

Clean Energy for Alaska's Future

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Renewable Energy Alaska Project (REAP)

Resource Development Council
Anchorage, Alaska
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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 Board of Directors

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
Kodiak Electric Association
Alaska Power and Telephone

Sierra Club
Alaska Center for the Environment
Alaska Conservation Alliance

Institute of the North
Rural Alaska Community Action Program (RurALCAP)
Green Star

Chena Hot Springs Resort
Ocean Renewable Power Company (ORPC)
ABS Alaskan

Bering Straits Native Corporation
Yukon River Inter-Tribal Watershed Conference
Cook Inlet Region Incorporated (CIRI)

REAP Contributing Members

Alaska Energy Authority (AEA)

Denali Commission

National Renewable Energy Lab (NREL)

Alaska Housing Finance Corporation (AHFC)

Alaska Center for Energy & Power (ACEP)

USDA Rural Development

Alaska Municipal League (AML)

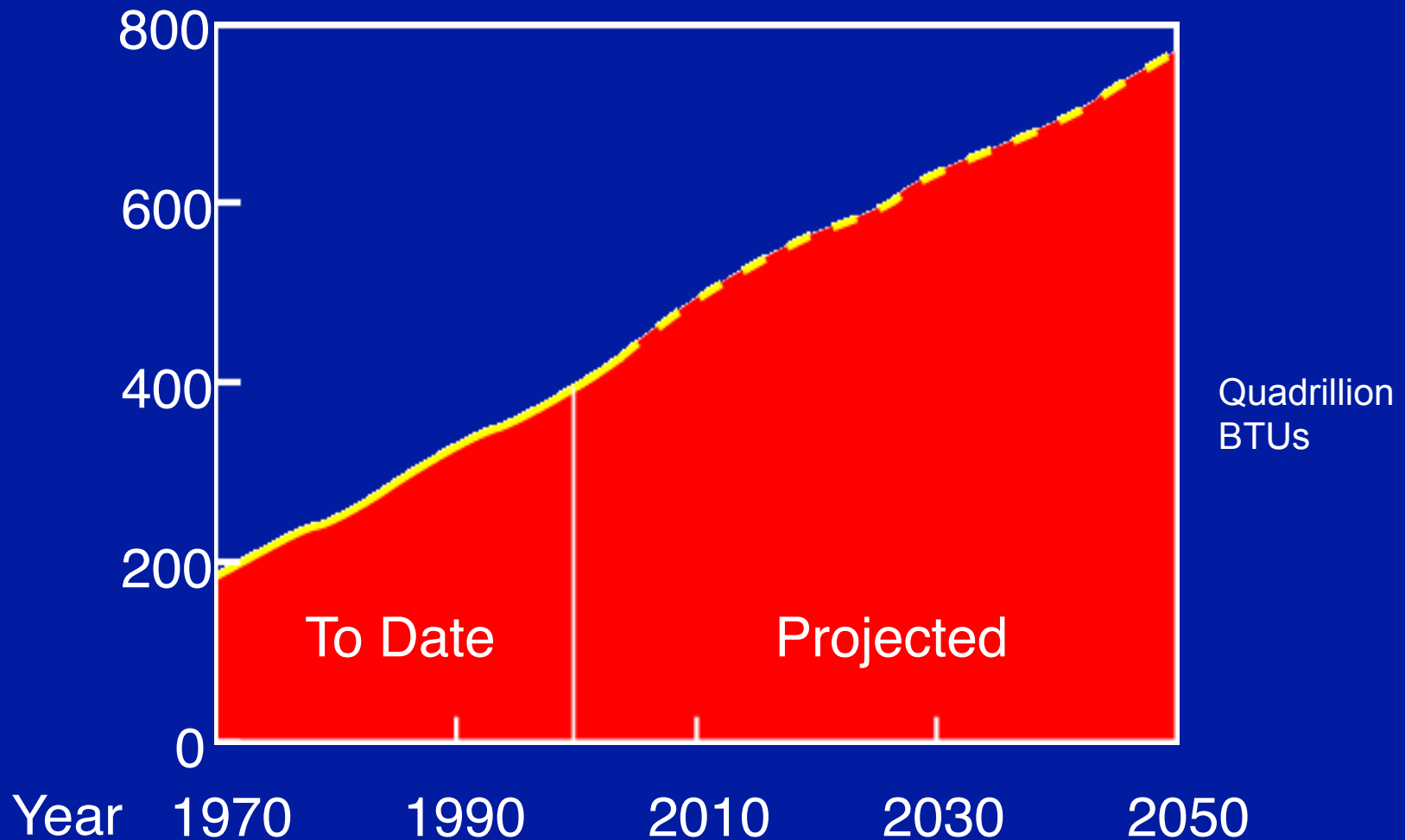






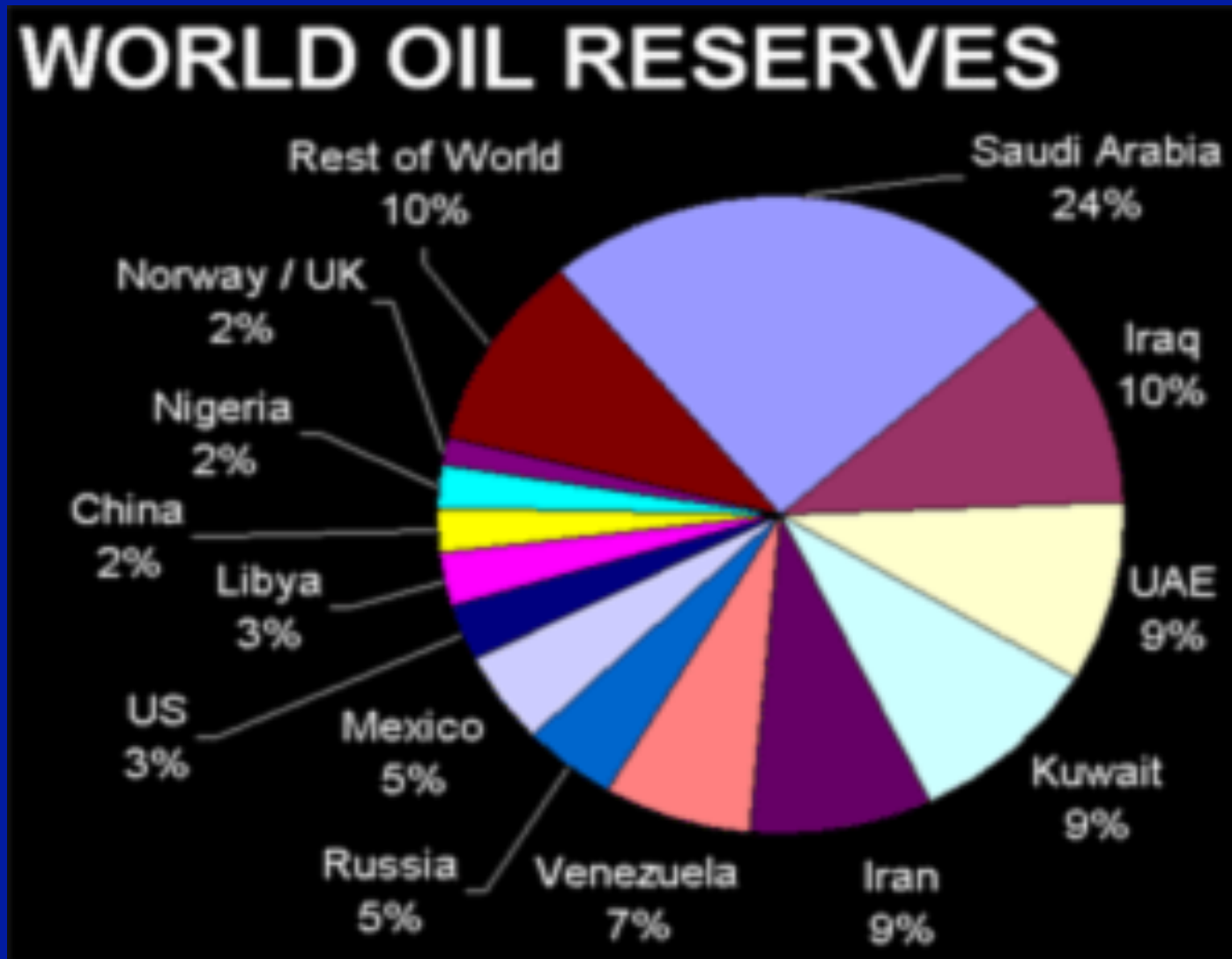
Renewable Energy is Risk Management:

Worldwide Energy Use Expected to Double by 2050

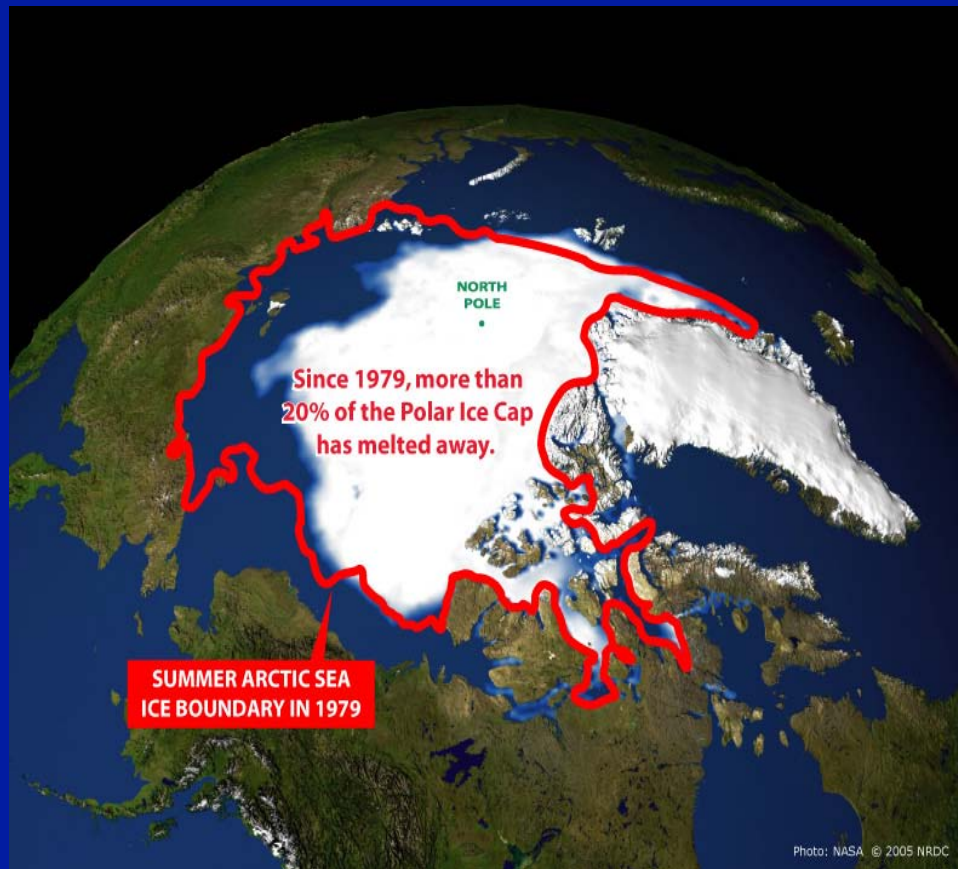


Renewable Energy is Risk Management

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



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 \$243 billion/yr clean energy market has doubled since 2006

Sharp

Enercon

Vestas

British Petroleum

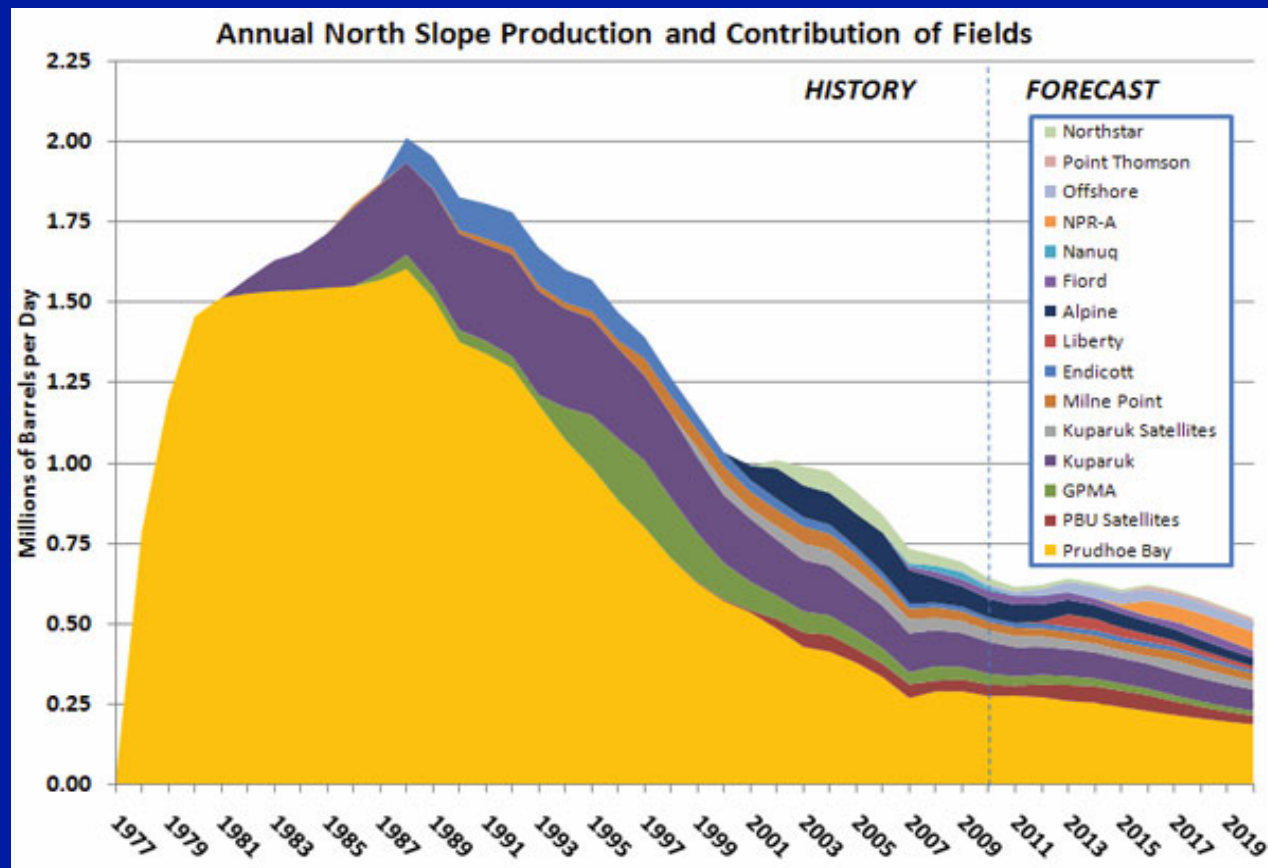
Gamesa

Toyota

Suntech



Alaska North Slope Oil Production



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.

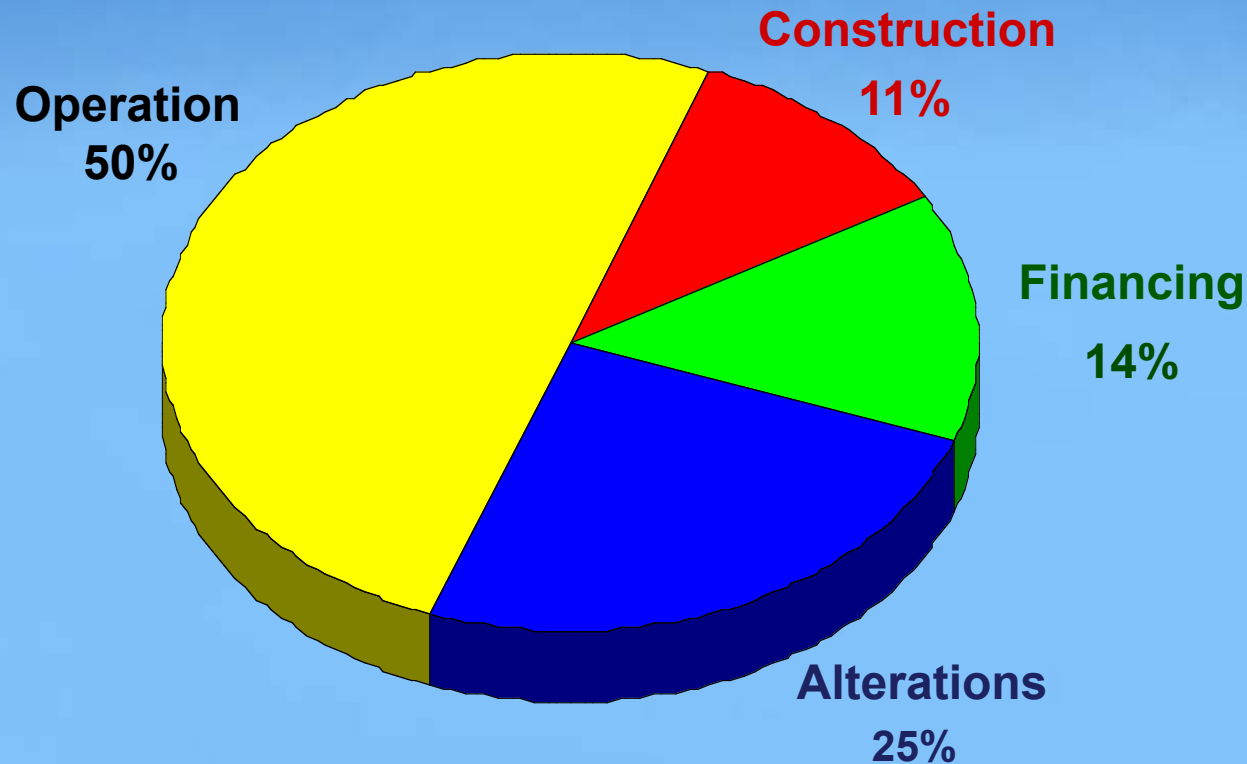


- *Energy conservation* requires conscious decisions and behavior changes that result in reductions in energy consumption.

2008 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
- *Utility based end use programs*
- *Legislate energy efficiency as priority*

Building Cost over 40 Years: Real World Costs*



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

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 new 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

AHFC Weatherization and Rebate Program Summary

- ~17,000 homes completed through 2011
- Reduced energy use 32%
- Reduced energy costs 30%
- Created a 2,500 - 4,000 jobs
- All original funds (\$360 million) obligated
- \$101 million more appropriated in 2011

Alaska's Renewable Energy Resources



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

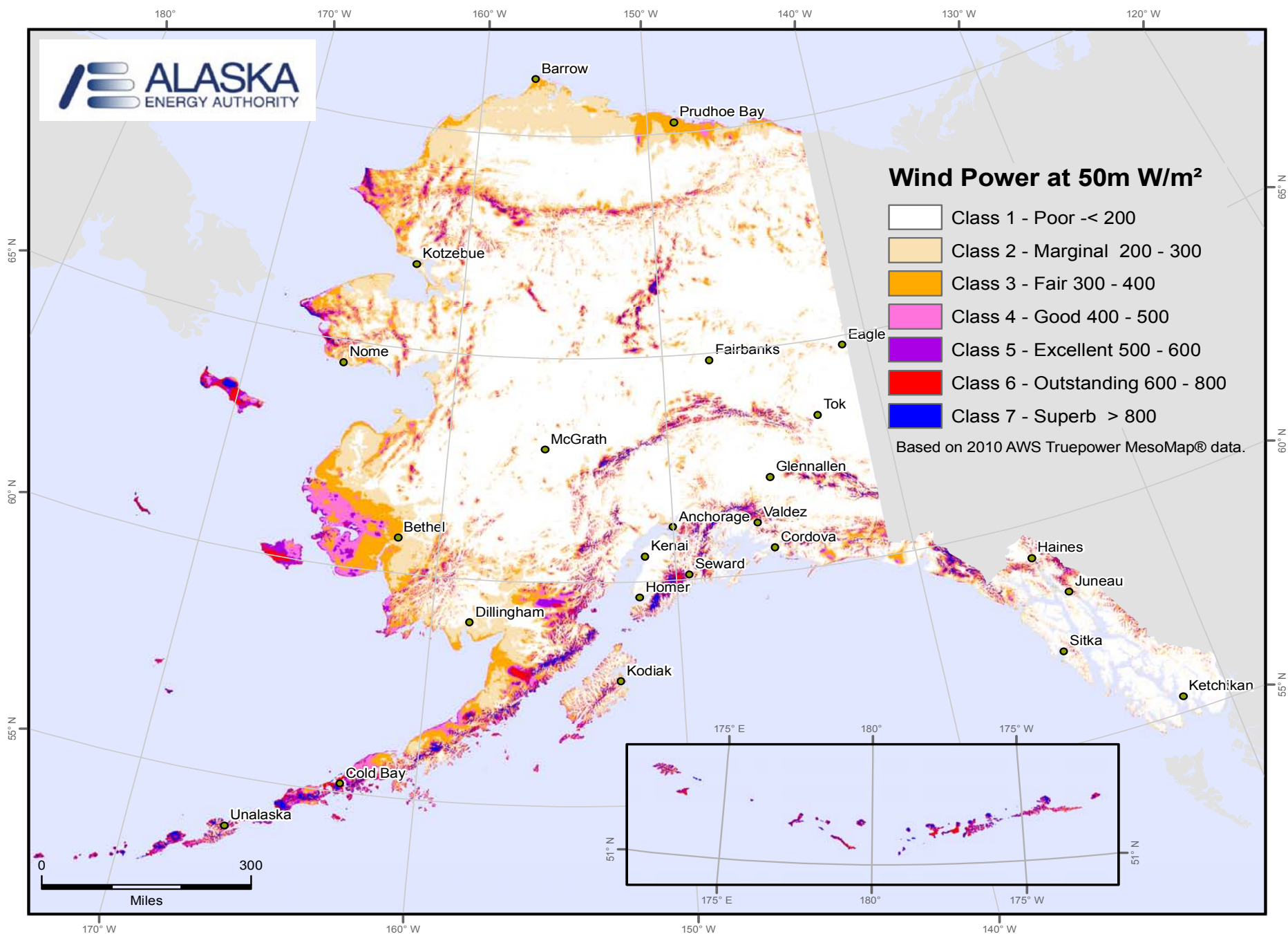
Advantages of Renewable Energy

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

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.







Mount Spurr

Exploration by ORMAT

Production well stage
will be \$25 million if
exploration justifies it

Base load potential



Ocean Energy – Tidal and Wave Power



Alaska has over 90% of the nation's tidal power potential, and more than 75% of the nation's wave energy potential

Mostly demonstration projects so far but projects are beginning to commercialize



ORPC developing pilot tidal project near Nikiski and a hydrokinetic pilot project near Tanana



Ocean

Tidal Electric Generation Potential MW

1.3 - 25	75 - 100
25 - 50	100 - 220
50 - 75	

Wave Power Potential

kW/m	
26 - 30	40 - 50
30 - 40	50 - 56

Tidal Energy in Cook Inlet



“As HEA looks for ways to lessen its dependence on natural gas, exploring renewable energy options is a priority for us. In addition to the obvious renewable energy potential, this project will also bring substantial economic benefits to the Kenai Peninsula.”

*Brad Janorschke
General Manager
Homer Electric Association*

Watana Dam

A 600 MW project with a 50% capacity factor

Entering FERC licensing stage

Costs and opposition still not completely known

100 year project

Electric Transportation



Key Levers

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

DSIRE™

Database of State Incentives for Renewables & Efficiency

U.S. DEPARTMENT OF
ENERGY

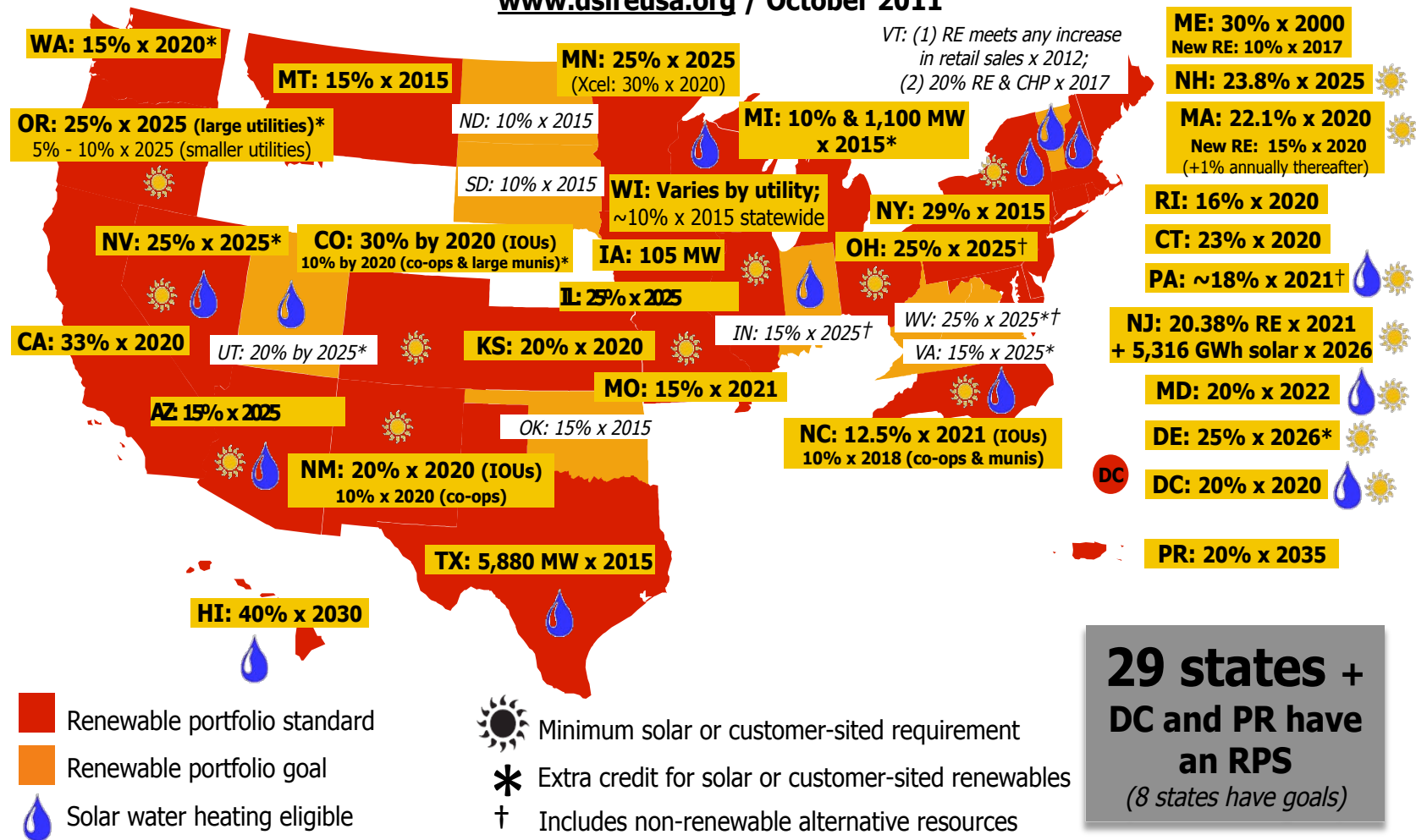
Energy Efficiency &
Renewable Energy

IREC
INTERSTATE RENEWABLE ENERGY COUNCIL

**NORTH CAROLINA
SOLAR CENTER**

RPS Policies

www.dsireusa.org / October 2011



2008 Legislative Session

- Renewable Energy Fund
 - \$250 million commitment (\$176.6 million so far for 208 projects)
 - HB 250 would extend the program until 2018
- Weatherization and Rebate Programs
 - \$461 million so far

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

Future Needs

- Re-authorization of RE Fund
- Energy Efficiency Resource Standard?
- Department of (domestic) Energy?
- Regulatory Reform?
- Sustainable Funding?

Alaska's Emerging Technology Opportunities

- Hybrid systems
- Biomass gasification
- Tidal and wave power
- Energy storage
- Electric transportation

What RE and EE Can Do For Alaska:

- *Reduce* fossil fuel use and imports
- *Stabilize* energy prices
- *Attract* investment
- *Diversify* our economy and create jobs
- *Help* us remain an “energy state”

Iceland's Vision

vision

- Iceland's government wants it to become the world's first fully Hydrogen-driven economy by 2050
- Producing enough Hydrogen would mean that Iceland would no longer need to import any fossil fuels
- A recent survey showed 93 per cent of Icelanders to be behind the idea
- Ríkisstjórnin hefur lýst vilja sínum til þess að Ísland verði fyrsta vetnissamfélag heims, líklega um 2050
- Með því að framleiða nægilegt vetni á Íslandi gæti olíuinnflutningur orðið óþarfur
- Nýleg könnun gaf til kynna að um 93% þjóðarinnar styður hugmyndina

Fourth Annual
Business of Clean Energy in Alaska
Conference
April 19-20, 2012
Dena' ina Center

Keynote: Jon Wellinghoff, Chairman, FERC

Thank you!
www.realaska.org