Citizens Utility Board:

Consumer Views of Smart Grid

June 29, 2010

What is CUB?

- Nonprofit, nonpartisan utility watchdog group
- Est. by Illinois legislature and began operation in 1984 to represent the interests of utility customers
- 25 employees
- Member supported
- $10 billion in consumer savings
- Advise consumers on ways to save on utility expenses:
  - Community Clinics
  - Consumer Counselors
  - Web Calculators

www.CitizensUtilityBoard.org

Overview

- Illinois Regulatory Background
- Initial Request for “System Modernization Projects”
- Commonwealth Edison Pilot
- Illinois Statewide Smart Grid Collaborative
- CUB View of Process
- Smart Grid Investment Quandries
- CUB View of Smart Grid

Illinois Regulatory Background

- Two major investor-owned utilities with different characteristics:
  - Commonwealth Edison (ComEd) serving appx. 3.8 million customers in northeast Illinois; membership in PJM.
  - Ameren Illinois Utilities (Ameren) serving appx. 1.2 million customers in central and southern Illinois; membership in MISO.
- Restructuring in 1997 separated distribution/transmission functions from generation.
  - Anticipated retail electric competition for power and energy supply.
  - Rates frozen through 2006.
- Settlement after 2006 created:
  - Illinois Power Agency
  - Energy Efficiency Portfolio Standards
- Additional legislation created:
  - Renewable Portfolio Standard for IPA and ARES
  - Consolidated Billing/Purchase of Receivables for ARES

System Modernization Projects

- Commonwealth Edison Proposal in ICC Docket No. 07-0566
- Cost recovery rider with annual reconciliation procedures; projects would be determined with stakeholders in collaborative process but not defined in rate case.
- No final answer on what smart grid is but general discussion of three buckets:
  - Distribution Automation
  - Advanced Metering Infrastructure
  - Home Area Networks
- Final Order created:
  - Two-year ComEd AMI pilot project.
  - Illinois Statewide Smart Grid Collaborative.

Commonwealth Edison Pilot

- Six months of stakeholder workshops prior to filing request for final pilot approval with ICC.
- Result:
  - 100,000 meters deployed in ComEd “Maywood Operating Center”
  - 30,000 meters deployed throughout City of Chicago
  - Appx. 500 installed in Tinley Park, Illinois
  - Customer Applications Pilot for Appx. 2400 Customers:
    - Testing 24 separate combinations of new rate designs, programmable control thermostats, in-home energy displays and web interface for all customers showing detailed energy usage information.
- Pilot is intended to test cost/benefit assumptions and potential customer response to new rate designs/technologies.

Illinois Statewide Smart Grid Collaborative

- ICC directed process to “address foundational policies as well as incorporate utility-specific issues.”
- Hosted by private facilitator, EnerNex, and open to wide variety of stakeholders.
- Divided at stakeholder request into five working groups:
  - Technology and Applications
  - Technical Characteristics
  - Consumer Policy
  - Cost-Benefit Analysis
  - Filing Requirements

CUB View of the Collaborative

- Policy Challenges:
  - ICC direction not always clear:
    - 13 foundational policies.
    - Policy docket at end of process.
  - Variety of stakeholder perspectives, expertise.
- Collaborative Benefits:
  - Stakeholder Education (Technology and Utility Systems)
  - Acknowledgement of Positions
  - Common Language
  - Identification of ICC Consumer Policy Questions
  - Cost Recovery Discussions

Smart Grid Investment Quandries

- Smart Grid Remains Undefined:
  - There is no one definition of what constitutes a “smart grid;” it encompasses a variety of technologies (e.g. distribution automation and automated metering infrastructure), a variety of characteristics (e.g. self-healing, capable of real-time data updating), and a variety of policy changes (e.g. dynamic pricing, energy efficiency programs).
- New Technology and Complicated Systems
- Discretionary Investments
- Amorphous Benefits
- Expensive, Long Term Investments With Risk:
  - Technology Risk
  - Investment Risk
  - Financing Risk
  - Timing Risk

Smart Grid Investment Quandries

- Two Different Sets of Concerns With Regulatory Proceedings:
  - Utility Concerns:
    - Prospective disallowance of investment expenses if deemed imprudent or not found “used and useful.”
    - Foregone earnings from regulatory lag.
    - Internal financing challenges.
  - Ratepayer Concerns:
    - Potential cost overruns passed on without opportunity to recapture.
    - Poor technology choices magnified over long investment/deployment horizons.
    - Projected benefits and savings not materializing.
    - Maintaining existing incentives for smart utility investment and operations.
    - Cost allocation without benefits *and/or* projected benefits/savings not materializing.
- Concerns magnified by:
  - Resource and information asymmetry between utilities and intervenors.
  - Possibilities of creating perverse incentives in order to make sure non-operational benefits are achieved – e.g. setting goals for moving folks onto a dynamic price.

www.CitizensUtilityBoard.org

Smart Grid Investment Quandries

- Cost Recovery Question Numero Uno: Are utilities (consumers) willing to accept less than than 100 (more than zero) of the risk? What would make them do so?
- Other Questions for Consideration:
  - How should questions about the prudency of deployment be answered?
  - Are all smart grid investments equal, i.e., are all concerns from utilities/ratepayers present with respect to all smart grid technologies?
  - How should programs/investments be designed to respond to what consumers really do, not what they say they do?
  - How should such things be tested for maximum consumer benefit?

CUB View of Smart Grid

- Current Grid Has Problems:
  - Poorly designed to work with customers:
    - Only one-way communication of usage.
    - Poor notification of outages.
    - Estimated billing problems.
  - Wastes Energy:
    - Estimates that 50% of the electricity generated never reaches consumers.
    - Line loss averages of 6-8%.
    - Vampire power adds 10-12% annually to customer bills.
    - Manual disconnection means unused energy, e.g. empty office space in Chicago estimated to add $35 million/annually to ComEd tab.
- Rising Demand Means Additional Strain:
  - Northeast Blackout of 2003 Est. Cost: $6 Billion
  - Handful of Peak Hours (20) = Rise in Price of 500%
  - Brattle Group Study in 2007: Reduction of peak demand by even 5% could save at least $35 billion over the next two decades.

CUB View of Smart Grid

- Smart Grid Technologies Offer Promise:
  - Better interval data benefits IPA and efficiency/conservation programs.
  - Better integration and management of intermittent resources increase reliability while more effectively integrating renewable resources with the existing grid.
  - Better measurement and verification data/communication encourages innovation in demand response/energy efficiency technology and program design.

  And

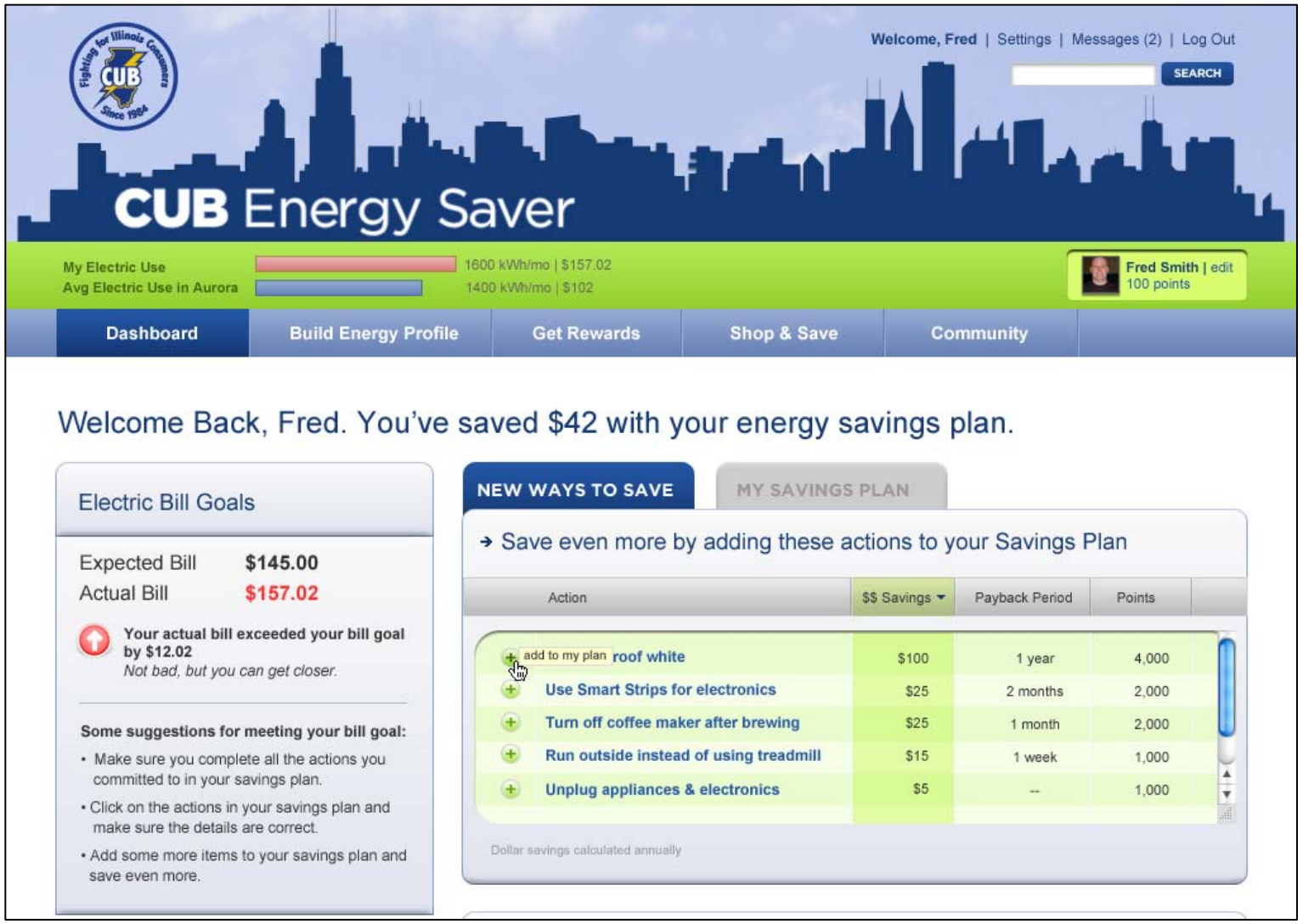
  - Improve customer service.

CUB View of Smart Grid

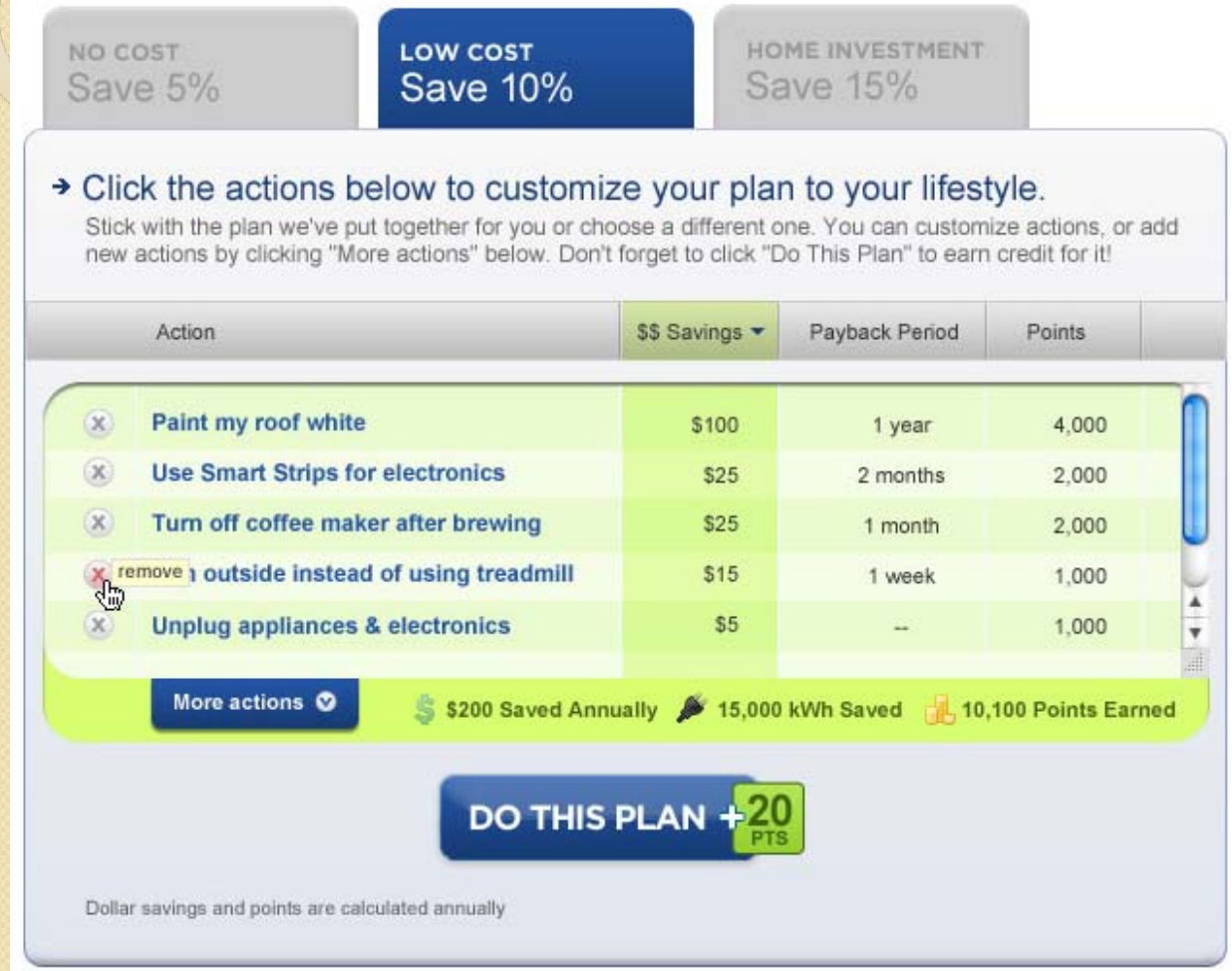
- However, caution is warranted:
  - Electricity is an essential service (protecting the vulnerable).
  - Incentives in many cases not aligned to encourage smart investments from consumer's point of view (sharing the wealth).
  - Illinois has two different existing utility systems with two different regional transmission organizations setting supply price (minimizing the throw away).
  - Security concerns and data access must be weighed with interoperability and open access standards (threading the needle).
- Consumer education and rate design must be considered as important as the choice of technology:
  - Not a hardware or software debate but program design debate.

CUB Energy Saver

Save money and energy at **www.CUBEnergySaver.com**



Choose Your Savings Actions



Getting Started with CUB

1 / choose a savings plan

Your plan is based on what we know about your home and the ways people use energy in Aurora, IL.

Choose the plan that fits your lifestyle and customize it by adding, deleting or editing actions. You can change your plan at any time.

Intital savings and points are subject to change based on the information we receive from your ComEd account in the next 48 hours.

The points you see for actions are estimated based on your potential savings. Points are earned based on actual bill savings relative to usage in your area. You will receive an email after we analyze your bill each month showing the actual points you have earned.

2 / build your energy profile

Your energy profile informs your recommendations for saving money and energy, and earning rewards.

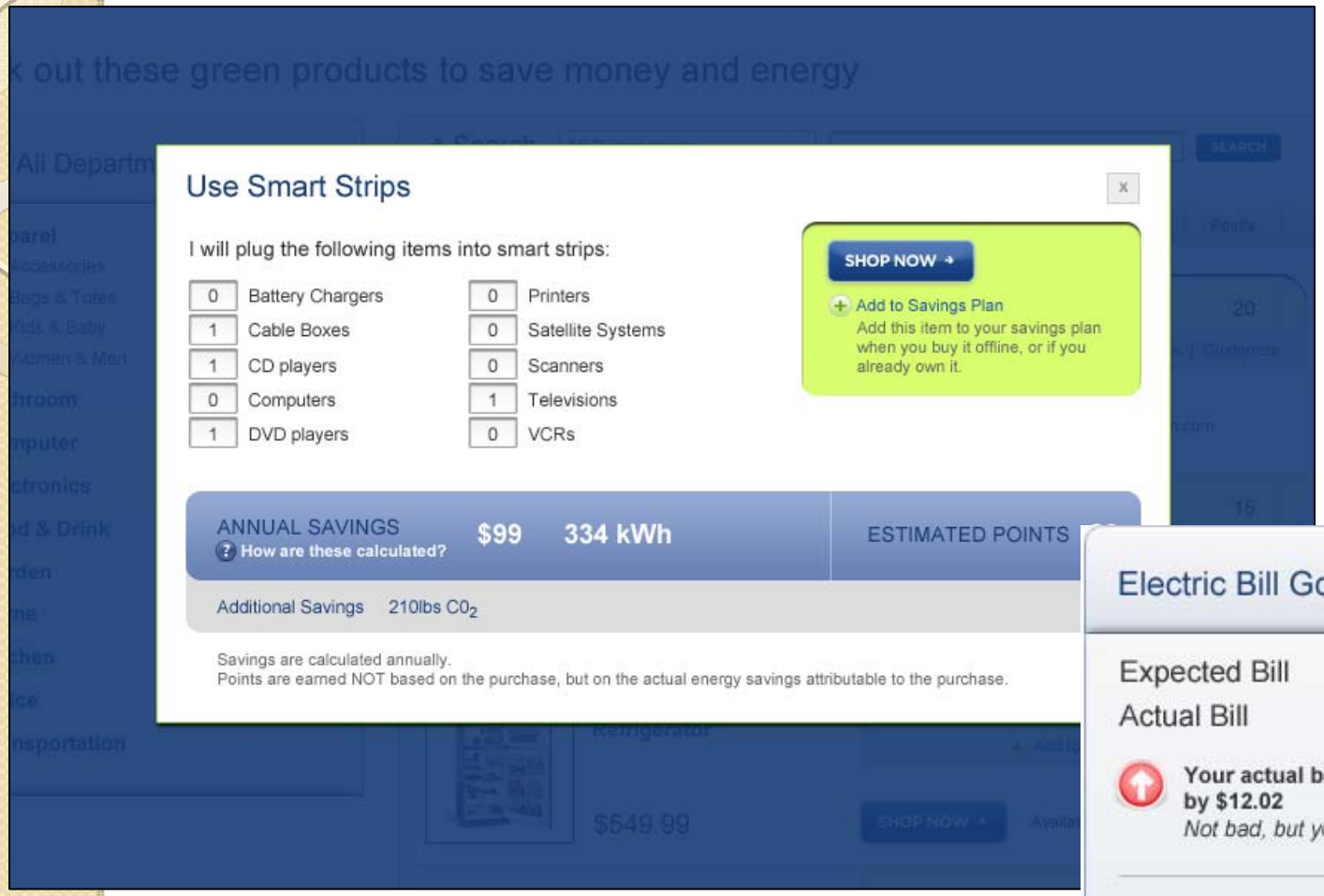
Our intelligent profiling system estimates values based on your address and bill, and gets smarter as you teach it about yourself by answering quick and easy questions.

3 / earn rewards

You can earn points for every action you take on the site that has a points button associated with it.

You earn these points based on your actual energy savings on the next month's bill, NOT on the estimated values in your plan, so it's very important that you carry out your plan in order to earn and redeem your points for cool stuff!

Learn more about points.



Customize an action and *commit to it* to figure out your yearly energy savings

Your Neighborhood

How do my savings compare to my neighbors'?

You save 10% more energy than your neighbors

MY SAVINGS	497kWh
AVG SAVINGS IN AURORA, IL	386kWh

You save 12% more money than your neighbors

MY SAVINGS	$42
AVG SAVINGS IN AURORA, IL	$32

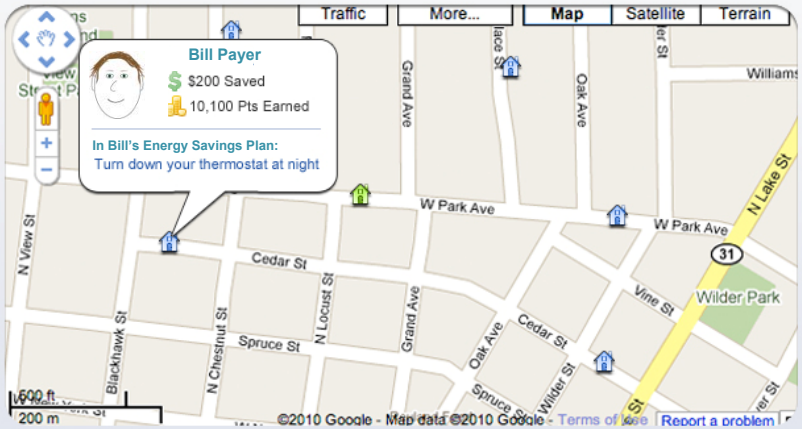
You earn 10% more points than your neighbors

MY SAVINGS	1,100 points
AVG SAVINGS IN AURORA, IL	990 points

About Me & My Community

- **My actions cut my energy use by 2.6% and save me $190 yearly.**
- My neighbors have cut energy use by 6% and save $390 annually.
- Aurora, IL is in the top 10 energy savers in all of Illinois.

My friendly neighbors in and around Aurora, IL



How does Aurora compare to other communities in Illinois?

Rank	Community	$ Saved	Energy Saved	CUB Members
1	Naperville	$477,212	14,195 kWh	121
2	Rogers Park	$453,109	14,115 kWh	102
3	Schaumburg	$421,106	13,975 kWh	98
4	Aurora	$402,182	13,874 kWh	87
5	Orland Park	$398,180	13,426 kWh	86

Fighting for Illinois Consumers CUB Since 1984