

**Xcel Energy**  
**Resource Planning & Energy Efficiency**  
**in the 21<sup>st</sup> Century**

**ACEEE National Conference on Energy  
Efficiency as a Resource**

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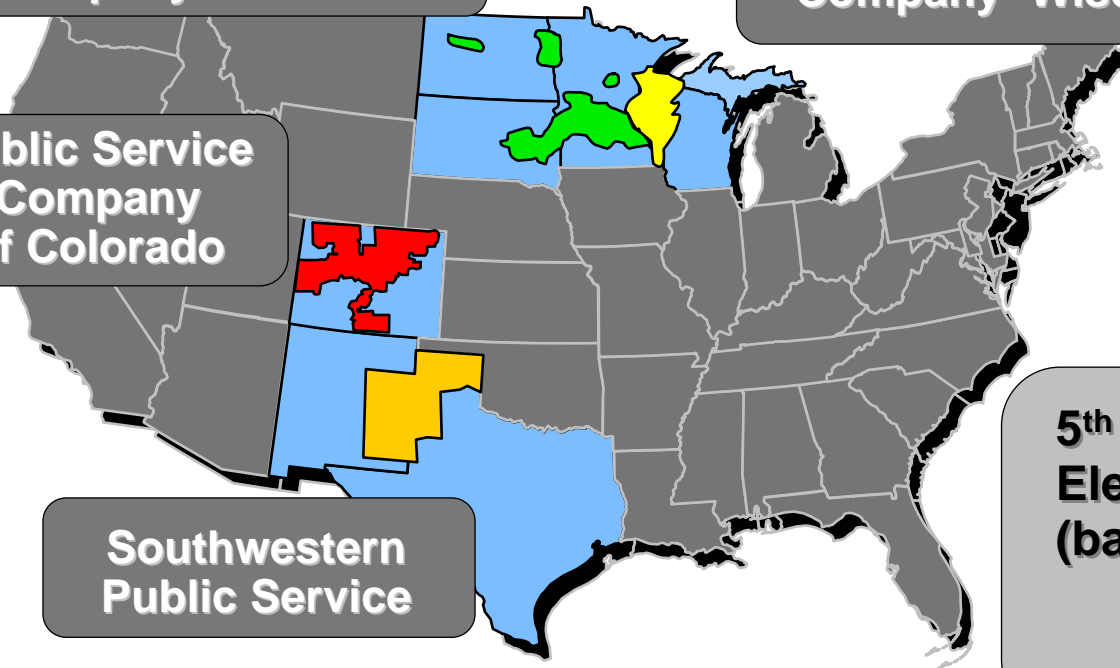
**Northern States Power  
Company- Minnesota**

**Northern States Power  
Company- Wisconsin**

**Public Service  
Company  
of Colorado**

**Southwestern  
Public Service**

**5<sup>th</sup> Largest Combination  
Electric and Gas Utility  
(based on customers)**



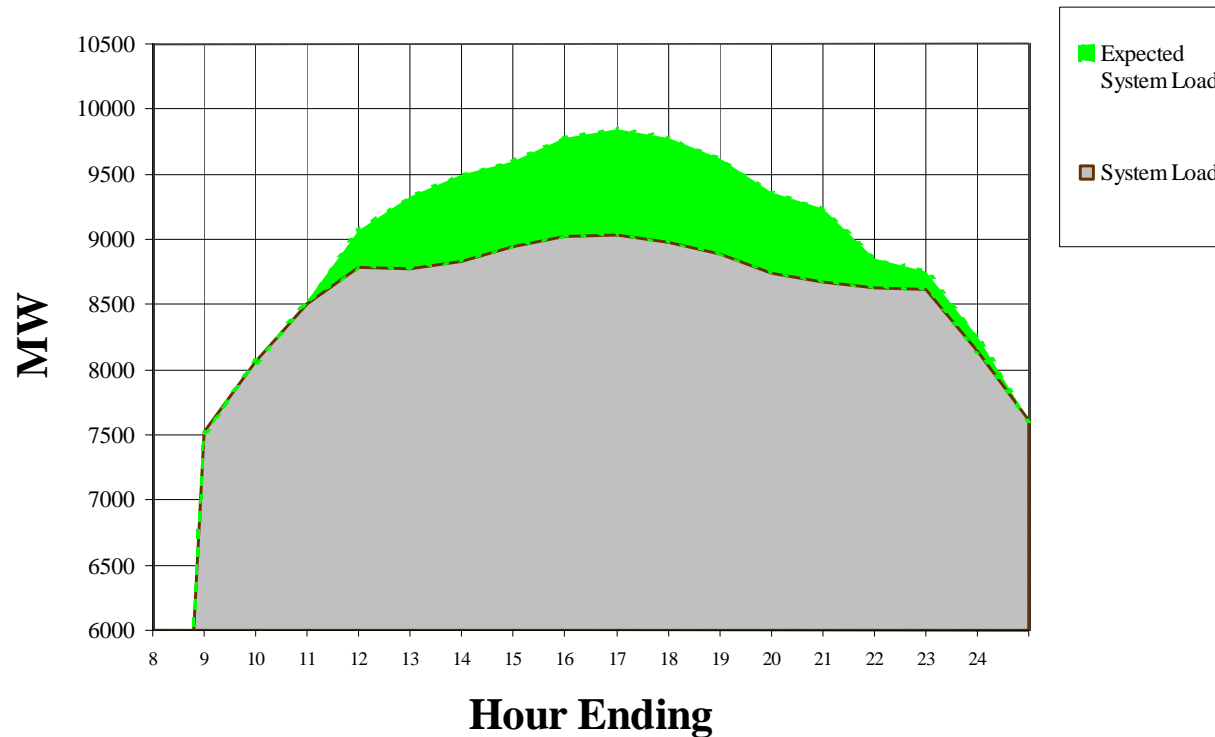
# Energy Efficiency Goals Minnesota & Colorado

<b>Electric EE Goals</b>	<b>Annual ~GWh Savings</b>	<b>% of Retail Sales</b>
<b>Minnesota 2006 Actual Savings</b>	<b>256</b>	<b>0.8%</b>
<b>Minnesota-New Legislation Minimum Goal</b>	<b>350</b>	<b>1.0%</b>
<b>Minnesota-New Legislation Target Goal</b>	<b>526</b>	<b>1.5%</b>
<b>Colorado 2006 Actual Savings</b>	<b>47</b>	<b>0.2%</b>
<b>Colorado LCP Settlement/New Legislative Minimum</b>	<b>110</b>	<b>0.4%</b>
<b>Colorado Utility Proposed Plan</b>	<b>200</b>	<b>0.7%</b>

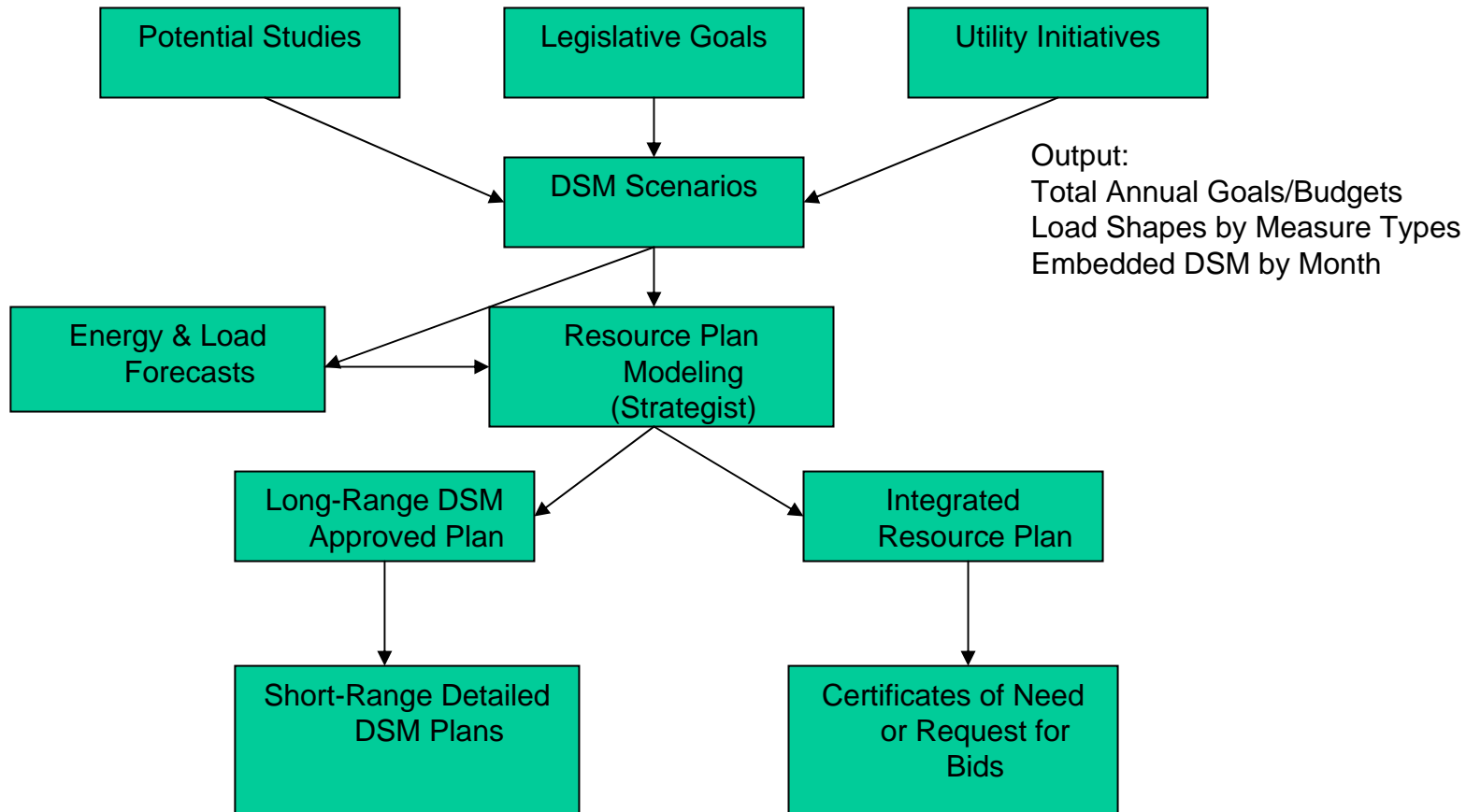
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## MN Summer System Peak Day

Actual System Load vs. Expected System Load



# EE & Resource Planning Cycle



# Treatment of EE in MN

## Resource Planning – 1990's - 2007

- Since early 1990's, Minnesota legislation has required an integrated resource planning process.
- Resource Plan in 1991 subtracted DSM from the Sales & Demand Forecast before determining amount of required supply resources.
- Beginning in 1993 plan, based on input from Commission & a collaborative, NSP began a “simultaneous integration” approach to determine least cost options.
- Load Management considered significant in Peak Demand Forecasting & in reducing need for peaking plants with 10% of system peak reduced by Load Management.
- ~1999 – Changed from peak goals to energy goals
- Commission has ordered higher DSM goals than Xcel has recommended in several resource plans.

# Treatment of EE in MN Resource Planning – 2008 & beyond

- New legislative goals (1.5% of electric and gas sales/year) will effectively double our previous approved Resource Plan goals. – includes utility infrastructure efficiency improvements
- DSM may be stratified into meeting long-term base load vs. intermediate load vs. peak load (under discussion)
- Driven by the new mandates, resource planning may move DSM to resemble “wind model” where least cost is not considered in model
- DSM will not be treated as a “choice” variable – will be subtracted from the total system forecast.
- Capacity credits given when capacity needed

# Treatment of EE in Colorado

## Least Cost Planning

- Previous Rules
  - ▣ Objective to minimize Net PV of Rate Impacts
  - ▣ Requires bid solicitation & evaluation for all resources including renewables and energy efficiency
- Legislation-HB07-1037 passed May 2007
  - ▣ Changed to minimize Net PV of Revenue Requirements
- Emergency Least Cost Planning Rules – Issued new “Order for Comment” on 9/7/07
  - ▣ Change from “Least Cost” planning to “Cost Effective” planning (CERP)
  - ▣ Renewables and Energy Efficiency elevated in importance
  - ▣ CERP will take into consideration “beneficial contributions of new clean energy & energy-efficient technologies” (added to language)

# Treatment of EE in Colorado Least Cost Planning

- EE scenarios are treated as a “modifier” to the load forecast (same as wind, solar, etc)
- Different levels of CO2 risk prices used
- Comparison between cost effectiveness of EE scenarios made in Strategist model
- Capacity & T&D credits given when capacity needed?
- EE Load Shapes by “measure type” proved difficult in Strategist and were abandoned.

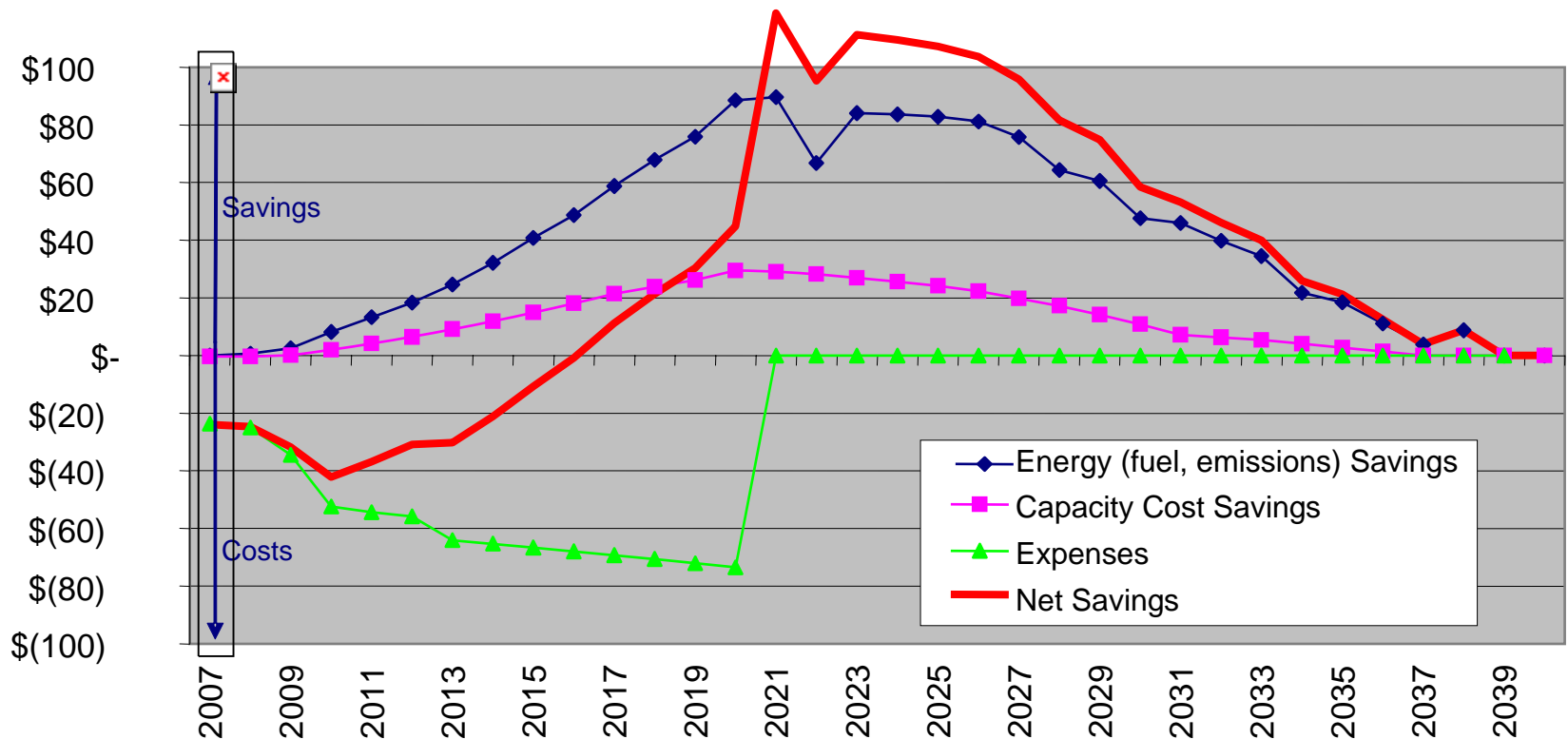
# DSM Planning Considerations

- DSM Market Potential Study has ~15 year time horizon maximum
- Resource Planning time horizon is 30 to 40 years
- New technologies not accounted for in potential studies
- How much of economic potential is feasible?
- Characterization of ending of DSM programs not realistic
- Treatment of embedded DSM and ramp-up, ramp-down affects sales forecast
- Forecasting the costs of increased DSM has been difficult

## Some issues to consider

- Characterization of DSM in RP shows costs are earlier than savings (see graph)
- Avoided costs = base plant, intermediate, or peaking?
  - Do we separate by program type?
- Resource needs are lumpy, DSM cannot start and stop
- When to start giving capacity and T&D credit?
- Should resource planners trust reliability of EE?

### DSM Program Savings & Cost Recovery Illustration



## Short-Term Resource Needs

- In all jurisdictions, Resource Planning asks for DSM above planned goals, usually for capacity shortages
  - ▣ DSM Planning reviews ability to quickly (1 to 3 years) add Demand Response programs (i.e., air conditioning cycling)
  - ▣ Ability to respond constrained by:
    - ▣ Budgets
    - ▣ Resources
    - ▣ Uncertain participation levels
    - ▣ Long lead times for installation of technology
    - ▣ Regulatory unknowns (i.e., need approvals, tariffs)

# Summary

- Energy Efficiency has gained importance in resource planning universally due to:
  - Long-running programs have steadily increased the total impact in energy efficiency savings
  - State mandated “stretch” EE goals sweeping the country
  - Climate Action Plans/carbon management
- Planners need to find reliable methods of forecasting energy efficiency