

Pursuing Household Electric Savings In-field Short Course

ACI HOME PERFORMANCE CONFERENCE 2008

Monday, April 7, 8 am -12 pm
Pittsburgh, Pennsylvania

Designed & Facilitated by:

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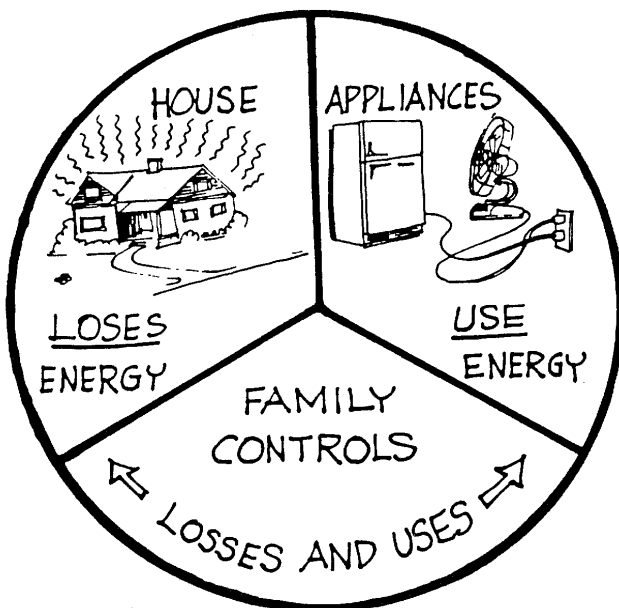
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The increasing demand for electric energy poses problems and opportunities at multiple levels. In many cases, addressing electric baseload and / or peak demand can be more cost-effective than traditional retrofits. Using a combination of interview, inspection, nameplate data, diagnostic tools, charts, calculation shortcuts, and websites we will explore, analyze, and express opportunities for both behavioral and technical activities.

By attending this session, participants will

1. Use consumption records and bills to establish seasonal and baseload use, and explore how the family, use patterns, rate class, and equipment affect electric consumption
2. Get hands-on practice using a variety of kWh meters and other diagnostic devices
3. Explore options and propose actions to maximize benefits

Our Fundamental Approach



Three things I want to get from this session:

- 1.
- 2.
- 3.

The goal is to understand how a particular household uses electricity, identify the possibilities for reducing that use and dialogue with the occupant for the best possible outcomes.

Assessing Savings Opportunity – Bill and Use History Analysis

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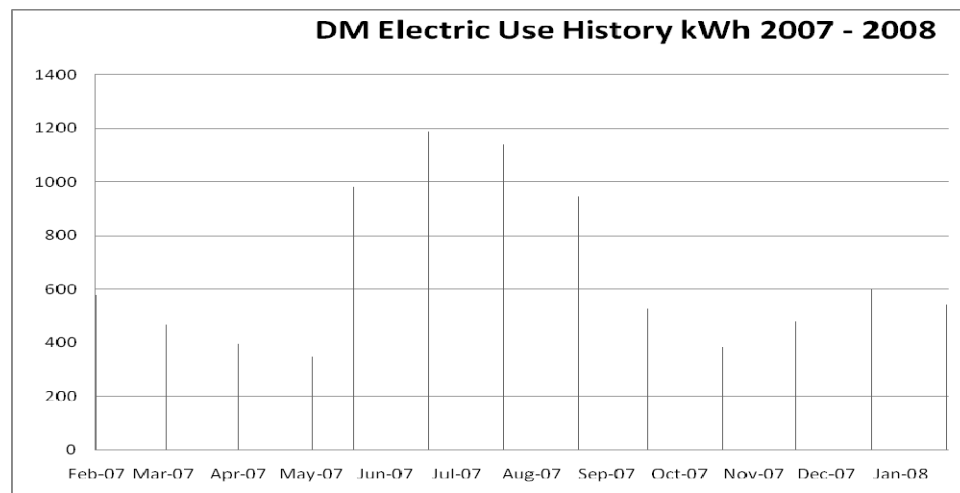
[REDACTED] CC 015 LST-BL 02 RD CYC 45 BL CYC 45 SERV START 08/31/00
[REDACTED] STATUS ACTIVE DS FNA LAST-TRAN 02/21/08
RT/RDR 010 000 DISPUTE EXP
PITTSBURGH PA 15212-1577 412 734 9975 RNTPROP NO
***** 03-06 RESIDENTIAL BILLING HISTORIES ***** 03/18/08 *** 1044 **
LN SRC T B/T B/M READ DAYS DUE RDG OPKWH OPTAMT KWH AVKWH AMOUNT
01 N J NOR 02 02/20/08 29 03/13/08 8852 667 91.00 540 18.6 75.30
02 N J NOR 01 01/22/08 33 02/13/08 8807 670 89.00 600 18.1 80.42
03 N J NOR 12 12/20/07 30 01/14/08 8757 673 84.00 480 16.0 61.77
04 N J NOR 11 11/20/07 32 12/13/07 8717 669 83.00 384 12.0 50.82
05 N J NOR 10 10/19/07 29 11/13/07 8685 673 84.00 528 18.2 67.25
06 N J NOR 09 09/20/07 30 10/15/07 8641 658 82.00 948 31.6 115.18
07 N J NOR 08 08/21/07 32 09/12/07 8562 612 77.00 1140 35.6 137.11
08 N J NOR 07 07/20/07 30 08/13/07 8467 617 77.00 1188 39.6 142.58
09 N J NOR 06 06/20/07 30 07/12/07 8368 625 78.00 984 32.8 118.56
10 N J NOR 05 05/21/07 31 06/12/07 8286 591 73.00 348 11.2 45.93
11 N J NOR 04 04/20/07 30 05/14/07 8257 593 73.00 396 13.2 51.32
12 N J NOR 03 03/21/07 29 04/12/07 8224 597 74.00 468 16.1 59.37
13 N J NOR 02 02/20/07 29 03/14/07 8185 614 74.00 576 19.8 69.76
14 N J NOR 01 01/22/07 33 02/13/07 8137 646 73.00 636 19.2 71.89
15 N J NOR 12 12/20/06 30 01/11/07 8084 696 73.00 432 14.4 47.79
* * * ARE THERE MORE RECORDS YES * * *
DSPLY 00 KEY TO NEW SS DSPLY KEY
    
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Important Points

1. Non-heating Residential Service 010 RS
2. All actual reads: NOR = normal
3. Meter multiplier is 12; that is, subtract last month RDG from present month RDG and multiply times twelve to get monthly kWh. Example: (8852-8807) x 12 = 540 KWH used between Jan 22 and Feb 20
4. Electric water heater and 2 occupants

Other interesting details

- FNA: Fixed network system, means there are daily/hourly reads and usage can be charted and supplied to customer upon request or consulted in case of dispute, etc.
- OPKWH: Option kWh is average use based on previous 11 months
- OPTAMT: Optional amount is 'budget billing' amount
- Average **cost per kWh is \$.0841**. Since PA is a state that has shopping "choice" this is the price a customer would have to better to benefit from changing electric providers.



Definitions: Baseload: electricity used to power things used year round

Seasonal use: electricity used to provide heating, cooling, often dehumidification, etc.

Separate the baseload use from the total use by adding together the three lowest months, (not weird numbers) dividing the sum by 3 to get an average baseload month's use, and then multiplying that number by 12 months. Or, look at the "shoulder months", those periods when there is neither heating nor cooling, and calculate based on those month's use. There are lots of ways to do this.

DM Use History Entered Into Excel Spreadsheet

Read Date	Days in Period	kWh Used	Summer kWh	Winter kWh
2/20/2008	29	540		164
1/20/2008	33	600		224
12/20/2007	30	480		104
11/20/2007	32	* 384		
10/19/2007	29	528	152	
9/20/2007	30	948	572	
8/21/2007	32	1140	764	
7/20/2007	30	1188	812	
6/20/2007	30	984	608	
5/21/2007	31	* 348		
4/20/2007	30	* 396		20
3/21/2007	29	468		92
2/20/2007	29	576		200
	13 month Total	8580	2908	804

Summary of Annual, Baseload and Seasonal Use

Annual Total	8004	
Average baseload per month	376	(*396 + *348 + *384) / 3
Average 12 month baseload	4512	(376 x 13 months)
Annual seasonal load	3492	(Annual – baseload)

Expressing Use for Different Periods and Assessing Potential

kWh Info from: <input checked="" type="checkbox"/> Bill History <input type="checkbox"/> Estimate	Annual	Average Monthly	Average Daily	Savings Potential (low, med, high)
Whole house	8004	667	22	
Baseload	4512	376	12	
Summer load	2908			
Winter load	804			

Is this a lot compared to PA Annual End Use Consumption Ranges?

Electricity Use	LOW	MID	HIGH
Baseload	2250	5000	8000
Domestic Hot Water			
Hot water use, 1-3 people	2500	4500	6000
Hot water use, 3-6 people	4000	6000	8000
Cooling			
Cooling load (total household)	750	1500	2500
Heating			
Electric heat load	2000	5000	8500

What is our reduction target if we want a 10% savings?

20%?

80%?

Assessing Opportunity as We Approach

What is the orientation? solar gain? shading benefits? drainage challenges? evident damage?



Seeing the outdoor post lamp we recall that they are one of the top 5 highest use lighting fixtures. (EIA 2004) The others are: kitchen ceiling light, living room table lamps, living room floor lamps, & bathroom vanity. Make a note to check wattage and inquire about use.

SITE NOTES