

A Bright Future for the  
**Heartland**

POWERING THE MIDWEST ECONOMY WITH CLEAN ENERGY

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**July 2011**



**Union of Concerned Scientists**

Citizens and Scientists for Environmental Solutions

# Major Findings



Job Creation: 85,700 new net jobs

Economic Development: \$40.9 billion in new capital investment

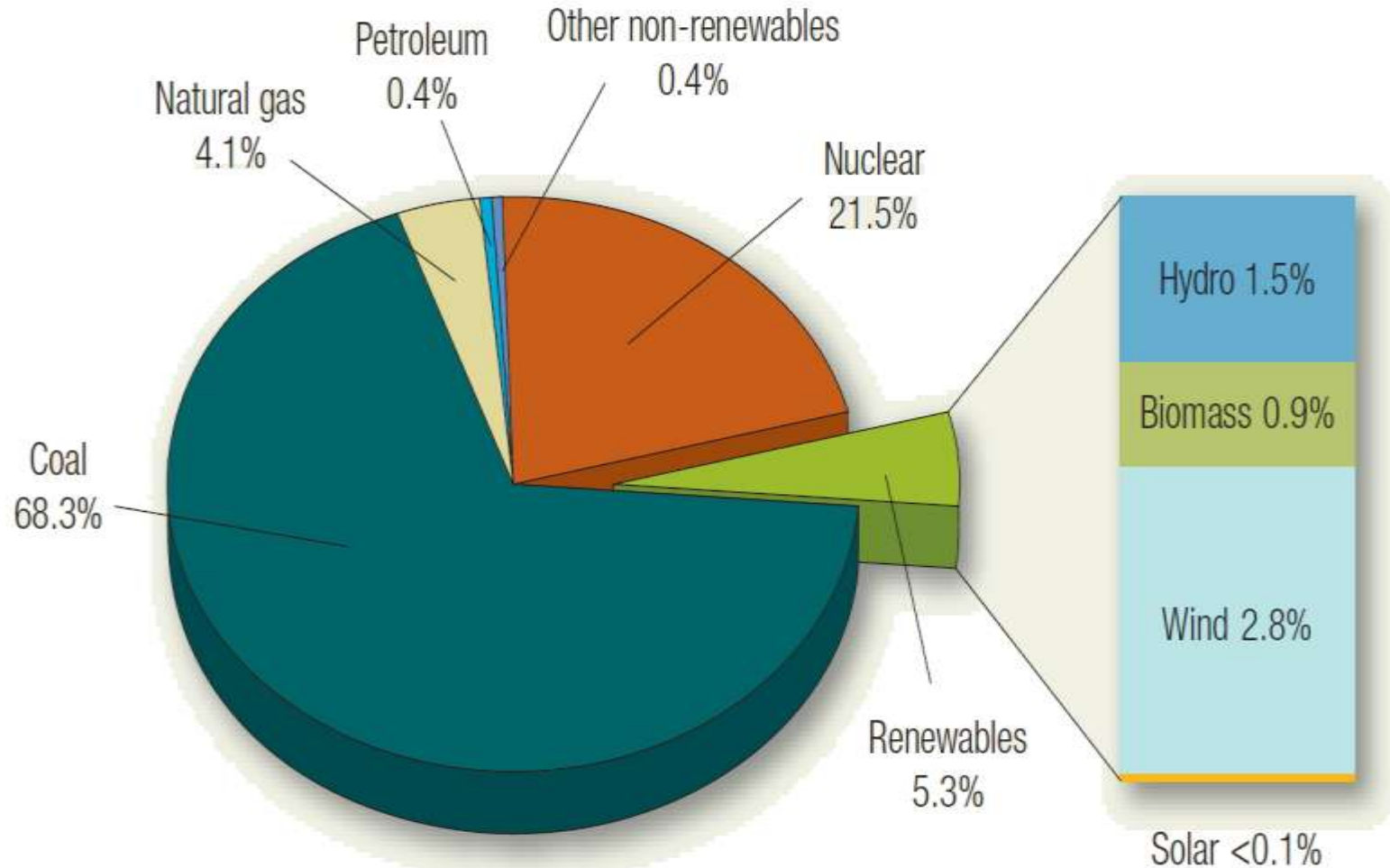
Consumer Savings: \$42.8 billion in lower electricity and natural gas bills

Diversified Energy Mix: 63,000 megawatts of renewable energy capacity

Climate Solution: Avoid global warming pollution from power plants equal to annual emissions from 30 typical coal plants

All Midwest states see benefits

# Midwest currently powered mostly by coal...



Sources of Midwestern Electricity, 2009

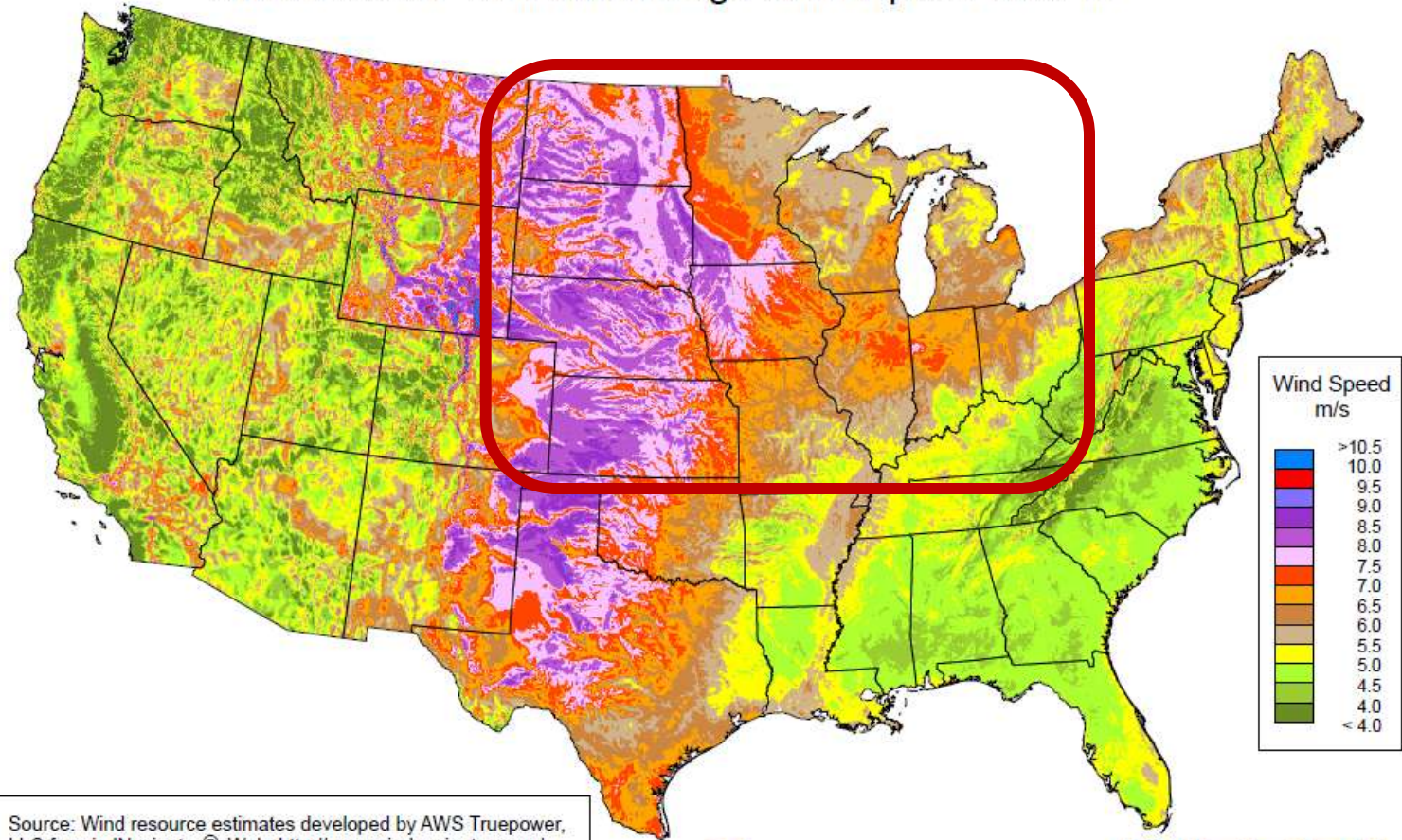
Source: EIA 2010

...largely imported from outside the region



# Midwest states have vast and diverse local untapped renewable resources

United States - Annual Average Wind Speed at 80 m



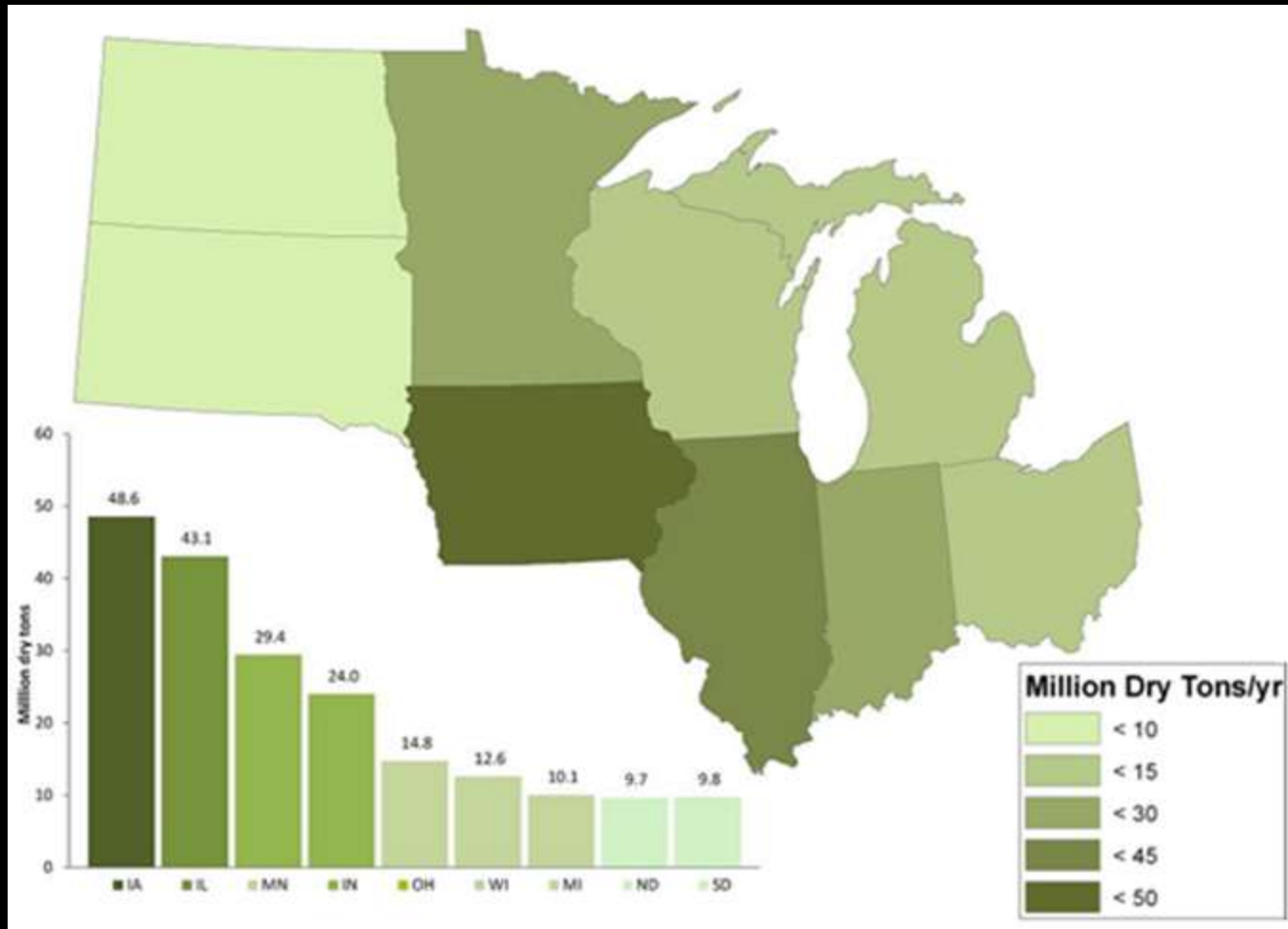
Source: Wind resource estimates developed by AWS Truepower, LLC for windNavigator®. Web: <http://www.windnavigator.com> | <http://www.awstruepower.com>. Spatial resolution of wind resource data: 2.5 km. Projection: Albers Equal Area WGS84.



Source: NREL 2011

# Midwest states have vast and diverse local untapped renewable resources

## Midwestern Biomass Resources



# Skilled labor force and strong manufacturing base

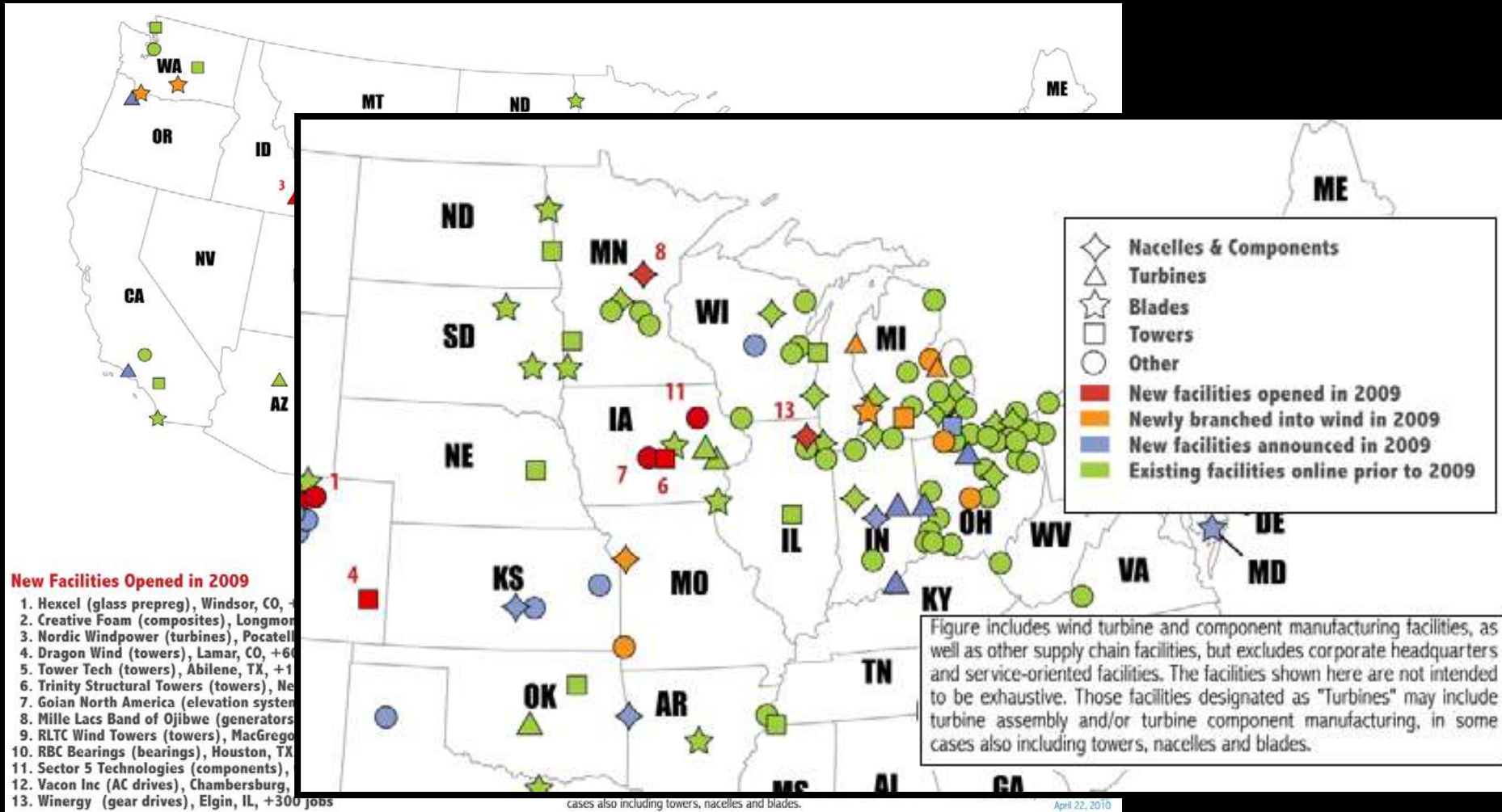


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# Large-scale wind component manufacturers



Source: NREL 2009

# Wind component manufacturers in Ohio



## Active or Emerging Companies in the Ohio Wind Supply Chain

▲	Auxillary .....	29
■	Bearings .....	6
●	Composites .....	27
+	Control Systems .....	8
★	Electrical/Electronics .....	22
▲	Fabrication .....	162
■	Fasteners .....	11
◆	Forge .....	13
●	Foundry .....	19
○	Gears .....	6
▲	Hydraulics .....	16
★	Machine Shops .....	204
■	Metal Coatings .....	25
★	Power Electronics .....	6
◆	Sensors .....	5
○	Support Services for MFG ..	59
○	Other Servies* .....	47
<b>Total .....</b>		<b>665</b>

\*includes engineering, legal, design, communications, and other support services

Source: Ohio Department of Development

# Significant energy efficiency opportunities



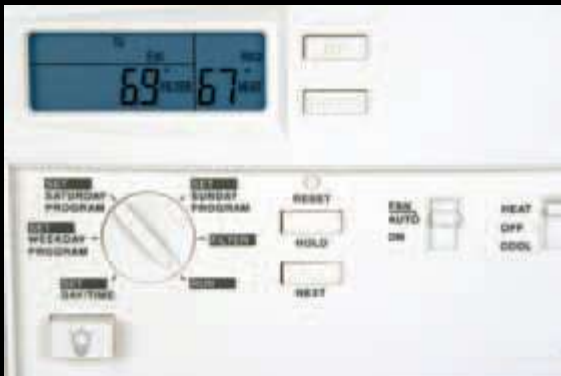
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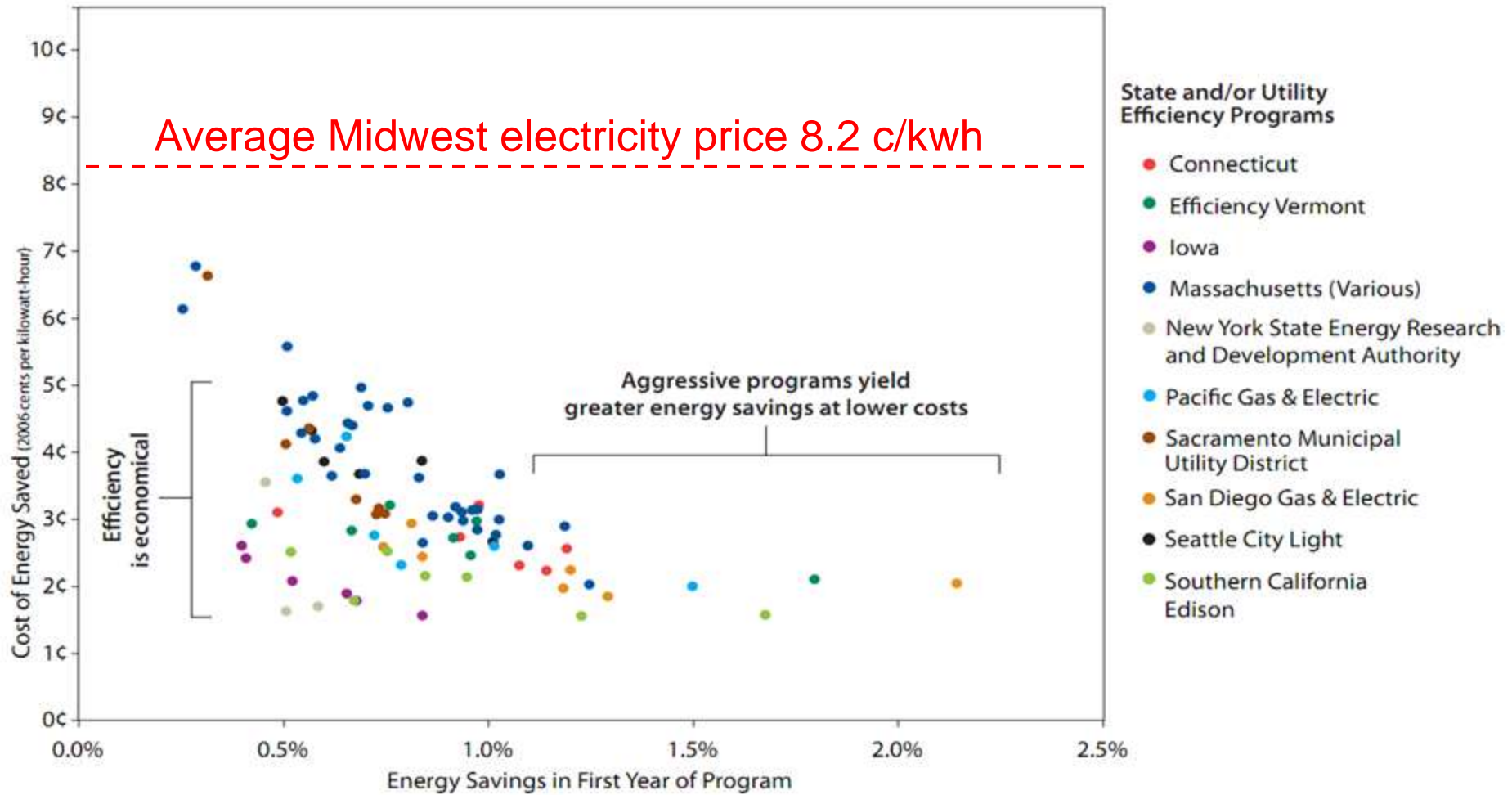


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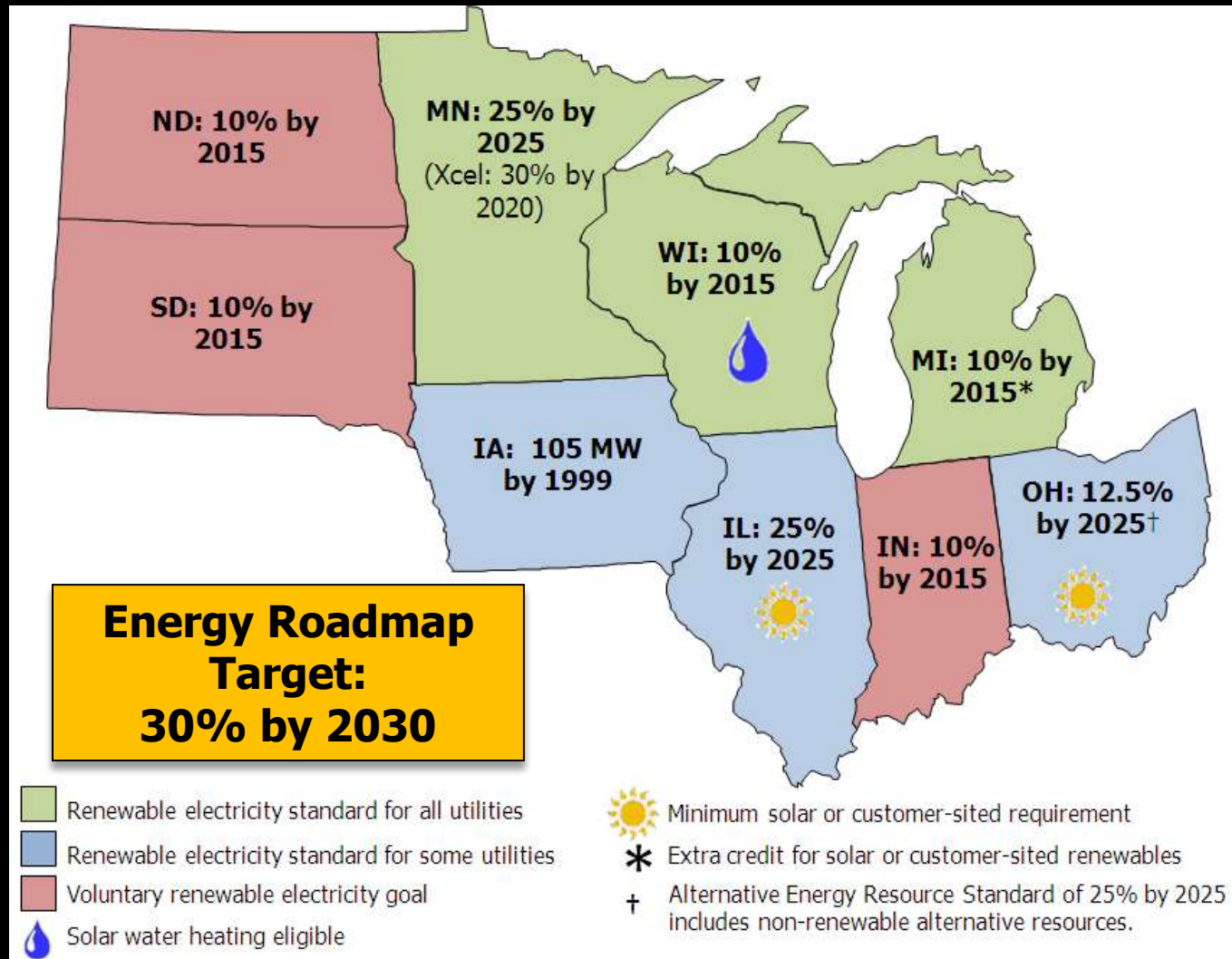
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# Energy efficiency is a low cost option



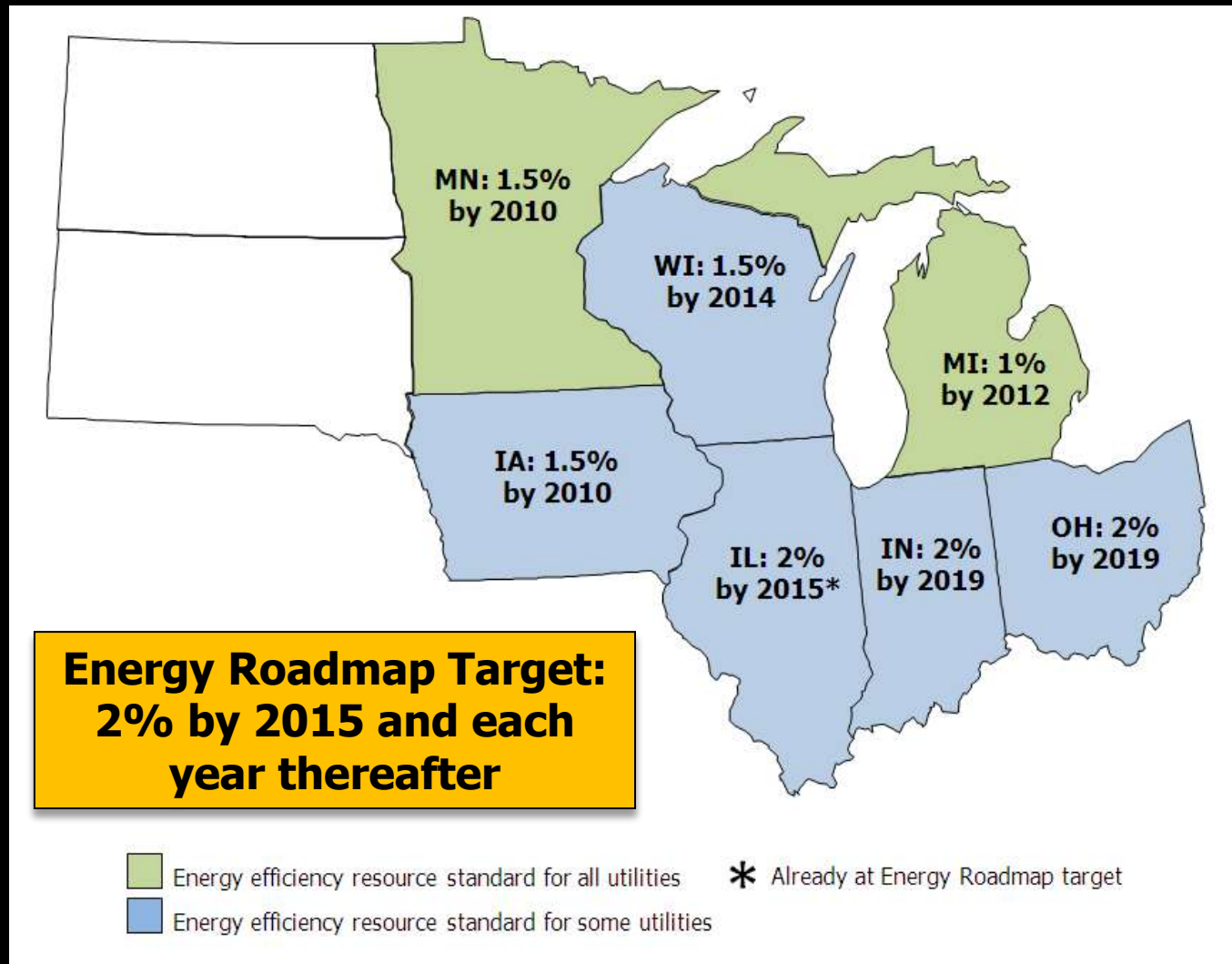
Source: Adapted from Hurley et al 2008.

# States should adopt the MGA Energy Roadmap Renewable Energy Targets



Source: Adapted from dsireusa.org

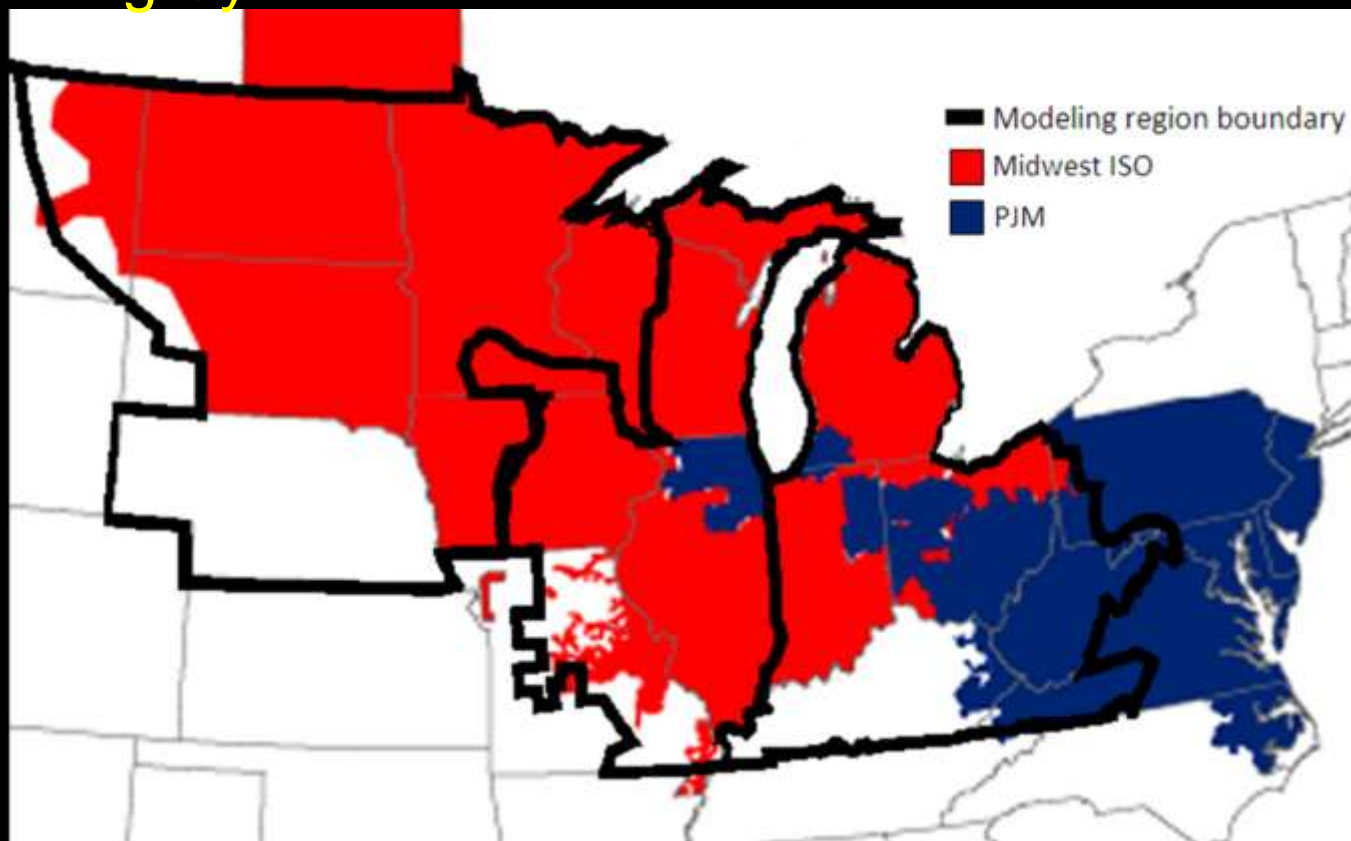
# States should adopt the MGA Energy Roadmap Energy Efficiency Targets



Source: Adapted from dsireusa.org

# Analysis methodology

Used a modified version of the EIA's National Energy Modeling System and IMPLAN economics model



Source: PJM 2011a, 2011b

# Economic benefits - Job Creation

**85,000 jobs created**



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# Other economic benefits

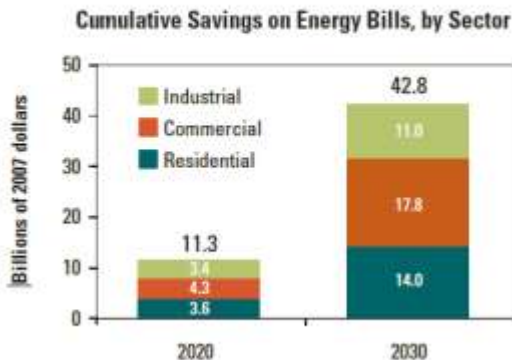
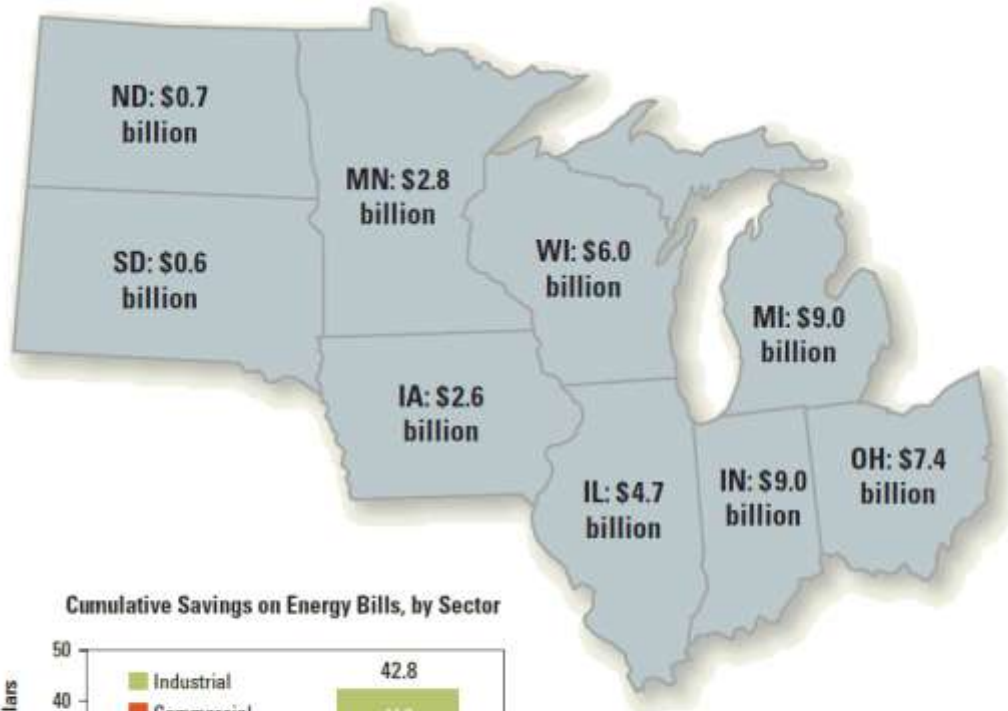


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- New capital investment: \$40.9 billion
- Biomass payments: \$610 million
- Wind land lease payments: \$390 million
- Property tax revenues: 3.5 billion

# Energy bill savings for families and businesses

## Cumulative Consumer Savings on Energy Bills, 2010–2030

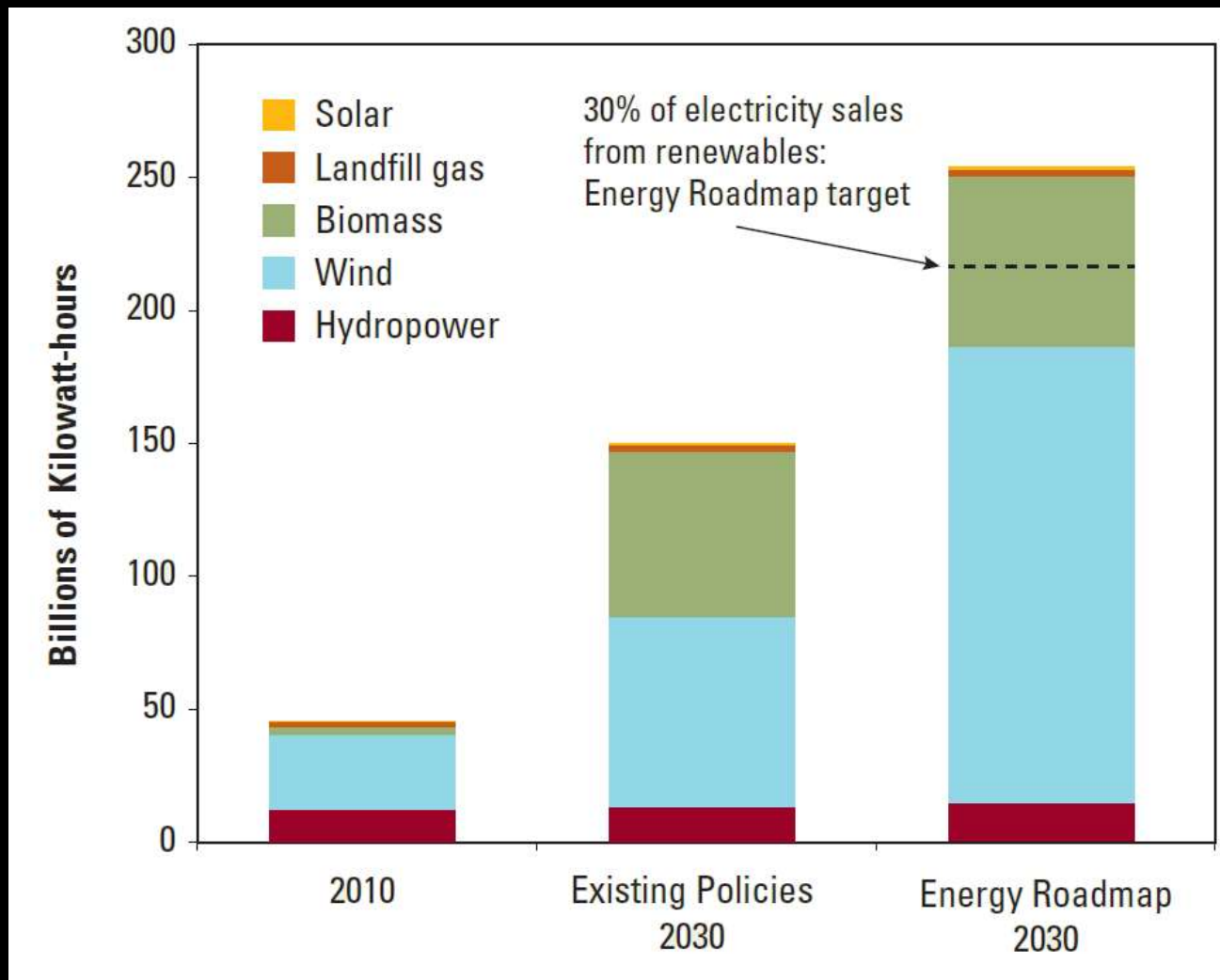


Average Annual Consumer Savings in 2030: \$187 per household

## Residential Annual Consumer bill savings per state in 2020 and 2030

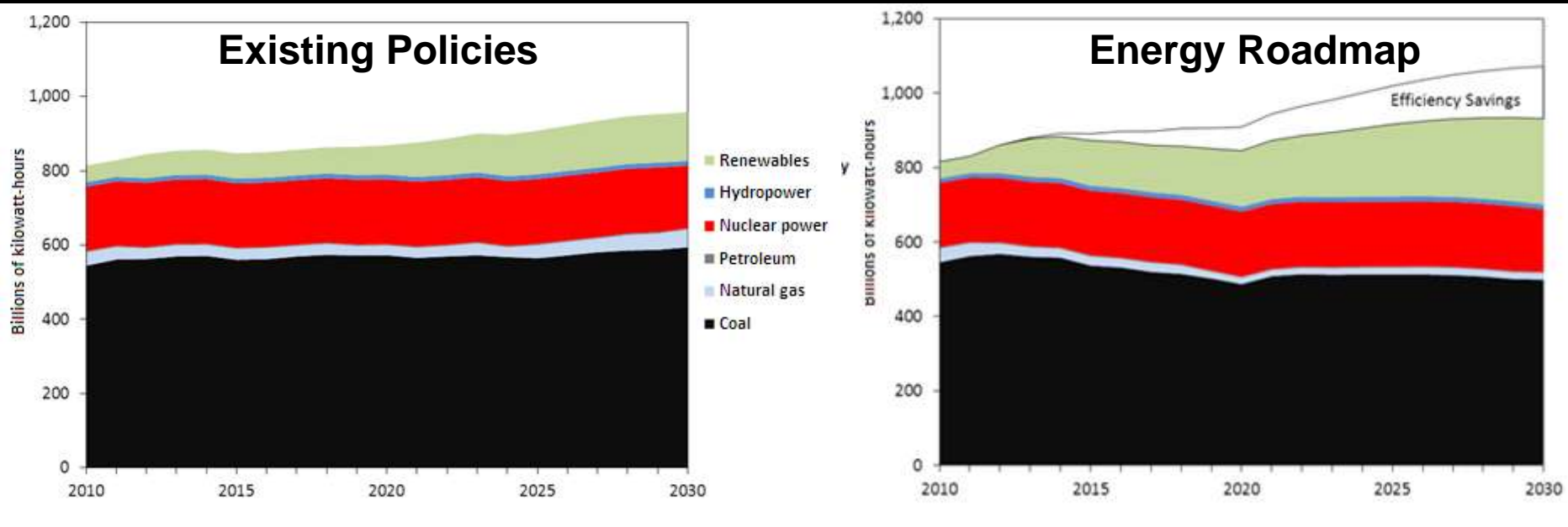
State	2020	2030
IL	\$ 15	\$ 79
IN	\$ 135	\$ 371
IA	\$ 75	\$ 226
MI	\$ 84	\$ 232
MN	\$ 35	\$ 141
ND	\$ 91	\$ 274
OH	\$ 50	\$ 124
SD	\$ 70	\$ 210
WI	\$ 98	\$ 269
<b>Wt. Avg.</b>	<b>\$ 64</b>	<b>\$ 187</b>

# Renewable energy development



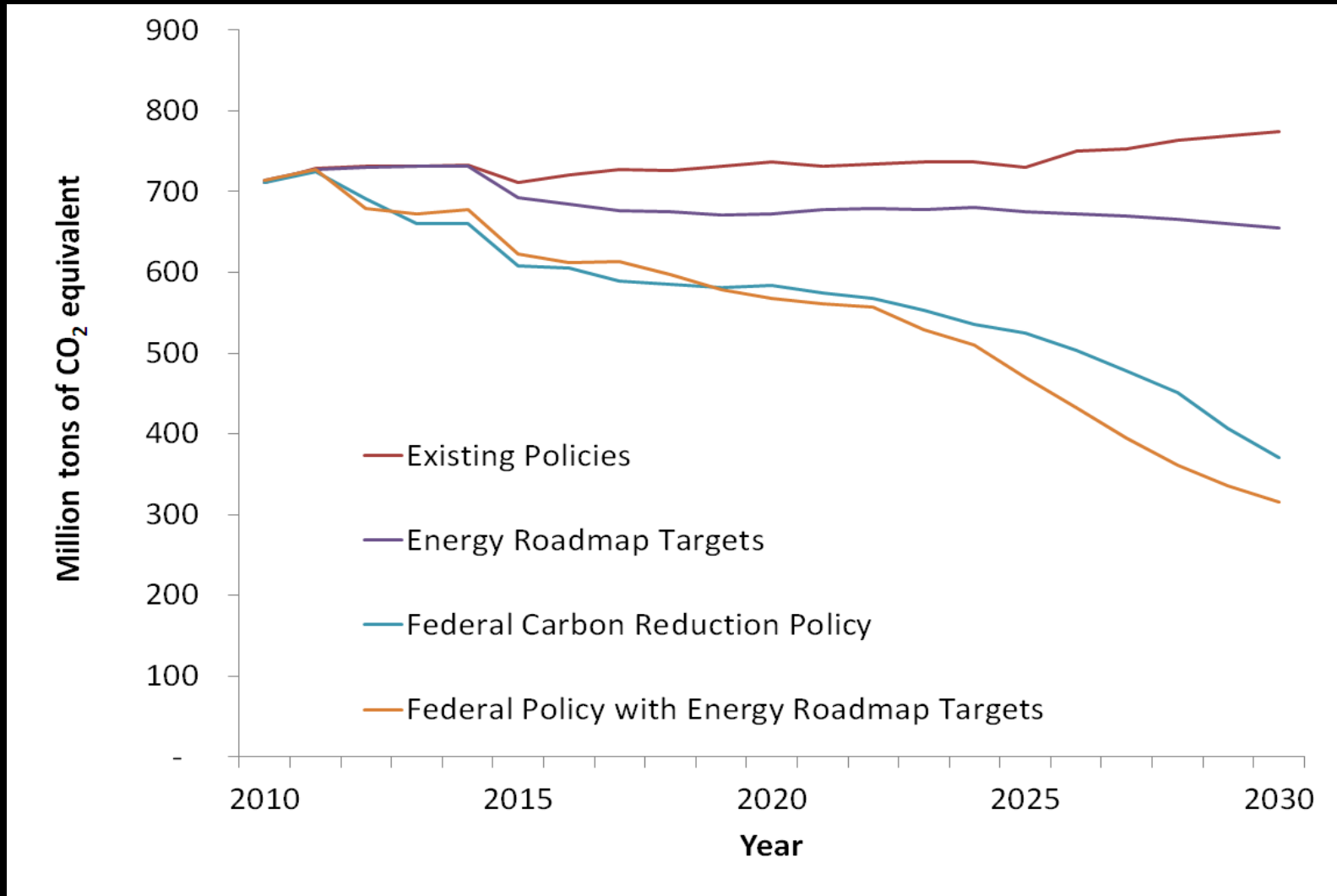
Renewable energy Mix in 2010 and 2030 with and without the Energy Roadmap targets.

# More diversified electricity mix



# Climate solution - a good first step

## CO2 Emissions from Midwest Power Plants under various scenarios



# In Conclusion



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Middle photo: © Suzlon Wind Energy Corporation

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# A call to action

- Help get the word about our report out in your state



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- Contact your Governor to
  - Support strengthening clean energy policies
  - Oppose threats



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**QUESTIONS?**

# References

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