MINNESOTA’S ENERGY LANDSCAPE

Estimated Minnesota Energy Use in 2012
~1700 Trillion BTU

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~1700 Trillion BTU

MINNESOTA’S ENERGY POLICIES

ENERGY EFFICIENCY
• Conservation policy
• Building energy codes/standards

RENEWABLE ENERGY
• Renewable energy goal
• Renewable electricity standard
• Solar electricity goal and standard
• Renewable fuel standards

CLIMATE
• Fossil fuel reduction goal
• Greenhouse gas emissions goal
ENERGY EFFICIENCY

POLICY

- Energy Conservation Improvement: Annually conserve 1.5% of retail electricity and 1% of natural gas sales ([M.S. 216B.241](https://flowcharts.llnl.gov/commodities/energy))

ENERGY EFFICIENCY

Annually conserve 1.5% of retail electricity and 1% of natural gas sales

POLICY COMPARISON TO OTHER STATES

• 26 states have electricity energy efficiency resource standards, ranging from 0.2% - 2.6% incremental savings
• 15 states have natural gas policies, ranging from 0.2% - 1.2% incremental savings

Energy Efficiency Resource Standards (and Goals)

www.dsireusa.org / March 2015

ENERGY EFFICIENCY

Annually conserve 1.5% of retail electricity and 1% of natural gas sales

PROGRAMS AND RESOURCES

- Conservation Improvement Programs (CIPs): utility programs that incentivize energy efficient products and practices.

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<tr>
<th>RESIDENTIAL</th>
<th>COMMERCIAL AND INDUSTRIAL</th>
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<tr>
<td>Energy audit</td>
<td>Building recommissioning</td>
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<tr>
<td>Energy-efficient construction guidelines</td>
<td>Manufacturing process improvements that reduce energy intensity and improve productivity</td>
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<tr>
<td>Rebates:</td>
<td>Rebates:</td>
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<tr>
<td>• High-efficiency heating, cooling, and water heating appliances</td>
<td>• High efficiency boilers, chillers, and rooftop units</td>
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<td>• Low-flow showerheads</td>
<td>• High efficiency lighting and lighting control systems</td>
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<td>• Compact fluorescent lighting</td>
<td>• High efficiency motors and drives</td>
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- The Conservation Applied Research and Development (CARD) Grant Program: identifies new technologies or strategies to maximize energy savings
ENERGY EFFICIENCY

Annually conserve 1.5% of retail electricity and 1% of natural gas sales

ENERGY EFFICIENCY

POLICY

• The Minnesota Sustainable Building 2030 (SB 2030) Program sets aggressive energy targets for new and renovated buildings. It is required for all state-bonded buildings that receive General Obligation (GO) bonds (M.S. 216B.241).

OUTCOMES

• SB 2030 has resulted in savings of 327 billion Btus and $5.24 million per year
ENERGY EFFICIENCY

POLICY

• Energy Standards for Public Buildings: 20% reduction in energy use in state-owned buildings (Executive Order 11-12). Each state agency must track energy use in B3 Benchmarking, set site-specific energy goals, and report progress annually.

OUTCOMES

• B3 Benchmarking tracks energy use in 7,890 buildings and has identified easily achievable savings of over 3 million MMBtu annually.
ENERGY EFFICIENCY

• Clean Energy Resource Teams (CERTs): a statewide partnership that supports individuals and communities in pursuing community-based clean energy projects

• Minnesota GreenStep Cities: a voluntary challenge, assistance and recognition program that helps cities achieve their sustainability and quality-of-life goals

Source: MPCA. Minnesota GreenStep Cities. For more information, visit: http://greenstep.pca.state.mn.us/
ENERGY EFFICIENCY

• Regional Indicators Initiative: a program that tracks annual performance metrics for Minnesota cities

RESIDENTIAL ENERGY USE
KBTU/HOUSEHOLD/DAY - 2012

Source: LHB. Regional Indicators Initiative. “Residential Energy Use.” For more information, visit: http://www.regionalindicatormsn.com/
ENERGY EFFICIENCY

- 1.8% reduction from 2007

ENERGY EFFICIENCY

- 5.7% reduction from 2007
- 12% higher than national average

OPPORTUNITIES | TOTAL ENERGY USE BY SECTOR (2013)

ENERGY EFFICIENCY

- Residential: 23%
- Commercial: 19%
- Industrial: 34%
- Transportation: 24%

RENEWABLE ENERGY

POLICY

• Renewable Energy Goal: 25% of total energy from renewable sources by 2025 (M.S. 216C.05 Subd. 2)
• Renewable Energy Standard: 25% of electricity from renewable sources by 2025 (M.S. 216B.1692)
• Solar Energy Standard: 1.5% of electricity from solar by 2020 (M.S. 216B.1692)
• Solar Energy Goal: 10% of electricity from solar by 2030 (M.S. 216B.1692)

Source: Lawrence Livermore National Laboratory. “Estimated Minnesota Energy Use in 2012.”
https://flowcharts.llnl.gov/commodities/energy
RENEWABLE ENERGY

POLICY

• Petroleum Replacement Goal: 30% renewable fuels in total gasoline sold or offered by 2025 ([M.S. 239.7911](#)).

• Biofuel Content Mandate: 10% ethanol or other approved biofuel in all gasoline fuel sold or offered ([M.S. 239.791](#))

• Biodiesel Content Mandate: 20% biodiesel in all diesel fuel sold or offered by 2018 ([M.S. 297.77](#))

Source: Lawrence Livermore National Laboratory. “Estimated Minnesota Energy Use in 2012.”
https://flowcharts.llnl.gov/commodities/energy
RENEWABLE ENERGY
25% of electricity from renewable sources by 2025

POLICY COMPARISON TO OTHER STATES
• 29 states have a Renewable Portfolio Standard, ranging from 2%-75%

PROGRAMS AND RESOURCES

- Made in Minnesota Solar Incentive Program: $15 million per year for incentives for Minnesota-made solar PV and solar thermal ([M.S. 216C.411-.416](http://www.mnseia.org/programs/made-in-minnesota)).

- Renewable Energy Production Incentive: up to $10.9 million per year for performance-based incentives for wind, hydroelectric, and on-farm biogas facilities ([M.S. 216C.41](http://www.mnseia.org/programs/made-in-minnesota)).

- Solar Production Based Incentive (Xcel Energy): $5 million per year for performance-based incentives for solar installations

RENEWABLE ENERGY

25% of total energy from renewable sources by 2025; 25% of electricity from renewable sources by 2025; 10% of electricity from solar by 2030.

PROGRAMS AND RESOURCES

- Community Solar Gardens: programs offered by utilities for customers to subscribe to a community solar installations (M.S. 216B.1641).

RENEWABLE ENERGY

25% of total energy from renewable sources by 2025; 25% of electricity from renewable sources by 2025; 10% of electricity from solar by 2030

http://www.cleanenergyresourceteams.org/solargardens#current
PROGRAMS AND RESOURCES

- Renewable Energy Equipment Grant Program: $150,000 per year for grants to low-income Minnesota households (Laws of MN 2015 1st Spec. Session, Ch 1, art 1. sec 8, subd 7).

- Property-Assessed Clean Energy (PACE): energy efficiency and renewable energy financing program for home and business owners.

- Net energy metering: credits solar PV system owners for the electricity they add to the grid (M.S. 216B.164).

- Value of Solar Tariff: an alternative to net metering that credits grid-tied solar PV system owners for the value they provide to the utility, its customers, and society (M.S. 216B.164, Subd. 10).

RENEWABLE ENERGY

25% of total energy from renewable sources by 2025; 25% of electricity from renewable sources by 2025; 10% of electricity from solar by 2030.
RENEWABLE ENERGY

25% of electricity from renewable sources by 2025

RENEWABLE ENERGY

25% of total energy from renewable sources by 2025

CLIMATE

POLICY

• Reduce per capita fossil fuel use for energy by 15% by 2015 (M.S. 216C.05 Subd. 2)

• Reduce greenhouse gas emissions across all sectors producing those emissions to at least:
  – 15% below 2005 levels by 2015;
  – 30% percent below 2005 levels by 2025; and
  – 80% below 2005 levels by 2050. (M.S. 216H.02)
PROGRAMS AND RESOURCES

- Climate Solutions and Economic Opportunities: project that identified and quantified strategies to bend the curve toward the statewide emissions goal

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**CLIMATE**

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<th>Energy Demand-Side Management</th>
<th>Transportation and Land Use</th>
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<td>40% Renewable Energy Standard</td>
<td>Combined Heat and Power</td>
<td>Transportation Pricing</td>
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<tr>
<td>Repower Sherco 1&amp;2 to natural gas</td>
<td>2.5%/yr Energy Efficiency</td>
<td>Carbon Tax</td>
<td>Increase Perennials</td>
<td>Community Forests*</td>
<td>Increased Recycling and Composting</td>
</tr>
<tr>
<td>Retire Sherco 1&amp;2</td>
<td>Thermal Renewable Energy</td>
<td>Fuel Tax</td>
<td>Advanced Biofuels</td>
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<tr>
<td>Repower one unit, retire the other</td>
<td>TLU-2&amp;3 (combined)</td>
<td>Compact Metro Development</td>
<td>State Biofuel Goal</td>
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<td>111(d) Scenarios</td>
<td>Metro Mass Transit</td>
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</table>

CLIMATE

Reduce per capita fossil fuel use for energy by 15% by 2015

CLIMATE

Reduce greenhouse gas emissions by 30% by 2025

OUTCOMES | EMISSIONS BY ACTIVITY

- Energy 87%
- Agriculture 10%
- Other 2%
- Waste 1%

Source: Minnesota Pollution Control Agency
CLIMATE
Reduce greenhouse gas emissions by 30% by 2025

Greenhouse gas emissions from energy have decreased 10% from 2005-2012.
CLIMATE

Reduce greenhouse gas emissions by 30% by 2025

Source: Minnesota Pollution Control Agency
What else do you need to know in order to identify priority strategies and technologies for Minnesota to focus on over the next ten years?

Additional questions? Send to becky.alexander@lhbcorp.com

APPENDIX

ENERGY EFFICIENCY
• Energy use by sector
• Vehicle travel per capita

RENEWABLE ENERGY
• Energy by fuel

CLIMATE
• Energy emissions by sector/fuel
• Forecasted emissions by sector

ENERGY ECONOMY
• Energy prices
• Energy cost per gross state product
TOTAL ENERGY USE BY SECTOR

ENERGY EFFICIENCY

ENERGY EFFICIENCY

• 4.7% reduction from 2007
• 12% higher than national average

RENEWABLE ENERGY

TOTAL ENERGY BY SOURCE


ENERGY SOURCES (2013)

HISTORIC MINNESOTA ENERGY EMISSIONS

Source: Minnesota Pollution Control Agency
FORECASTED MINNESOTA EMISSIONS

Source: Minnesota Pollution Control Agency
ENERGY ECONOMY

ENERGY EXPENDITURES PER GSP