

# **Developing Israel's Offshore Hydrocarbon Resources- Present Status and Future Plans**

**A presentation for :**

**International Pavilion AAPG ICE 2018  
Cape Town  
November 6, 2018**

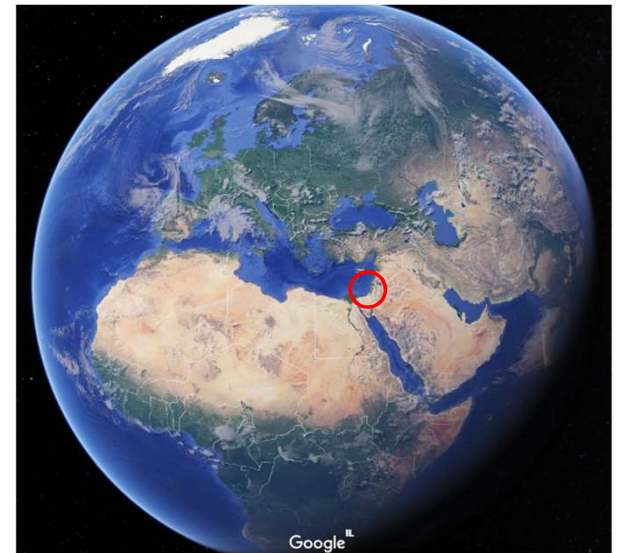
**Dr. Michael Gardosh**  
Head of G&G Dept.



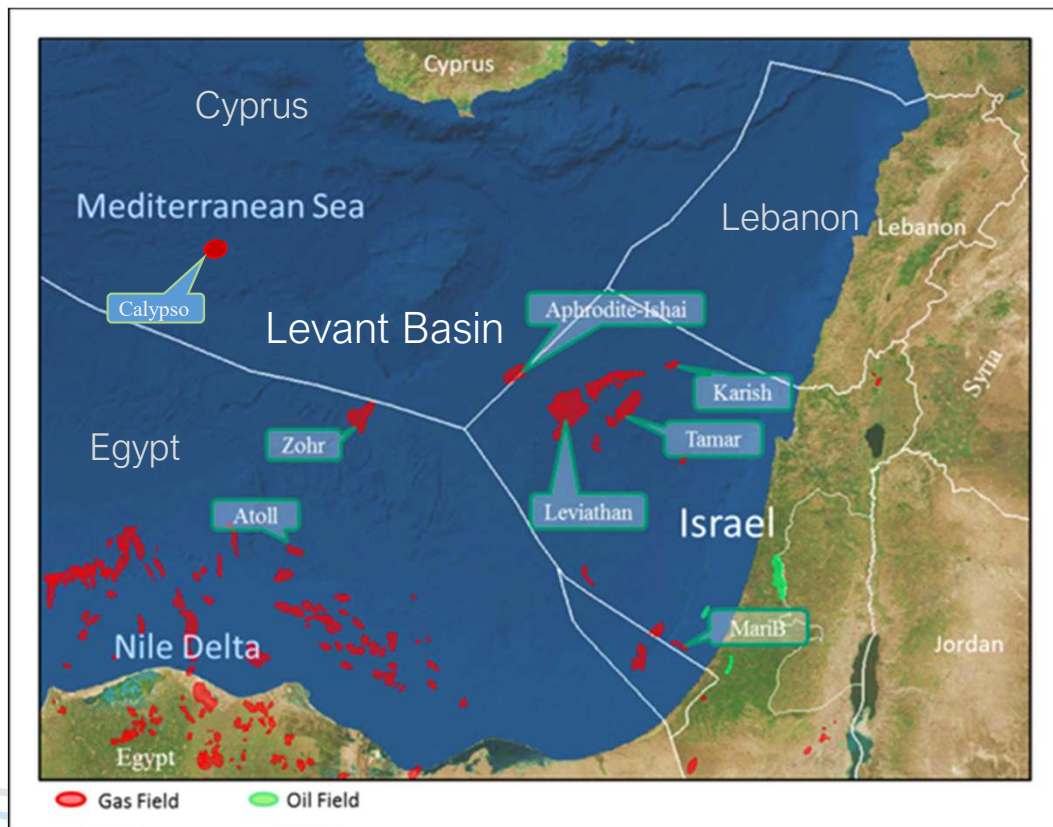
**Ministry of Energy**  
[www.energy.gov.il](http://www.energy.gov.il)

# Outline of Presentation

- The Israeli Gas Revolution
- Levant Basin Hydrocarbon Potential
- Gas Demand and Export Options
- Fiscal Regime
- 2<sup>nd</sup> Offshore Bid Round



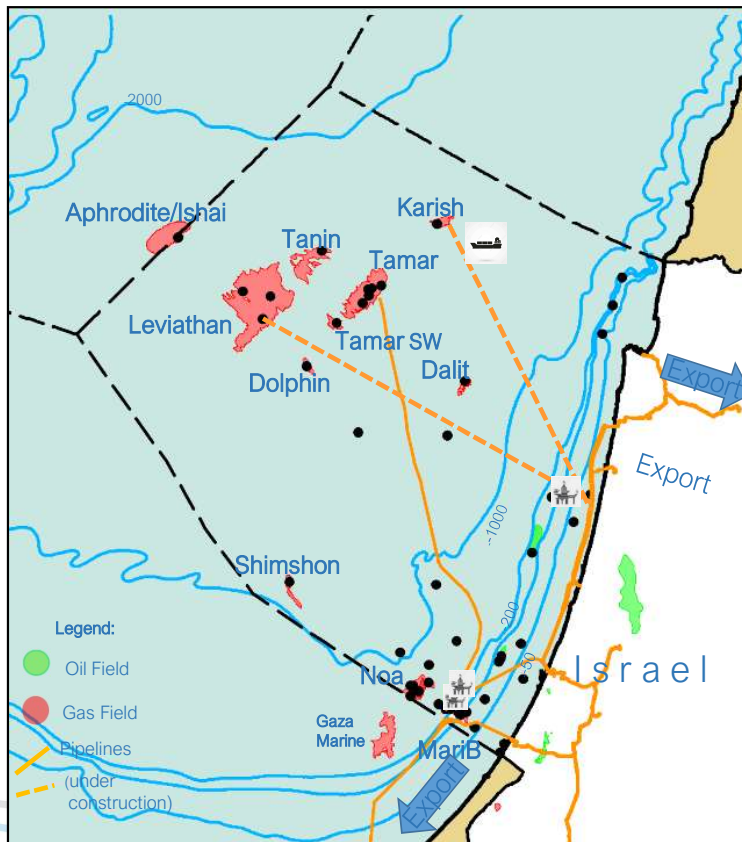
# The Levant Basin- An Emerging Exploration Hot Spot



- Approx. 2000 BCM (75 TCF) of gas were discovered in the Levant Basin in the last 10 years
- This last phase of activity started in Israel with the discovery of the Tamar and Leviathan fields in 2009-2010
- More recently, the large Zohr field was discovered in Egypt and Calypso in Cyprus
- The Levant Basin is an emerging hot spot for exploration with activity currently taking place in Israel, Egypt, Cyprus and Lebanon



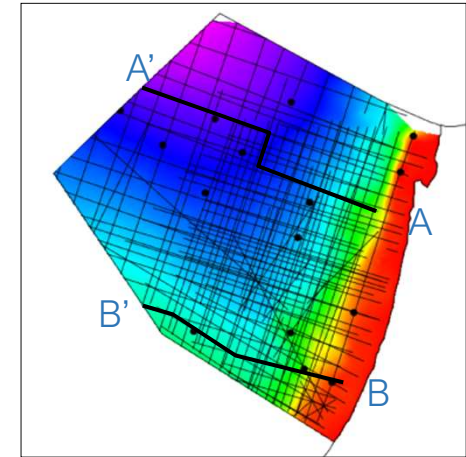
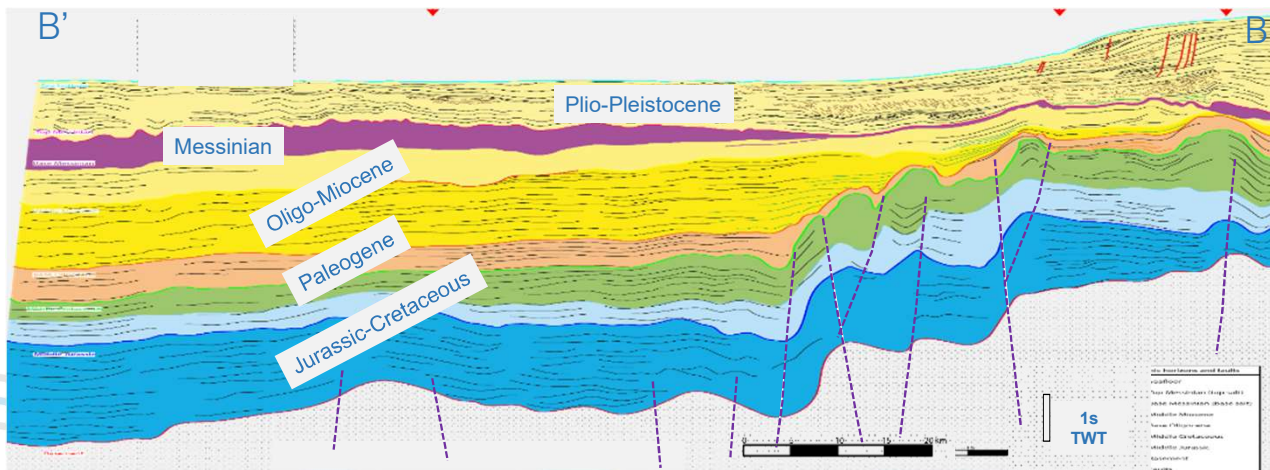
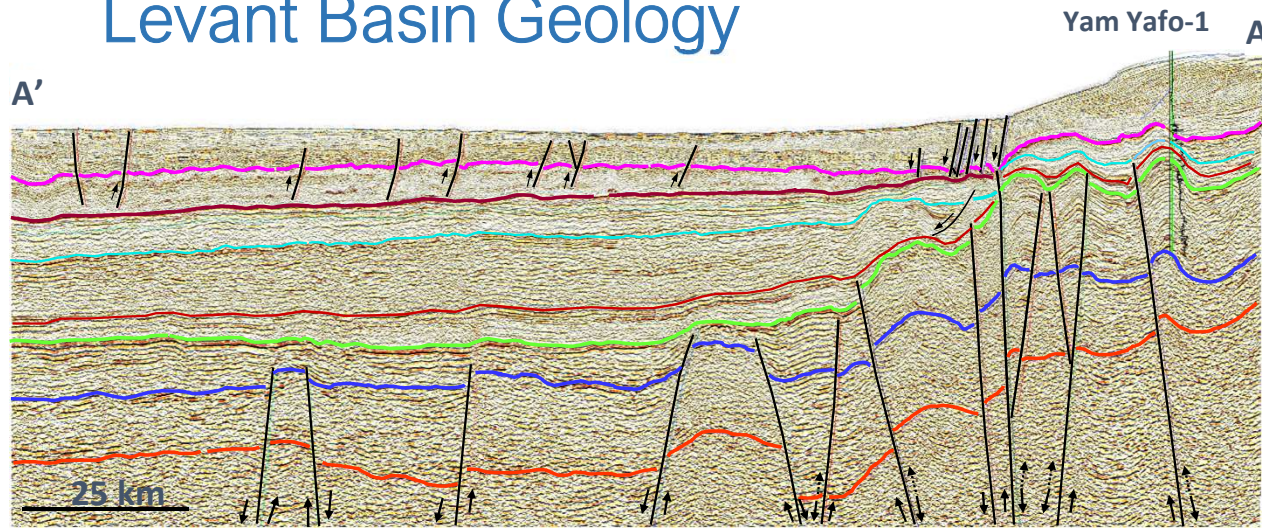
# The Israeli Gas Revolution



- To date 10 gas fields have been found including the giants Tamar and Leviathan, discovered by Noble Energy in water depth of ~1600m
- Present reserves are estimated at 604 BCM (2P) with additional contingent resources of 234 BCM (2C)
- The Tamar field was connected to shore in 2013 in a record time of less than 3 years after discovery
- Leviathan and Karish are under development with first gas planned to 2019 and 2020
- Israel is rapidly adopting to this new gas era with 65% of its electricity generated from gas (will increase to 90%)



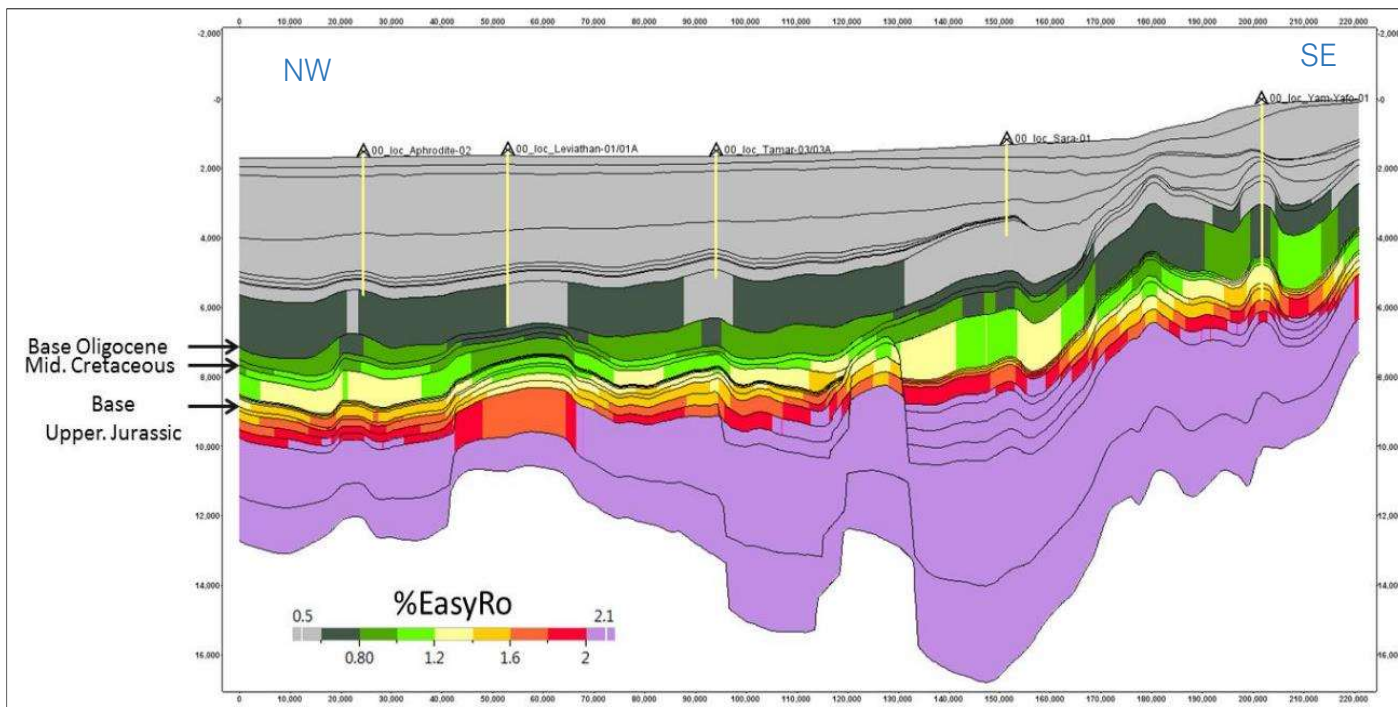
# Levant Basin Geology



- Large extensional structures at depth
- Shallower inverted structures
- Thick Tertiary sedimentary fill
- Regional evaporitic seal



# Basin Modelling Predicts High Potential for Gas and Oil Generation



Thermal maturation profile across the Levant Basin

Beicip-FranLab 2015-Basin Analysis

## YTF resource estimate

	TOTAL OIL	TOTAL GAS
	<i>Billions bbl</i>	<i>BCM</i>
<b>YET-TO-FIND in Place Best Estimate</b>	<b>6.6</b>	<b>2137 (75 TCF)</b>

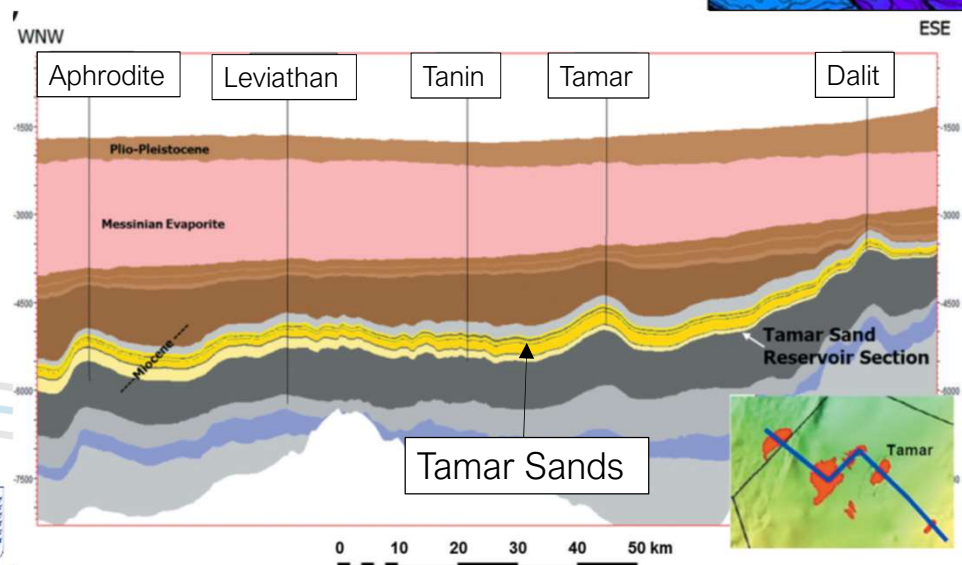
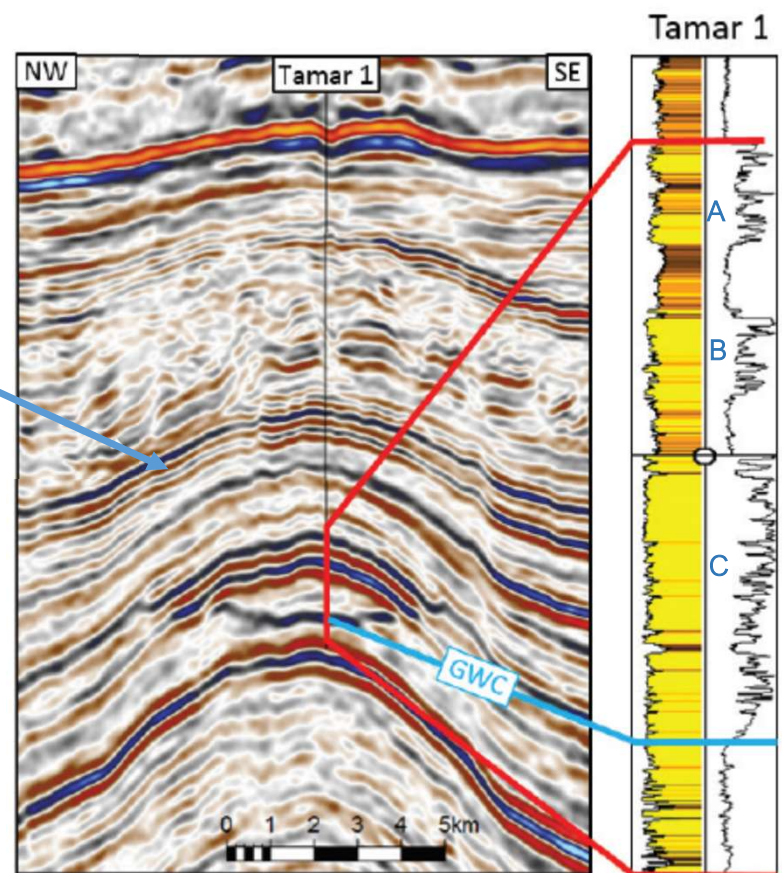
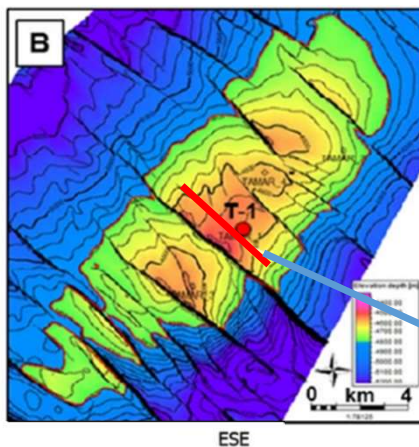
- Basin modeling shows extensive, shallow biogenic Gas System and deep thermogenic Oil System



# The Tamar Sand Play

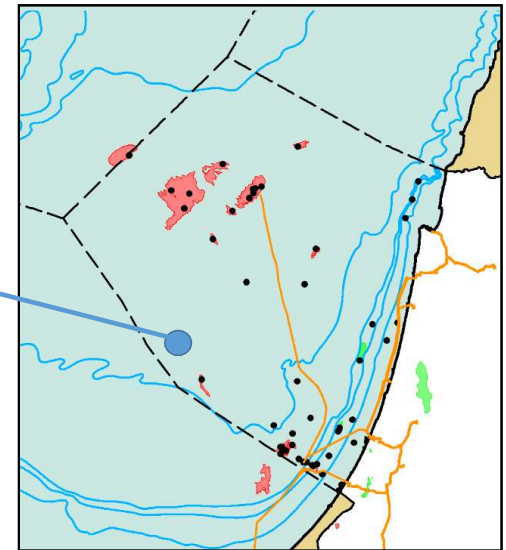
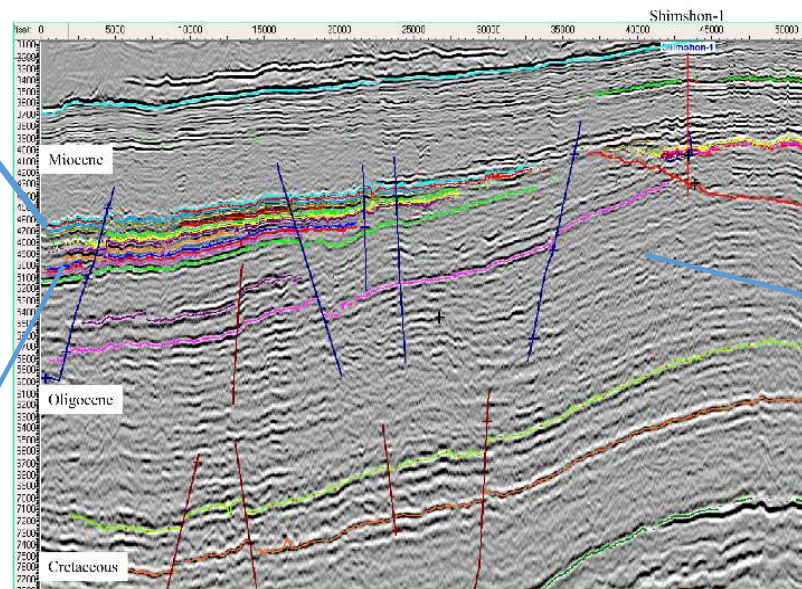
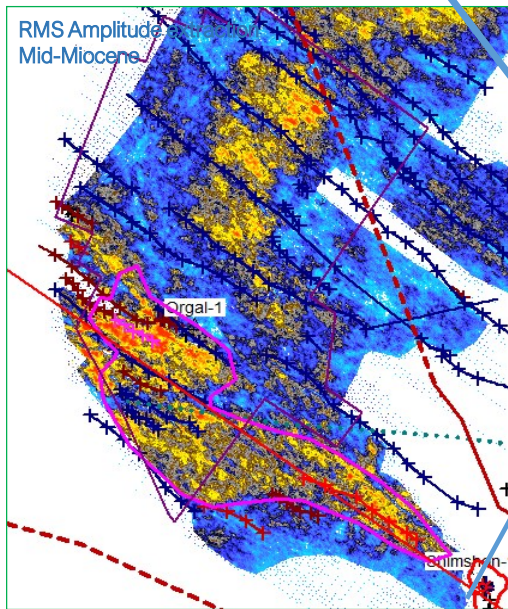
- Series of turbidite sandstones of Oligo-Miocene age with excellent reservoir properties (25% / 1D)
- Charged with biogenic gas
- Extending more than 100 km across the eastern part of the Levant Basin
- 100% drilling success due to DHI

## The Tamar Field



(after Needham et al., 2017)

## More Potential Targets in the Basin- Tamar-Like Stratigraphic Traps



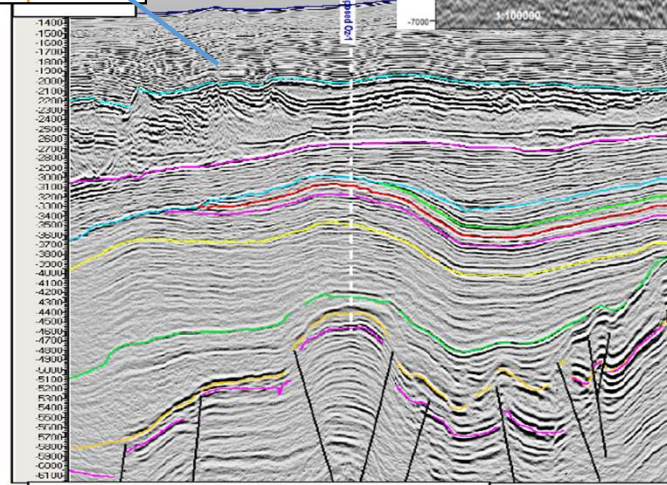
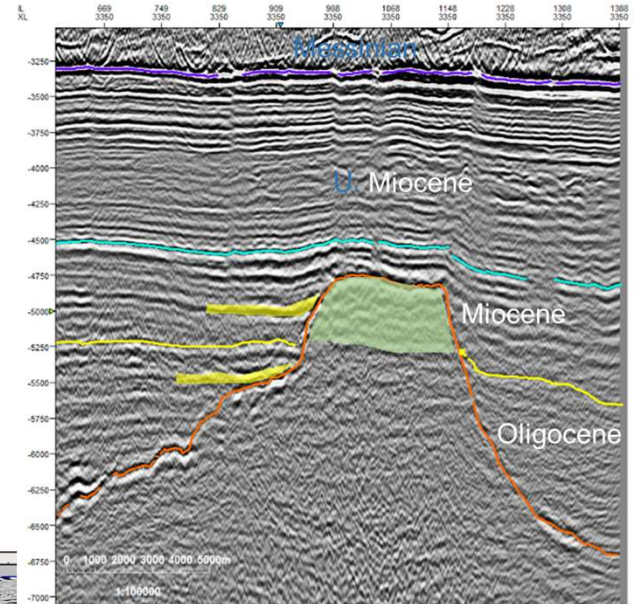
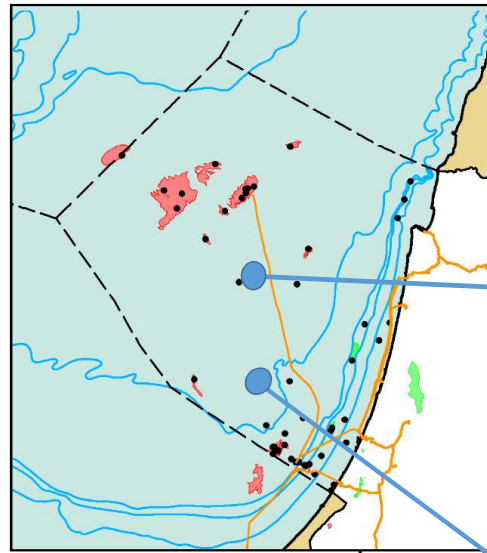
- Turbidite lobes at the mouth of the Afiq Canyon
- Possibly charged with biogenic gas





# More Potential Targets for Oil in the Basin-Mesozoic Structures

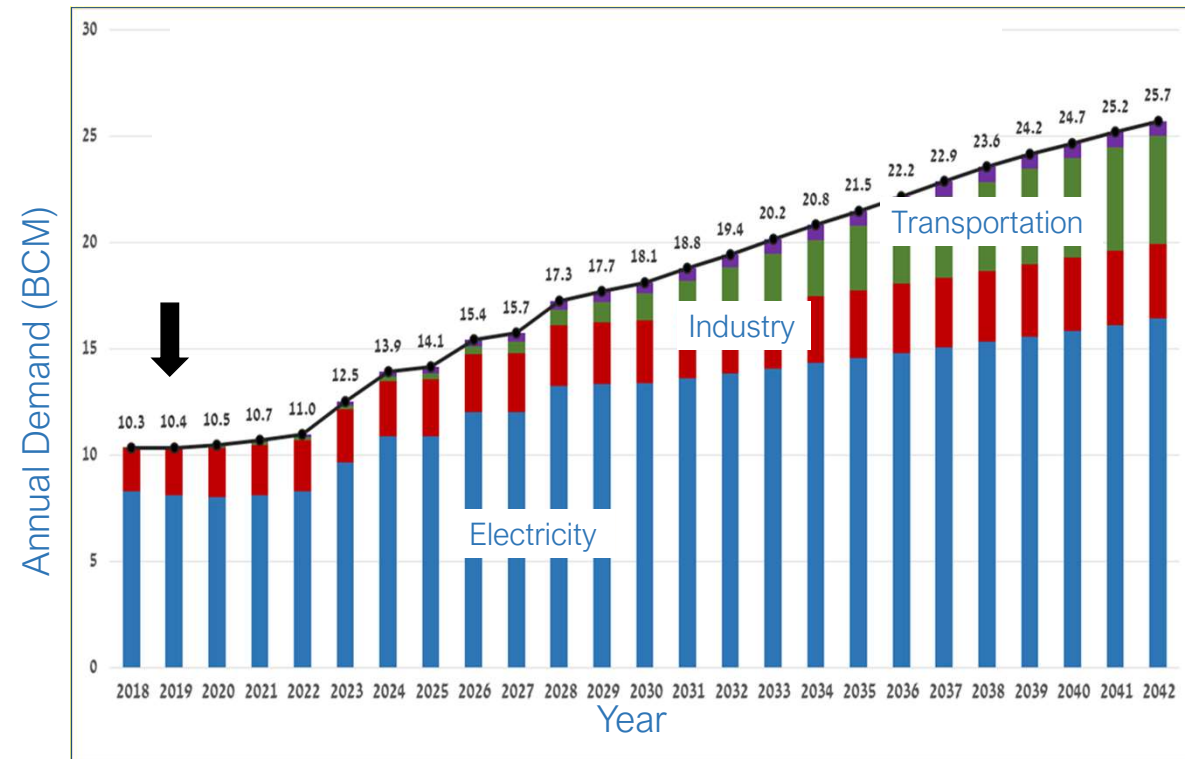
- A basement high capped by Mesozoic carbonate buildup (Zohr Like) in the center of the basin
- Large, Late Cretaceous Syrian Arc folds along the eastern margin of the basin



The Jonah Basement High

The Oz Syrian-Arc Fold

# The Israeli Domestic Market



Gas Demand Forecast - Likely Scenario  
(Gas Authority, 2018)

## Main Factors for Increase in Demand:

- Natural growth of population
- Closing coal-based electric plants
- Wider use in heavy industry and households
- Conversion to electric and CNG cars (No imports of fuel based cars by 2030)
- 90% of Electricity will be generated from gas and renewables by 2030



# Export Options



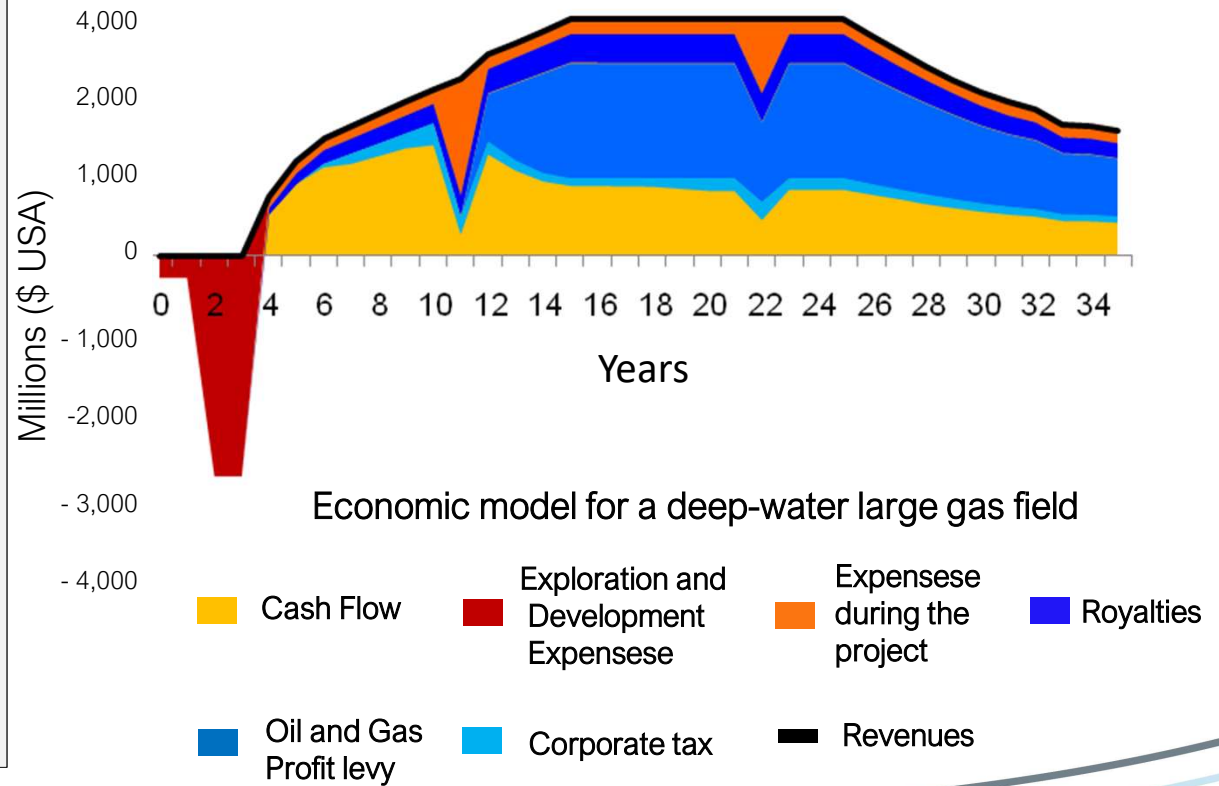
## Status of Export :

- Jordan: two contract are signed (47 BCM)
- Egypt: - one contract is signed (64 BCM)  
- two more contract are negotiated for LNG export
- Europe: feasibility studies for the EastMed Pipeline are ongoing (10-20 BCM/Y)

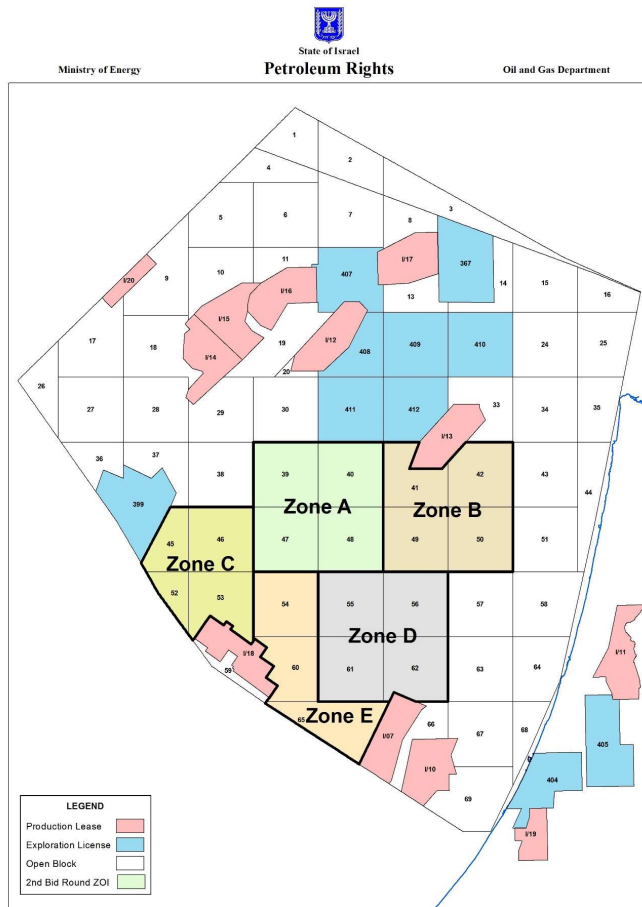


# Fiscal Regime

- Petroleum Rights are managed as concessions under a Royalty/Tax fiscal regime
- Royalties - 12.5% of market value
- Corporate Tax: 23% (2018)
- Oil and gas profits levy-Progressive R-Type Formula applied after 150% return on investment
- Overall Government Take up to ~65% is attractive for investment



## 2<sup>nd</sup> Offshore bid round

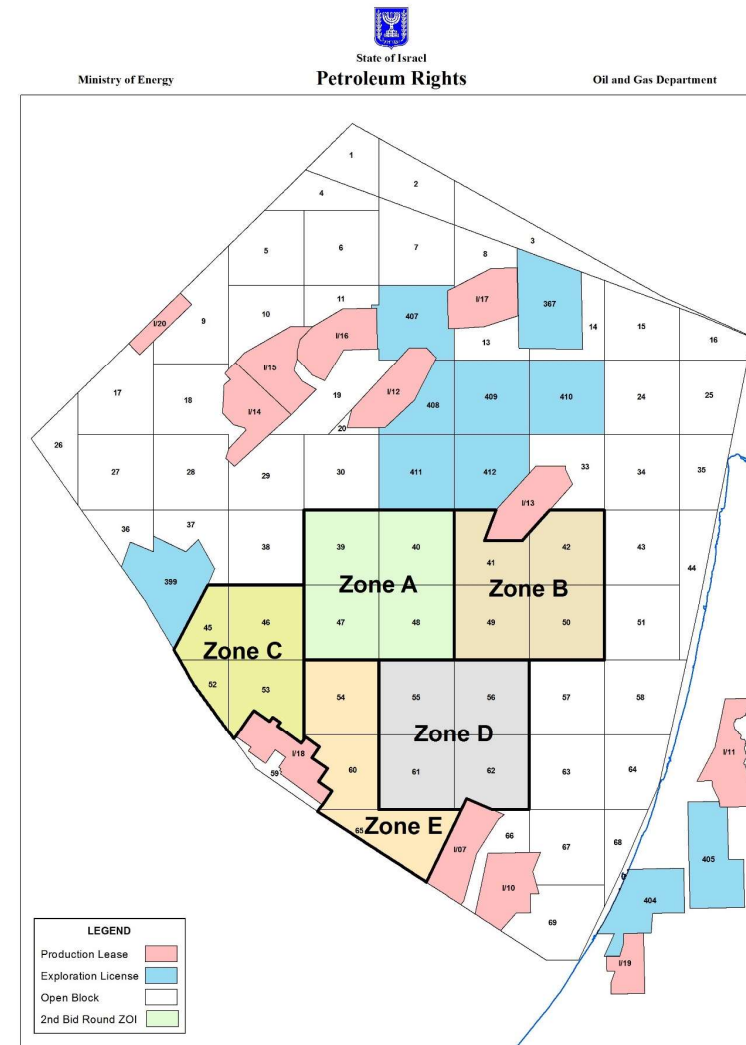


- The Ministry completed its 1<sup>st</sup> offshore bid-round in November 2017, awarding 6 exploration blocks (Energean, OVL)
- A 2<sup>nd</sup> bid round was just opened November 2018 and will be closed in June 2019
- 19 exploration blocks are being offered, grouped into 5 different Zones (A-E)
- Each zone includes 3-4 blocks, with a total area of up to 1600 km<sup>2</sup> for a zone
- In each zone there are identified targets for gas or oil

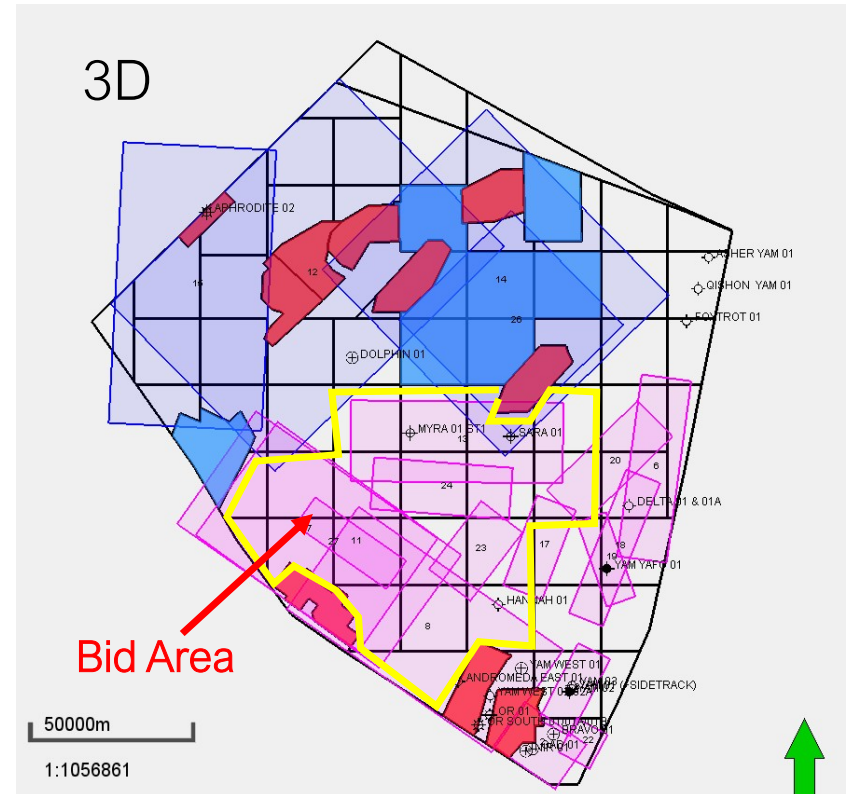
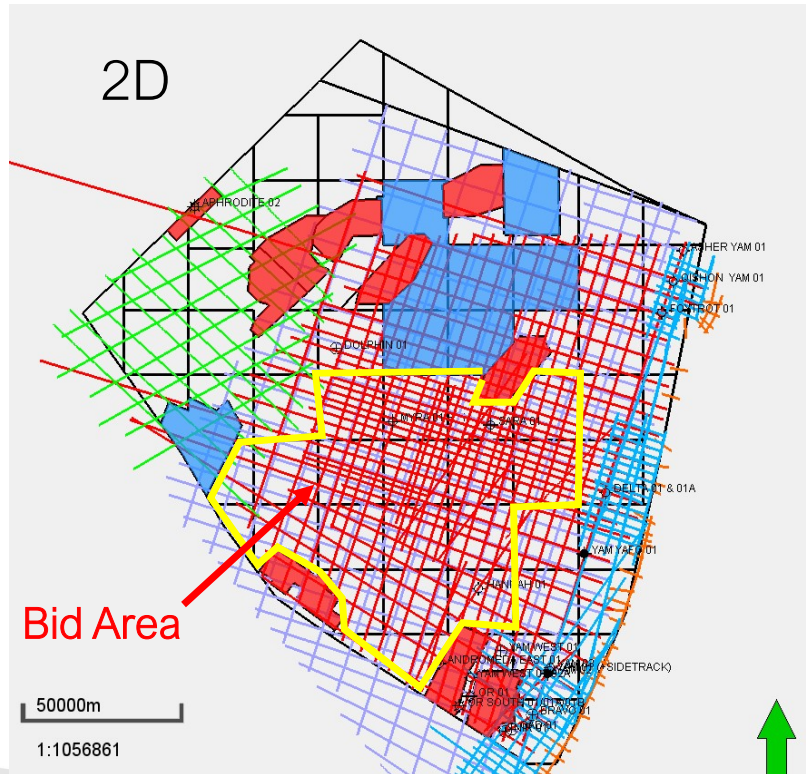


# Bid Terms

- Exploration licenses will be granted for up to 7 years with two drill-or-drop decision points (3+2+2 years)
- No well is required in the first 3 years
- At least 1 well is required to be drilled in one of the blocks within the Zone in the first 2 years period
- All undrilled blocks within the Zone need to be drilled in the second 2 years period
- A full Data Packages including well and 3D seismic data will be offered in an attractive price



# Data Coverage



## Summary:

- Favorable Geologic Conditions
- Proven Success
- Domestic and Export Markets
- Moderate Government Take



We Invite Interested Parties To Participate in our 2<sup>nd</sup> Offshore Bid Round  
Which will be open from December 2018 to June 2019

More information in our website: [www.Energy-Sea.gov.il](http://www.Energy-Sea.gov.il)



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