

# **Renewing Michigan's Economy**

## ***Wind Power and Rural Economic Development***



**Steve Clemmer**  
**Research Director, Clean Energy Program**  
**Union of Concerned Scientists**  
**[www.ucsusa.org](http://www.ucsusa.org)**

***Unleashing the Potential: The Future of  
Wind Energy in Michigan Conference***

**Lansing, MI**  
**October 21, 2005**



**Union of Concerned Scientists**



# Rural Economic Challenges

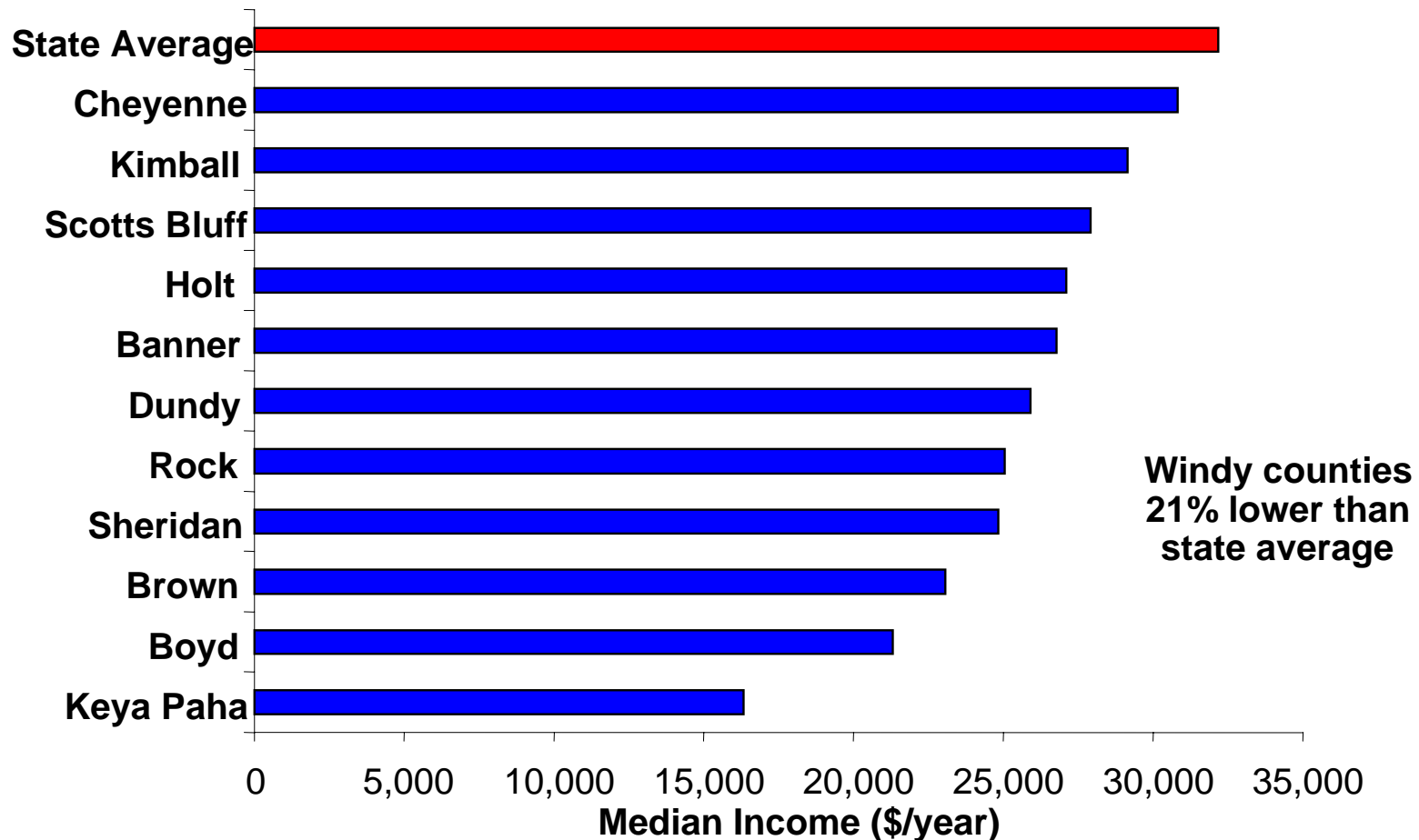
- ⌘ **Low commodity prices**
- ⌘ **Fuel price uncertainty**
- ⌘ **High fertilizer prices**
- ⌘ **Migration to cities**
- ⌘ **Eroding local tax bases**
- ⌘ **Water shortages**





# Windy Rural Areas Need Economic Development

## Median Income in Nebraska's 10 Windiest Counties





# Economy and Population Declining in Lincoln County, MN

- ⊕ **Per capita income 35% below state average**
  - ranked 81 of 87 counties in MN in 1999
  
- ⊕ **12% of residents below poverty level (state avg = 9%)**
  
- ⊕ **Unemployment rate higher than state**
  
- ⊕ **Population declined 22% between 1980 and 2000**
  - Population density = 12 persons/sq mile (state avg = 62)
  - 25% over age 65 (state avg = 12%)



# Economic Development Benefits

- ⌘ **Construction**
- ⌘ **Operations and maintenance**
- ⌘ **Property tax revenues**
- ⌘ **Landowner revenues**
- ⌘ **Manufacturing**
- ⌘ **Multiplier effect**
- ⌘ **Net economic development impacts of wind vs. fossil fuels**





# Construction and O&M Jobs

- ✦ **80-140 direct construction jobs/100 MW**
- ✦ **6-20 direct O&M jobs/100 MW**
- ✦ **Contracts with local construction and service industry**
- ✦ **Benefits are greater if local area has robust technical and construction resources**
- ✦ **Multiplier effect: increased local income induces spending on other local goods and services (by up to 2-3 times).**





# Wind Power Property Tax Revenues for Rural Areas

- **Varies greatly from county to county, depending on assessed value, abatements, tax rate, exemptions**
  - Typically 1-3% of assessed value
  - Some states have payments in lieu of taxes
  
- **Examples:**
  - TX: 1,100 MW = \$11.7 million/yr to school districts in 10 counties
  - IA: 240 MW = \$2 million/yr
  - OR/WA: 300 MW = \$1.2 million/yr
  - CO: 162 MW = \$821,000/yr to school district, \$195,000 to medical center, \$815,000 to general fund; 26% increase to Prowers County.
  - MN: 107 MW = \$353,000/yr
  - SD: 40 MW = \$250,000/yr
  - WY: 85 MW in Carbon Co. = \$480,000/yr
  - WI: 20 MW in Kewaunee Co. = \$200,000/yr in property taxes; 50% of county's budget



# Wind Power Landowner Revenues

- **Lease payments from wind developers**
  - **Proprietary data**
  - **Range: \$2,500-\$4,000/MW, 2-3% of gross revenue**
  
- **May be negotiated as flat rate up front over vary over the life of the project**
  
- **Local ownership of wind projects can greatly increase revenues**





# Wind Power Creates New Manufacturing Jobs

- **Wind industry contributes to the economies of 46 states (AWEA)**
- **Increasing US wind power by 8x today's levels could create 8,550 mfg jobs in MI (rank 4<sup>th</sup>, REPP)**
  - **129,300 mfg jobs lost in MI 1/01-5/04**
- **Companies are building wind turbine mfg plants in US**
  - **Spanish company Gamesa is building new plant in PA, creating 1,000 new jobs over next 5 years & \$40 mil. in new investment**
  - **Gamesa CEO credits PA renewable standard, creating market for up to 3,600 MW of new wind**
  - **Clipper built mfg plant in Cedar Rapids IA**



- **ND towers & blades = valuable exports**
  - **LM Glasfiber blade mfg plant created 130 jobs = 20% of ND lignite industry**
  - **DMI has towers installed in 12 states**



# Wind Keeps More Dollars in Michigan than Coal and Gas

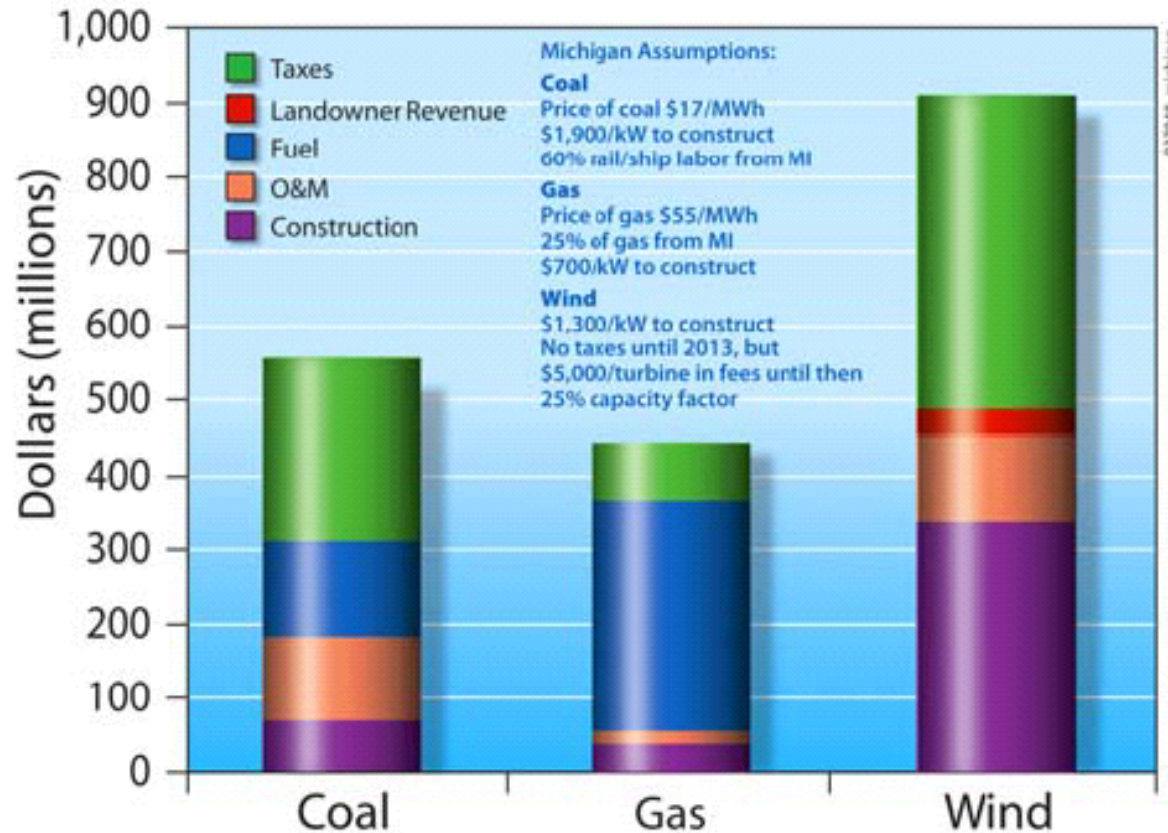


Figure 15. Dollars spent on new electricity generation from coal, gas, and wind in Michigan

Source: S. Tegen, NREL, *Comparing Statewide Economic Impacts of New Generation from Wind, Coal, and Natural Gas in Arizona, Colorado, and Michigan*, prepared for Windpower 2005, Denver, CO.

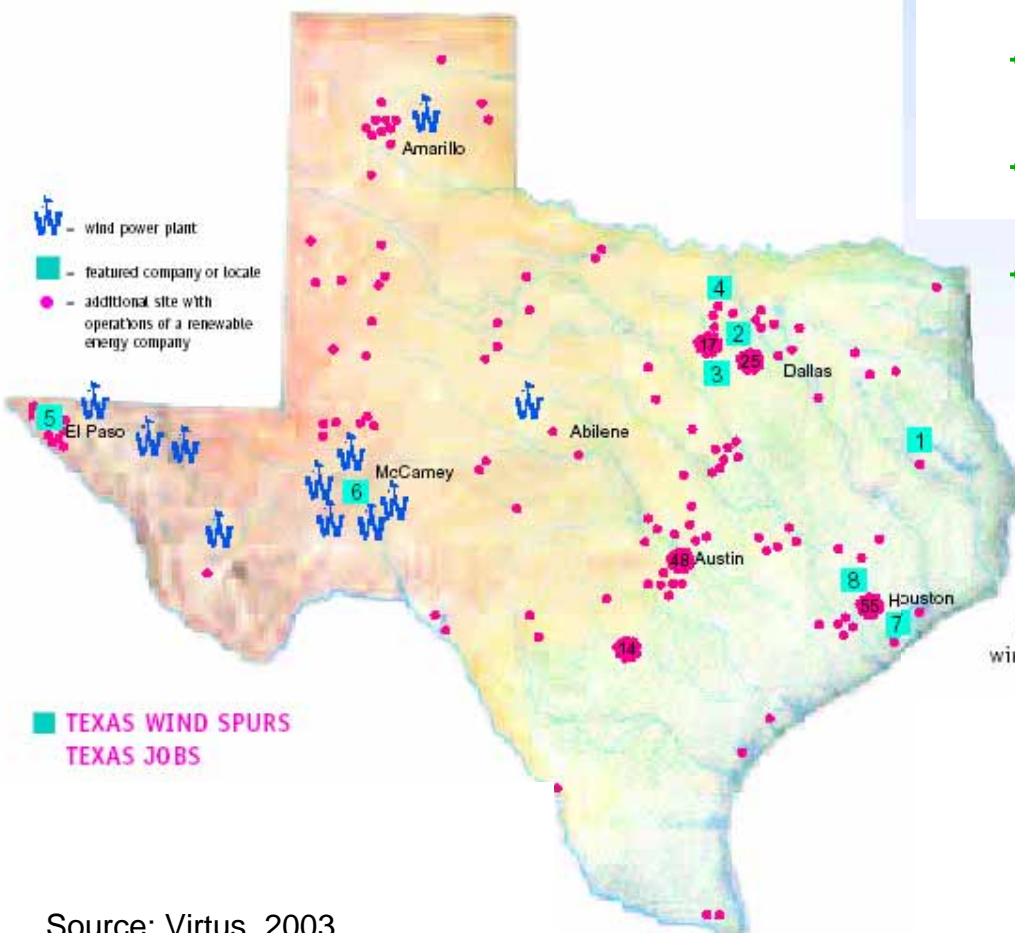


Union of  
Concerned  
Scientists

# Texas Wind Spurs New Jobs and Rural Development



- ✦ In 2001, Texas renewable standard resulted in 913 MW of new wind & \$1 bil. investment
- ✦ supported 2,500 jobs, \$75 mil. payroll + 2,900 indirect jobs
- ✦ \$11.7 mil./yr in tax revenues to school districts in 10 counties
- ✦ \$2.5 mil./yr in income for landowners



**TEXAS WIND SPURS  
TEXAS JOBS**

- 1 CAB (Nacogdoches, 40 jobs) - from deep in the piney woods come steel components for wind projects nationwide
- 2 Trinity Structural Towers (DFW, 310 jobs) - nation's leading manufacturer of wind industry towers.
- 3 Lone Star Transportation (Ft Worth, 325 drivers national freight hauler of wind power plant components.
- 4 Molded Fiber Glass (Gainesville, 200 jobs) - produces blades and other composite components for wind machines.
- 5 Bergen Southwest Steel (El Paso, 120 jobs) - major wind tower fabricator since 1987.
- 6 McCamey - \$800 million worth of wind turbines surrounding the "wind capital of Texas" help support the region's schools & rural government services.
- 7 Port of Houston - In 2001 handled nearly \$1 billion worth of equipment on its way to wind projects throughout the U.S.
- 8 Zilkha Renewables (Houston - 15 jobs) - successful oil & gas entrepreneurs, Houston's Zilkha family now develops wind projects world-wide.



# Wind Power Benefits Lincoln County MN Economy

- ⌘ **107 MW wind project in Southwest MN**
- ⌘ **31 new permanent jobs and \$909,000/year income from operation and maintenance**
- ⌘ **Landowner revenues -- over \$500,000/year**
- ⌘ **Tax revenues -- \$353,000 in 2002**

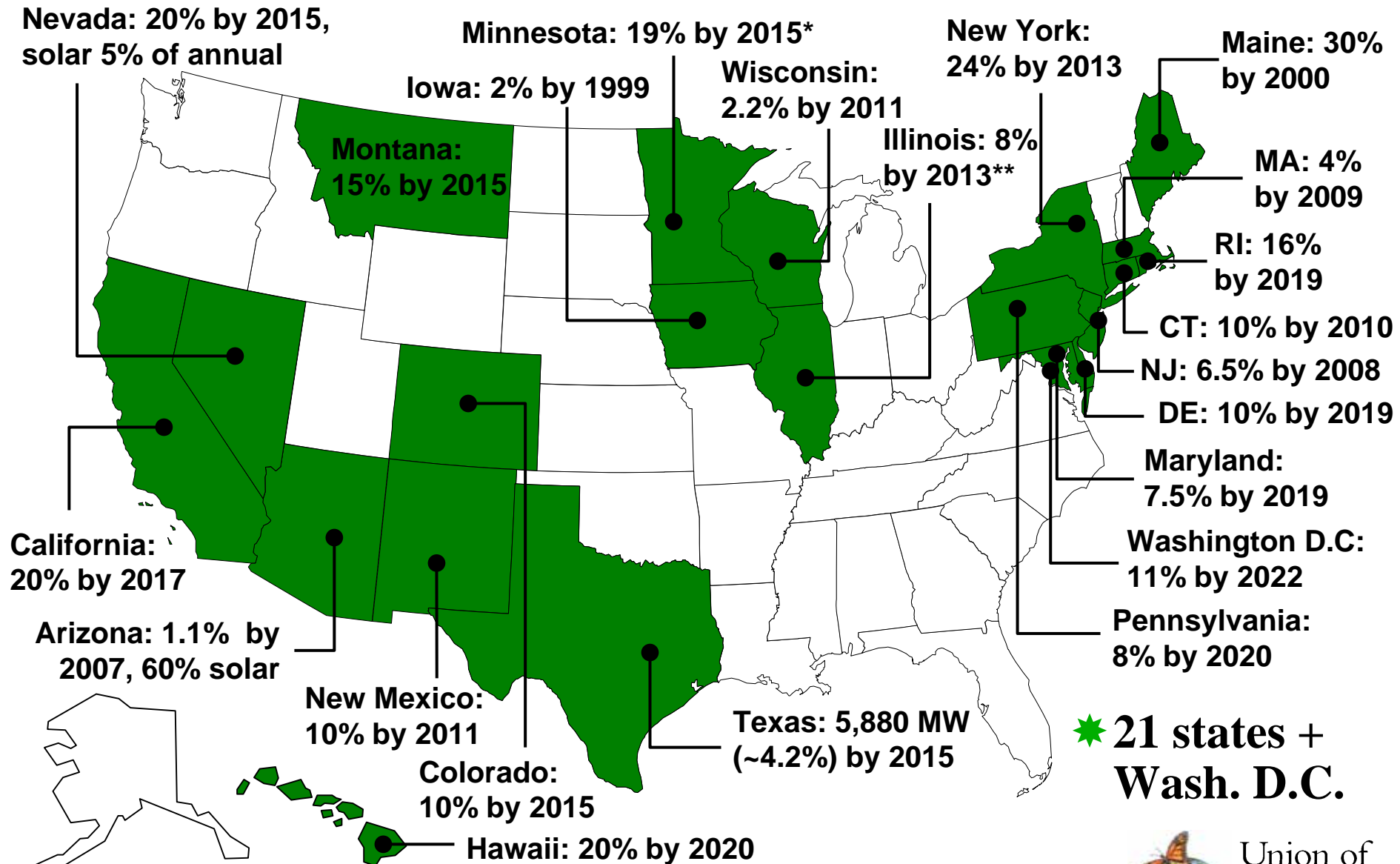


# Wind Power Benefits Iowa Rural Economy

- ⌘ **240 MW wind development**
- ⌘ **200 construction jobs**
- ⌘ **40 long-term O&M jobs**
- ⌘ **\$2 million/yr in property tax revenues**
- ⌘ **\$640,000/year in lease payments to landowners**
- ⌘ **Doesn't include multiplier effect**



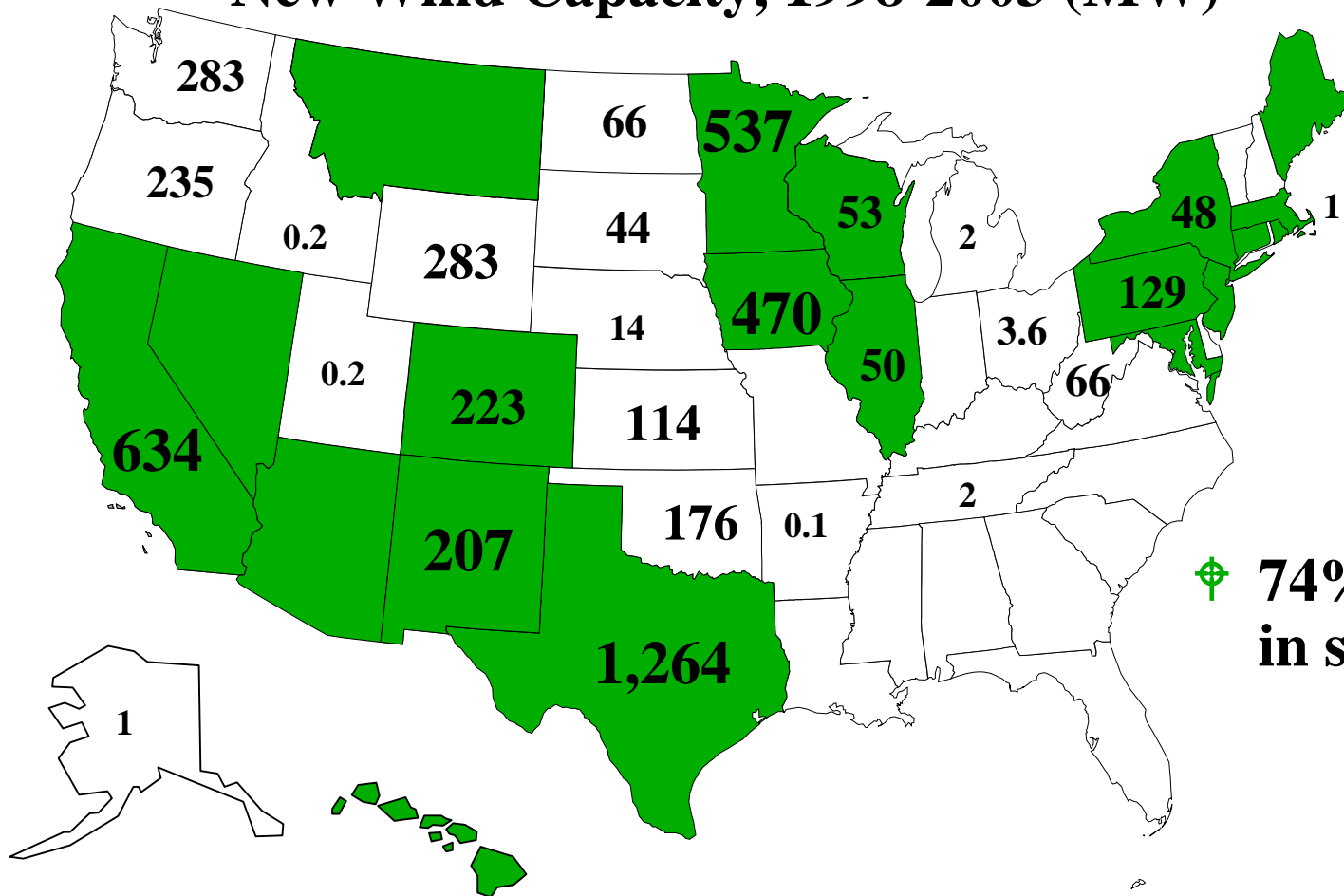
# Renewable Electricity Standards





# Most new wind capacity installed in states with renewable standards

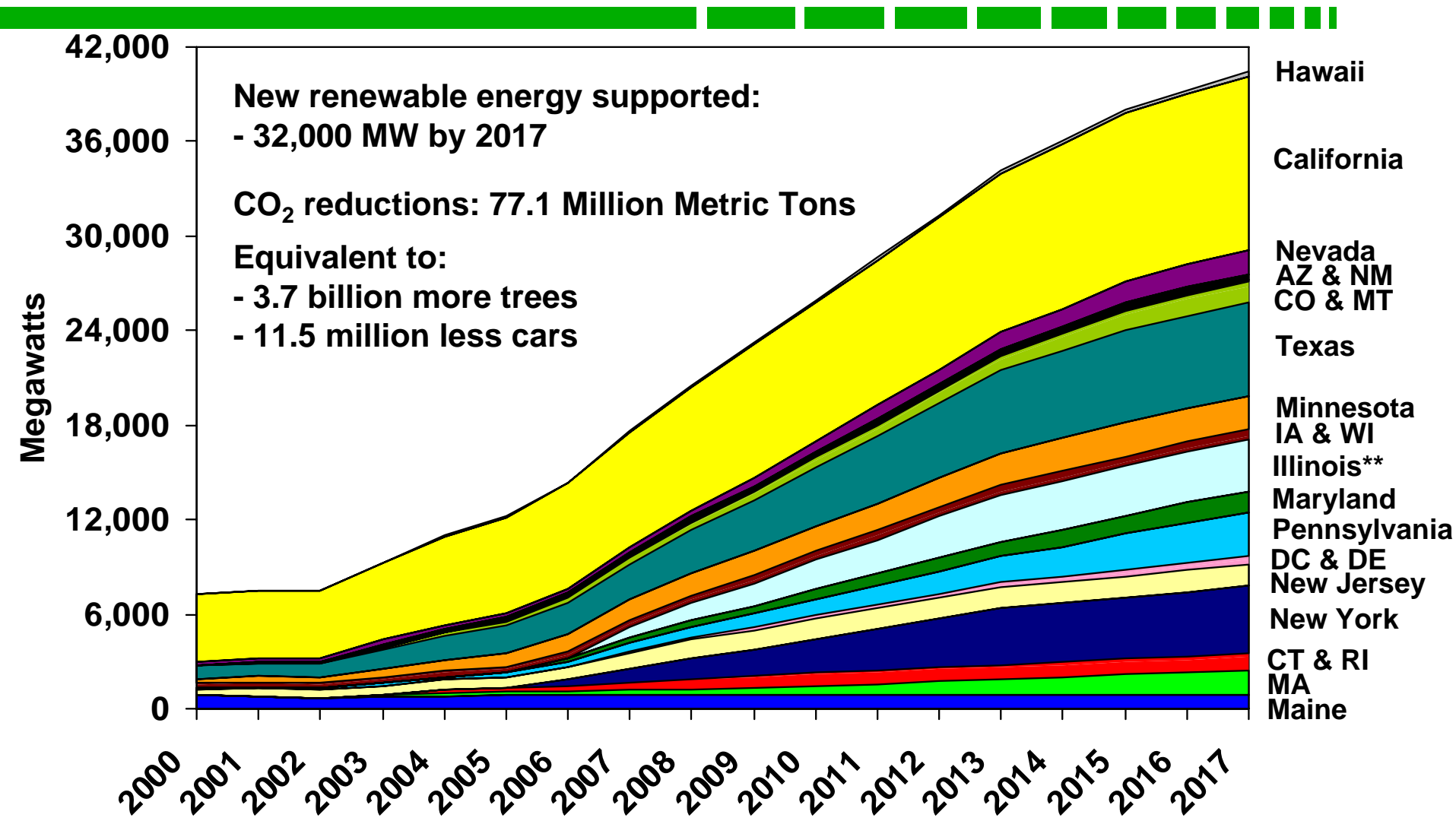
## New Wind Capacity, 1998-2003 (MW)



⊕ **74% (3,620 MW)  
in states with RES**



# Renewable energy expected from state standards\*



\*Projected development assuming states achieve annual RES targets.

\*\*Assumes regulatory enforcement of voluntary RES.



- **Analyzed national renewable electricity standard (RES) of 10% by 2020 and PTC extension through 2006**
  - **RES passed the Senate for the 3<sup>rd</sup> time in 4 years**
- **Used modified version of EIA's National Energy Modeling System (NEMS) to analyze direct costs and benefits**
- **Used expanded version of NREL's jobs and economic development impact (JEDI) model to analyze job impacts**
- **Results available for U.S. and several states**



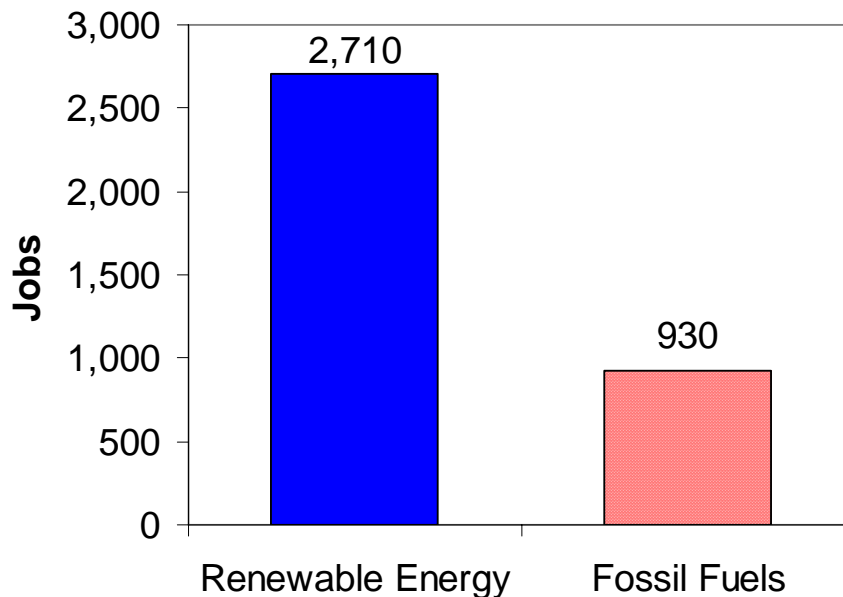
Union of  
Concerned  
Scientists

# Renewable Energy Creates Jobs in Michigan

**By 2020, a 10% national RES  
would provide Michigan with:**

- **2,700 MW of renewable capacity**
  - **8% of covered electricity sales**
  - **Mostly wind**
- **2,700 new high-skilled jobs**
  - **2.9 times more jobs than importing fossil fuels**
- **\$70 million in income**
- **\$60 million in gross state product**

**Renewable vs. Fossil Fuel Jobs, 2020  
(national 10 percent by 2020 RES)**





# Renewable Energy Boosts Michigan's Rural Economy

**By 2020, a 10% national RES  
would provide MI with:**

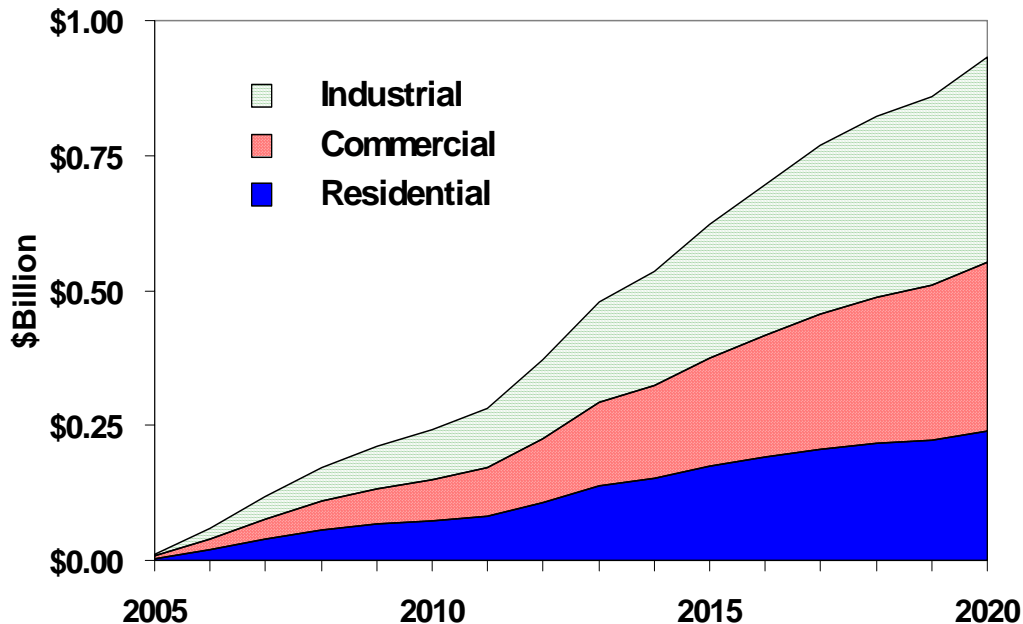
- **\$715 billion in new capital investment**
- **\$196 million in new property tax revenues for local communities**
- **\$38 million in payments to rural areas from producing biomass energy**
- **\$9 million in lease payments to ranchers and rural landowners from wind power**





# National Renewable Standard Saves MI Consumers Money

**Cumulative Energy Bill Savings by Sector,  
Michigan (10 percent by 2020 RES)\***



- **Total NPV Energy Bill Savings through 2020 = \$930 million**
- **Commercial = \$310 million**
- **Industrial = \$380 million**
- **Residential = \$240 million**
- **National savings by 2025 = \$23 billion (EIA) to \$38 billion (UCS)**

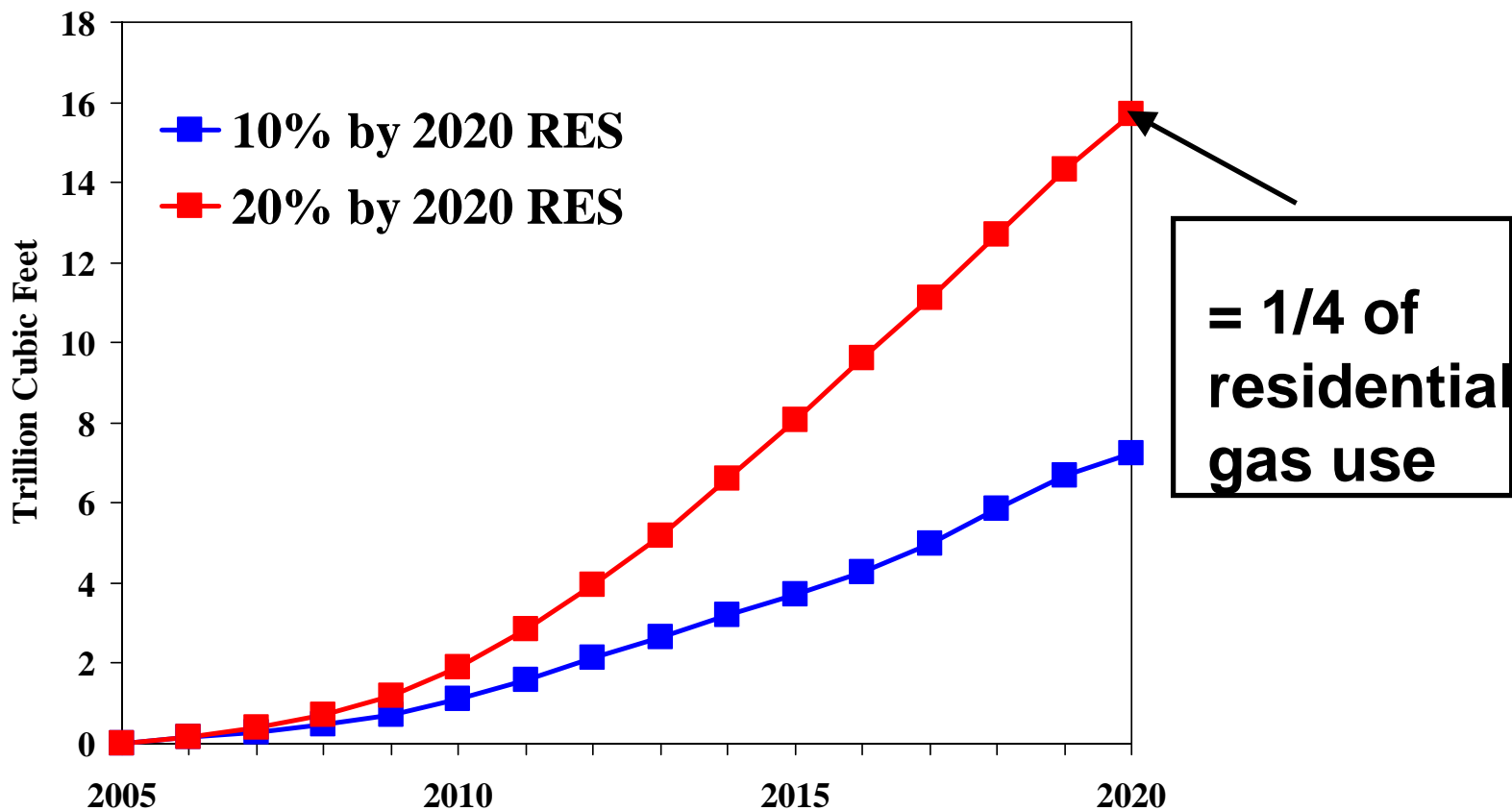
\*Excludes transportation. Net present value using a 7% real discount rate.

**EIA: 71% increase in natural gas home heating bills for the Midwest this winter**



# Renewable energy can help save natural gas, ease supply crunch

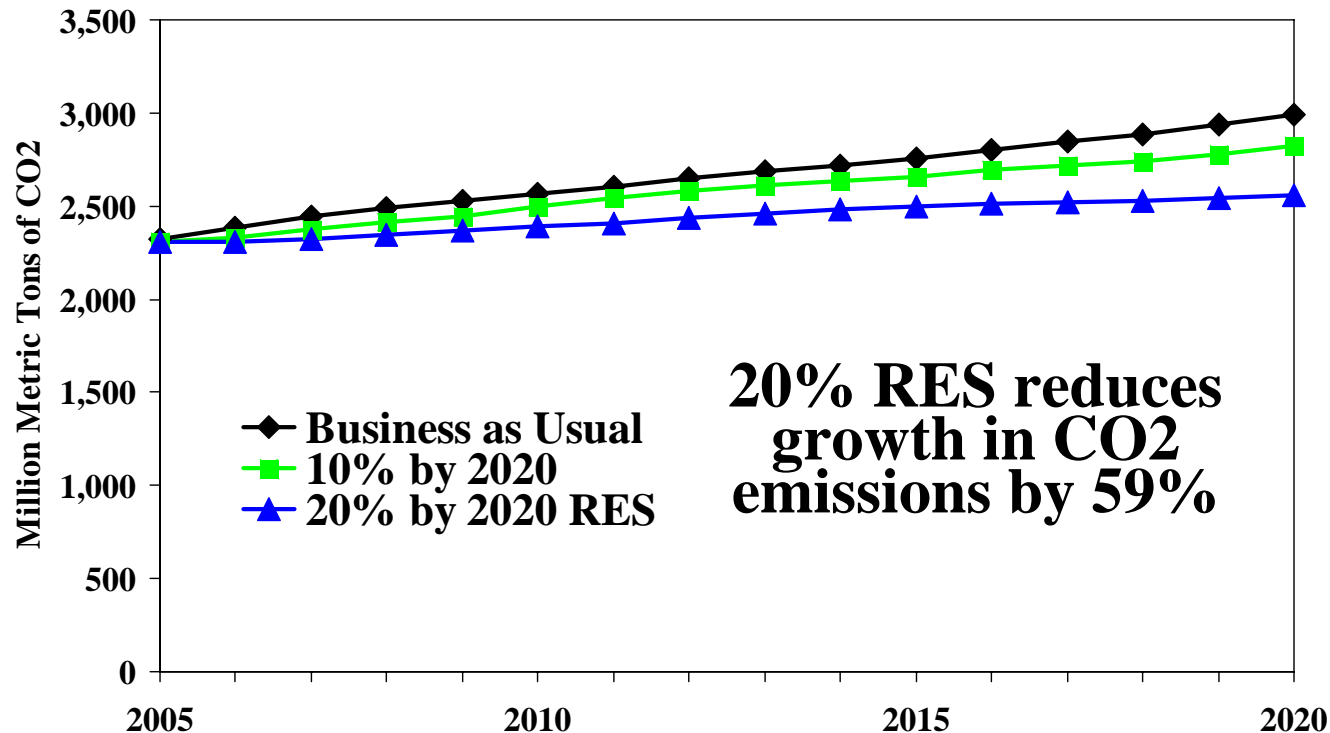
## Cumulative US Natural Gas Savings





# Renewable Energy Reduces Emissions and Environmental Compliance Costs

## Carbon Dioxide Emissions, U.S. Power Plants





# **JEDI: A New Tool for Evaluating the Economic Benefits of Wind Power**

- **Jobs and Economic Development Impacts (JEDI) model, developed by the National Renewable Energy Lab (NREL)**
- **User-friendly model for identifying the state or local benefits of constructing and operating wind projects**
- **Designed for a broad user base with varying experience with economic development modeling**
  - **Wind developers, renewable energy advocates, government officials, decision makers, and other potential users who might not have the resources to develop their own economic development model**
- **Can incorporate state or local economic data and project specific data**
- **Model available at:**  
**[www.eren.energy.gov/windpoweringamerica/economics.html](http://www.eren.energy.gov/windpoweringamerica/economics.html)**



# Conclusions

- ✓ **Wind power can provide significant rural economic benefits and more jobs and income than fossil fuels**
- ✓ **State renewable electricity standards are key driver for wind and economic development and for creating long-term stable markets**
- ✓ **National renewable electricity standard would provide even greater economic benefits**
- ✓ **Wind power can provide hedge against natural gas price increases and future limits on carbon emissions**