



Minnesota Value of Solar

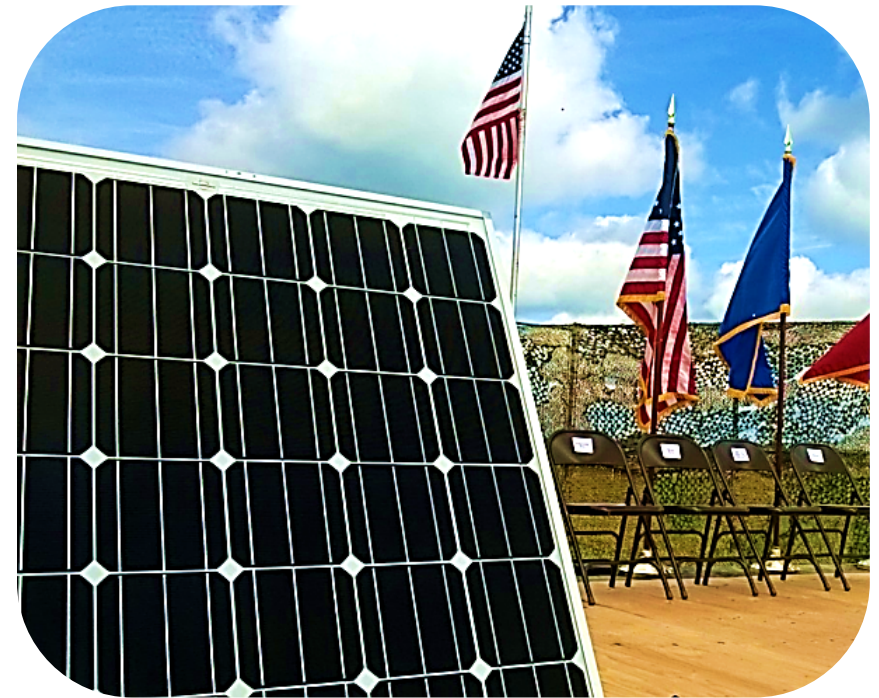
Lise Trudeau | Sr. Engineering Specialist
National Council on Electricity Policy, Annual Meeting





Today's Presentation

- VOS Background
- Methodology development
- Recent developments
- Next steps
- Resources

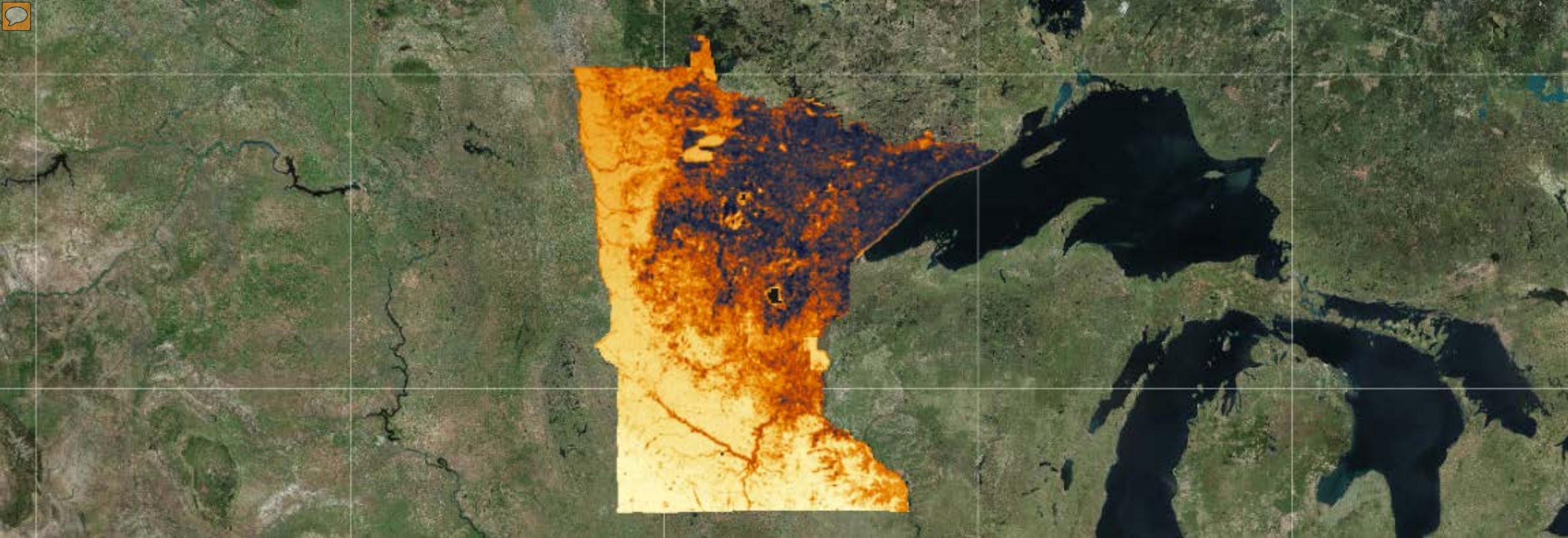




Key Points for MN VOS

- Separates customer electricity usage and production
- Quantifies net value to the utility, its customers, and society
- Expressed as a 25-year levelized value stream
- Not an incentive for distributed PV
- Stakeholder engagement and education is critical to understanding of valuation methods





Background



Timeline - Minnesota DG





MN Value of Solar Methodology



Required value components

- energy and its delivery
- generation capacity
- transmission capacity
- transmission and distribution line losses
- environmental value



MN Value of Solar Methodology

Investor Owned Utilities may apply to the MN PUC for a VOS tariff:

- in lieu of Net Metering for solar PV < 1MW
- charges customer for electricity consumed at retail rate
- compensates customer through VOS bill credit

VOS is rate for use in Community Solar Gardens



Methodology Development



VOS Methodology Development and Review Process

Project team:

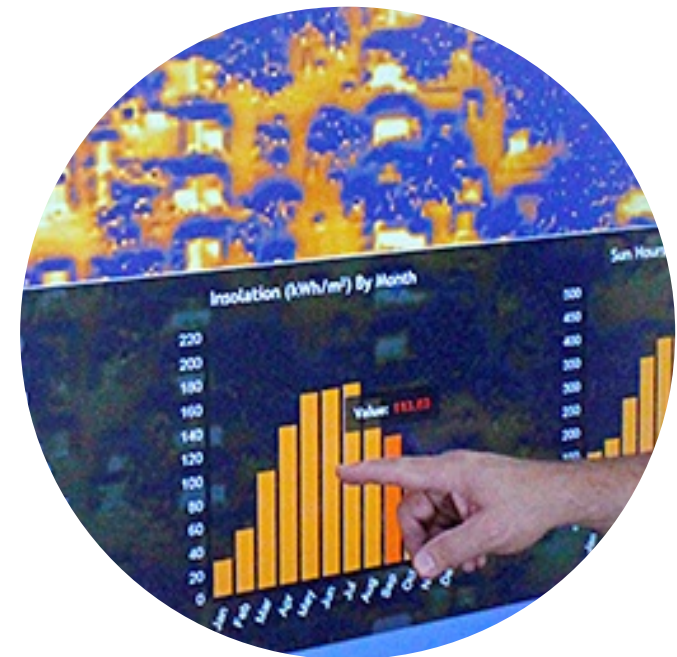
- **MN Department of Commerce** - designed and led stakeholder process
- **Clean Power Research** – technical and analytical support
- **Rocky Mountain Institute** – Meta-analysis of Solar PV Benefit & Cost Studies
- **Rabago Energy** – Austin Energy VOST experience



Approach for MN VOS Methodology

Objectives:

- **Quantify value streams** from a societal perspective;
- **Simplify** methodology and inputs;
- **Provide transparency**; and
- **Facilitate modification.**





Stakeholder Engagement

- 4 workshops
- 3 comment periods

- **Sept 17, 2013: Workshop 1:** Overview of National Efforts on Solar PV Benefit & Cost Studies
- **Sept 20, 2013: Initial Comments** these comments were used to frame the Oct 1 workshop
- **Oct 1, 2013: Workshop 2:** Proposed approach to methodology, Stakeholder perspectives, Identification of key issues
- **Oct 8, 2013: Comments on key issues** these comments were used to frame the Oct 15 workshop
- **Oct 15, 2013: Workshop 3:** Discussion of key issues, Facilitated discussion with stakeholders
- **Nov 19, 2013: Workshop 4:** Presentation of Initial Draft Methodology
- **Dec 10, 2013: Comments on draft methodology** informed the final draft methodology that the Department submitted to the PUC



MN PUC Review Process

- **Jan 31, 2014**
Department submitted the VOS Methodology to the PUC (**Docket 14-65**)
- **Feb 13, 2014**
Initial Comments Due to PUC
- **Feb 20, 2014**
Reply Comments Due to PUC
- **Mar 4, 2014**
Information Hearing
- **Mar 12, 2014**
Testimony and Deliberations – PUC **voted to approve the Methodology**
- **Apr 1, 2014**
PUC issued its order approving the Value of Solar Methodology.

- **March 12, 2014**
MN PUC approved VOS Methodology



Foundations of Methodology

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- **2013: Comments on draft methodology** informed the final draft methodology that the Department submitted



Recent Developments



VOS for Community Solar

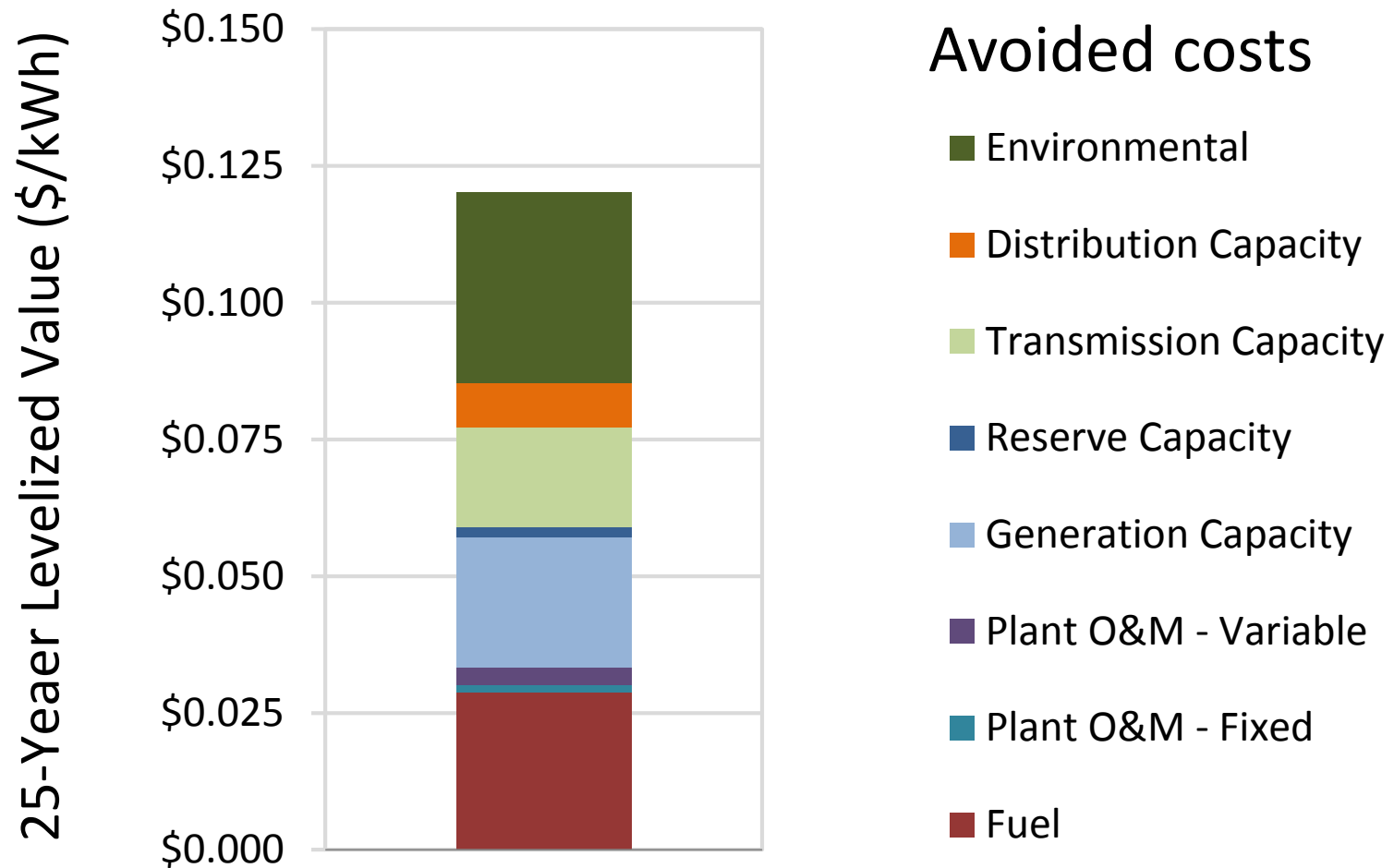
MN Statute requires use of VOS for Community Solar Gardens (CSG)

- Xcel:
 - As of 2017, new CSG applications use VOS rate
- Mn Power:
 - VOS under consideration for CSG





Xcel 2018 VOS for CSG





Next Steps



Value of Solar for Xcel CSG – Next Steps

Per March 26, 2018 PUC Order:

- 2018 updates
 - Weather-normalized historic distribution costs
 - Include environmental costs for NO_x , SO_2 , and $\text{PM}_{2.5}$
- under consideration:
 - Locational distribution values





Anticipated Impacts

- Will residential customers subscribe to community solar at the VOS rate?
- Will utilities opt for VOS as an alternative to net metering?
- Too soon to tell.





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Resources

- eDockets:
 - MN Value of Solar Methodology, Docket 14-65
 - Xcel Community Solar Garden, Docket 13-867
 - Minnesota Power Community Solar Garden, Docket 15-825
- NREL: Solar STAT Blog "Minnesota Values Solar Generation with VOS Tariff"



Thank You!

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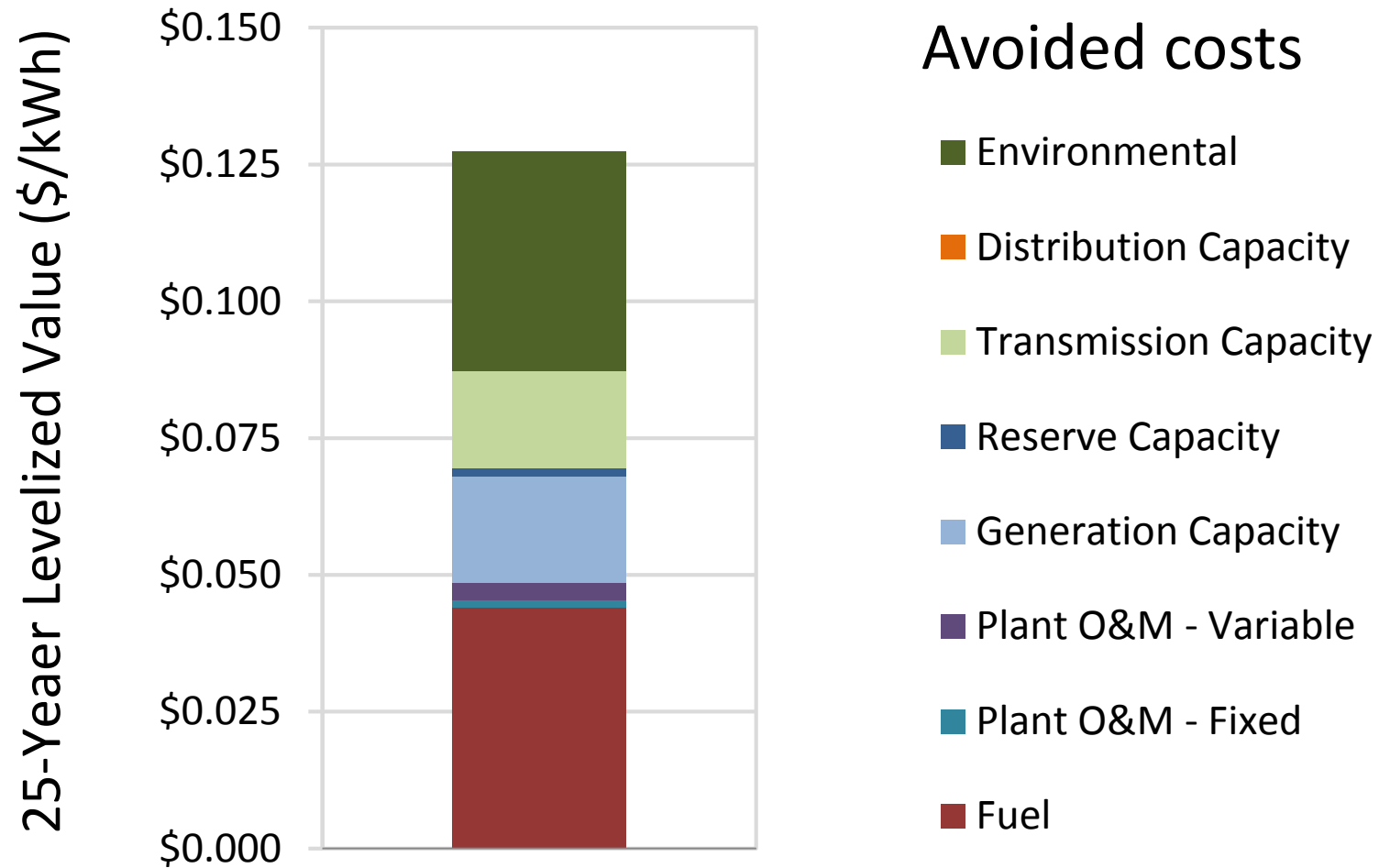


Xcel VOS for CSG

	Levelized	1 st year
2014	\$0.1208	\$0.0940
2015	\$0.1364	\$0.1075
2016	\$0.1239	\$0.0995
2017	\$0.1275	\$0.1033
2018	\$0.1202	\$0.0976

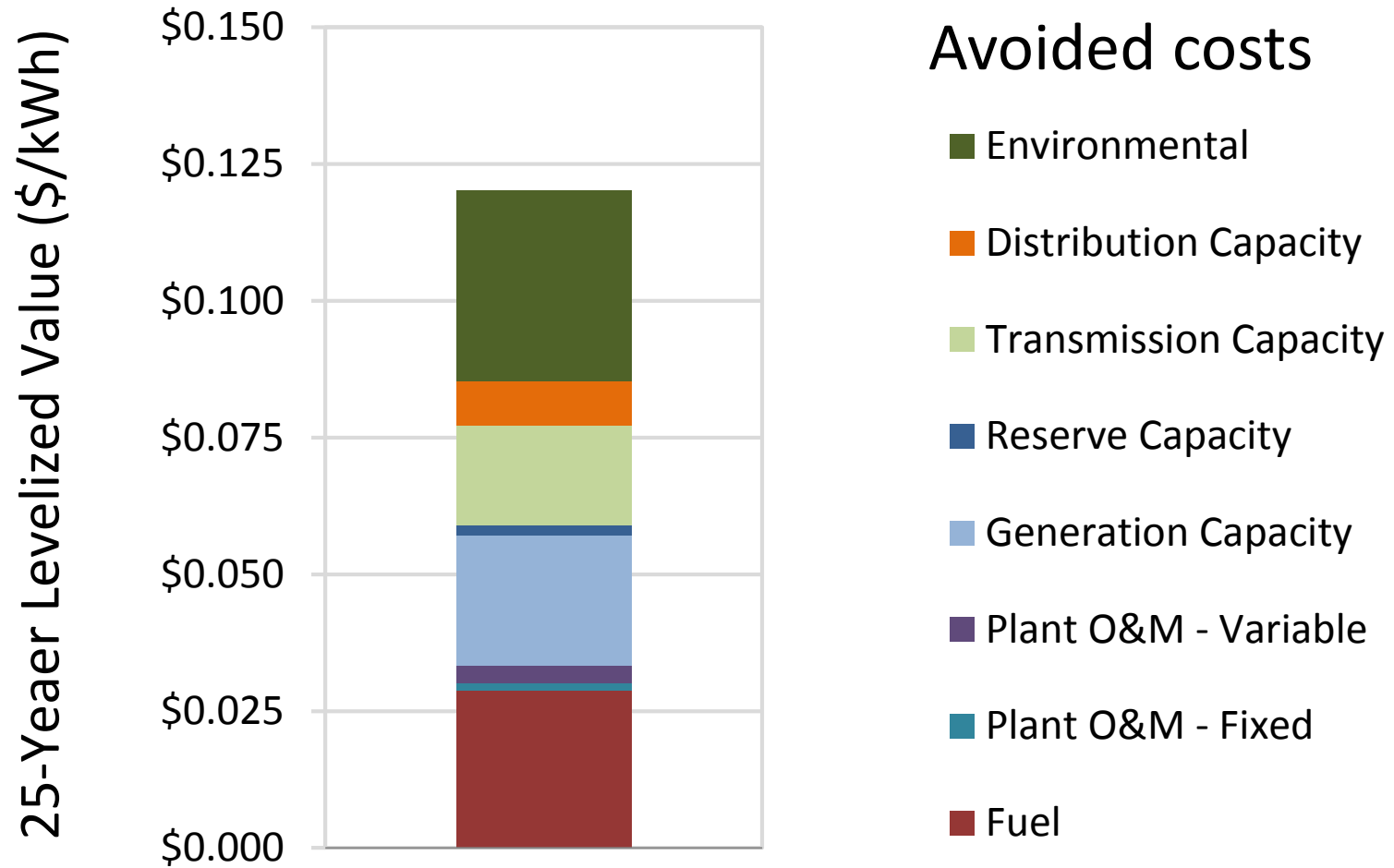


Xcel 2017 VOS for CSG



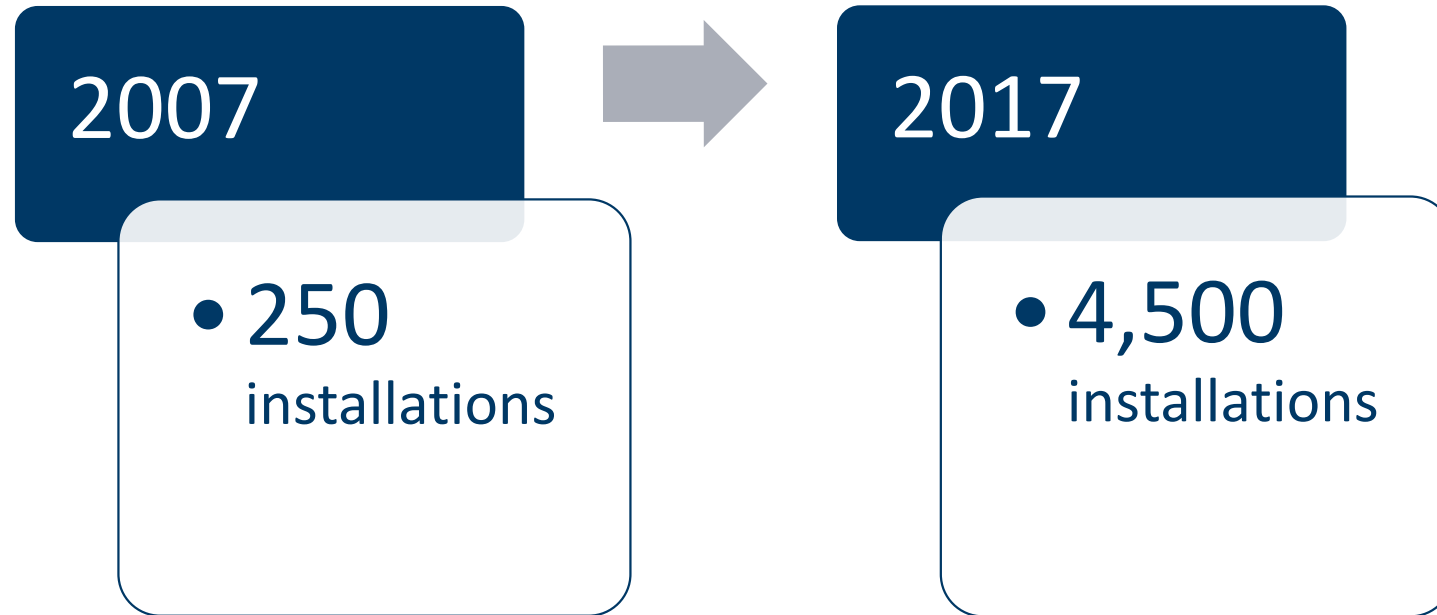


Xcel 2018 VOS for CSG





Solar Electricity in Minnesota



- systems are getting bigger
- more installations at commercial sites
- market is primarily in IOU territory