



ENERGY CENTER
OF WISCONSIN

From points and participants to kilowatt-hours and therms: an impact evaluation of the Cool Choices sustainability game

Ingo Bensch

Behavior Energy and Climate Change Conference

20 November 2013

Agenda

- basics of the Cool Choices game we evaluated
- how we measured energy impacts
- the energy impact results
- what else we learned



Inspire

sustainable

actions that save
money and reduce
pollution

Nonprofit established
to address behavior

Partner with
companies to **engage
employees**

Holistic approach
that includes water,
travel, wellness *and*
energy

Cool Choices: a team-based “card game”



Energy
Transportation
Water
Wellness

Examples:

Switch your furnace fan setting from continuous to auto

A continuously running fan can cost households \$400 more per year than one set on 'auto'

Watch 2 hours less TV today

Slow from 75 to 65 when driving on the highway

Prepare a meatless meal today

Use reusable shopping bags at the store

Explore household water usage

Multiple reasons to play

Fun

Lifestyle choices

Social

Competition

Money savings

Prizes

The first game...Miron Construction

- May-Nov 2011
- 220 participants of 330 permanent staff
- 3,500 unique actions reported – half were new
- most common:
 - switching furnace fan to auto (147 players)
 - avoiding sudden starts and stops (145 players; 1,722 actions)
- thought to be most impactful (in energy terms):
 - switching furnace fan to auto (initial est. 254,000 kWh)
 - removing/unplugging 2nd refrigerator (initial est. 80,000 kWh)
 - turning off game console (initial est. 56,000 kWh)
 - replacing 85% of incand. bulbs with CFLs (initial est. 26,000 kWh)

Methodology

Triangulation among...



Player Actions Reported
n=220 players, 3,500 actions
screened for new actions
initial savings assumptions



Billing Analysis
n=70 players
weather normalized
pre/post comparison



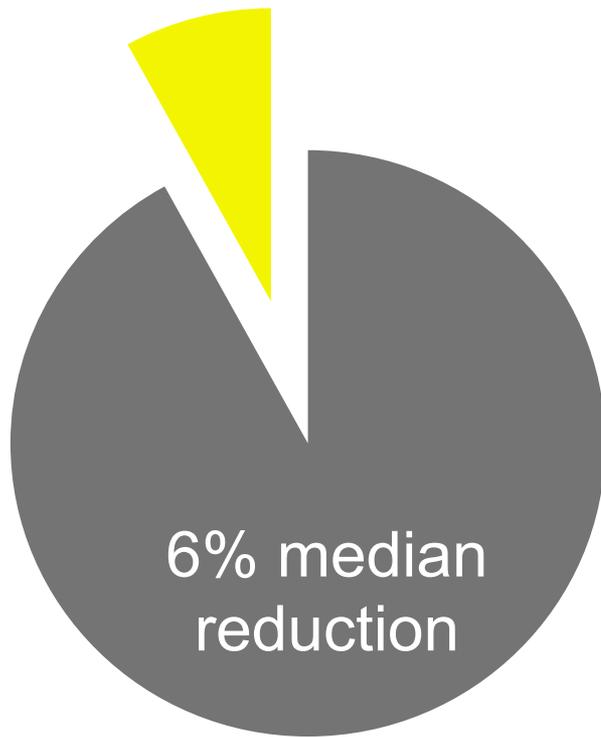
Player Interviews
n=45 players
1-year post-game
focus on 8 actions

Other attributes of our approach

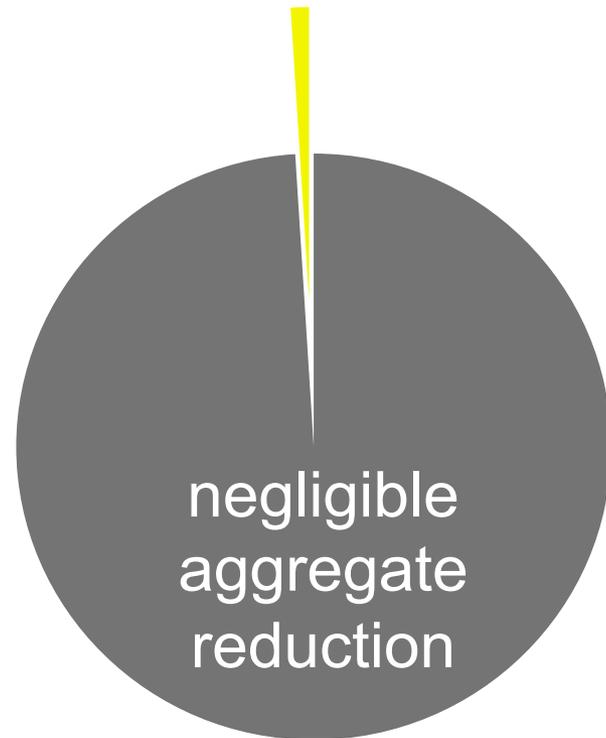
- Accounted for statistical uncertainty and consistency in the overall picture
 - assumptions, usage changes & patterns, post-game self-reports
 - also had context from pre/post player survey, mid-game interviews, Cool Choices team's relationship with the players
- Part of a longer-term evaluation strategy
 - higher uncertainties okay; getting initial read
- Random control group not viable; needed a different tool
 - Social dynamics / interactions are part of the program design
 - “No one talk to Bob, Sarah, or Chris about sustainability for the next six months”
 - Too small to set aside a control group of thousands
- Did not assess transportation, water, wellness impacts

Energy impact from actions taken

Electricity usage
annual kWh



Natural gas usage
annual therms



time frame: 6-12 months post-action

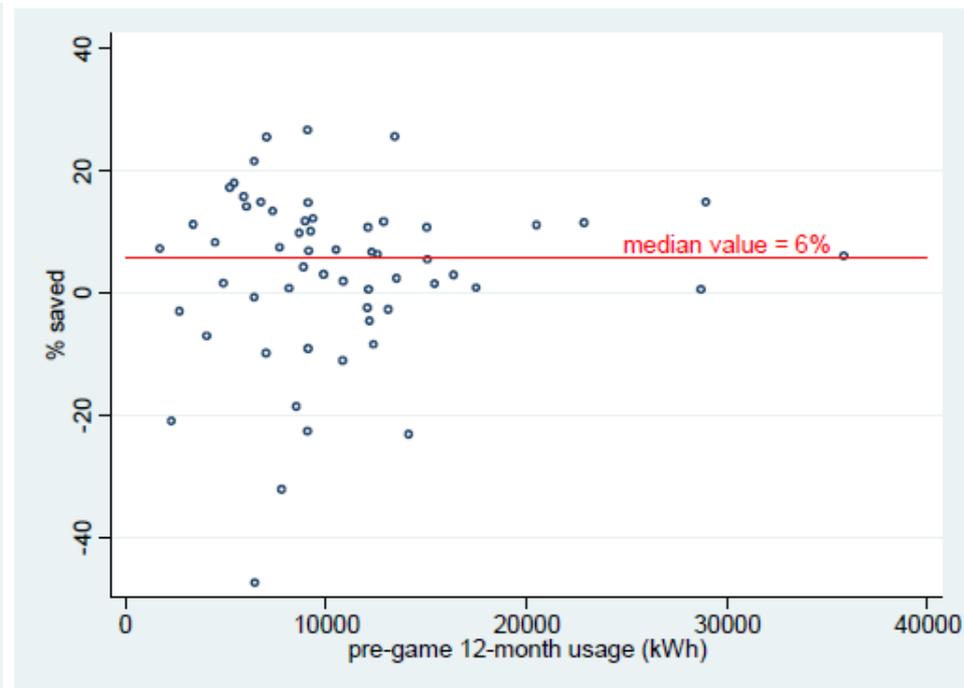
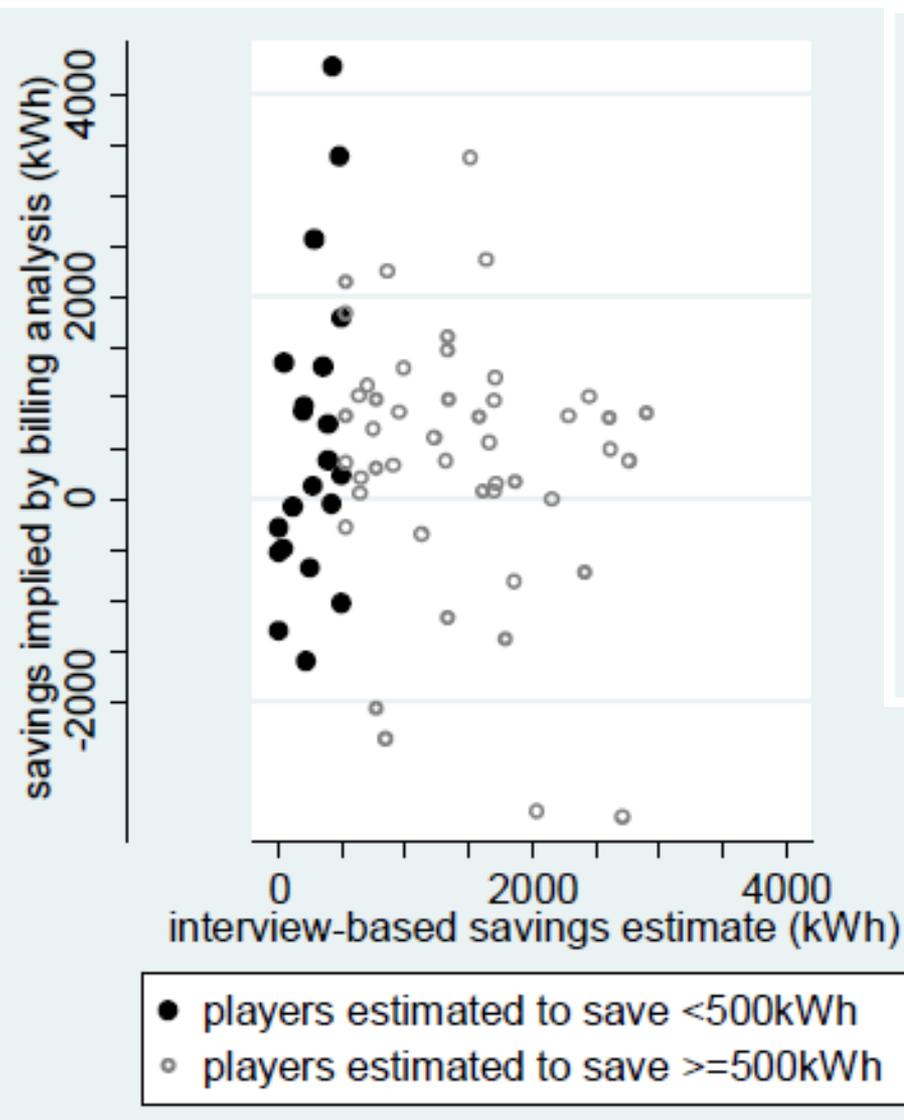
Energy impacts ... more details

Method	Savings estimate	Uncertainty
billing analysis	400 kWh	95% confidence: 100-800 kWh
engineering calcs	700 kWh	+200 kWh from unverified actions

Engineering calculations are based on post-game interviews on the 8 actions that accounted for 90% of initial electricity impact and 76% of initial natural gas impact

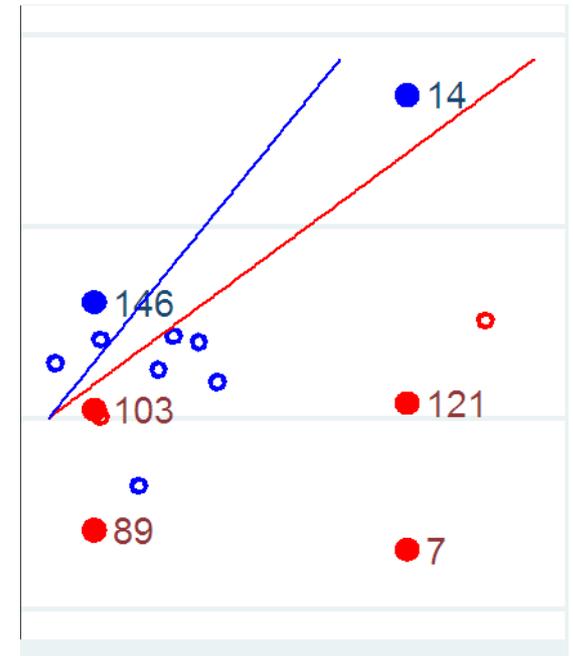
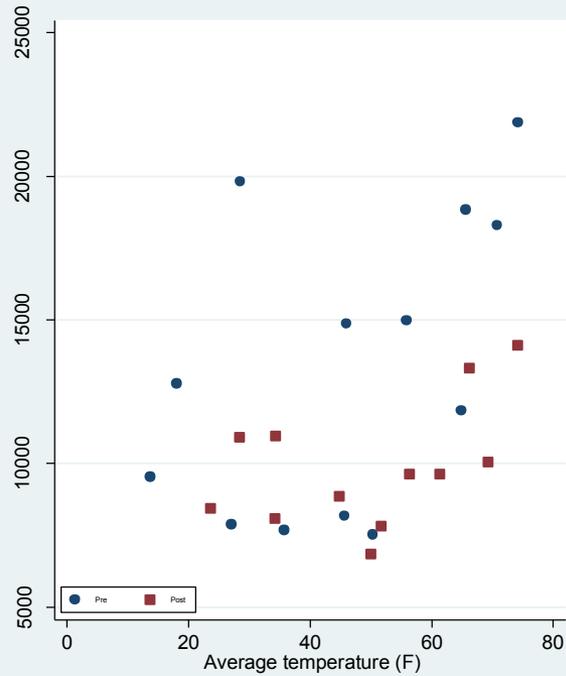
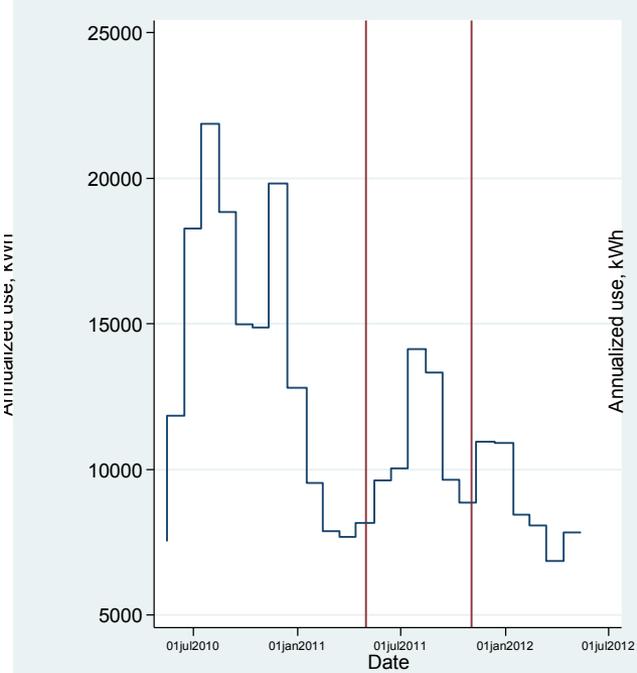
Negligible amount of natural gas savings at the aggregate level

Generally consistent, but noisy story...

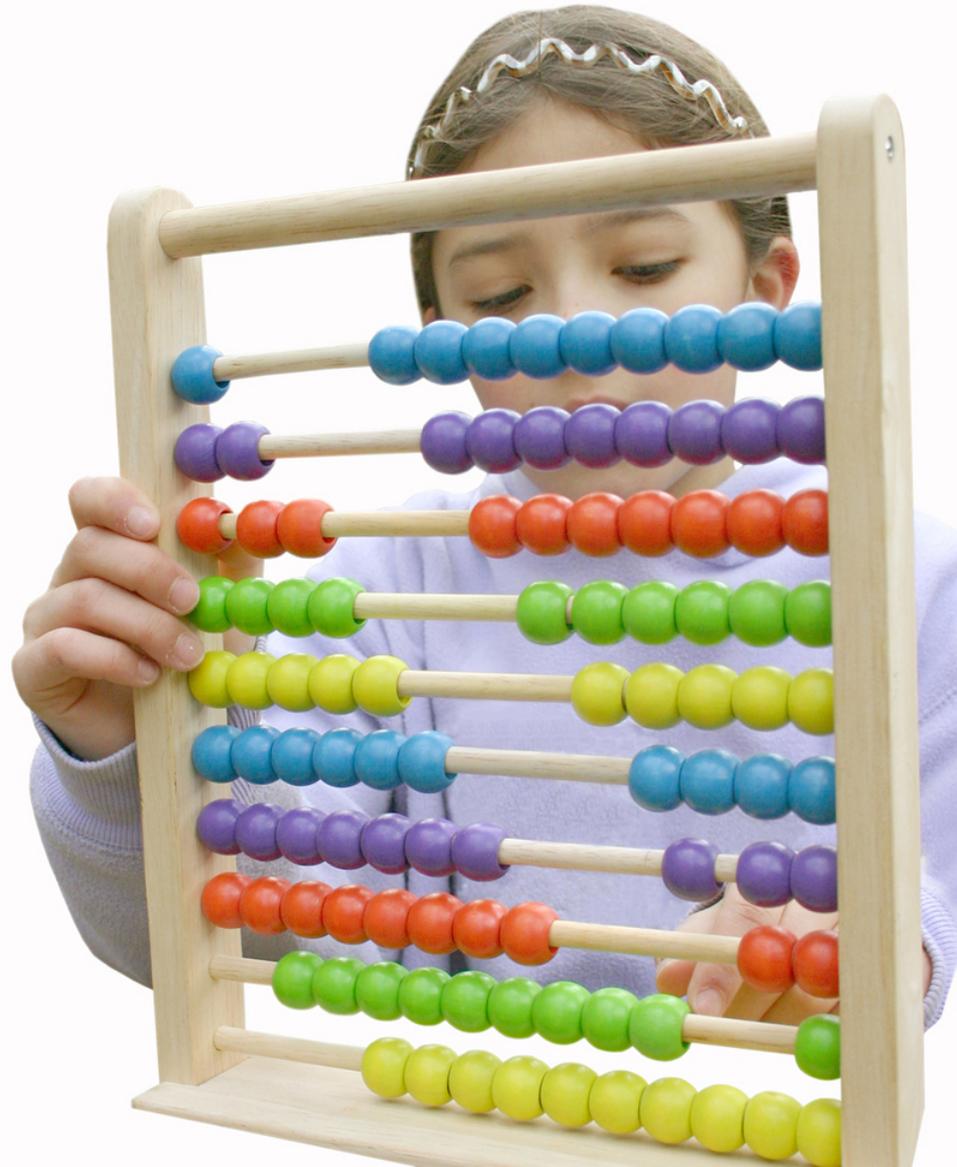


A look under the hood...

Playerid: 14 E



What else did we learn?



Players implement actions in many ways

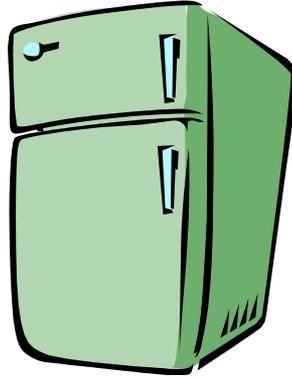


Card instruction: Replace 85% of incand. bulbs with CFLs

Assumption: Players move from 0% CFLs to 85% CFLs

Player actions: Players moved from 20% to 90% CFLs

Players implement actions in many ways



Card instruction: Remove or unplug your second refrigerator

Assumption: Players would get rid of full-size refrigerators

Player actions: Players unplugged (and sometimes gave away) a variety of refrigeration units

- 35% full-size refrigerators

- 30% mini fridges

- 35% freezers – split evenly among full-size and chest

Players implement actions in many ways



Card instruction: Switch furnace fan setting from on to auto

Assumption: Players would play this card if they had been running their fan all the time on a standard furnace

Player actions: Pregame usage of the continuous (on) setting varied

30% always on

50% seasonally on

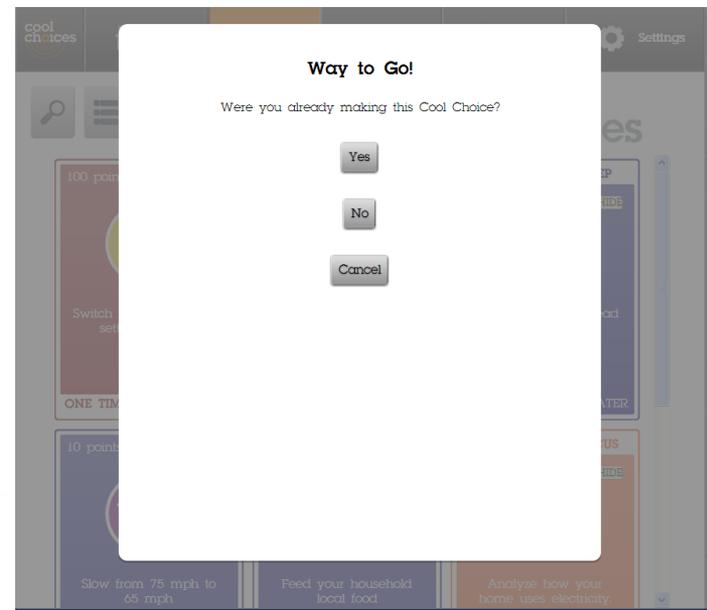
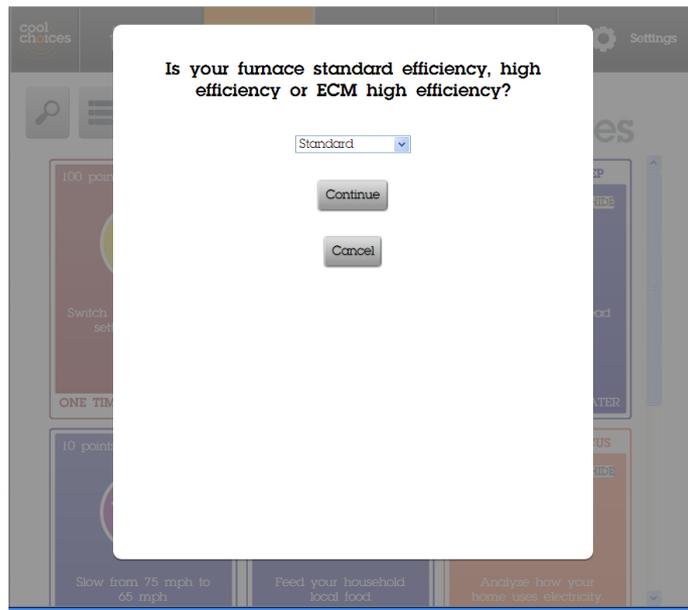
20% already auto

Understanding player actions led to...

- improved assumptions for Cool Choices' tracking system
 - examples:
 - conversion to 85% CFLs revised from 510 to 420 kWh
 - refrigerator removal revised from 1,285 to 532 kWh
 - switching furnace fan revised from 3,686 to 1,336 kWh

Understanding player actions led to...

- improved assumptions for Cool Choices' tracking system
- better data collection
 - gather key baseline info when certain cards are played



Understanding player actions led to...

- improved assumptions for Cool Choices' tracking system
- better data collection
- insights for messaging
 - example:
 - Messaging now emphasizes removing second refrigerators

One-year persistence is good...

Action	Estimated 1-year persistence
Replacing incandescent light bulbs	complete (100%)
Air sealing and insulating	complete (100%)
Switching furnace fan settings	complete (100%)
Replacing water heater	complete (100%)
Removing or unplugging second fridge	high (80-99%)
Turning off game console when not in use	moderately high (60-79%)

Thank you

Ingo Bensch

Energy Center of Wisconsin

608-210-7145

ibensch@ecw.org

For report, go to:

www.coolchoices.com

What works -> Results -> Evaluations & research

Report Title: Identifying the Impacts of Cool Choices' Game at
Miron Construction...