ENERGY CENTER OF WISCONSIN

Energy Savings from Daylighting
An Opportunity Rediscovered

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YOUR PARTNERS IN ENERGY RESEARCH, EDUCATION & CONSULTING


WELCOME

“jewel box” buildings can inspire but also overwhelm

Milwaukee Art Museum

Thrivent Bank - Wisconsin

Stater Bros. Grocery Store - California

Chilton High School - Wisconsin

Ash Creek School – Pacific Northwest

Walmart - Wisconsin

Andersen Windows - Wisconsin

Why we believe it's a VERY real opportunity…

- Daylighting Collaborative – potential MT effects
- Appleton School District – retrofit savings in the field
- DOE/NASEO Daylighting in Schools Field Research

Daylighting Collaborative

Field MT Results

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- No $ for incentives
- Education/training and tech. asst. only
- Interim field evaluation based on self reporting of changes in design approach and attitude towards daylighting

DAYLIGHTING collaborative

Survey results indicated architects and engineers:

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- Are incorporating daylighting into some of their designs
- Have altered design elements as result of program's training and technical assistance
- View potential cost issues as a barrier
- Believe a program offering training, technical assistance and real-life examples of daylighting should continue

Design Element	% of Respondents*
Placement of windows	70%
Characteristics of glass specified	65%
Amount of installed electric lighting	65%
Use of shading devices	57%
Use of daylighting controls	51%
Sizing of cooling system	24%

**Pulled a sample of 89 from database of program participants*

Appleton SD –
Retrofit Savings from Daylighting

	Base case	Daylighting (with dimming)
Lights (kWh)	**2773**	**471** (83% reduction)
Equipment (kWh)	**890**	**890**
Pumps/ auxiliary (kWh)	**156**	**100** (36% reduction)
Fans (kWh)	**1216**	**1216**
Total (kWh)	**5035**	**3664** (27% reduction)
Peak kW (September)	**2.2**	**1.6** (27% reduction)

Daylighting –
A Controlled Experiment

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Daylighting controls + high performance glazing =

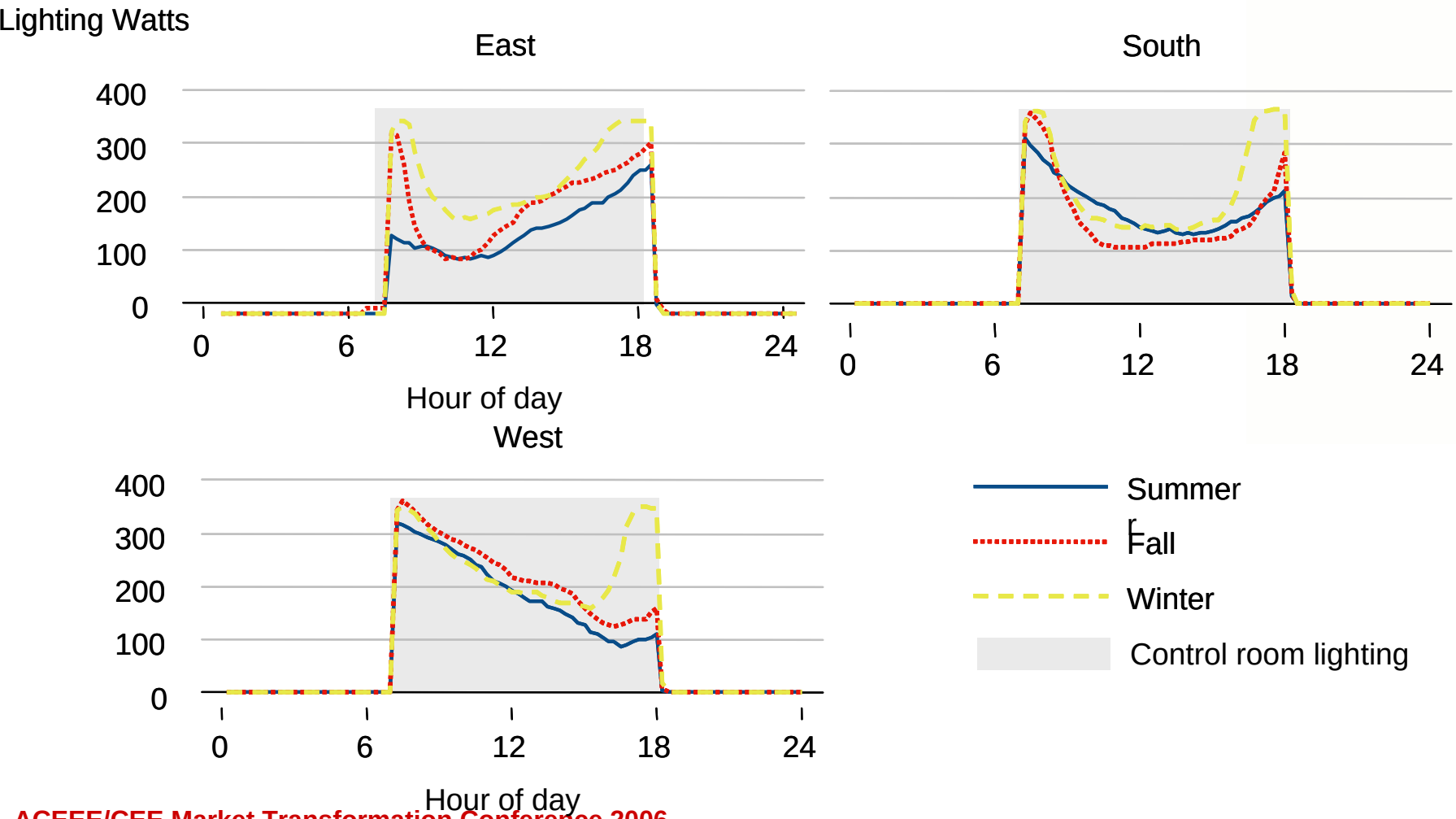
- **reduced electricity for lighting**
- **reduced HVAC loads**
- **a more pleasant environment**

dimmable ballasts + light sensors to automatically adjust the level electric lighting in response to the available daylight

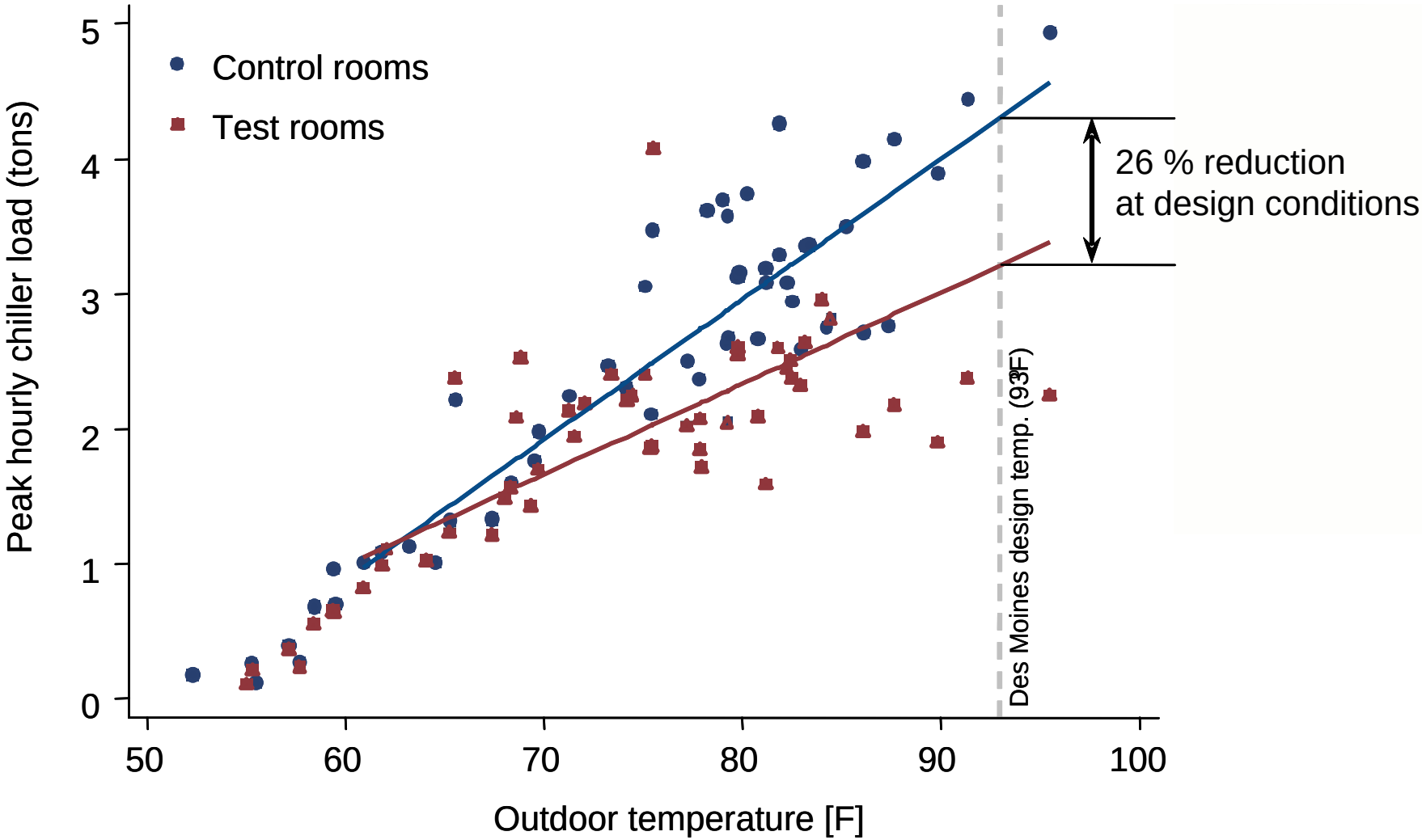
reduced visible transmittance (VT) to reduce glare, and reduced solar heat gain coefficient (SHGC) to reduce cooling load

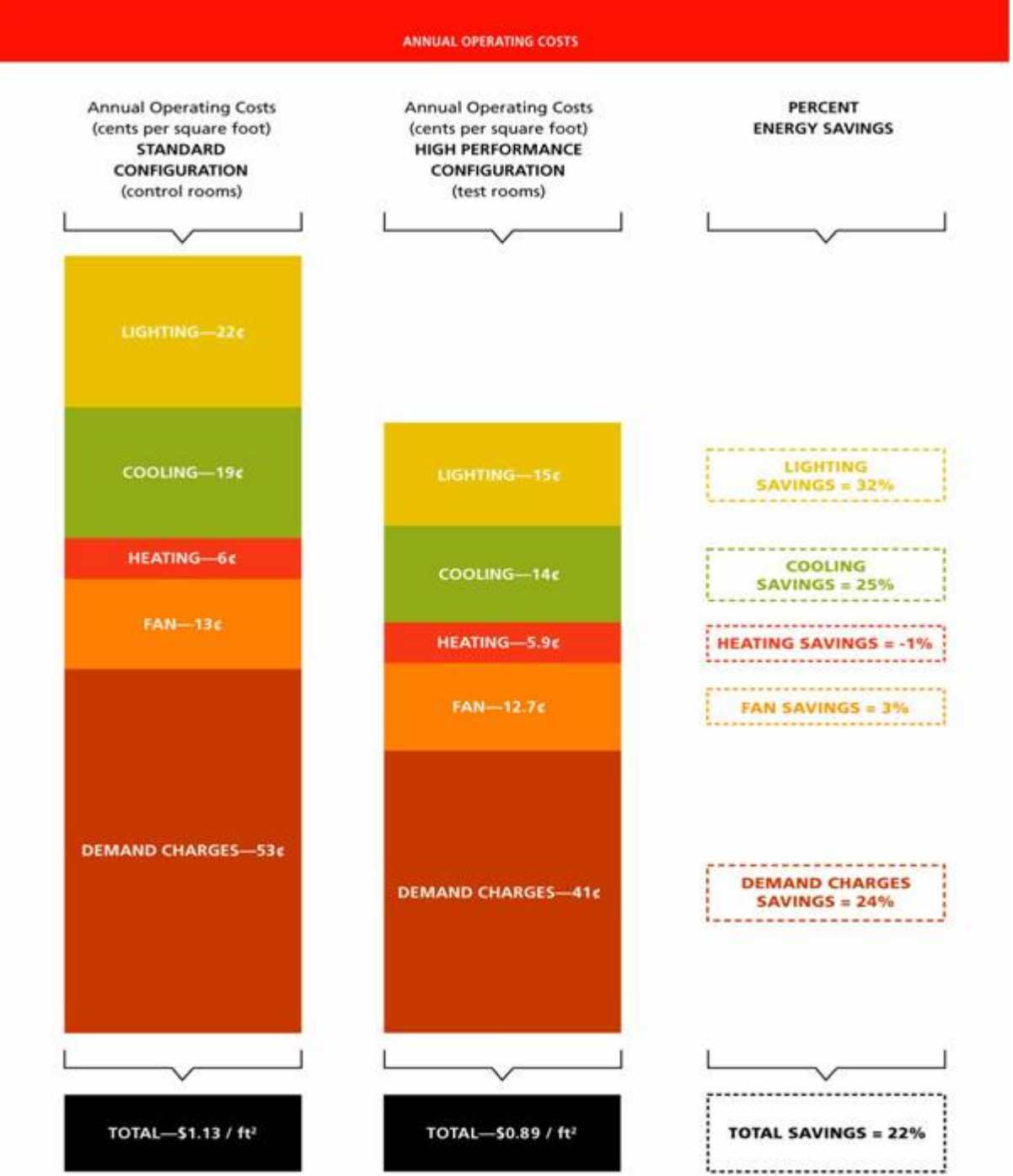
Lighting savings

Overall: 41% savings (32% incl. interior rooms)



Peak cooling load





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- **Only considering sidelighting – very conservative approach**
- **Due to time of day when usage decreased, significant demand reduction**

What could a program look like?

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- Cannot take primary research and put in field
- More than one way to daylight a building – bldg type, climate and budget
- Use realistic examples for success stories
- Energy savings ***and*** human performance benefits
- Not “state of the art” but “straight off the shelf”
- Incorporate strategy of working with product manufacturers
- Mix of “incentives” - $ measure, $ design grant, technical assistance, local examples of success

Light every building with only the sky

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