



U.S. DOE Midwest Clean Energy Application Center

Promoting CHP, District Energy & Waste Heat Recovery

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Illinois Save Energy Now Industrial Energy Efficiency Forum

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U.S. DEPARTMENT OF ENERGY
Midwest Clean Energy Application Center

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U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Evolution of “Clean Energy Application Centers”

- Originally Established as “Regional **CHP** Application Centers”
- Pilot Center Started in 2001 in the Midwest
- Eight Regional CHP Application Centers Established in 2003/2004 through DOE Competitive Process
- Energy Independence & Security Act (EISA) - 2007
 - *Re-designated the 8 Regional “**CHP** Application Centers” as “**Clean Energy** Application Centers”*
 - *Directs DOE to Continue the Operation and Effectiveness of the 8 Centers*



Clean Energy Application Centers (RACs)

- **Mission:** Develop technology application knowledge and the educational infrastructure necessary to lead “clean energy” technologies as viable energy options and reduce any perceived risks associated with their implementation
- **Focus:** Provide an outreach and technology deployment program to end users, policy, utility, & industry stakeholders aimed at:
 - **Targeted Education**
 - **Unbiased Information**
 - **Technical Assistance**



“Clean Energy” Technologies

CHP



The sequential production of electric and thermal power from a single dedicated fuel source

Waste Heat Recovery



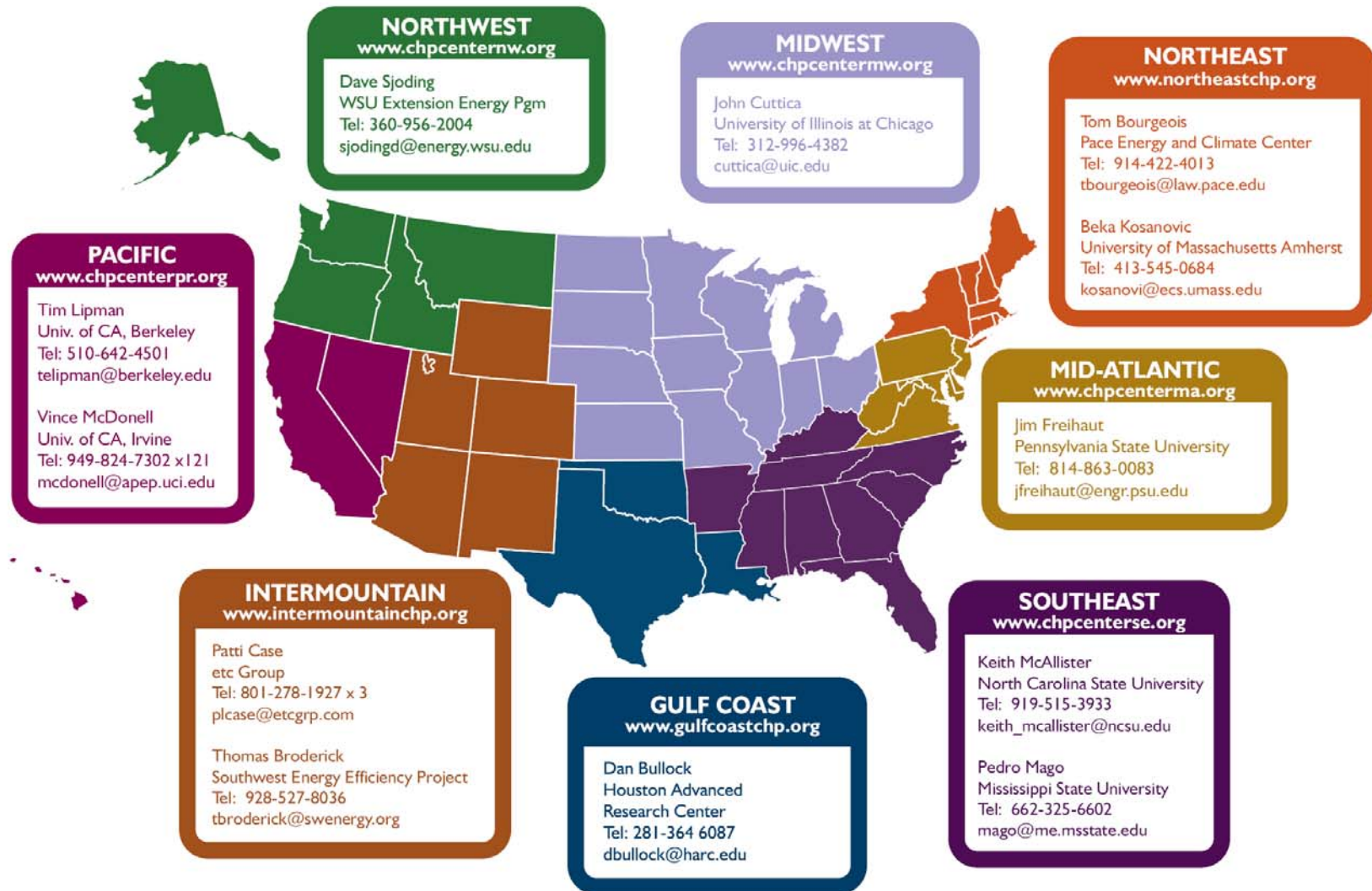
Captures heat otherwise wasted in an industrial process and utilizes it to produce electric power. These systems may or may not produce additional thermal energy

District Energy



Central heating & cooling plants that incorporate electricity generation along with thermal distribution piping networks for multiple buildings (campus / downtown area)

DOE Clean Energy Application Center Locations, Contacts, and Web Sites



For more information visit <http://www1.eere.energy.gov/industry/distributedenergy/racs.html>

DOE Clean Energy Application Center Program Contacts

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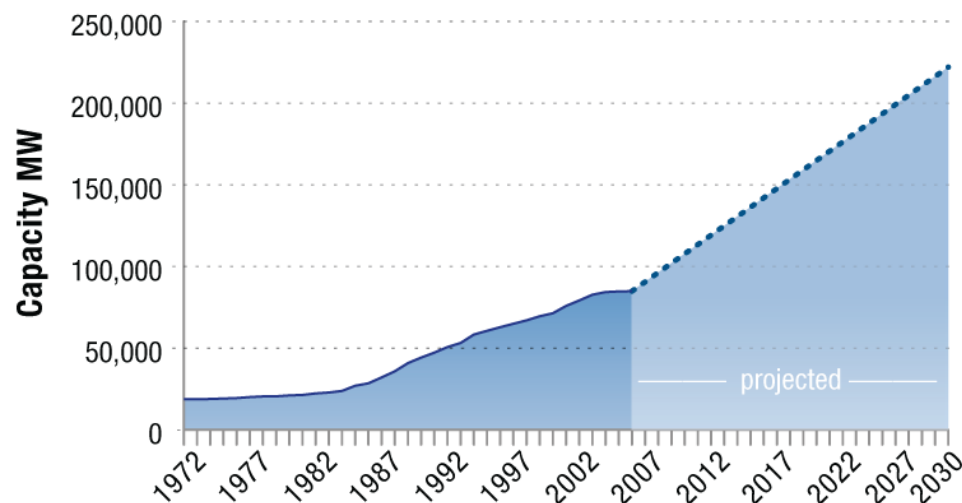
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CHP Program Manager
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RACs Support DOE Industrial Technology Program (ITP)

- ITP overall goal of reducing energy intensity in the industrial sector by 25% over the next ten years
- Increase CHP Capacity from 9% of total generating capacity in 2010 to 20% by 2030

Historical CHP Capacity and Growth Needed to Achieve 20% of Generation



- \$234 billion private sector investment
- Nearly 1 million new jobs
- Reduces fuel use and CO₂ emissions

Source: Combined Heat & Power – Effective Energy Solutions for a Sustainable Future Dec. 2008



RAC Services & Capabilities

Unbiased Information

Develop & distribute informational materials

Perform market research to identify high profile candidate applications

Targeted Education

Develop & conduct target market workshops, seminars, internet programs to educate end users, regulators, and other stakeholders

Assist in overcoming policy and other market barriers

Technical Assistance

Provide technical assistance to potential user sites

Provide or coordinate on-site assessments for entities considering deployment of clean energy technologies



Information (State & Regional Basis)

Type of Information

- Basic Information
- Market Specific Applications
- Policies & Regulations
- Installations and Contacts
- Project Profiles
- Technical Reports/Studies
- Evaluation Tools
- News & Events
- Presentations

www.MidwestCleanEnergy.org

www.CHPCenterMW.org



Information Examples

- Over 100 Project Profiles Available
- CHP Guidebooks (more than 150,000 copies downloaded since 2004)
- CHP Site Walk-thru Document
- CHP Installation Data Base by State
- Numerous Technical Reports

The collage displays several documents from the Midwest CHP Center:

- SC Johnson Waxdale Plant 6.4 MW CHP Application**: A project profile document with sections for Quick Facts, Project Overview, and Project Description. It includes a photograph of the plant.
- Broshco Fabricated Products 4.55 MW CHP Application**: Another project profile document with similar sections and a photograph of the facility.
- Combined Heat & Power (CHP) Resource Guide**: A guidebook with a yellow and red cover, titled "Second" edition. It covers Integrated Energy Systems (IES), Cooling, Heating and Power, Cogeneration (Cogen), and Total Energy Systems.
- Combined Heat & Power (CHP) Resource Guide for Hospital Applications**: A guidebook with a white and red cover, published in 2007. It is provided by the Midwest CHP Application Center, Avalon Consulting, Inc., and Oak Ridge National Laboratory.



Education Examples

- Educated Over 25,000 Individuals on CHP
 - 120+ targeted workshops, seminars, webinars
 - 60+ conferences
- Audiences:
 - State Policy Makers
 - Targeted Market Sectors
 - Architects and Engineers
- Presentation Materials Available on Website

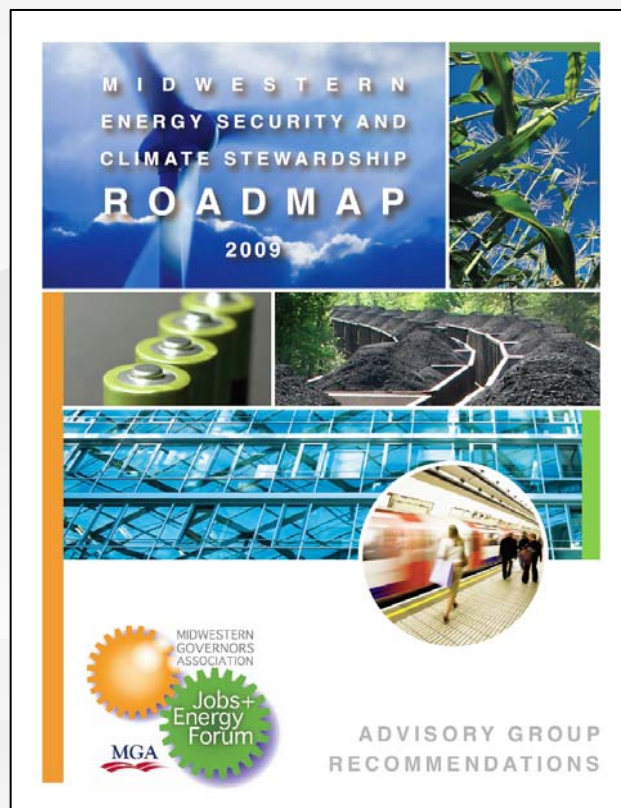


Springfield, Illinois



Wooster, Ohio

Sample Accomplishments - Policy



- **Midwest Governors Association** published their “Midwestern Energy Security & Climate Stewardship Roadmap 2009” which was approved by the Midwest Governors

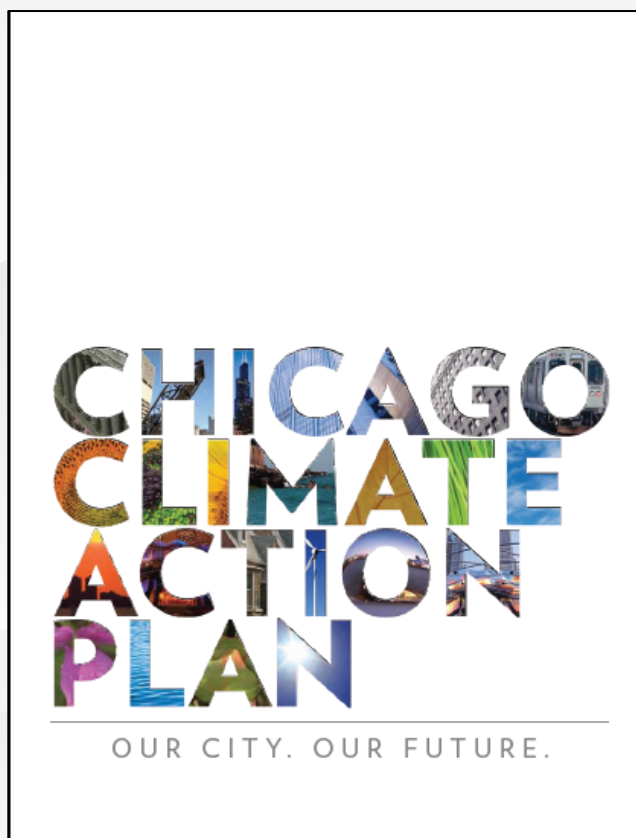
Midwest RAC provided:

- All the input on CHP (education and analytic calculations) for the report
- Participated in the MGA task force
- The report calls for doubling the CHP capacity in the Midwest by 2030 (21.2 GW) with annual CO₂ emissions avoidance of 64 MMT annually
- The report outlines policy needs to reach those targets (Midwest RAC input)

<http://www.midwesterngovernors.org/Publications/Roadmap.pdf>



Sample Accomplishments - Policy



- Mayor Daley created a multi-stakeholder task force to produce a **“Chicago Climate Action Plan” (CCAP)**

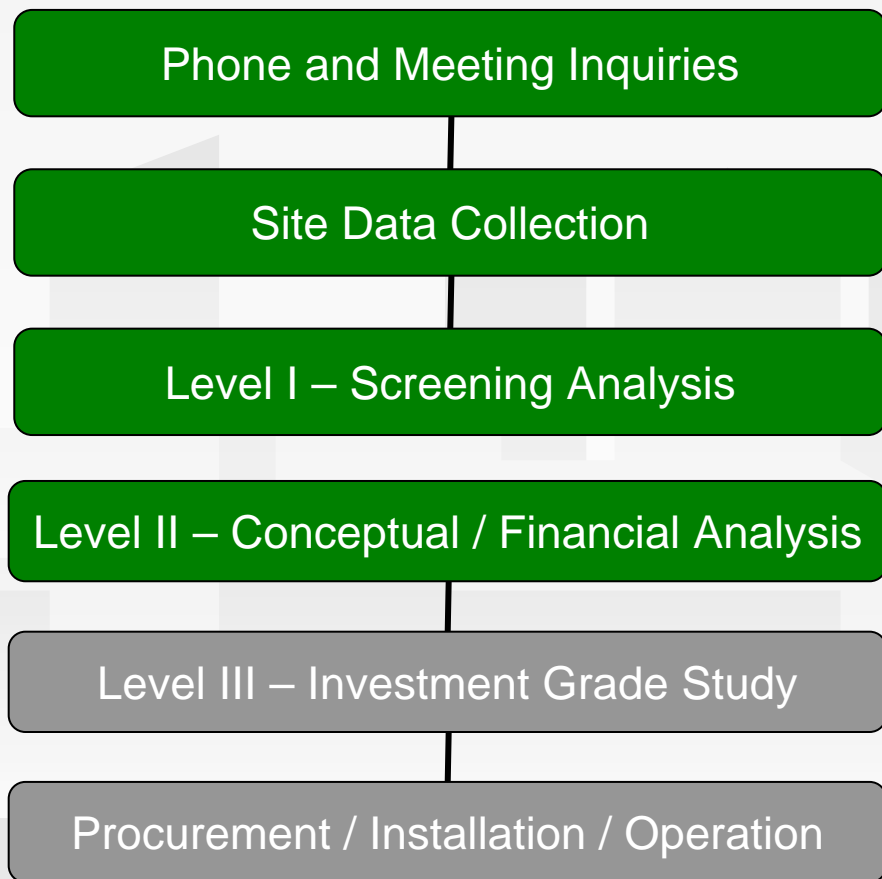
Midwest RAC worked with the ELPC to provide:

- Input on CHP (education and analytic calculations) for the report
- The report calls for DG/CHP replacing more than 2 GWh of electricity and 81 million therms of natural gas by 2020, resulting in a drop of 1.12 MMTCO₂e



Technical Assistance

Feasibility Steps



RAC Capabilities

- Analysis Performance thru Level II
- Consulting Expertise thru all Steps
- Bringing customers and CHP engineering community together

RAC Project Support

- Over 225 assessments & 700 tech support activities
- Represents over 1.5 GW installed or in development



Sample Accomplishment – Technical Assistance

- **Illinois Renewable Energy Resources Biogas and Biomass to Energy Grant Program**
- Midwest RAC manages program for IL DCEO
- Recently Awarded Projects include:
 - **Hunter Haven Farms**: 130 kW biogas-fired CHP reciprocating engine
 - **Packer Engineering**: development and operation of CHP gasification system to increase acceptable feedstock
 - **John Deere Harvester Works**: co-firing of agricultural corn bran pellets and wood chips in existing coal fired CHP system





Questions / Discussions

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