SLIDES: Costs and Benefits of Development: An Industry Perspective

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THE PROMISE AND PERIL OF OIL SHALE
COSTS AND BENEFITS OF DEVELOPMENT

AN INDUSTRY PERSPECTIVE

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Disclaimer – the views presented are the authors views, and not the views of any one industrial firm or of the National Oil Shale Association as a whole.
THE PROMISE AND PERIL OF OIL SHALE

- THERE IS NO OIL SHALE INDUSTRY, AND NEVER HAS BEEN ONE THE U.S.
- ONLY A HUGE RESOURCE AND THE POTENTIAL FOR MAKING ITS DEVELOPMENT ECONOMIC AND SUSTAINABLE
- MAY NEVER BE AN INDUSTRY

TECHNOLOGY IS THE KEY

- CONTINUING CURRENT R,D&D IS IMPORTANT

MISCONCEPTIONS ABOUND

- E.G. INFERIOR HYDROCARBON RESOURCE, FEDERAL LEASING UNNECESSARY, SOCIAL IMPACTS ARE ALL NEGATIVE

STIGMA OF BLACK SUNDAY
WHAT HAS CHANGED SINCE BLACK SUNDAY

- No Federal Government funding or rush to meet federal production mandates
- Evolution of technologies and environmental mitigation strategies and stricter regulations
- Focus on in situ technologies in the deep Piceance Basin of Colorado and need for Federal Resources in that region
- Successful commercialization of surface technologies developed abroad
- Deliberate and expensive private research, development and demonstration programs
WHY IS INDUSTRY INVESTING $MILLIONS ON R,D&D

- Long term profit potential
- New technologies with the potential of competing with conventional petroleum
- Proven non-U.S. oil shale technologies that provide less technical and investment risk
- Huge & well defined domestic resource with no discovery risk or offshore political risk
- Potential to add $billion to assets if projects are economically viable
- Potential for small commercial operations
Some allege no progress is being made on R,D&D leases.

Leases were issued by BLM in 2007 – 10 year leases.

State and BLM requirements:
- 4-quarters of hydro data
- Detailed development plan
- Permit approvals
- Reclamation bonding

Example - AMSO has all permits to begin work.

Other projects are also moving ahead.
Historically oil shale has been more expensive than conventional oil & gas production.

Detailed cost estimates were performed by developers in the 1970’s but they are of little use today.

Current R&D and D is focused upon improving economic return, reducing investment risk, and proving environmental mitigation strategies.

Estimated costs of shale oil production range from $20 to around $80 per barrel depending upon the technology and level of project maturation.

Initial demonstration plants are needed to define costs and technical parameters.
OIL SHALE BENEFITS FOR THE PUBLIC

- Revenues from taxes, royalties and fees
- High paying jobs
- Infrastructure improvements
- Long lived industry/large reserve base
- Security of oil supply
- Potential to drive down gasoline prices long term

Battlement Mesa, Colorado – a town built for oil shale development in the 1980’s
OBSTACLES FACING INDUSTRY

- Technical
  - Few commercially demonstrated technologies – long lead times

- Political
  - Federal and regional opposition, and stigma of 1980’s collapse

- Environmental
  - Carbon management, water, air & wildlife issues have technical solutions that will be expensive

- Regulatory
  - Limited access to federal oil shale resources

- Social & Economic
  - Social benefits obscured by external emphasis upon impacts

- Investment Risk

Estonian Oil Shale Plant
Petroleum is becoming harder to find and more expensive.

94% of the U.S. transportation system runs on liquid fuels made from petroleum.

Oil shale is one of the U.S. domestic energy resources that can reduce the societal cost of increasing oil importation.

A balance between public costs and benefits is the desired end result.

Technology is the key to whether oil shale will in the end become competitive with petroleum.
NOSA IS A NOT-FOR-PROFIT ORGANIZATION THAT STANDS FOR RESPONSIBLE DEVELOPMENT OF U.S. OIL SHALE TO BENEFIT THE LONG TERM ENERGY NEEDS OF THE NATION.

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Members include corporations and individuals

Recently produced DVD available
OIL SHALE PROJECTS

Shell*
Chevron*
AMSO*
  (w/TOTAL)
Exxon
OSEC*
  (w/Petrobras & Mitsui)
EcoShale
Paraho (STI)
Enshale

Shell Mahogany Project Freeze Wall 2009

*BLM R,D&D Lease Holder
ADDITIONAL OIL SHALE PROJECTS

- Schlumberger
- AuraSource
- Quasar Energy LLC
- Percy Kean Clean Technologies
- IEP
- Mountain West Energy
- PetroProbe
- University of Denver
- Phoenix-Wyoming
- Natural Resources Recovery
- Millennium Synfuels
- Chattanooga Corporation
- CRE Energy
- Global Resources
- Natural Soda/Sentient
- General Synfuels International
- ConocoPhillips
- Encana
- Anadarko

EnShale Pilot Plant in Utah