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The Promise and Peril of Oil Shale Development  
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### SLIDES: The Peril of Energy Usage

Mike Tupper

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# The Peril of Energy Usage

Mike Tupper



“In this house we obey the laws of thermodynamics”

### **The Second Law of Thermodynamics**

- The universe is constantly losing usable energy and never gaining.
- Ultimately there would be no available energy left.

# Energy Sources

- **Renewable energy is not necessary clean, it is renewable**
- **Fossil fuels are not necessarily more dirty, they are not renewable**
- **Complex system**
  - **Geopolitics**
  - **Economic prosperity**
  - **Quality of life**
  - **Climate destabilization**
  - **Pollution**
    - **Health**
    - **Environment**
    - **Wildlife and natural habitats**

# No Free Lunch – Impact of Renewable Energy

- **Wind Energy**
  - Visibility and noise
  - Land use
  - Bird deaths
- **Solar Energy**
  - Manufacturing wastes & energy
  - Land Use
- **Geothermal Energy**
  - Air and water pollution
  - Disposal of hazardous waste
  - Location and land use
- **Biomass**
  - Air pollution
  - Degradation of agricultural land
- **Tidal and River Currents**
  - Impact of fish
  - Navigation and recreation
  - Leaching of chemicals
- **Conventional Hydro**
  - Impact of fish
- **Nuclear Fission**
  - Waste
  - Geopolitics
- **Conventional & Unconventional Oil**
  - Air pollution
  - Water usage
  - Land use

**Most renewable supplies are intermittent, require storage capability**

Source: Union of Concerned Scientists

# Conservation and Improved Efficiency

- **Easiest way to**
  - **Maintain or improve economic prosperity**
  - **Maintain or improve quality of life**
  - **Slow impact of climate destabilization**
  - **Reduce pollution**
    - **Health**
    - **Environment**
    - **Wildlife and natural habitats**
- **Requires augmenting our lifestyles**
  - **How many people drove here alone today?**

# **Conservation will Increase as the Cost of Energy Increases**

- **Tax energy**
- **Tax carbon**
- **Use increased taxes to**
  - **Further increase conservation and efficiency**
  - **Develop energy sources and storage devices that reduce/minimize impact**
- **Conservation will Increase When Money Can be Made**
  - **Financially reward conservation**
  - **REDEUCE, reuse, recycle**
  - **Not Reduce, reuse, RECYCLE**

# Better Use of Existing Energy Sources

- Energy use is increasing worldwide and in the US
  - Current production of conventional fossil fuels is not expected to be able to keep up with the growth
- Renewable sources
  - Generally have lower impact
  - Goal is only supply 20% of our energy by 2020 or 2030
- How will the other 80% be supplied near-term?
  - Reasonable enhanced oil recovery should be considered
  - Oil Shale
  - Nuclear
  - Coal
- Most renewable sources require storage capability



# **Oil Shale – Local and Global View**

- **Local concerns**
  - Environment
  - Economy
  - Way of life in Western Colorado
- **Global Concerns**
  - World energy supply
  - Domestic energy security

# Oil Shale Promise or Peril?

- **We don't know yet!**
- **In-situ processes hold promise**
  - Need to continue development to see if this promise can be realized
  - Without overburdening the local environment
- **Guidance to the industry**
  - Value land, wildlife, clean air and water, economic and energy security, and our future
  - Through careful consideration and an open and transparent process of where it is best to build energy generation facilities
- **Industries responsibility to the community**
  - Openness to finding the best energy sources for a diverse and reliable energy supply