

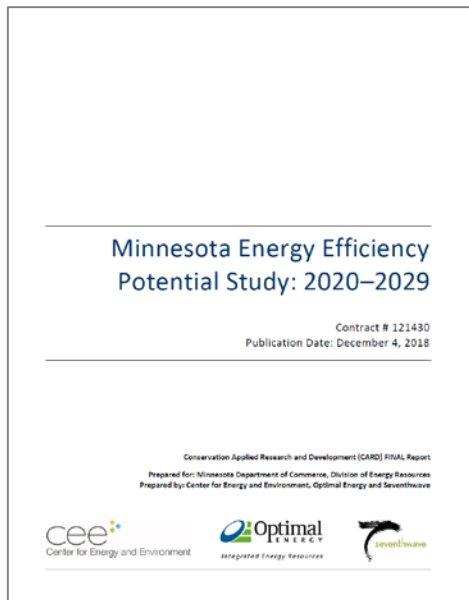
When Modeling of Energy Efficiency Gets Real: *Connecting the Minnesota Potential Study to Xcel's Long-Term Carbon Reduction Plans*

Carl Nelson, Center for Energy and Environment

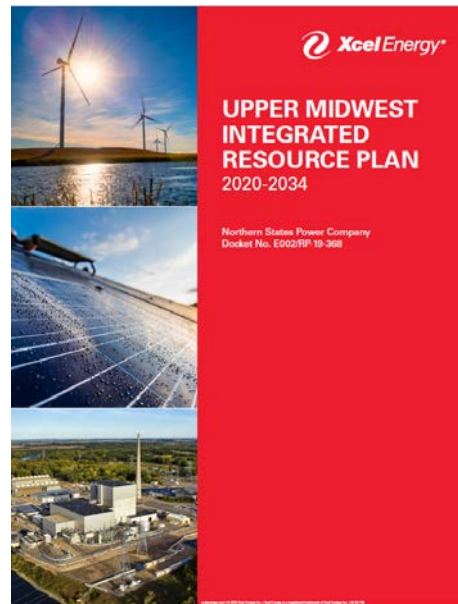
Nick Minderman, Xcel Energy



High Future Goals for Energy Efficiency



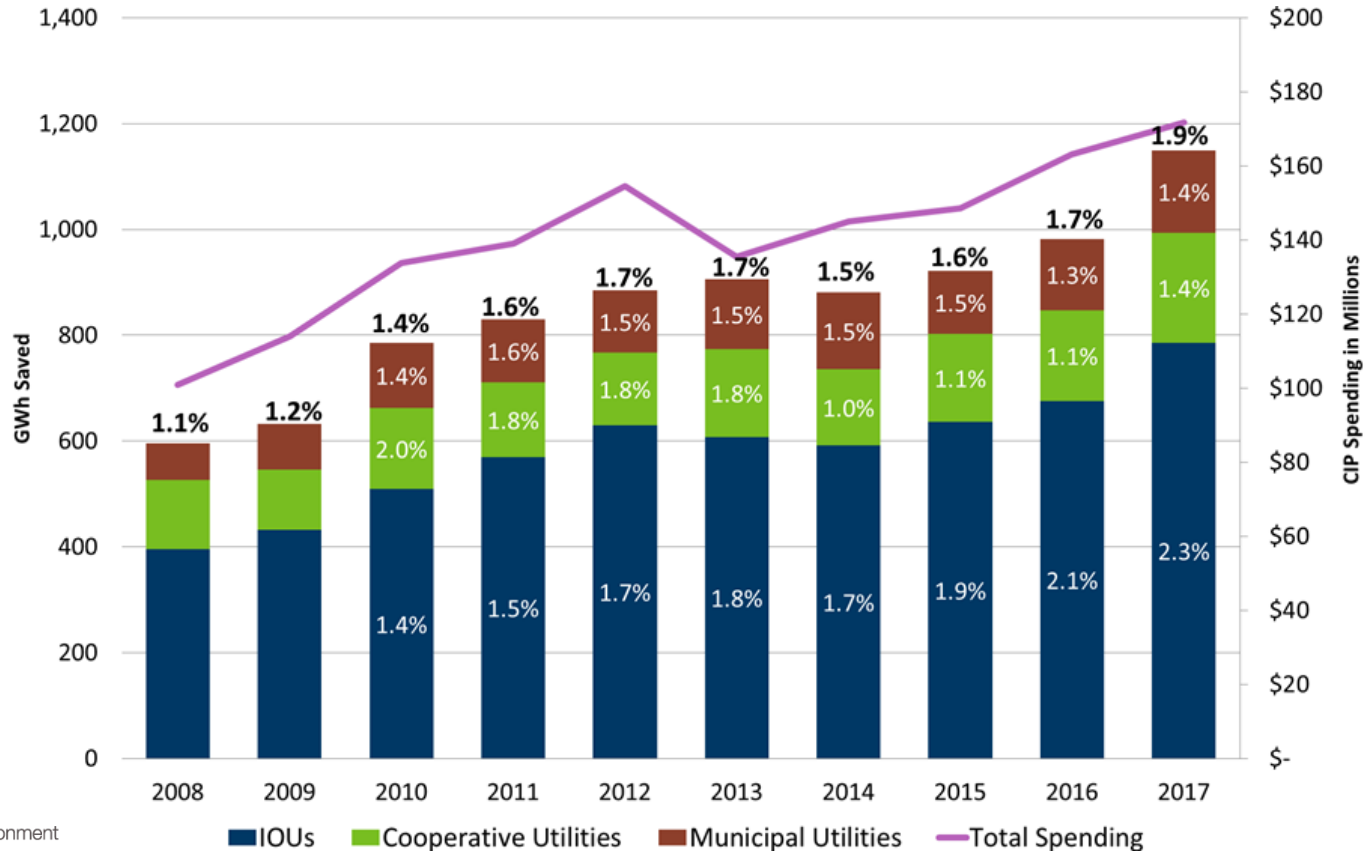
- EE modeled as bundles for IRP
- Highest level of EE ever in Xcel's IRP



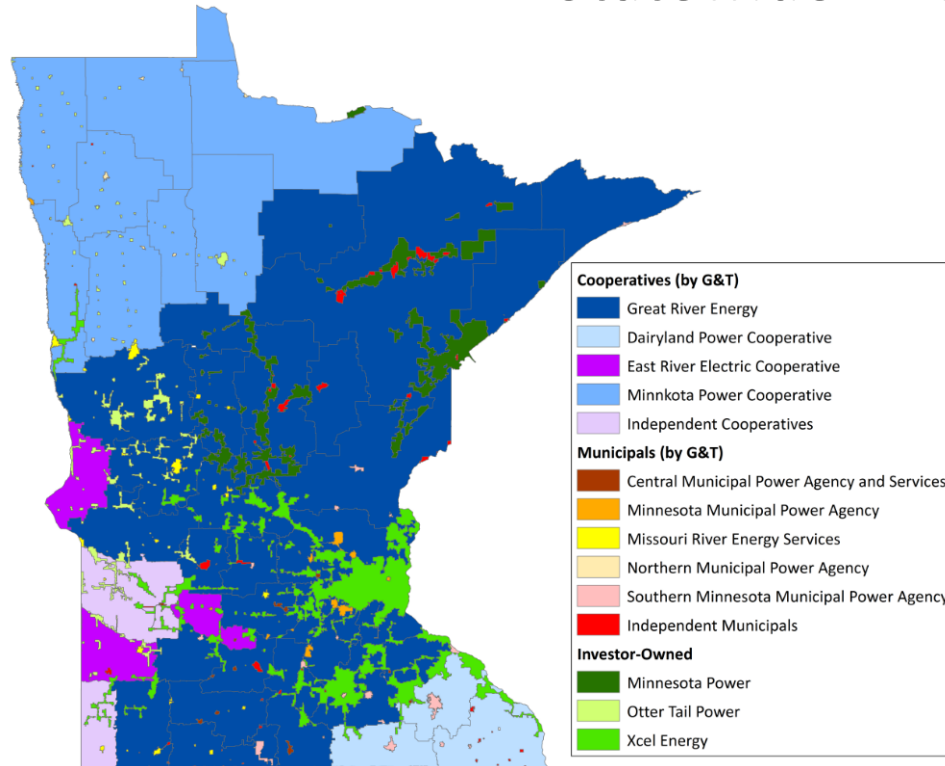
AGENDA

- Background on MN statewide EE potential study
- Summary of study results
- Xcel's Integrated Resource Process
- Incorporating potential study modeling into the IRP
- Path to achieving high energy savings goals

MN EE Achievements – Electric

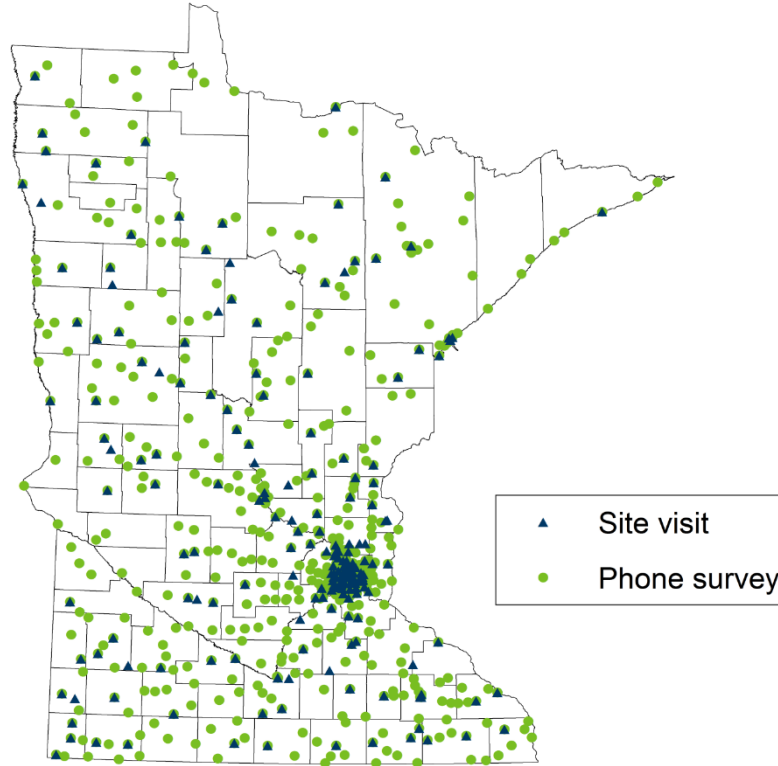


Statewide EE Potential Study



- 120 electric utilities
- 7 separate models
- 2020 - 2029
- Scenarios modeled:
 - Max achievable (100% rebates)
 - Program achievable (50% rebates)

Primary Data Collection Informed Study Inputs



Stakeholder Engagement



Advisory Committee Member Organizations:

- CenterPoint Energy
- Citizens Utility Board of MN
- Energy Insight Inc.
- Fresh Energy
- Great River Energy
- League of MN Cities
- Minnesota Energy Resources
- MN Municipal Utilities Association
- Minnesota Power
- Minnkota Power Cooperative
- Missouri River Energy Services
- Minnesota Chamber of Commerce
- MN Rural Utilities Association
- Otter Tail Power
- Southern MN Municipal Power Agency
- Xcel Energy

Overall Potential is Impacted by Policy

Table 35. Summary of policy findings, stakeholder input, and study conclusions.

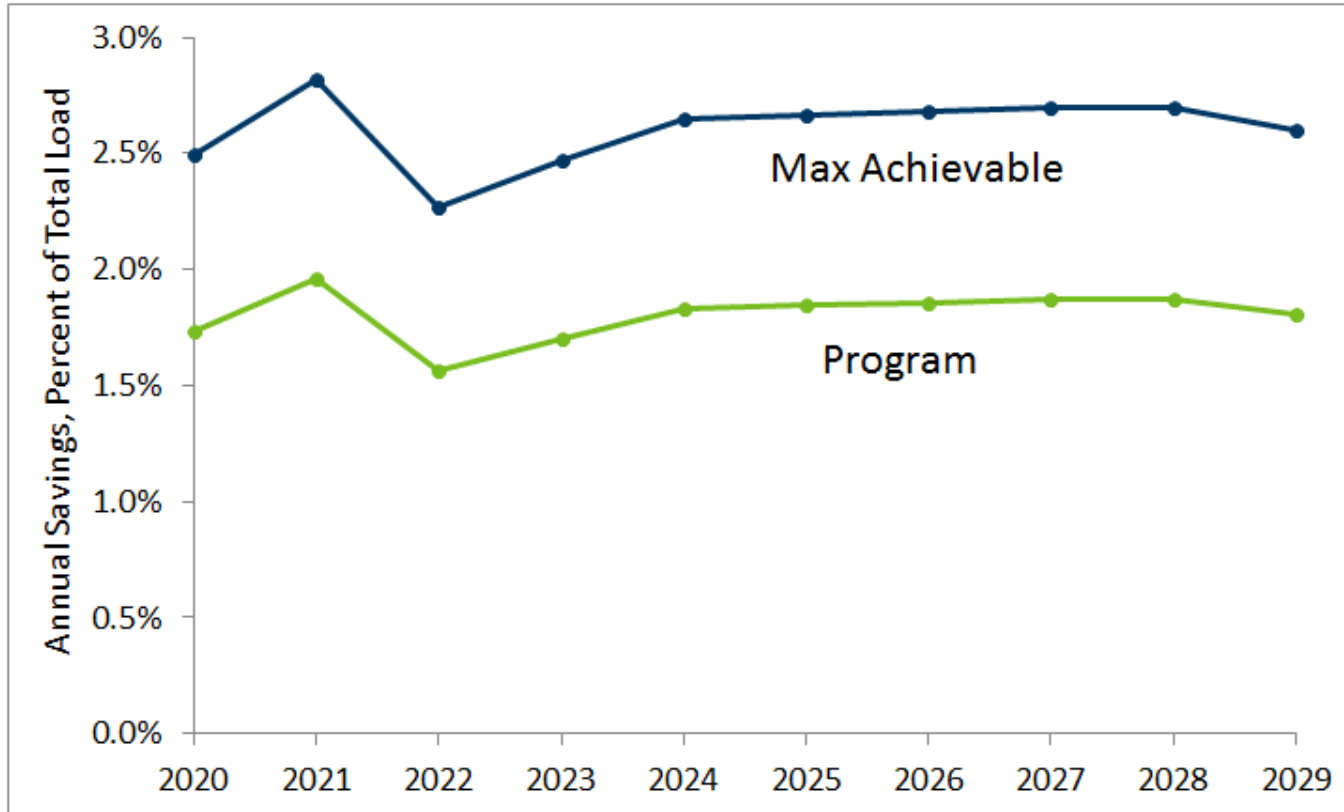
Topic Area	Relevant findings from potential study	Stakeholder input	Conclusions
Achievement of CIP goals	<p>Meeting or exceeding, on average, the current CIP goal of 1.5% for electric utilities and the statutory minimum of 1.0% for gas utilities is achievable in the 2020-2029 timeframe.</p> <p>Achieving savings targets is likely to require increased but still cost-effective spending.</p> <p>The existing incentive structure has been effective at motivating investor-owned utilities to exceed their energy-savings goals.</p>	<p>Small consumer-owned utilities report facing additional challenges in implementing programs; thus, it may not be possible for them to achieve the same energy-savings level as the investor-owned utilities.</p> <p>More emphasis on lifetime savings is justified, but the first-year savings goal is still preferred as the main statutory CIP goal.</p>	<p><i>The 1.5% savings goal can continue to be achieved using the existing flexibility to adjust goals when justified.</i></p> <p>Lifetime savings could be better measured and tracked through the annual reporting process, rather than a statutory change.</p> <p>Consider allowing consumer-owned utilities to report savings in a multi-year framework.</p>
Regulatory oversight of CIP	<p>CIP programs in the 2020s will need to expand into new end uses and technologies, increasing the complexity of regulatory issues.</p> <p>Results from Commerce-funded conservation applied research and development projects inform this potential study's estimates and pave the way for increased savings from new end uses.</p>	<p>The stakeholder survey shows mostly strong support for current Department regulation.</p> <p>Most stakeholders support a practical approach that minimizes confusion and provides regulatory clarity.</p>	<p><i>Clarity on key regulatory topics could be accomplished through the creation of a CIP guide.</i></p> <p>Consider creating a formal advisory committee for CIP regulatory topics to increase transparency and avenues for stakeholder coordination on CIP implementation.</p> <p>Continue to have strong research and development to support future energy savings.</p>
Incorporating demand-response & efficient fuel-switching into CIP	<p>Demand-response programs will increasingly be needed for integrating carbon-free renewables onto the grid, and to balance high load with high-generation times.</p> <p>With appropriate safeguards, efficient fuel-switching could significantly increase overall efficiency, decrease emissions, and reduce costs for consumers.</p>	<p>There is strong electric utility support for incorporating demand-response and efficient fuel-switching into CIP.</p> <p>Public interest concerns were raised about investor-owned utilities receiving incentives for load-building activities.</p> <p>Public interest concerns were raised about demand-response and fuel-switching diluting or competing for limited capital with energy efficiency efforts.</p> <p>Both demand-response and fuel-switching programs are customer-facing programs, like CIP.</p>	<p><i>Consider whether to incorporate "integrated demand-side management" into the CIP framework — with appropriate safeguards.</i></p> <p>In crafting specific policy for integrating demand-response and fuel-switching, safeguards should ensure end-use efficiency is not decreased; utility incentives for investor-owned utilities should be considered separately (demand-response) or not provided (fuel-switching).</p>

Incentives for IOUs are essential to exceeding 1.5% goal

Policy framework for demand-response could be expanded

"Efficient Fuel Switching" policy could further increase savings

Results – Electric Incremental by Year

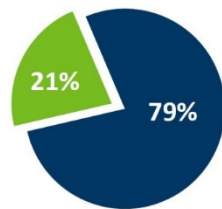


Changing End-Uses of Programs: Potential Study Results vs Current Programs

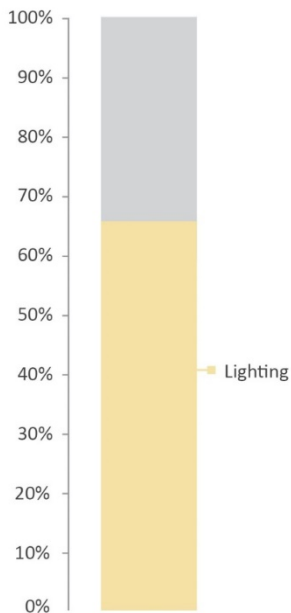
2017



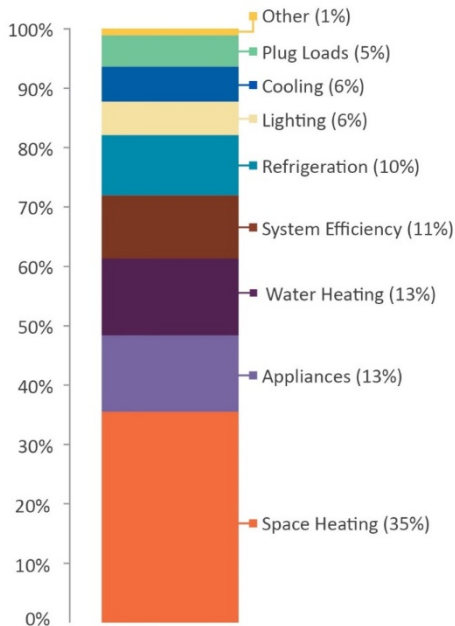
2029



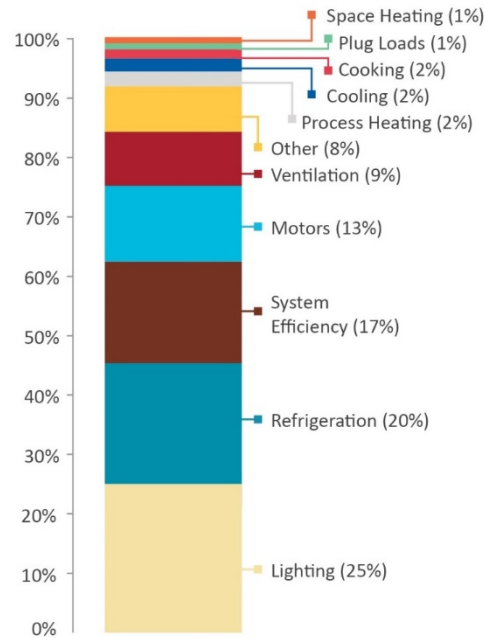
All Sectors



Residential



Commercial & Industrial





Energy Efficiency in Minnesota – Reaching a High Bar

10.16.2019

Upper Midwest Resource Planning

Xcel Energy Resource Plan includes:

- Five-State Northern States Power (NSP) system
- 1.5M Residential and 200k C&I Customers
- Served 44,000 GWh and 8,500 MW in 2017
- Minneapolis-St. Paul metro area drives energy use in NSP



Turning Potential Study Into Results

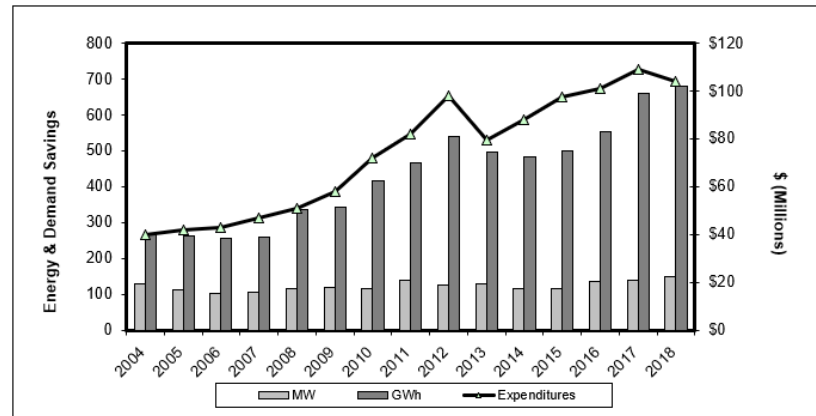
Important Dates:

- IRP modeling fall 2018-early 2019
- IRP filed July 2019
- Includes EE from 2020-2034 programs years
- Effects continue after first year using typical measure lives
- First opportunity to implement is in 2021-2023 triennial plan

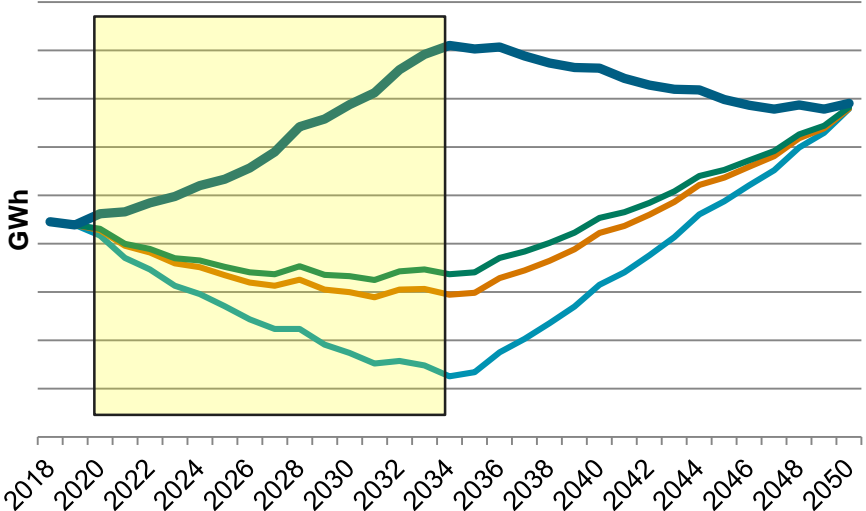
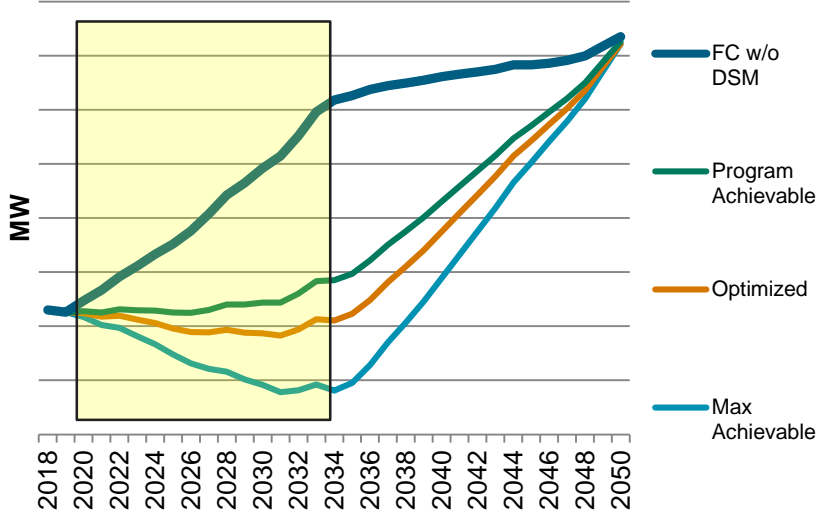
Key Information for Modeling

Developing bundles of efficiency considered:

- Finding a balance – size vs. diversity
- Understand supply context
- Lean on past experience



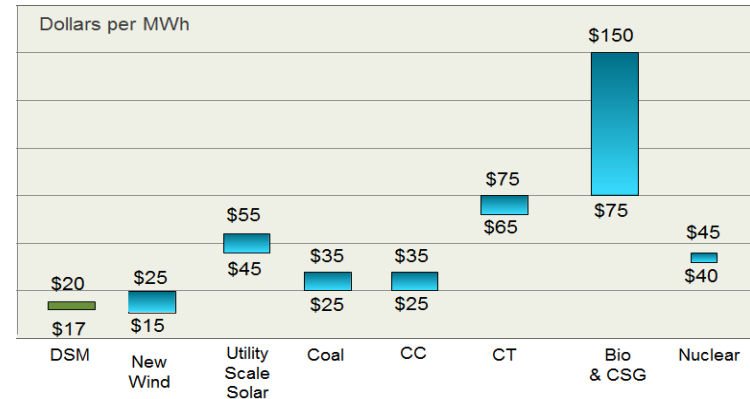
Forecasting the Future



Is It Real Yet?

Threats to an Aggressive Portfolio

- Changing baselines & market transformation
- Increasing costs vs. carbon free resources
- Timing conflicts between EE and carbon free
- Mismatch between EE policy goals and value



Opportunities to Grow EE

- More sophisticated controls and accessible automation
- Access to advanced metering
- Better segmentation – information and program models
- Customers want to be engaged, though not all in the same way

