelihood that it may not be possible to export this gas to global markets is increasing
- Even if East Med were to be successful to export some of its gas, given low global gas prices profitability is likely to be low
- Without change, the perception of future riches from East Med gas risks remaining a perception