ΟΙ ΥΔΡΟΓΟΝΑΝΘΡΑΚΕΣ ΣΤΗΝ ΑΝΑΤΟΛΙΚΗ ΜΕΣΟΓΕΙΟ

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ΕΡΕΥΝΕΣ ΥΔΡΟΓΟΝΑΝΘΡΑΚΩΝ

ΤΕΡΕΖΑ ΦΟΚΙΑΝΟΥ
ΠΡΟΕΔΡΟΣ ΕΠΙΤΡΟΠΗΣ ΥΔΡΟΓΟΝΑΝΘΡΑΚΩΝ ΙΕΝΕ
ΠΡΟΕΔΡΟΣ FLOW ENERGY S.A.
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Petroleum Industry (oil & gas) is divided into three major sectors

- **Upstream** sector includes the searching for potential underground or underwater crude oil and natural gas fields, drilling of exploratory wells, and subsequently drilling and operating the wells that recover and bring the crude oil and/or raw natural gas to the surface.

- **Midstream** sector involves the transportation (by pipeline, rail, barge, or truck), storage, and wholesale marketing of crude or refined petroleum products. Pipelines and other transport systems can be used to move crude oil from production sites to refineries and deliver the various refined products to downstream distributors.

- **Downstream** sector commonly refers to the refining of petroleum crude oil and the processing and purifying of raw natural gas, as well as the marketing and distribution of products derived from crude oil and natural gas.
UPSTREAM SECTOR
(E & P of Hydrocarbons)

Significant difference from the other two sectors

The Investments are:

- High Risk
- High Reward (IRR)
- Highly Capital Intensive
- Highly advanced technology
Fiscal Systems for oil & gas E&P

Government Take

- After 1960 Governments offer exploration acreage through formal bidding rounds, under fiscal terms and conditions established by law or negotiated case by case.

- **Fiscal system**, means all the payment to government required under a petroleum arrangement. Important aspects of arrangement are: bonuses, rentals, royalties, P. S. arrangements, carried interest provision, corporate/special taxes.

- **Government Take** is the “Price” for the acreage
  - Government Take is the total effect of the fiscal system on the cash-flows of an oil field is expressed as a percentage.
  - The world average Government take is 64% varying between 25%-95%.
  - In Europe ranges between 35%-65%
Three types in the world in order to achieve the maximum Government Take

1. **Concessions Agreement (Royalty/Tax)** grants the ownership of petroleum. Modern concessions grants a fixed period (exploration 3-6 y. Exploitation 30-40y) and government revenue is deprived mainly from Royalties (11.5-14.5%) and net income taxes. This type is generally used by the non-producing countries and new comer to the oil industry and want to encourage foreign investment to develop their resources.

Examples are U.S.A. Canada, Norway, UK, Brazil, Algeria, S. Africa, Thailand, Australia.
2. Production Sharing Contracts (PSC’s): Government doesn’t grant ownership, the contractors are provided with an amount of oil for the recovery of their cost, as well as an amount that represent a share of the profit.

The government receive the remainder of the profit oil. Sometimes PSC’s have also royalties and taxes.

Both government and contractor share the risk and reward from the operational net profits.

PSC is generally used by countries very hostile to foreign companies and want to participate more actively to E&P, refinery, marketing and distribution.

Examples: Indonesia, Malaysia, Egypt, Gabon, Ivory coast, Syria, Yemen, Trinidad & Tobago, and recently Cyprus.
3. **Risk Service Contract**: RSC’s: Service contract is one under which a private company agrees to perform certain specified services for the government or a GOE in return for fixed payment (pure service, Technical Service Agreement, which have money but lack of the technical know-how) or probable profits (risk service).

- Examples: Mexico, Iran, Iraq, Kuwait.

- The difference between service and PSC is nature of payment - Cash or Crude.

No inherent differences, in the level of Government Take revenues that can be obtained through the 3 types of petroleum regime.
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 sortfall. IEA warns producers for Red Zone.

Dynamics of Offshore Energy are changing.
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 world's 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)
Oil and Gas produced offshore are major elements of global supply.

Top 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.
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 overall cost aims reduce the breakeven price at half, from about $80/b to $40/b and less.
Life of Field Cash Flow

- **Pre-Concession Work** (few months)
- **Concession Round** (1.5–2 years)
- **Exploration** (3–7 years)
- **Appraisal & Development Planning** (1–2 years)
- **Project Execution** (5–7 years)
- **Production & Maintenance Operations** (25–30 years)
- **Abandonment** (~1 year)

Exploration Cost: 15–30%

Project Development Cost: 60–70%

License Award

Discovery Sanction

Start Production

End Production
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 world’s remaining conventional resources.
Major opportunities for new giant gas field discoveries in ultra deep water.

- Discovered: 4000 bcm of gas
- Yet to find: 2800–8500 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

- ExxonMobil–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

**Main Gas Reserves (fields and operators)**

**Cyprus**
- Aphrodite = ~200 bcm reserves
  - 70% Noble Energy
  - 15% Delek Drilling
  - 15% Avner Oil and Gas

**Egypt**
- Nile Delta = ~1.4 tcm reserves
  - Basin fields
  - Main operators:
    - BP
    - RWE-DEA
    - ENI
    - BG Group
    - Shell
    - Shell Group

**Israel**
- Leviathan = ~530 bcm reserves
  - 39.66% Noble Energy
  - 22.67% Avner Oil and Gas
  - 22.67% Delek Drilling
  - 15% Ratio Oil Exploration
- Tamar = ~240 bcm reserves
  - 36% Noble Energy
  - 28.75% Isramco Negev
  - 15.625% Delek Drilling
  - 15.625% Avner Oil and Gas
  - 4% Dor Gas Exploration

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Acreage situation in March 2018

Source: HHRM
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 UltraDeep 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.
- 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 BELONGS TO THOSE WHO PREPARE FOR IT!

THANK YOU FOR YOUR ATTENTION!