

Managing the Human Element of Energy Consumption

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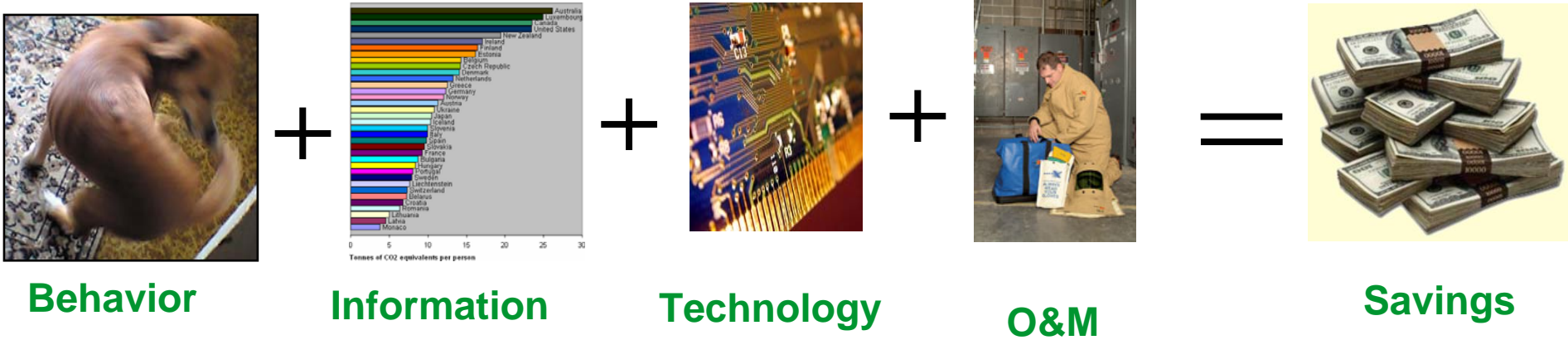
Agenda

1. A balanced approach maximizes savings
2. Savings potential
3. Unique characteristics of electricity
4. Energy attitudes
5. Energy myths
6. Organizational pitfalls
7. Leveraging environmental consequences
8. Critical success factors

Managing the Human Element of Energy Consumption

Those of us who call ourselves energy analyst have made a mistake...we have analyzed energy. We should have analyzed human behavior." If trends continue, he cautions, "Lifestyle changes could eat into everything you think you've saved." —Lee Schipper, *Energy Economist*

A balanced approach maximizes savings



The Potential Financial Impact of Managing the Human Element

- Lockheed Martin—Employee action contributed to \$4,800,000 in cost avoidance annually.
- Simon Property Group—A substantial portion of 133 million kWhs for 2004 and 2005 combined, as compared to 2003. This represents a 6.8 percent reduction in electrical usage across comparable properties. At a rough average price of \$0.10 a kWh this equates \$13.3 million dollars in savings over a two year period, or approximately \$6.65 million per year of energy savings.
- Solutia—£350,000 was mainly achieved through an employee awareness campaign targeted at employees.
- Thomas Properties Group, LLC, Sacramento—\$50,000.
- Unisys, California—\$263,250 in five months and 19 percent power reduction for 2001.
- Verizon, California—\$750,000, Verizon, nationwide—\$17,000,000 (partial year savings between January and September 2001).

Easy 15% Savings

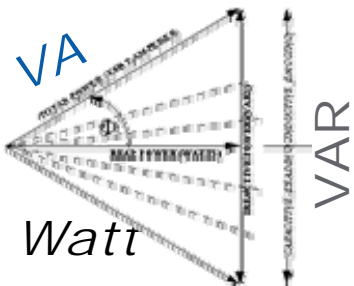
Some Unique Characteristic of Electricity



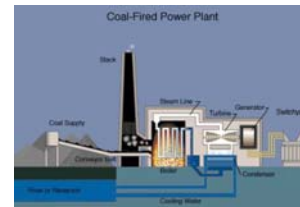
1. It's invisible



4. It's consumed the instant it is made



2. It's complicated



5. It's just a carrier of energy



3. It's use is effortless

Energy Attitudes

- Resistance to coercion
- Over-zealousness can backfire
- Bias against conservation
- Too big a problem for individuals
- Belief that technology will save the day
- Energy can be a status symbol
- Change is hard
- Saving energy is inconvenient
- It's impossible to conserve natural resources
- Energy costs are too small to worry about



Energy Myths

We must dispel energy myths in the market place

- Inrush myth
- Life cycle/premature failure
- Air conditioning cycles
- Efficiency improvements
- Screen savers save energy
- Off is off
- Electricity is clean power



Organizational Pitfalls

- Spilt Incentive
 - Internal
 - External
- Master metered
- Not invented here
- Energy saving not required
- Disempowered energy manager
- Zero complaint policy
- Capital misallocation
- We're already energy efficient
- Organizational instability
- Exclusive reliance on technology



- Keep the factory running
- Increase Reliability
- Improve Productivity
- Maintain Comfort

- Switch equipment off
- Reduce Energy Consumption
- Reduce Costs
- Reduce Green House Gas Emissions

Leveraging The Environment Impact of Energy Consumption

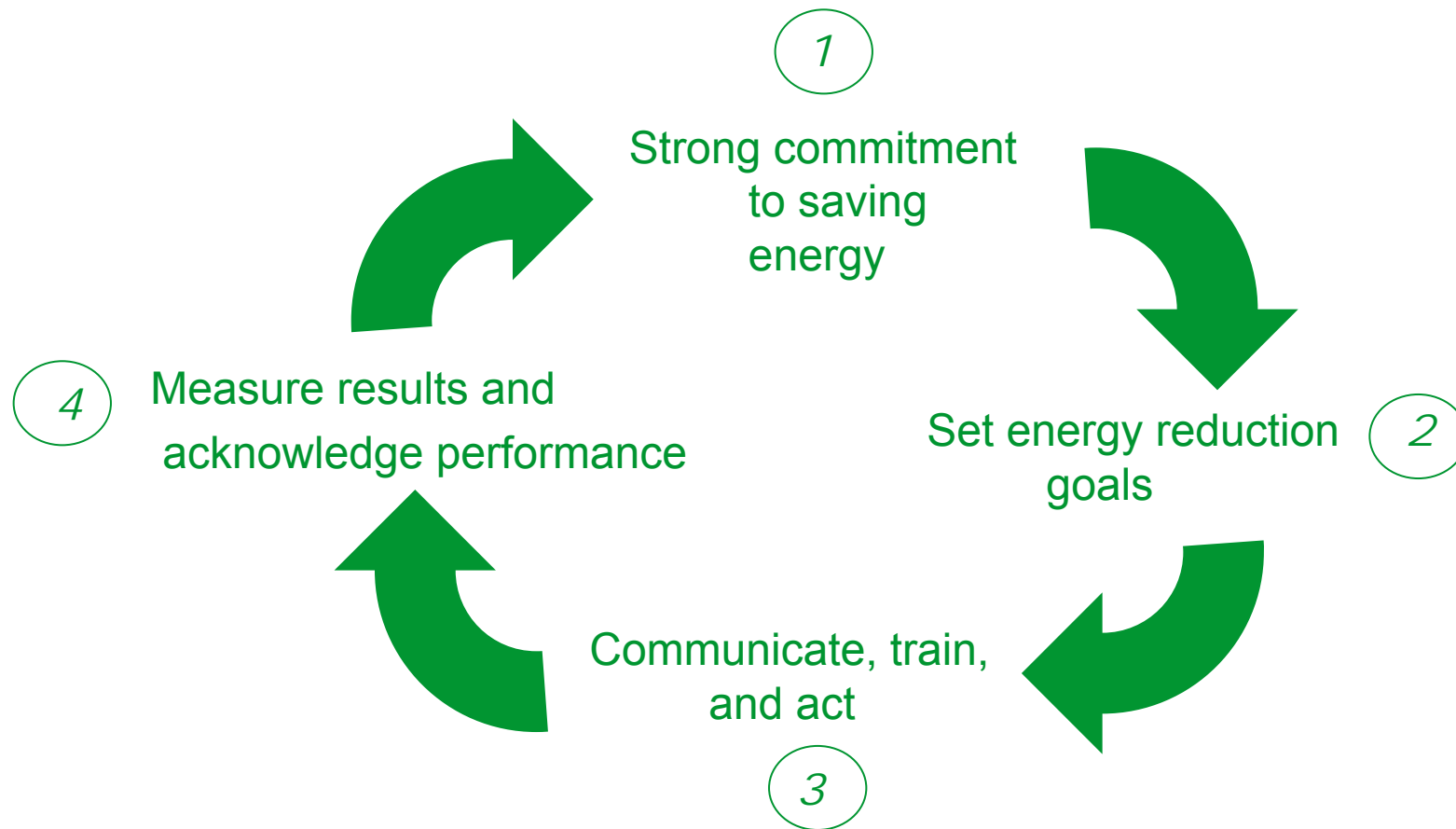
- Convert energy use to emissions equivalents
- Leverage, don't fight, global warming and other emission issues

The shear face of the massive B-15A iceberg in McMurdo Sound after it broke off the Ross Ice Shelf in Antarctica, Nov 2000. Scientists say that more than 200 coastal glaciers in are in retreat because of higher temperatures. (AFP/HO-NSF/File/Josh Landis)



Critical Success Factors

Verizon's employee awareness efforts cost less than \$5,000 to implement – but yielded savings of \$750,000 and 10 million kWh in California alone.



Critical Success Factor #1

Make a serious commitment to reducing energy costs

High level (executive) commitment can:

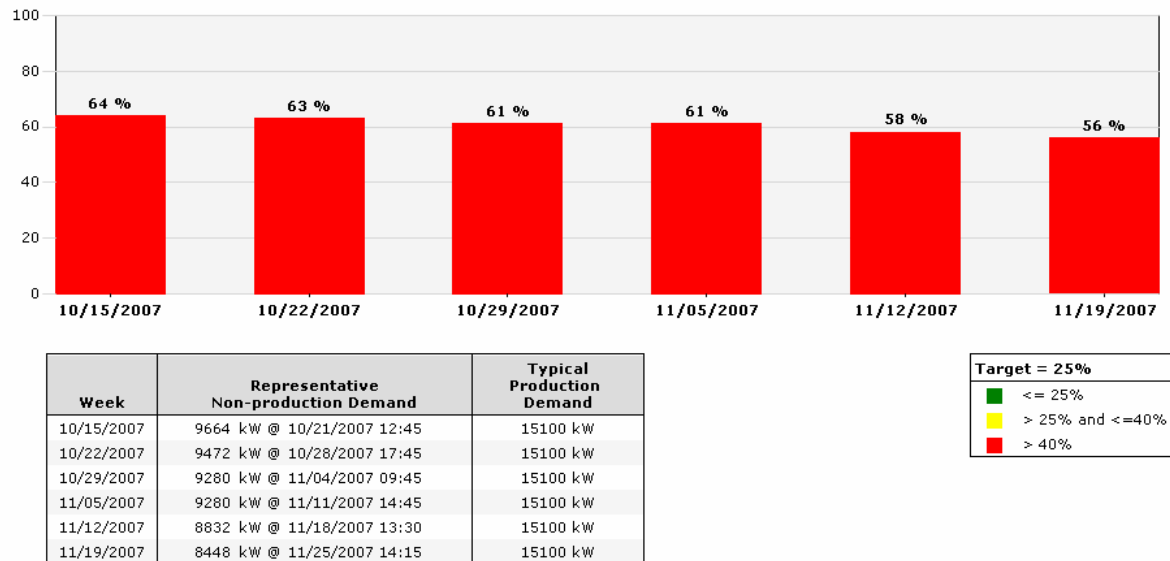
- Elevate the program importance and credibility
- Ensure all organizational members are aware of the initiative
- Guarantee employee suggestions are dealt with appropriately
- Ensure necessary funding and budgeting
- Assign responsibility
- Form a cross functional team

Critical Success Factor #2

If you don't know where you are going... You might end up someplace else...
 —Yogi Berra

Set energy goals

- Goals can be absolute or intensity related such as
 - Energy or energy cost emissions per unit of production or square foot
 - Benchmarks to other facilities
 - A fixed number or versus prior year(s)
- Don't set goals that can't be tracked; start with what you can measure



Critical Success Factor #3

In an aluminum foundry, the production director placed a board outside the canteen door and wrote on it: “Last week we used 74 gallons of oil per tonne of aluminum. Our target is 49.” Within three months the target had been achieved, a savings of 34%. And further savings are still being made. —Carbon Trust

COMMUNICATE AND TAKE ACTION

The Personal Touch

- *Small Face-to-face Meetings*
- *Dedicated Presentations*
- *Internal Training*
- *Informal Gatherings*
- *Door-to-door Canvassing*
- *Competitions*
- *Suggestion Box*
- *Videos, Web Casts, and DVDs*

Print Material

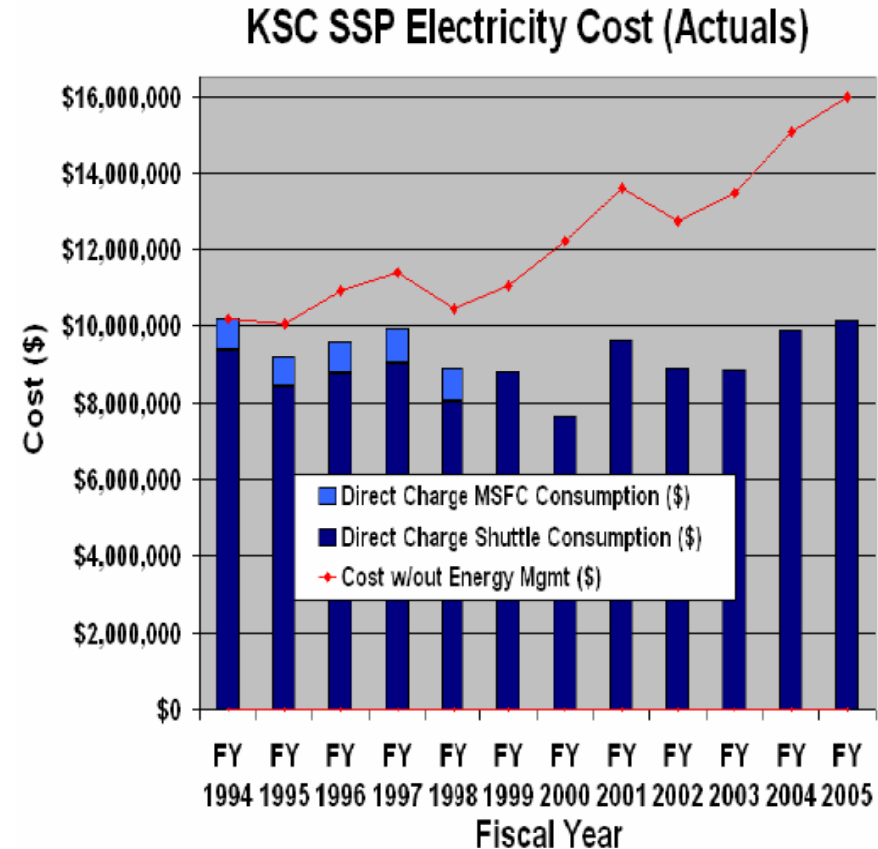
- *Direct Letters, Newsletters, Pamphlets and Brochures*
- *Books*
- *External Publicity*
- *Posters*
- *Stickers*
- *Websites*

In another plant, just labeling the light-switches, so everyone could see which switches controlled which lights, saved \$30,000 in the first year.

Critical Success Factor #4

MEASURE PERFORMANCE

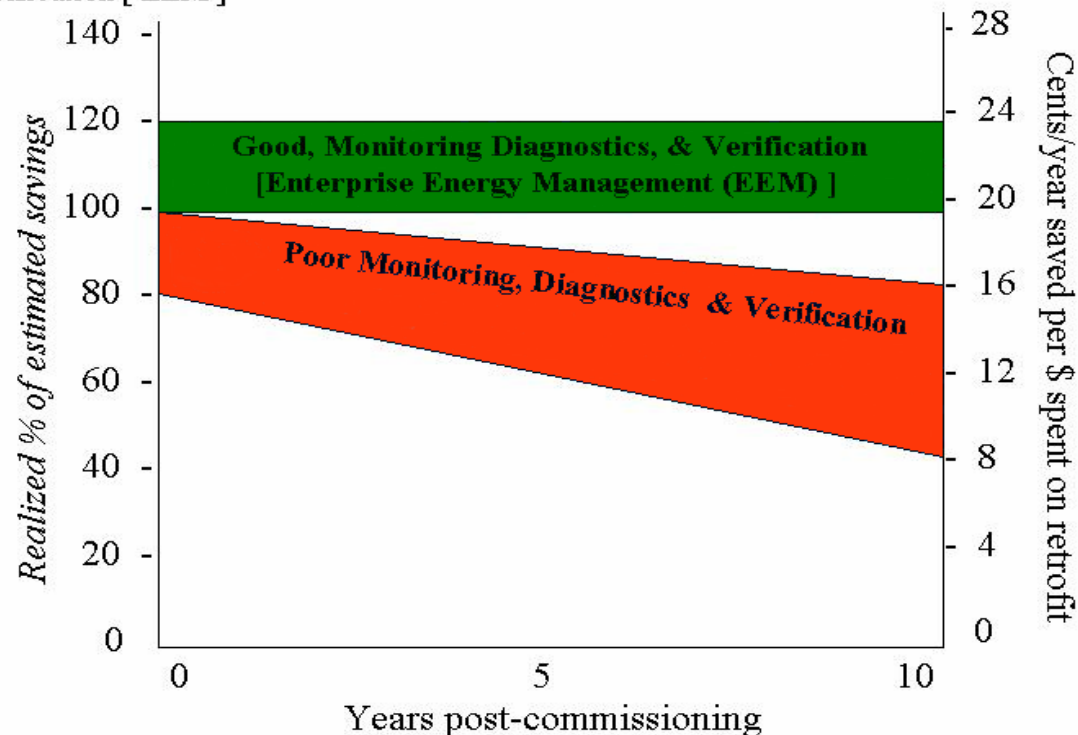
- Measurement is essential. If we can measure it, we can manage it; if we can manage it, we can improve it.
- Be sure to factor out:
 - Changes in energy tariffs
 - Energy Upgrades
 - Occupancy
 - Production
 - Weather
 - Maintenance
 - Neglecting routine maintenance, will of course, increase
 - Slowly Changing Dimensions



Critical Success Factor #4 - Continued

“Persistence of savings. . . . Not surprisingly, installations that boast real-time measurement of savings tend to have higher savings initially and experience savings levels that remain high...” - G. Kats et al, US DOE

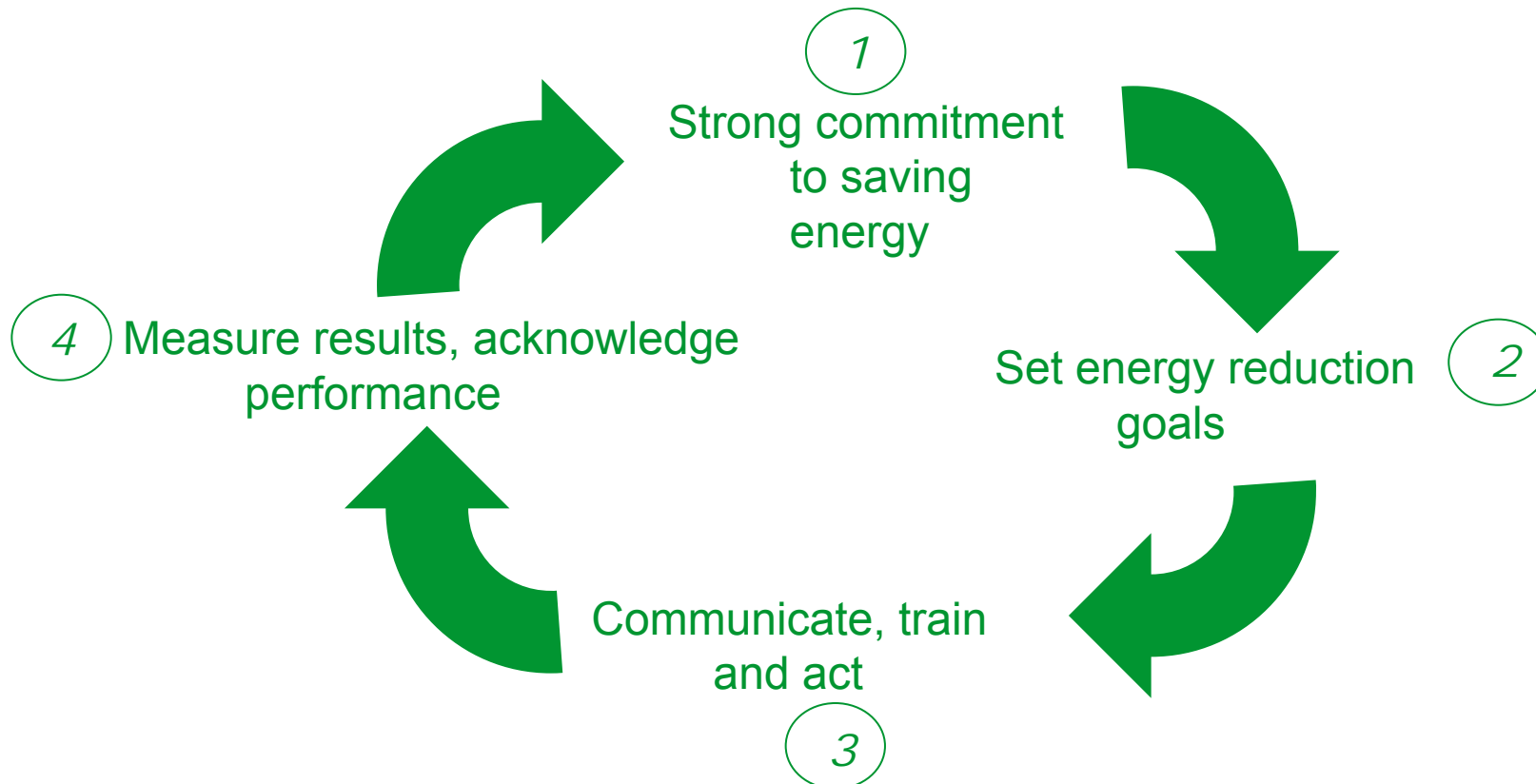
Figure 1. Time trends of savings with and without regular monitoring, diagnostics, and verification [EEM]



Critical Success Factor #5

Energy saving is a hard grind but absolutely essential. Proper housekeeping is vital and there is a constant need to impress on people that they have to turn off taps, switch off lights and switch off machines and services. There is an ongoing task to double check. —John O’Leary, Energy Manager, Waterford Crystal

REPEAT STEPS #1 THROUGH #4



Additional Resources

Websites

- <http://www.fypower.org/>
- http://www1.eere.energy.gov/femp/services/energy_aware.html
- http://www.bchydro.com/powersmart/industrial/industrial_workplace_conservation_awareness
- http://www.aeecenter.org/store/detail.cfm?id=953&category_id=6

Book

Managing Energy Costs: A Behavioral and Non-Technical Approach, Fairmont Press/Association of Energy Engineers

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Questions?



THANK YOU!

Make the most
of your energySM

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