Alaska's Opportunity to be an "Energy State" in 2050

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Executive Director
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Commonwealth North
Anchorage, Alaska
April 15, 2011

Renewable Energy Alaska Project (REAP) is:

- Since 2004, Alaska's first *education and advocacy* group for renewable energy and energy efficiency.
- An Alaskan coalition of small and large electric utilities and utility interests, environmental groups, consumer groups, businesses, Alaska Native organizations and energy agencies with the goal of "increasing the production of renewable energy in Alaska."

REAP Contributing Members

Alaska Energy Authority
Denali Commission
National Renewable Energy Lab (NREL)
Alaska Housing Finance Corporation
Alaska Center for Energy & Power
USDA Rural Development
City of Bethel
Matanuska-Susitna Borough
Alaska Municipal League

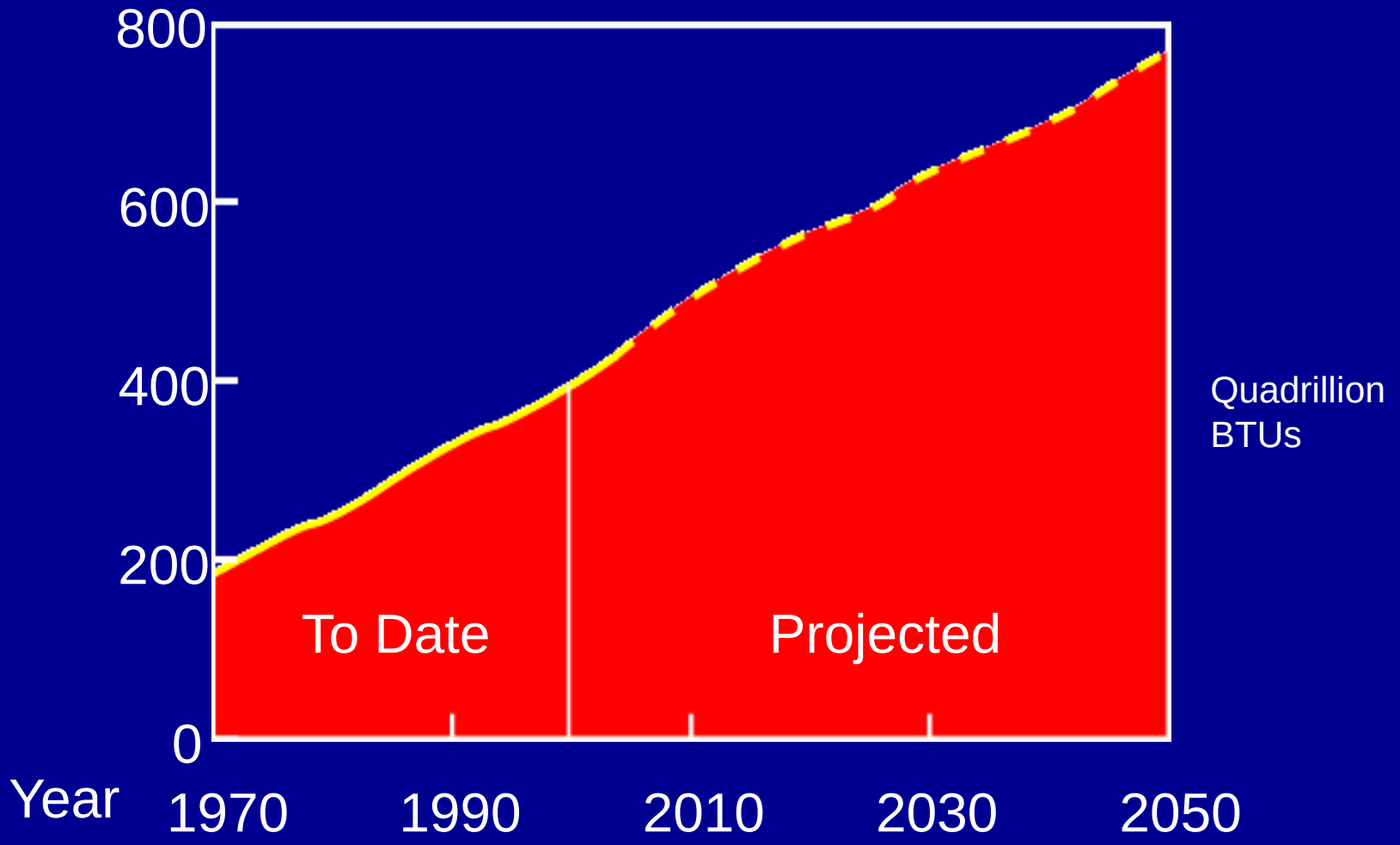
REAP Board of Directors

Aleutian/Pribilof Islands Association (APIA)
Yukon River Inter-Tribal Watershed Conference
Cook Inlet Region Incorporated (CIRI)
Chugach Electric Association (CEA)
Municipal Light and Power (ML & P)
Golden Valley Electric Association (GVEA)
Homer Electric Association (HEA)
Kotzebue Electric Association (KEA)
Alaska Village Electric Cooperative (AVEC)
TDX Power
Alaska Power Association (APA)
Alaska Power and Telephone
Sierra Club
Alaska Center for the Environment
Alaska Conservation Alliance
Alaska Public Interest Research Group (AkPIRG)
Rural Alaska Community Action Program (RurALCAP)
Green Star
Chena Hot Springs
Ocean Renewable Power Company (ORCP)
ABS Alaskan

Energy is what sets humans apart

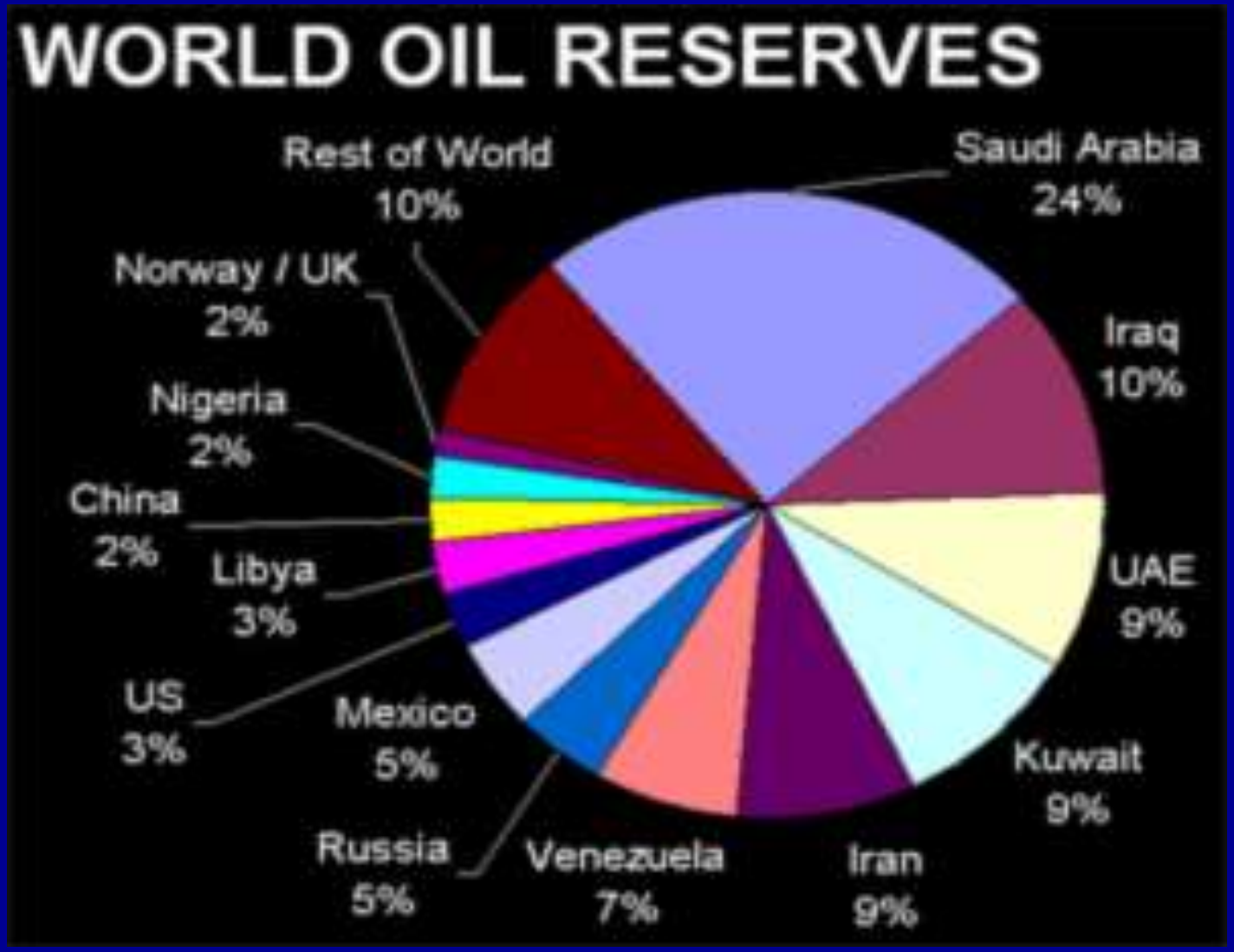
Renewable Energy is Risk Management:

Worldwide Energy Use Expected to Double by 2050



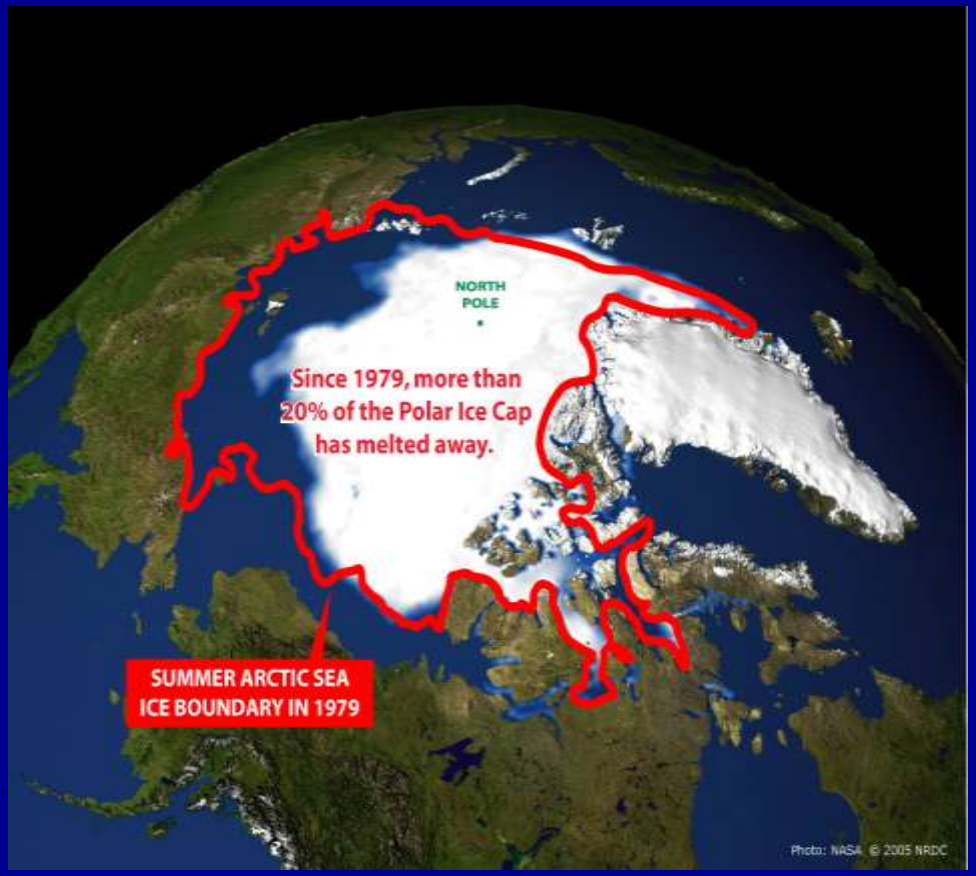
Renewable Energy is Risk Management

Two Thirds of the World's Proven Conventional Oil Reserves are in the Persian Gulf




EPSON
wynn
BTCK
KYOCERA
ABBOTT
Nikon
LG电子

Renewable Energy is Risk Management:
The World's Climate is Changing



"For Swiss Re, climate change is more than a scientific issue. It is a financial issue."

Chris Walker, Managing Director, Greenhouse Gas Risk Solutions Unit for Swiss Re, the world's second largest re-insurer

Renewable Energy is Risk Management:

The $55 billion/yr Clean Energy Market is Expected to Quadruple by 2015

Sharp

Enercon

Vestas

British Petroleum

Gamesa

Toyota

Suntech

In the next 20 years it's estimated rural Alaska will spend $5 BILLION on diesel fuel alone if we continue business as usual

During the same period the Railbelt would spend $60 BILLION on fossil fuels for transportation,

electricity and heat

What about the next 40 years?

Efficiency and Conservation

Doing More with Less

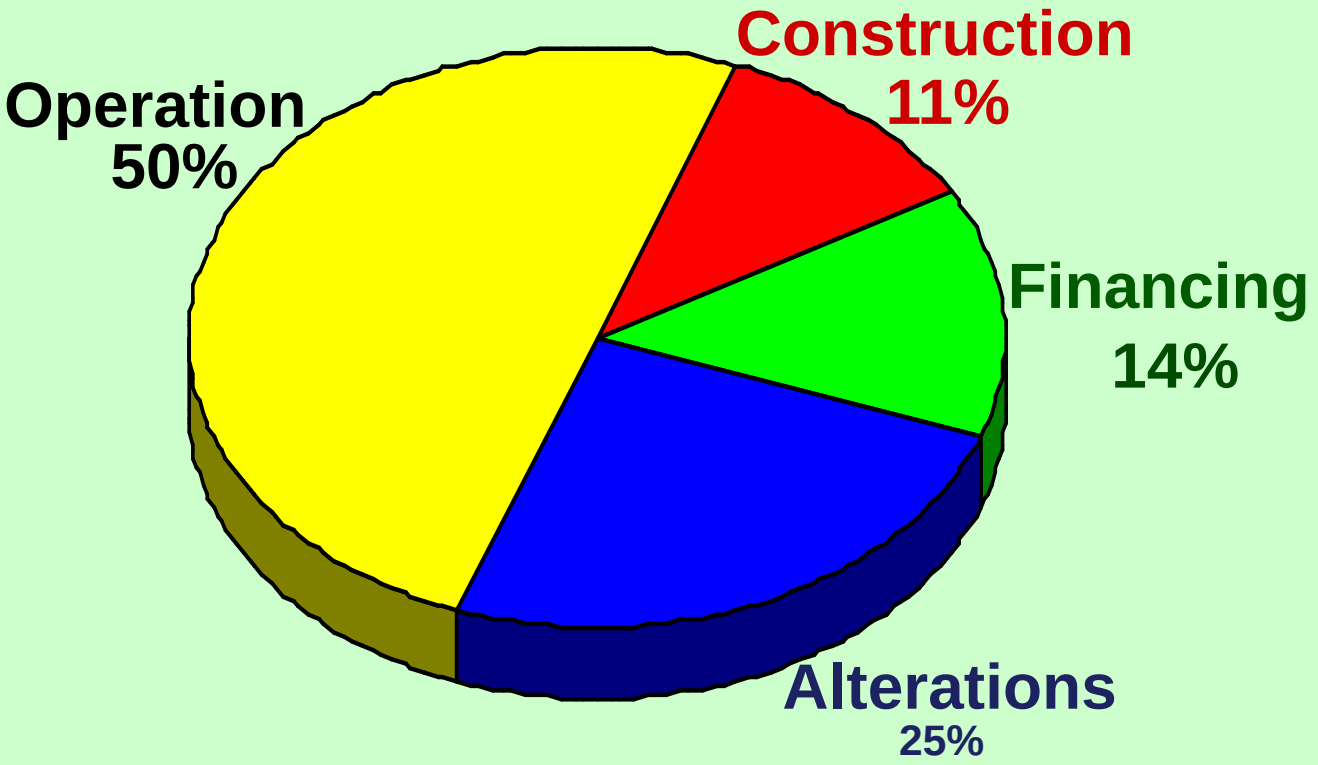
- ***Energy efficiency*** reduces the amount of energy consumed while still delivering the same quality of energy.
- ***Energy conservation*** requires conscious decisions and behavior changes that result in reductions in energy consumption.

Energy Efficiency is Always Cheaper than Generation

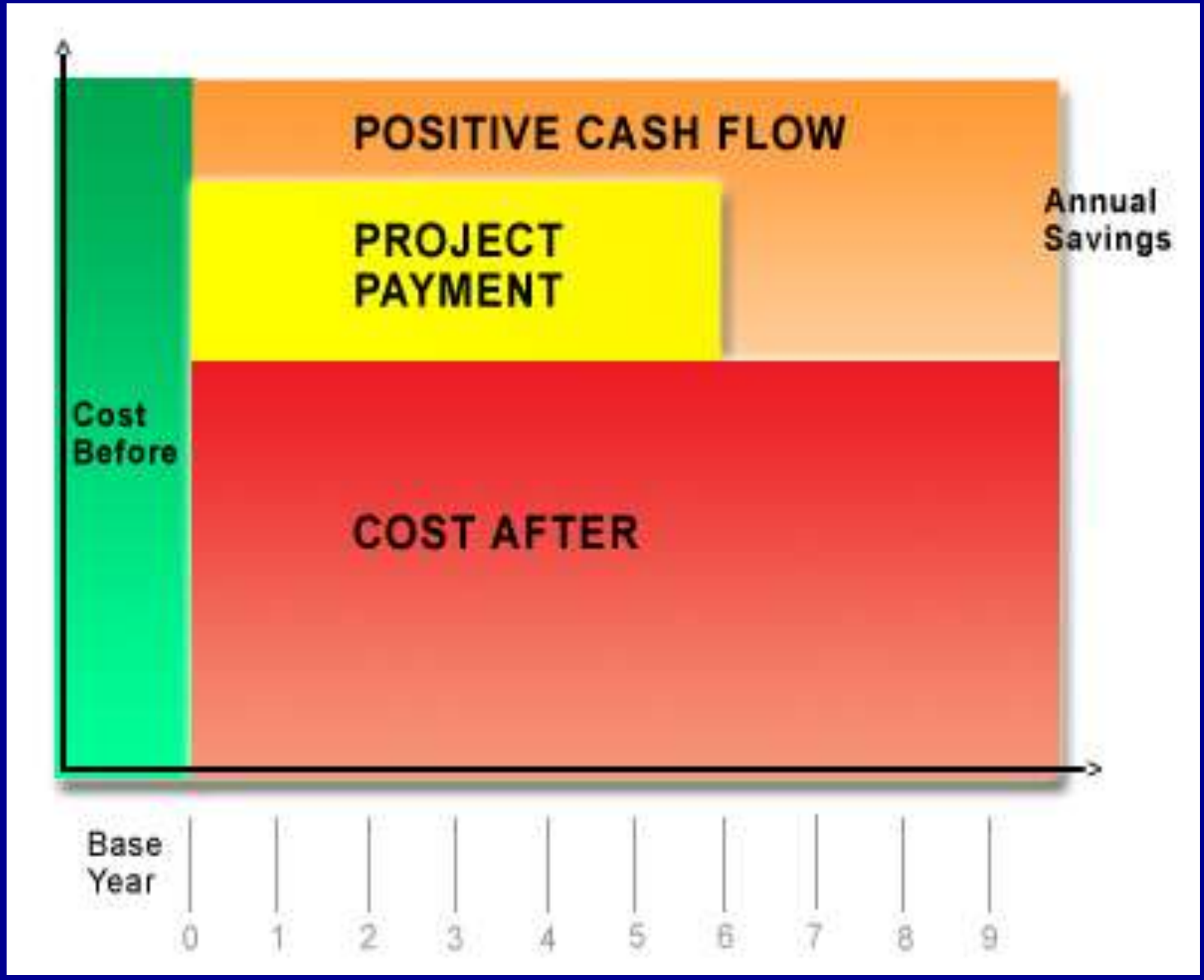
- ACEEE - the average cost of delivering energy efficiency programs in the U.S.
  - In 2004, $0.03 per kWh
  - **In 2009, $0.025 per kWh**

- Compared to energy supply-side resources
  - Coal $0.07 to $0.14 per kWh
  - Natural Gas $0.07 to $0.10 per kWh
  - Wind $0.04 to $0.12 per kWh

Why EE?
Building Cost over 40 Years:
Real World Costs



ASHRAE - American Society for Heating, Refrigeration & Air Conditioning Engineers


POSITIVE CASH FLOW
PROJECT PAYMENT
Annual Savings
Cost Before
COST AFTER
Base Year
0
1
2
3
4
5
6
7
8
9

State Energy Efficiency Study & Recommendations

- State Leadership
- Funding Energy Efficiency
- Public Education and Outreach
- Baseline Data
- Existing Residential Buildings
- New Residential Construction
- Existing Commercial Buildings
- New Commercial Construction
- Public Buildings.

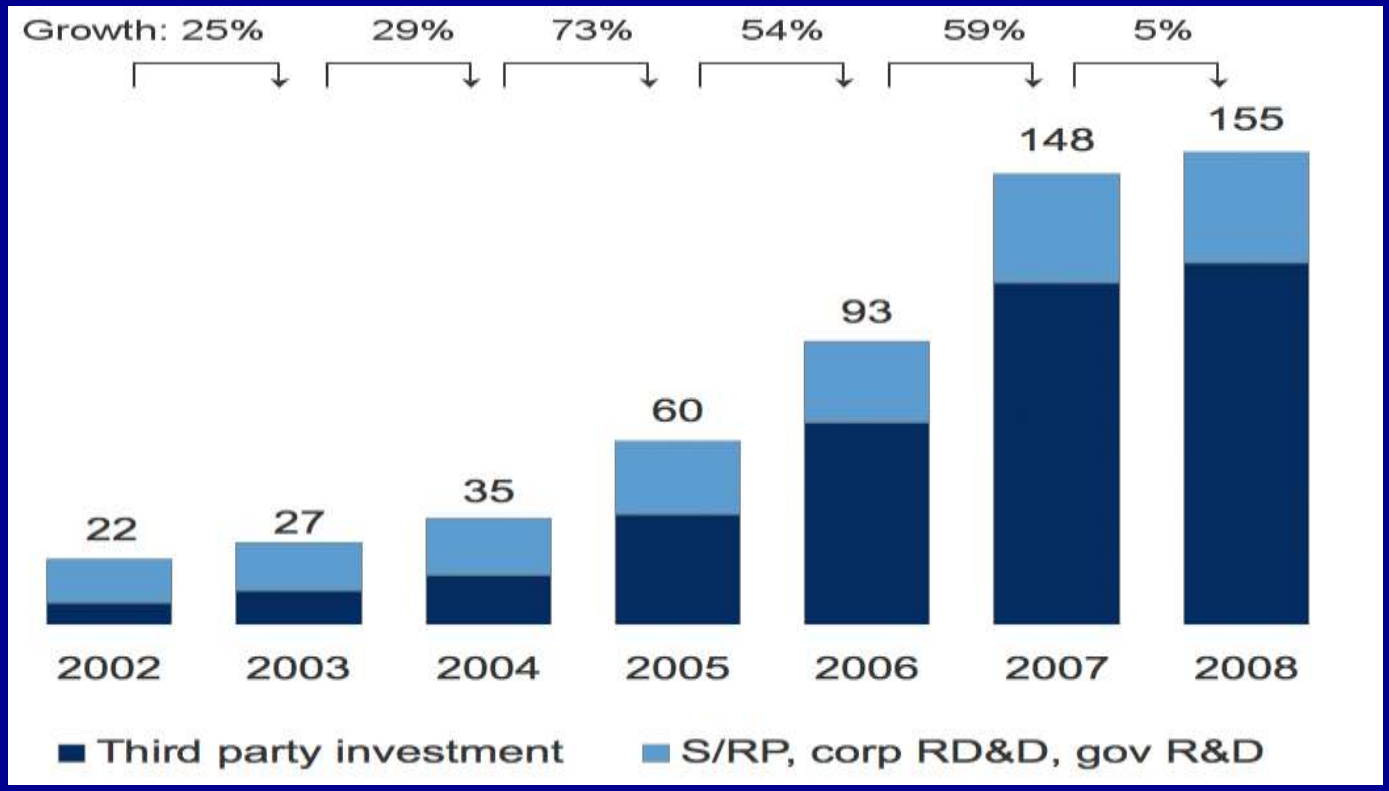
Alaska's Renewable Energy Resources

- Wind
- Geothermal
- Biomass
- Tidal/Wave
- Hydro
- Solar

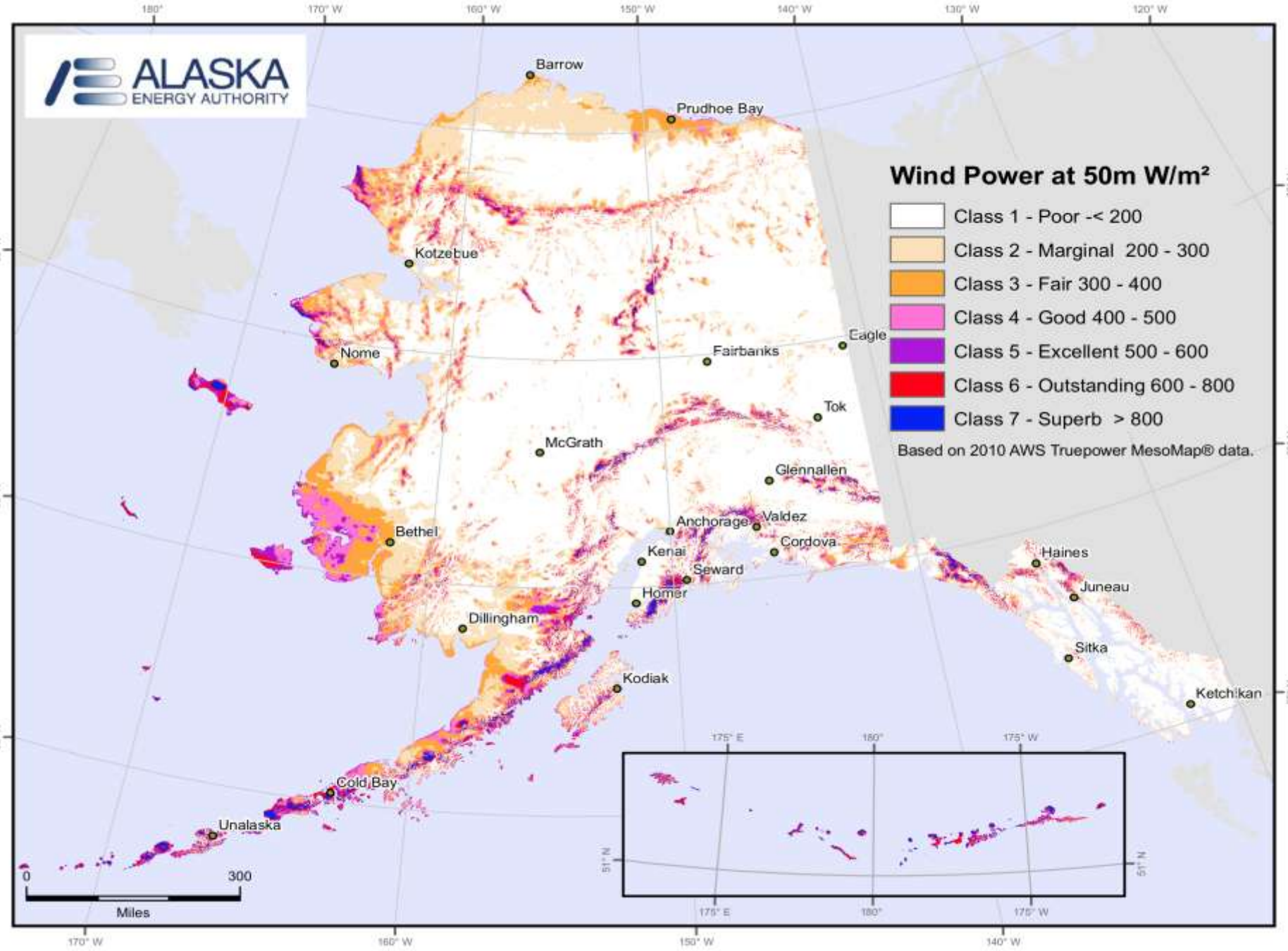
Advantages of Renewable Energy

- Stably Priced (no fuel costs)
- Clean
- Inexhaustible
- Local

New Investment in Clean Energy, 2002-2008, in billions



Source: New Energy Finance


ALASKA
ENERGY AUTHORITY
Wind Power at 50m W/m²
Class 1 - Poor -< 200
Class 2 - Marginal 200 - 300
Class 3 - Fair 300 - 400
Class 4 - Good 400 - 500
Class 5 - Excellent 500 - 600
Class 6 - Outstanding 600 - 800
Class 7 - Superb > 800
Based on 2010 AWS Truepower MesoMap® data.
Barrow
Prudhoe Bay
Kotzebue
Nome
Fairbanks
Eagle
Tok
McGrath
Glennallen
Anchorage
Valdez
Cordova
Bethel
Kenai
Seward
Homer
Haines
Juneau
Sitka
Ketchikan
Dillingham
Kodiak
Cold Bay
Unalaska
0
300
Miles

Mt Spurr

Exploration by ORMAT

Production well stage will be $25 million

50-100 MW with 99% capacity factor

Ocean Energy – Tidal and Wave Power

Alaska has over 50% of the nation's tidal power potential, and more than 75% of the nation's wave energy potential

Limited to a few demonstration projects so far

Twelve FERC permits granted in Alaska

Experts expect commercialization of technologies in the next 5-7 years

Alaska Ocean Energy Resources

Watana Dam

Project studied at a cost of $140 million in the 1980's was two dams and 1,800 MW

600 MW today with a 50% capacity factor

$5 billion??

Environmental opposition??

Key Levers

- *Policy*
- *Technology*
- *Financing*

Constraints

- *Political capital*
- *Economic capital*
- *Human capital*
- *Time*

Also Need….

Education

Understand benefits, dispel myths and create a vision

Standardization

National policy creates certainty

Market Aggregation

Create economies of scale

Community Buy-In

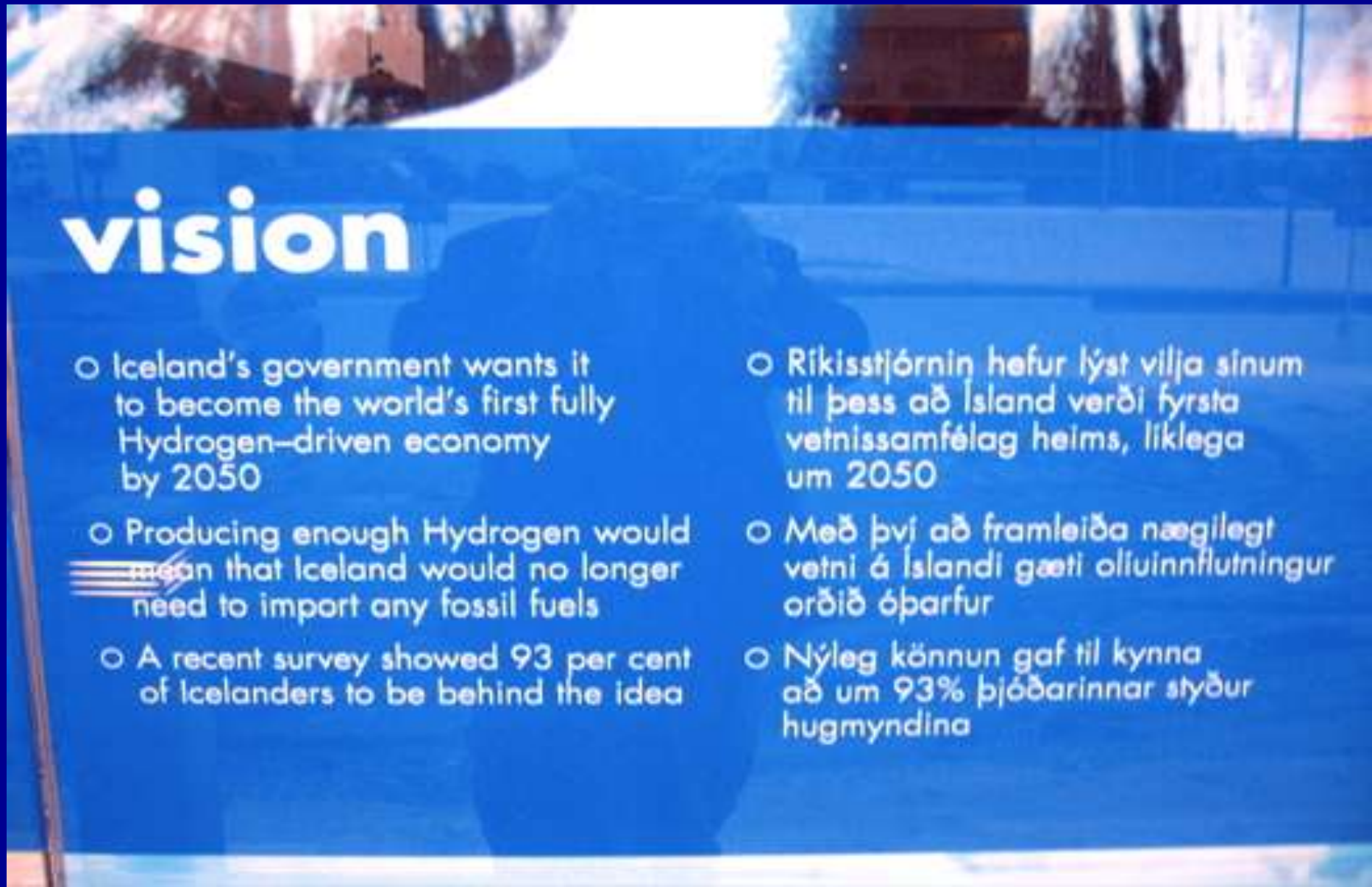
2010 Legislative Session

- 50% renewable electricity by 2025 *goal*
- 15% energy use reduction by 2020 *goal*
- 25% public building retrofit by 2020 *mandate* with $250 million revolving loan fund
- Emerging Energy Technology Fund created

Alaska's Opportunities

- Reduce fossil fuel use and imports
- Stabilize energy prices
- Attract investment
- Diversify our economy and create jobs
- Remain an energy state in 2050

Iceland's Vision



KEYNOTE SPEAKERS:

Former Colorado Gov. Bill Ritter

Director, Center for New Energy Economy

National Green Building Expert Jerry Yudelson

Founder, Yudelson Associates

April 28-29 • Dena'ina Center • Anchorage

Register at: www.BCEAconference.com

Early Bird Registration ends: April 8