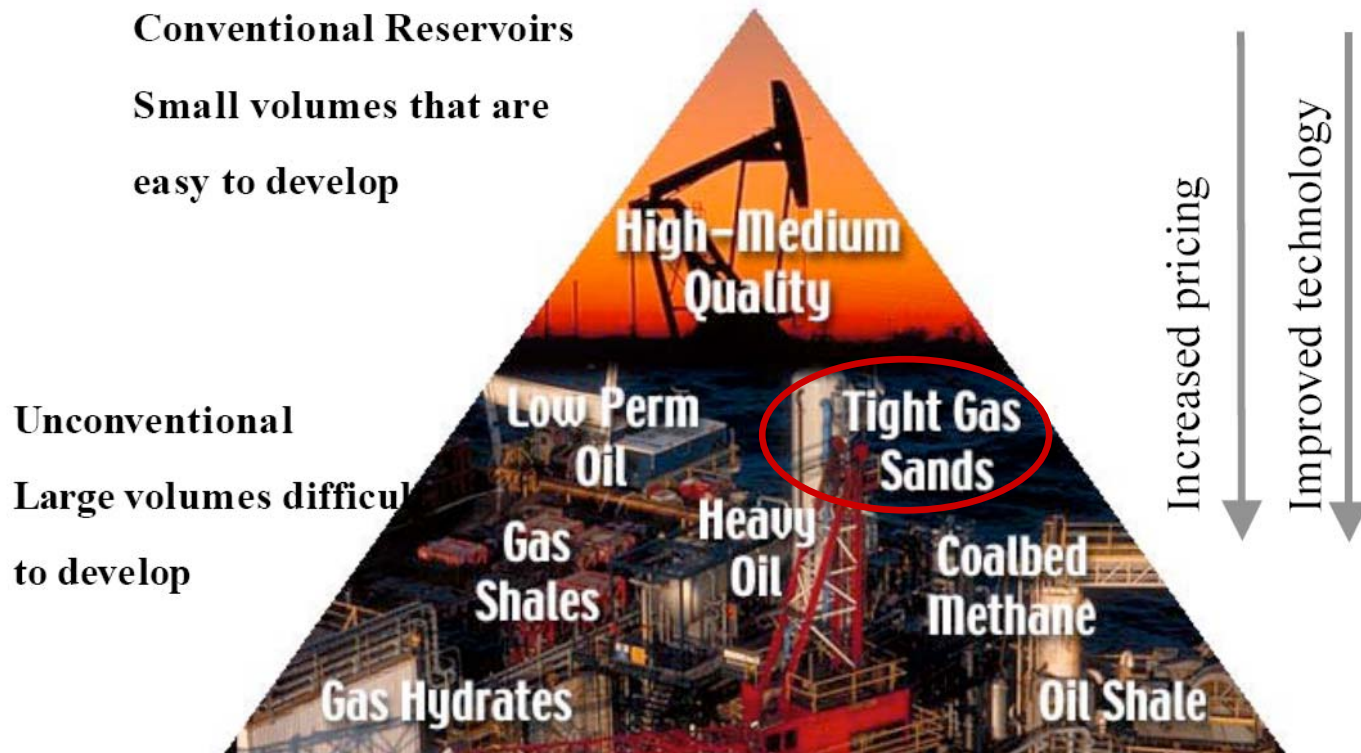


Unconventional exploration as a way of organic growth in Upstream



▶ **MOL GROUP**

Resource Pyramid



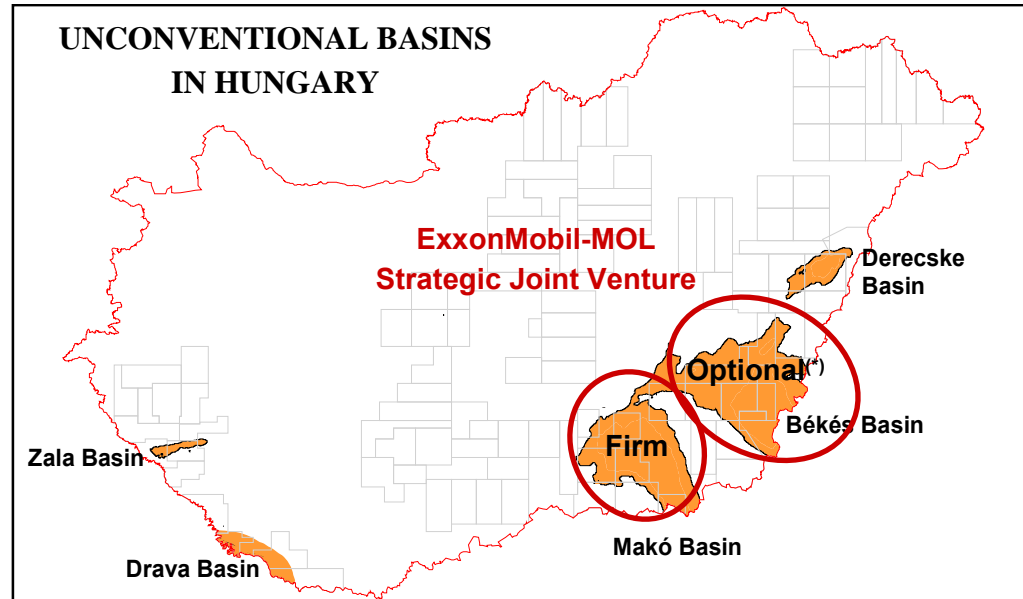
Strategic joint venture with ExxonMobil in Hungarian unconventional exploration

MOL-ExxonMobil strategic joint venture relies on synergies based on:

- ▶ MOL's understanding of local geology
- ▶ MOL's acreage position in the Mako and Bekes basins
- ▶ ExxonMobil's unconventional expertise and proprietary technology

Milestone's of the joint venture:

- ▶ *May 2007:* Agreement signed to prepare a Joint Technical Study (JTS) for Makó and Békés basins to evaluate unconventional potential
- ▶ *April 2008:* start exploration on MOL's acreage in Makó trough area
- ▶ *April 2008:* cooperation with TXM on TXM's area in Makó trough

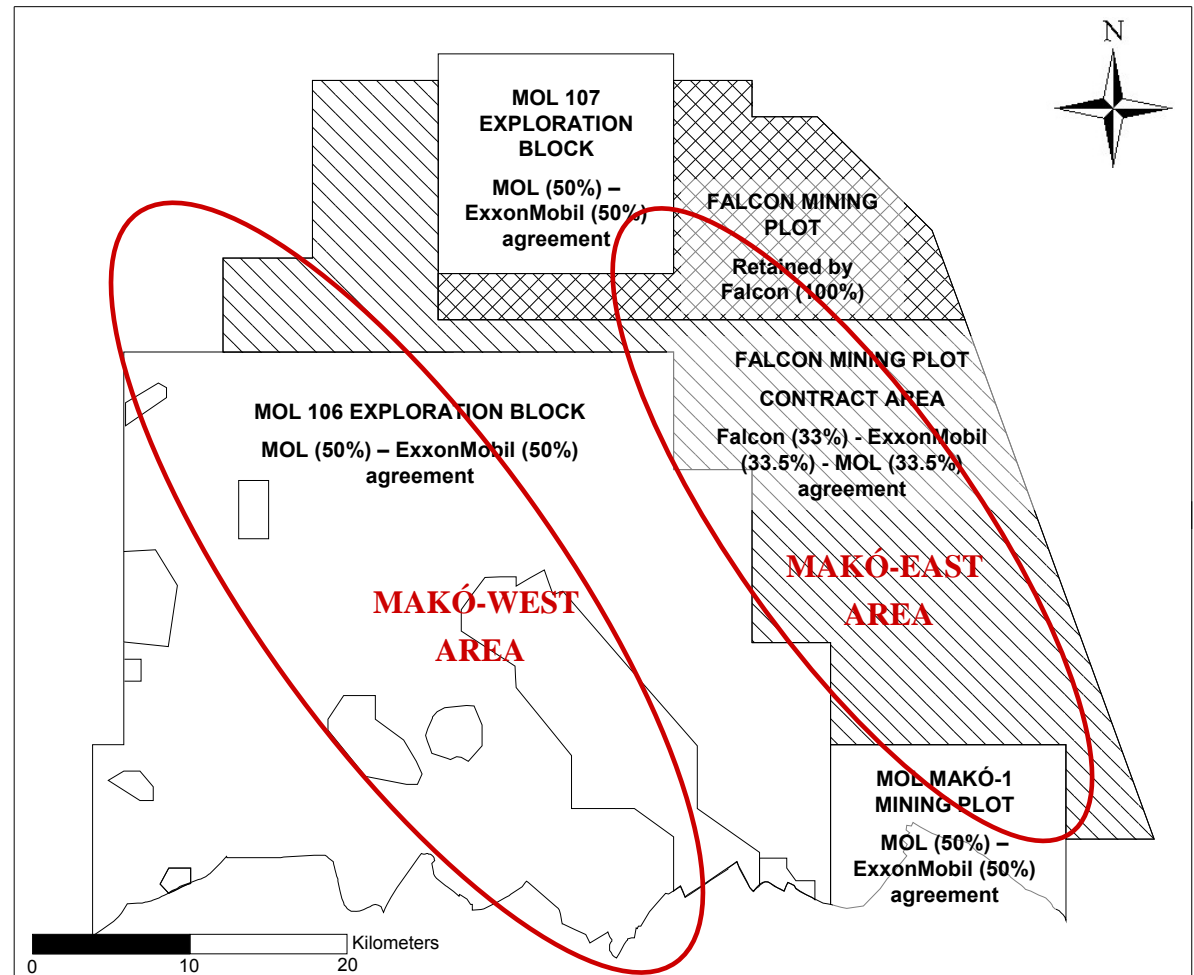


- ▶ MOL and ExxonMobil are 50%-50% coventurers in MOL's acreage in Makó trough area
- ▶ MOL and ExxonMobil follow jointly elaborated exploration strategy in Makó basin

(*) subject to MOL's decision

Technical program of the joint venture in Makó trough area

- ▶ Joint Technical Study prepared for Makó and Békés basins
- ▶ Based on the promising results of the JTS MOL-ExxonMobil decided to launch an exploration program on
 - ▶ Makó-West area and
 - ▶ Makó-East area
- ▶ The aim of the Makó exploration program is to
 - ▶ Reduce uncertainty on HC resource distribution and producibility
 - ▶ define costs related to production
 - ▶ estimate the budget for drilling & fracing the wells
- ▶ In success case, field development and starting of production is planned for 2012 - 2014



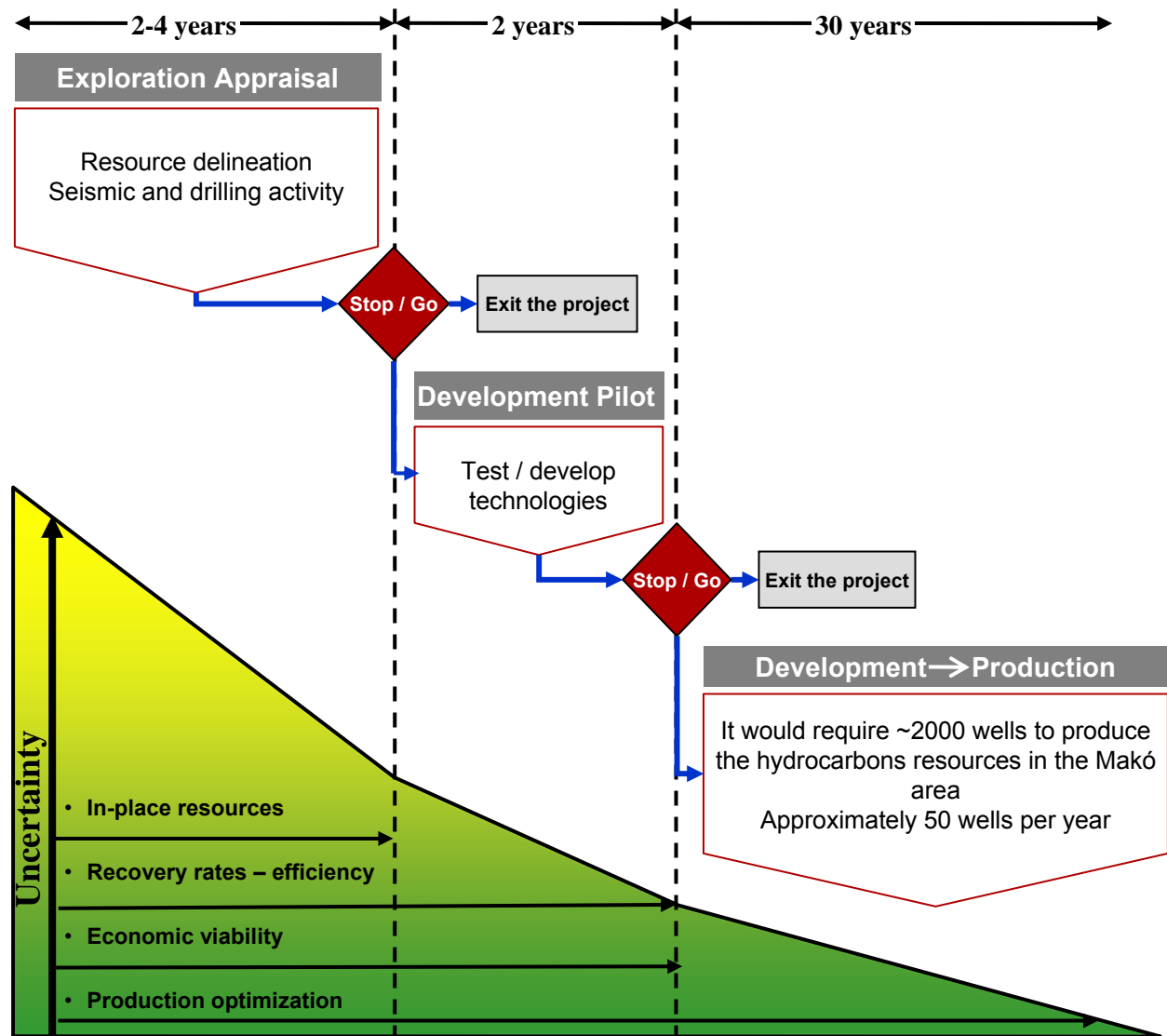
Project Evaluation

- ▶ **Exploration Appraisal**
 - ▶ Reduce uncertainty on HC resource distribution
 - ▶ Reservoir producibility

- ▶ **Development Pilot**
 - ▶ Select development concept to maximize economic productivity

- ▶ **Development – Production**
 - ▶ Achieve / maintain economic production levels
 - ▶ Continuous field development
 - ▶ High well density (2-3 well/km²)

- ▶ Will require growth in oil field services in Hungary



Makó Trough work program

MAKÓ WEST AREA

Committed Exploration Work Program based on MOL-ExxonMobil Joint Technical Study
Goal: Prove commerciality of production

- Drilling 4-6 new wells
- Testing, fracturing wells



Piloting

Field Development and Production

Exit the project

2009

2012

2008

2010

MAKÓ EAST AREA

Initial Work Program

1. Primary focus: testing Szolnok geological formation
 - reentering, testing & fracturing existing wells and /or drilling optional new wells
2. Secondary focus: Endrőd formation, Basal Conglomerate



Appraisal Work Program

- Drill additional wells to further delineate resource



Field development and production

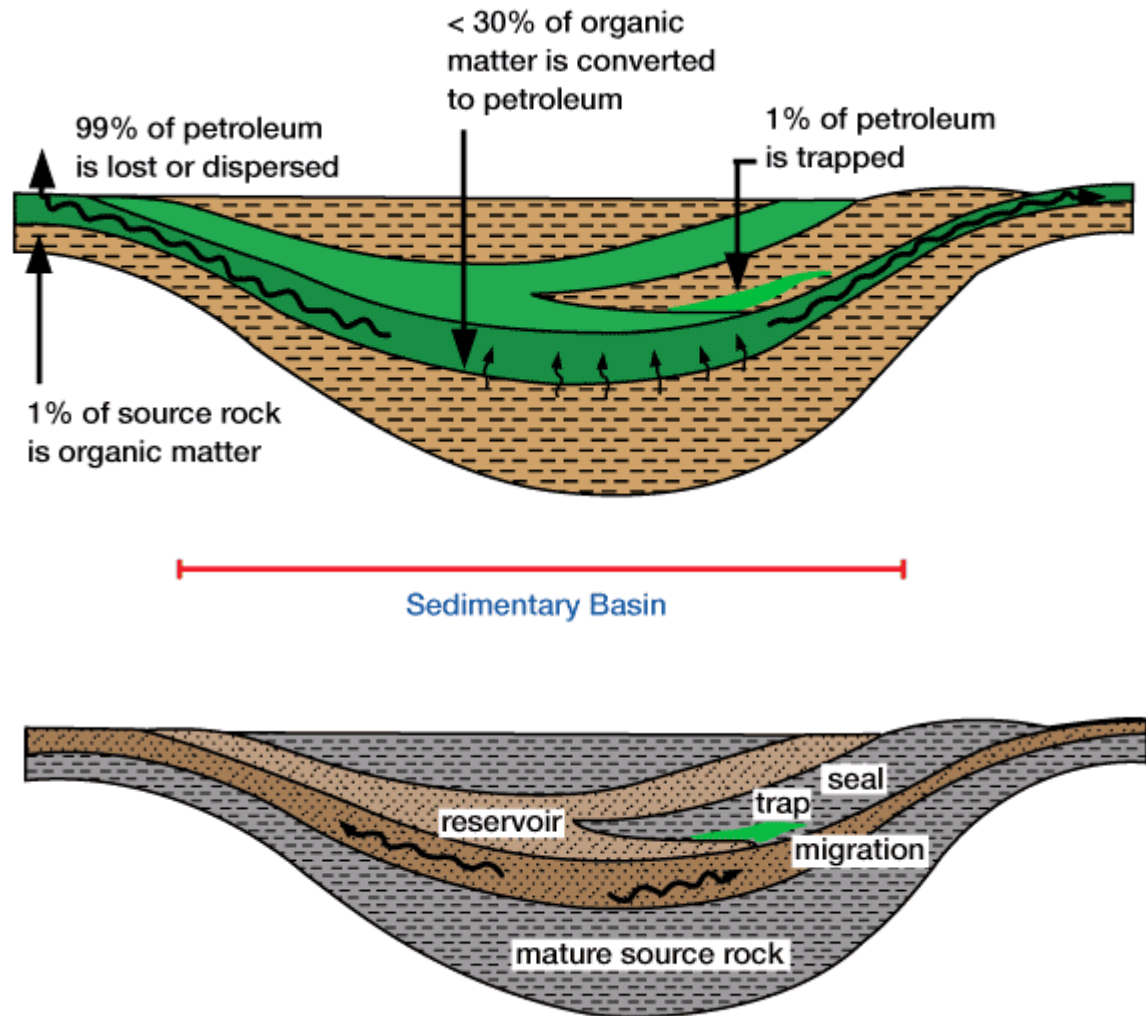
Exit the project

Exit the project

Requirements for Petroleum Accumulation

rock containing original organic matter is a *source rock*:
80% of the world's sedimentary rock volume
1% to 2% organic matter

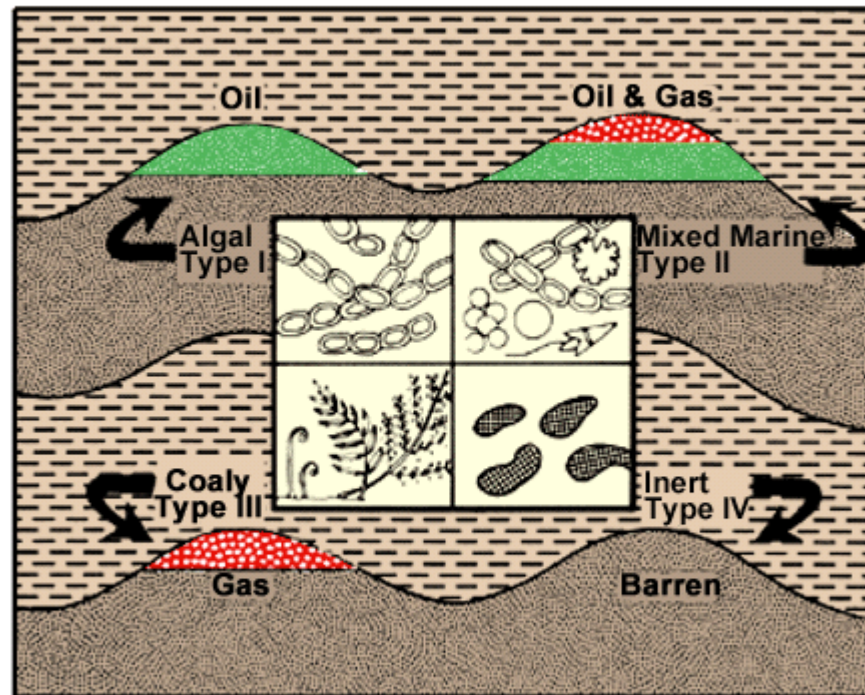
less than 1%, is able to undergo *migration* out of the source bed to accumulate within a porous and permeable *reservoir*.



Source: IHRDC IPIMS.ep

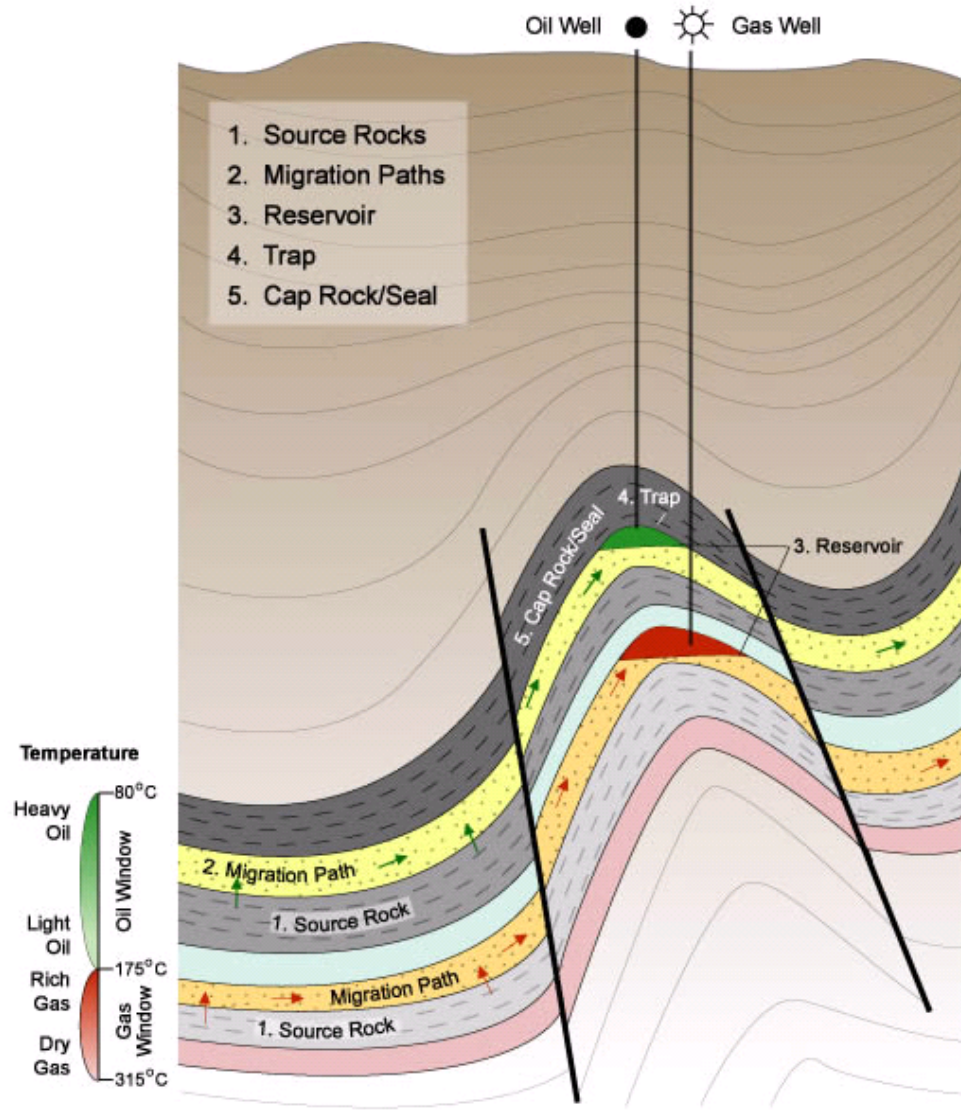
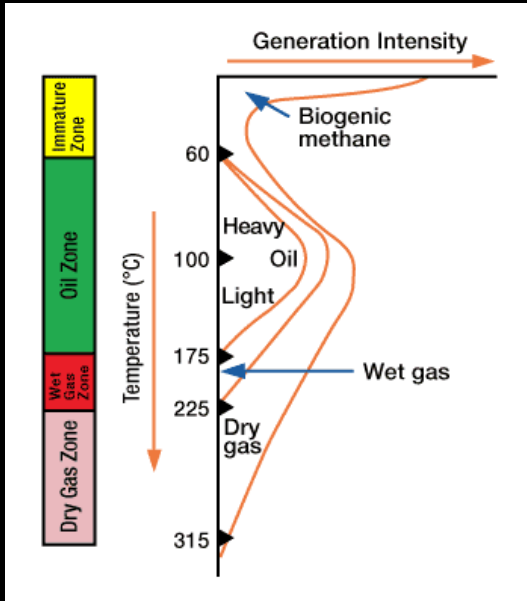
Requirements for Petroleum Accumulation

Material originated from different kinds of living organisms, with different kinds of biological molecules, kerogens will not all have the same chemical compositions and will yield different types and amounts of petroleum.

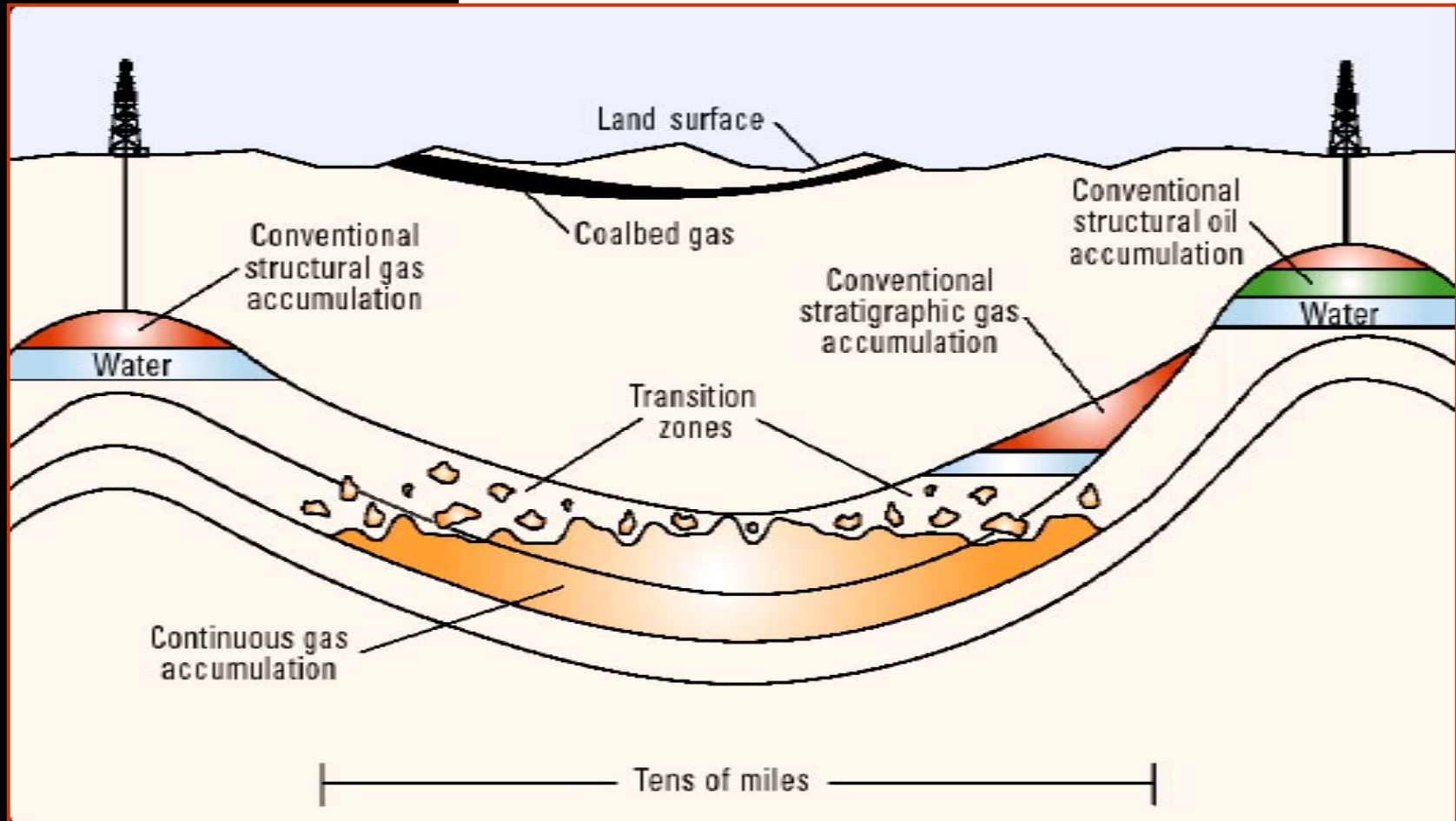


Source: IHRDC IPIMS.ep

Conventional reservoirs

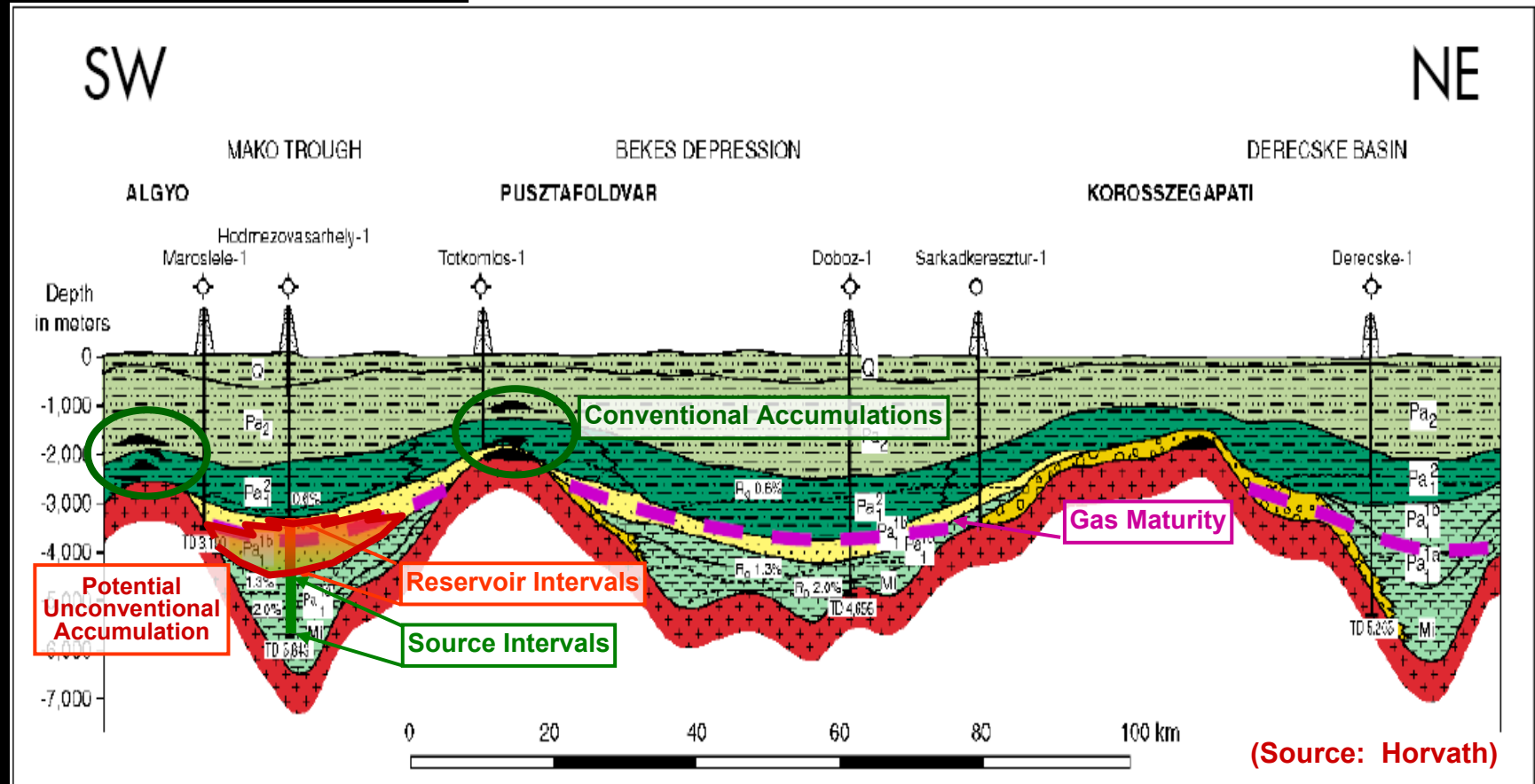


Unconventional tight gas – Basin Centered Gas Accumulation



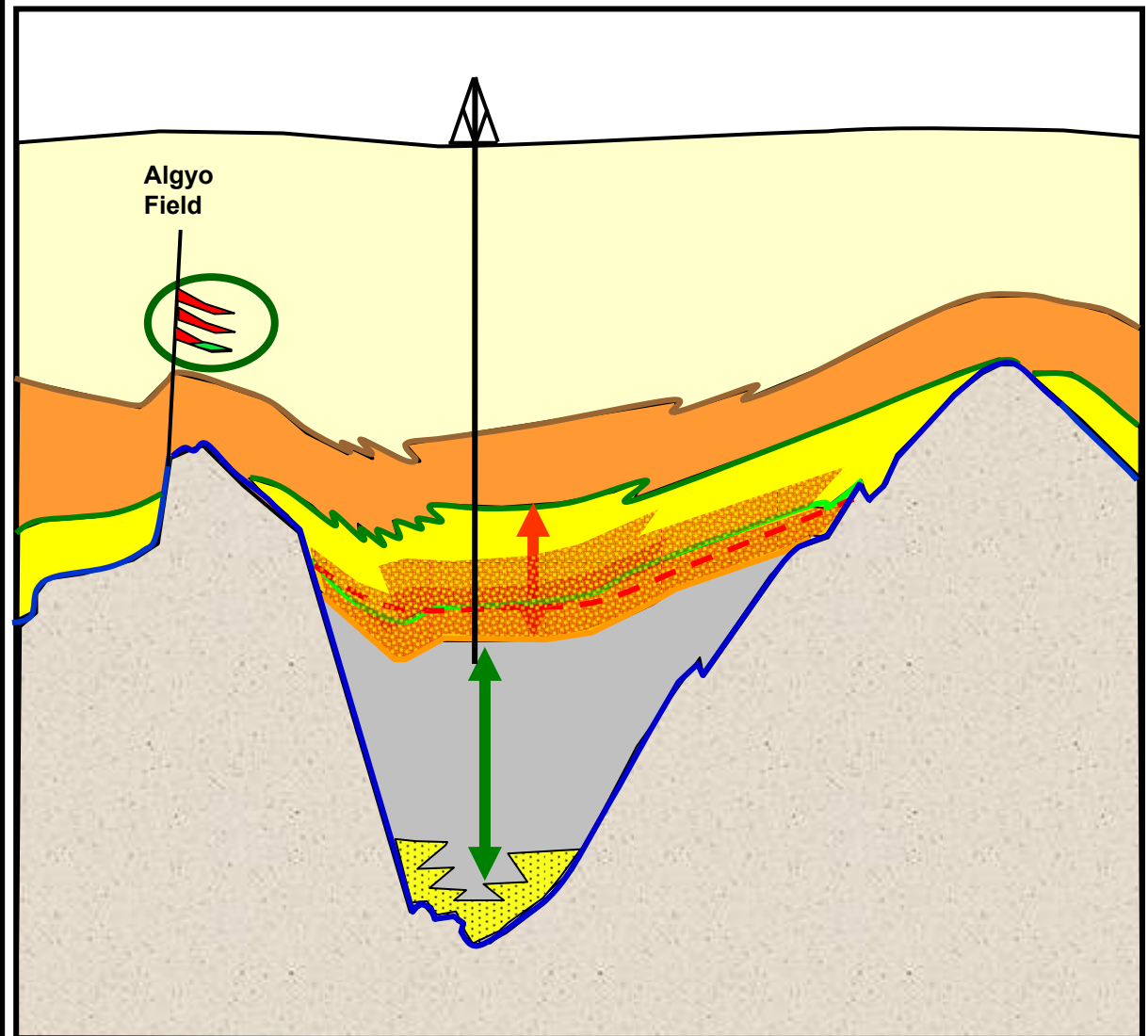
(Pollastro and others, 2003)

Basin Centered Gas Accumulation – Makó trough



Basin Centered Gas Accumulation – Makó trough

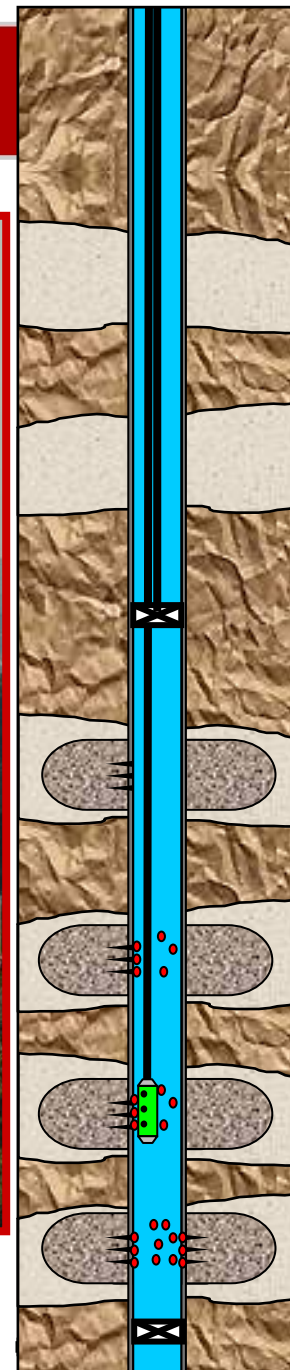
- ▶ Source Intervals
- ▶ Reservoir Intervals
- ▶ Present Gas maturity window
- ▶ Conventional HC accumulation
- ▶ Potential Unconventional HC Accumulations



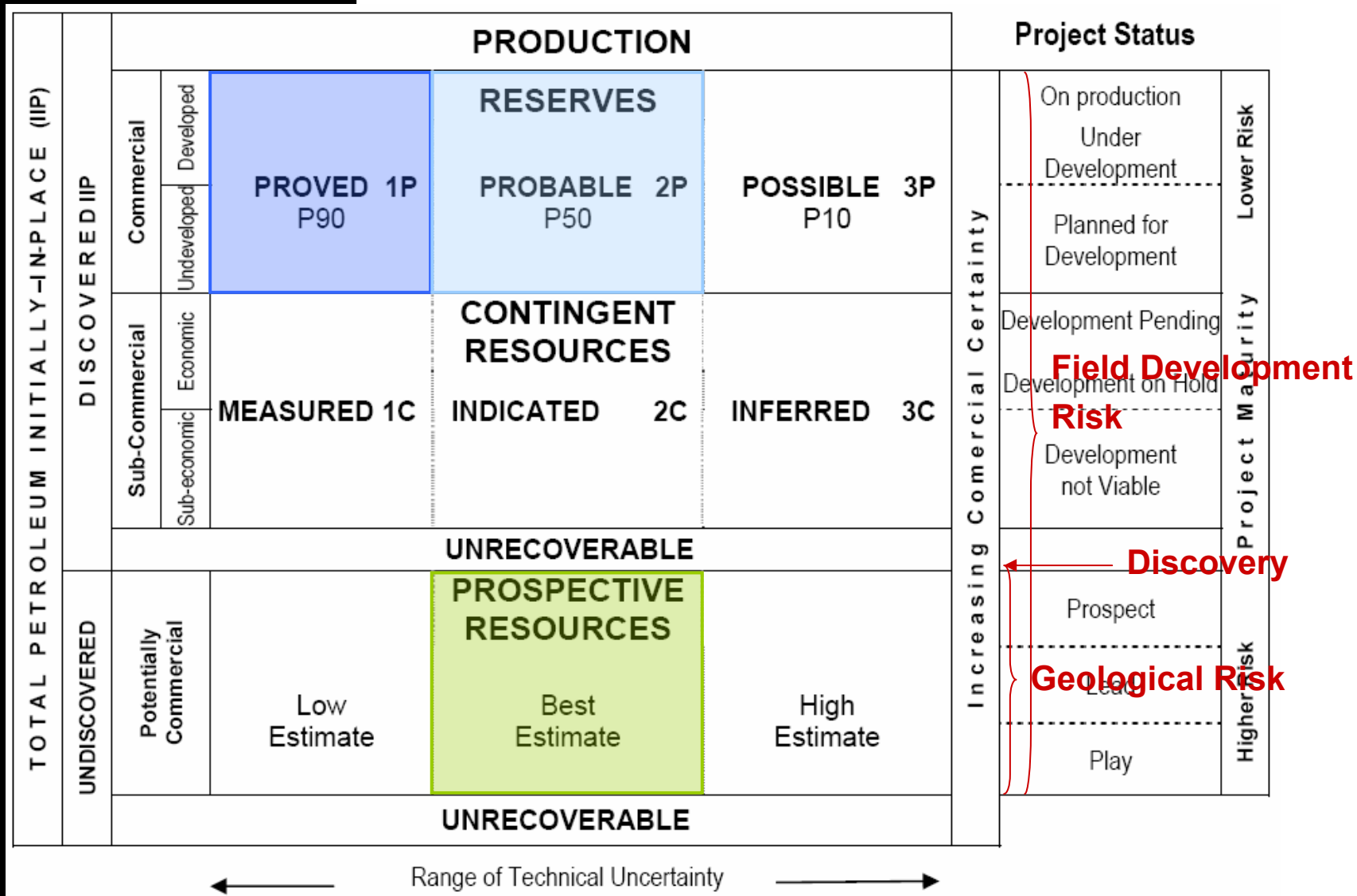
ExxonMobil's Multiple Zone Stimulation Technology



Piceance Basin,
Colorado, USA



SPE – PRMS Classification system



Initial assumptions on resource distribution of the Makó Trough

- ▶ Continuous field development
- ▶ High well density (2-3 well/km²)

- ▶ Resources of the basin >2000 MMboe (>340 Bcm)
- ▶ MOL controls approximately 40% of the Mako basin acreage
- ▶ Appr. the 30% of the basin's resources could be recovered in the next 30 years with 50 wells drilled per year
- ▶ Will require growth in oil field services in Hungary

Field Development

It would require ~2000 wells to produce all hydrocarbons from Makó area

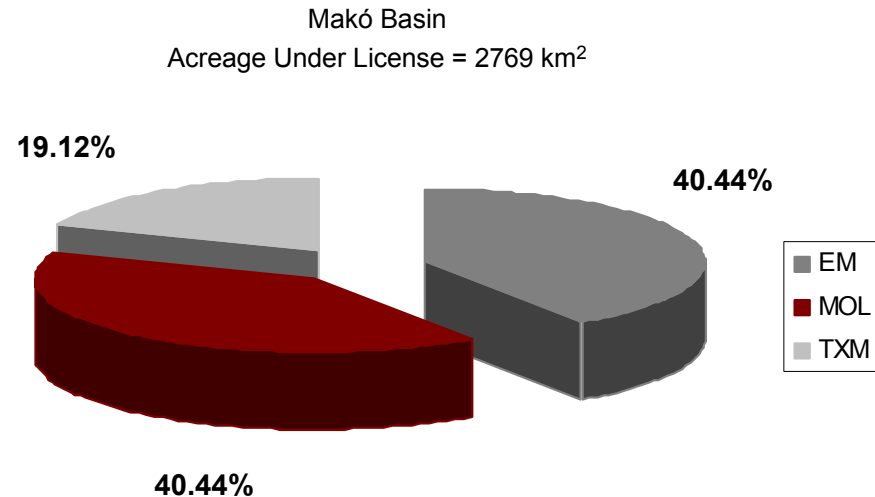
Approximately 50 wells can be drilled in one year in our current knowledge

Discounted payback period of a well is 2-3 year

Wells are drilled through the lifetime of the project

Resources & Production

- ▶ The following charts show the acreage within the Mako basin controlled by MOL



Economic valuation – main assumptions

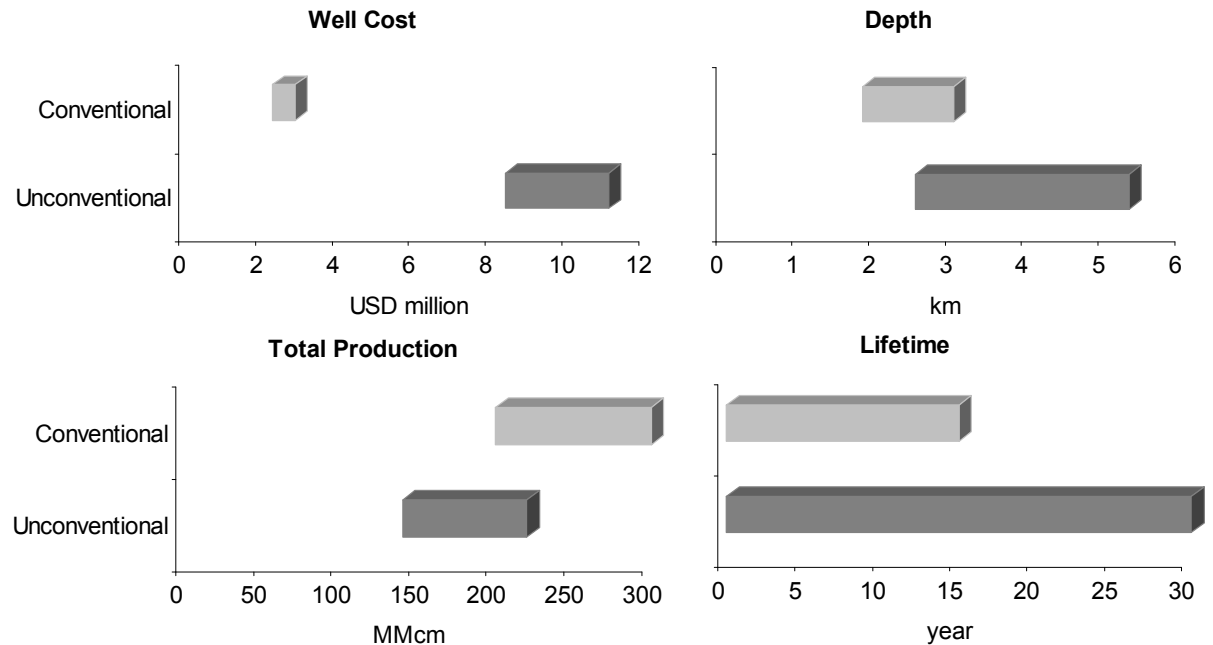
- ▶ Unconventional wells vs. conventional are
 - ▶ Deeper
 - ▶ More expensive
 - ▶ Produce less

- ▶ High initial production
- ▶ Rapid production decline to a relatively low but sustainable level

Cost Estimates

- ▶ Surface facilities: USD 22-28 million + USD 6-11 million/year
- ▶ OPEX: USD 2-3/boe
- ▶ Well cost: USD 8-12 million

Comparison of Single Producer wells in the Makó Trough Area



Uncertainties

Geological challenge is understanding hydrocarbon distribution

Technical challenge is the producibility

The overall probability of success reaches a certain threshold encouraging MOL to start exploration program

Unconventional exploration as a way of organic growth in Upstream

- ▶ Unconventional resources play an increasing role in worldwide hydrocarbon production, mainly due to pricing and technical developments
- ▶ In Hungary, due to pricing and regulatory issues, the time has just come to start to put serious efforts to this area
- ▶ MOL is the largest acreage holder for unconventional plays in Hungary and is the owner of a well-developed infrastructure
- ▶ MOL devised a differentiated strategy for various Hungarian basins with unconventional potential
- ▶ Based on joint studies prepared by MOL and Exxon experts, the overall probability of success reached a threshold encouraging MOL to participate in the Makó Trough exploration programs
- ▶ MOL's local strengths joined with ExxonMobil's expertise and proprietary technology create a unique combination for unconventional hydrocarbon exploration in the Makó trough
- ▶ In case of success, unconventional gas production may play a significant role in MOL's production portfolio long-term