



Review of Recent Midwest DSM Potential Studies

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ACEEE 2009 EE Resource

September 29, 2009

Agenda

- Goals for talk
- Brief summary of reviewed studies
- Residential electric results
- Residential gas results
- Commercial/industrial electric results
- Commercial/industrial gas results
- Conclusions

Goals for Talk

- Provide an update to my similar 2008 ACEEE Summer Study paper. That paper was an update of sorts to a 2004 ACEEE paper by Nadel that reviewed DSM potential study results from across the country, but that did not include any Midwest studies.
- Increase national awareness of significant DSM planning work that is happening in the Midwest.
- Explain the wide variations in DSM potential results between the studies reviewed.

Study Selection Criteria

- Studies selected for paper were all publicly available.
- Studies selected were the most recent public study conducted in each state of which the authors are aware.
- Five new Midwest studies reviewed for this talk.
- Also discuss the results from previous seven Midwest studies for comparison purposes.

Brief Summaries of New Studies Reviewed

- American Electric Power Ohio (2009). Conducted by Summit Blue Consulting and the Midwest Energy Efficiency Alliance. Used AEP customer survey results, secondary info, significant DSM benchmarking.
- Indianapolis P&L DSM Potential Study and Action Plan (2008). Conducted by Forefront Economics and Gil Peach. Used IPL customer survey results and secondary info.
- Iowa Municipal Utilities Association (2009). Conducted by the Energy Center of WI and GDS Associates. Used utility customer data, secondary information, and a Delphi survey of experts/IAMU members.

Summaries of New Studies Reviewed (2)

- Kansas Energy Council DSM Potential Study (2008). Conducted by Summit Blue Consulting and Energy Insights. Used Kansas utility customer survey results, secondary info, significant DSM benchmarking.
- Energy Efficiency Resource Potential in Wisconsin (2009). Conducted by the Energy Center of WI, ACEEE, and GDS Associates. Used WI residential customer data, secondary information, and a Delphi survey of experts.

Purposes of New Studies

- Three of the five new studies were done to support regulatory filings of various types:
 - To gain approval for new or expanded utility DSM program portfolios (AEP, IPL, Iowa).
- Two of the studies were done for public policy purposes:
 - Kansas Energy Council
 - Energy Center of WI

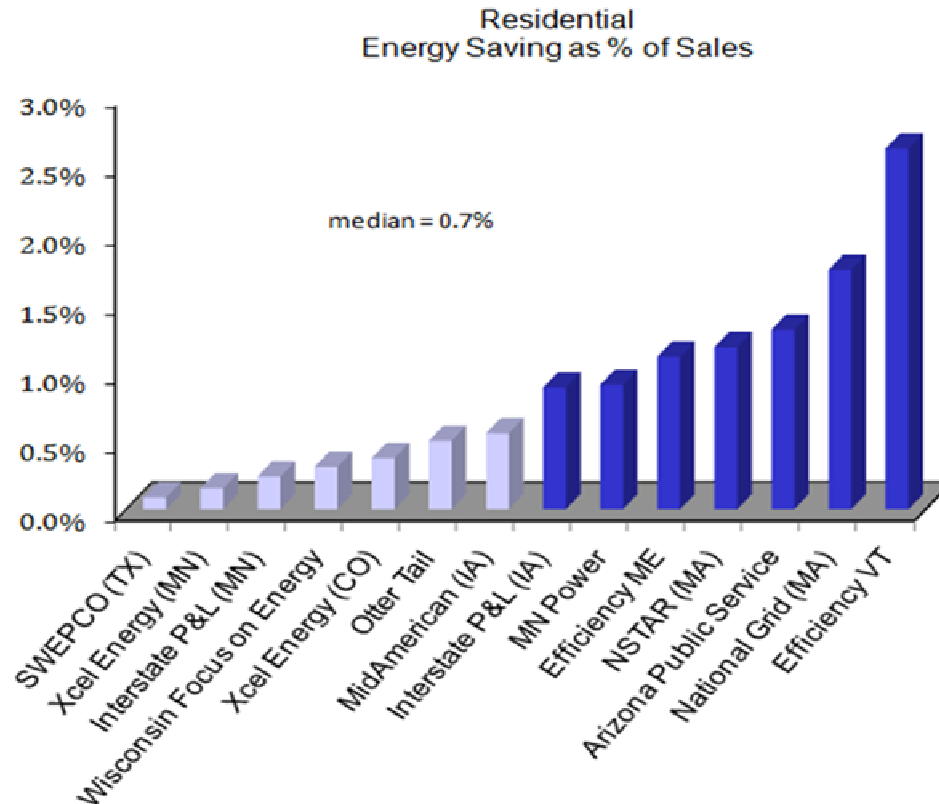
Residential Electric DSM Potential Results

- Wide range of DSM potential estimates reported from the five studies:
 - Two studies included specific residential technical and economic potential estimates.
 - Achievable EE potential estimates per year varied from 0.2% to 1.0%.
 - The most recent Midwest studies have similar range of results and mean results as was previously found from Midwest studies that were done three to five years ago.
- Wide variation in potential estimates is matched by wide variations in actual residential electric DSM program results.

Residential Electric DSM Potential Results

<u>Organization</u>	<u>State</u>	<u>Year</u>	<u>Fuel</u>	<u># Years</u>	<u>Technical Potential</u>	<u>Economic Potential</u>	<u>Achievable Potential</u>	<u>Achievable Potential/Yr</u>
Indianapolis P&L	IN	2008	Electric	5	38.0%	29.0%	0.9%	0.2%
Iowa Assn of Munis	IA	2009	Electric	10	33.0%	22.0%	11.0%	0.8%
American Electric Power	OH	2009	Electric	20	38.0%	30.0%	13.0%	0.7%
Kansas Energy Council	KS	2008	Electric	20	43.0%	35.0%	11.0%	0.6%
Energy Center of WI	WI	2009	Electric	4	NA	16.7%	2.9%	1.0%
Means			Electric	12	38.0%	26.5%	7.8%	0.6%

2007 Residential Electric DSM Program Results, as % of Sales



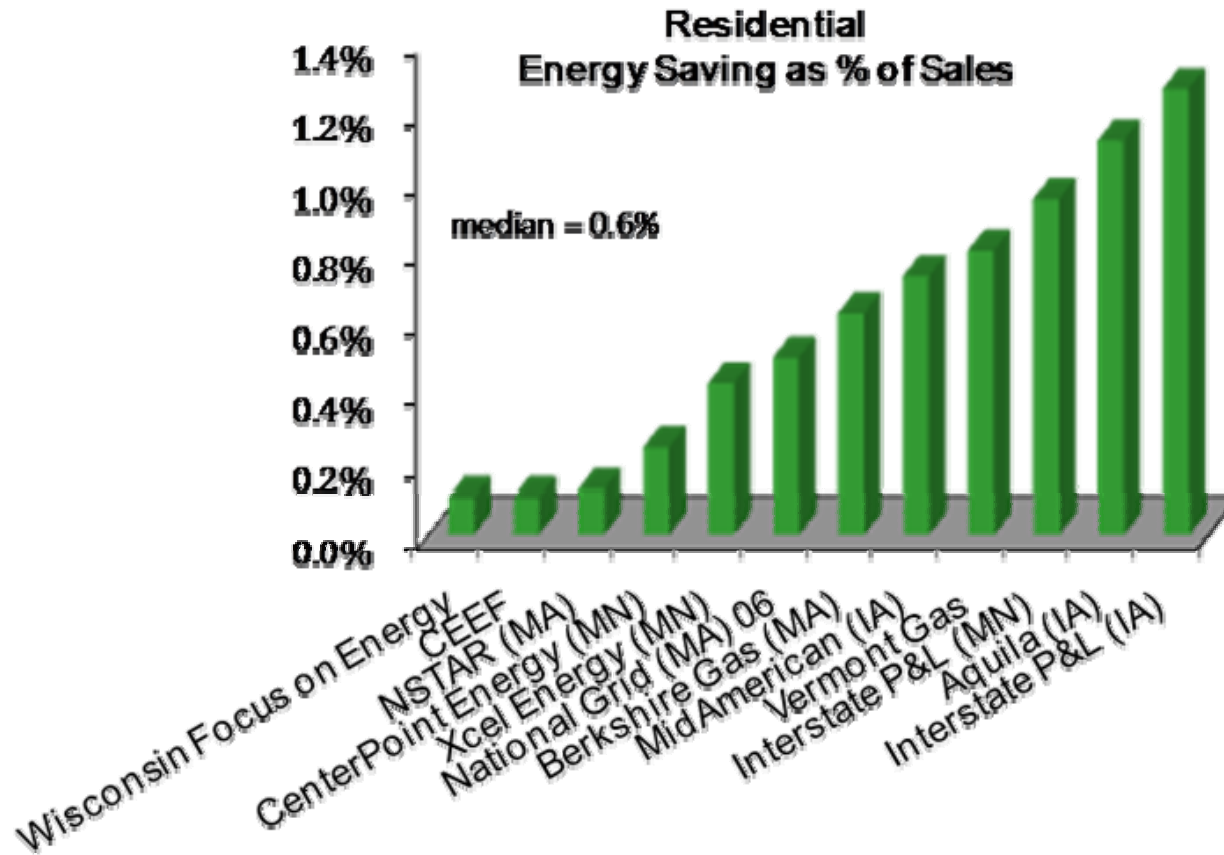
Residential Natural Gas DSM Potential Results

- Wide range of DSM potential estimates reported from the three studies that included gas DSM potential estimates:
 - Achievable annual EE potential estimates were 0.2% to 2.2%.
 - The most recent Midwest studies have very similar range of results and mean results as was previously found from Midwest studies that were done three to five years ago.
 - Primary variation between studies seem to be based on the “calibration targets” that the authors were using for the final estimates.
- Wide variation in potential estimates is matched by wide variations in actual residential gas DSM program results.

Residential Gas DSM Potential Results

<u>Organization</u>	<u>State</u>	<u>Year</u>	<u>Fuel</u>	<u># Years</u>	<u>Technical Potential</u>	<u>Economic Potential</u>	<u>Achievable Potential</u>	<u>Achievable Potential/Yr</u>
Iowa Assn of Munis	IA	2009	Gas	10	28.0%	21.0%	13.0%	2.2%
Kansas Energy Council	KS	2008	Gas	20	59.0%	46.0%	29.0%	1.5%
Energy Center of WI	WI	2009	Gas	4	NA	12.3%	0.6%	0.2%
Means			Gas	11	43.5%	26.4%	14.2%	1.3%

2007 Residential Gas DSM Program Results, as % of Sales



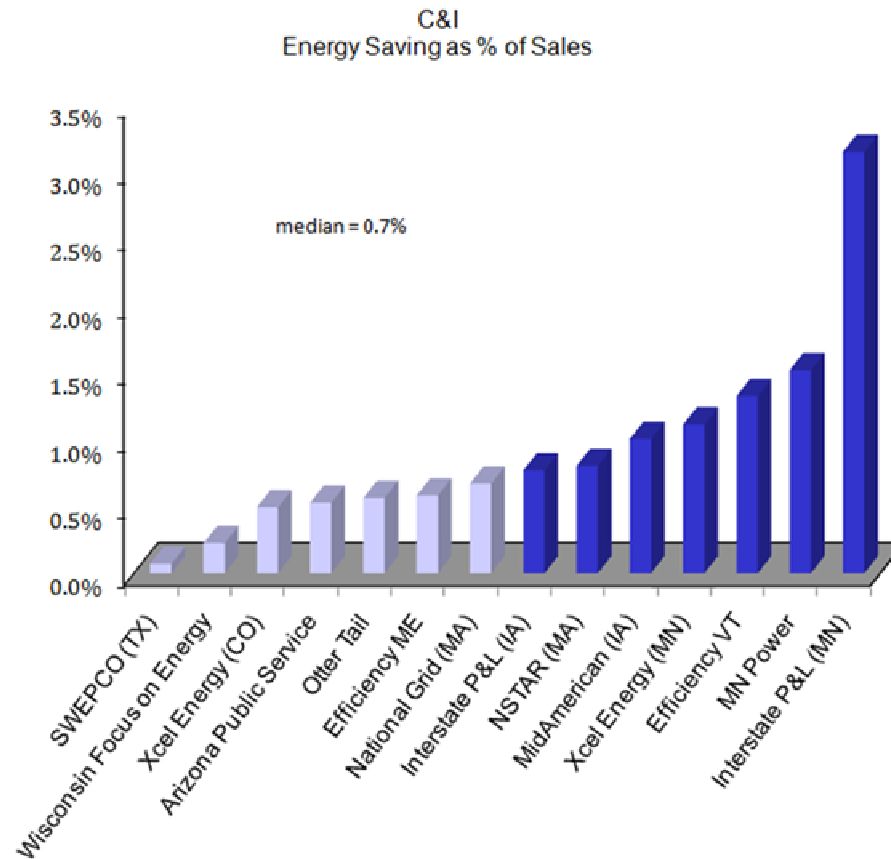
Commercial/Industrial DSM Potential Results

- Wide range of electric DSM potential estimates reported for C&I electric DSM potential estimates:
 - Achievable annual EE potential estimates vary from 0.3% to 2.0%.
 - However, IPL C&I DSM potential estimates are only for small C&I customers covered by DSM programs in Indiana.
- Actual C&I electric DSM program results for Midwest also show a wide range of results.
- C&I gas DSM potential results have a much narrower range than the other estimates: 1% to 1.8% annual savings.

C&I Electric DSM Potential Results

<u>Organization</u>	<u>State</u>	<u>Year</u>	<u>Fuel</u>	<u># Years</u>	<u>Technical Potential</u>	<u>Economic Potential</u>	<u>Achievable Potential</u>	<u>Achievable Potential/Yr</u>
Indianapolis P&L	IN	2008	Electric	5	38%	23%	1.3%	0.3%
Energy Center of WI	WI	2009	Electric	4	NA	17.2-20.4	4.5-5.5%	1.6%-2.0%
Iowa Assn of Munis	IA	2009	Electric	10	33%	22%	11.0%	1.2%-1.5%
American Electric Power	OH	2009	Electric	20	36%	29%	14.0%	0.7%
Kansas Energy Council	KS	2008	Electric	20	34%	33%	17.0%	0.9%
Means			Electric	12	35%	25%	10%	1.0%

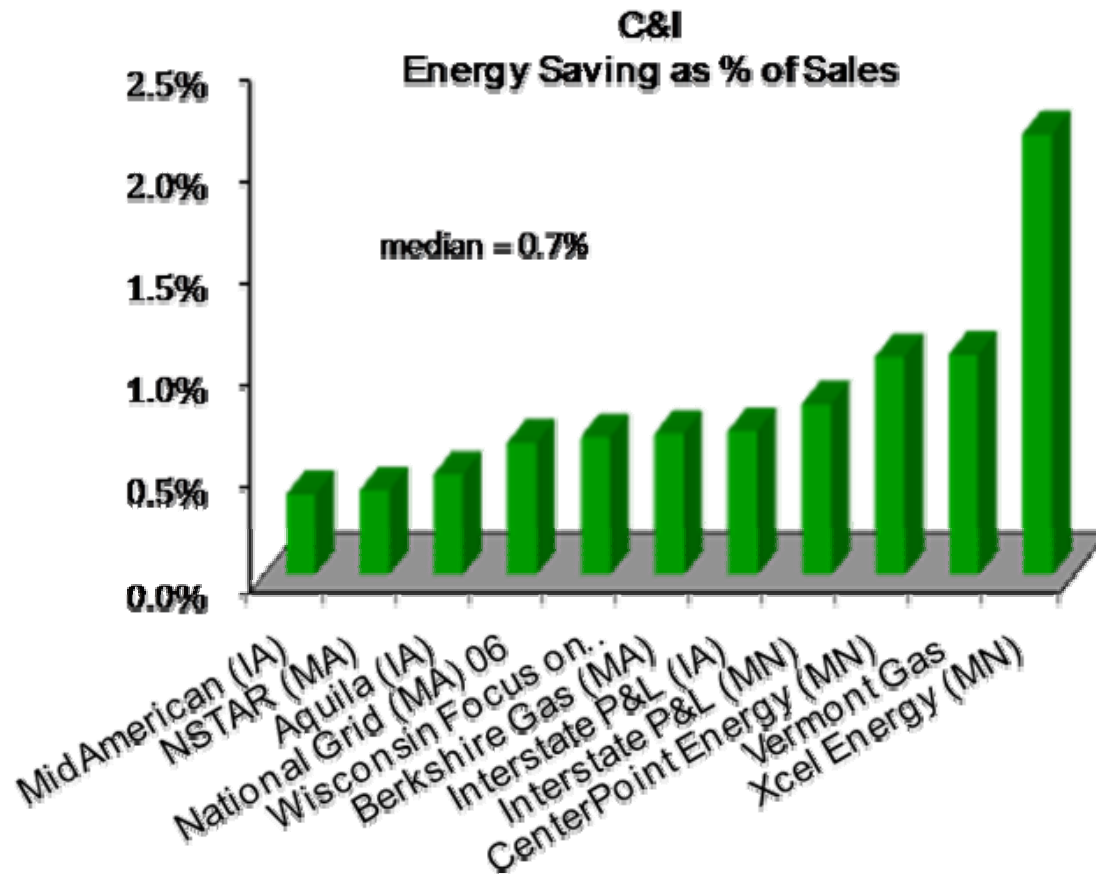
C&I 2007 Electric DSM Program Results, as % of Sales



C&I Gas DSM Potential Results

					Technical	Economic	Achievable	Achievable
<u>Organization</u>	<u>State</u>	<u>Year</u>	<u>Fuel</u>	<u># Years</u>	<u>Potential</u>	<u>Potential</u>	<u>Potential</u>	<u>Potential/Yr</u>
Energy Center of WI	WI	2009	Gas	4	NA	22%	2.7-5.1%	1.0% - 1.8%
Iowa Assn of Munis	IA	2009	Gas	10	28%	21%	13.0%	1.5%-1.6%
Kansas Energy Council	KS	2008	Gas	20	45%	45%	19.0%	1.0%
Means			Electric	11	37%	29%	12%	1.3%

C&I 2007 Gas DSM Program Results, as % of Sales



Conclusions

- DSM potential results are presented very differently between the studies reviewed, which makes apples to apples comparisons between studies difficult.
- The biggest factor explaining the wide range of study results seems to be the “calibration factors” that the study authors use to guide at least the near term DSM potential results. The most important calibration factors for these studies included:
 - DSM benchmarking and best practices analyses.
 - Delphi surveys with energy experts and client cooperative representatives.
 - The consultant’s judgment regarding what was feasible in the area being studied.
 - Legislative DSM requirements.

Best Practice DSM Potential Study Components

- Primary data collection sufficient to estimate the starting DSM measure saturations for all major measures.
- Ensuring that the results are consistent with industry best practices and program results.
- Conducting scenario analysis or other types of analyses to consider uncertainty in the inputs and outputs.
- Presenting the results in a clear and consistent manner that makes it easy for the reader to:
 - Understand the inputs that were used in the analysis.
 - Understand the general structure of the model that was used.
 - Presents results for residential customers separately from C&I.

Discussion

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