BEFORE THE CALIFORNIA ENERGY COMMISSION

2008 Order Instituting Informational Proceeding and Rulemaking on Load Management Standards	Docket No. 08-DR-01

COMMENTS OF ICE ENERGY INC. ON PROPOSED LOAD MANAGEMENT STANDARDS

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Ice Energy, Inc. ("Ice Energy") respectfully submits these comments on the California Energy Commission's Energy Efficiency Committee ("Committee") Draft Committee Report issued in this docket titled, *Proposed Load Management Standards*, (CEC-400-2008-027-CTD), November 2008[1] that was the subject of an Energy Efficiency Committee Workshop held on December 10, 2008 ("Draft Report"). These comments provide the context and background for two additional standards proposed by Ice Energy to be included in the next version of the Draft Report that relate to use of distributed energy storage as an enabling technology for Load Management.

I. INTRODUCTION.

In the Committee's Scoping Order,[2] and again in the Committee's Notice of Efficiency Committee Load Management Standards Workshop on Draft Proposed Standards,[3] the Committee made the following very broad, and entirely accurate, statement of its authority to adopt standards for distributed energy storage as an enabling load management technology, including thermal, electro-chemical, and kinetic forms of storage:

> "The Energy Commission has had authority to adopt load management standards since 1976. Public Resources Code section 25403.5 directs the Energy Commission to: '. . . adopt standards by regulation for a program of electrical load management for each utility service area.' These standards apply to all utilities in

[1] This docket was opened by an Order Instituting Informational and Rulemaking Proceeding ("OII/OIR") issued on January 2, 2008.
[2] The Scoping Order was issued on April 4, 2008.
[3] The Committee Workshop was held on December 10, 2008.

the state, including both Investor Owned Utilities (IOUs) and Publicly Owned Utilities (POUs). The standards were established to provide the Energy Commission with the ability to develop programs for reducing peak demand and reshaping utility load duration curves. Under the broad scope to adopt load management standards the Energy Commission "shall consider, but need not be limited to," the following load management techniques:

(1) "Adjustments in rate structure to encourage the use of electrical energy at offpeak hours or to encourage control of daily electrical load.

(2) End use storage systems which store energy during off-peak periods for use during peak periods.

(3) Mechanical and automatic devices and systems for the control of daily and seasonal peak loads."

The substantive criteria for adopting load management standards are that:

(1) "The standards shall be cost effective when compared with the costs for new electrical capacity and technologically feasible.

(2) Any expense or any capital investment required of a utility by the standards shall be an allowable expense or an allowable item in the utility rate base and shall be treated by the Public Utilities Commission as such in a rate proceeding." (Scoping Order, page 2; Notice, page 2).

II. THE COMMITTEE SHOULD ADOPT LOAD MANAGEMENT STANDARDS FOR ALL FORMS OF ENERGY STORAGY AS AN ENABLING LOAD MANAGEMENT TECHNOLOGY.

The Committee's Draft Report makes a number of very favorable references to thermal energy storage, as an example of a mature commercially available energy storage technology ready for distribution scale deployment, but explicitly declines to take the next logical step of including distributed energy storage standards for public comment in proposed regulations:

> "Enabling technologies include a variety of technical applications, many of which are available today . . . [an] example is a thermal storage unit that allows a building manager to store cooling energy over night when electricity is inexpensive, and then use the stored energy to cool during the afternoon when prices are high." (at page 17). "Load shifting technologies allow customers to permanently modify their energy use pattern, generally shifting their energy use to times when costs are lower and reliability higher." . . . Distributed system technologies allow utilities to manage and balance load and supply at a distribution level to moderate calling on larger peaking resources and to enhance distribution circuit reliability. Examples of these technologies include distribution

scale utility storage systems, such as thermal and battery storage, and additional intelligence in distribution technology." (at page 44).

"At the June 19 Workshop, presenters described some of these technologies, and Commissioners expressed support for the concept, but indicated that there may be no need for a standard to address their market penetration at this time. With all customers moving toward at least TOU [time of use] rates under AMI [advanced metering technology], the value of such technologies to Customer would appear to be increasingly attractive. Properly implemented, this enabling technology could be invisible to the building occupants and provide significant bill savings under a favorable pricing plan, while assisting the system overall by shifting load off peak. The Committee recommends that utilities provide information about the potential for load shifting technologies to customers as they are moved onto dynamic rates." (at pages 48-49).

In fact, what the Commissioners said exactly at the June 19 Workshop on Enabling Technologies was the following exchange contained in the Workshop Transcript:[4]

"ASSOCIATE MEMBER ROSENFELD: It's such a good idea it should pay without any, without you having to see us particularly.

PRESIDING MEMBER PFANNENSTIEL: Yes, what is the role of regulators in helping this technology?

ASSOCIATE MEMBER ROSENFELD: Yes, what am I supposed to do, except applaud? (Laughter and applause).

MR. WEINGARTEN: We feel -- Well first of all, the demonstration programs at PG&E and Southern California Edison are certainly a good start. But this could certainly be used as a utility resource. And not just individually to the individual business owners. I know it is not in the utility model for their business structure but this certainly can be considered a utility resource.

PRESIDING MEMBER PFANNENSTIEL: Right. So you should talk to the utilities about using it as a utility resource. I think Art and I agree that it sounds like it is a terrific technology.

MR. WEINGARTEN: Yes.

PRESIDING MEMBER PFANNENSTIEL: We've watched it being used and we support it. But we're just, and I share his confusion about the appropriate role of government in the market that should be out there for your technology.

[4] The Transcript, together with all related documents referred to in these comments, is available at:

MR. WEINGARTEN: All right. We'll prepare a written comment to that and address it." (Transcript, at pages 287-289).

The written comments that were requested by the Commissioners were duly submitted by Ice Energy, and are attached to these comments for ease of reference as Attachment "A."

In its Scoping Order the Efficiency Committee made the following introductory statement that anticipated the reaction of the Commission that California's utilities will have to play an active role in implementing whatever load management standards are ultimately adopted:

> "As described in the OII/OIR, the Committee recognizes the importance of work being done at the California Public Utilities Commission (CPUC) and the California Independent System Operator (CAISO) on demand response in California. The Committee indicates that this proceeding will be very closely coordinated with these entities. The Committee also recognizes that publicly owned utilities are engaging in demand response programs and activities, and will coordinate with those activities. The Committee notes again that the Energy Commission's load management standards authority under Public Resources Code section 25403.5 applies to all utility service areas in the state, and encourages the active participation of publicly owned utilities in this proceeding." (at page 3).

The Committee recognizes that its authority to set load management standards has legal limits that are at the intersection of the jurisdiction of the Energy Commission with the Public Utilities Commission ratemaking authority. It will take concerted action by both Commissions to require the utilities to fully utilize the benefits of distributed energy storage in load management, and the standards adopted in this docket will be a crucial part of the optimally balanced solution.

III. STANDARDS FOR AN EXISTING BUILDING ENERGY STORAGE PROGRAM AND AN ENERGY STORAGE TECHNOLOGY ADOPTION PROGRAM ARE BOTH NECESSARY AS LOAD MANAGEMENT STANDARDS.

The proposed standards that are presently contained in the Draft Report should be supplemented to include the following specific distributed energy storage load management standards, that are closely patterned on current Standards LMS-5 and LMS-6, for public comment in the next version of the Draft Report:

> "LMS-X. *Existing Building Energy Storage Program*. To require utilities to develop and expand programs that encourage cost-effective distributed energy storage improvements in existing building stock within their service territory.
>
> This article should apply to all utilities in California.

Compliance with this article shall be enforceable 3 days after the Load Management Standards are filed with the Secretary of State.

Within six months of the effective date of these standards, each utility shall submit to the Executive Director a proposal for an energy storage program. The program shall:

1. Target buildings with the greatest potential for energy savings.

2. Compile energy use data to identify those customers meeting specific targeting criteria.

3. Provide feedback on customer energy use through utility websites.

4. Coordinate energy storage programs with utility incentives programs.

5. Connect customers with energy efficiency upgrade financing programs administered by the utility or other institutions.

6. Provide customers with energy storage program marketing materials through bill stuffers, media campaigns, or other proven means.

LMS-Y. *Enabling Energy Storage Technology Adoption Program*. To require utilities to develop programs supporting customer adoption of distributed energy storage enabling technologies. These programs should support consumer purchase of these devices in a traditional retail environment. These energy storage technologies should be capable of facilitating customer load reductions responding to dynamic prices using the Open Automated Demand Response communication standard Internet protocol through the Statewide Time Differentiated Rate Broadcast and through additional communications channels, including the utility AMI systems.

This standard creates a customer driven market for all forms of energy storage technology.

This article shall apply to all utilities in California.

Compliance with this article shall be enforceable 3 days after the Load Management Standards are filed with the Secretary of State.

Within four months of the effective date of these standards, each utility shall submit to the Executive Director a proposal for an Energy Storage Program. The program shall provide.

1. A plan for publicizing the Energy Storage Program to building owners.

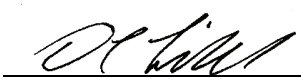
2. A customer incentive covering a portion of the retail cost for building owners.

3. A customer incentive covering a portion of the wholesale cost for building developers."

IV. CONCLUSION

Ice Energy thanks the Committee for this opportunity to comment on the Proposed Load Management Standards.

Respectfully submitted,



Donald C. Liddell
DOUGLASS & LIDDELL

Counsel for
ICE ENERGY, INC.

Date: December 19, 2008

ATTACHMENT A

California Energy Commission

Docket No. 08-DR-01 June 19, 2008

Energy Efficiency Committee Workshop

Presentation related to CEC authority to adopt standards to shift peak demand via end use storage systems which store energy during off-peak periods for use during peak periods (PRC 25403.5).

Permanent Load Shifting
The first technology for widespread customer load management

ICE ENERGY®

CLEAN ENERGY DOESN'T GET ANY COOLER THAN THIS.

Permanent Load Shifting

- **CPUC Final Decision 06-11-049** (Commissioner Chong)
  - Defines Permanent Load Shifting (PLS)
  - Finds use of DR funds for PLS to reduce peak load is reasonable
  - Q1-08, First IOU PLS Contracts for Ice Bear Storage
    - Trane, Honeywell, and Cypress execute contracts with PG&E and SCE
    - 140,000 megawatt hours of load shifting over 20-year life

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Ice Bear unit - Ice Storage Air Conditioning

- **CEC Optional Compliance Method for 2008 Title 24**
- **Residential and Non-Residential Buildings Energy Efficiency**
  - Residential ~ 50% reduction in building cooling energy in hot dry climates
  - Non-Residential ~ 20% reduction in building cooling energy
- **95% reduction in building cooling energy during peak period (Noon – 6 PM)**

Climate Zone	Standard cooling energy (TDV KBtu/sqft-yr)	ISAC cooling energy (TDV Kbtu/sqft-yr)	Reduction in cooling energy
10	23.23	11.36	51%
11	22.09	10.68	52%
12	14.33	6.9	52%
13	31.93	15.77	51%
14	32.07	15.63	51%
15	74.25	37.89	49%

Source CEC Staff Report: CEC-400-2006-006-SF

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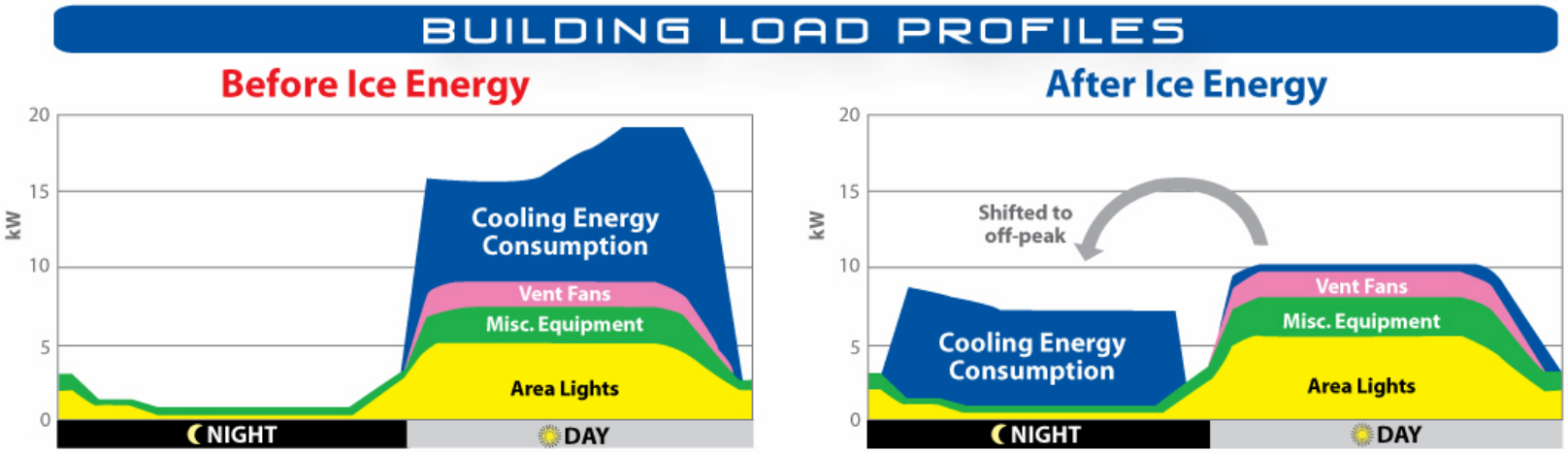
Most Buildings Have a Poor Load Factor ~ 53%

Manage customer load by efficiently shifting A/C energy to the off-peak



Low capacity factor

High capacity factor

- ***Enabling Technology for TOU rate switching***
  - ***Consume low cost, off-peak energy***
  - ***Reduce expensive on-peak demand and on-peak energy***
  - ***Zero loss storage measured at building meter***

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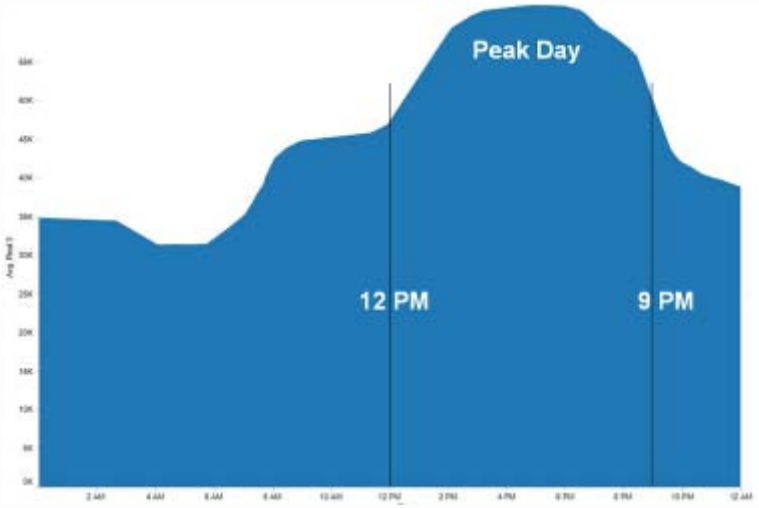
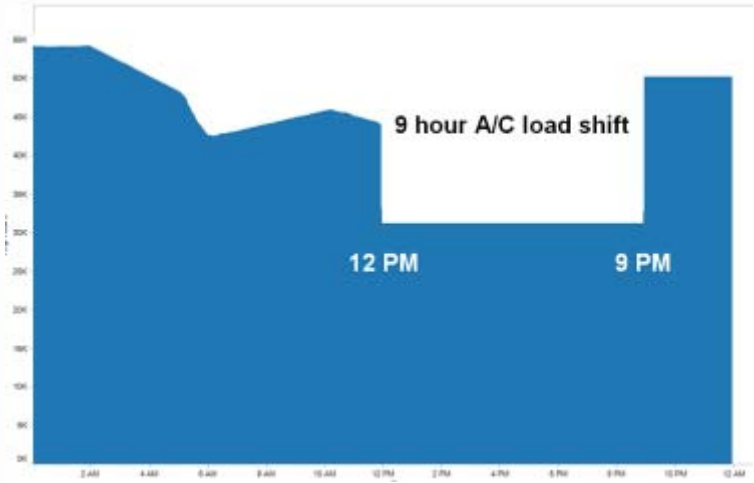
Victorville, CA Police Station - Meter Data

Electric Utility Meter Load Profile (inclusive of all loads)

Before



After



- 45 kW peak day demand reduction
- 300 kWh load shifting per day (on peak to off peak)
- 105% high desert round trip storage efficiency (saves site energy)
- 6 hour minimum of storage per day summer (9 hours on shoulder months)

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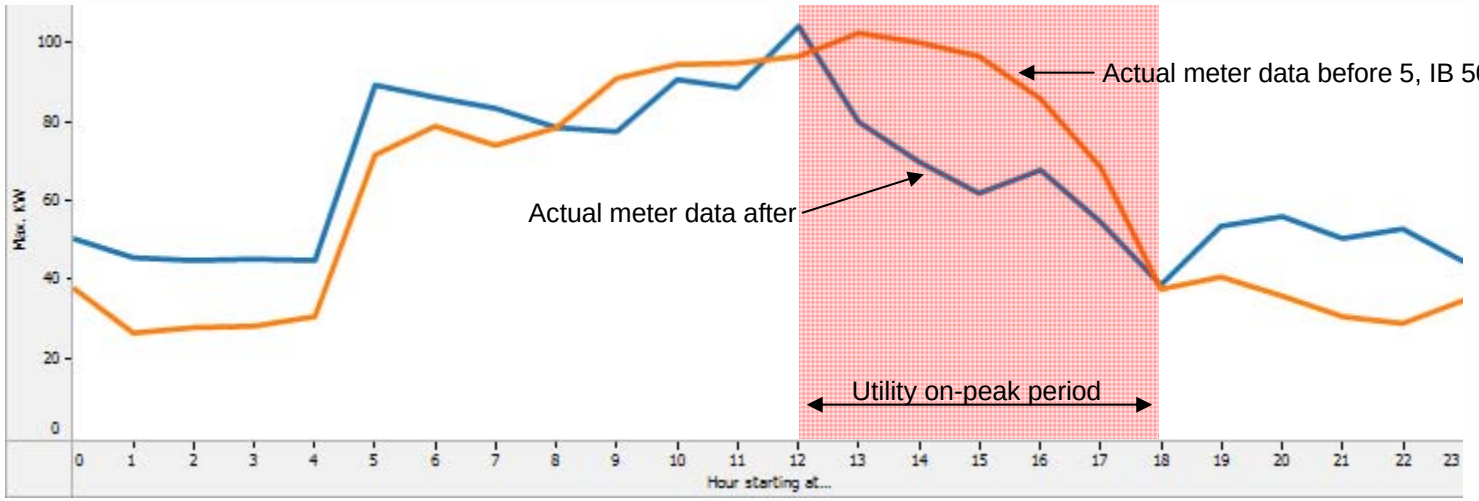
CoolData® SmartGrid Controller Schedule/Dispatch/Measurement & Verification

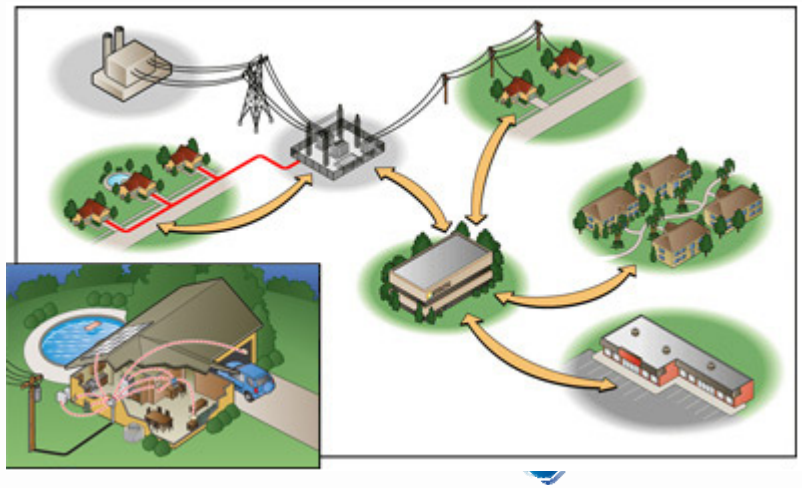
Si Manufacturing Interval Meter Data, Average of 5 Consecutive Weekdays



Central control
Remote data storage
Highly scalable

- **Demand Response**
- **Equipment Health**
- **Plug-in Hybrid charging**

Ice Energy's CoolData



CoolData® SmartGrid Controller

- "SmartGrid" ready
- Network communications
- Local scheduling and remote dispatch
- Direct load control for demand response of other building assets
- Real-time status, sub-metering, and data monitoring of customer equipment
- Performance analysis and automated diagnostics
- Configuration management
- Physical & Cyber security

- 1-Wire Dallas Sensor Network
- NI LabVIEW Application Layer
- Web Server
- OSIsoft, PI Enterprise Layer

MAXIM
NATIONAL INSTRUMENTS
OSIsoft.

Most advanced HVAC controller on the market

ICE ENERGY

Ice Bear® 50 Hybrid Air Conditioner

From this…

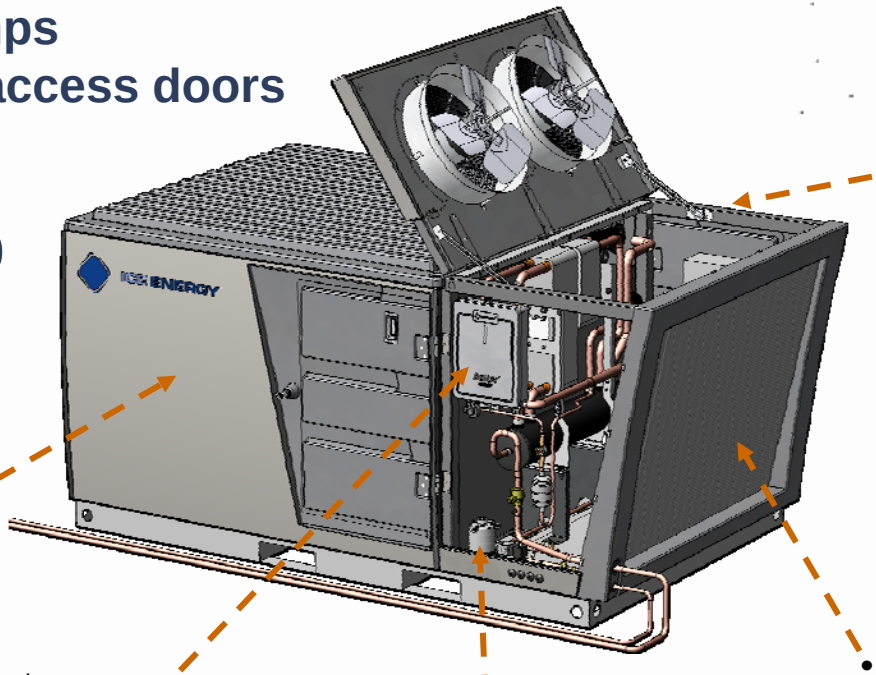
Ice Bear® 30 Hybrid Air Conditioner

To this!!!!

Advanced Technology for Lower Cost and Serviceability

- **Lower cost**
  - Integration of ice storage module, dedicated ice-make condensing unit, and new CoolData® smart grid controller & web server
  - 16 units on one truck
- **Longer 20-year asset life**
- **Greater reliability**
  - Isolated ice-make compressor, always factory quality
- **Hot swap pumps**
- **Easy service access doors**

Ice Bear® 30



- Door on opposite side for service access to compressor and water pump
- 5 Ton Cooling Output
- 6 hours of load shift
- 32 Ton-hour storage module (35 kWh)
- CoolData® Controller
- Refrigerant pump
- Compressor location

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Thank-You

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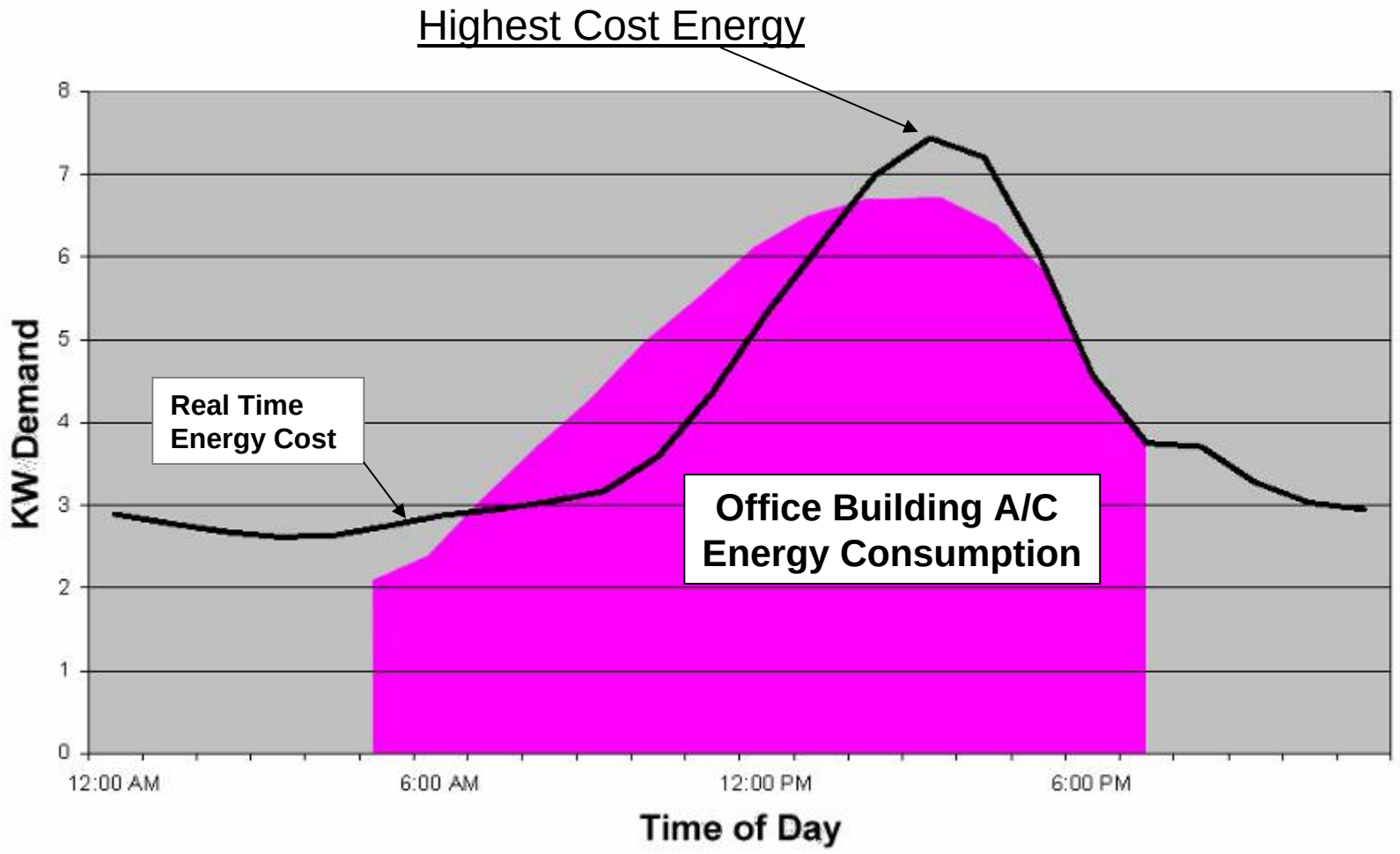
Building Air Conditioning Energy Profile Drives System Peak



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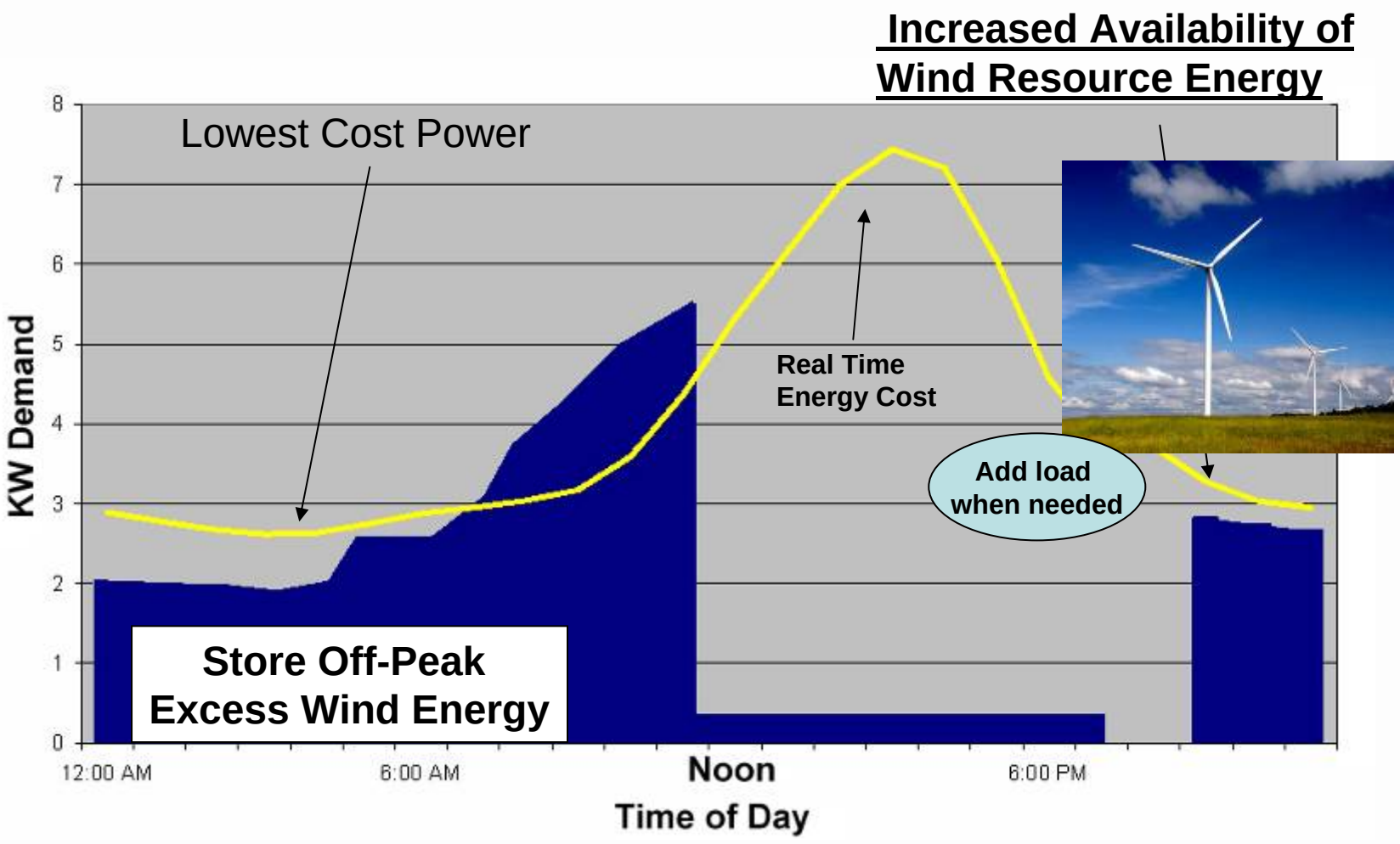
Create a market for off-peak wind *and* reduce the need to run on-peak generators

Bi-Directional Utility Controlled Regulation Energy Resource



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Ice-on-coil Heat Exchanger