

Unconventional Oil and Gas R&D at University of Alaska Fairbanks

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RPSEA Problem Identification
Workshop

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Fossil Fuel Energy Gap



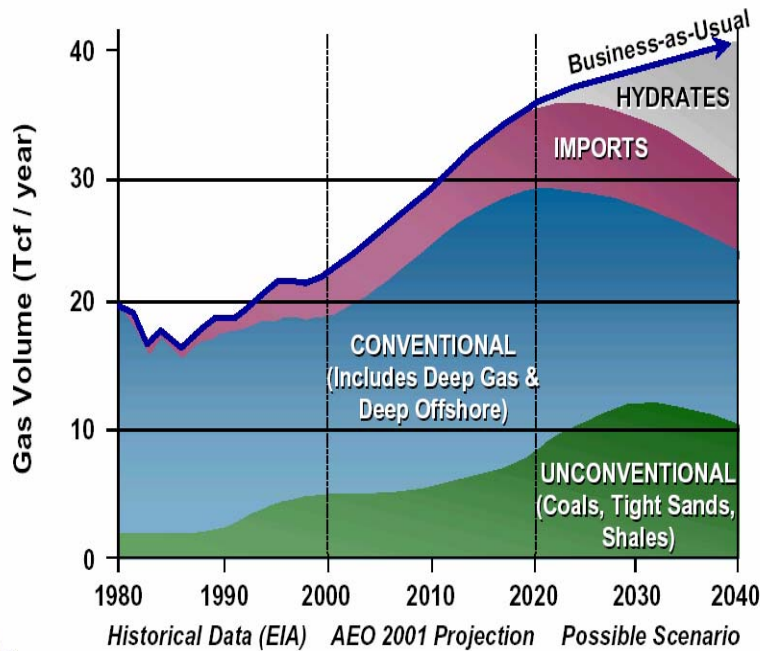
Largely ignored

***Major thrust to date,
'business as usual'***

***Largely untapped,
'ignored'***

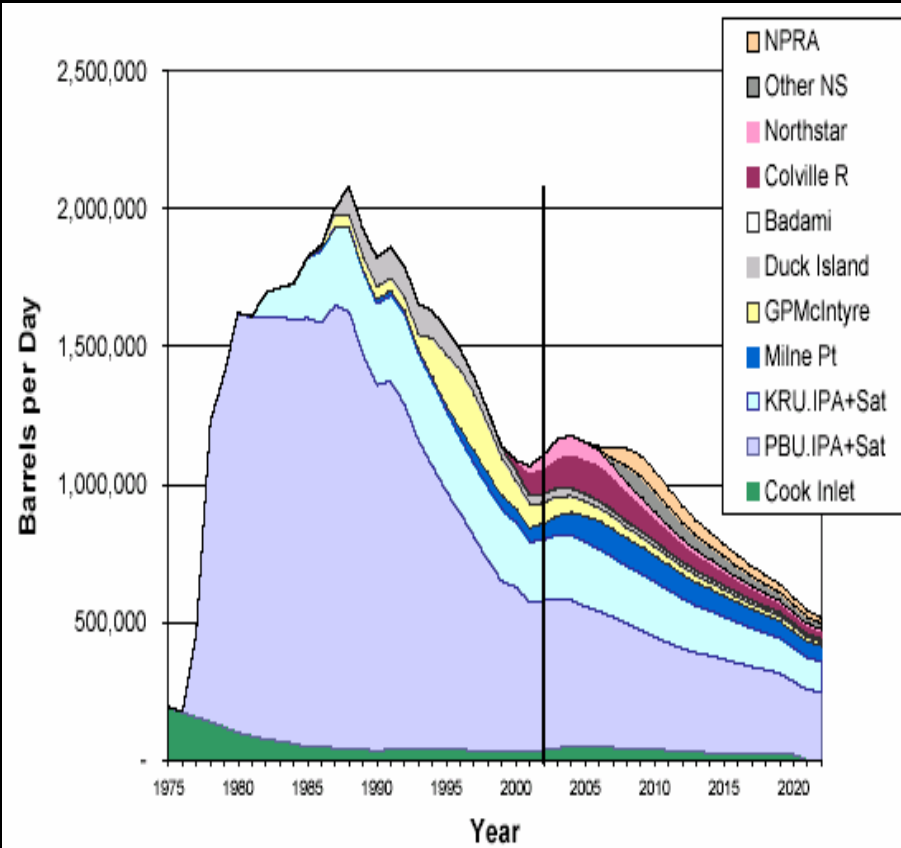
Can Alaskan Viscous Oil, Conventional and Unconventional Gas Resources Fill Fossil Fuel Energy Gap?

Enough Affordable Gas to Meet Demand?



NETL, Baswell

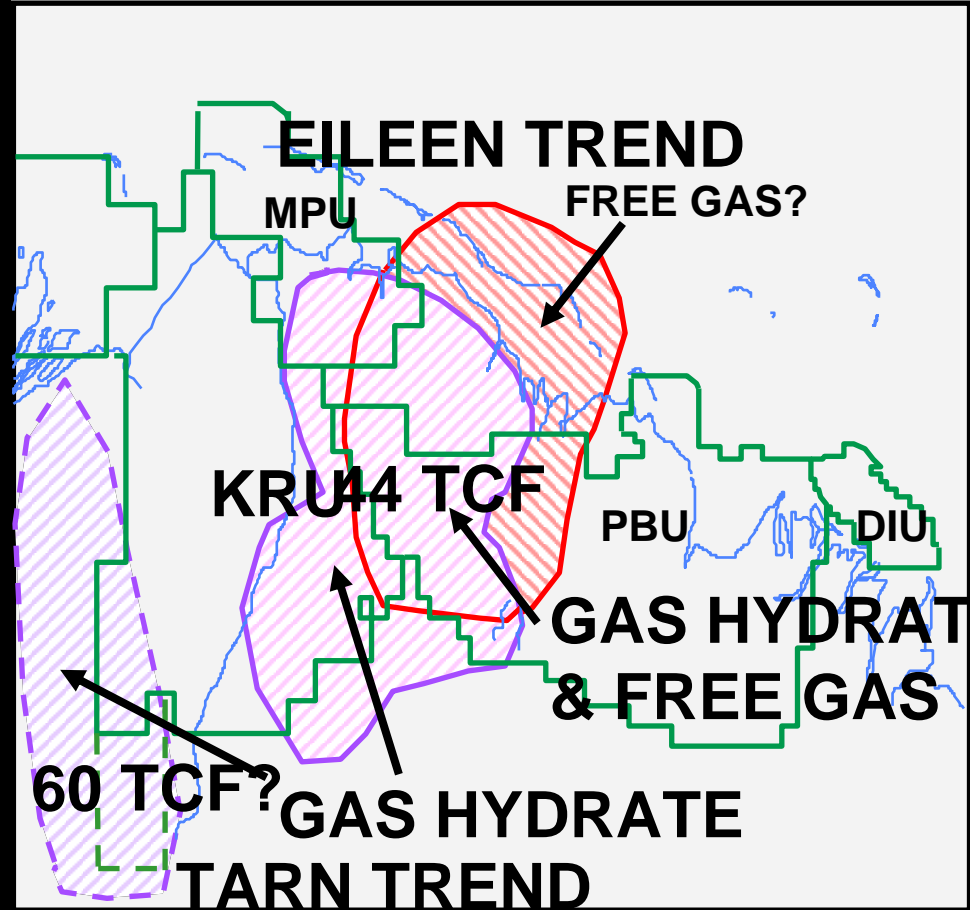
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Alaska CH₄ Hydrate Resource Estimates

Synergy with viscous oil development – fuel for thermal recovery processes?

- **Onshore – Existing Facility, Reservoir**
 - **Eileen Trend – to 44 TCF in-place**
 - **Accessible Prize Requires Characterization**
 - **Associated Free Gas Present, Undefined**
 - **Tarn Trend – to 60 TCF in-place**
 - **Less Well Defined**
 - **No Known Associated Free Gas**



Alaska CBM Resource Estimates close to 1000 TCF



35 COMMUNITIES

Alatna	King Salmon
Allakaket	Kobuk
Ambler	Koyuk
Atqasuk	Koyukuk
Beaver	McGrath
Bettles	Mekoryuk
Birch Ck	Naknek
Chalkyitsik	Nightmute
Chignik	Nikolai
Chignik Lg	Noatak
Chignik Lk	Nulato
Deering	Point Lay
Evansville	Rampart
Fort Yukon	Selawik
Galena	Shungnak
Kaltag	Toksook Bay
Kiana	Venetie
	Wainwright

UAF Facilities- Petroleum Dev. Lab.



Research in gas hydrates; CBM; Heavy oils; CO2 Sequestration; GTL

Some of the problems?

- Significant heavy oil resources, however, there are problems in producibility
- How much do we know about the heavy oil PVT – two phase splits etc.; compositional surprises?
- Determining the true viscosity of heavy oil is a complex process – when we say viscosity is 200 or 500 cp; how certain are we? Same is true with modeling viscosity
- How much reduction in the viscosity by CO₂ or MI injection are we getting? How certain are we as far as the viscosity values are concerned?

And, some more problems?

- Significant efforts need to be directed in modeling and measurement of heavy oil viscosity
- TAPS production is steadily declining
- Midstream activities – heavy oil transportation issues, very critical for Alaska
- Properties of binary blends of conventional Prudhoe Bay type TAPS oil and heavy oils – viscosities, densities, gel strengths, propensity for solid deposition

And, some more problems?

- ‘*Mild*’ surface upgrade of the viscous oils improves the transportation through TAPS?
- Optimum blend ratios that fit within the existing TAPS infrastructure?
- Significant gas resources on the slope but no local market, no infrastructure to take it to markets – any synergies with viscous oil development?
- Alaskan villages require fossil fuels but in very small quantities; that means production has to be somehow constrained – how will the well(s) correspond?

Alaska's Rural Communities

Typical view before replacing and upgrading tank farms in rural Alaska.



Reduce hazards of liquid fuel transport and storage

Barge, aground at Mekoryuk Bay. (photo by DEC)



After all we are talking about "Energy Future of America"!

Source: AETDL CBM



DEC DSPR, Response Summaries

**In summary: Lot of
problems to tackle
with in the paradigm
shift in the oil and gas
industry**

Thank You!