SLIDES: The Peril of Energy Usage

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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 necessarily 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 & Uncoventional 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