2012 DFW Solar Home Tour
October 6, 2012
Reference – Energy Monitoring

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Reduce costs:
- Lower operating costs:
  a. Instant visualization tool - stimulates usage reduction (i.e., adjust tstats, turn off lights/appliances) – raises consciousness of being more energy frugal.
  b. Provides information needed to adjust maintenance settings.
- Lower maintenance costs - Anticipate repair needs in advance of more catastrophic expenses.

Increase satisfaction:
- Confirm improvements, enhancements, corrective actions were effective.
- Verify advertised equipment performance
- Ensure results occur, surprises don’t happen, promised savings materialize.

Enhance decision making:
- Optimize decisions by providing quantitative feedback:
  a. Provides ‘base line’ to compare future actions to.
  b. Identifies what to work on next – facilitates pareto analysis.
  c. Offers data for informational and analysis purposes – perform ROI analysis.
- Enables questioning of unusual anomalies to identify more opportunities.

Speed up repairs / problem solving:
- Fix specific problems quicker / more accurately.
Energy Monitoring Example

http://welserver.com/WEL0043

Web Energy Logger (WEL)

http://www.welserver.com

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Energy Monitoring – Why?

Example – Lower Operating Costs
(Visualization tool to stimulate usage reduction)

- Pool pumps
- Heating & cooling
- Microwave, blow dryers
- Dishwasher
- Refrigerators
- Lighting, electronics, oven
- Night time lighting
- Computers, ‘phantom loads,’ Things plugged in
- Last 36 hours

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Electronics, TV, cooking, lights

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Energy Monitoring – Why?

Example – Lower Maintenance Costs
(Anticipate repair needs in advance of catastrophic expenses – i.e. heat pump coil replacement)

Outgoing Compressor Refrigerant Temperature - Weekly Maximum

- Evaporator coil replaced before compressor burnout
- Leading indicator of refrigerant leak
- Effective Heat Mode alarm level
- Return to normal temps
- Normal range
- Heating Mode
- Cooling Mode
- Last year
- This year

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Energy Monitoring – Why?

Example – Increase Satisfaction
(Confirm improvements, etc. result in real savings - i.e. geothermal HVAC replacement)
Energy Monitoring – Why?

Example – Increase Satisfaction
(Verify advertised equipment performance)

Heat pump #1 heating at about 2 tons
Heat pump #2 heating at about 3 tons
Heat pump #1 cooling at about 2 tons
Heat pump #2 cooling at about 3 tons
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Energy Monitoring – Why?

Example – Increase Satisfaction

(Ensure results occur, surprises don’t happen, promised savings materialize)

71% reduction since 2006

Monthly Electricity & Natural Gas Costs Total - 2006 to Present

2006: $673/mo avg
2011: $250/mo avg
2012: $193/mo avg (estimated)

Net of all cash flows
Energy Monitoring – Why?
Example – Enhance Decision Making
(What to work on next – i.e. base load)

Electricity Consumption Distribution Starting 2009
(12 mo. Rolling Averages)

Portion of Total Electricity Consumption (%)

- Base = 58%
- HVAC = 28%
- Pool = 16%

Now focus here
58%
Perform ROI analysis – i.e. solar PV system

Example – Enhance Decision Making

$21/mo net savings on rolling 12 mo. avg (pos cash flow)