Shale Gas & Oil , Tight Gas & Oil Imperatives on Improving Fiscal Terms

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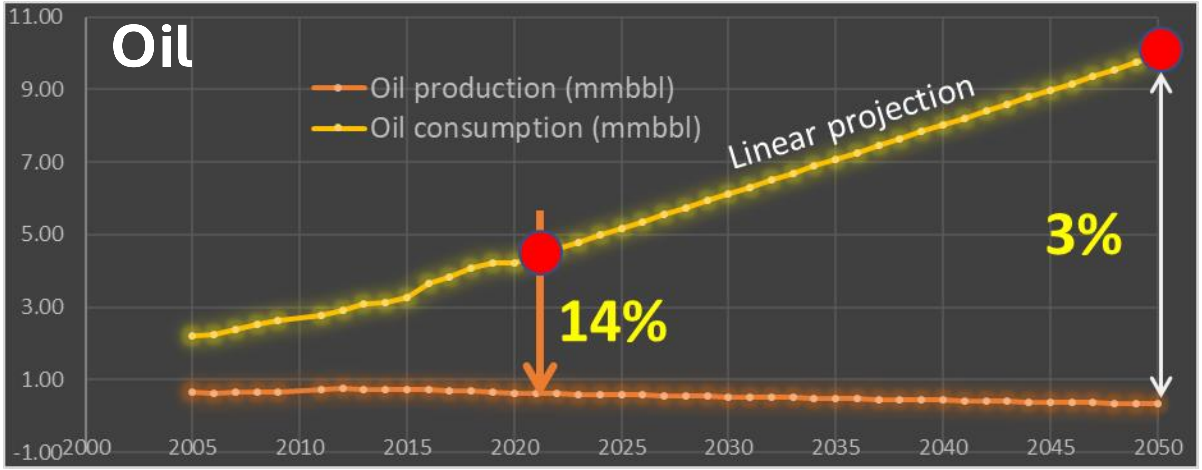
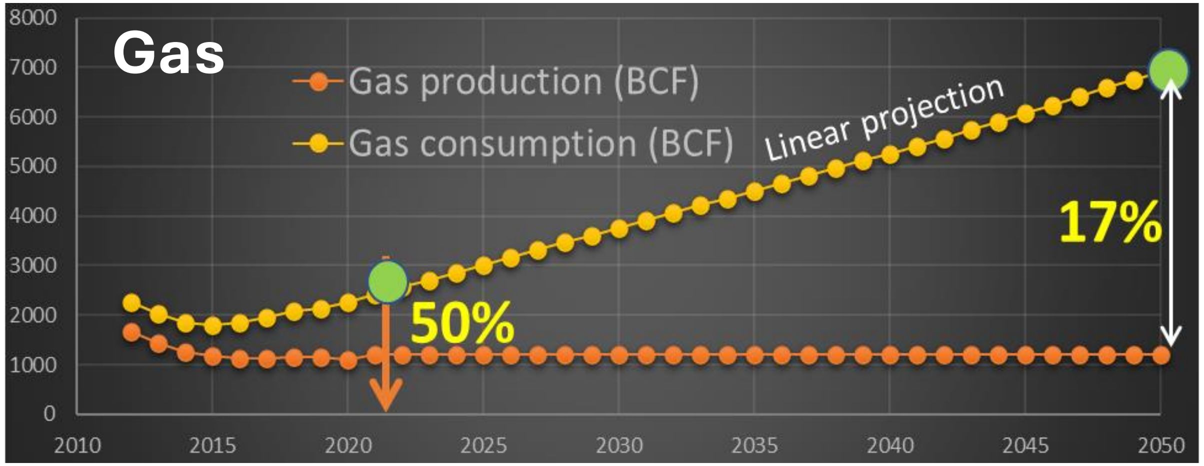
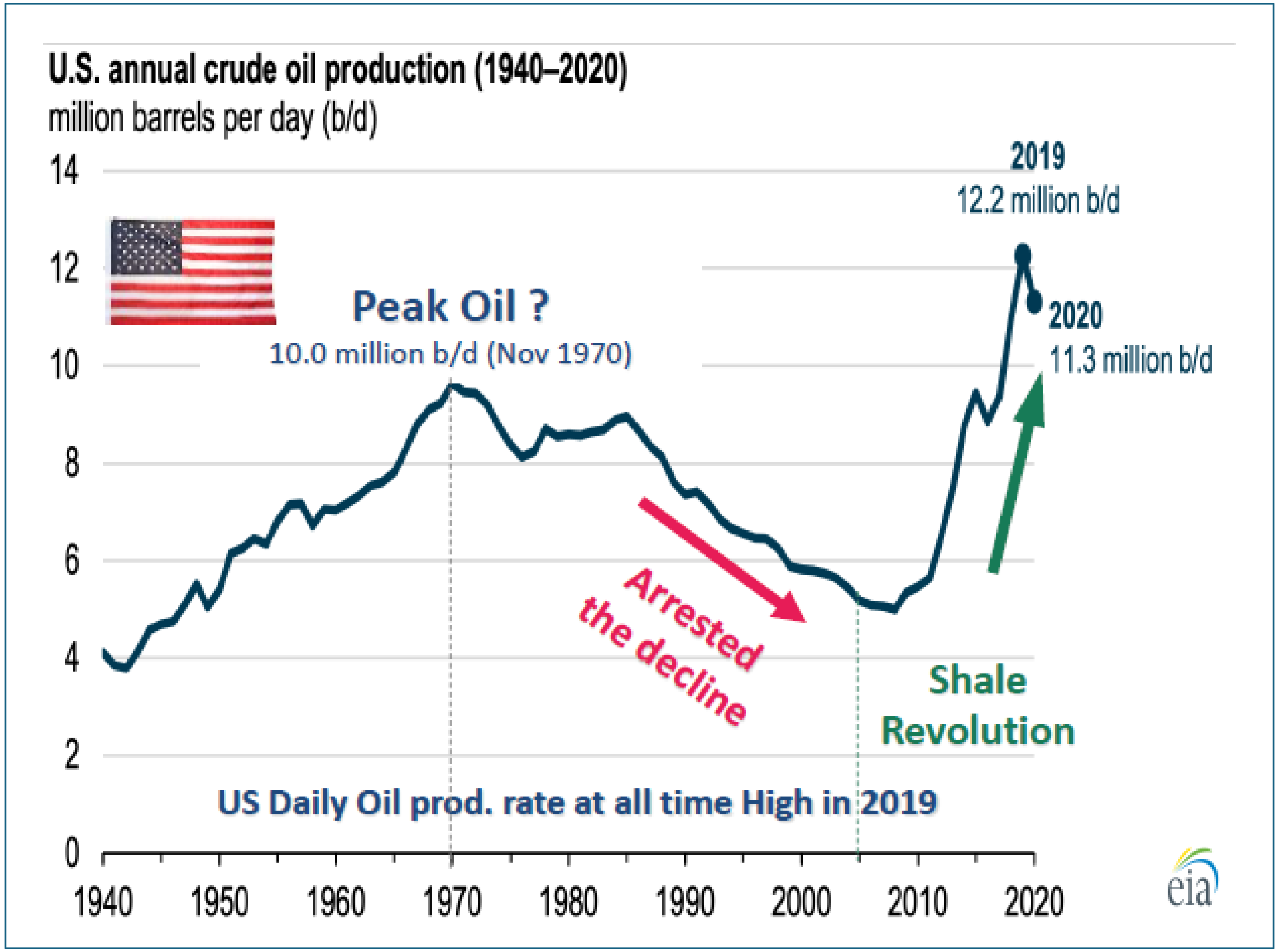
Oil & Gas Production and Consumption scenario in India





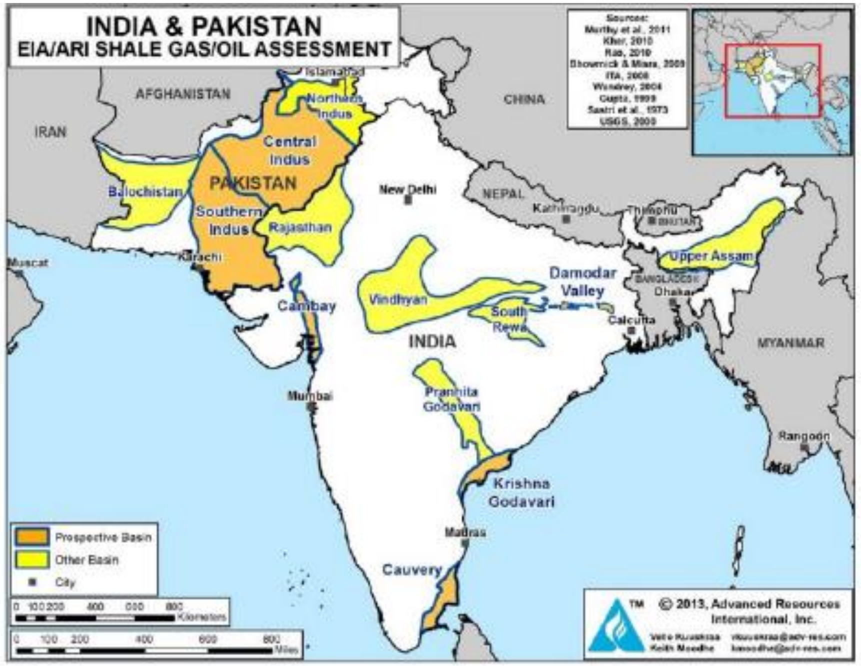
- **Oil demand 2050:**
  - 10 million bopd from current level of 4.4 million bopd (GOI,2020)
- **Gas demand 2050:**
  - 338% increase in 2050 from current level (GOI,2020)
- Increasing import of oil & gas
- Security of supply risk
- Need for stepping up domestic supply

Turn around in Oil Production: US Example



India Tight oil/gas and Shale oil/gas potential

About 5 bbl oil and 100 TCF gas



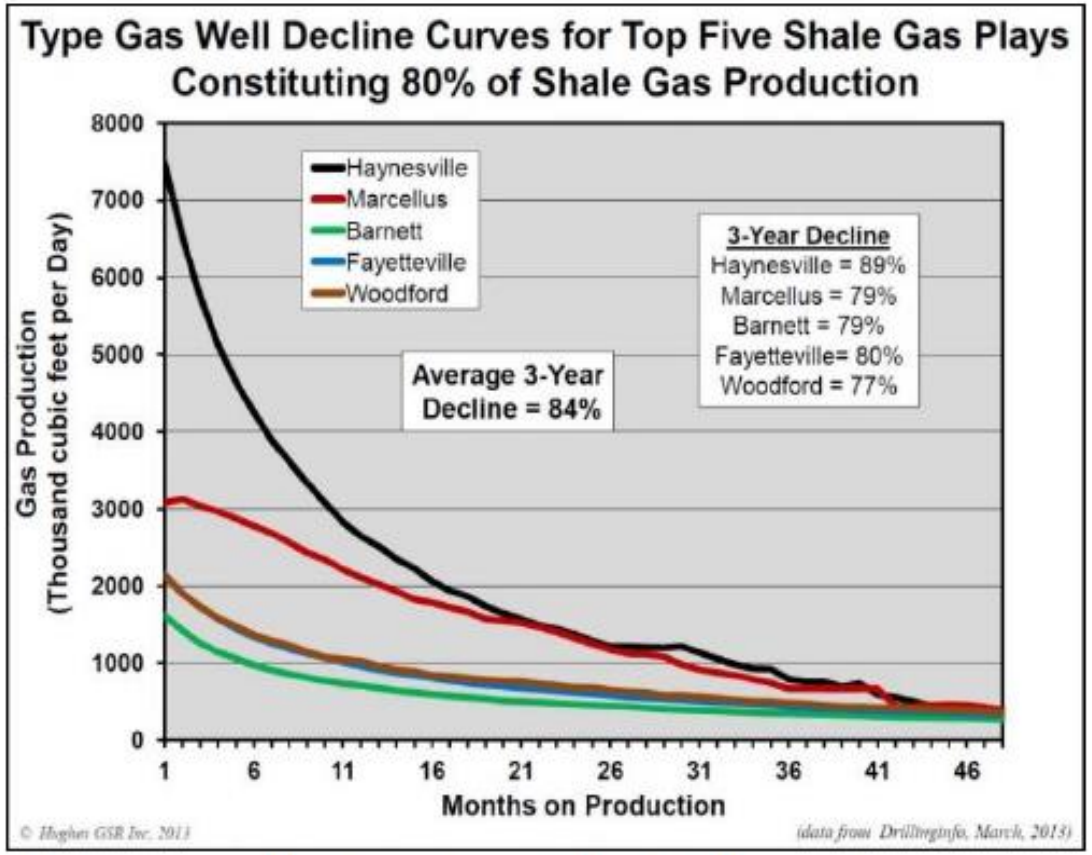
- Cambay TRR: 29.5 TCF Gas, 2.71 BnBbl Oil
- K-G TRR: 56.9 TCF Gas, 0.60 BnBbl Oil
- Cauvery TRR: 4.5 TCF Gas, 0.23 BnBbl Oil
- Damodar TRR: 5.4 TCF Gas, 0.21 BnBbl Oil

EIA Estimates

Nature of these plays?

- Less than 25% of plays have been commercially developed globally
- Commercially productive areas comprise about < 25% within a play
- High variability in well performance
- Long Appraisal Cycles, Learning Curves
- High Decline Curve and need for Continuous drilling

Nature of Shale/ Tight sand plays



Major north American Shale Plays show >80% decline in first 3 Year

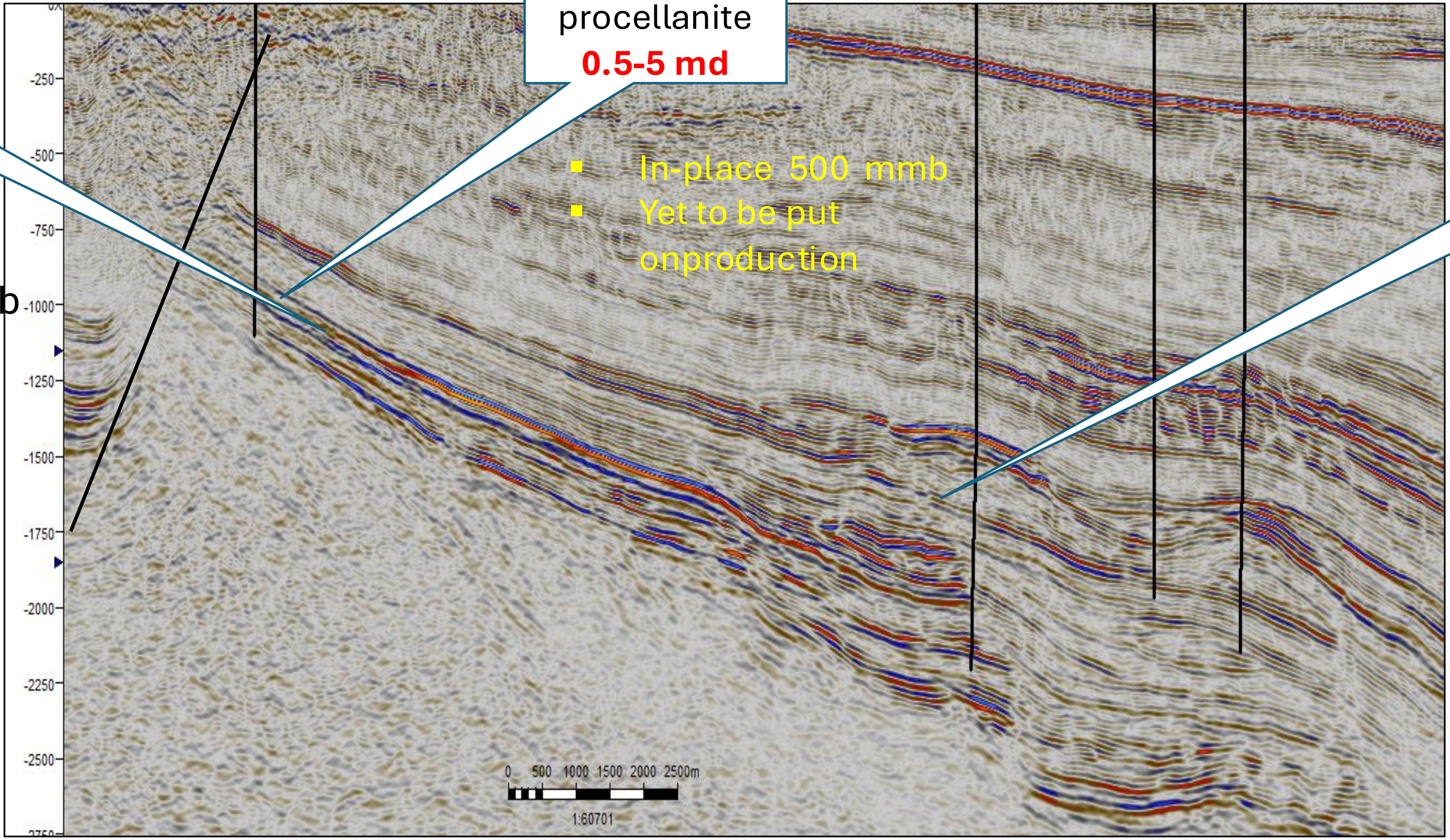
- Long learning curve for unconventional resource developments.
- Need for **“staying power”** as companies come up the learning curve, recognizing there will be a significant number of **“uneconomic producers”**.
- A **start-and-stop development** program is not conducive to learning.

Nature of Shale/Tight sand plays

Stacked Fluvial channels
Multi darcy

- In-place 400 mmb
- Peak production >30000 bopd

Lacustrine procellanite
0.5-5 md



Lacustrine Turbidite complex
0.5-1 md

- In-place 1500 mmb
- Yet to be put onproduction

Unified licensing policy with same fiscal terms will not be able to rejuvenate Shale and Tight sand plays

Fiscal Regimes required

- Unified Licensing permitting exploration & development of all energy sources under “Mineral Oil”- A welcome measure
- An appropriate fiscal regime is required to support and rejuvenate Shale and Tight sand plays

Thank You