

Value of Solar Thermal in Minnesota

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Solar Heating and Cooling (SHC) in Minnesota




The Value of Solar Heating and Cooling (SHC) in Minnesota

Solar Thermal and Minnesota Energy and Climate Goals

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Meister Consultants Group, Inc. (MCG)
www.mc-group.com

Commissioned by the Minnesota Department of Commerce
<http://mn.gov/commerce/energy>



Project Team included:

- Meister Consultants Group,
- CR Planning,
- Ever-Green Energy,
- Experts associated with the National Renewable Energy Lab and Florida Solar Energy Center

Minnesota Session Laws
2013 Ch. 85, Art. 12, Sec. 6

Three SHC Technologies



- Solar Hot Water
- Solar Air Heat
- Transpired Air Heat

Many End Uses

Scope of Work

- Overview of solar thermal technology and applications for Minnesota
- High level technical potential analysis in Minnesota
- Market barriers and opportunities
- Levelized Cost of Energy (LCOE) analysis
- International/national policy best practices
- Recommendations



Key Findings

Immediate opportunities in the following market sectors:

- **Commercial customers using expensive heating fuels** such as electricity, propane, or fuel oil
- **Agricultural applications** where load characteristics coincide with solar resource
- **Low-income housing** where fossil fuel price volatility is problematic for owners and residents



Report Recommendations

1 Create Incentive Eligibility for High-Value SHC Customer Segments

2 Implement “Solar Ready” Building Standards

3 Require Solar Thermal in Public Buildings and/or the Building Code

4 Explore Innovative Financing Options to Reduce SHC Upfront Costs

5 Reduce SHC Soft Costs by Streamlining Permitting

Report Recommendations

6 Reduce SHC Soft Costs by Implementing a Community Aggregation Purchase Program

7 Create an Online, Community-based Outreach and Information Campaign

8 Create SHC Advisory Group on Metering, Certifications, and Standards

9 Engage Delivered Fuel Providers to Explore SHC Opportunities

10 Assess Potential for Integrating Solar Thermal into District Energy Systems

Conclusions

Solar Heating and Cooling (SHC) market development is not as advanced as solar electricity in MN

SHC is a high value technology option in MN, but under-utilized due to market barriers:

- Initial cost
- Cooperative and municipal customers are often ineligible for programs like Made in Minnesota

Solar thermal can mitigate:

- Expense of heating with electricity
- Volatility associated with pricing and availability of delivered fuels