



# Measuring Efficiency Effectiveness

South Dakota Public Utilities Commission  
Energy Efficiency Workshop  
June 23, 2010

*“Everything that can be counted does not necessarily count;  
everything that counts cannot necessarily be counted.”*

--Albert Einstein

# Evaluation Methods – 3 Types

- Impact Evaluation
- Process Evaluation
- Market effects evaluations

Hi-light to add text

# Impact & Process Evaluation

- Impact Evaluation
  - Participation tracking
  - Engineering estimates
  - Billing analysis
  - End use metering
  - Comparison or control group.
- Process Evaluation
  - Informal data collection
  - Formal data collection (surveys)

# Impact Evaluation

- Measurement and verification
  - Representative sample is selected, savings determined, and applied to the project population
- Deemed savings
  - Per unit energy savings value from installing specific measure
  - Based on stipulated values coming from historical savings from typical projects (motor, T8 lamp, energy star refrigerator, etc.)
  - Operating hours and climate can impact

# Minnesota's Deemed Savings Database

- MN Office of Energy Security hired Nexant, Inc to develop standard energy savings for common prescriptive measures
- Cross functional technical workgroup

# Objectives of DSD

- Reduce uncertainty in EE savings estimates
- Provide consistent estimates of energy and demand
- Considers geographic variables
- Reasonable, realistic inputs to benefit/cost analyses
- Reduces need for duplicate efforts at utilities
- Focus budgets on validation of deemed savings

# Deemed Savings

- Consists of a number of Excel spreadsheets.
- Each spreadsheet may contain one or more energy efficiency measures.
- Measures key maps each measure to its corresponding spreadsheet
- Series of drop down boxes let you select measures and amounts

# Engineering Assumptions

- EE Measure
- Baseline
- Hours of operation or cycles per year
- Normalization units (HP, tons)
- High efficiency consumption
- Building type
- Location
- Product useful life
- Application (measure type) – Retrofit, replace on burnout, new
- Cost basis: incremental measure cost (capital cost between base and high efficiency) or total measure cost (incremental cost and installation cost, labor, mark up)



# Measures Include:

- Chillers Air Cooled
- Chillers Centrifugal
- CommercialLighting
- CommercialRefrigeration
- CondensingUnits\_Large
- EfficientComputerPowerSupply
- ElectricFoodService
- LEDTrafficSignalGreen
- MotorsReplaceOnFailure
- MotorsRetrofit
- ResidentialCFLs
- ResidentialCentralAC
- ASHP
- ResidentialElecAppliances
- Insulation
- ResidentialElectricDHW
- ResidentialRoomAC
- CentralACTuneup
- ResidentialTorchieres
- RooftopUnits
- SplitSystems
- VendingMiser

**Table 1: HVAC Interactive Factors (Reference 2)**

HVAC system	HVAC_cooling_kWhsa vings_factor	HVAC_cooling_k Wsaavings_factor
Heating only	1.00	1.00
Heating and cooling	1.11	1.33

**Table 2: Coincident Peak Demand Factors and Annual Operating Hours by Building Type (Reference 2)**

Building Type	CF	Annual Operating Hours
Office	78%	3435
Restaurant	94%	4156
Retail	94%	3068
Grocery/Supermarket	94%	4612
Warehouse	96%	2388
Elemen./Second. School	73%	2080
College	71%	5010
Health	84%	3392
Hospital	84%	4532
Hotel/Motel	51%	2697
Manufacturing	96%	5913
Other/Misc.	96%	2278
24-Hour Facility	94%	8234
Safety or Code Required	100%	8760

## CIP Commercial Prescriptive Lighting Calculator - v01

Clear Equipment with Button to begin. Select Program, heat or AC status, and Market Segment. Work left to right for each row (8 through 17). Use Rows 19 through 21 for lighting controls measures. Print when done to see line by line results.

Clear Equipment

Select Program	Select Heat or AC Status	Select Market Segment
Retrofit	Heating Only	Grocery/Supermarket

Enter Both Existing and Proposed Equipment - Use Last Three Rows for Lighting Controls

Select Prescriptive Product	Select Proposed Equipment	Qty	Select Existing Equipment	Qty
T8 Ballasts, 4 ft., 3 and 4 lamp	(3) F32T8 48" 32W Lamp with a high efficiency, low ballast factor electronic ballast	40	(3) F40T12 48" 34W lamps, electronic ballast	40

### Total Project Savings

	<b>kWh</b>	<b>3505</b>	<b>kW</b>	<b>0.760</b>
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# OTP Deemed Savings Use

- Planning
- Calculation and verification in cost/ben analysis
- Technical assumptions

Do not use for:

- Reporting tool
- Every calculation, process improvements
- Some technologies

# Thank you!

- The official repository for the Minnesota Deemed Savings Database is currently in docket no. E,G999/CIP-08-272.
- Dockets may be accessed in online at <https://www.edockets.state.mn.us/EFiling>.

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