GLOBAL DEVELPMENT IN DEEP WATER E&P OF HYDROCARBONS

IENE

3RD S.E Europe Hydrocarbons Upstream workshop

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TEREZA FOKIANOU
M . BOD IENE / Head of IENE's Upstream W.G
PRESIDENT FLOW ENERGY S.A.
Ex . CEO DEP-EKY

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overview

- In a world full of uncertainty, one thing is certain: The word energy needs will continue to rise sharply over the next 25 years
- Global Energy Demand increasing largely, driving by expected strong world economy and the increasing world population by 1,7 b reaching 9,2 b in 2040

  (BP Energy.Outlook 2018).
- Trump's decision to reiposing sanction to Iran, could cause significant supply shortfall. IEA warns producers for 'Red Zone'.
- Dynamics of Offshore Energy are changing.

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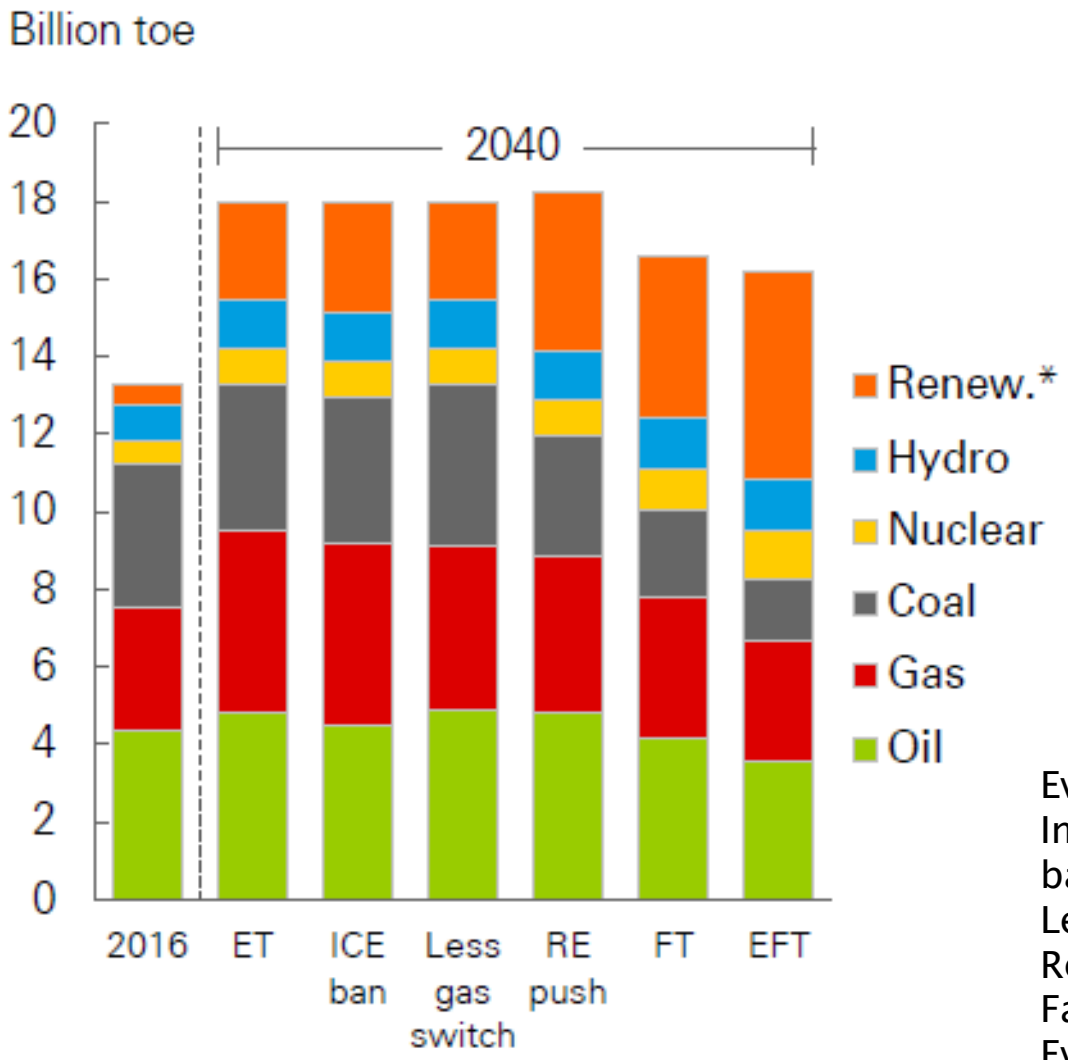
KEY FACTORS OF BP' s ENERGY OUTLOOK 2040

- Fast growth in developing economies drive up global energy demand a third higher.
- The global energy mix is the most diverse in the world has ever seen by 2040, with oil, gas, coal and non –fossil fuels each contributing around 25%.
- Renewables are by far the fastest – growing fuel source, increasing five fold and providing around 14% of primary energy.
- Demand for oil grows over much of Outlook period before pick oil in the later year.
- Natural gas demand grows strongly and overtakes coal, as the second largest source of energy.
- Oil & Gas together account for over half of the worlds energy.

Primary Energy Consumption by Fuel



Source: BP Energy Outlook 2018

Evolving transition (ET)
Internal combustion engine ban (ICE ban)
Less gas switching
Renewables push (RE push)
Faster transition (FT)
Even faster transition (EFT)

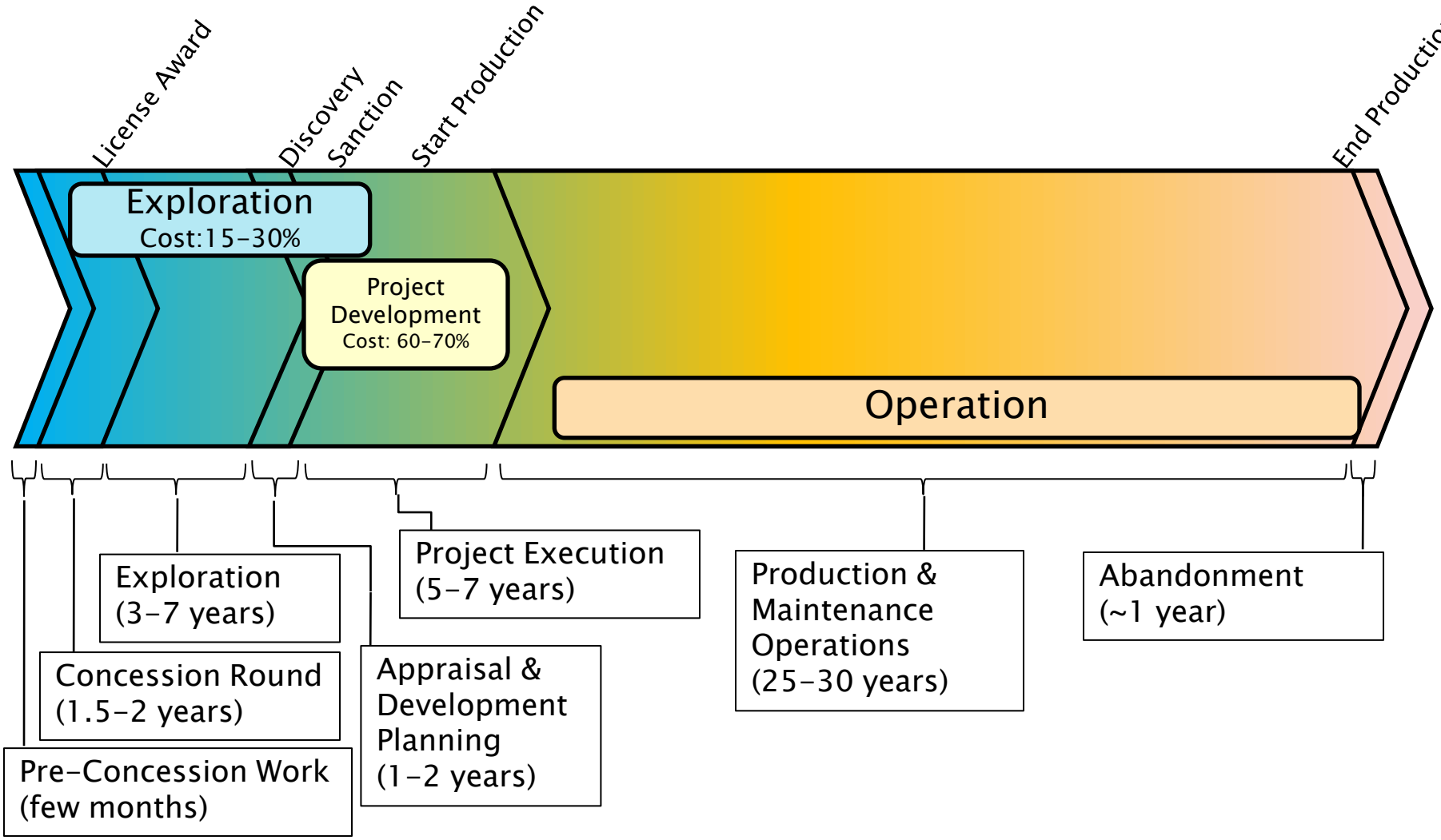
OFFSHORE ENERGY ACTIVITY

- Oil and Gas produced offshore are major elements of global supply.
- Top offshore producing areas: Middle East, North Sea, Brazil, Gulf of Mexico, Caspian Sea.
- Significant rise in ultra deep water more than 2000m, driving factors:
  - potential for discoveries of large H/C recourses.
  - Need to offset declining production from onshore and shallow waters basins.
  - Increase economic viability of deep water development.
  - Increasing energy demand.
- Subsea development will continue to account as an ever increasing share of global offshore activity.

TECHNOLOGICAL ADVANCES

- New technologies introductions in deep water E&P have been occurring in a fast pace.
- New technologies can change the whole economic of cash flow projects.
  - Reduce upfront investment.
  - Reduce operating costs.
  - Reduce time to reach positive cash flow.
  - Make the difference between non-go and go-ahead decisions.
- The implication of this reduction for the over all cost aims reduce the breakeven price at half, from about $80/b to $40/b and less.

Life of Field Cash Flow



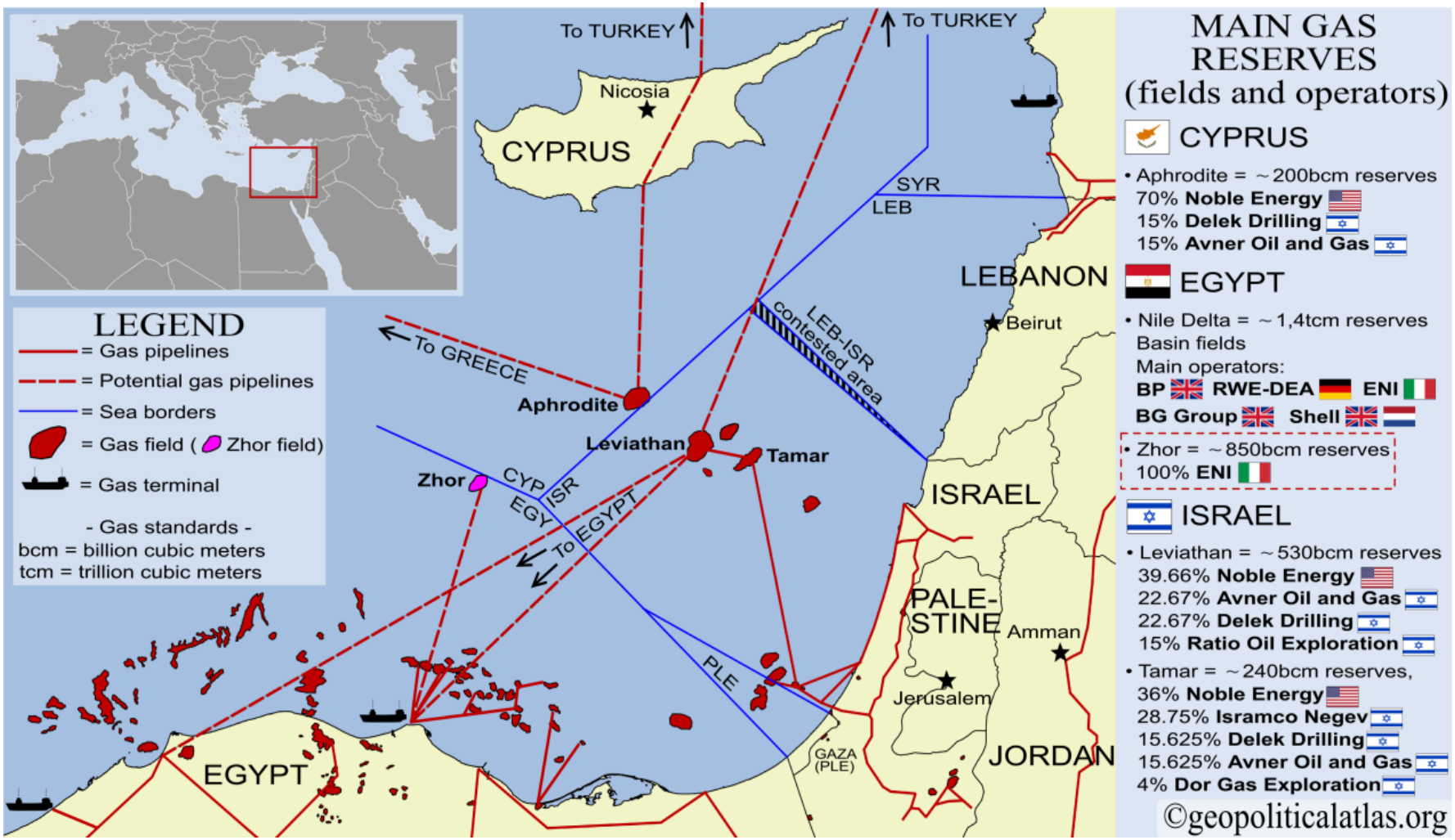
OFFSHORE OPPORTUNITIES

- Offshore has been a focus for exploration in new frontiers in ever deeper waters in search of new giant discoveries.
- Deep water development efforts are invariably mega-projects, requiring high upfront investments, relatively a long time to develop and have along payback period.
- These projects are not sensitive to short time price movements.
- The stock of existing offshore reserves, technically recoverable, offer significant possibilities for production growth.
- Offshore accounts:
  - Global oil reserves 15%, almost 30% of the world's remaining conventional resources.
  - Global gas reserves close to 45%, about 60% of the worlds remaining conventional resources.

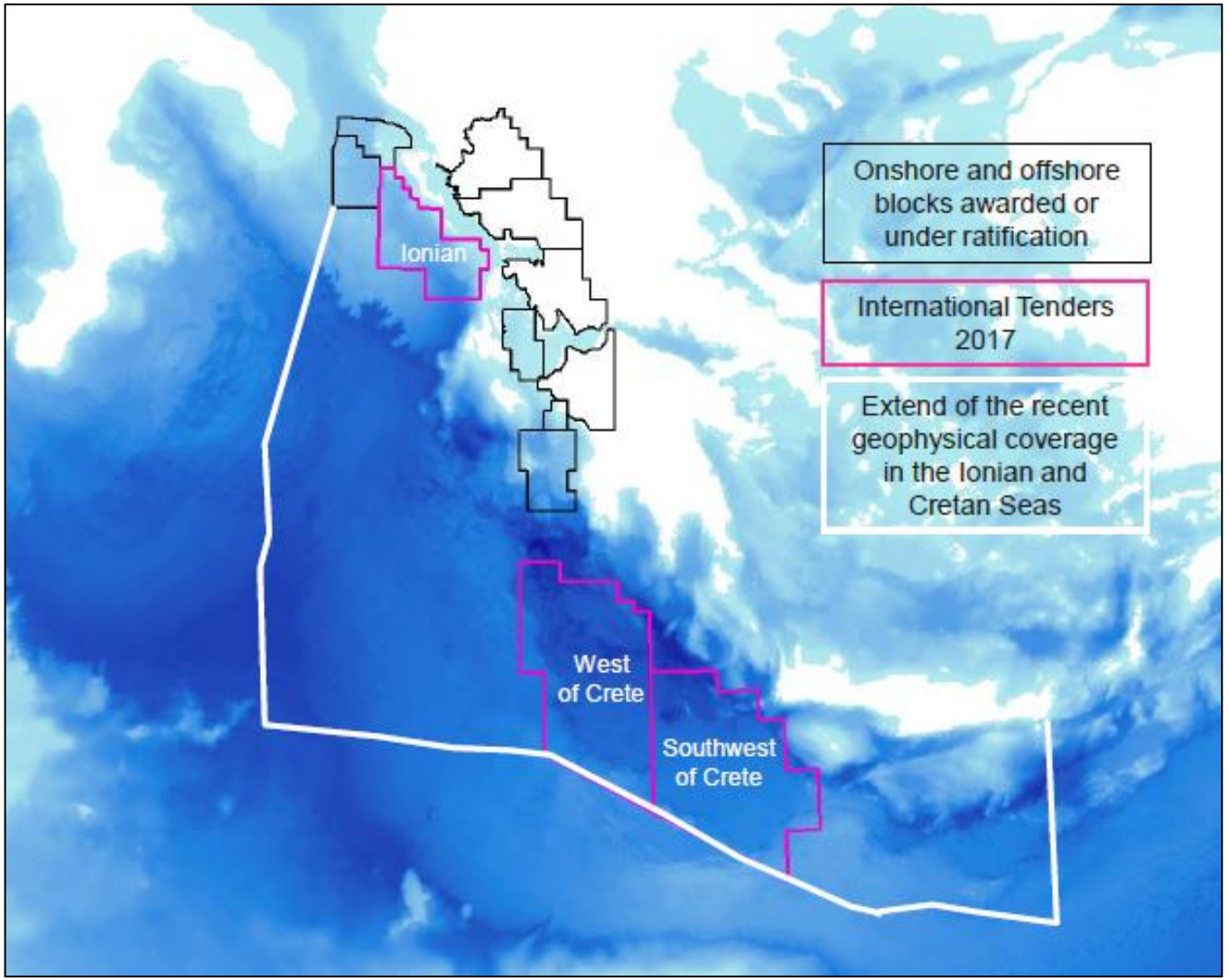
EAST MEDITERRANEAN– GREECE

- Major opportunities for new giant gas field discoveries in ultra deep water.
- Discovered: 4000 bcm of gas
- Yet to find: 2.800 – 8.500 bcm
- ENI' s Zohr giant gas field, offshore Egypt, in previously unknown carbonate layer, has attracted major companies to find similar geological structure, with vast volumes of gas in place.
- Greece, the new comer in deep water go ahead to explore with
  - Exxon Mobil –Total – Helpe consortium, in two blocks of Crete in ultra deep water with geology similar to Zohr and
  - Repsol – Helpe in one block in Ionian sea to the west in a carbonate layer.

Main Gas fields in Easter Mediterranean



Acreage situation in March 2018



Source: HHRM

CONCLUSIONS

- Deep /ultra deep water is fast becoming an important element in IOC' s global portfolio.
- Driving factors:
  - increased economic viability from new technology in deep water development,
  - need to offset declining production from onshore & shallow water basin.
  - Potential of large hydrocarbon reserves.
- Contractual terms for IOC's in Ultra Deep Waters:
  - must be compatible with the higher Risk involved in such depth
  - include important technical & economic incentives
  - technical incentives could be included for cases where well testing periods are very long or where "early production systems" are necessary for a better knowledge of the reservoir characteristics
  - economic incentives related to the royalties level could be variable depending on water depth & total drilling depth under the seabed.

Conclusions (continue)

- East Mediterranean, with deep water success over the recent years and high deep water hydrocarbons potential has increasingly attractive to IOC's.
- Gains related to new technology, including closer collaboration between oil companies with distribution of risks and reward , could see East Mediterranean to become into a key development area for IOC's.
- Greece has the possibility to take advantage of the new opportunities with its participation to the East Med deep water party and to eliminate the weakness of the past.

THE FUTURE BELOGS TO THOSE WHO PREPARE FOR IT!

THANK YOU FOR YOUR ATTENTION!

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