• IEDA Energy Team and Programs
• Importance of Energy and Water Use in Iowa
• EDGE Industrial Recognition Program
• Incentives for Energy Projects
• Combined Heat and Power Initiative
Housed at the Iowa Economic Development Authority

Formerly the Iowa Office of Energy Independence

Small Team - 4 team members

Focus Areas

- Energy Efficiency (Public and private sectors)
- Renewable Energy
- Biomass and Biofuels
- Public policy
Water and Energy Trends
Sector Energy Use Trend in US

U.S. total energy consumption estimates by end-use sector, 1950-2011
quadrillion Btu

- Industrial
- Transportation
- Residential
- Commercial
Energy Source Trend by Sector

Energy consumption estimates by end-use sector, 1950-2011

- Residential consumption, by major source (quad Btu):
  - coal, natural gas, petroleum, renewables, electrical losses, electricity

- Commercial consumption, by major source (quad Btu):
  - coal, natural gas, petroleum, renewables, electrical losses, electricity

- Industrial consumption, by major source (quad Btu):
  - coal, natural gas, petroleum, renewables, electrical losses, electricity

- Transportation consumption, by major source (quad Btu):
  - petroleum, natural gas, renewables

IOWA economic development
Energy Consumption by Sector in Iowa

Iowa Energy Consumption by End-Use Sector, 2010

- Residential: 16.4%
- Commercial: 13.6%
- Industrial: 49.1%
- Transportation: 20.9%

Source: Energy Information Administration, State Energy Data System
Industrial Energy Use Trend in Iowa

Total Industrial Energy Usage

- Iowa
- National Average

500 550 600 650 700

Midwest Energy Efficiency Alliance
IOWA economic development
### Sector Energy Use Trend in Iowa

<table>
<thead>
<tr>
<th>Sector</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>23.9%</td>
<td>22.2%</td>
<td>20.1%</td>
<td>16.4%</td>
</tr>
<tr>
<td>Commercial</td>
<td>12.5%</td>
<td>14.6%</td>
<td>14.7%</td>
<td>13.6%</td>
</tr>
<tr>
<td>Industrial*</td>
<td>39.9%</td>
<td>38.8%</td>
<td>42.2%</td>
<td>49.1%</td>
</tr>
<tr>
<td>Transportation</td>
<td>23.6%</td>
<td>24.4%</td>
<td>23.0%</td>
<td>20.9%</td>
</tr>
</tbody>
</table>

*Industrial sector includes agricultural activities*
Industrial Energy Use in the Midwest

Total Industrial Energy Consumption, 2008 (trillion BTU)

- Ohio, 4: 1,341.00 trillion BTUs
- Illinois, 7: 1,236.90 trillion BTUs
- Michigan, 11: 756 trillion BTUs
- Iowa, 13: 654.1 trillion BTUs
- Wisconsin, 15: 619 trillion BTUs
- Minnesota, 16: 615.1 trillion BTUs
- National Average: 614 trillion BTUs
- North Dakota, 37: 213.7 trillion BTUs
- South Dakota, 44: 129.9 trillion BTUs

Source: MEEA

MEEA (Midwest Energy Efficiency Alliance)
Industrial Energy Use by Sector

Figure 2. U.S. manufacturing consumption of energy as a fuel declined 13 percent from 2002 to 2010

Industrial Energy Use by Sector

U.S. industrial consumption of delivered energy, 2011

- 25 quadrillion Btu
- 20
- 15
- 10
- 5
- 0

2011

- non-energy-intensive manufacturing
- energy-intensive manufacturing
- non-manufacturing

- other manufacturing
- plastics
- wood products
- electronic equipment
- transportation equipment
- computers
- machinery
- fabricated metal
- alumina & aluminum
- iron & steel
- cement & lime
- glass
- petroleum refineries
- bulk chemicals
- paper products
- food products
- construction
- mining
- agriculture

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Energy Efficiency as an Investment

Efficiency Investment Risks and Returns

Source: ACEEE estimates adapted from the U.S. EPA and the Vanguard Group
Case for Energy Efficiency

Keep money in local economy

In Iowa, for each $1 million invested in energy efficiency:

- 25 job years created
- $1.50 of additional disposable income per $1 invested

Improve economic competitiveness

Meet environmental goals
Water Availability a Growing Concern

By 2030, 2 of 3 people will live in an area of high water stress
Water Shortage not the only Problem
Water Use Statistics

- In 2005, Iowa used 1.23 trillion gallons of water
- In the US, 22% of water used for industry
- 70% of Iowa’s public water supply from groundwater
- Average Iowan uses 100 gallon of water/day
- Considering indirect uses (energy generation, manufactured products, food production, etc.) the average water use increases to 1,100 gal/day
59% identify water as a substantial risk factor for their business

Greater than 33% have already suffered water related business impacts
Nearly all respondents report having a water plan, including identifying water related cost reductions.
Energy intensity from a typical water cycle equals:

2,000 to 20,000 kWh/MGal*

As local freshwater resources become scarce, even more electricity will be needed to transport water from farther distances — a move that will further increase the cost of water.

*kilowatt hours per million gallons
IOWA EDGE

GAIN AN EDGE OVER YOUR COMPETITION

INCREASE PLANT COMPETITIVENESS
<table>
<thead>
<tr>
<th>Intent:</th>
<th>PAST: Save energy</th>
<th>FUTURE: Career development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience:</td>
<td>Engineer/facilities</td>
<td>Multi-disciplinary</td>
</tr>
<tr>
<td>Focus:</td>
<td>Boiler room</td>
<td>Business needs</td>
</tr>
<tr>
<td>Product:</td>
<td>Projects</td>
<td>Business solutions</td>
</tr>
<tr>
<td>Dynamic:</td>
<td>Program PUSH</td>
<td>Program PULL</td>
</tr>
<tr>
<td>Perception:</td>
<td>Distraction</td>
<td>Opportunity</td>
</tr>
</tbody>
</table>

Source: Christopher Russell, ACEEE
“Perfect Storm” of Opportunity for Industrial EE

- $2.2 T cash on corporate balance sheets
- Re-shoring of manufacturing on U.S. soil
- Closure of older, inefficient plants
- Pent up capital investment needs
- Smart grid and energy M&V infrastructure
- Facility manager population: age 55+
- New generation: “green” awareness and tech savvy
- Sustainability driving more company decision-making
EDGE Program Objectives

Create a highly visible recognition program that recognizes industries that have undertaken significant energy efficiency initiatives to reduce energy and water usage.

Make significant progress in reducing energy and water consumption and greenhouse gases by bringing process efficiencies to Iowa’s industrial and manufacturing plants and encouraging forward-thinking design for new industrial construction.
EDGE Program Outcomes

Recognize the energy and water efficiency achievements of industrial organizations through an ongoing goal setting and utility tracking process

Increased coordination with state and federal energy resources

Through efficiency gains, improve business competitiveness to retain and create jobs in Iowa
EDGE Focus on Energy Management

Enhance an industry’s energy management approach through the following:

- Evolve from **PROJECTS** to **SOLUTIONS**, from **EPISODES** to **RELATIONSHIPS**

- Groom **proactive leadership** so that energy management can grow at member organizations

- **MONETIZE** energy outcomes to harvest income from waste
EDGE Advisory Committee

Iowa Association of Municipal Utilities

Office of Consumer Advocate

Department of Natural Resources, Pollution Prevention Services

MidAmerican Energy

Alliant Energy

Other members
EDGE Financial and Technical Support Team

EPA Region 7
  - Pollution Prevention Grant

EPA Better Plants Challenge

Department of Energy
EDGE Timeline and Milestones

- **Q1 & Q2 (2013)**
  - Recruit 10 companies
  - Hold kick-off event
  - Begin baselining and goal setting process

- **Q3 (2013)**
  - Companies begin work towards goals

- **Q1 (2014)**
  - Recruit 10 more companies
  - Orientation for second set of companies

- **Q3 (2014)**
  - Recognition event for 10 original members

- **Q4 2014**
  - Document results and close EPA grant

- **Webinars/workshops and peer networking (ongoing, schedule TBD)**

- **Ongoing cycle of goals and recognition for all participants**
Company Selection Process

Market to companies with total utility bills of $500,000 or more per year (Some flexibility built-in)

Target energy reduction of 2% or higher per year

Companies should commit to establish or maintain green team/energy team

Diverse geographic & industry profile
IEDA’s EDGE Assistance

Technical Assistance
- Energy Management 101
- Green Team/Leadership
- Baselining Energy & Water
- Federal Energy Efficiency Programs & Resources
- Resources for Energy & Water Audits

Financial Assistance
- State and Federal financing options
- Utility financial assistance- rebates, custom incentives
- 3rd party financial assistance

Project Implementation Support
- One-on-one assistance
- Case studies- development and dissemination
- Hold peer networking events
ENERGY STAR for Industry

• Benchmarking Tools
• Energy Assessment Matrix
• Sector specific tools
• ENERGY STAR Plant Label
• Challenge for Industry Recognition program for 10% reduction in Energy Intensity within 5 years
The DOE provides:
• Advanced Manufacturing Office online tools, software and resources (i.e, Motor Master, compressed air fact sheets)

• Better Buildings, Better Plants Challenge

• Superior Energy Performance
## Colorado Industrial Energy Challenge

### CIEC Total Energy Savings

<table>
<thead>
<tr>
<th>Total Energy Savings from 2009-2012 (MMBtu/yr)</th>
<th>Equivalent Dollar Savings ($/yr in 2012)</th>
<th>Average Savings per year, % of total consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,360,000</td>
<td>$12.5 million</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Based on reported data from 22 companies.
International Organization for Standardization

ISO 50001

Energy Management Standard
ISO Continual Improvement Model
What is the DOE eGuide for ISO 50001?

The DOE eGuide for ISO 50001 is a toolkit designed to help organizations implement an energy management system through an organized step by step process. It includes forms, checklists, templates, examples, and guidance to assist the Energy Champion and Energy Team throughout the implementation process.

https://ecenter.ee.doe.gov/EM/SPM/Pages/Home.aspx
Financial Assistance and Incentives
Database of State Incentives for Renewables & Efficiency (DSIRE)

Financial incentives for energy efficiency

- Tax incentives
- Rebates
- Grants
- Loans
- Bond program
- Green Building incentives

http://www.dsireusa.org/incentives/index.cfm?state=us
USDA programs for energy projects

- Cities of fewer than 50,000 residents
- Business and Industry Guarantee Loans
- Rural Energy for America Program (REAP)

Utility Provider Services

• Audits
• Account manager expertise
• Rebates
• Loans
• Performance contracting
• Commissioning
• Building Operator Certification
Federal Tax Credits

• Commercial buildings: lighting; building envelope; heating, cooling and water heating

• Combined Heat and Power (CHP)

• Onsite renewables: solar; wind; geothermal

• http://energycosts.org/
Federal Tax Credits: Example

Energy Efficiency Commercial Buildings
• Through 2013

• Tax deduction of $1.80/sf for improvements to reduce energy by 50%

• Partial eligibility if savings < 50%
State Tax Credits

- Sales tax incentive for renewable technologies
- Property tax incentive
- Methane conversion tax incentive
- Wind energy production tax credit
- Solar and geothermal tax credits

http://www.dsireusa.org/incentives/index.cfm?state=us
IADG Energy Bank Revolving Loan Fund

Iowa Area Development Group (IADG) has partnered with Iowa Economic Development Authority to offer low interest financing.

For Iowa businesses and industries to do energy efficiency improvements, renewable energy projects and energy management and implementation plans.

Intended to provide an ongoing source of low interest financing for the implementation of cost effective projects that will save energy and money, improve facilities and processes, and enhance job creation and profitability.

www.IADG.com/EnergyBank
NGA’s CHP Policy Academy
The Policy Academy on Enhancing Industry Through Energy Efficiency and Combined Heat and Power focused on hosting senior-level policy advisors to identify cost-effective strategies, design new policies, programs and other measures, structure financing and funding options, and explore outreach, education and training techniques.
Iowa Utilities Board (IUB) and Iowa Economic Development Authority (IEDA) submitted a joint application to the National Governors Association.

Iowa was selected along with three additional states including Illinois, Arkansas, and Alabama. Tennessee was later added on to the Policy Academy.

Two national convening in Portland, OR, and Philadelphia, PA.
Goals

Compile and share information

Increase understanding of potential CHP market

Identify and address potential policy options
Major Activities Undertaken

- Literature review and research on existing CHP and potential of CHP in Iowa
- Stakeholder meetings
- Survey on challenges and barriers related to CHP
- Site-visits to ADM plant in Des Moines as well as to the Des Moines Wastewater Reclamation Facility
- Compilation of the final report and memo to the Governor and National Governors Association (ongoing)
CHP Survey

Goal

- Seek feedback on factors affecting CHP installation and operations from CHP stakeholders.

Two similar surveys were sent to:

- Existing CHP Facilities and those interested in CHP

Surveys were sent and completed electronically. Some paper responses were received.

Survey Components

- Background Information on CHP (size, # of FTEs, fuel source, years of operation)
- Brief Description of CHP System
- CHP Installations and Barriers
- Qualitative Response
- Contact Information
Barriers: Existing CHP

Significant Barriers
- Compliance with environmental regulations
- Initial capital cost
- Permitting
- Time to recover investment
- Standby rates
- Interconnection with grid owner/operator

Somewhat Significant
- Staff time and expertise for operation and maintenance
- Lack of incentives (tax credits, grants, low-interest loans)
- Electric energy rates
- Iowa net metering rules
- Interaction with MISO
- Power purchase agreement

No Barriers
- Natural gas prices
- Lack of information on CHP

Note: Arranged by most common to least common response
Memo to the Governor on the next steps on the CHP Policy Academy

IEDA will plan to hold three webinars in May on the following topics:

- Small scale CHP systems and its applicability
- Boiler MACT rules and CHP as an option

The CHP Final Report will be released to the stakeholders

Possible topics that may be explored further relate to information sharing, permitting and financing as well as utility topics.
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515-725-0418

www.iowaeconomicdevelopment.com/Programs/Energy