



**Union of
Concerned
Scientists**

Citizens and Scientists for Environmental Solutions

Cashing in on Clean Energy:

A National Renewable Electricity Standard will
Benefit the Environment and the Economy

**Renewable Energy & Economic Development
Session**

EIA 30th Anniversary conference
Washington DC
April 7, 2008

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Renewable electricity standards: a primary driver of new renewables

- The #1 driver of renewable energy development.

Goldman Sachs

- “... the most important driver for new renewables in the U.S. and Canada over the next 10 years.”

Navigant Consulting

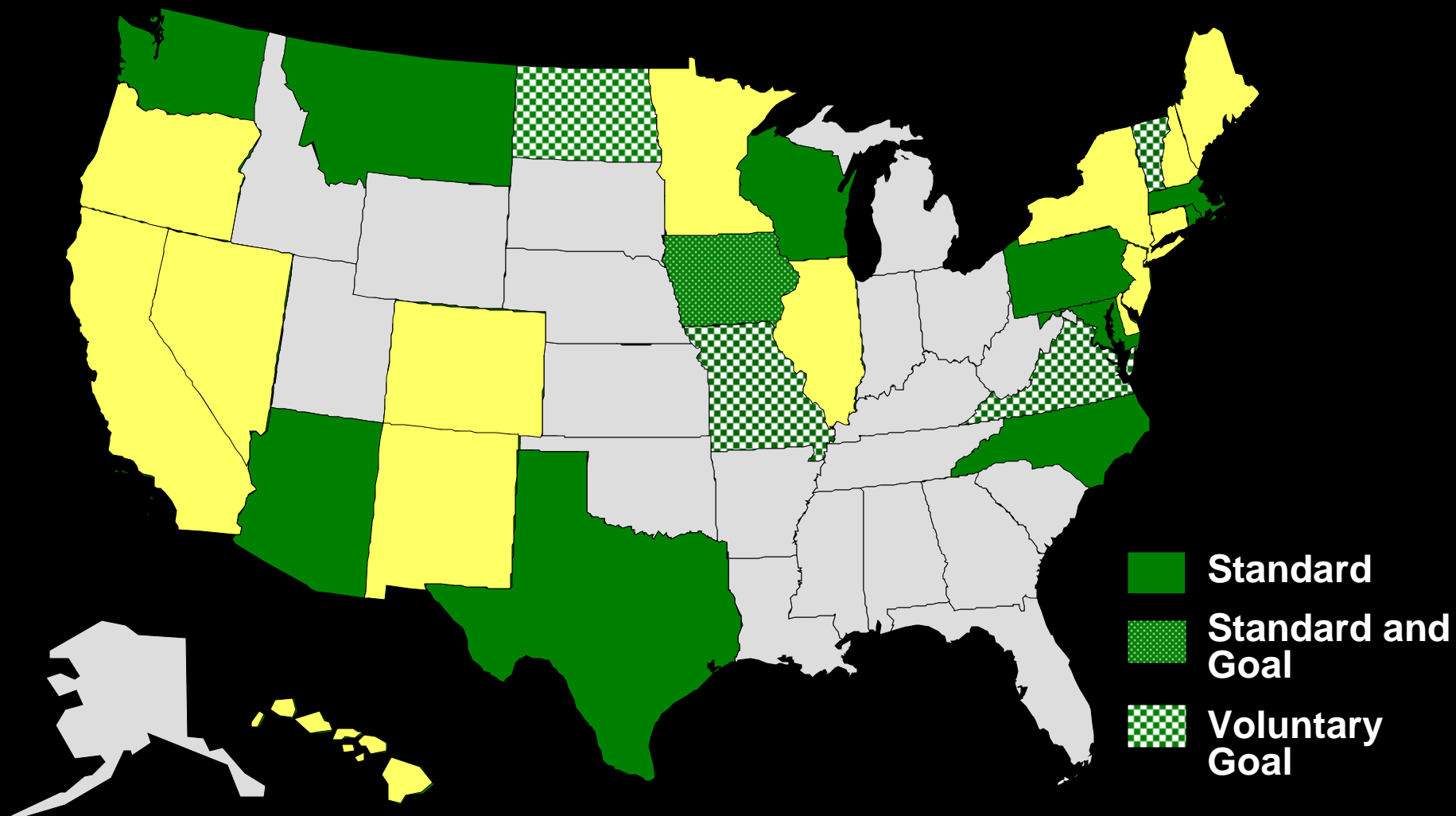
- “the most powerful tool that a state can use to promote wind energy.”

Natl Renewable Energy Lab



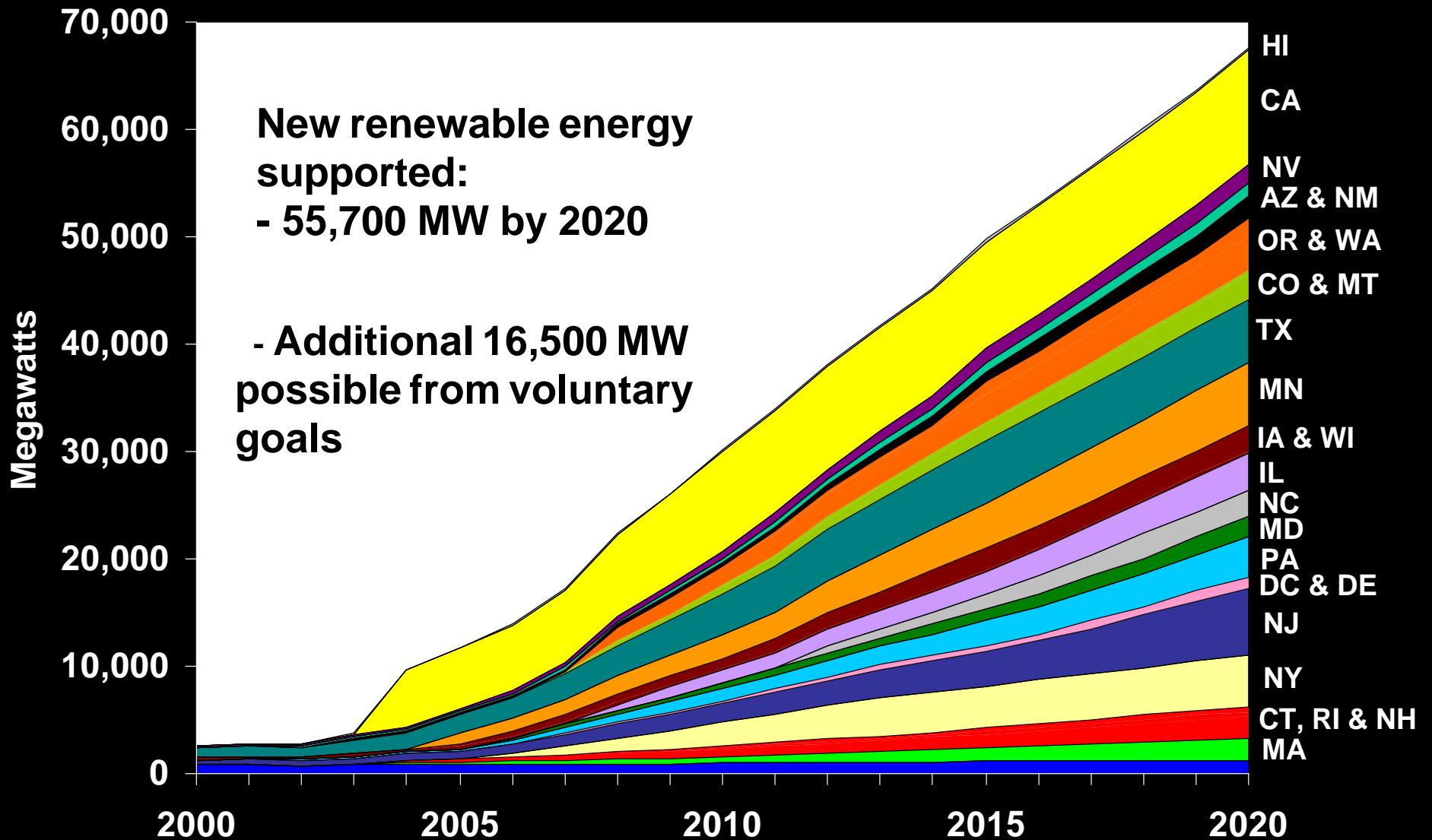
Renewable electricity standards

25 States + D.C.



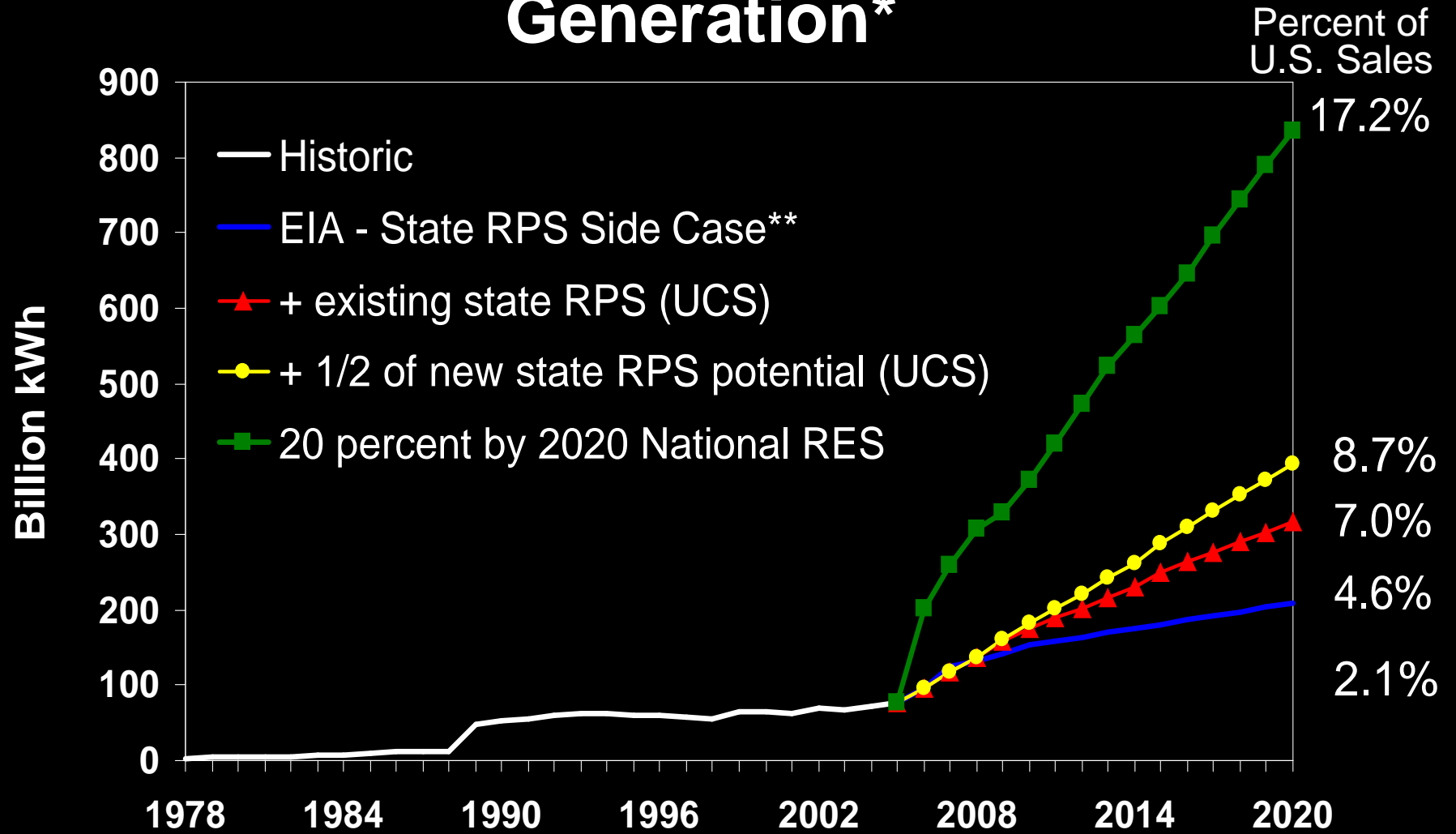
❖ 14 states have requirements of 20% or higher

Renewable Energy Required by State Standards*



*Projected development assuming states achieve annual renewable energy targets.

Renewable Energy Generation*



*In addition to hydro and MSW.

**Assumes non-compliance with some state programs, does not include new or higher standards adopted since September 2006.

Sources: EIA (AEO 2007); UCS.

UCS National RES Analysis

- Used EIA's National Energy Modeling System
- Analyzed impacts of a 20% by 2020 national RPS proposed in House using EIA assumptions and UCS assumptions

For UCS Case:

- Used Black & Veatch cost and performance assumptions for wind, coal, gas, and nuclear
- Used costs for solar, geothermal and biomass more in line with DOE/NREL projections
- Included recent capital cost increases from actual renewable and conventional projects

Union of Concerned Scientists
FACT SHEET

Cashing In on Clean Energy

A National Renewable Electricity Standard Will Benefit the Economy and the Environment

America's current energy system is dominated by fossil fuels, which pose serious threats to our health and environment and leave us vulnerable to price spikes and supply shortages. With the threat of global warming becoming increasingly urgent, we must make responsible energy choices today that ensure a safe, reliable power supply and a healthy environment for future generations.

Fortunately, there are practical and affordable ways to achieve this goal.

and popular at the state level is the renewable electricity standard (also known as the renewable portfolio standard or RPS), which requires electricity providers to supply a minimum percentage of their power from clean energy sources. As of June 2007, renewable electricity standards have been adopted in 23 states and Washington, D.C. At the national level, the U.S. Senate has passed a 10 percent by 2020 national renewable electricity standard three times since 2002—most recently in June 2005.

Momentum continues to grow for a strong national standard. A 20 percent by 2020 standard was introduced in the House of Representatives in February 2007, and a 15 percent by 2020 standard is under consideration in the Senate.¹ Using a model from the Energy Information Administration (EIA), the Union of Concerned Scientists (UCS) examined the long-term effects that a national 20 percent by 2020 standard would have on the economy and the environment, under two different scenarios: an "EIA case," which assumes no changes to the model, and a "UCS case," which makes several modifications (described in the "Modeling Methods" on the back page). We then used the UCS case results to conduct additional analysis on the potential effects a national standard would have on job creation. The findings from the UCS case 20 percent national standard are presented below, followed by findings for the EIA case 20 percent standard.

20 Percent by 2020: The Benefits of a National Renewable Electricity Standard

Job Creation
185,000 new jobs from renewable energy development

Economic Development
\$66.7 billion in new capital investment, \$25.8 billion in income to farmers, ranchers, and rural landowners, and \$2 billion in new local tax revenues

Consumer Savings
\$10.5 billion in lower electricity and natural gas bills by 2020 (growing to \$31.8 billion by 2050)

Climate Solutions
Reductions in global warming pollution equal to taking 36.4 million cars off the road

CONSUMER SAVINGS
Under the UCS case 20 percent national standard, consumers in all sectors of the economy would experience a reduction in both their cumulative electricity and natural gas costs compared with business as usual (BAU). Cumulative savings would reach \$10.5 billion by 2020 and, by 2050, would grow to \$31.8 billion (\$10.4 billion for households, \$13.4 billion for commercial customers, and \$8.1 billion for industrial customers).² In addition, energy bills would be reduced in every region of the country.

The national renewable standard saves consumers money by reducing the demand for fossil fuels and creating new competitors in the U.S. energy market. As a result, energy companies are limited in their ability to raise fossil fuel prices in the future. Compared with BAU, natural gas (and coal)

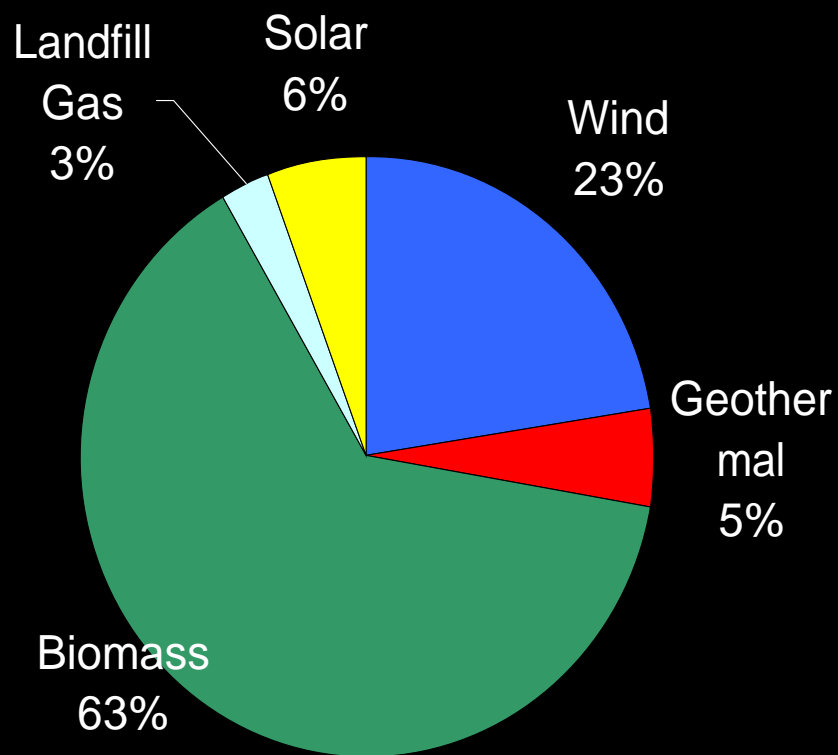
Homegrown renewable energy resources—such as wind, solar, bioenergy, and geothermal—can help reduce our dependence on polluting fossil fuels. These clean energy sources can also help stabilize energy prices, stimulate the development of innovative new technology, and create high-quality jobs and other economic benefits.

Strong national policies can ensure these benefits are fully realized. The policy that has proven most effective

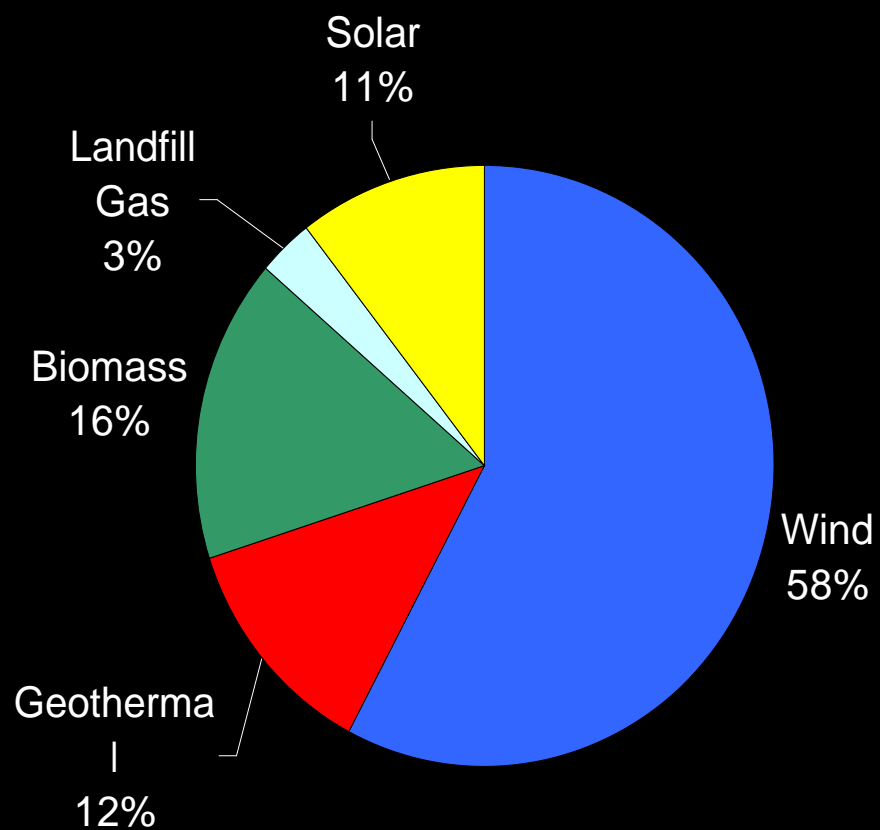
Photo: PPM Energy

Renewable Energy Mix, 2030

EIA Case

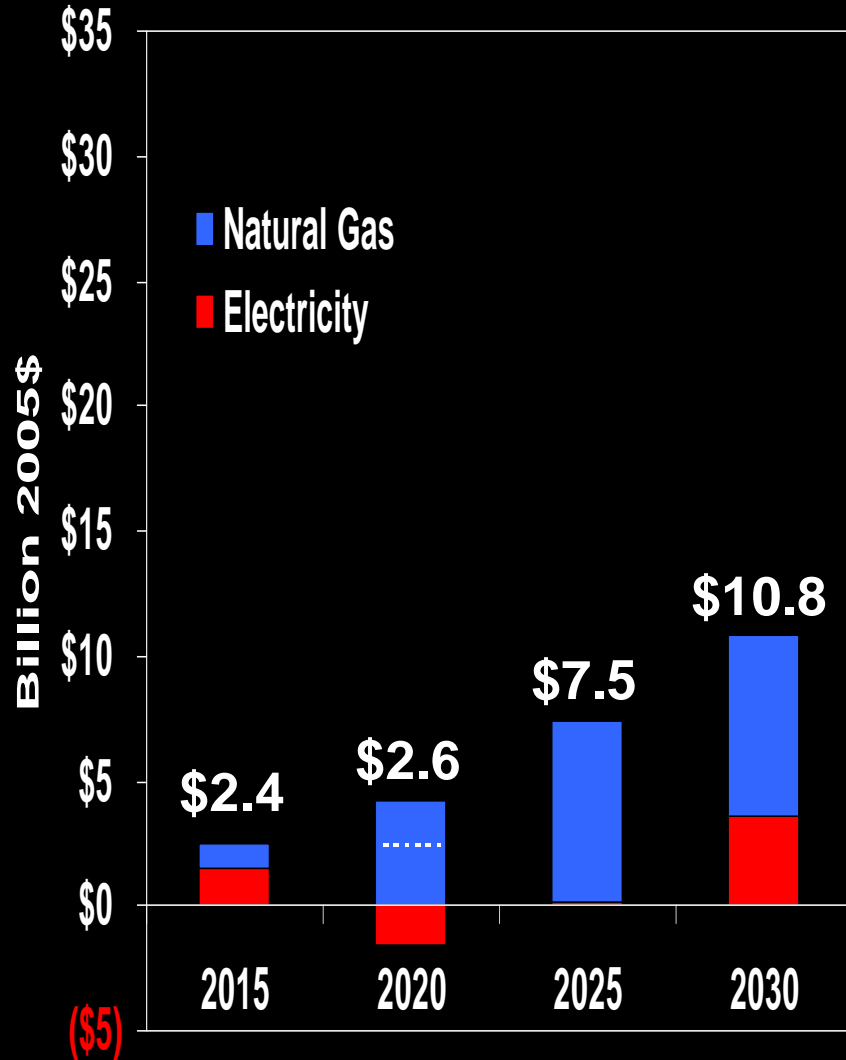


UCS Case

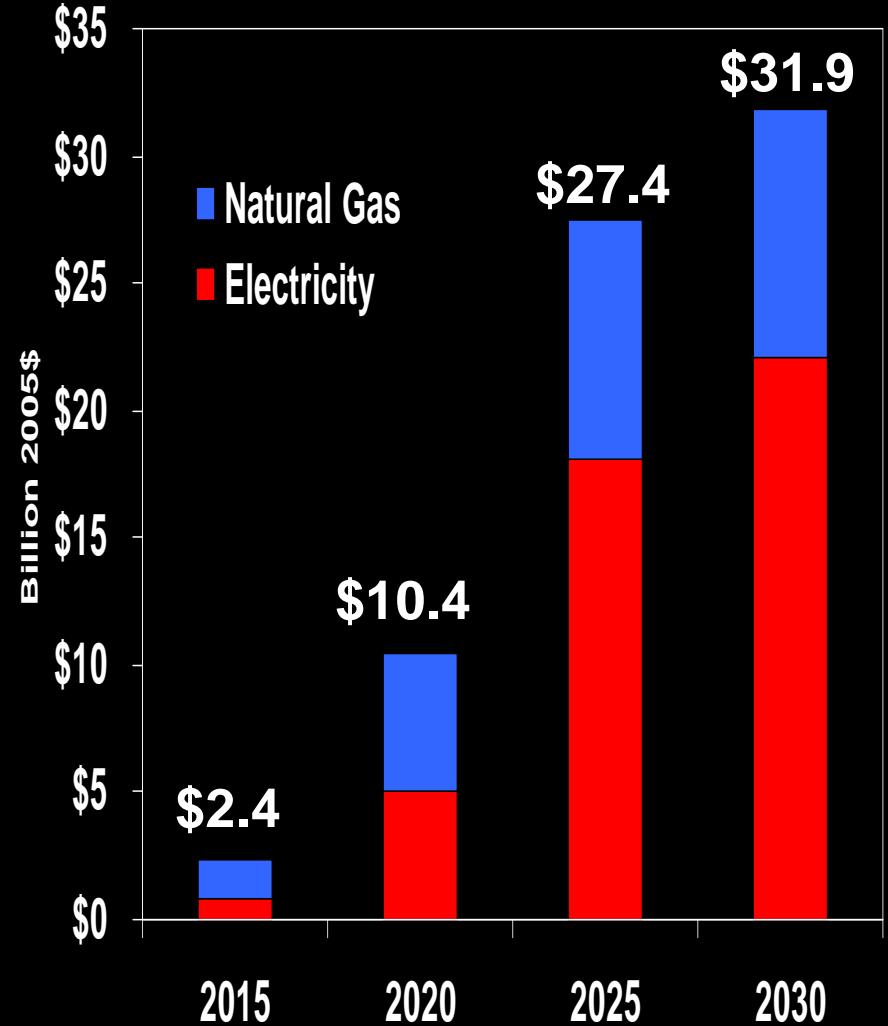


Cumulative Natural Gas and Electricity Bill Savings, 20% National Standard

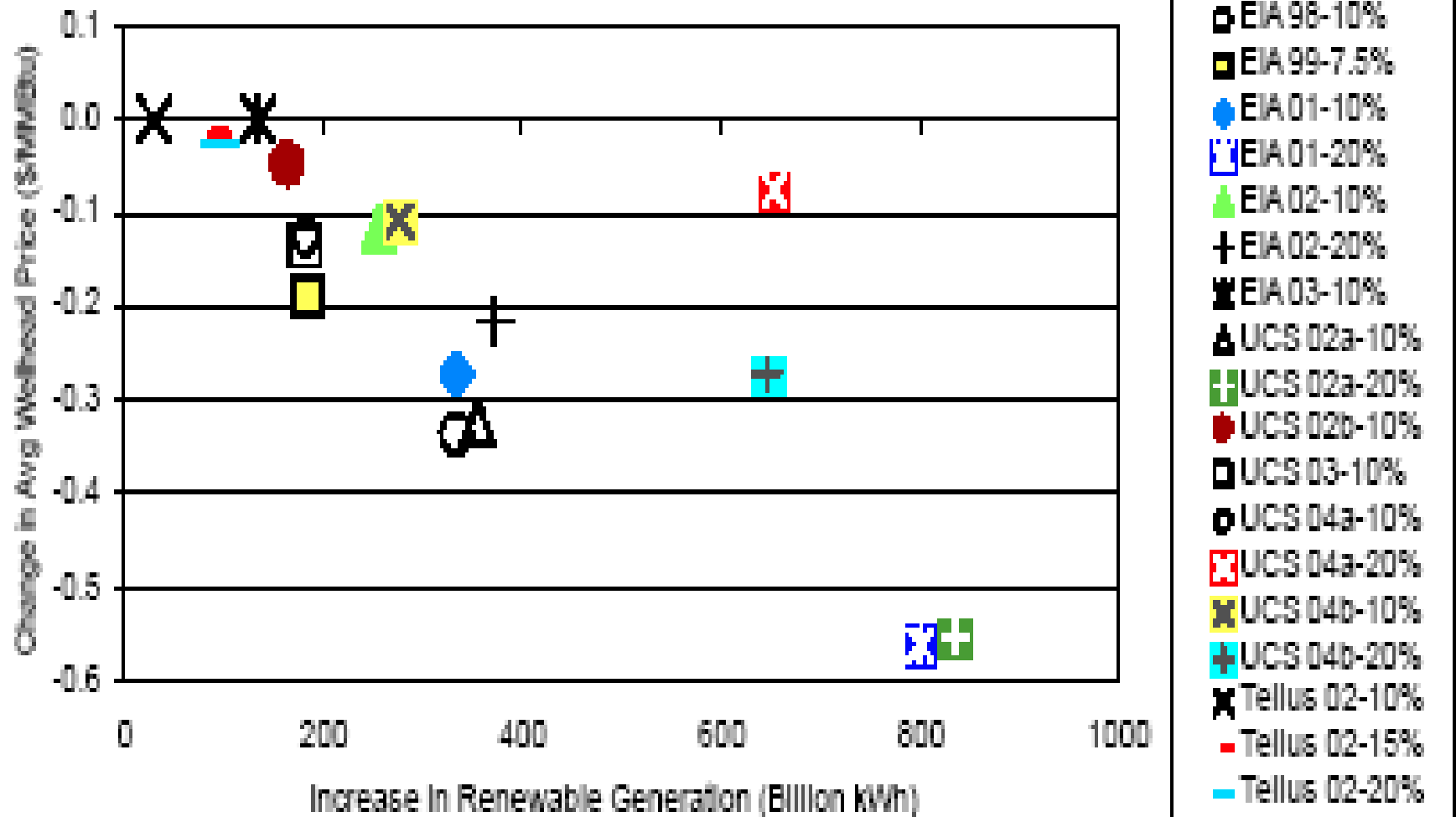
EIA Assumptions



UCS Assumptions



Renewable energy reduces natural gas price risk



Source: Lawrence Berkeley Lab, 2005.

Other recent national RPS studies show modest savings or costs

Study	Energy Bill Savings (\$)	Energy Bill Savings (%)	NPV?
EIA 25%	\$2 b	<0.1%	Y
UCS 20% (EIA assumptions)	\$10.8 b	0.2%	Y
UCS 20% (UCS assumptions)	\$31.8 b	0.6%	Y
UCS (House-passed 15%) <i>Higher RE case</i>	\$28 b	0.5%	Y
EIA (House-passed 15%) <i>Case B (more RE)</i>	\$3.3 b	0.1%	Y
ACEEE 15%	\$35 b	0.7%	Y
EI (15%)	-\$175 b	-0.7%	N, Nominal \$
Wood MacKenzie	\$240 b	3%	Y

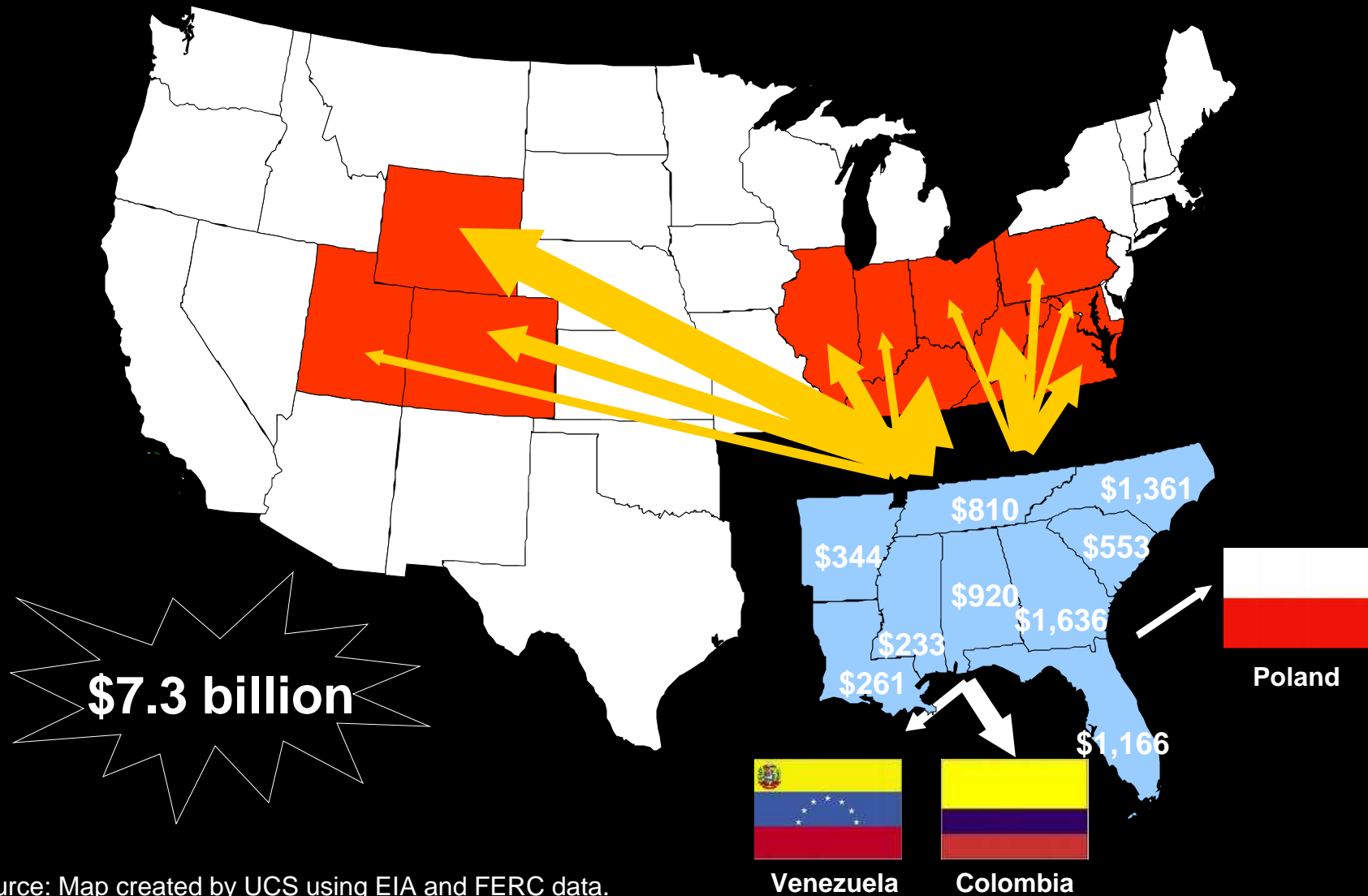
Consumers save money in all regions UCS 20% by 2020 scenario

Cumulative Natural Gas and Electricity Bill Savings* by U.S. Census Region, 2007-2030



Helping to keep energy dollars at home

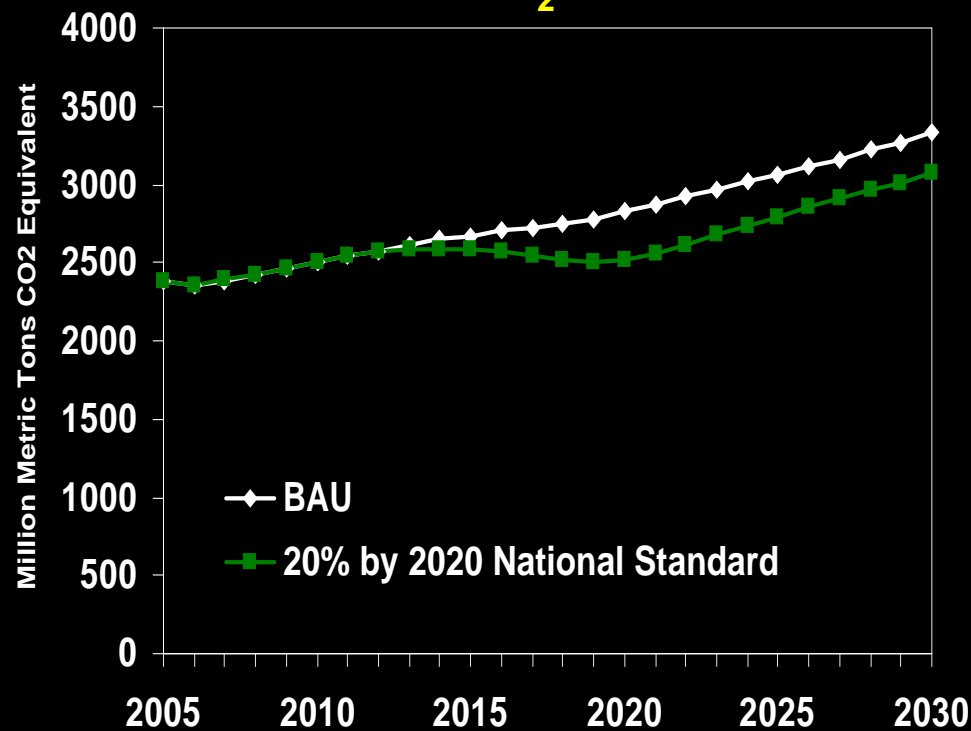
Annual Coal Import Expenditures, 2005 (million \$)



Source: Map created by UCS using EIA and FERC data.

A downpayment on reducing global warming emissions

Power Plant CO₂ Emissions



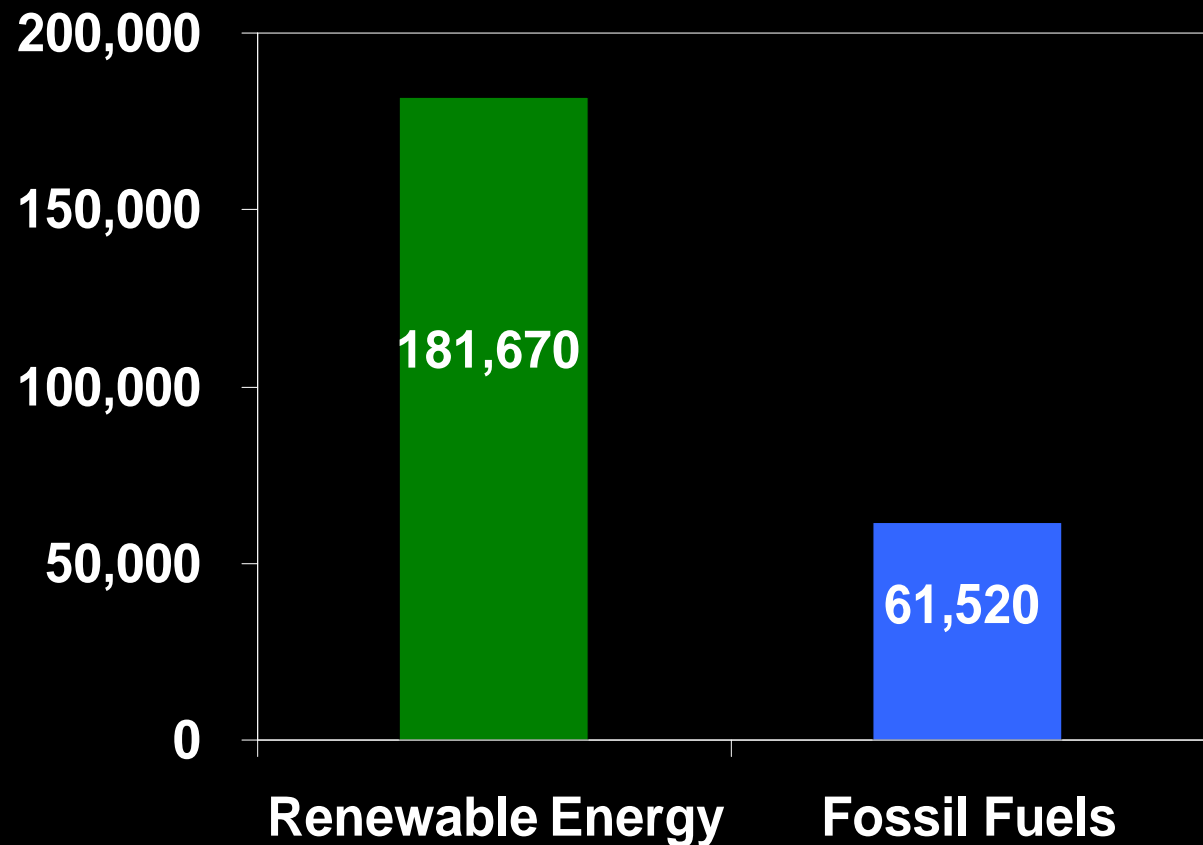
In 2020, equivalent to taking 36.4 million cars off the road



Jobs and other benefits to local economies

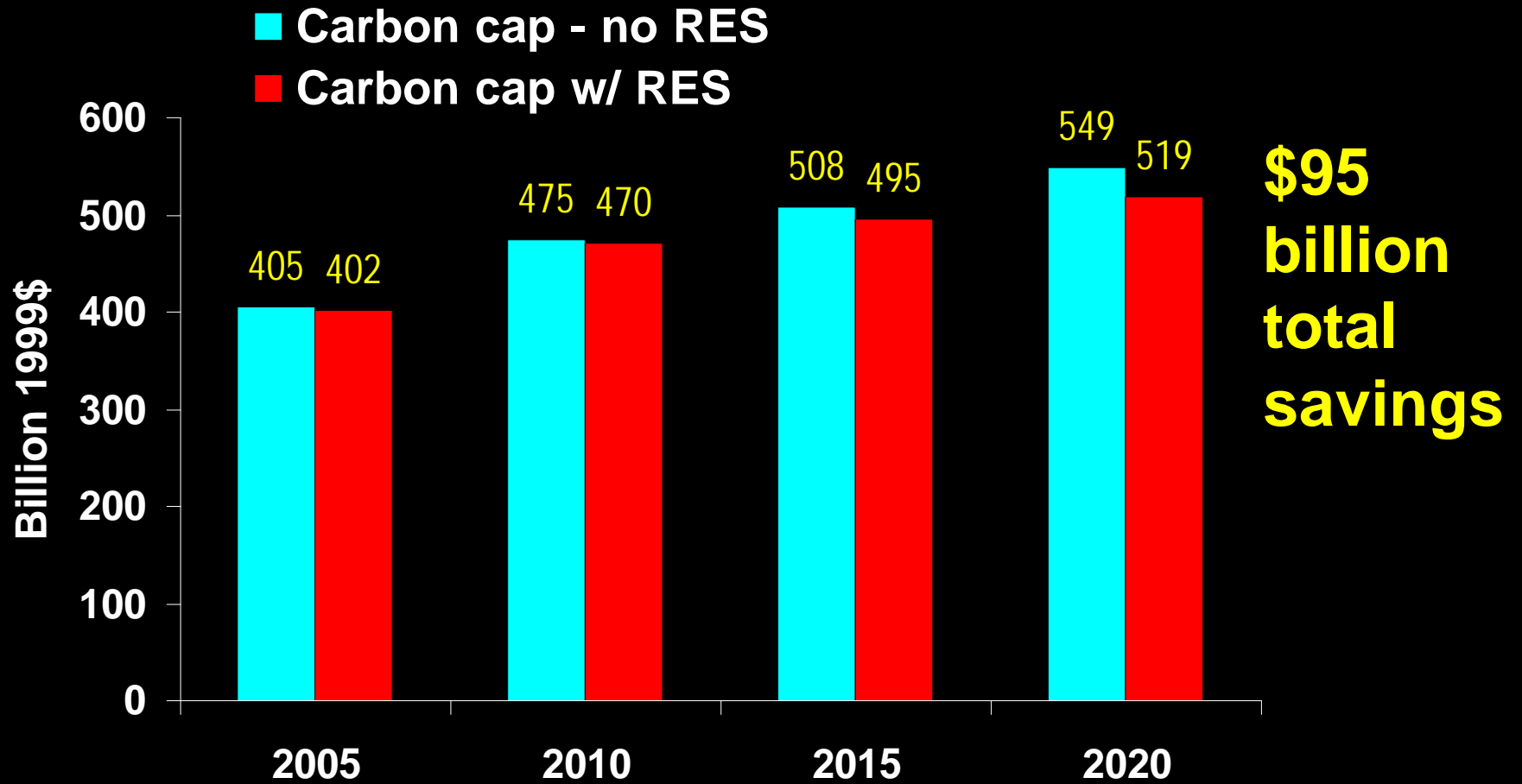
- Net benefit of 120,000 jobs
- \$66.7 billion in new capital investment for renewable energy technologies*
- \$25.6 billion in new income for farmers, ranchers, and rural landowners
- \$2 billion in new property tax revenues

**Renewable Energy vs. Fossil Fuels Jobs
2020 UCS Case**



*Results are presented in 2005 dollars using a 7 percent real discount rate.

Renewables reduce the cost of carbon cap (EIA 2001)



\$95 billion total savings

Total Consumer Energy Bills (not including transportation)

“Low-carbon electricity” standard?

Renewables

More land; impacts more visible

Renewable- conserve resources for future generations

Diversify existing resource supply

Use little to no water

Little or no mining or wastes

No terrorist targets

Little or no accident risk

Commercially available today, short construction lead times

Track record -- manufacturing economies/price declines

Technology people prefer (at least if somewhere else)

Coal/CCS and Nuclear

Less land; impacts less visible

Resources large but depletable

Expand dominant resources

Use increasingly scarce water

Mining impacts, long-lived wastes

Nuclear –targets; proliferation risk

Need liability insurance exemption

Commercially available 10-25 years, very long lead times

Track record – construction cost overruns

Technology people dislike/oppose

Thank you. Any questions?

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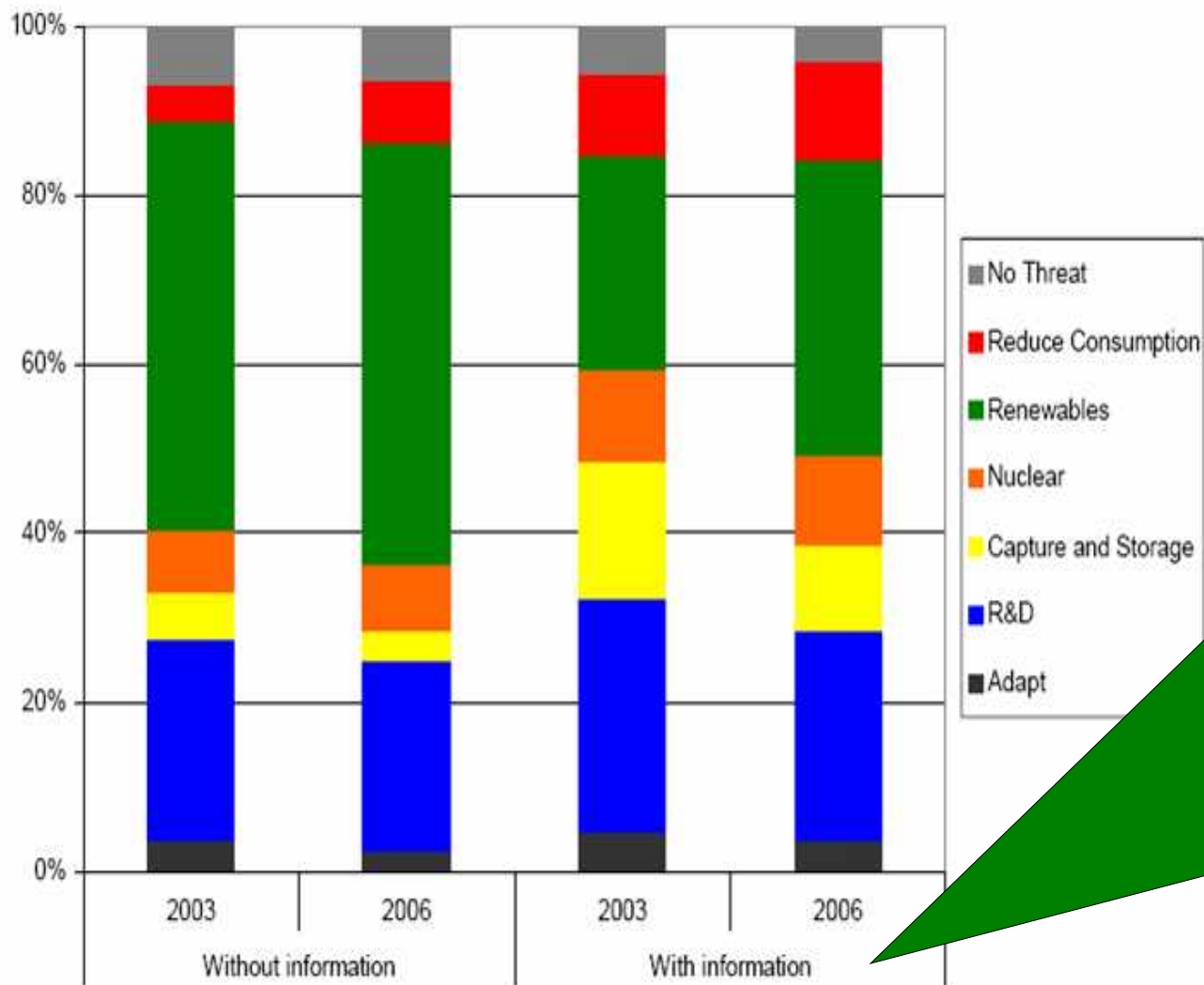
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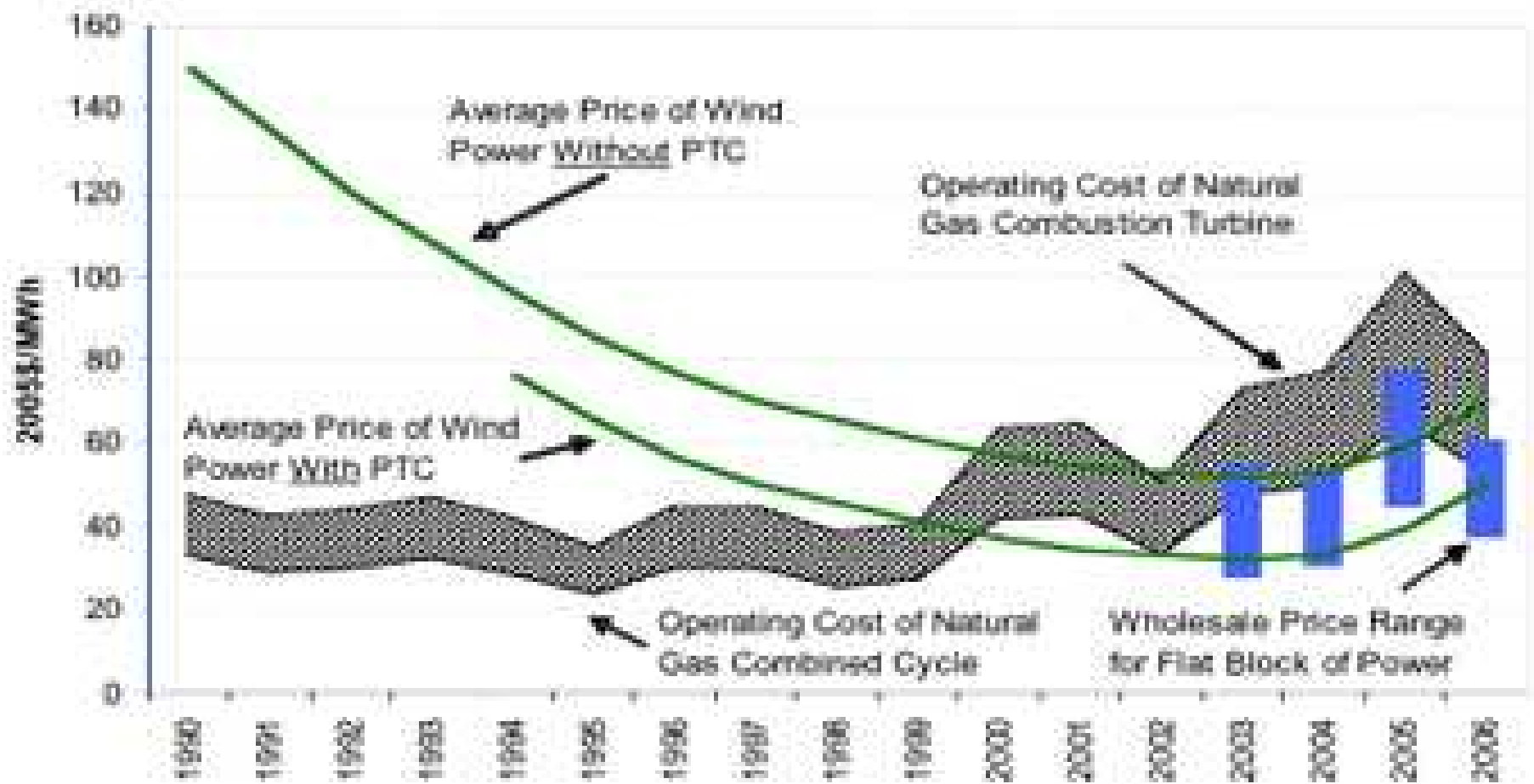


Additional slides

Public favors renewables >3:1 Even if much more expensive



- “With information:”**
- Avg. elec. bill = \$1,200/yr.
 - Nuclear = \$2,400/yr.
 - CCS = \$2,400/yr.
 - Renewables = \$4,000/yr.



Source: Lawrence Berkeley National Lab