

The fields and discoveries of the Eastern Mediterranean.

The changing reserves story.

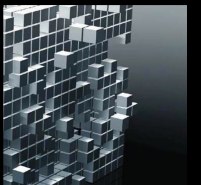


Mike Cooper, Jeremy Lockett & Ben Duncan

Opportunities in the Eastern Mediterranean, Finding Petroleum Event

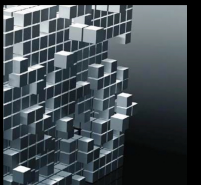
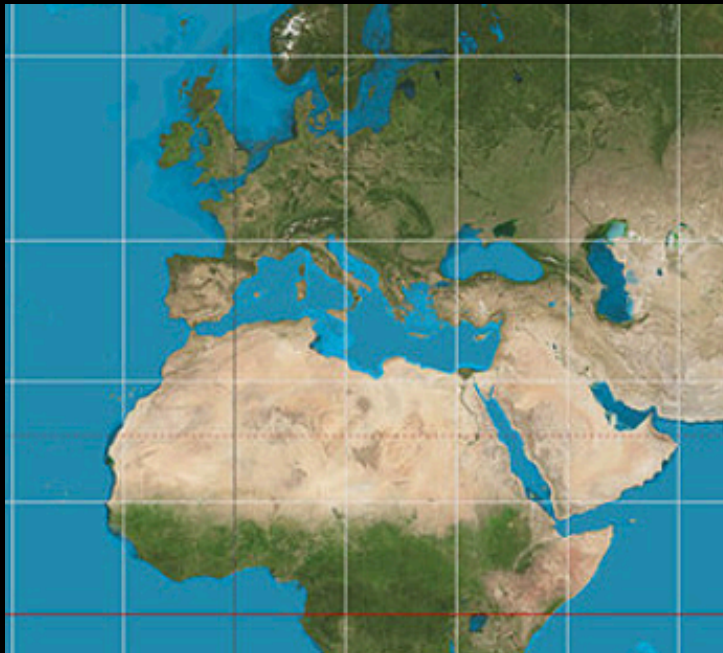
Geological Society, London

20th September 2019



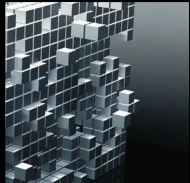
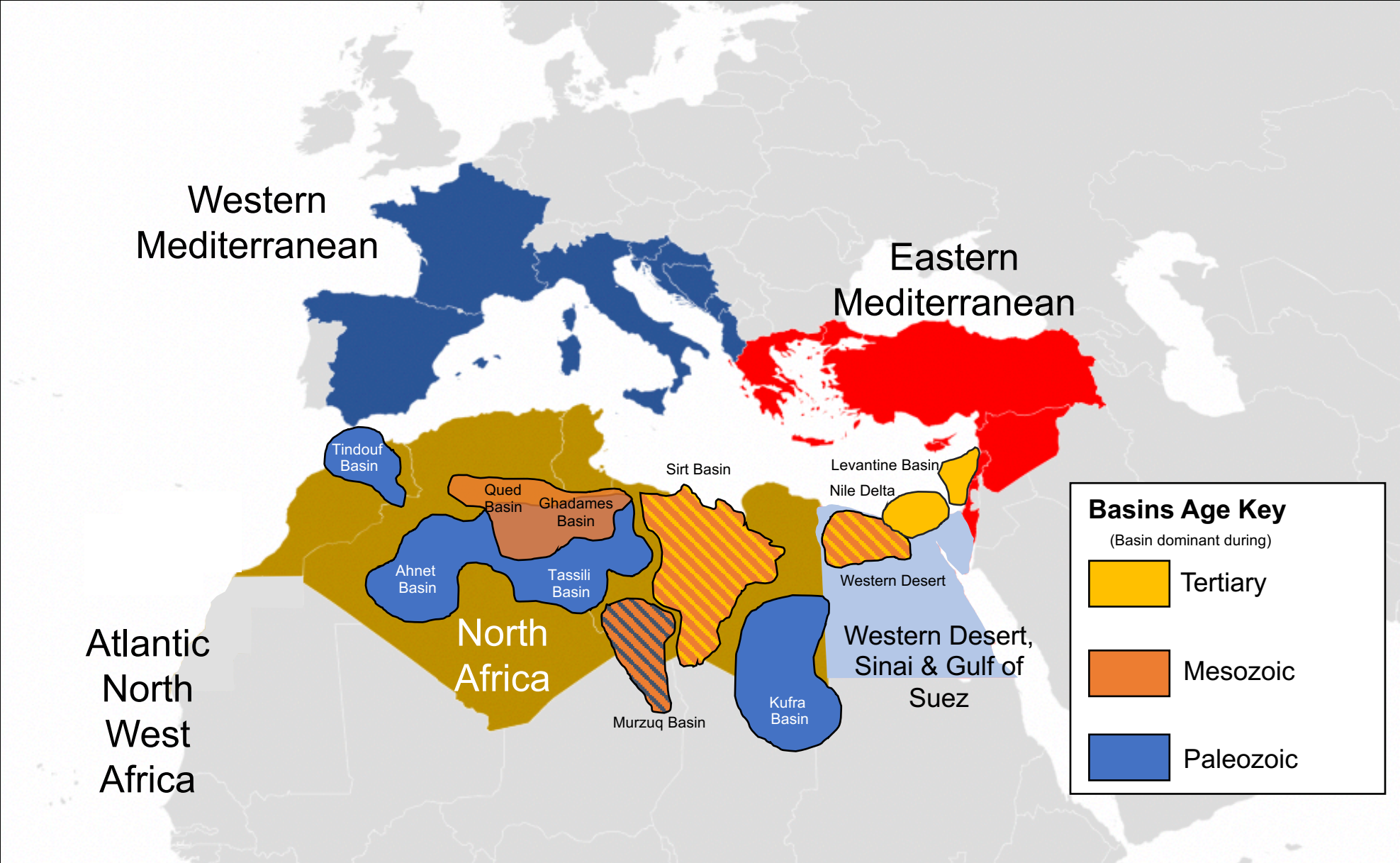
1st Subsurface

Mercator v Equal Land Area Projections



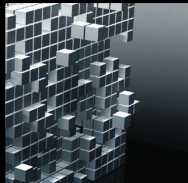
1st Subsurface

TROVE Coverage – in the Eastern Mediterranean region



1st Subsurface

BP Statistical Review 2019

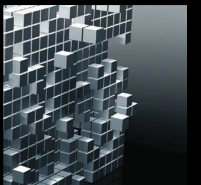


1st Subsurface



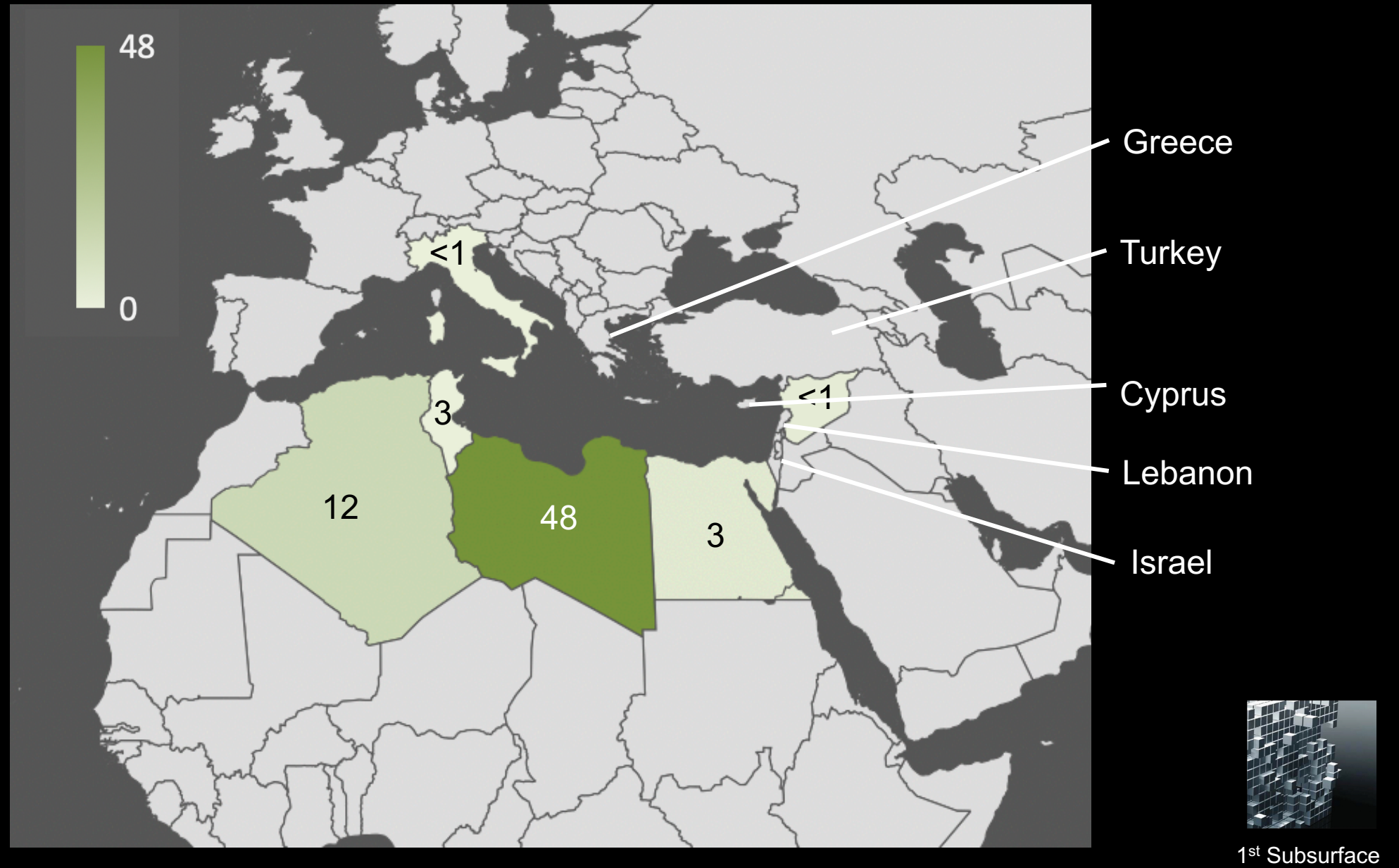
BP Statistical Review of World Energy

2019 | 68th edition

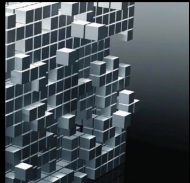
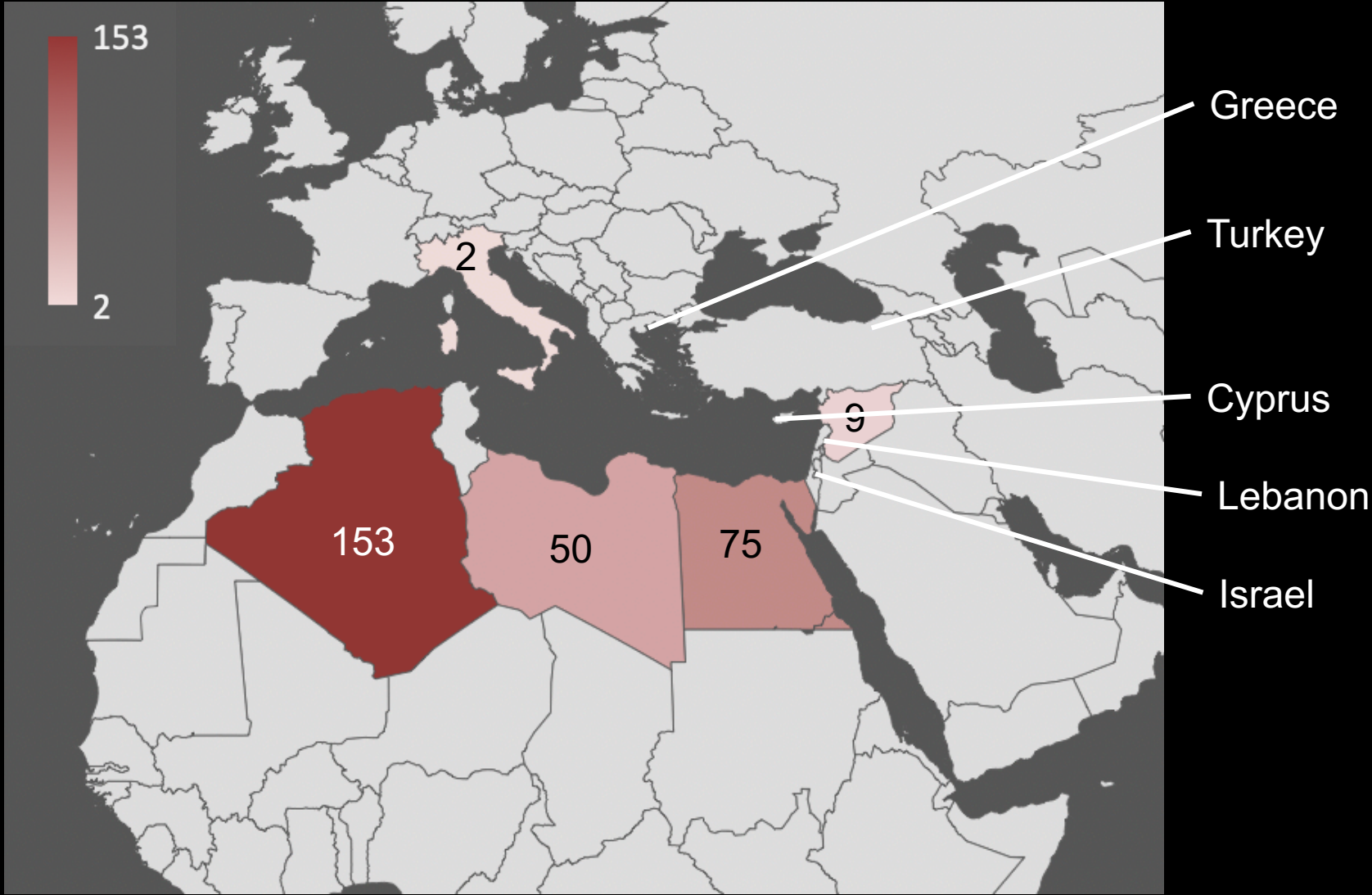


1st Subsurface

Total Proved Oil Reserves (Billion Barrels at End 2018)



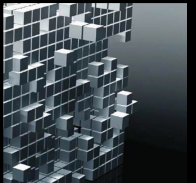
Total Proved Gas Reserves (Tcf at End 2018)



1st Subsurface

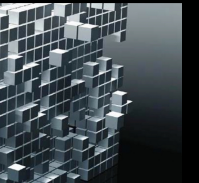
Reserves Definition

- “Total proved reserves of oil – Generally taken to be those quantities that geological and engineering information indicates with **reasonable certainty** can be recovered **in the future** from known reservoirs **under existing economic and operating conditions**.
- The data series for total proved oil reserves **does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level**, for instance as published by the SEC, nor does it necessarily represent BP’s view of proved reserves by country”.
- We will include “high probability” Contingent Resource.



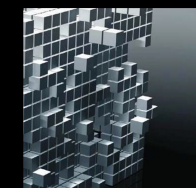
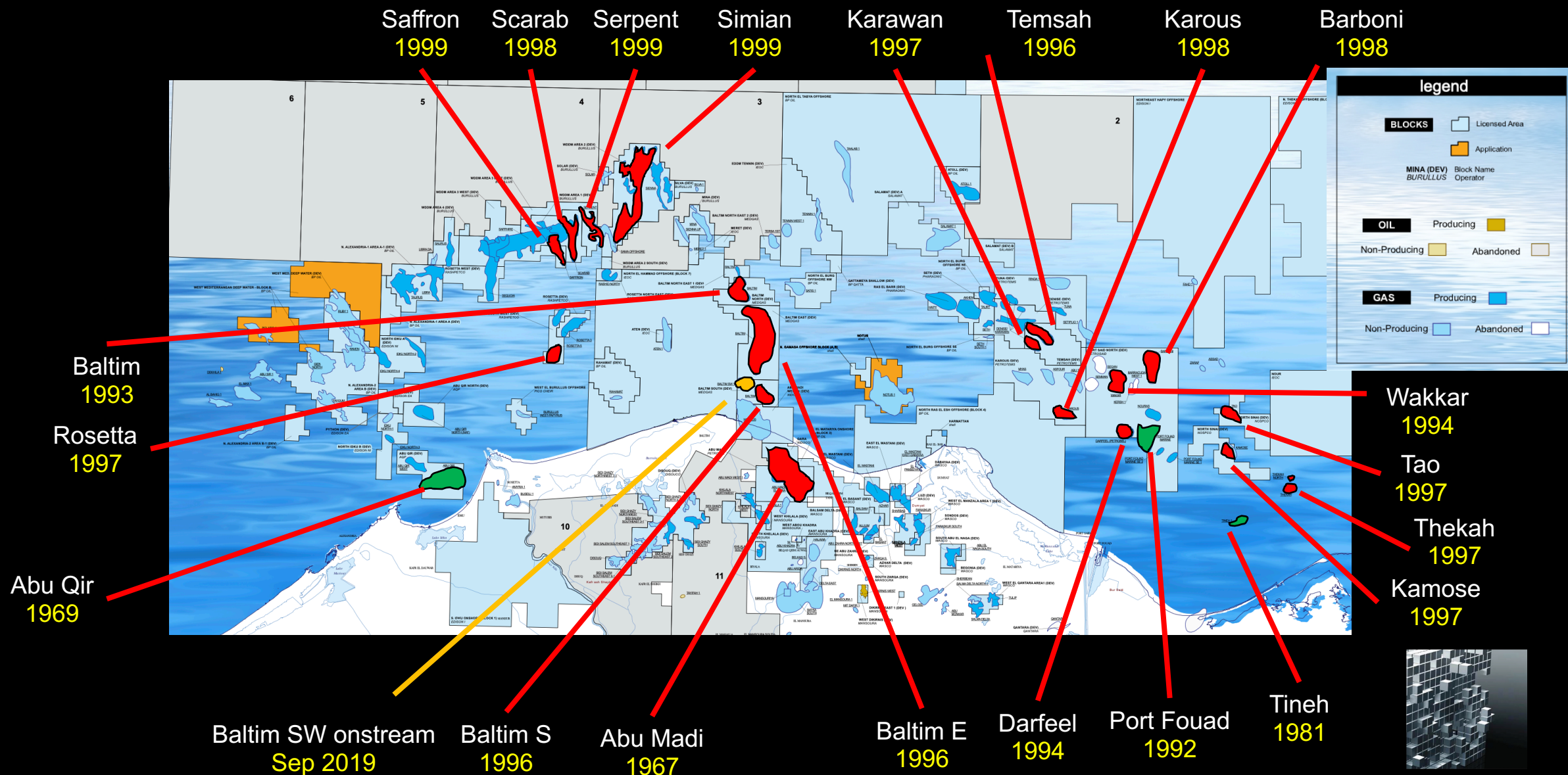
1st Subsurface

History of Hydrocarbons in the Eastern Mediterranean



1st Subsurface

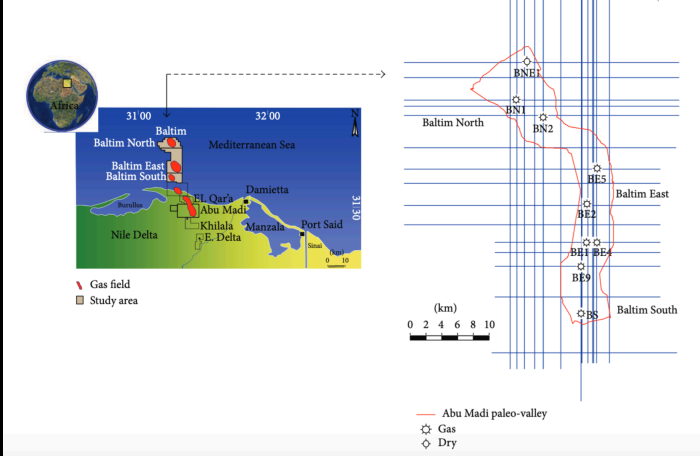
Egypt – 1967 onwards



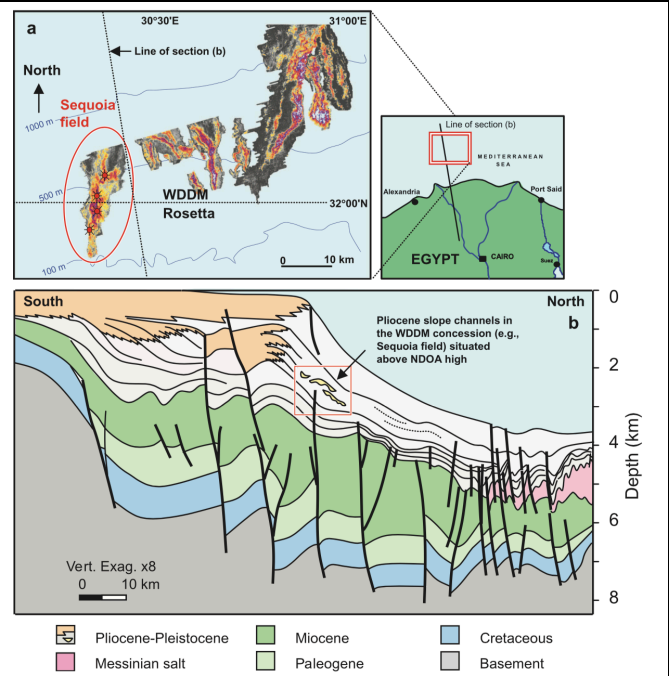
1st Subsurface

Egypt – technologies unlocking reserves

HP/HT Oligocene pre-salt
(Abu Madi play)

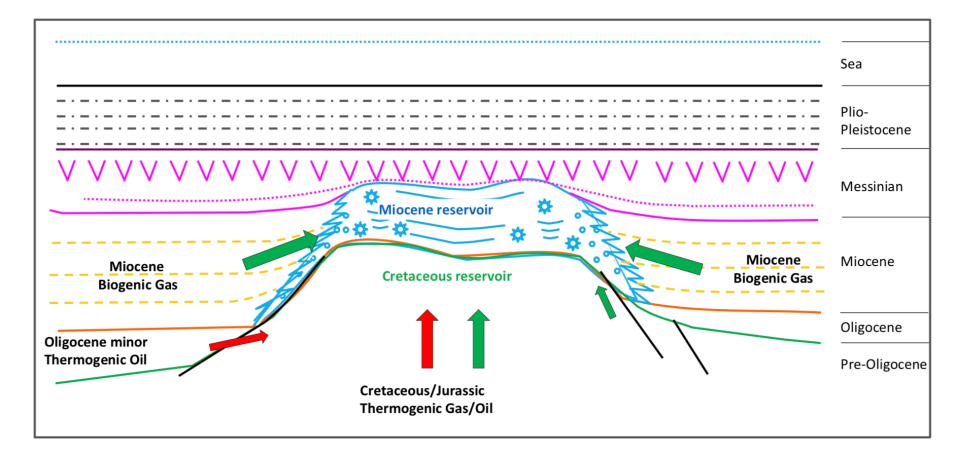


Pliocene, DHI, post salt, deeper water
(e.g. Sequoia)

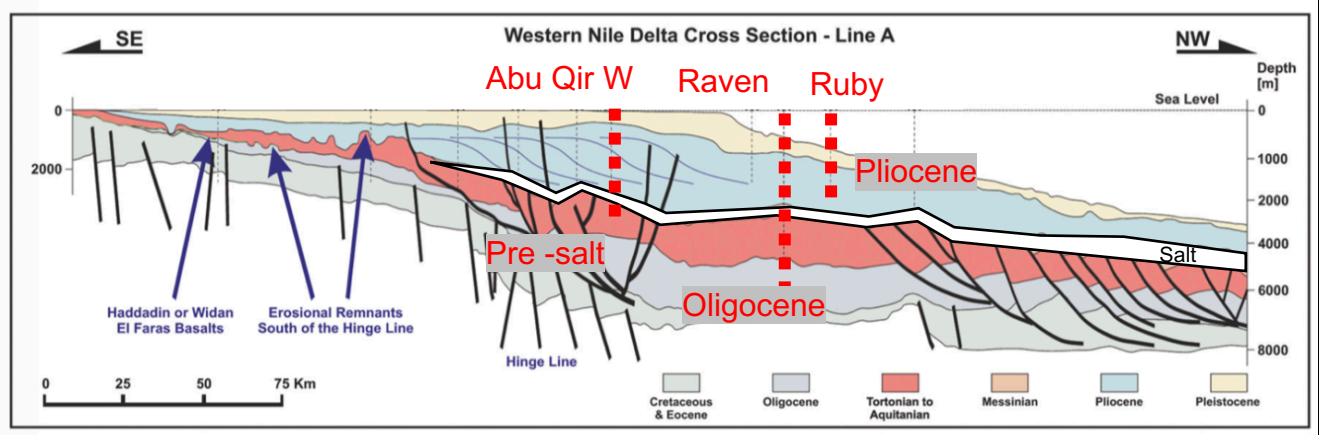


DOLSON, J. C. et al, 2005

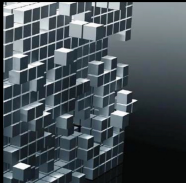
Miocene/Cretaceous
Carbonates



A. Cozzi et al, 2018



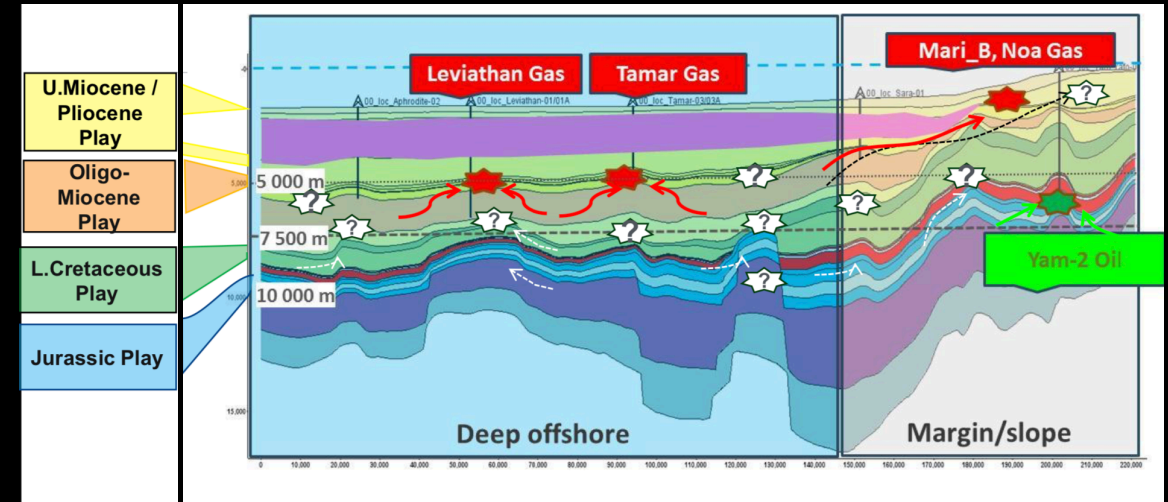
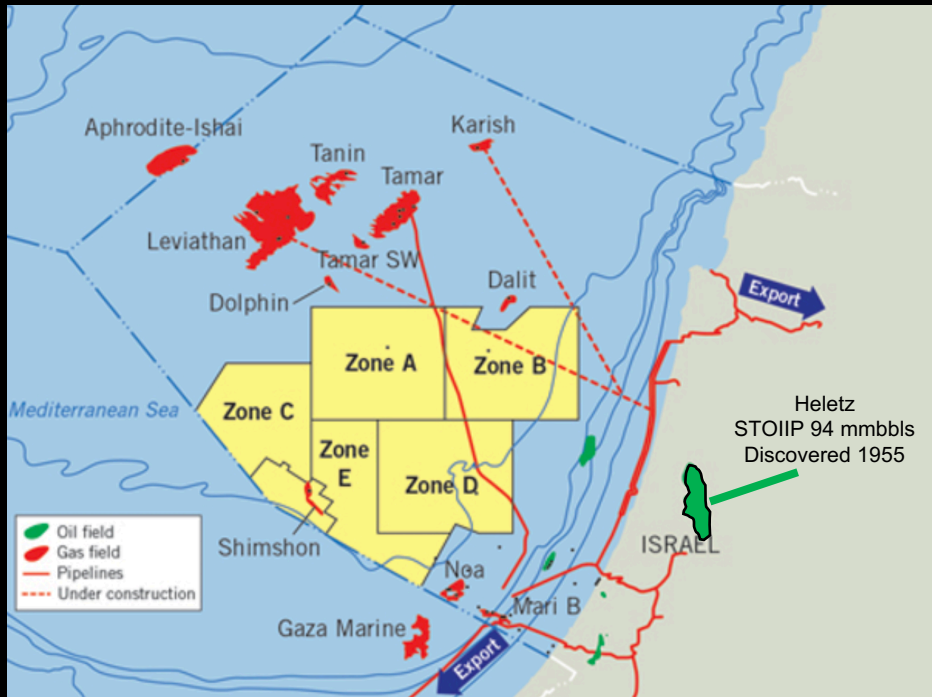
Kellner, A et al, 2018



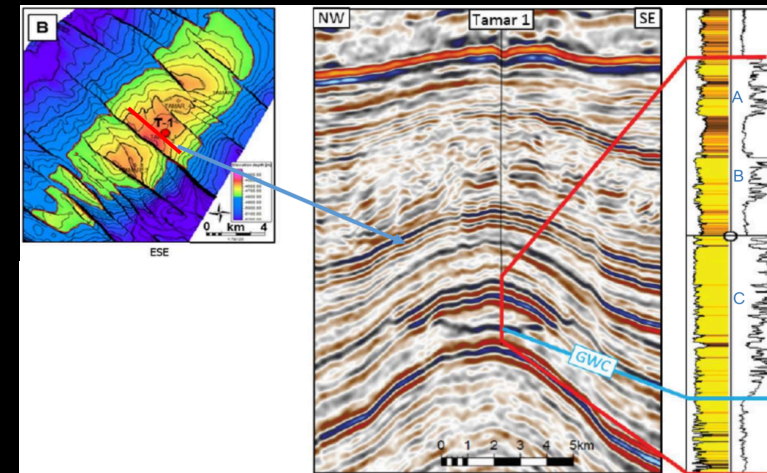
1st Subsurface

Israel

Heletz was the first oil field discovered in the Eastern Mediterranean Cretaceous sandstone reservoir, Early Cretaceous shale source



Play types – the prolific Oligo-Miocene play



Tamar - Oligo-Miocene turbidite sandstones with excellent reservoir properties (25% porosity / 1D) Biogenic gas.

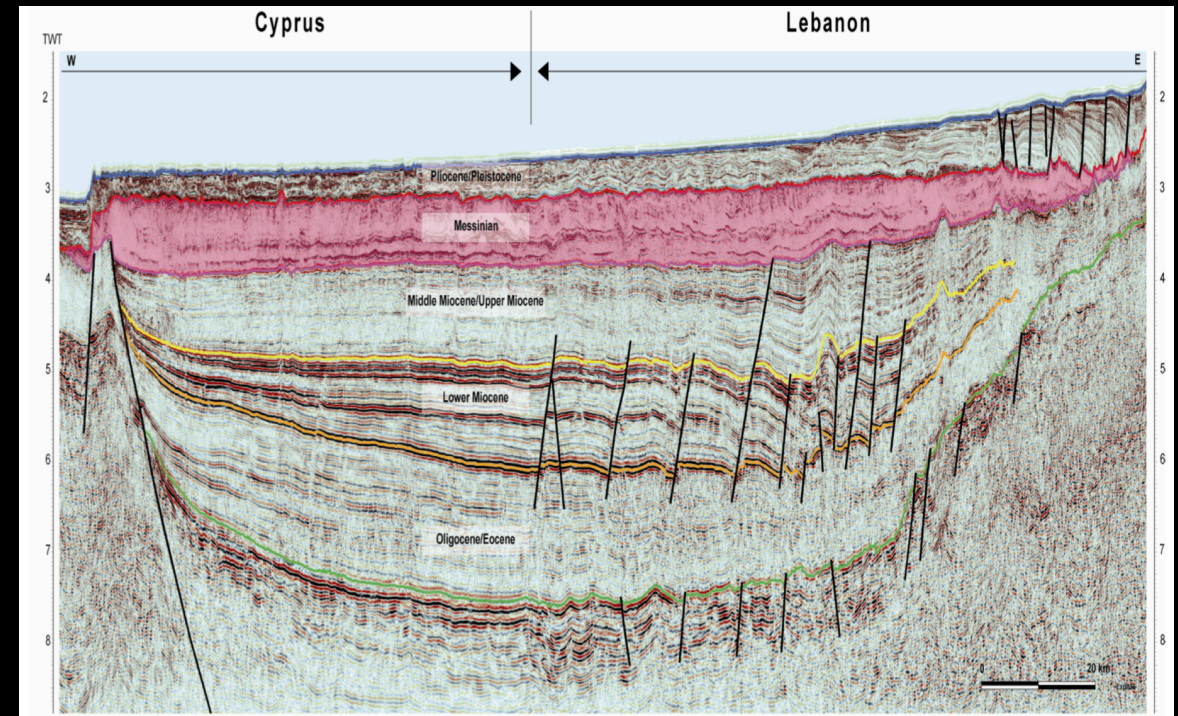
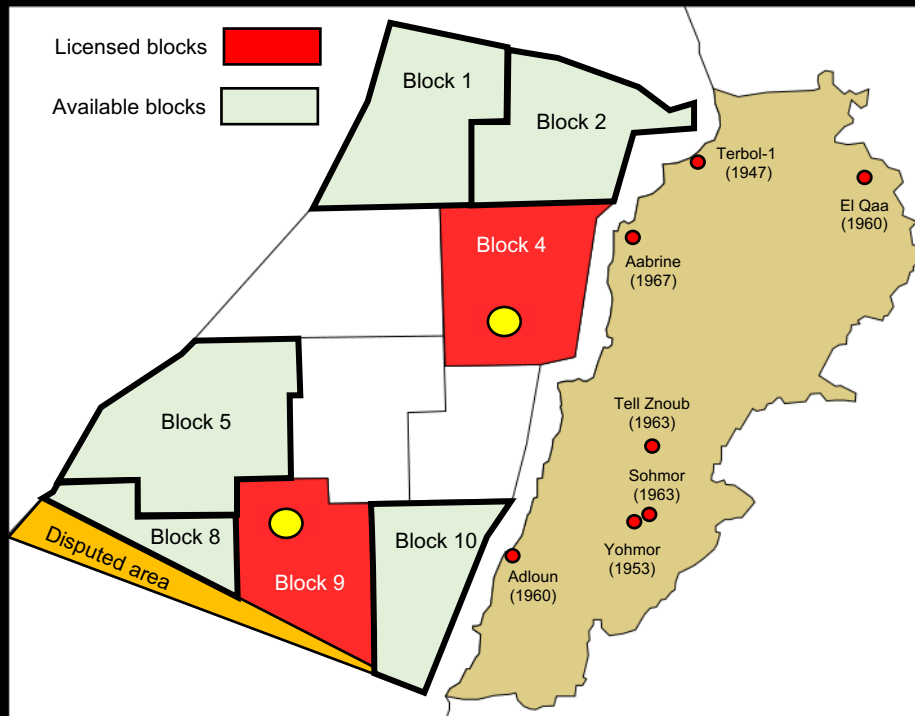


1st Subsurface

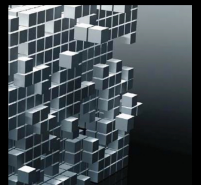
Lebanon – awaiting first offshore drilling results

1st License Round awarded two blocks (2017)

2nd Round - blocks on offer (Closes Jan 2020)



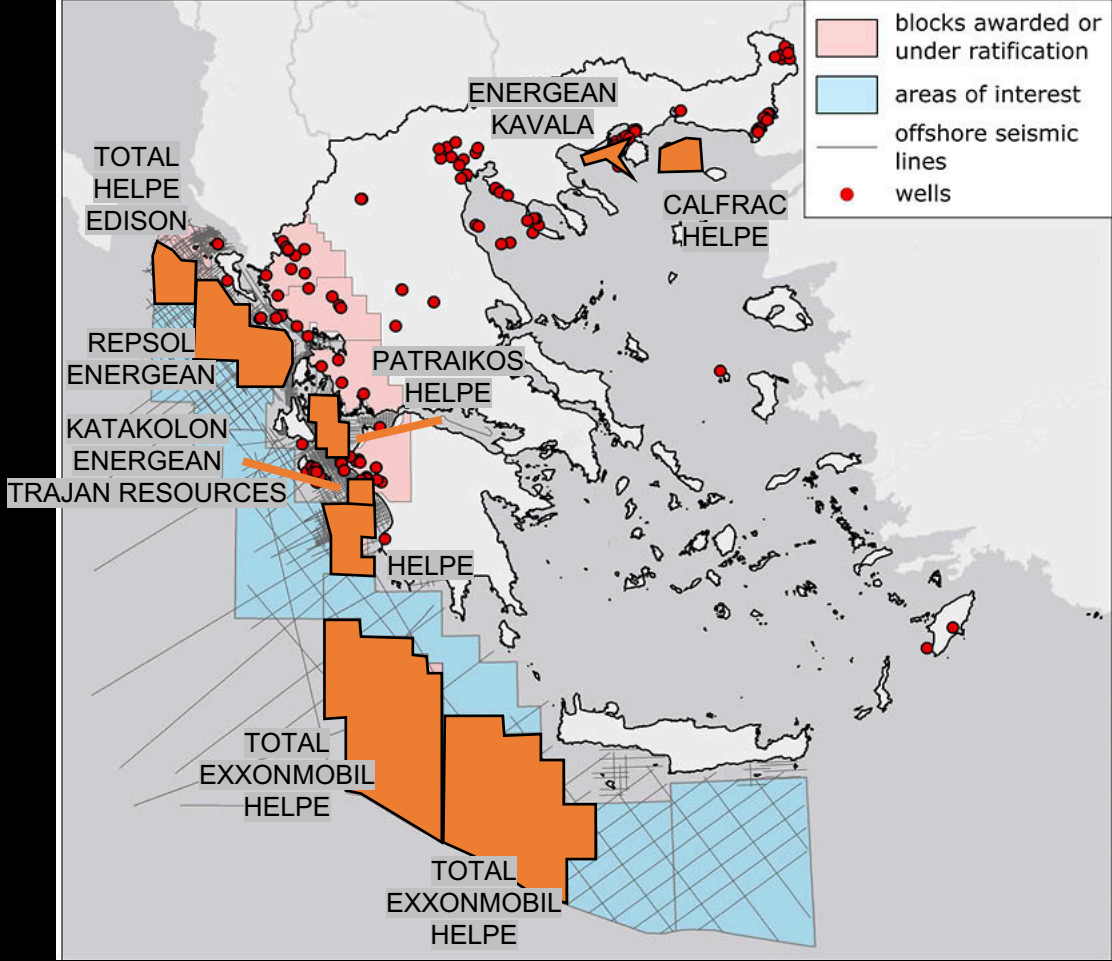
>7 sec TWT Tertiary sediments



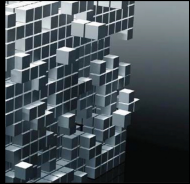
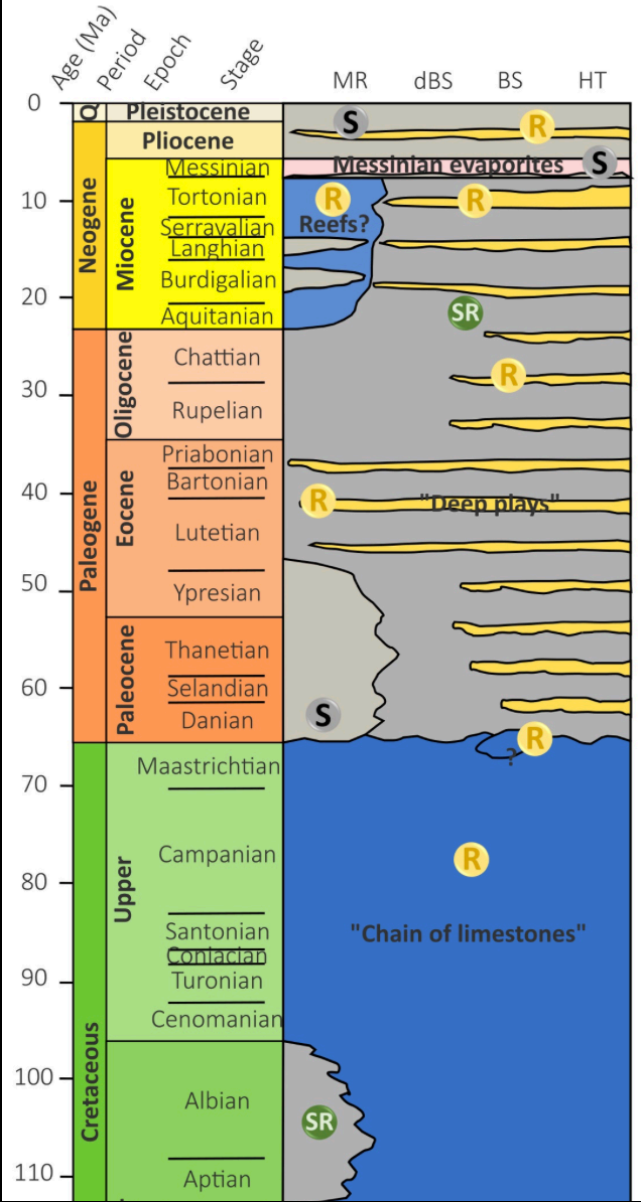
1st Subsurface

Greece

West of Crete –Cretaceous & Tertiary plays



Awarded exploration areas



1st Subsurface

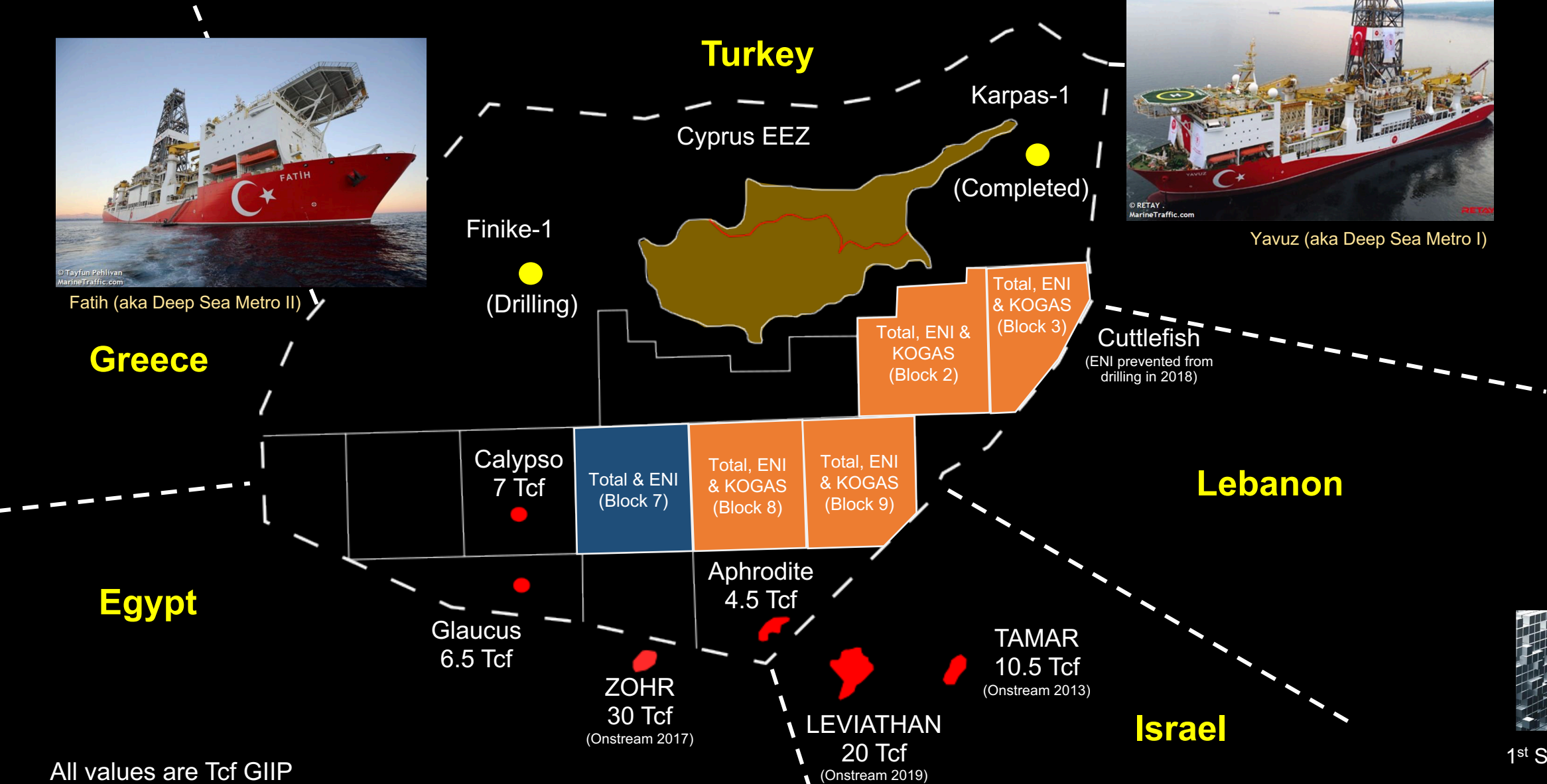
Cyprus – Politics trumps Exploration



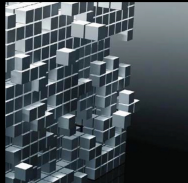
Fatih (aka Deep Sea Metro II)



Yavuz (aka Deep Sea Metro I)



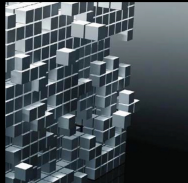
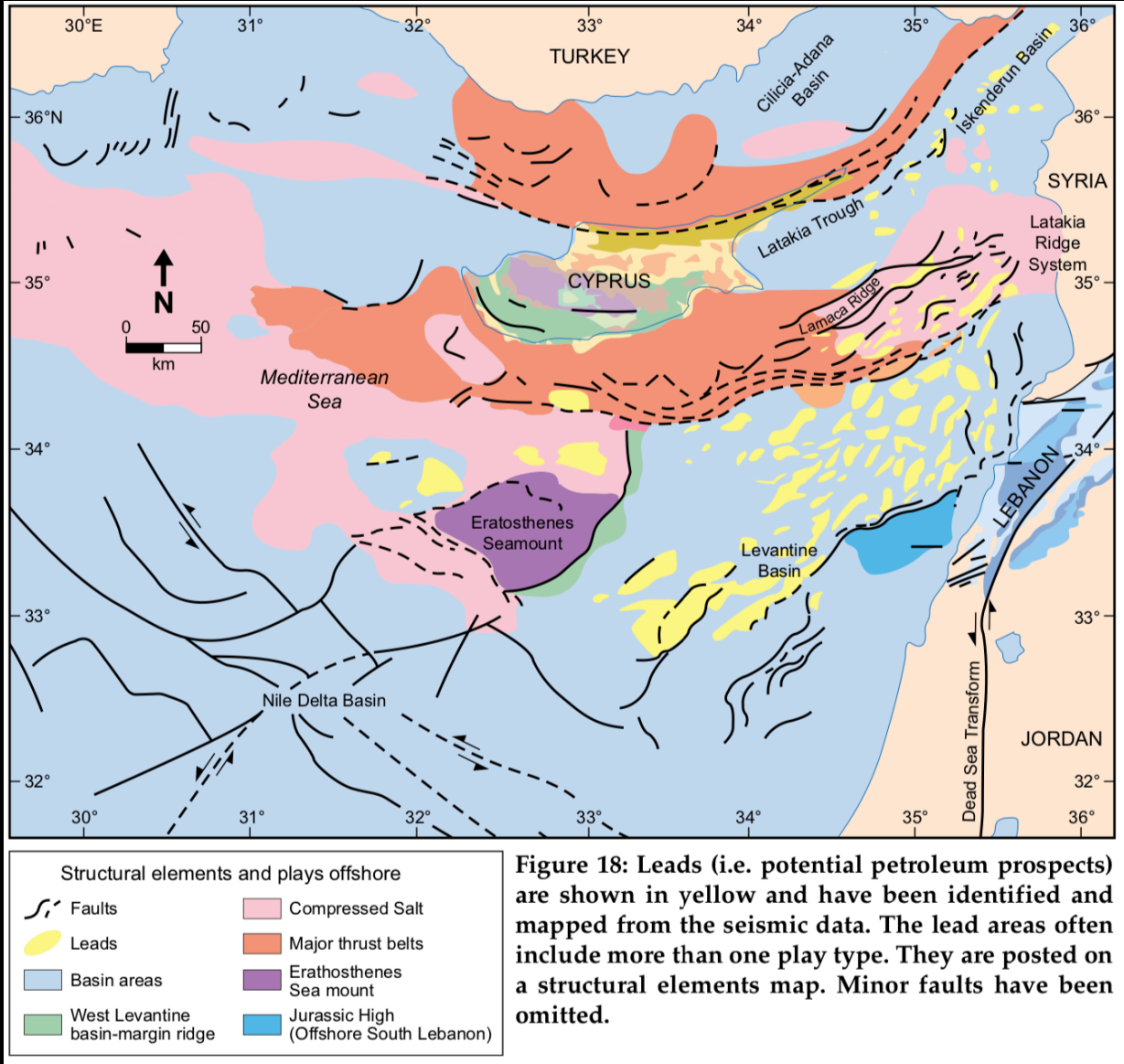
All values are Tcf GIIP



1st Subsurface

YouTube video coming soon!

Turkeys Eastern Med drilling



1st Subsurface

Turkey - Eastern Mediterranean drilling activity

Alanya-1
2018

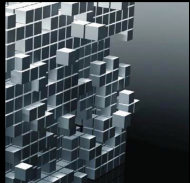
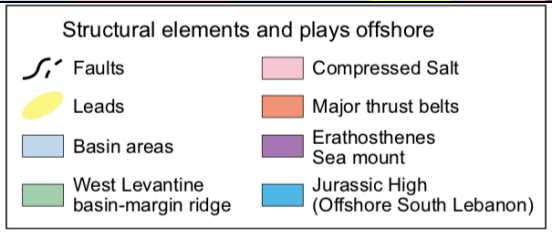
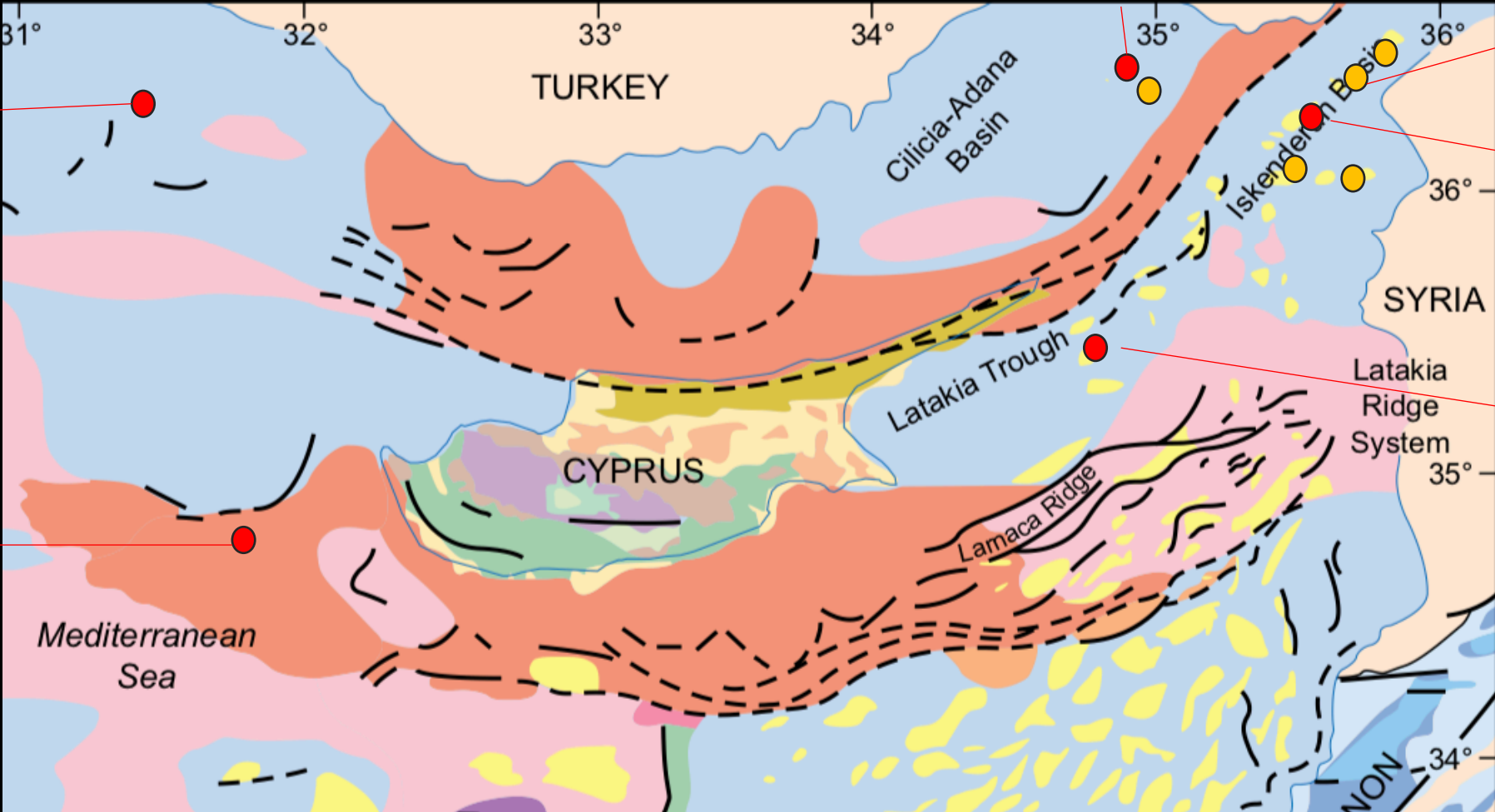
Erdemli-1
2019

Gas discovery

Kuzupinari-1
2019

Karpas-1
2019

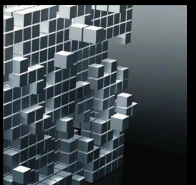
Finiki-1
2019



1st Subsurface

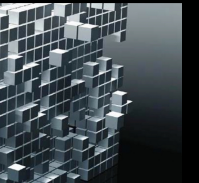
Future Changes to the BP Statistical Review

- Egypt Reserves adds likely awash with ongoing production (Zohr plateau?)
Maturity of Western Desert, Gulf of Suez & Niger Delta
- Israel Major reserves adds expected in 2020 Statistical Review. (Leviathan)
- Lebanon & Greece Frontier exploration, potential to be proven. No short term adds.
- Cyprus Major reserves adds expected but highly unlikely in 2020.
- Turkey Will results be made public?



1st Subsurface

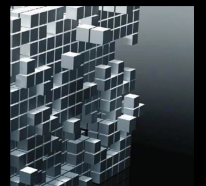
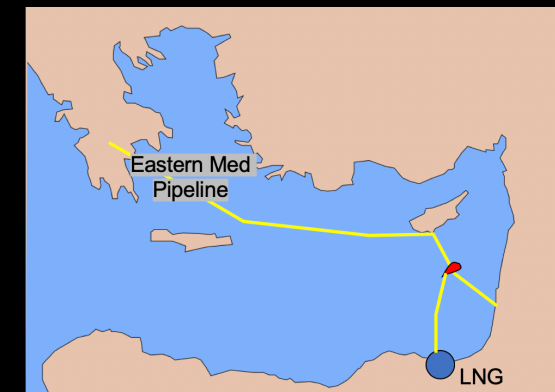
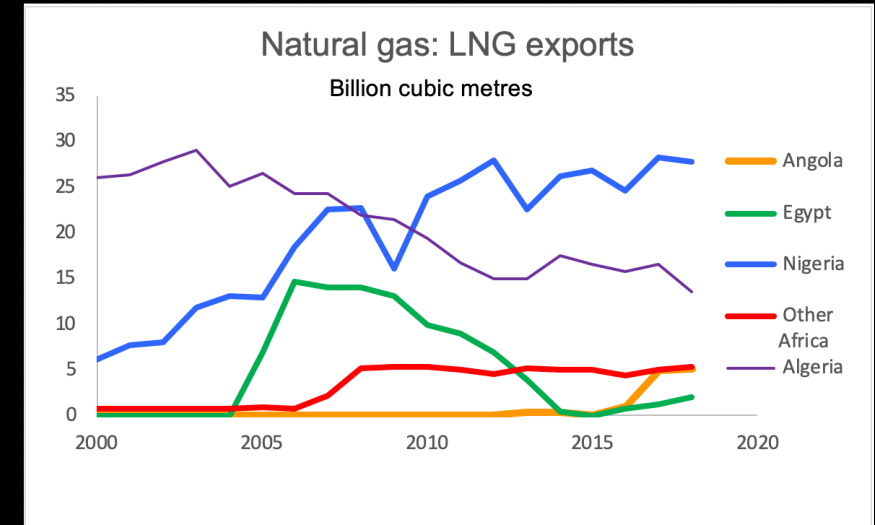
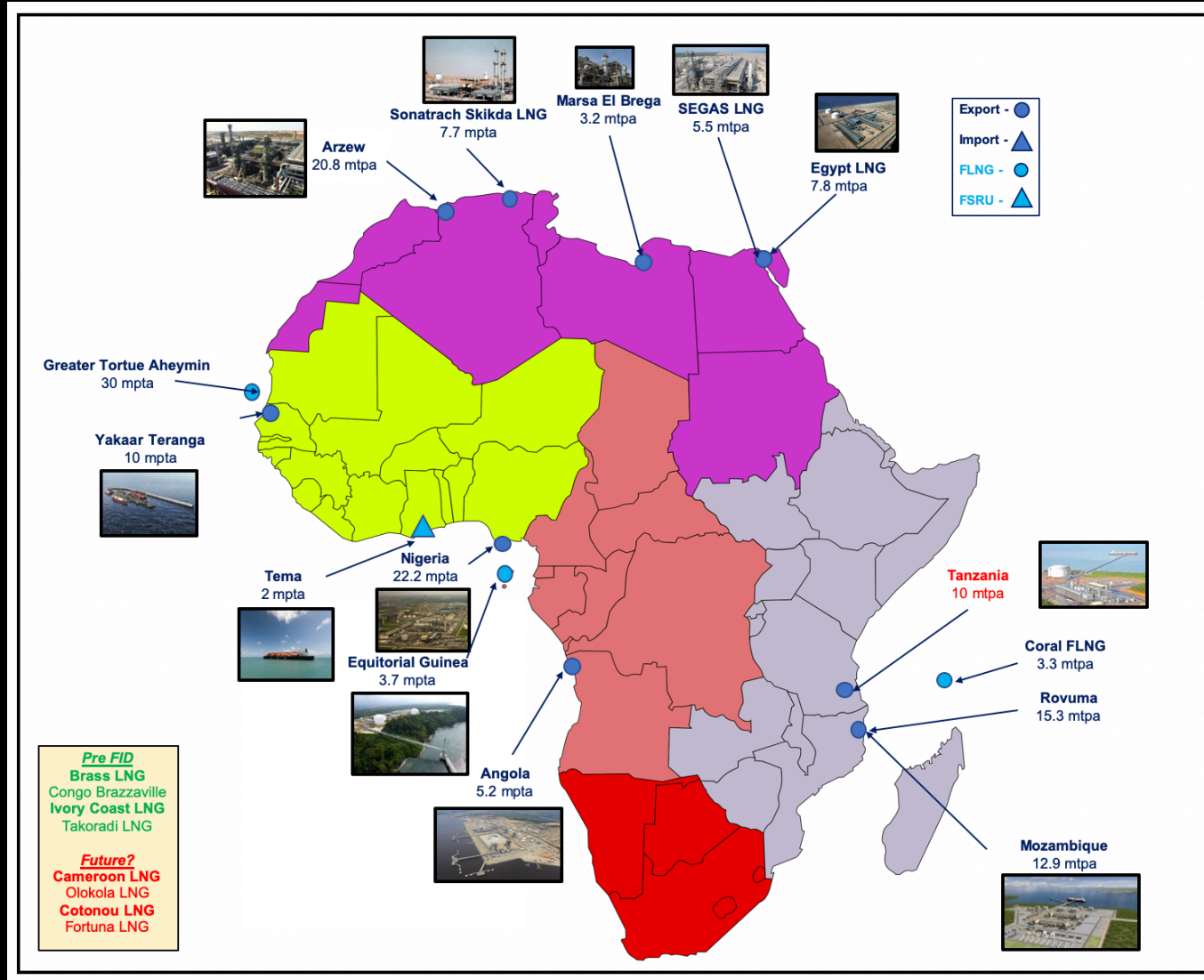
The Future.....



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LNG in Eastern Mediterranean as part of Energy Transition

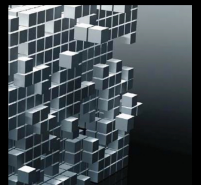
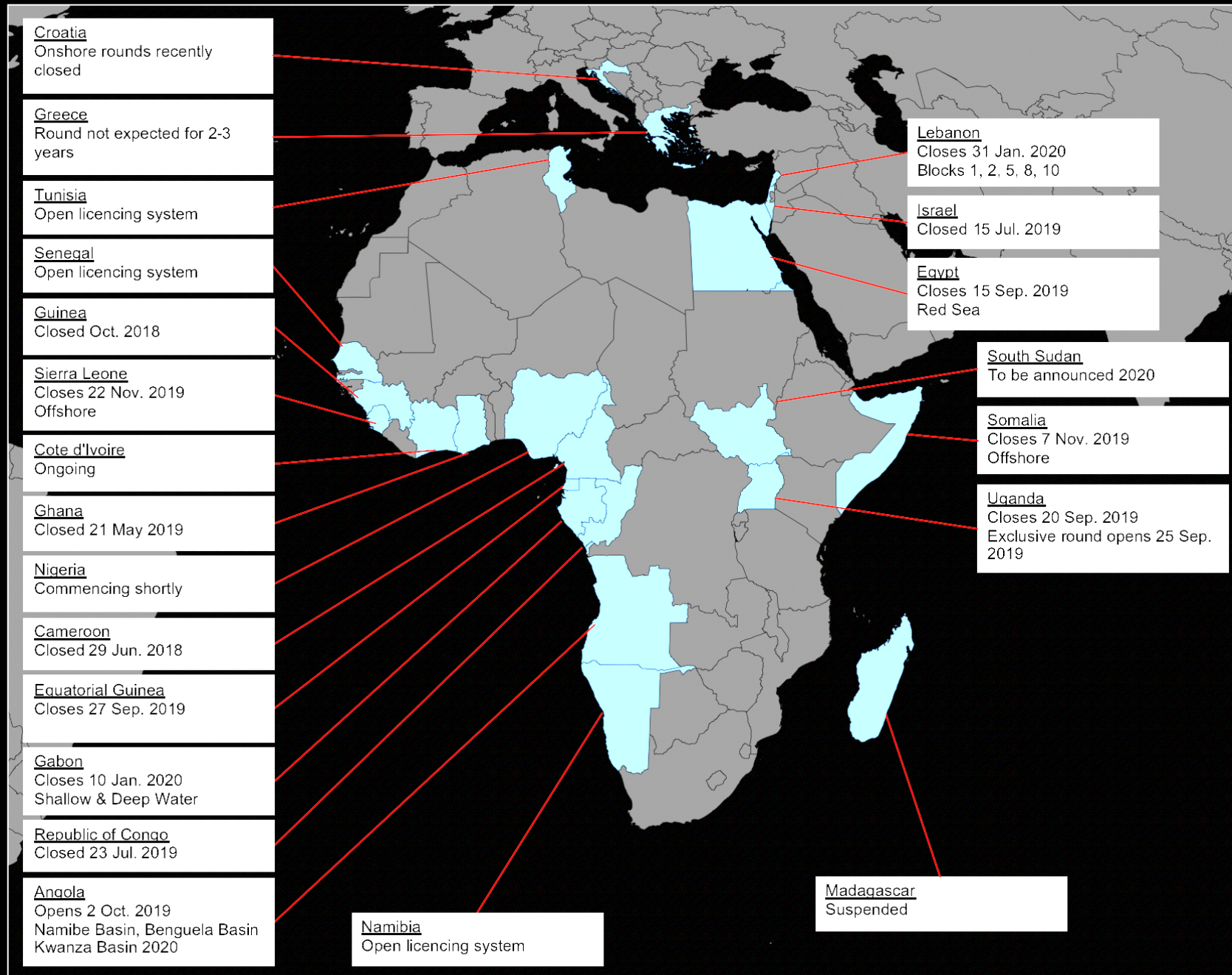
Egypt became a net importer of gas in 2014. Since Zohr, Egypt has surplus gas and potential for export. Plans for export of Israeli gas via Egypt



1st Subsurface

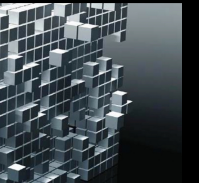
188 mtpa LNG Capacity throughout Africa

Licensing Rounds



1st Subsurface

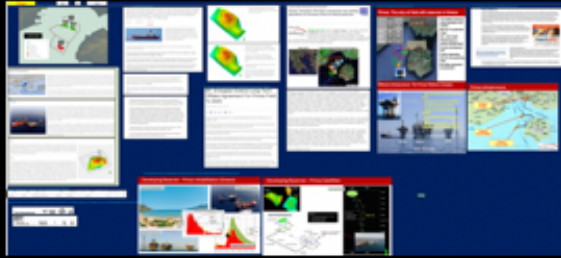
Why TROVE?



1st Subsurface

Eastern Mediterranean – TROVE data sources

Prinos, Greece



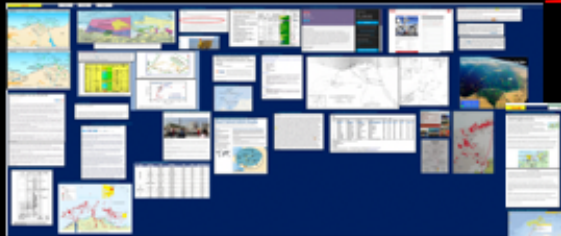
Zohr, Egypt



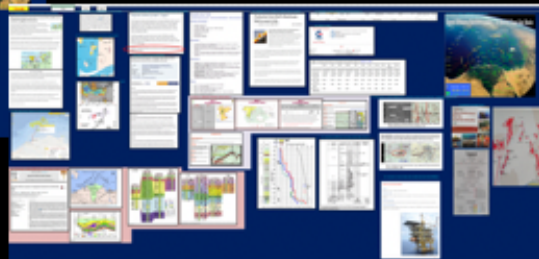
Simian, Egypt



Abu Qir, Egypt



Rosetta, Egypt



Thekah, Egypt



Tamar, Israel



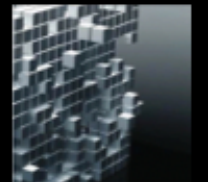
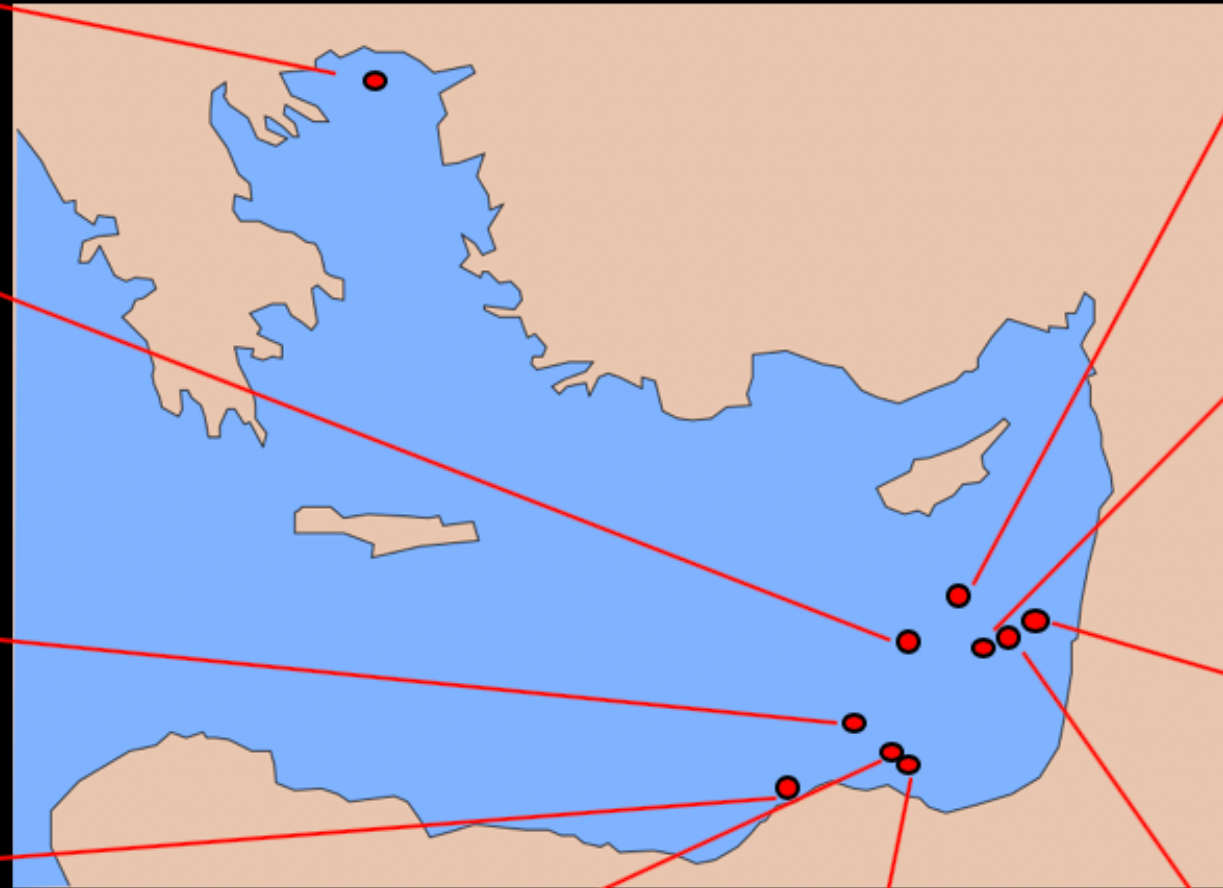
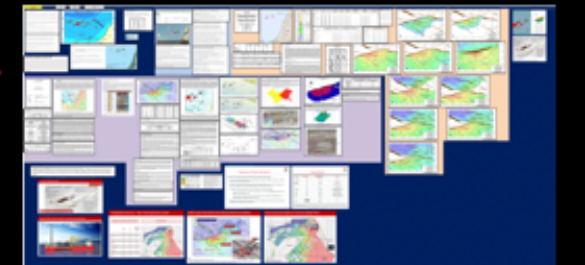
Aphrodite, Cyprus



Leviathan, Israel

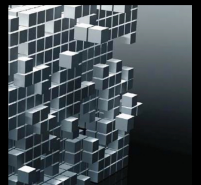
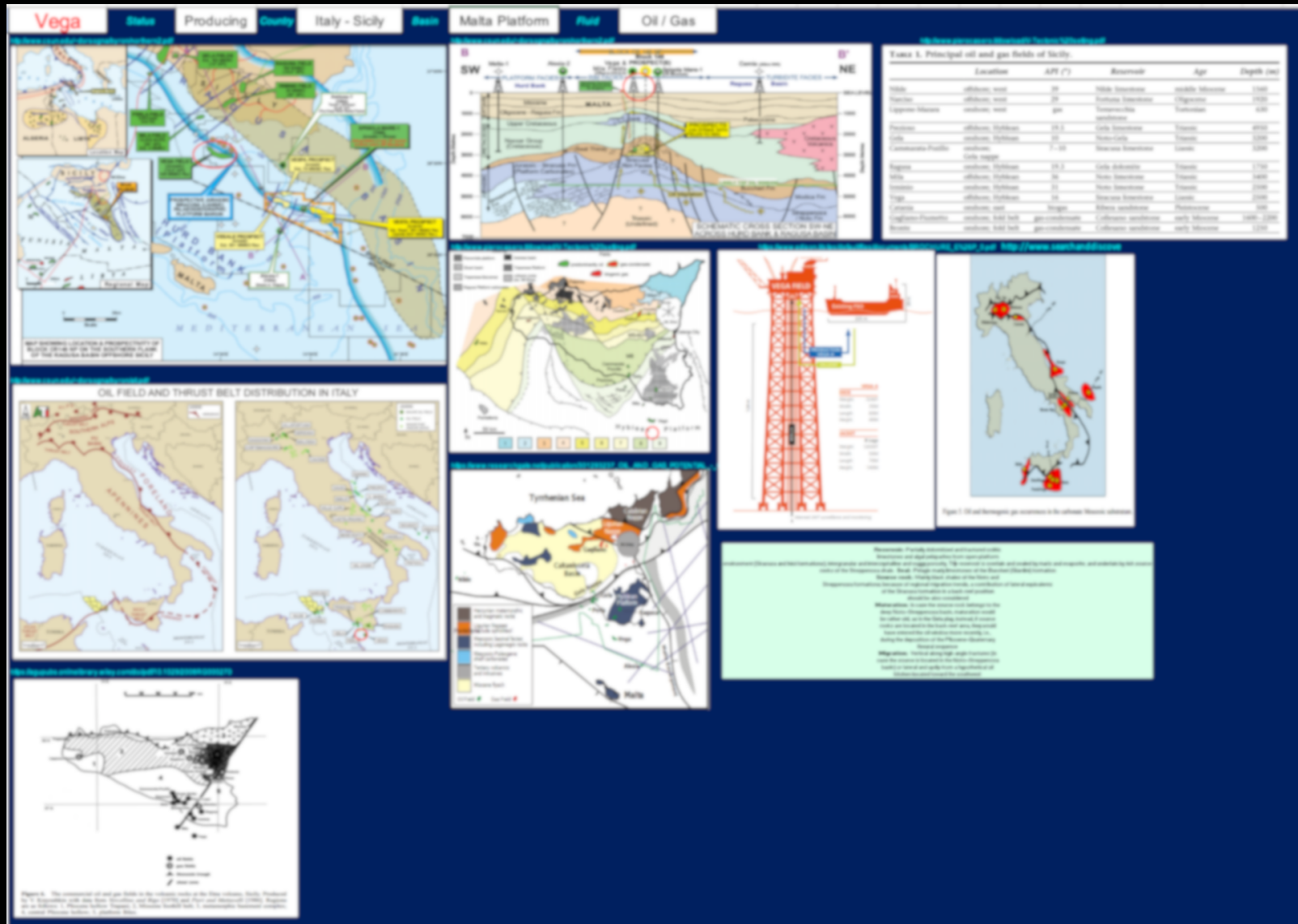


Karish, Israel

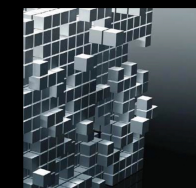
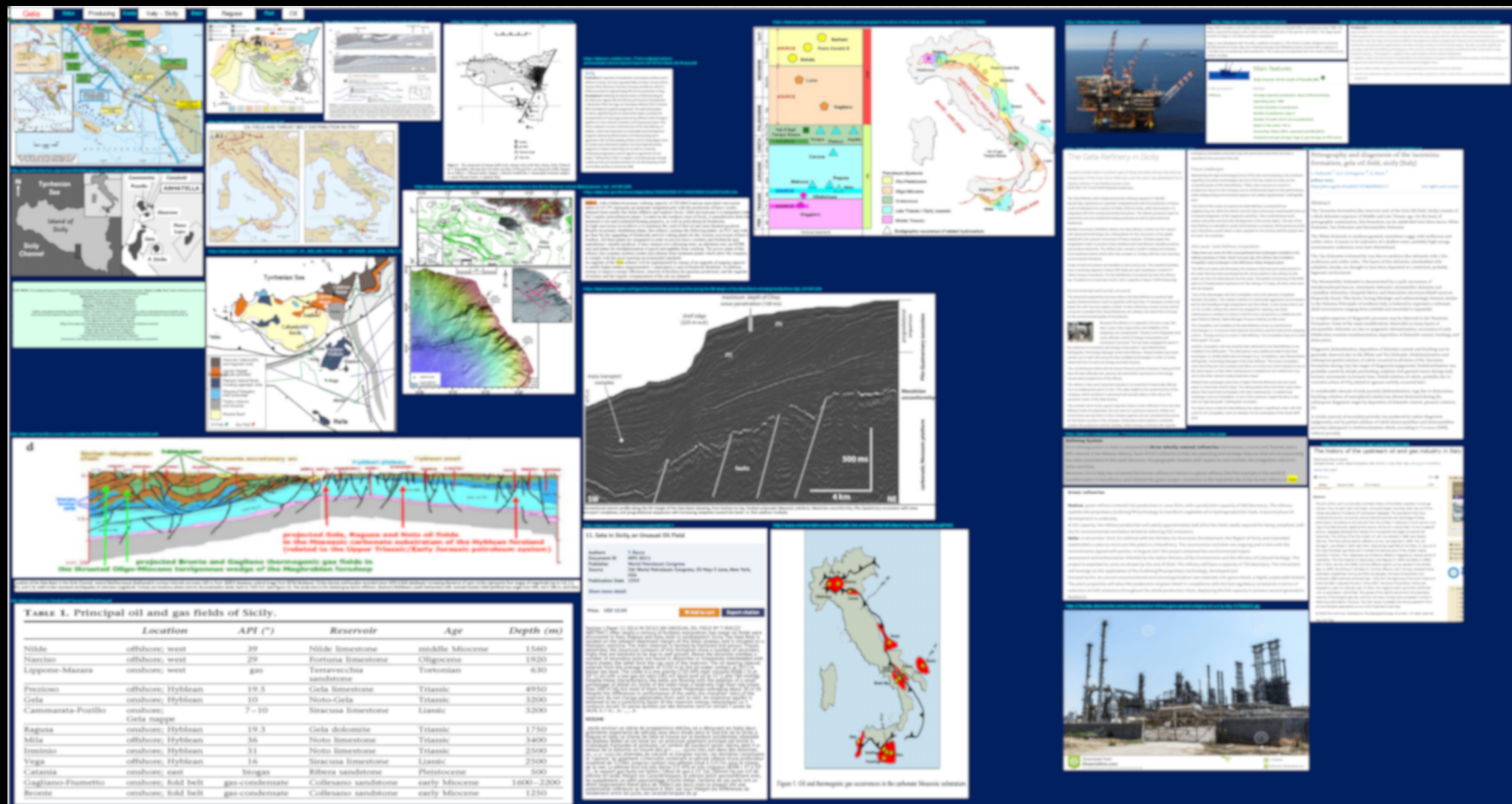


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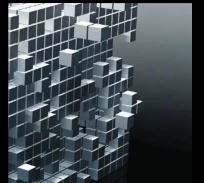
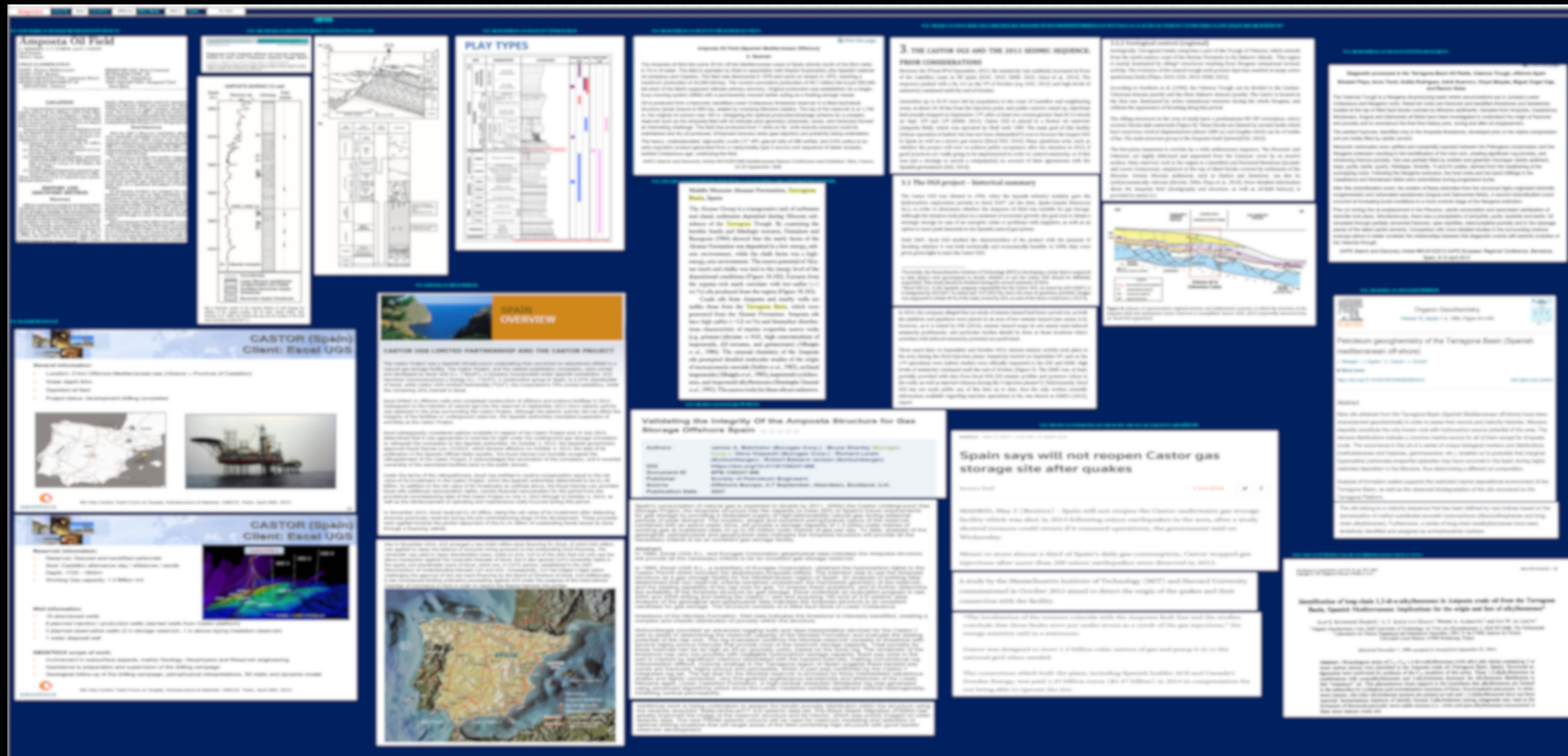
Vega, Italy



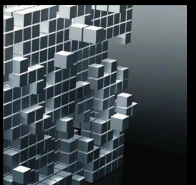
Gela, Italy



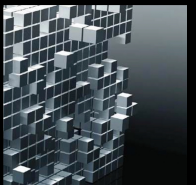
Amposta, Spain



Zohr, Egypt

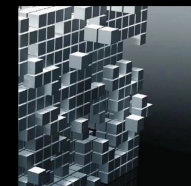
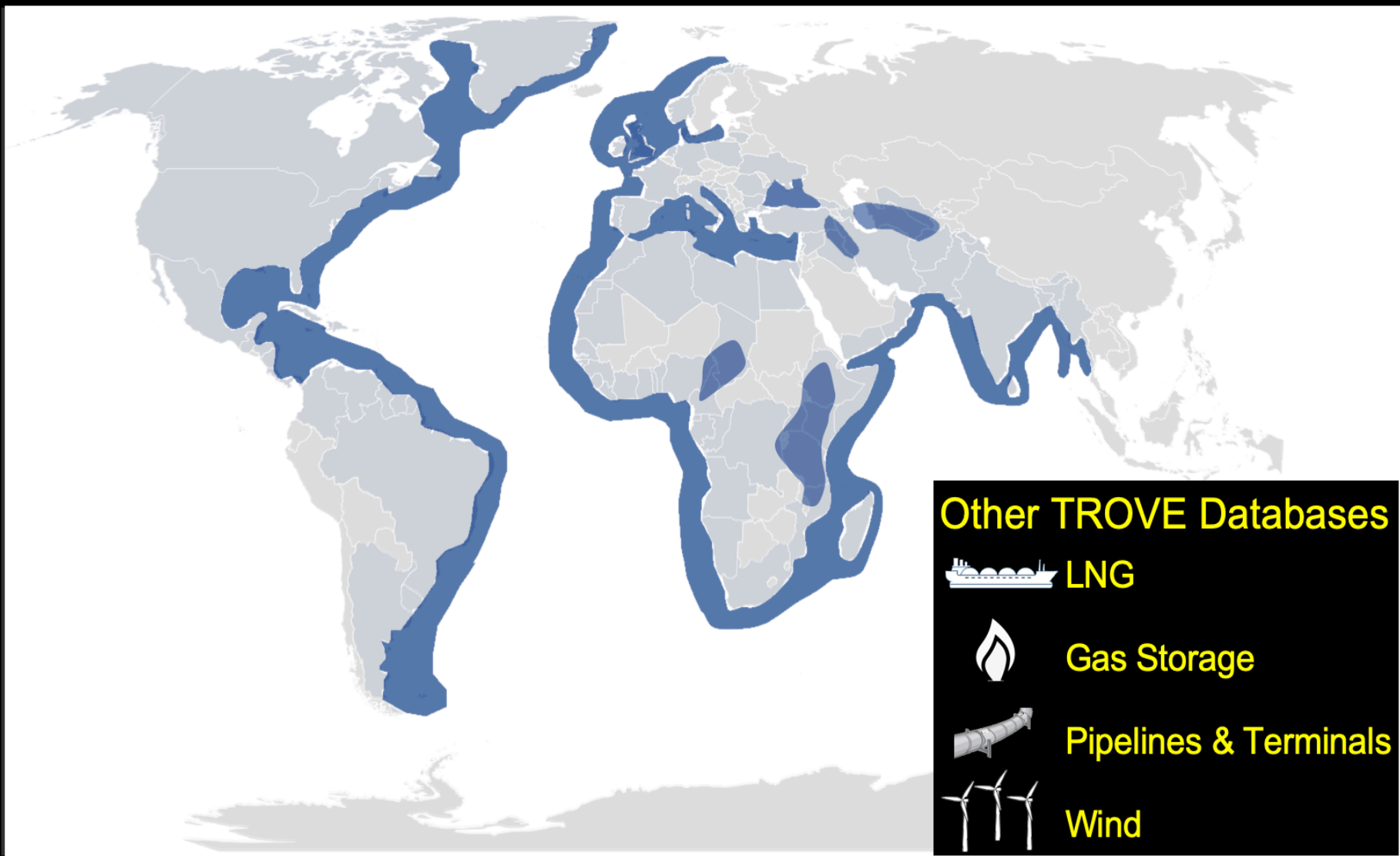


Al Bouri, Libya



1st Subsurface

Current TROVE Coverage



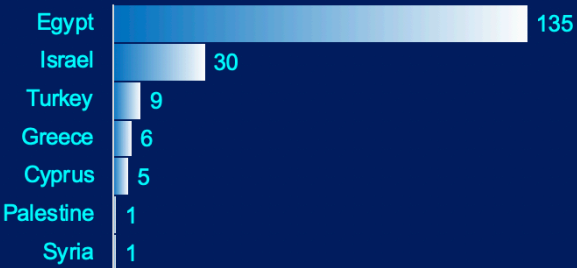
1st Subsurface

TROVE Dashboard

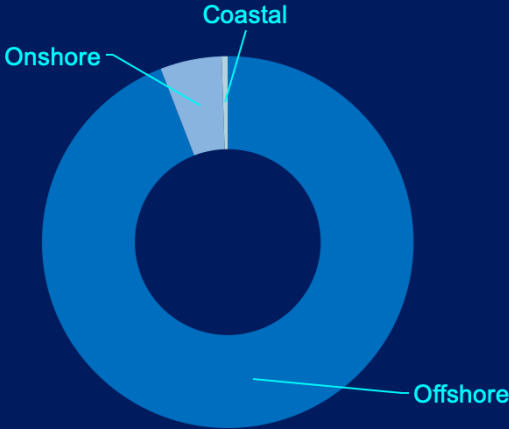


- Country**
- Cyprus
 - Egypt
 - Greece
 - Israel
 - Palestine
 - Syria
 - Turkey
 - Lebanon

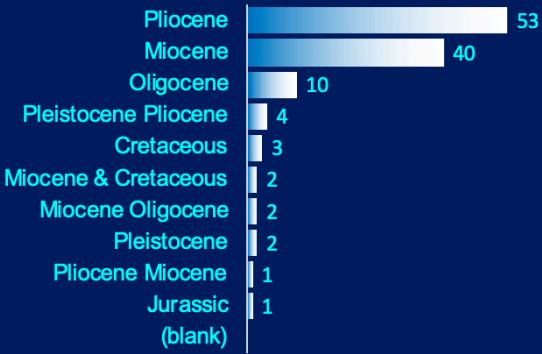
No. of assets per country



Onshore / Offshore

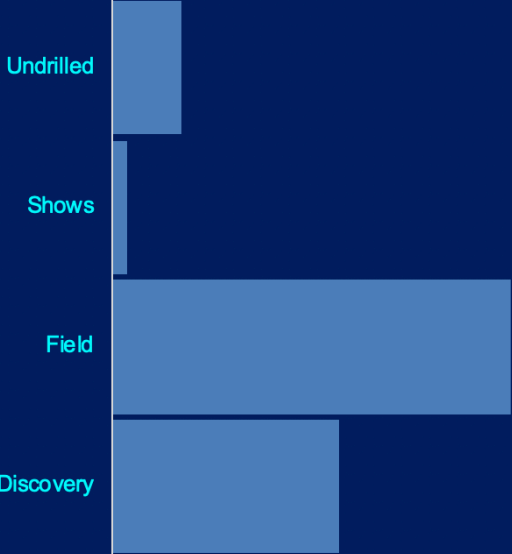


Age

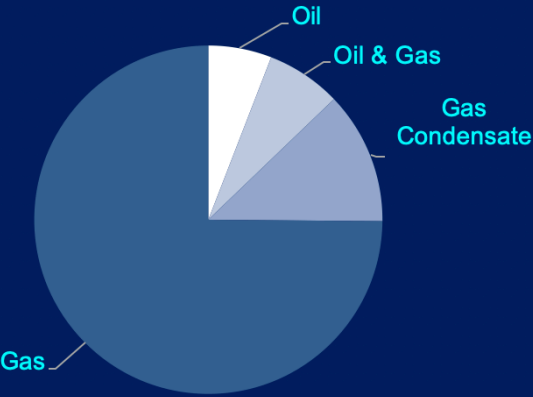


- Age**
- Cretaceous
 - Jurassic
 - Miocene
 - Miocene & Cretaceous
 - Miocene Oligocene
 - Oligocene
 - Pleistocene
 - Pleistocene Pliocene
 - Pliocene
 - Pliocene Miocene
 - (blank)
 - Jurassic Cretaceous
 - Tertiary

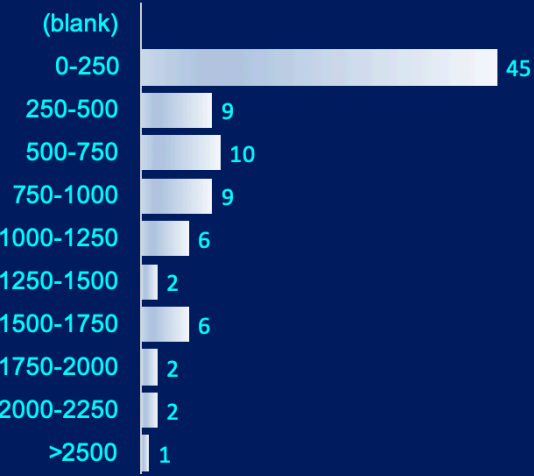
Asset Types



Fluid Type



Water Depth (m)



- Water Depth (m)**
- (blank)
 - >2500
 - 0-250
 - 1000-1250
 - 1250-1500
 - 1500-1750
 - 1750-2000
 - 2000-2250
 - 250-500
 - 500-750
 - 750-1000
 - 2250-2500

- Fluid Type**
- Drilling
 - Dry Hole
 - Gas
 - Gas Condensate
 - Oil
 - Oil & Gas
 - TBC

TROVE Eastern Mediterranean

Trove Data Sources

Legal

Data

References

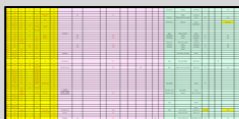
20 Sep 19

Dashboard



Dashboard

Data



Data Table

Analysis

Summary Form

Comparison Table

Conversions

Countries

Cyprus



Egypt



Greece



Israel



Lebanon



Palestine



Syria



Turkey



Geological Timeline



Timeline

Infrastructure

Pipelines

Companies

Maps

Geology

Overview

Salt - Messinian Salinity

Stratigraphy

Nile Cone

Levant Basin

Structural

Well Data

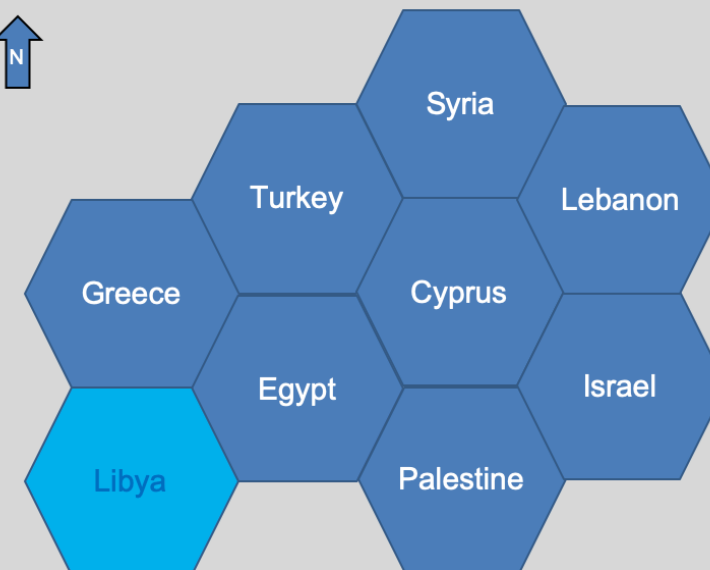
Israel

Greece

Reports

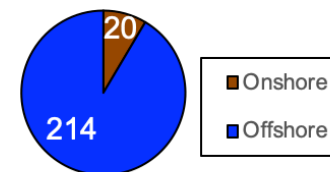
Reports

Please report any updates needed to:
info@1stsom.com

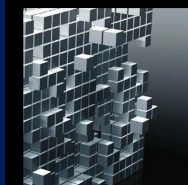
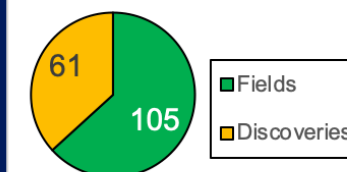


This map not an authority on international boundaries, for accurate maps please refer to <http://www.maritimejournals.org/download.php>

Onshore & Offshore Assets



Eastern Mediterranean



Field Reactivation & Further Development of Unsanctioned Discoveries - Libya

~2000 exploration wells

165 fields developed

29 > 1 Billion bbls STOIIIP

11 > 1 Tcf GIIP

Cumulative production to
end 2018

30.3 Billion bbls

12.0 Tcf

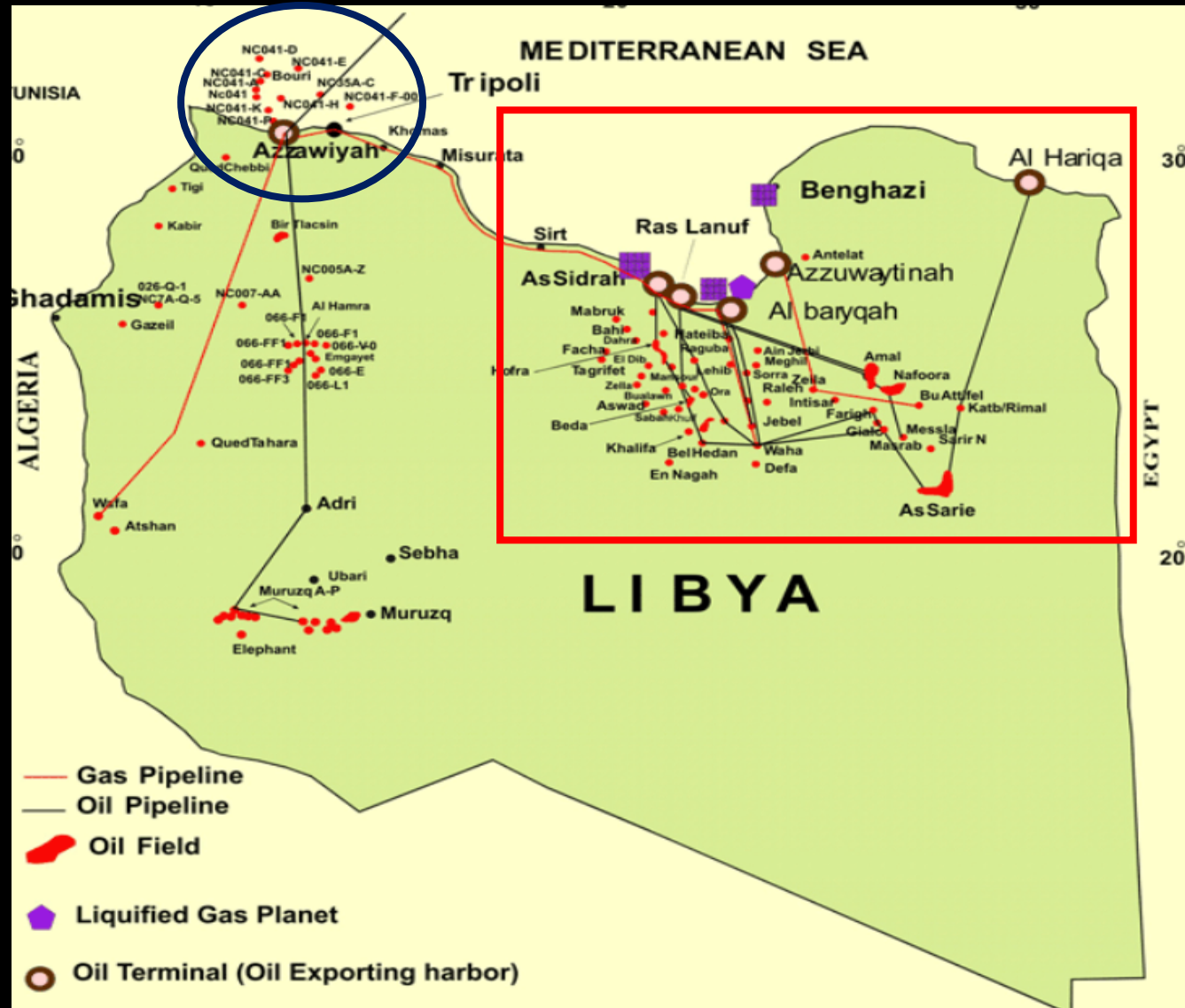
~550 discoveries

130 Bbbls STOIIIP

72 Tcf GIIP

385 unsanctioned
discoveries

5 Bbbls STOIIIP



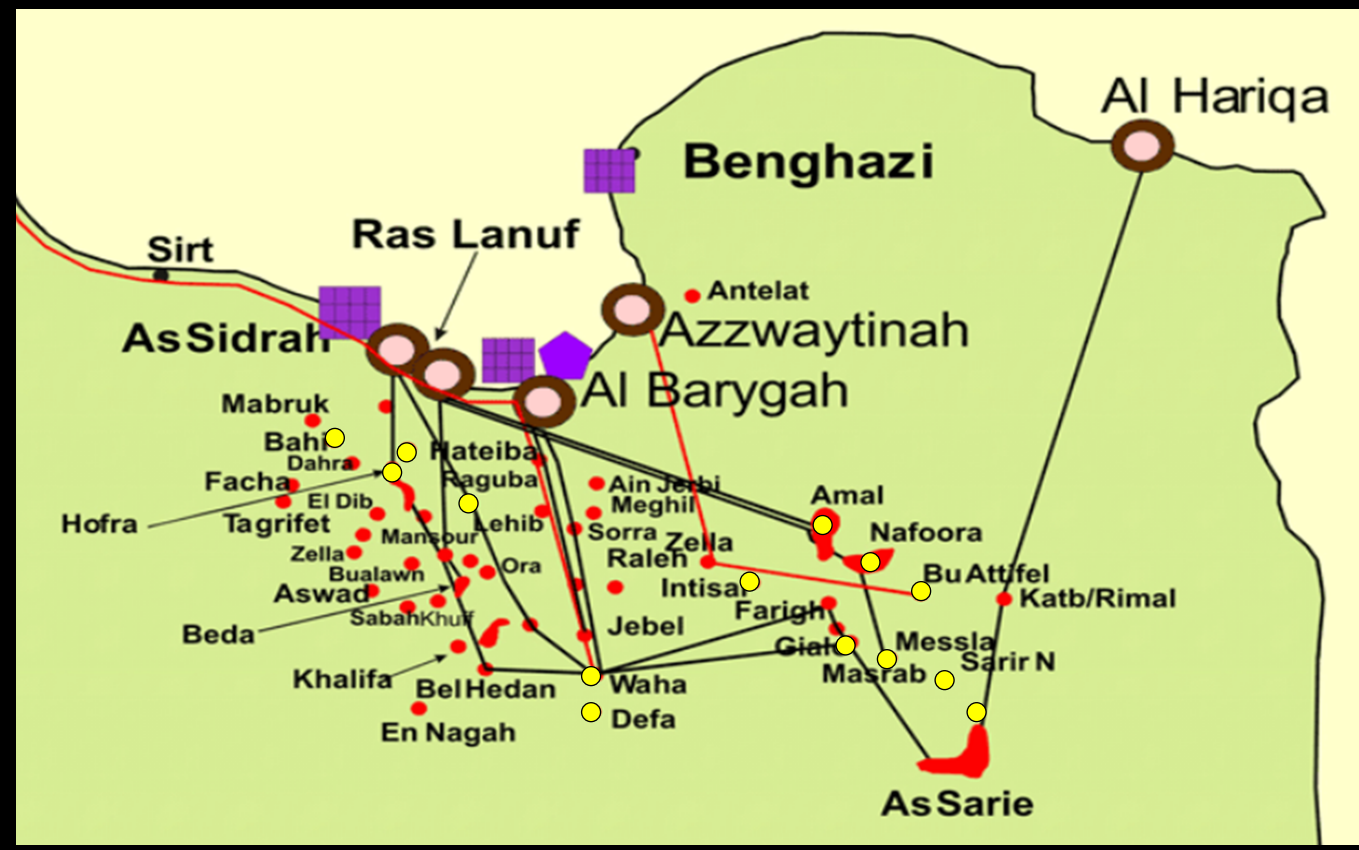
1st Subsurface

Libyan Fields

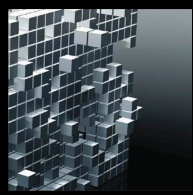
Seeking pre-commitments to a regional North Africa subsurface analogue database.

165 fields & 550 discoveries in Libya alone

To include Algeria & Tunisia analogues – on & offshore

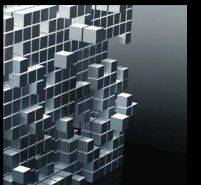
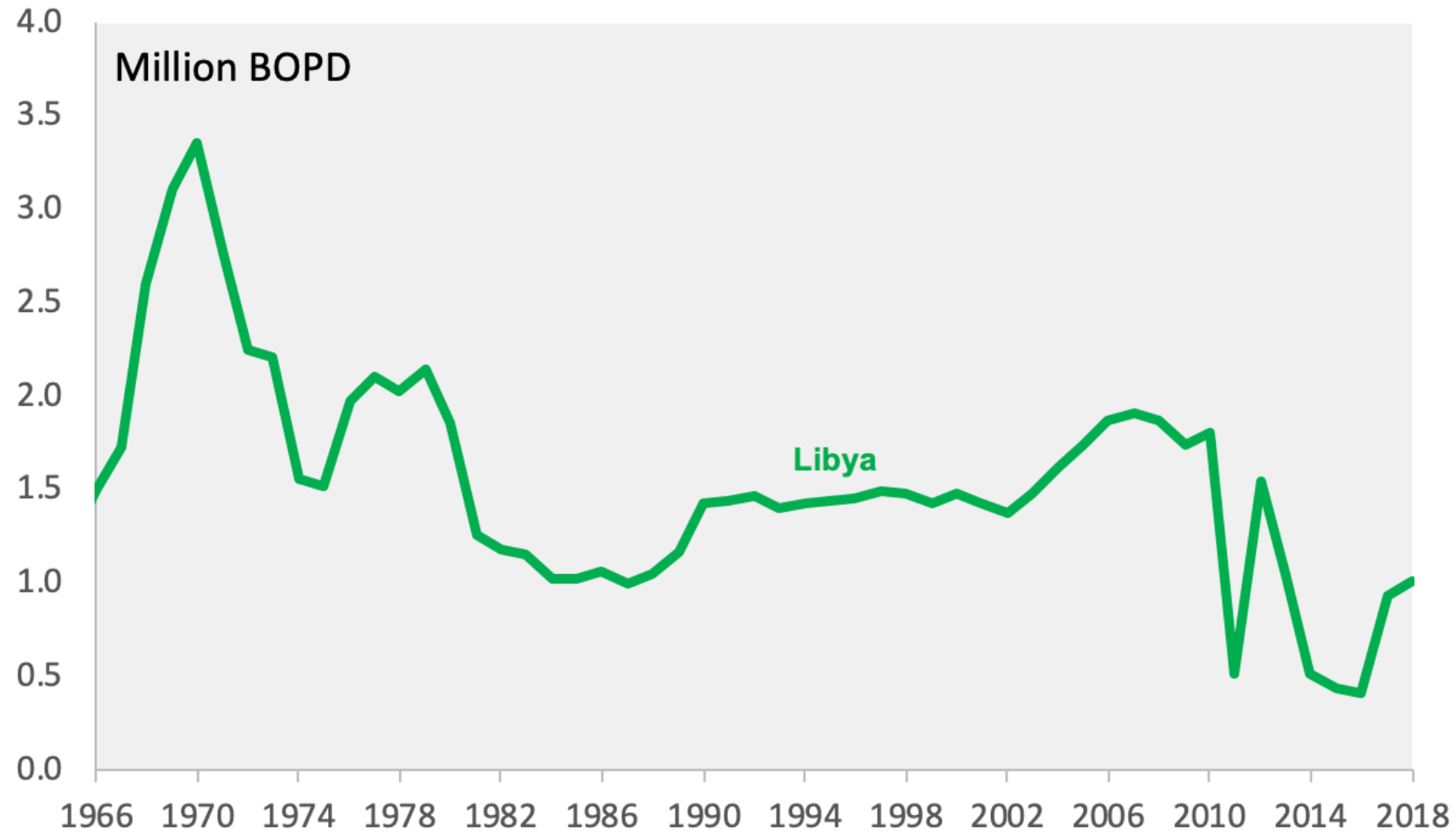


>1 Bbbls STOOIP
and / or
>1 Tcf GIIP



1st Subsurface

Oil Production



1st Subsurface

Summary

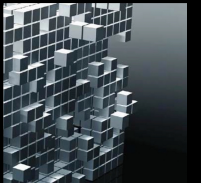
Highly charged political disputes affect the exploration pace in the region.

Frontier exploration potential remains, but governments need to compete to attract exploration investment. The Eastern Mediterranean has a low drilling density.

Enormous potential in unsanctioned opportunities, requiring no exploration funding, with its inherent funding difficulties.

Development & Redevelopment Opportunities Abound (e.g. Libya).

The Statistical Review 2020 should feature significant reserves adds.



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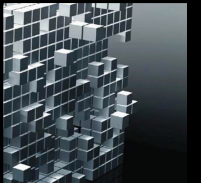
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