Partnering to benefit our world and your bottom line

Rapid Improvement Associates, LLC

Energy Management: Ideas and Tools

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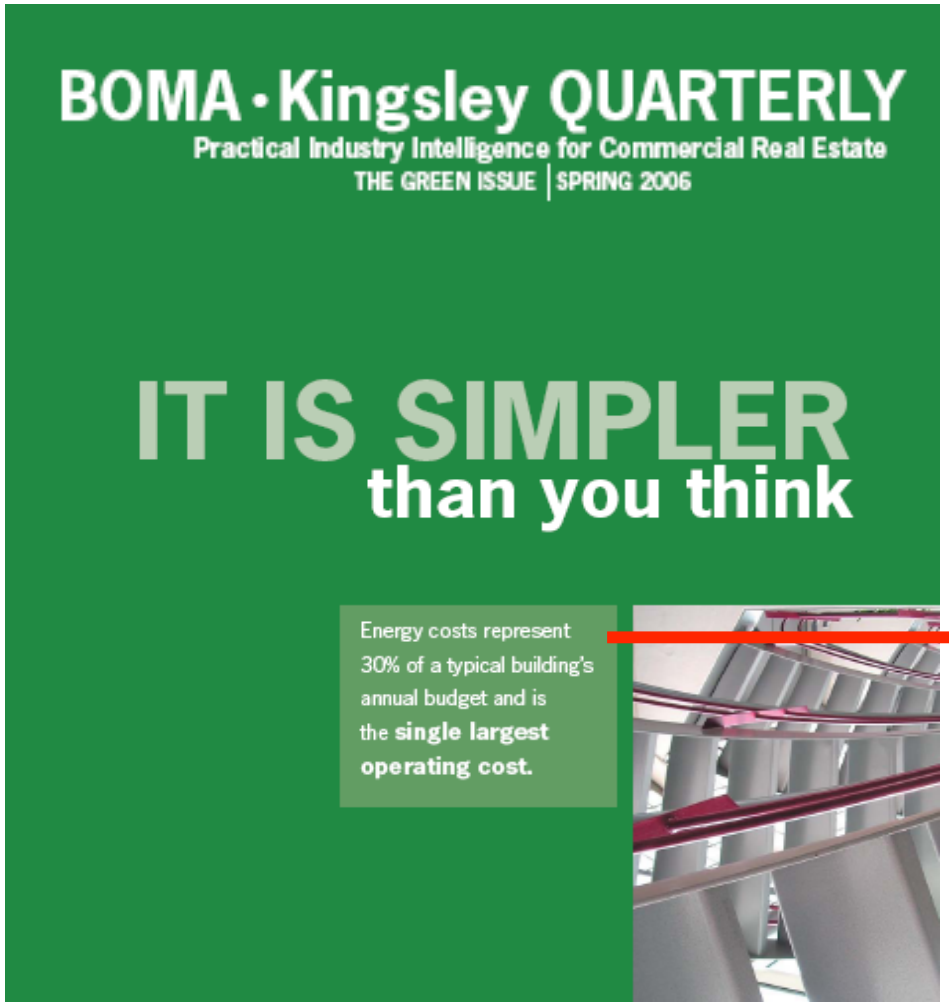
Energy Market Concerns

- Rising energy costs
- Energy reliability issues
- Impact on climate change
- Public demand for environmental stewardship
- Regional and state GHG reduction requirements
- Pending federal legislation
- ➢ **Green Buildings Trend**

Green Starts with Energy



Energy costs represent 30% of a typical building's annual budget, and is the single largest operating cost.

A few words from the President*

- **Energy efficiency in existing buildings is our greatest opportunity for a sustainable future**
- **86% of construction dollars go into existing buildings**
- **75% to 80% of all buildings that will exist in 2030 exist today!**

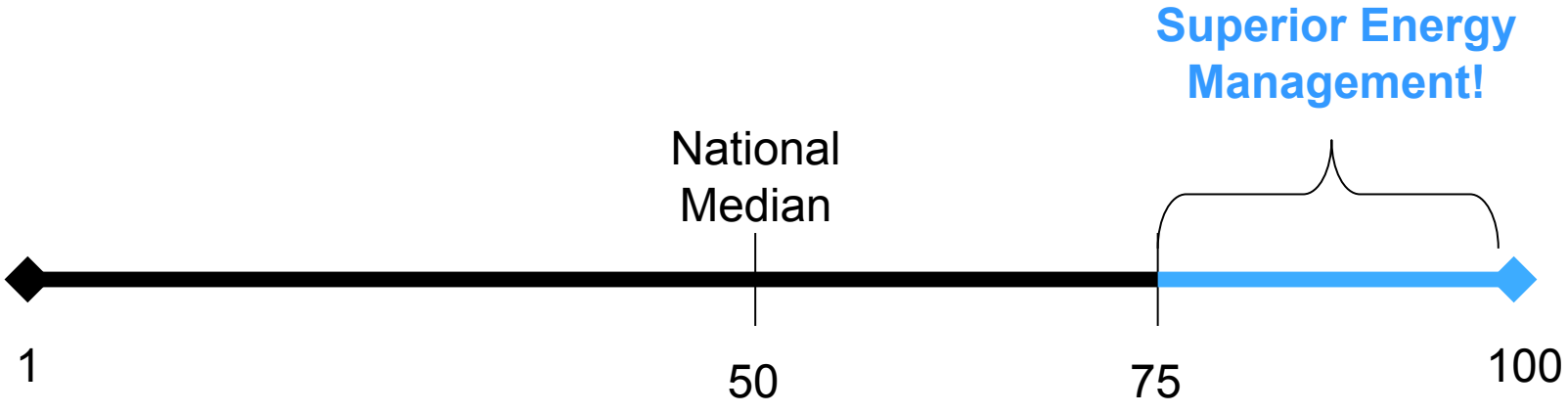
*ASHRAE Presidential Address June 2009 http://www.ashrae.org/aboutus/page/30

What is ENERGY STAR®?

- Voluntary climate protection partnership with EPA
- Strategic approach to energy management, promoting energy efficient products and practices
- Helps organizations save money and protect the environment
- Influential brand recognized by over 75 percent of Americans

ENERGY STAR for Commercial Buildings

- National recognition for top energy performance of commercial buildings.
  - Over 7,200 buildings have earned the ENERGY STAR to date.



Percentile of Commercial Building Population in terms of EE

Eligible Space Types for Rating

Houses of Worship added 8/09

Hospitals

Retail

Office Buildings

Hotels

Medical Office Buildings

Waste Water Treatment Plants

Courthouses

Financial Centers

Warehouses

Dormitories

Supermarkets

K-12 Schools

All Buildings Can Benchmark But Some Cannot Receive a Rating

- Benchmark your facility against itself
  - Look at trends in historical data
- Compare to other buildings in your portfolio
  - Prioritize upgrade opportunities
  - Create an internal benchmark
  - “Create a Group” to compare select buildings
- Compare to national average energy use intensity (EUI) for your building type
  - Set performance targets

Portfolio Manager, the ENERGY STAR web application

+ Tracks energy data on multiple buildings
+ Gives national benchmark for 13 building types
+ Tracks greenhouse gas emissions
+ Links to advanced tools for planning
+ Use mandated by some states (CA, WA, …)
- Complex for non-expert users
- Not designed to engage a team of users
- Emphasis on data, not action

An Aside: The Prius Analogy or Fallacy?

For feedback to lead to effective action, you need to…

1. Sense,
2. Interpret, and
3. Translate the feedback into one or more actions that will "work".
4. Have the power to act ("can do");
5. Actually act to change system performance ("will to do").

ENERGY STEWARDS™ WEB PLATFORM

Energy Stewards™: Transparent Energy Management

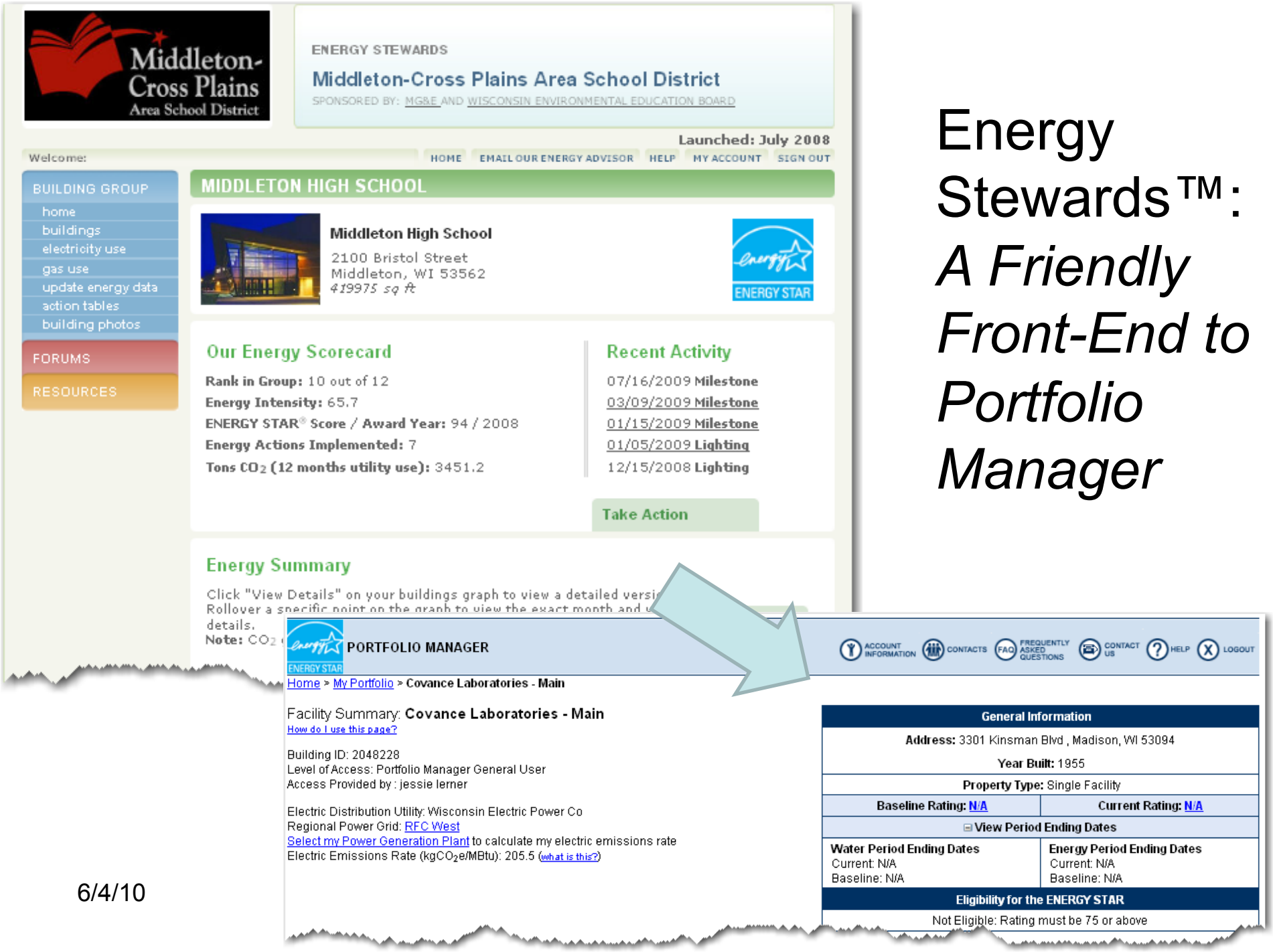
Features

- Energy Data
- Actions
- Shared Lessons

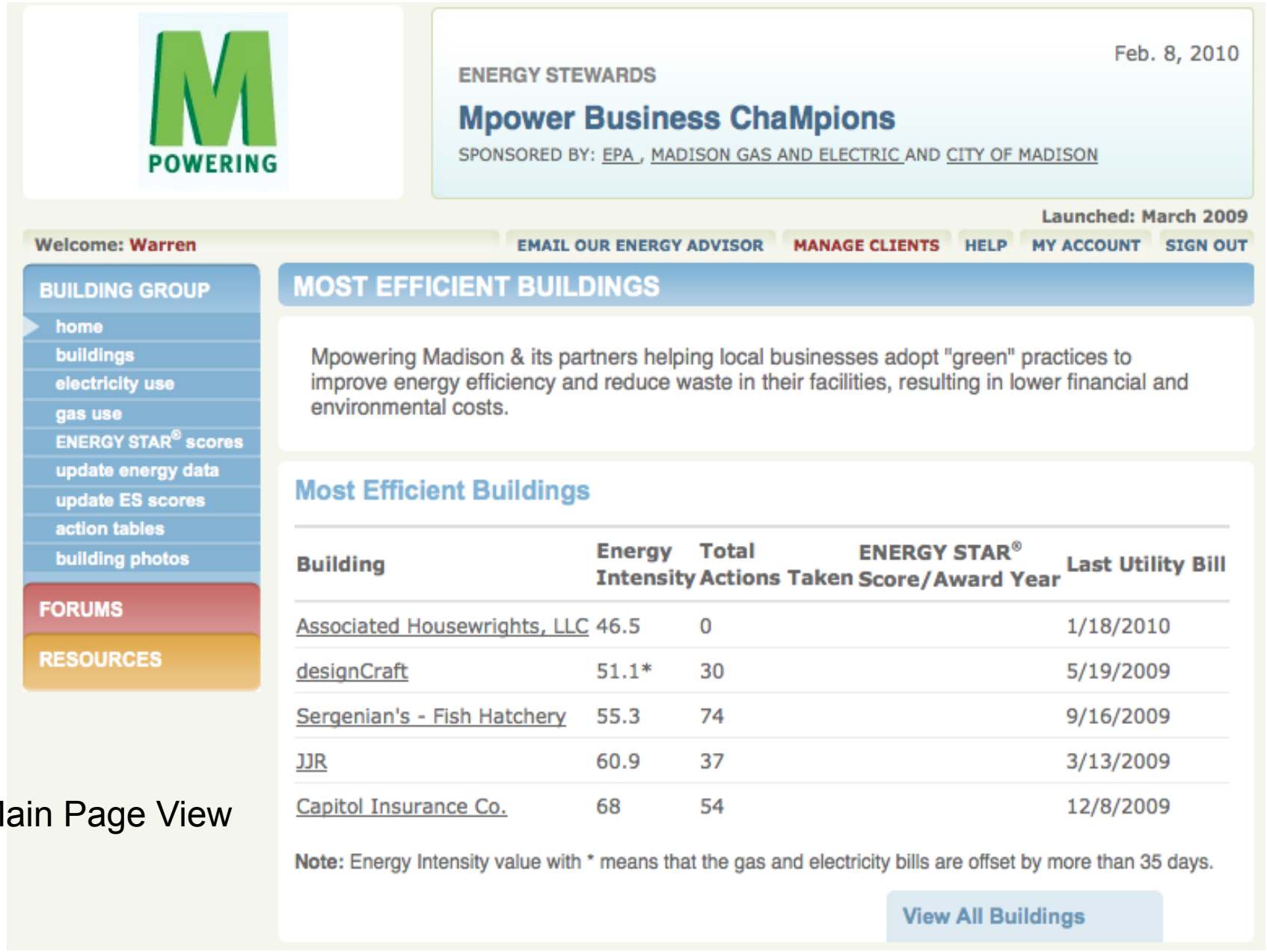
Functions

- See state of Energy Management at a glance
- Engage building users and other stakeholders
- Actions visible to all

www.energystewards.net/video



Energy Stewards™: *A Friendly Front-End to Portfolio Manager*



Main Page View

BUILDINGS IN OUR GROUP

Project Results to Date

Total Active Buildings: **18**
Action Items Checked: **902**

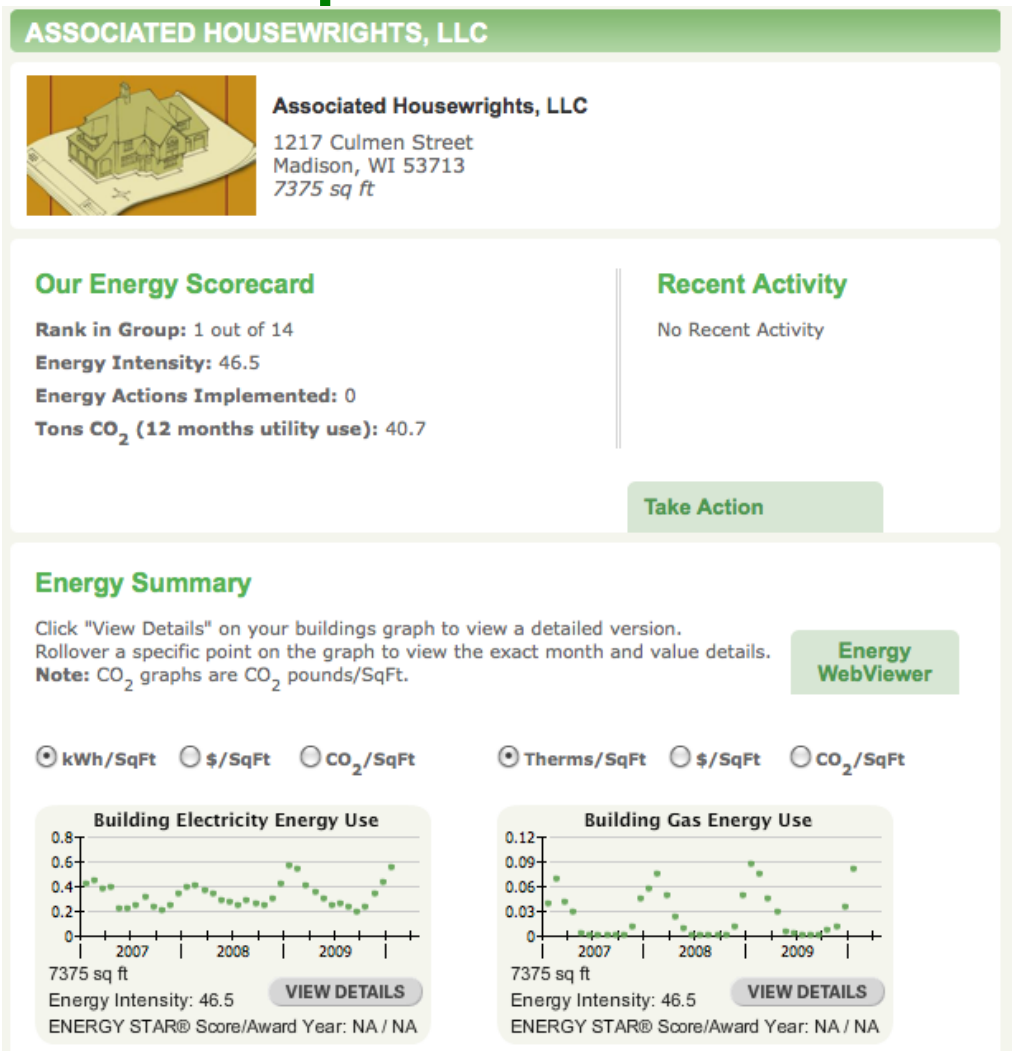
Note: Click a heading to sort the list of buildings.

Building	Energy Intensity	Total Actions Taken	ENERGY STAR® Score/Award Year	Last Utility Bill
Associated Housewrights, LLC	46.5	0		1/18/2010
designCraft	51.1*	30		5/19/2009
Sergenian's - Fish Hatchery	55.3	74		9/16/2009
JJR	60.9	37		3/13/2009
Capitol Insurance Co.	68	54		12/8/2009
Payroll Company	73.9	60		9/2/2009
Sergeinian's - West Beltline	87.6	70		9/29/2009
Union Cab Garage	91.2	0		1/8/2010
Union Cab Office	100.7	0		1/8/2010
Lakeview Veterinary Clinic	102.3	0		1/6/2010
Great Big Pictures	115.5	56		11/20/2009
Webcrafters - Fordem	143.3	57		12/1/2009
Webcrafters - Bluebill Park	285.9	55		12/1/2009

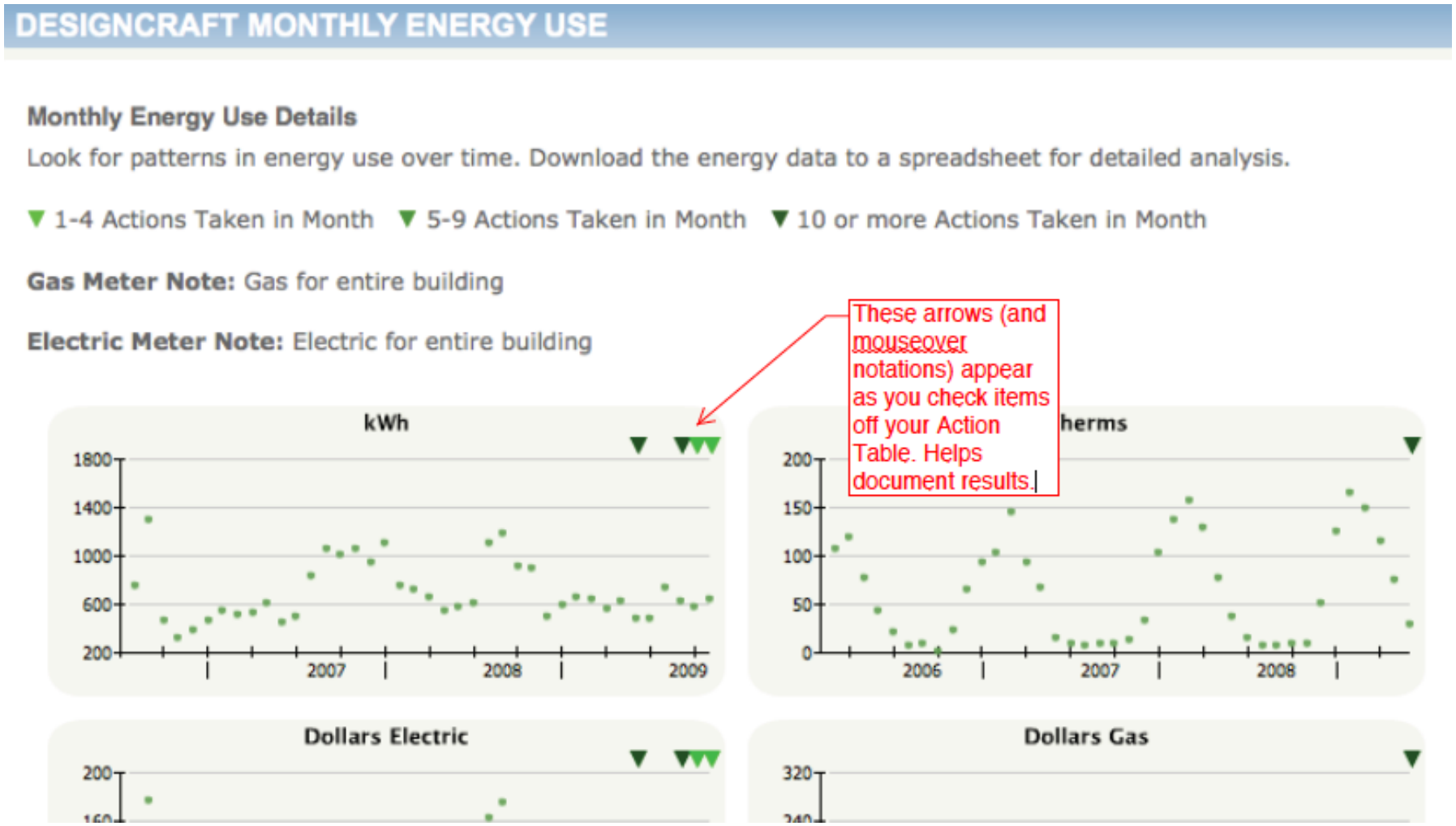
What Do You Want To Achieve in 2010?

How Will You Know Change Is Improvement?

Building Page View



Energy Charts Link to Action



What Can You Test In Your Unique Organization?

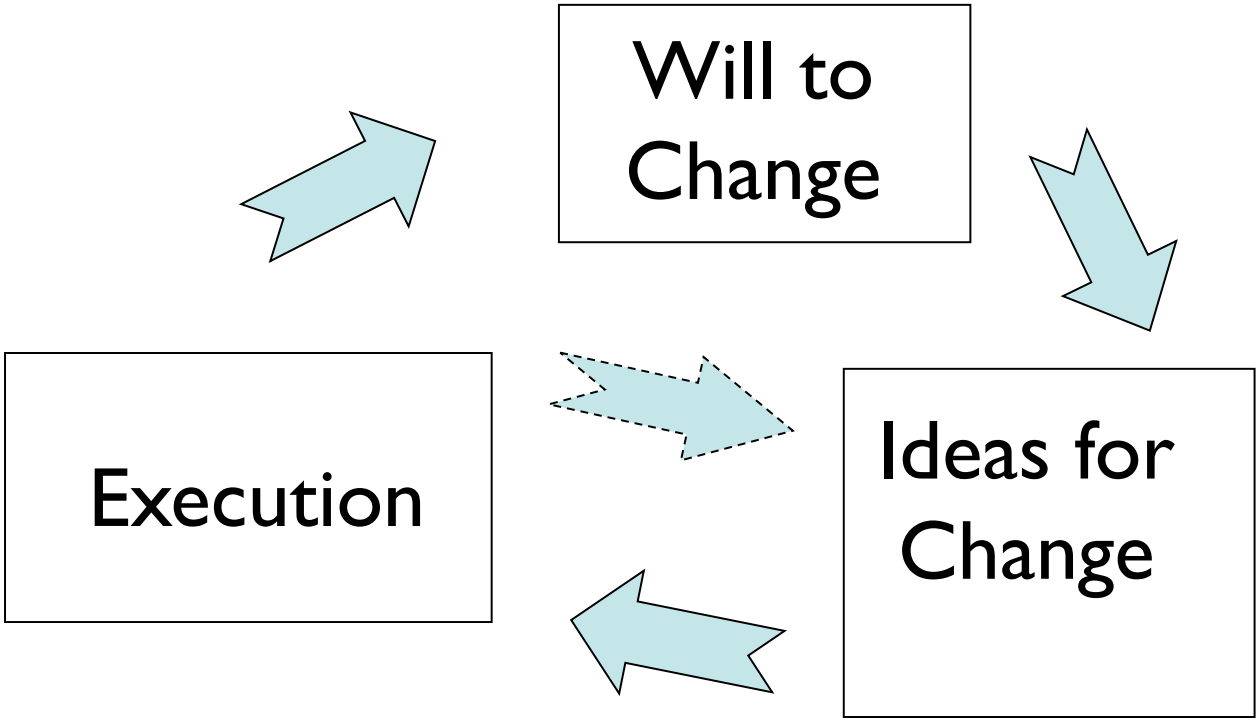
Improve Energy Efficiency	
Category	**Action**
Actions Common to All	20.01 Ensure proper weatherization of building (i.e. doors and windows have tight seals; Insulate and/or coat windows to reduce heat gain/loss; outside walls are adequately insulated; caulk and insulate around electrical outlets, where service lines enter building, between wood and masonry, etc.)Â
Actions Common to All	20.02 Centralize refrigerators by eliminating surplus and multiple small units.
Actions Common to All	20.03 For south facing windows consider awnings, levelors or meco shades (lets light not UV in) to reduce heat capture in summer.
Actions Common to All	20.04 Install aluminum reflectors in fluorescent fixtures.
Actions Common to All	20.05 Install programmable thermostats that can be secured.
Actions Common to All	20.06 Insulate hot water heater.
Actions Common to All	20.07 Plant trees south of the building to increase shade, on west as a wind buffer or anywhere to offset emissions.
Actions Common to All	20.08 Replace incandescent exit signs with Energy Star LED fixtures.
Actions Common to All	20.09 Replace overhead fluorescent fixtures with T-8 or T-5 lamps.
Actions Common to All	20.10 Replace screw-in incandescent bulbs with energy star compact fluorescent bulbs.
Actions Common to All	20.11 Ensure timers or sensors are installed where appropriate (i.e. outside lighting, restrooms and other spaces intermitantly used).
Actions Common to All	20.12 Research and identify efficient operations/process equipment.
Actions Common to All	20.13 Upgrade electronics and appliances to Energy Star efficient models (don't forget high efficiency vending machines).
Actions Common to All	Other - Completed other energy efficiency measure (please describe in forum).

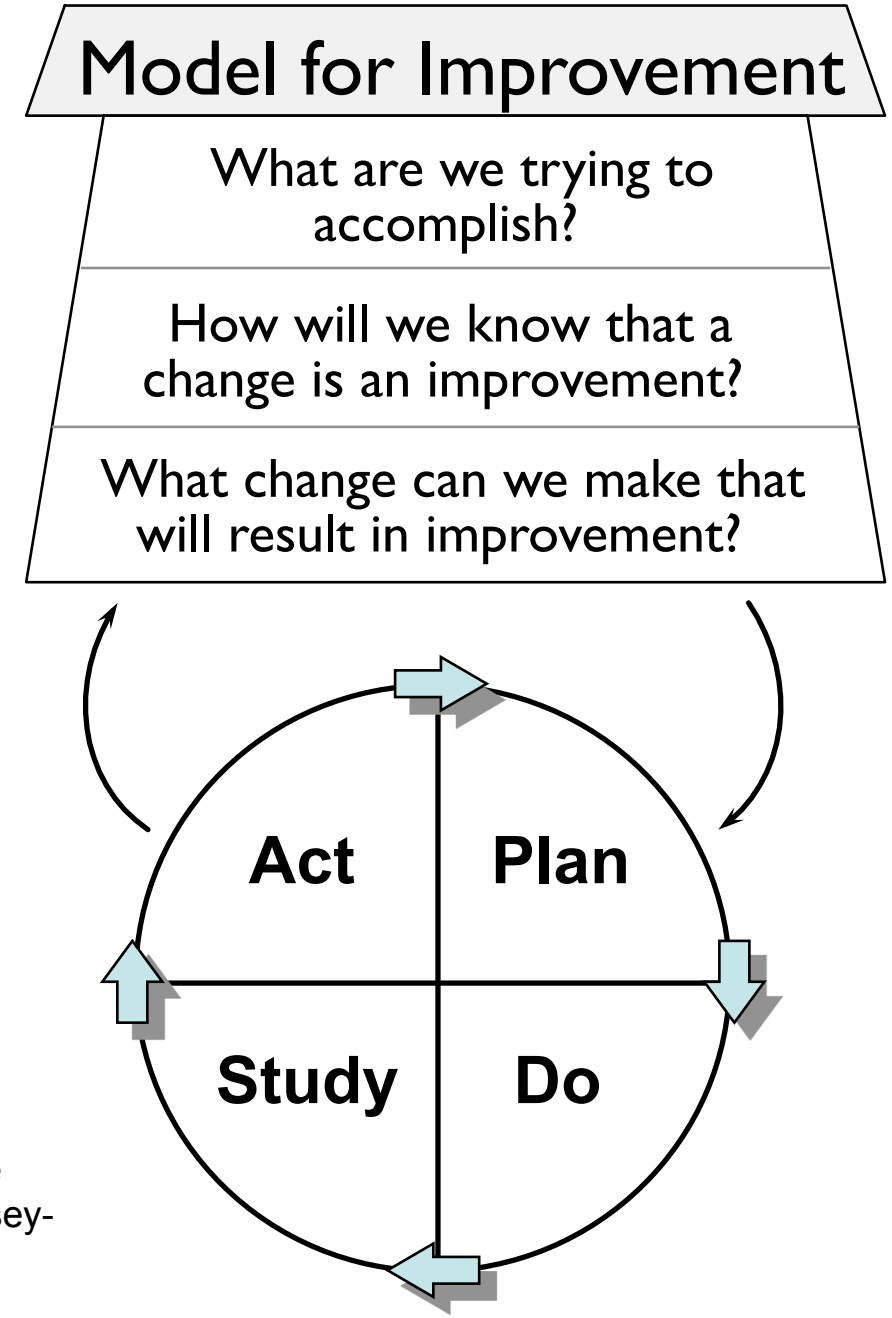
Key Questions We Ask

- Who has to be on your team to succeed?
- Why would they want to support you?
- How will you involve them starting today?
- How will you get everyone involved?
- What can you test this week?

APPENDIX: WHAT IT TAKES TO IMPROVE PERFORMANCE

Ingredients Needed to Change What We've Been Doing





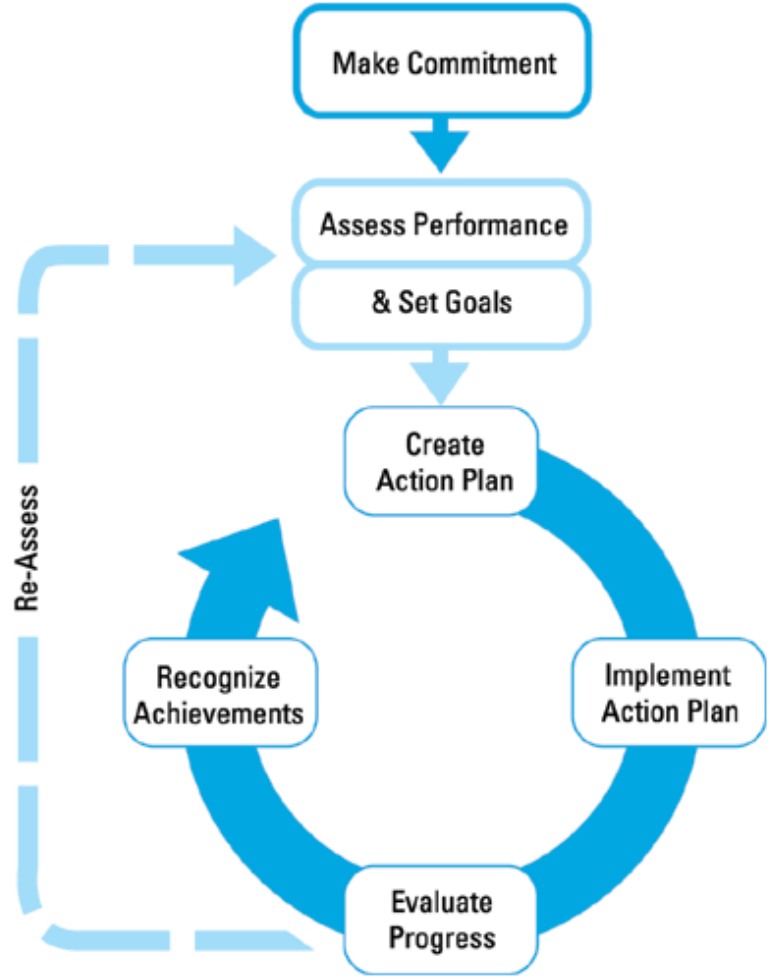
Langley et al. (1996), The Improvement Guide, Jossey-Bass: San Francisco.

Advice on Testing

Deciding on the Scale of a Test		*Current Commitment within Your Organization*		
Belief in effectiveness	*Failure Cost*	No Commitment	Some Commitment	Strong Commitment
Low degree of belief that change idea will lead to improvement	Cost of failure large	Very small-scale test	Very small-scale test	Very small-scale test
	Cost of failure small	Very small-scale test	Very small-scale test	Small-scale test
High degree of belief that change idea will lead to improvement	Cost of failure large	Very small-scale test	Small-scale test	Large-scale test
	Cost of failure small	Small-scale test	Large-scale test	Implement

source: Table 7.1 from G. Langley et al. (2009) *The Improvement Guide,* 2nd Ed.,

Energy Star Guidelines for Energy Management



Reference

www.energystar.gov