Recycled Energy

Save Money, Cut Pollution, and Increase Industrial Productivity

Advancing Renewables in the Midwest Conference

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Presentation Overview

- The world faces an economic, energy and environmental storm, but the Midwest can turn this into a huge opportunity by tapping into a resource at our industrial base.

- Generation of heat and power causes 2/3's of CO_2 emissions but generation efficiency has not improved in 50 years.

- Policy changes could make the Midwest and the U.S. a world leader in reducing carbon while improving manufacturing competitiveness and standard of living.

RED
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What is Energy Recycling

- The Elephant in the Room
- Opportunity for the Midwest
- Regulatory Barriers & Policy Incentives

What is Energy Recycling?

- Energy-intensive manufacturers consume massive amounts of energy to transform raw materials, then vent waste energy.
  - Waste energy comes in many forms – heat, flare gas, pressure drop, etc.
  - Energy recycling plants upgrade waste into electrical and thermal energy.
- Target industries include: metals, lime, cement, chemicals, refineries, gas compressor stations, glass, and most large steam or natural gas users.

West Virginia Silicon Metal Plant
Waste Heat Recovery Project

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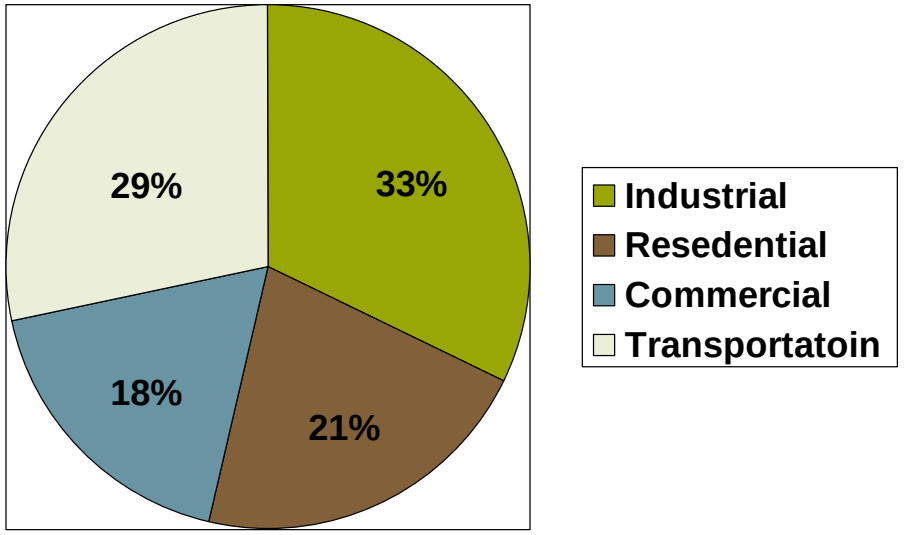
Policy Incentives

Industrial Efficiency Largely Ignored in Energy Policy Discussions

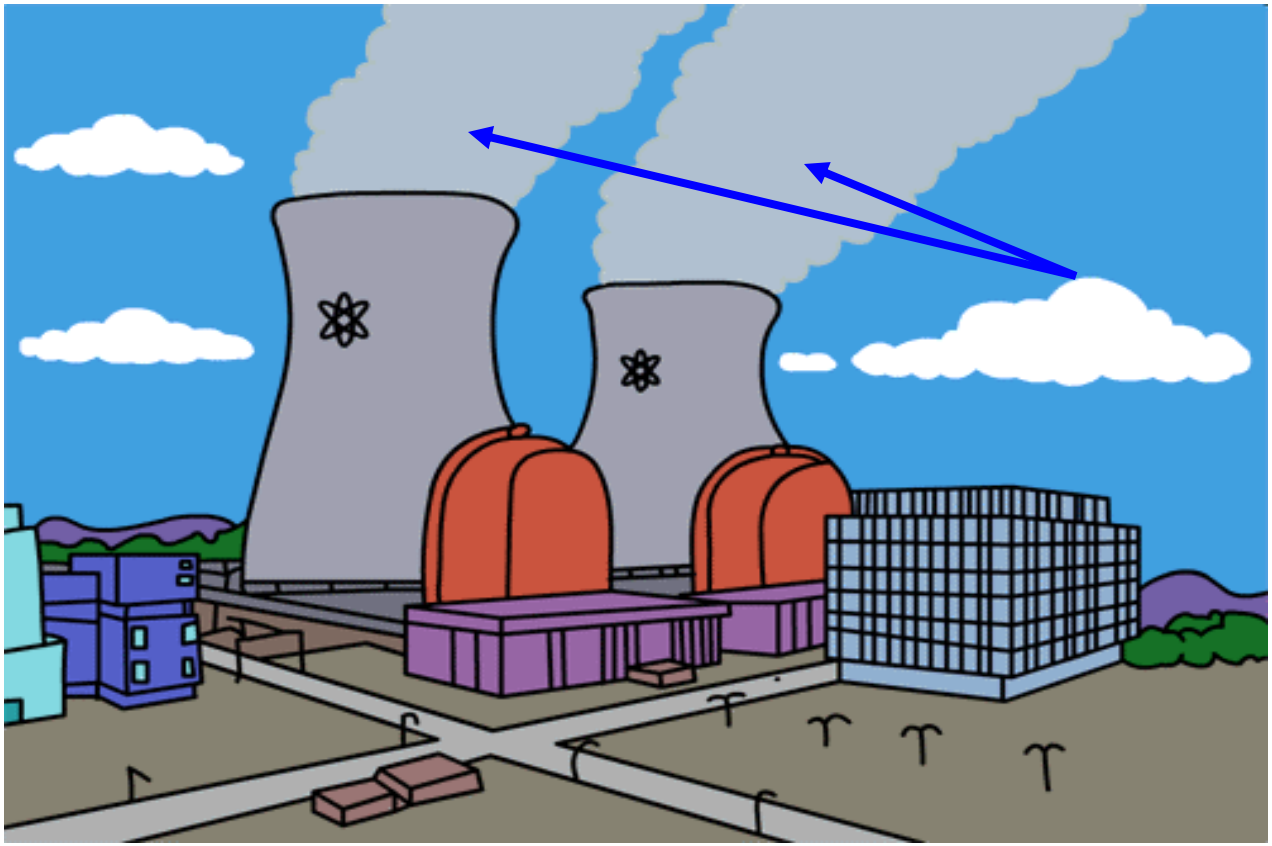
Industrial Energy Consumption

The industrial sector is the largest energy consumer in the US.



Source: DOE EIA, Annual Energy Outlook 2008.

Homer Simpson's generating plant wastes lots of energy…



...so do ours

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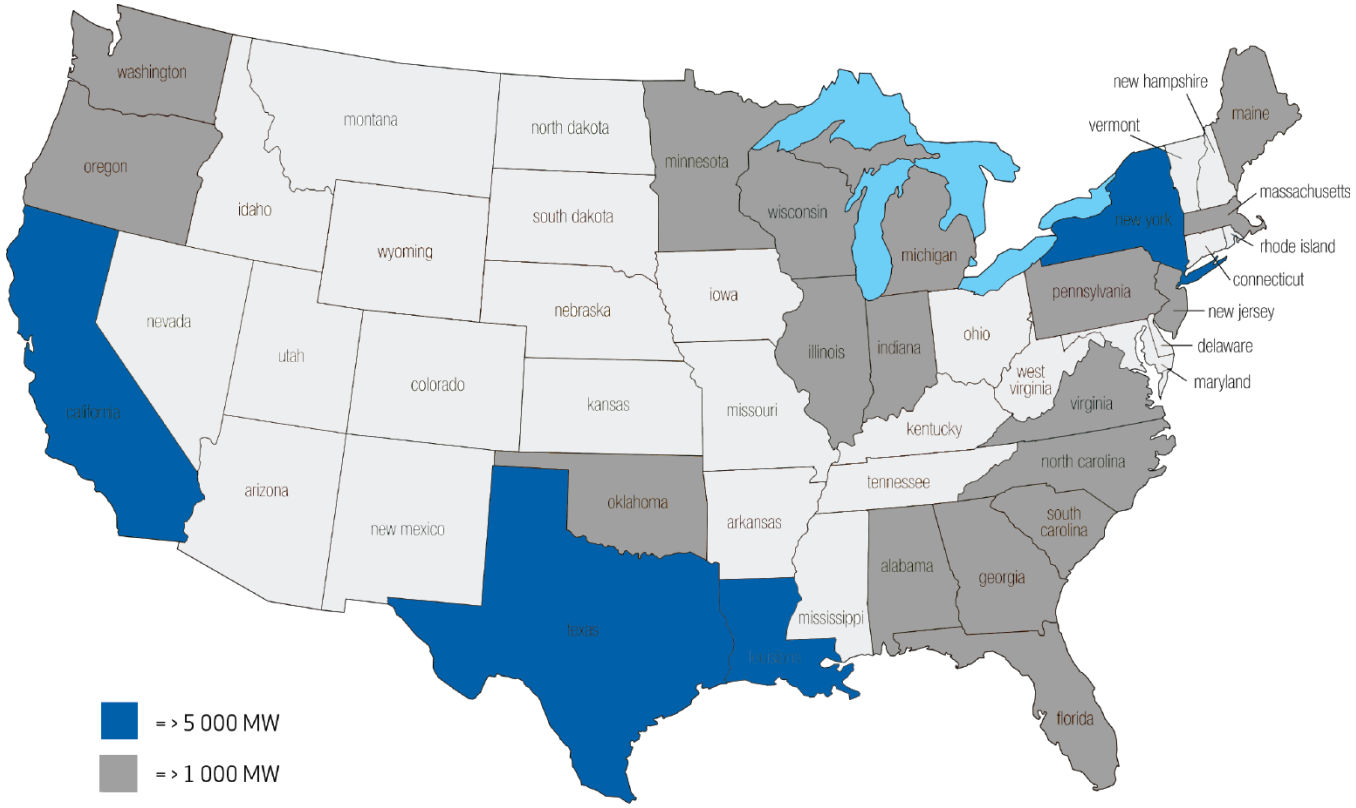
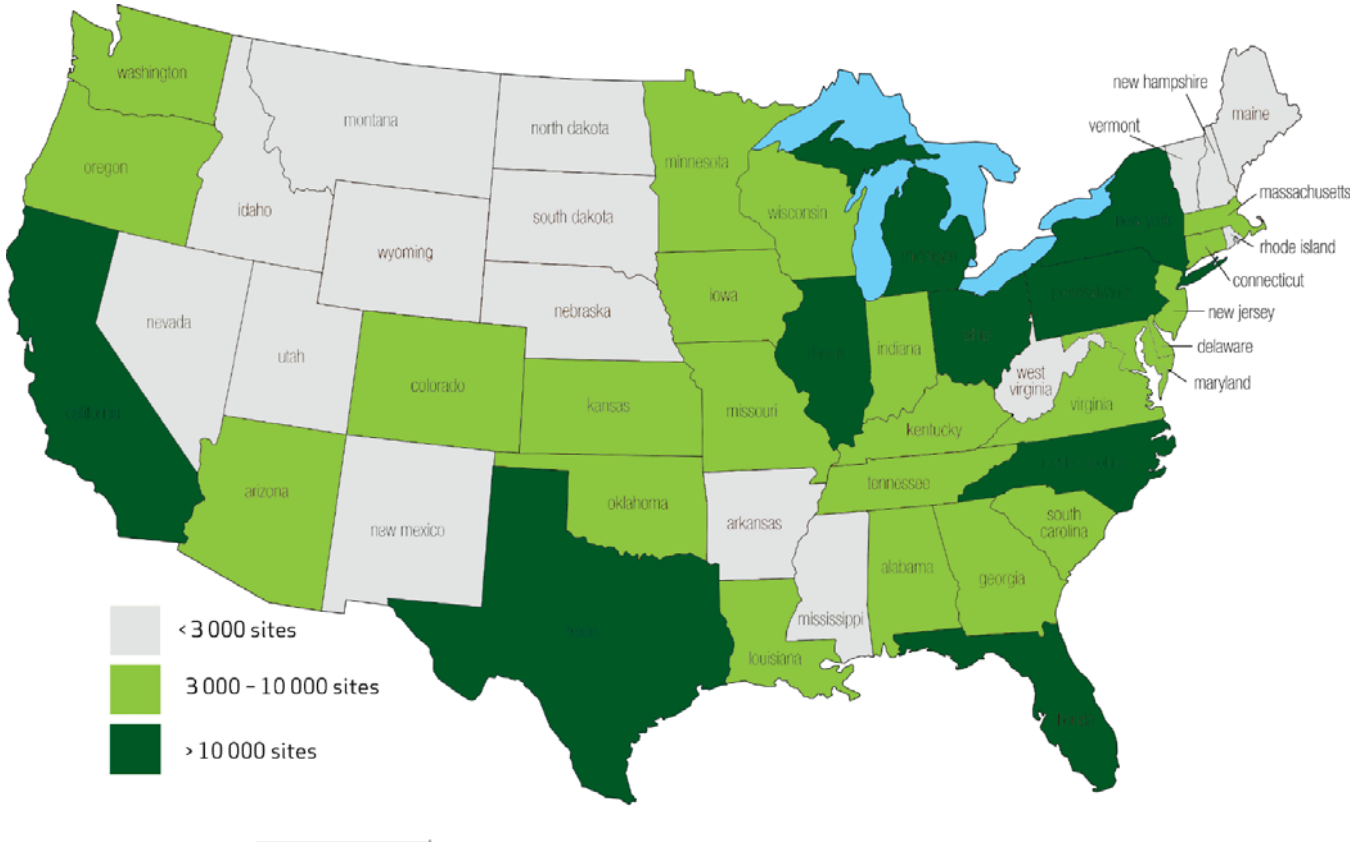
Midwest states do not rank among the top for installed CHP…



Source: International CHP/DHC Collaborative, US Scorecard, 2008.

…however Midwest states have tremendous technical potential for CHP



Source: International CHP/DHC Collaborative, US Scorecard, 2008.

Benefits of Recycled Energy / CHP

Job Retention and Creation: CHP/WHR systems help make facilities more cost competiveness which preserve and creates valuable industrial jobs.

Economic Development: The Midwest's manufacturing sector makes up a large part of the economy. CHP/WHR systems can provide an additional revenue stream to these facilities.

Environmental: CHP/WHR systems can help reduce a facilities carbon footprint. Carbon reduction strategies can help secure the Midwest's place in the global market by making manufacturers leaner and greener.

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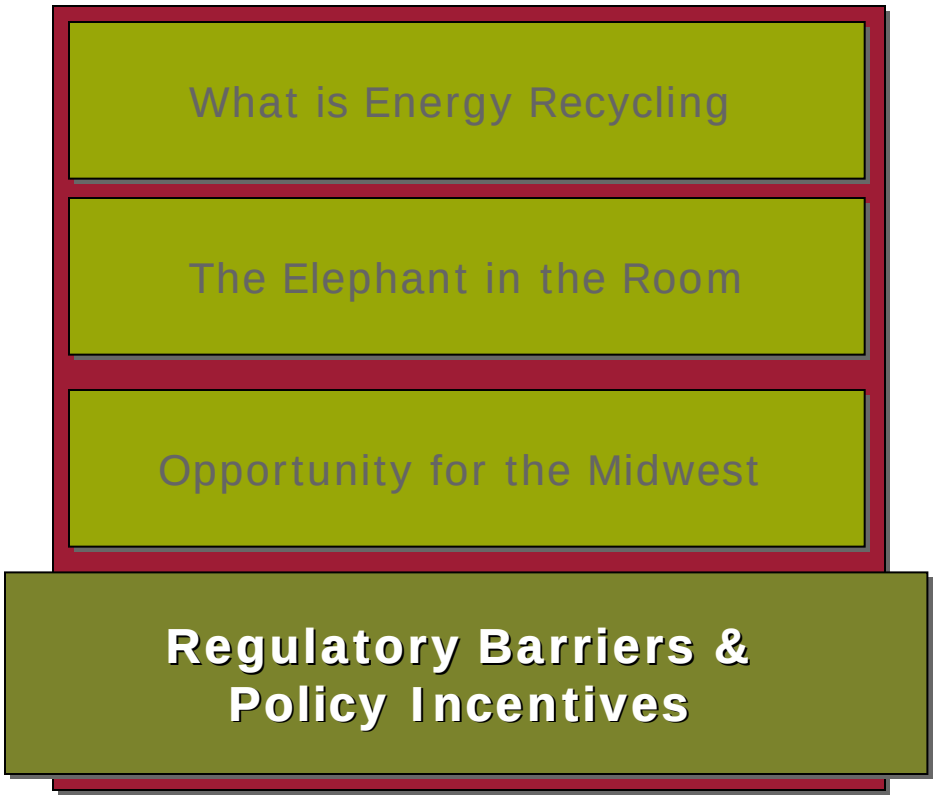
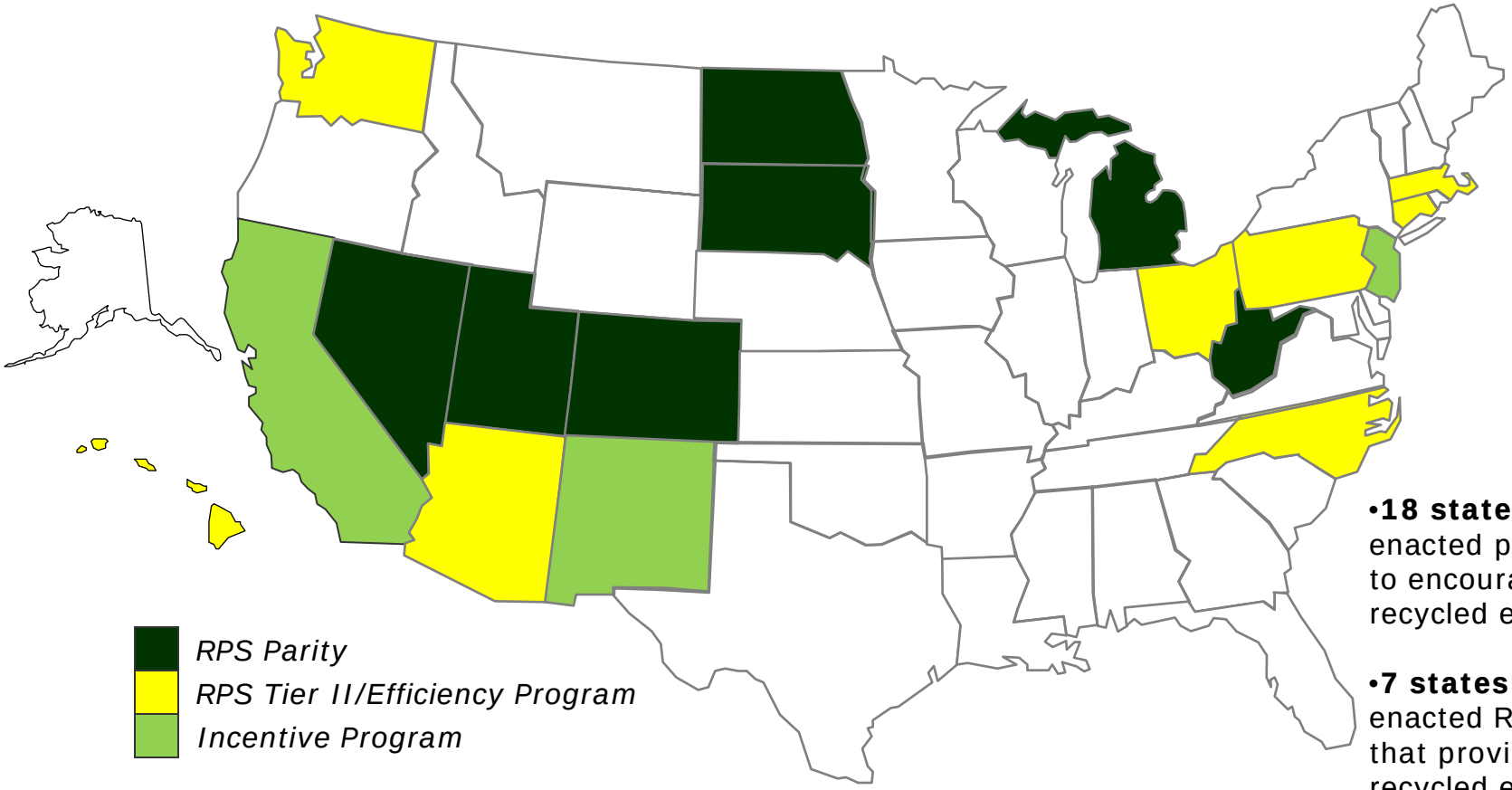


Regulatory Barriers to Industrial Efficiency

- Few utility incentives for industrial efficiency
- The 1970 Clean Air Act (CAA) does not mandate efficiency
- New Source Review (NSR) under the CAA discourages industrial efficiency projects
- Few states have enacted policies to encourage industrial efficiency
- Generally, waste heat recovery is not an RPS eligible resource

State Policies that Encourage Recycled Energy / CHP



- **18 states** have enacted policies to encourage recycled energy
- **7 states** have enacted RPS's that provide recycled energy parity with renewable energy

Policy Incentives

- Include recycled energy in state Renewable Portfolio Standards (CO, MI, ND, NV, SD, UT, WV).
- Promote recycled energy/CHP in efficiency standards (WA).
- CHP feed-in tariff programs. California is the first state to enact a CHP feed-in tariff and they have started to qualify projects for participation.
- Public financing programs. Pennsylvania has grant s and low interest loans available for CHP energy development.
- State tax breaks for the development of recycled energy/CHP (NM).

Conclusions

- Deploying clean energy in the Midwest, as well as the entire U.S. would cut the cost of electricity and thermal energy.
- The Midwest has the manufacturing for the steel, cement, silicon, and other components required for new clean energy plants.
- **To profitably lower CO_2 emissions and improve Midwest competitiveness, we must change the way we generate electricity and thermal energy.**
- **Renewable energy and efficiency must be the fuel of the future.**