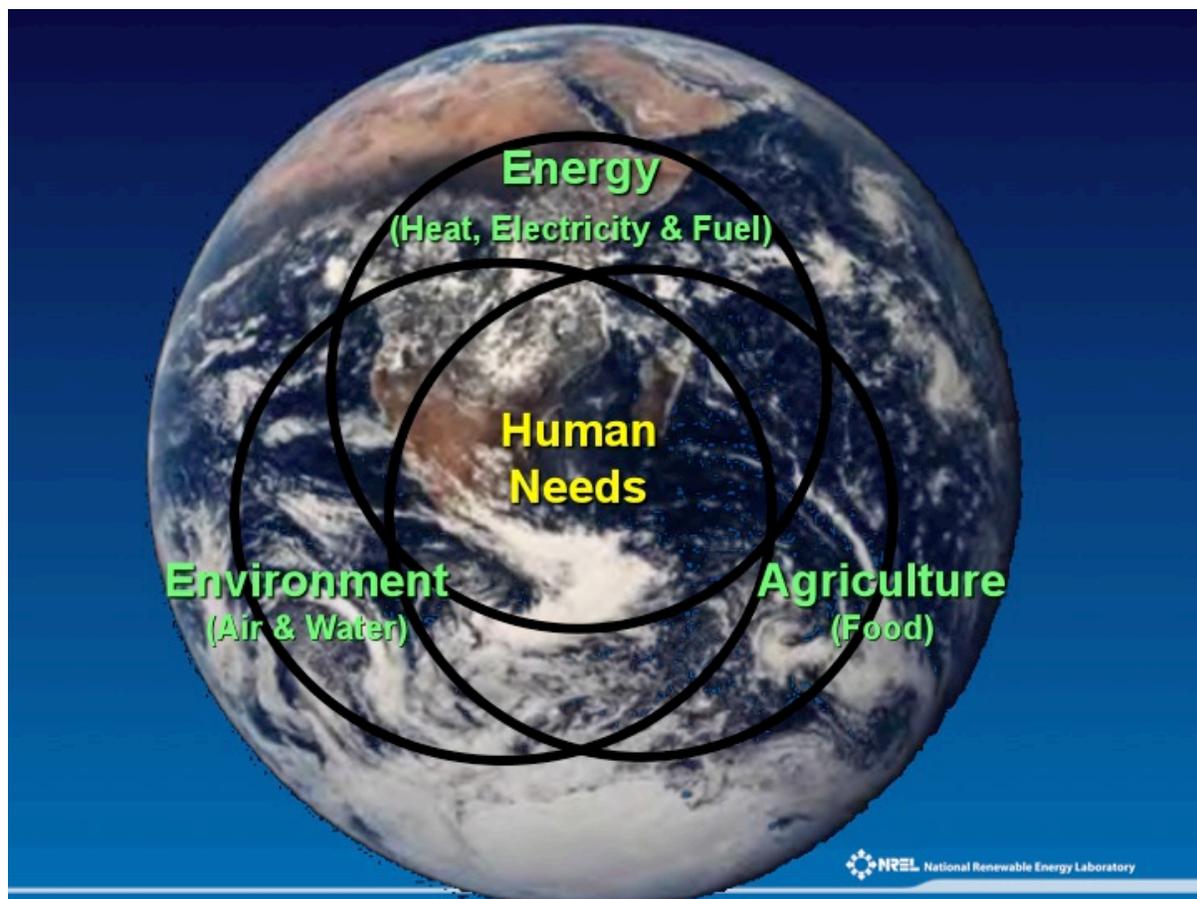
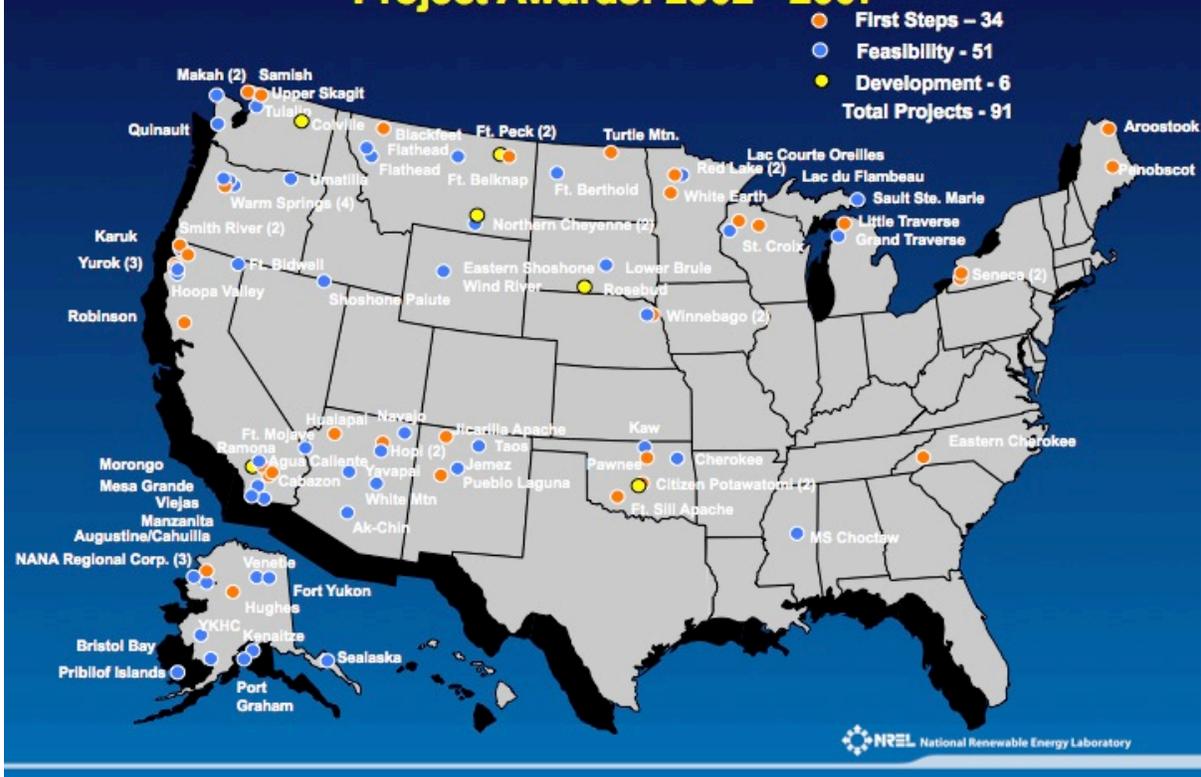
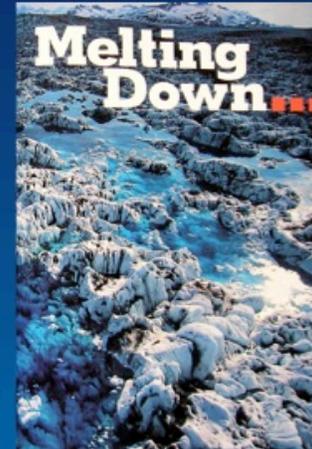
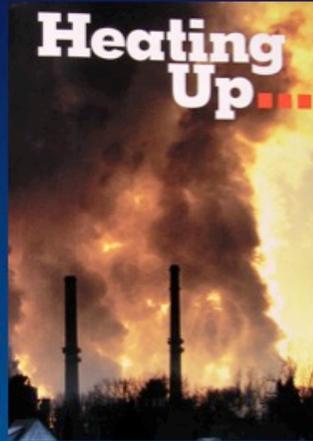
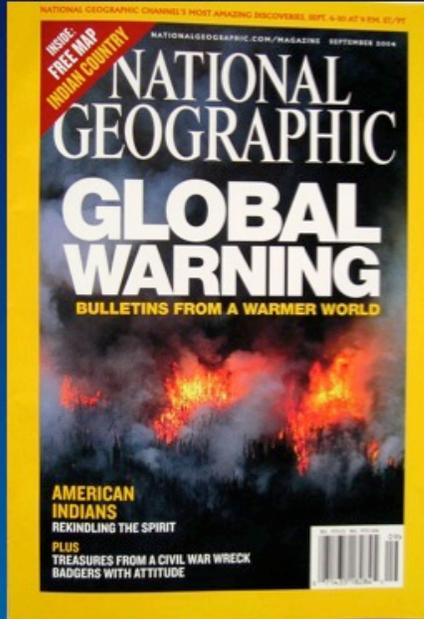


DOE's Tribal Energy Program Project Awards: 2002 - 2007

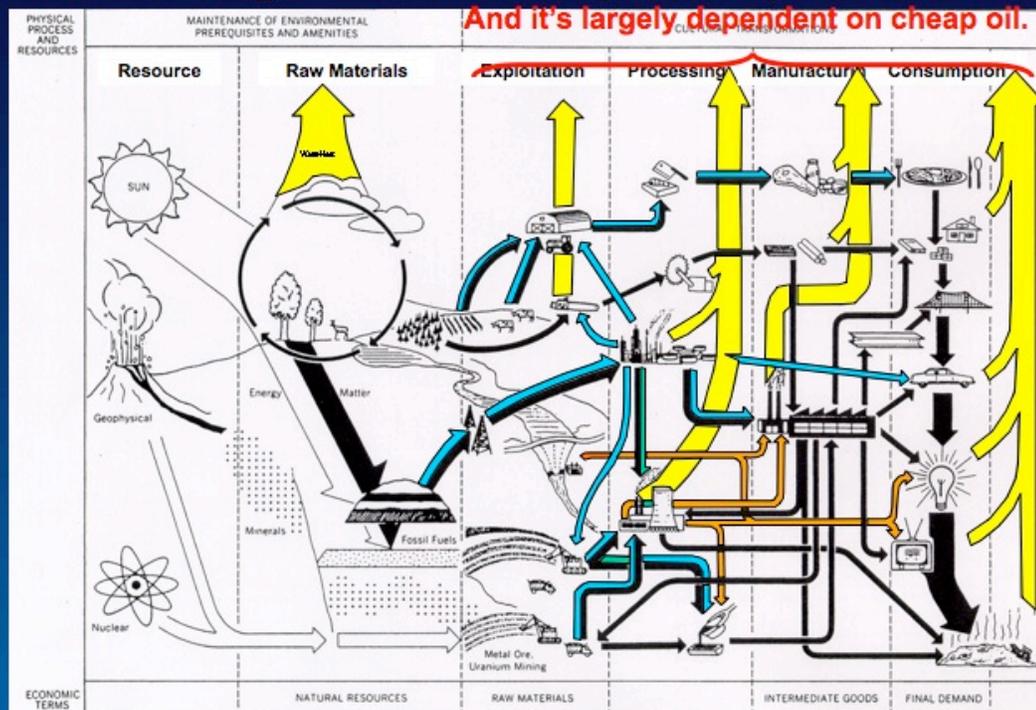


We Live in a Changing World

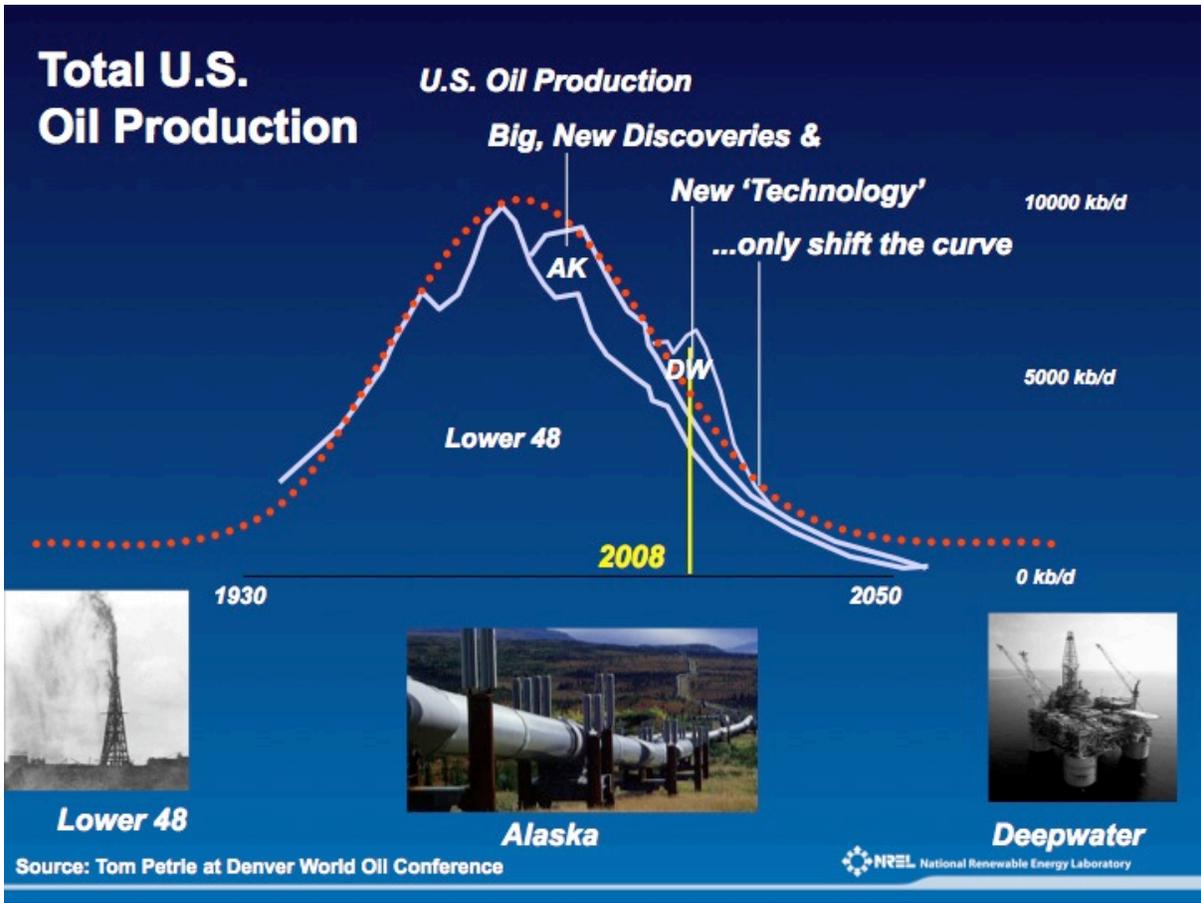


Where the global economy is very complex

And it's largely dependent on cheap oil.



Total U.S. Oil Production



Lower 48



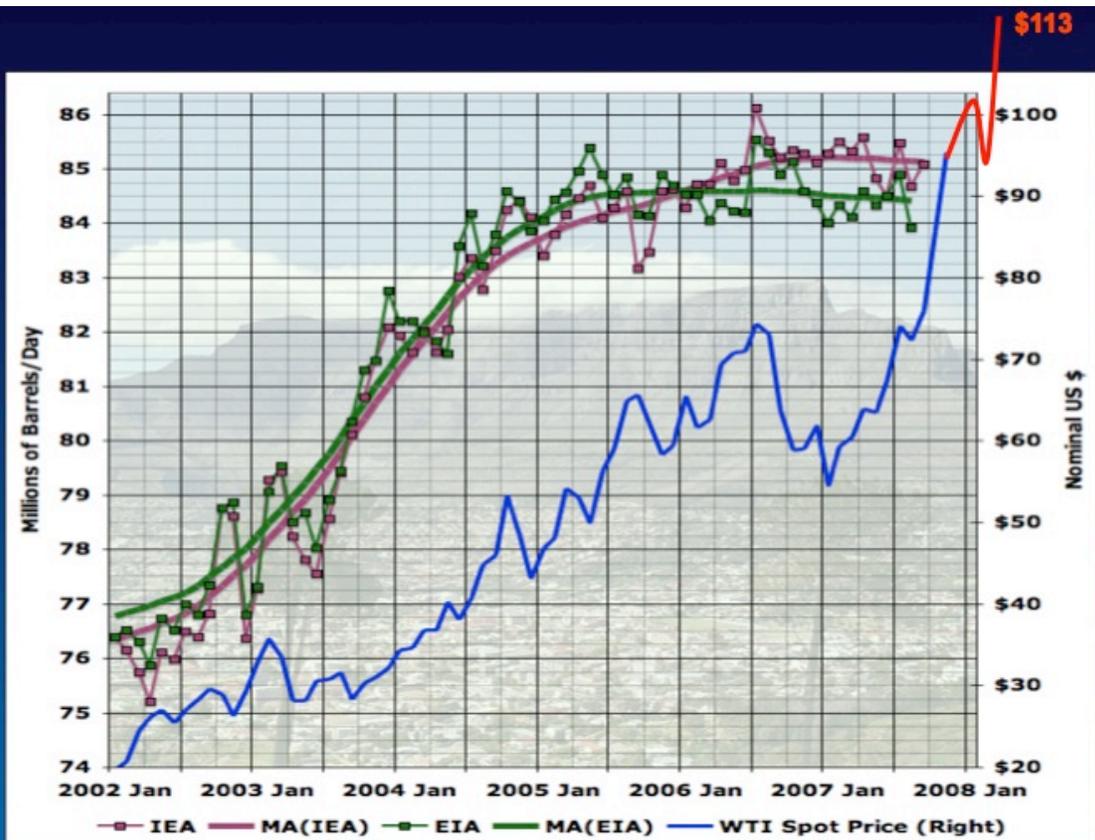
Alaska



Deepwater

Source: Tom Petrie at Denver World Oil Conference

NREL National Renewable Energy Laboratory



Source: The Oil Drum

NREL National Renewable Energy Laboratory

Our Great Grand Parents *7 Generations Span The Age of Oil*

Our Grand Parents

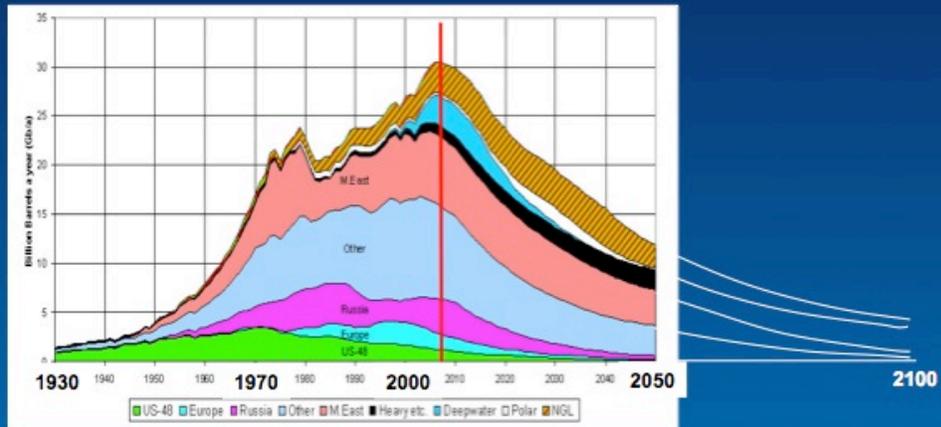
Our Parents

Our Generation

Our Children

Our Grand Children

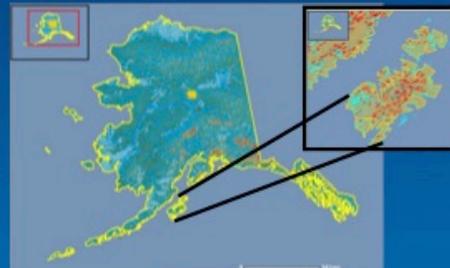
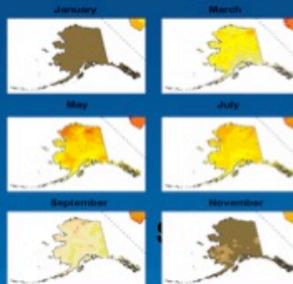
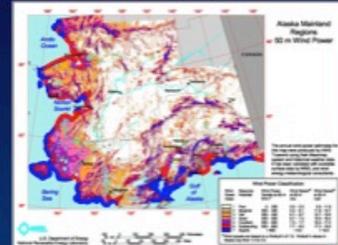
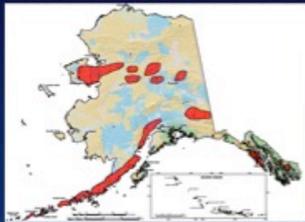
Our Great Grand Children



Peak Oil Graph from: ASPO.com - Colin Campbell 2004

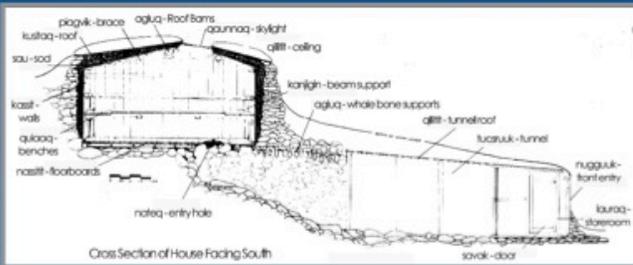
NREL National Renewable Energy Laboratory

Renewable Resource Options



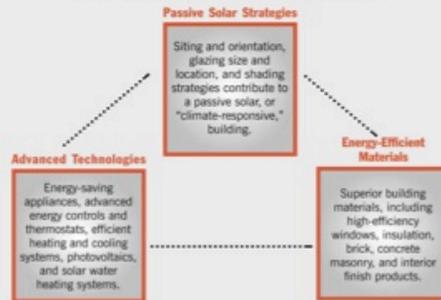
NREL National Renewable Energy Laboratory

Building Design



“Whole Buildings” Strategy:

Existing R&D programs, building technologies, and components tied together by Systems Integration and Computerized Design Tools.



Energy Efficiency



Energy Star Appliances

Refrigerators – Half as much energy



Clothes Washers – Save up to \$110 per year



Oil & Gas Boilers – Save up to 10%



Programmable Thermostats – Save up to \$100 per year



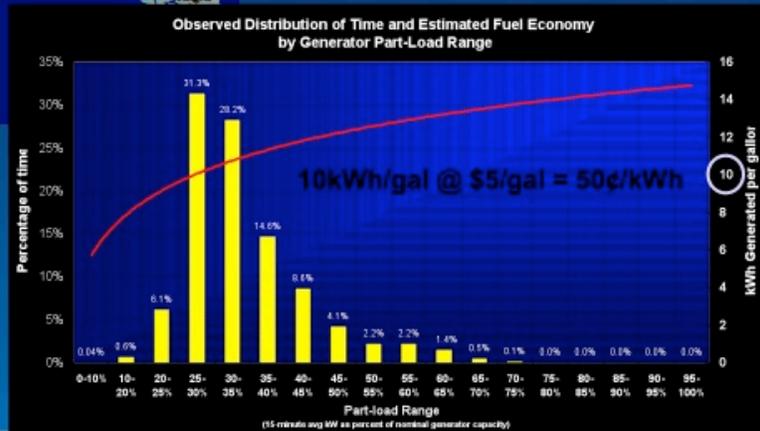
Efficient Lighting



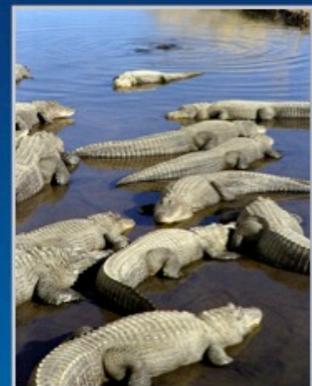
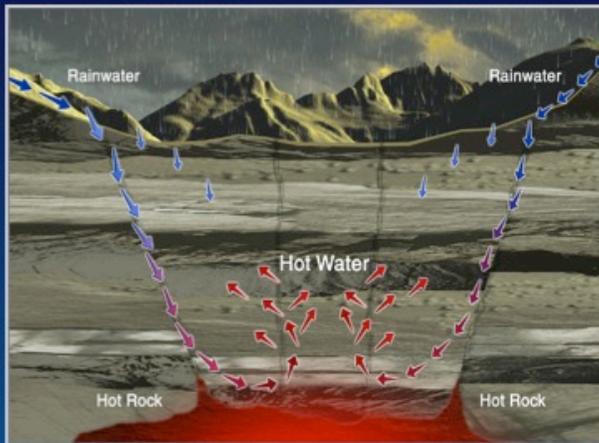
If every American changed out 5 lights, we'd save \$6 billion/year and the equivalent of 21 power plants.



Solar Options



Geothermal Options



Chena Hot Springs



Low Temperature: 165°F
Village Power: ~225kW
Water or Air Cooled

Small & Micro Hydro Power Options

<http://hydropower.inl.gov/prospector/>

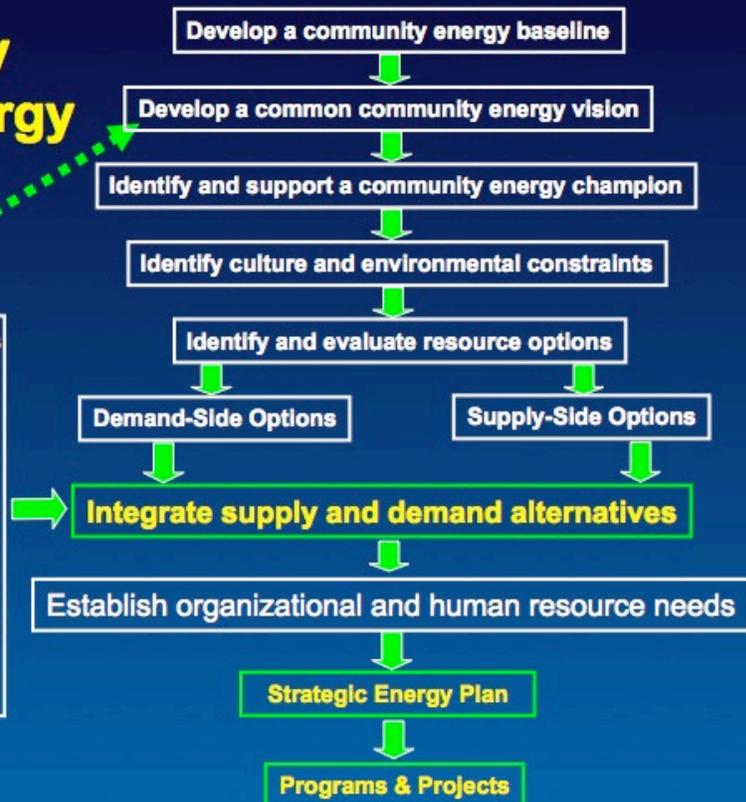


Strategic Energy Planning

*Defining where you are,
Where you want to go,
What are your energy options, and
Developing a plan to get there.*

Community Strategic Energy Planning

- Community Objectives**
- Energy Reliability & Security
 - Off-Grid Electrification
 - Minimize Environmental Impacts
 - Supply Diversification
 - Use of Local Resources
 - Economic Development
 - Jobs
 - Build technical expertise
 - Respect for Mother Earth
 - Others??



The Community Energy Development Challenge



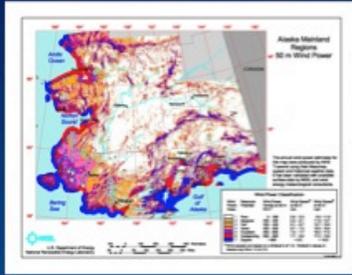
A few things to keep in mind

- **Urgency: Rural AK energy transformation**
- **Every Community needs an energy plan**
- **Many RE resource options**
- **Economics of installation & O&M**
 - **Hub & Spoke**
 - **"Standardized systems"**
- **Business & Workforce mobilization**
- **Push the limits of heat & electricity RE penetration**

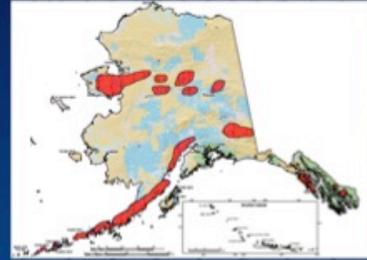
Indigenous renewable energy resources are key to human survival and future village economies in Alaska

Diesel-based villages are not sustainable

Wind



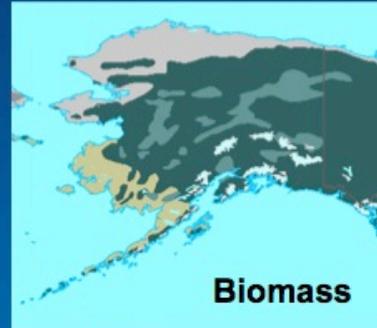
Geothermal



Solar



Small Hydro



Biomass