

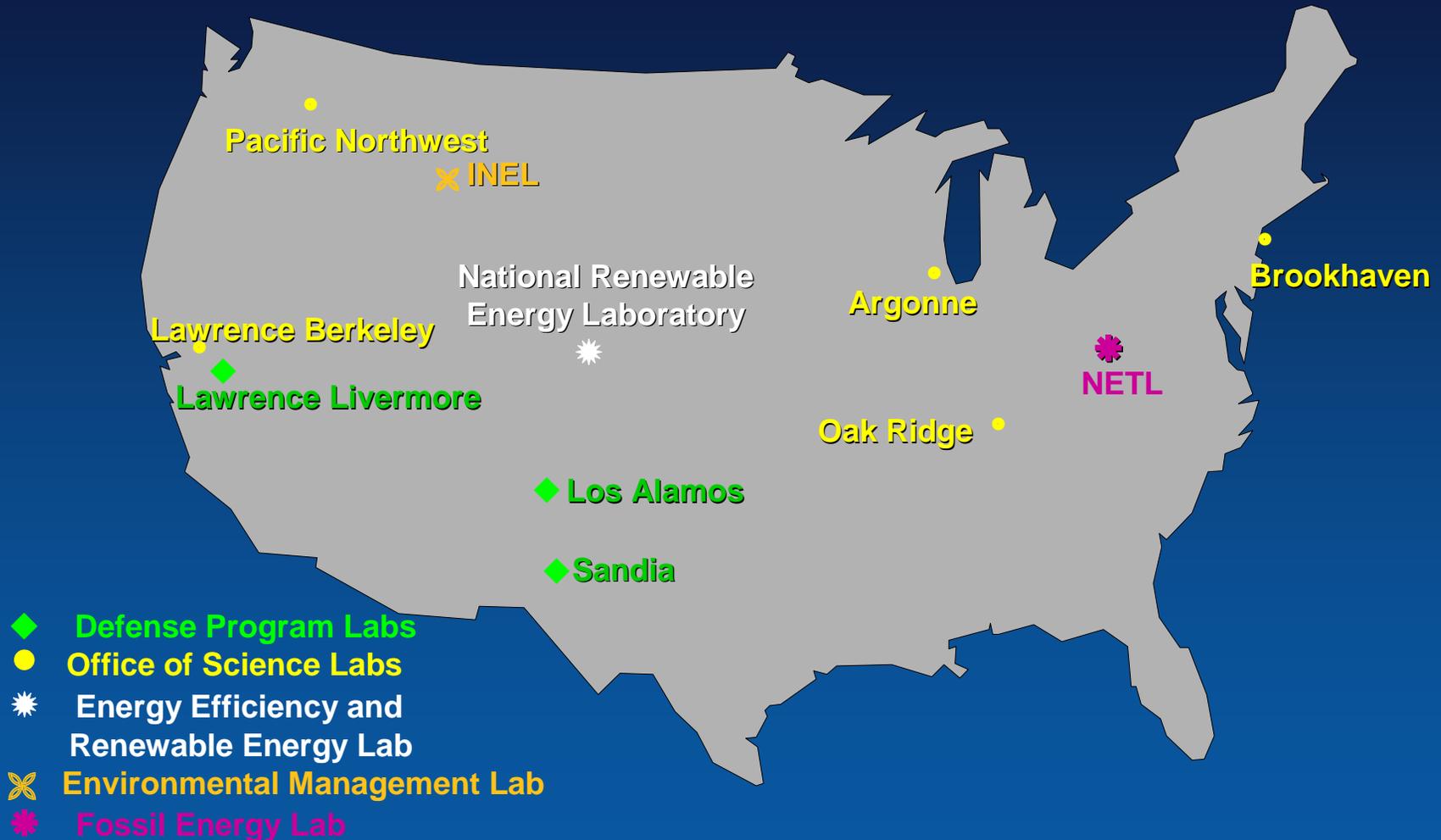
2005 DOE Tribal Energy Program Review

Roger Taylor
TEP Manager
National Renewable Energy Laboratory

October 17-20, 2005

Laboratory Resources
RE Technology Opportunities
The Changing National Energy Environment
Tribal Strategic Energy Planning

Major DOE National Laboratories



Major NREL Technology Thrusts

Supply Side

Wind Energy

Solar Photovoltaics

Concentrating Solar
Power

Solar Buildings

Biomass Power

Biofuels

Geothermal Energy

Hydrogen

Superconductivity

Distributed Power



Demand Side

Hybrid Vehicles

Fuels Utilization

Buildings Energy
Technology

Federal Energy
Management

Advanced Industrial
Technologies

Cross Cutting

Basic Energy Science

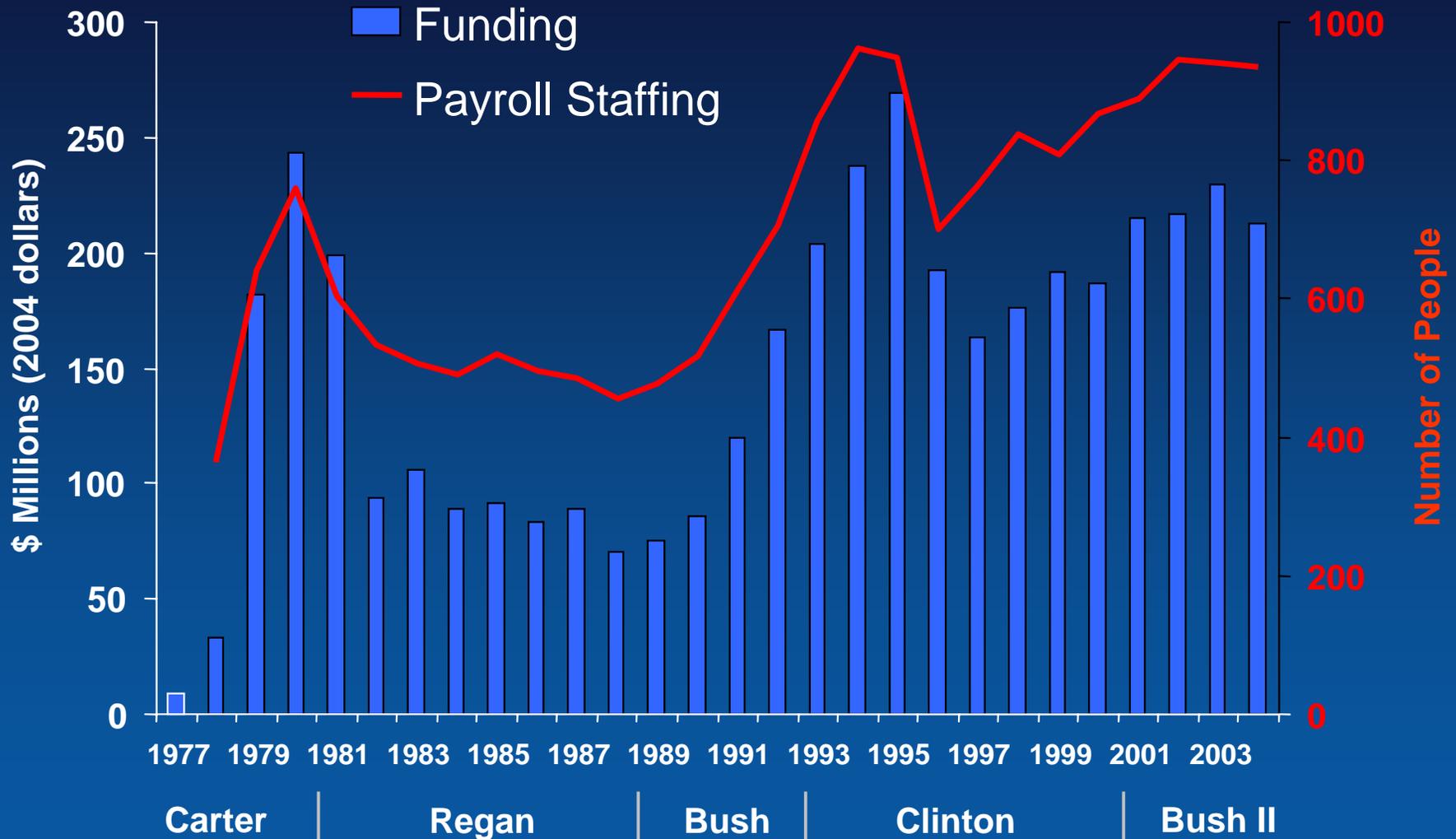
Analytical Studies

International Programs

Tribal Energy Program

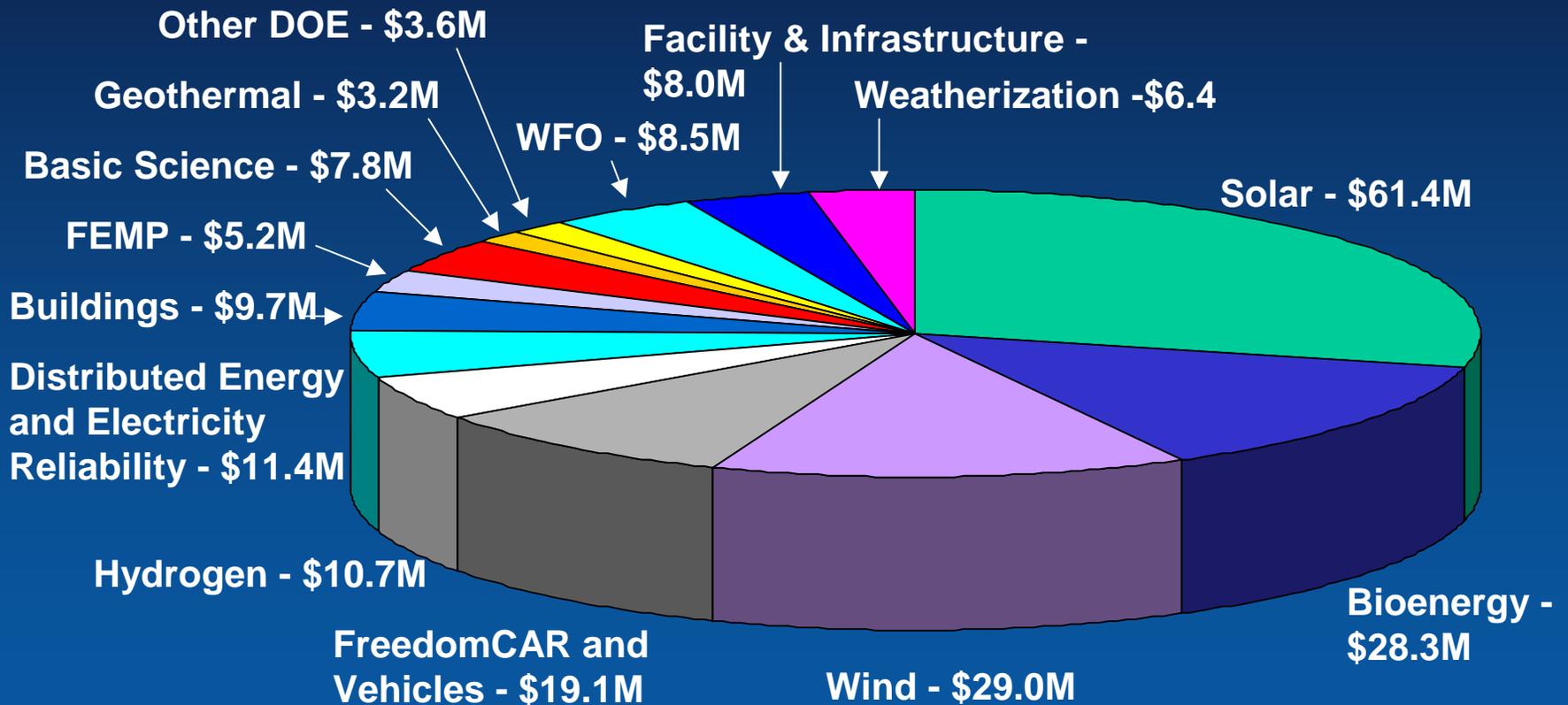
NREL Funding and Staffing

Funding in 2004 Dollars

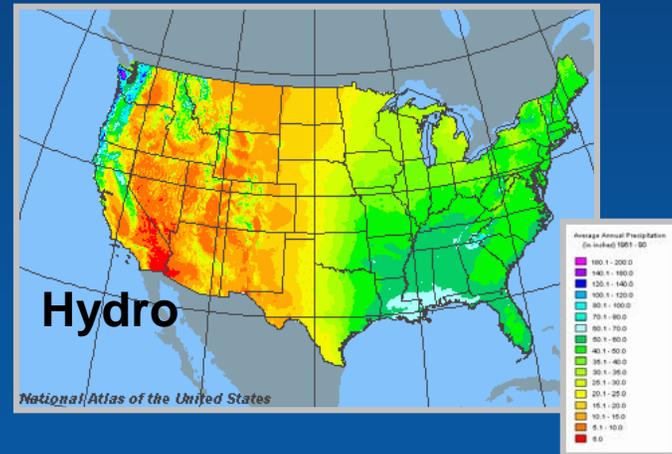
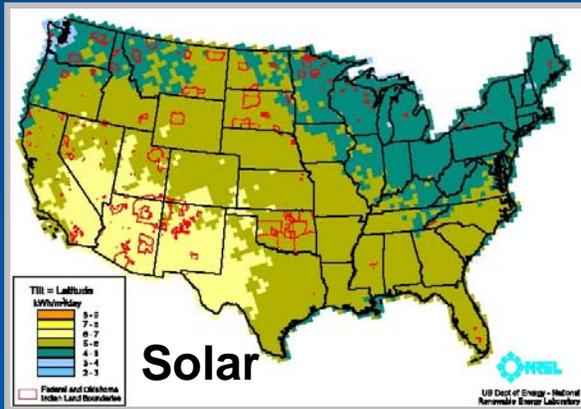
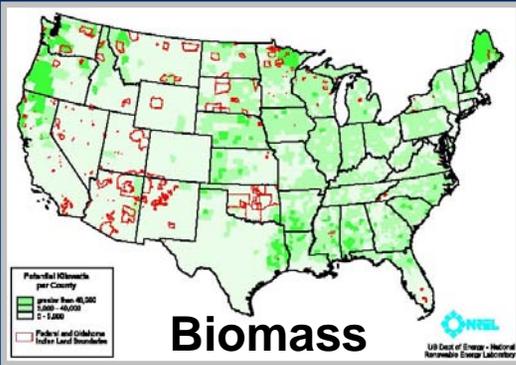
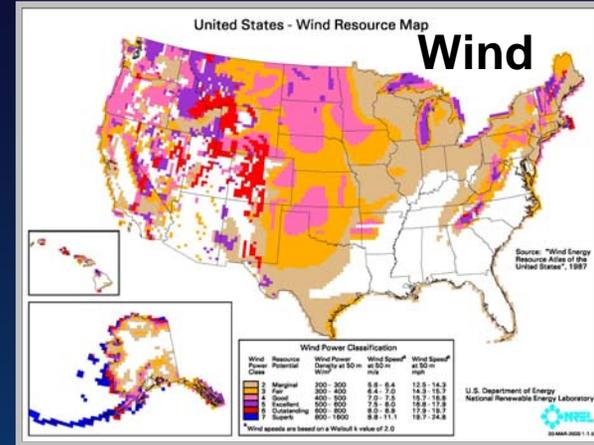
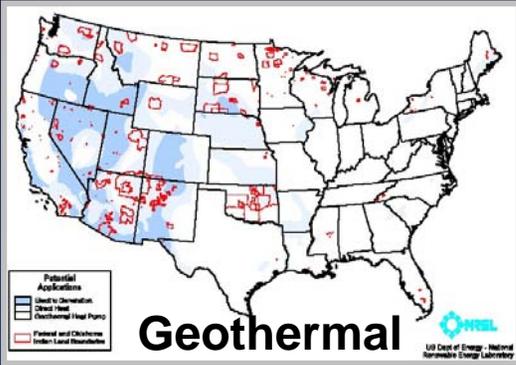


NREL FY 2004 Program Portfolio

\$212.3 Million



Renewable Resource Options



Renewable Technology Options

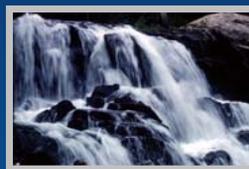
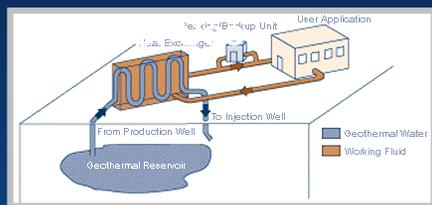
Small Modular Power



Power



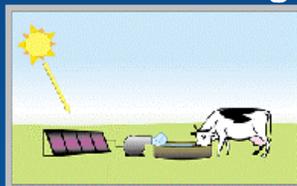
Direct Use



PV - Remote Homes



Stock Watering



Diesel Hybrids



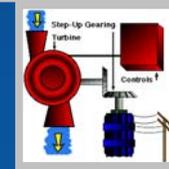
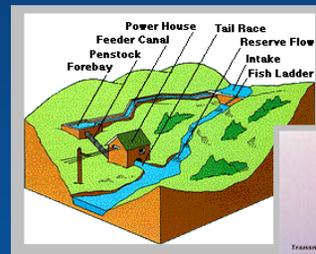
Small Wind



Big Wind



Small Hydro



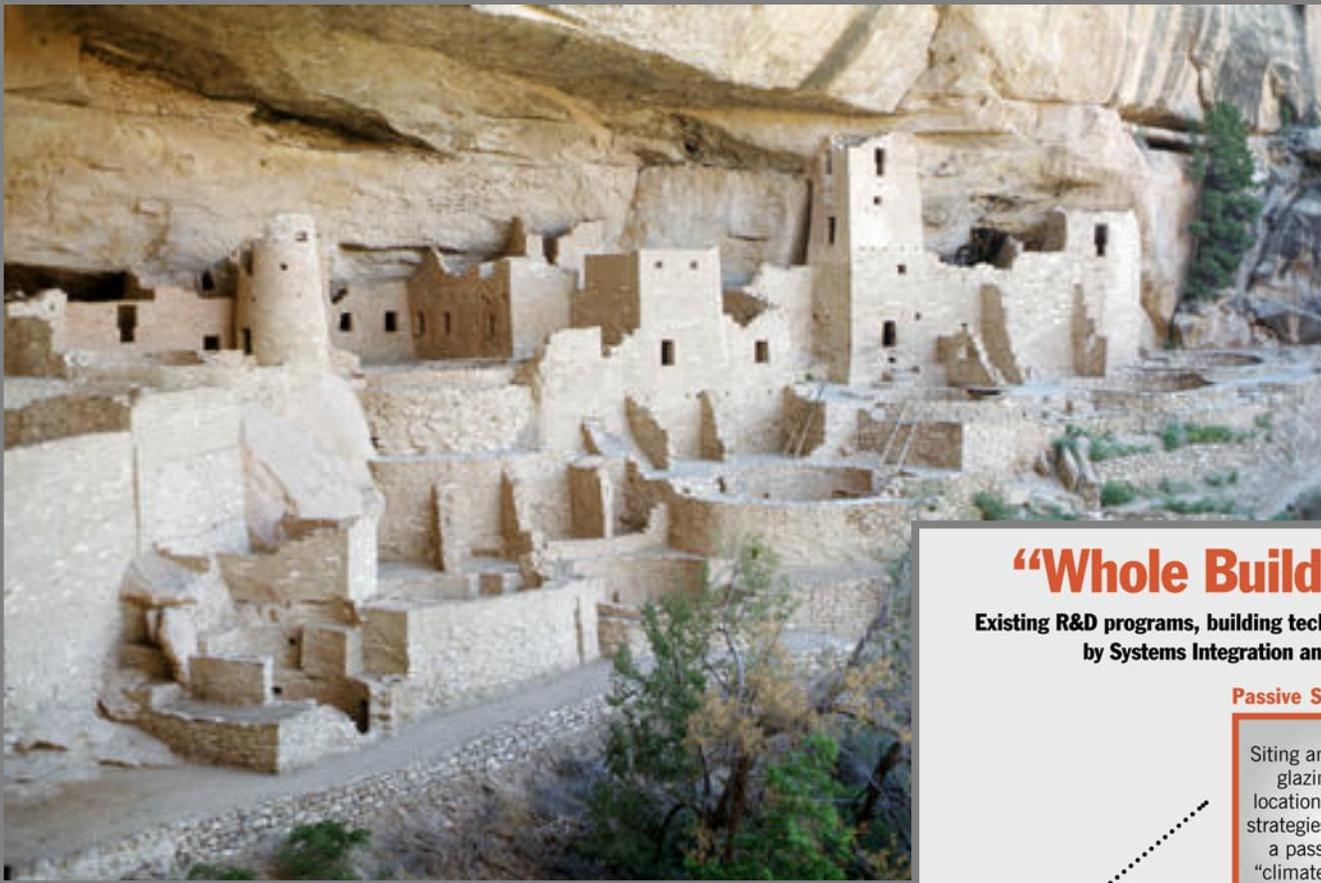
Process Heat



Buildings

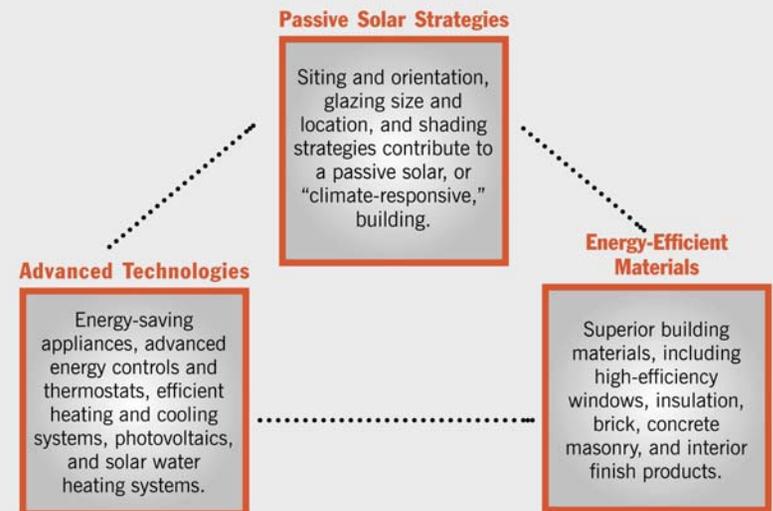


Building Design



“Whole Buildings” Strategy:

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



Energy Efficiency Options



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.



Wind Turbine Sizes and Applications



Small (≤ 10 kW)

Homes

Farms

Remote Applications
(e.g. water
pumping, telecom
sites, icemaking)



Intermediate (10-250 kW)

Village Power

Hybrid Systems

Distributed Power

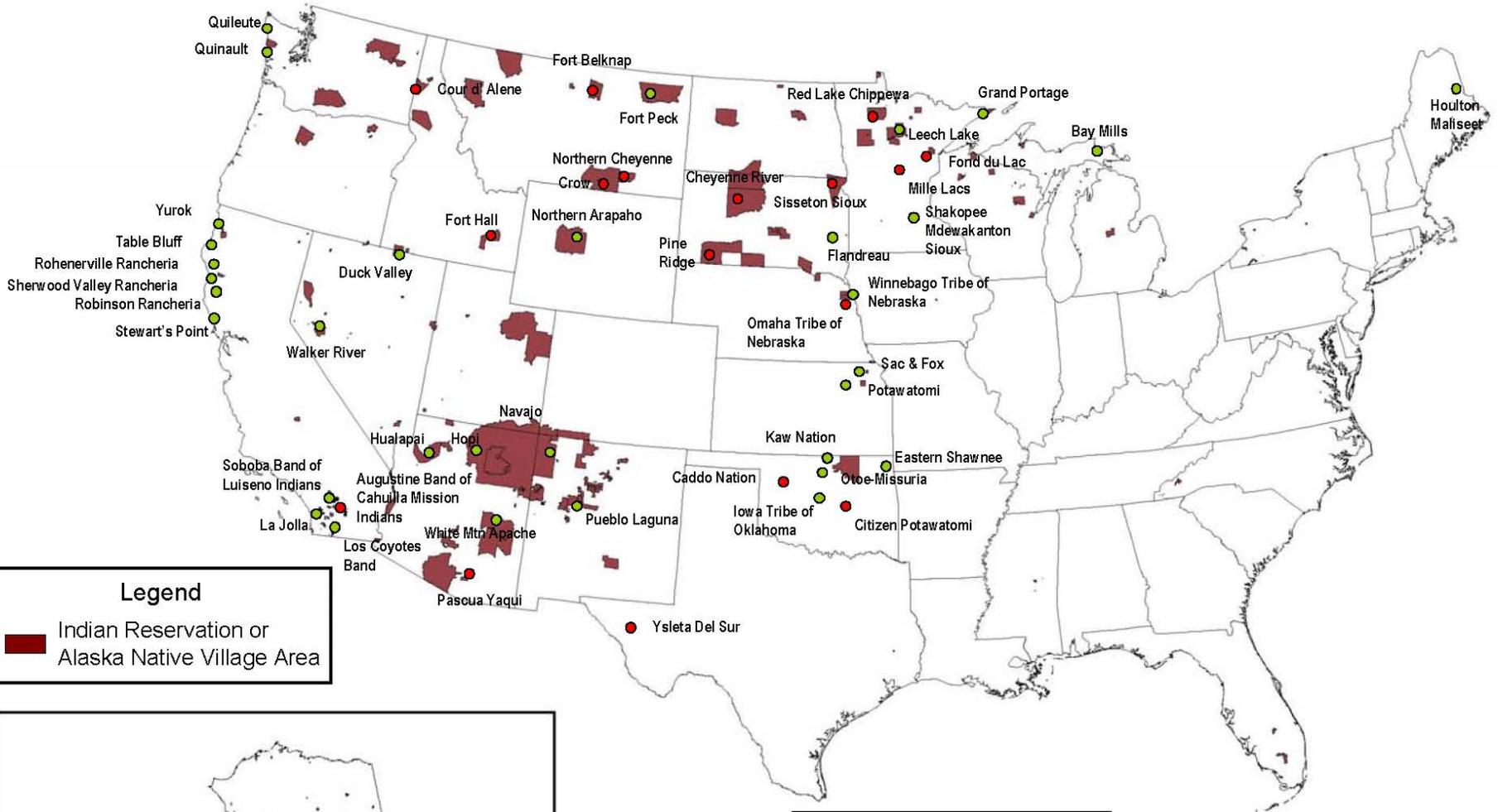


Large (250 kW – 2+ MW)

Central Station Wind Farms

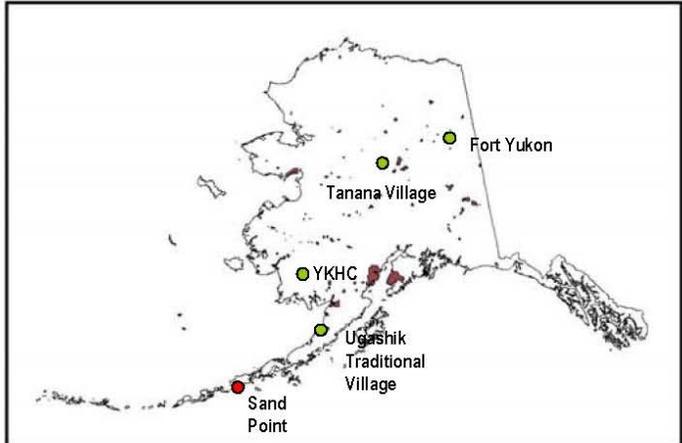
Distributed Power

NREL Anemometer Loan Program Sites: 12 Oct 2005



Legend
 Indian Reservation or Alaska Native Village Area

Legend
 Monitoring Completed
 Anemometer installed



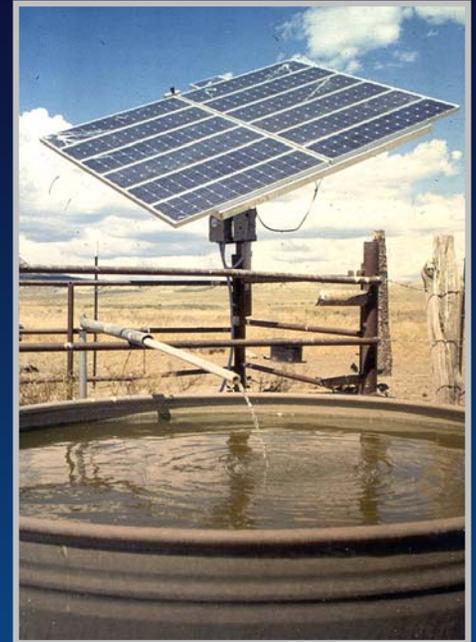
U.S. Department of Energy
 National Renewable Energy Laboratory



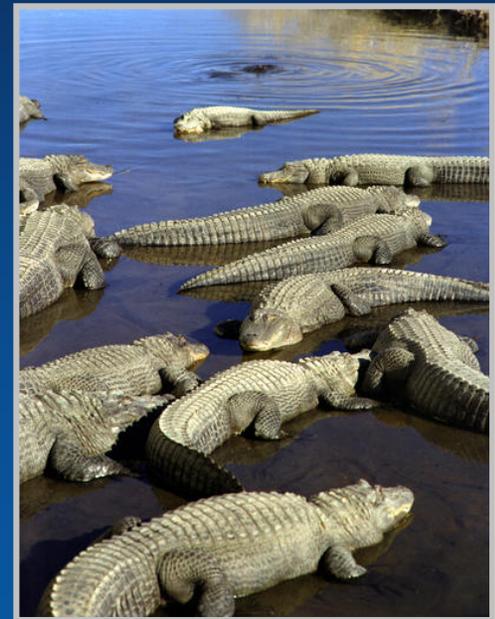
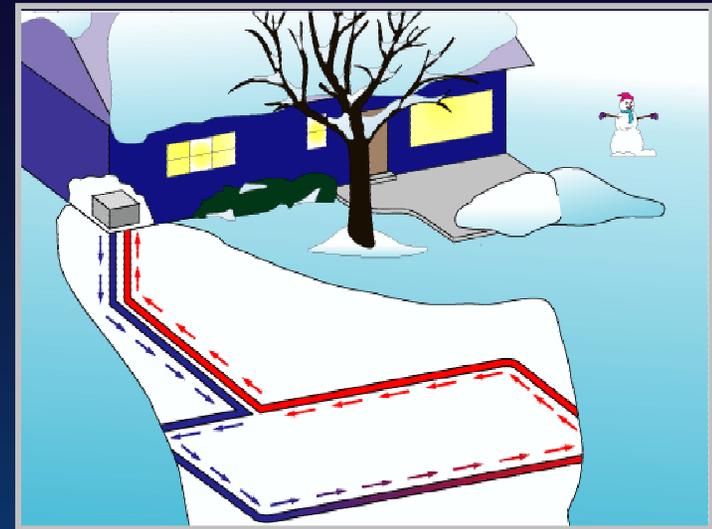
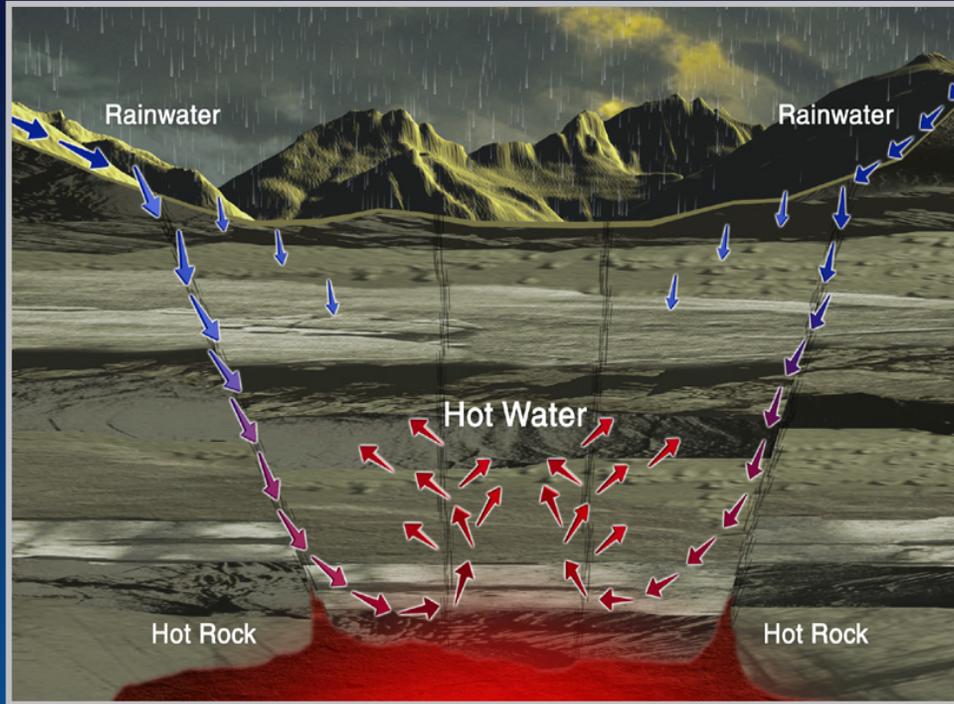
Bioenergy Criteria for Success



Solar Options



Geothermal Options



Small Hydro Power Options

INL Idaho National Laboratory Search

Home > [Renewable Energy](#) > [Hydropower](#) > [Virtual Hydropower Prospector](#) >

Virtual Hydropower Prospector

Region Selector

Click on a region to access the VHP desktop



Region Selector

- User Guide (PDF 4.3 MB)
- Pop Enabling
- Data Sources
- Disclaimers

Document Archive
Related Links
Contacts

A-Z Index
Contact Information
Staff Directory

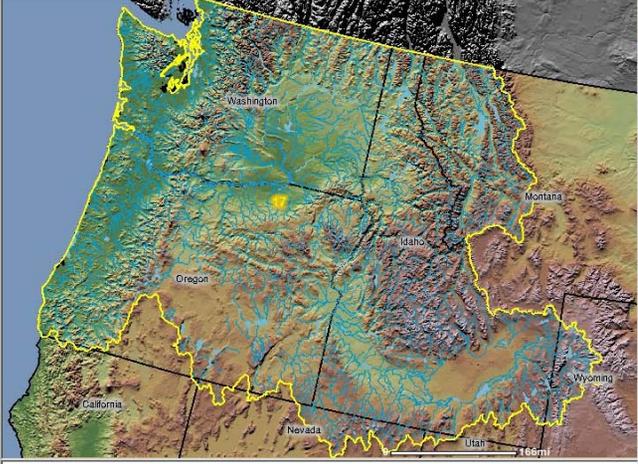
Idaho Cleanup Project

The Idaho National Laboratory is operated for the U.S.

Refresh Map

Legend

- Water Energy Resource Sites
- Hydrography
- Power System
- Transportation
- Areas & Places
- Land Use



Thumbnail Map On/Off

- Zoom In
- Zoom Out
- Pan
- Zoom to Previous
- Full Extent
- Identify
- Find
- Select By Rectangle
- Select By Distance
- Buffer
- Query
- Clear Pins
- Clear Select
- Measure

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

Refresh Map

Legend

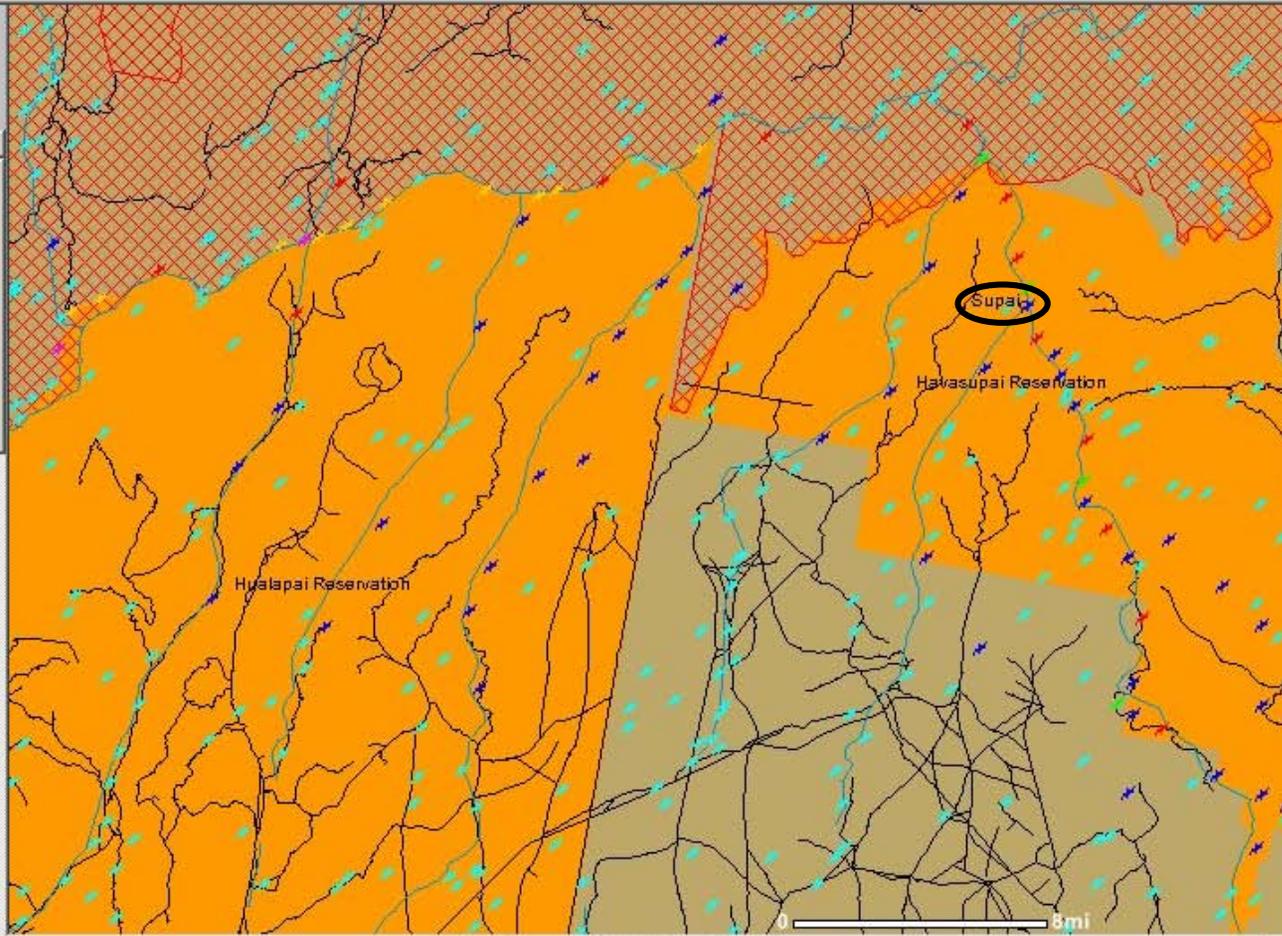
Water Energy Resource Sites

Feature Active
Select Feature

- High Head High Power
- Low Head High Power
- High Head Low Power
- Low Power Conventional
- Low Power Unconvention
- Microhydro

Hydrography Power System

Feature Active



Active Layer - High Head/Low Power

Rec	Power Class	Power Potential (MW)	Hydraulic Head (ft)	Flow Rate (cfs)	Federally Excluded	Environmentally Excluded	Nearest Rd. (mi)	Nearest RR (mi.)	Nearest Population (mi)	Nearest Powerline (mi)	Nearest Substation (mi)	Nea Power (r
1	High Head/Low Power	0.463	34.91	156.44	N	N	1.611	999999	0.073	999999	999999	999

Map On/Off

Zoom In

Zoom Out

Pan

Zoom to Previous

Full Extent

Identify

Find

Select By Rectangle

Select By Distance

Buffer

Query

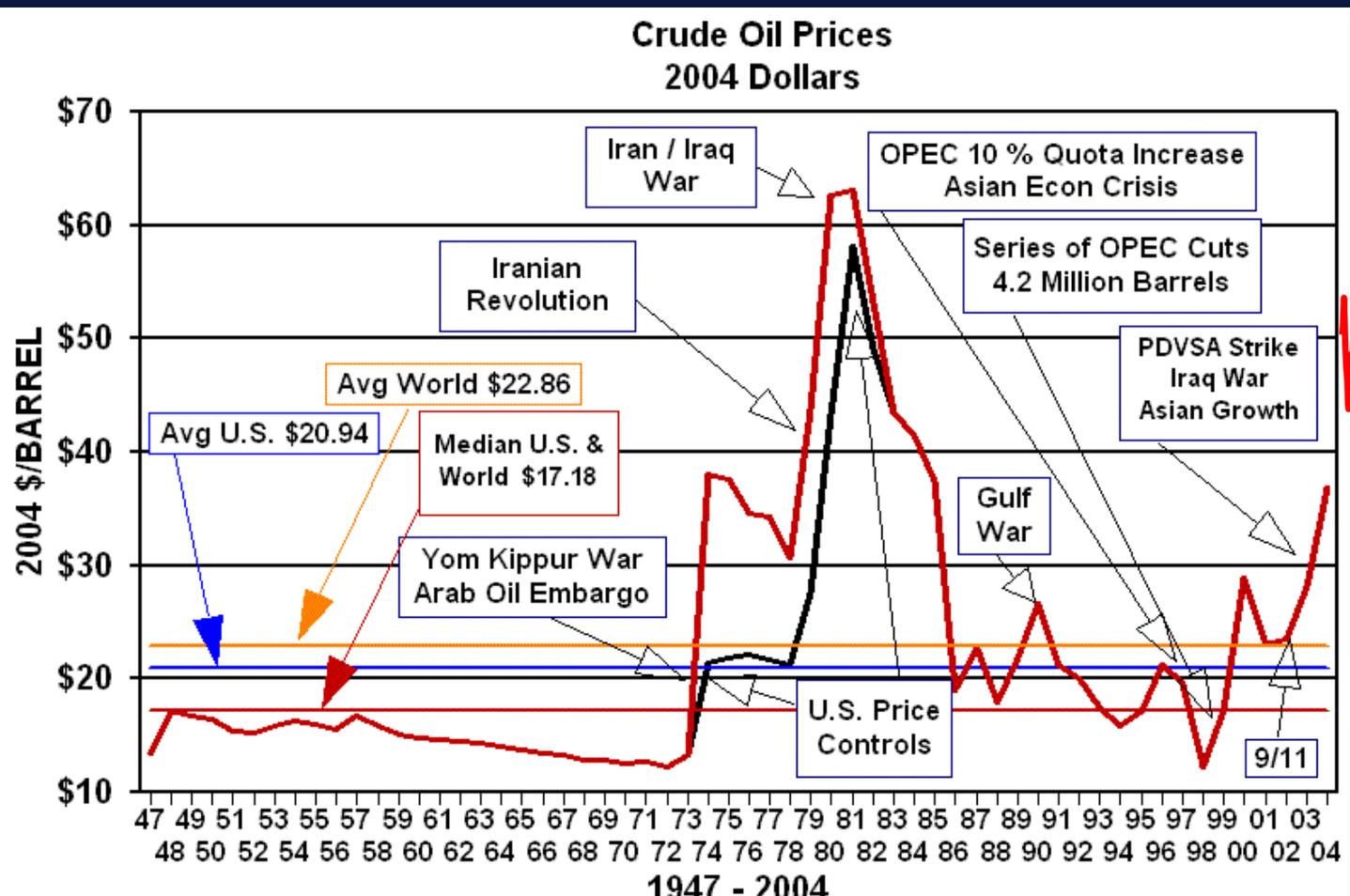
Clear Pins

Clear Select

Measure

Print

The Changing National Energy Environment

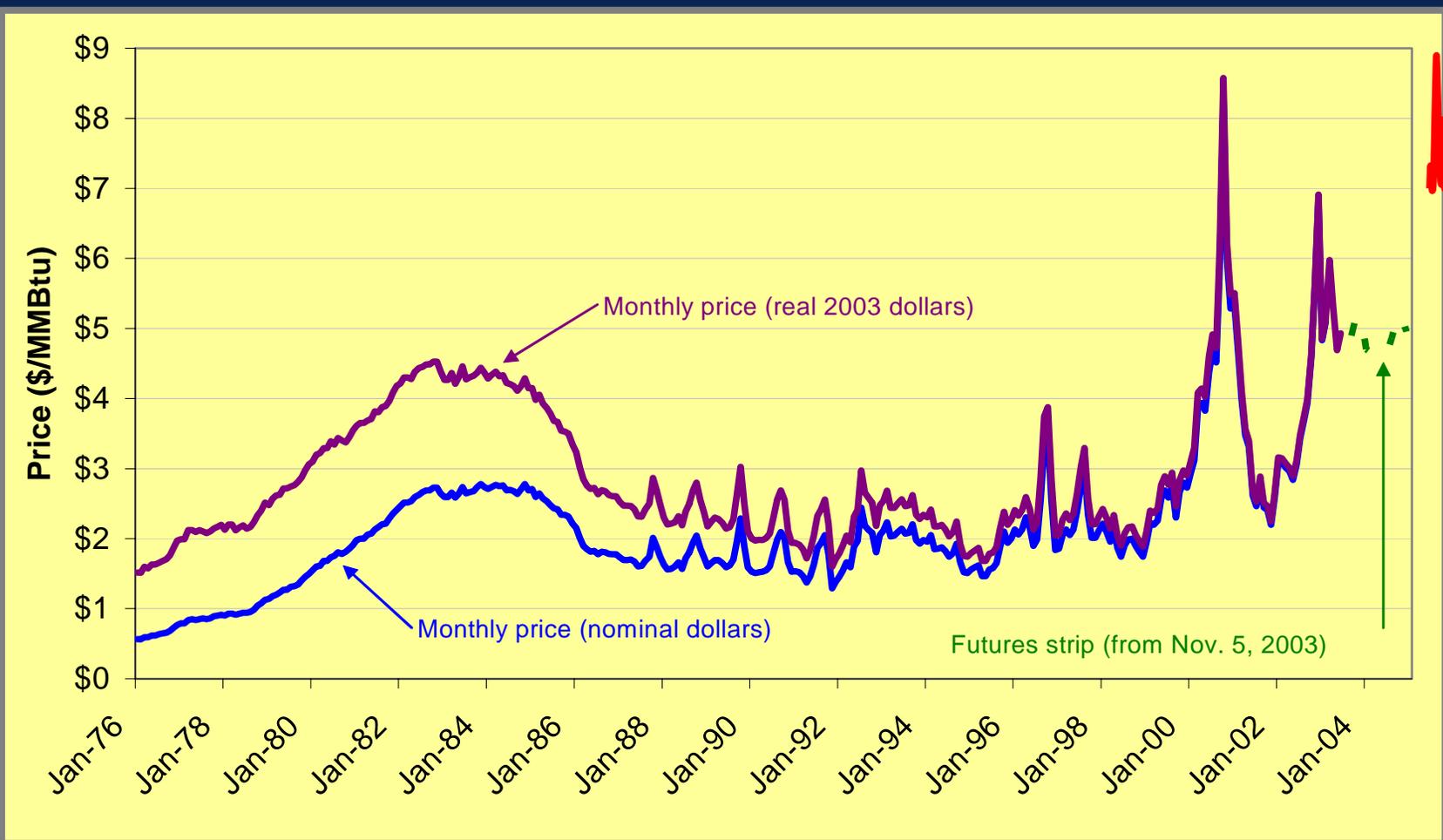


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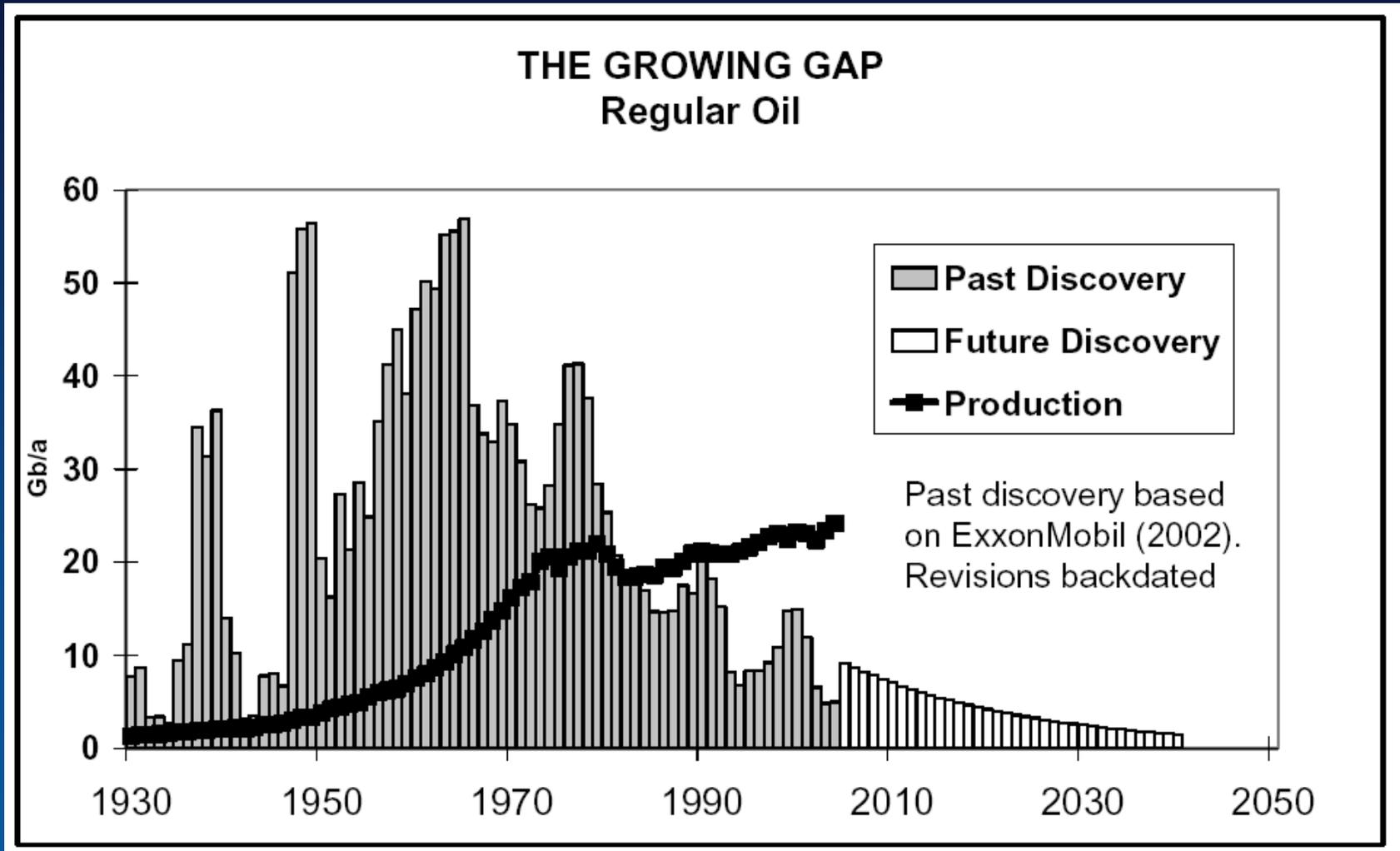
WTRG Economics ©1998-2005
 www.wtrg.com
 (479) 293-4081

After a decade of low prices, natural gas prices are now more volatile at a higher level.

\$13.50
Nov



Worldwide Discovery Trend



Source: Campbell, August 2005

7 Generations Span The Age of Oil

Our Grand Parents

Our Parents

Our Generation

80

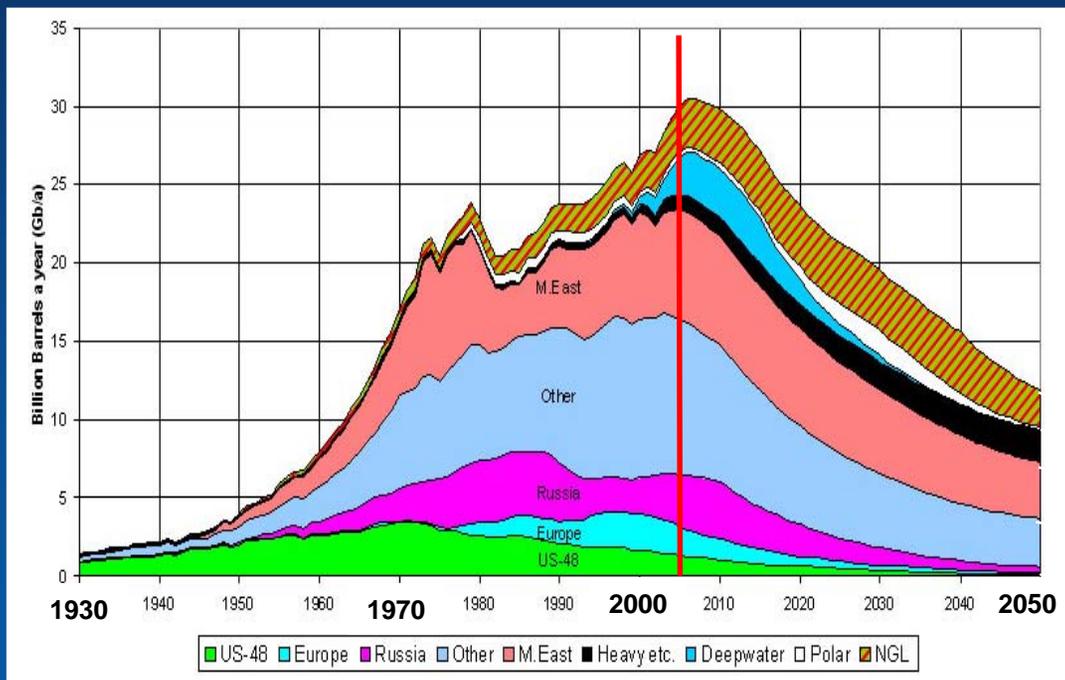
30

Our Children

Our Grand Children

Our Great Grand Children

Our Great-Great
Grand Children



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

Tribal Strategic Energy Planning

Tribal 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??



These 3 ½ days are a unique opportunity to learn about a broad range of opportunities and challenges in conducting EERE projects in Indian Country.

This Program review is as much for you, as it is for us from the government.

Please take advantage of it, and ask questions of us, and your Tribal colleagues!