

Energy Efficiency through Innovative Technology

*An Approach to Creating Customer Energy
Savings through Behavioral Change*

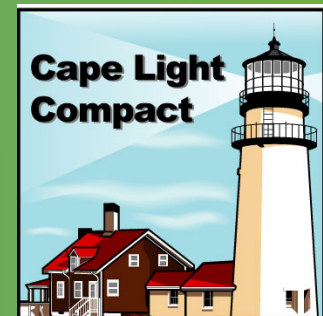
April 12, 2011

ACEEE

National Symposium on Market Transformation

Washington, D.C.

Briana Kane, Cape Light Compact



About Cape Light Compact

- Municipal Aggregator, Administer \$24 million Energy Efficiency 2011 Program Budget
- Serve 21 Towns on Cape Cod and Martha's Vineyard through local governing board
- Approx. 200,000 electric accounts
- 87% of accounts are residential
- Industry mix is tourism and retirement services, small biz
- Seasonal and second homes



Innovative New Programs

Massachusetts Green Communities Act

- “...electric and natural gas resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost effective or less expansive than supply.”
- Deeper and broader savings
- Explore pilot programs that may be unique to individual PA territories
- Northeast Energy Efficiency Partnership lead us to *GroundedPower*



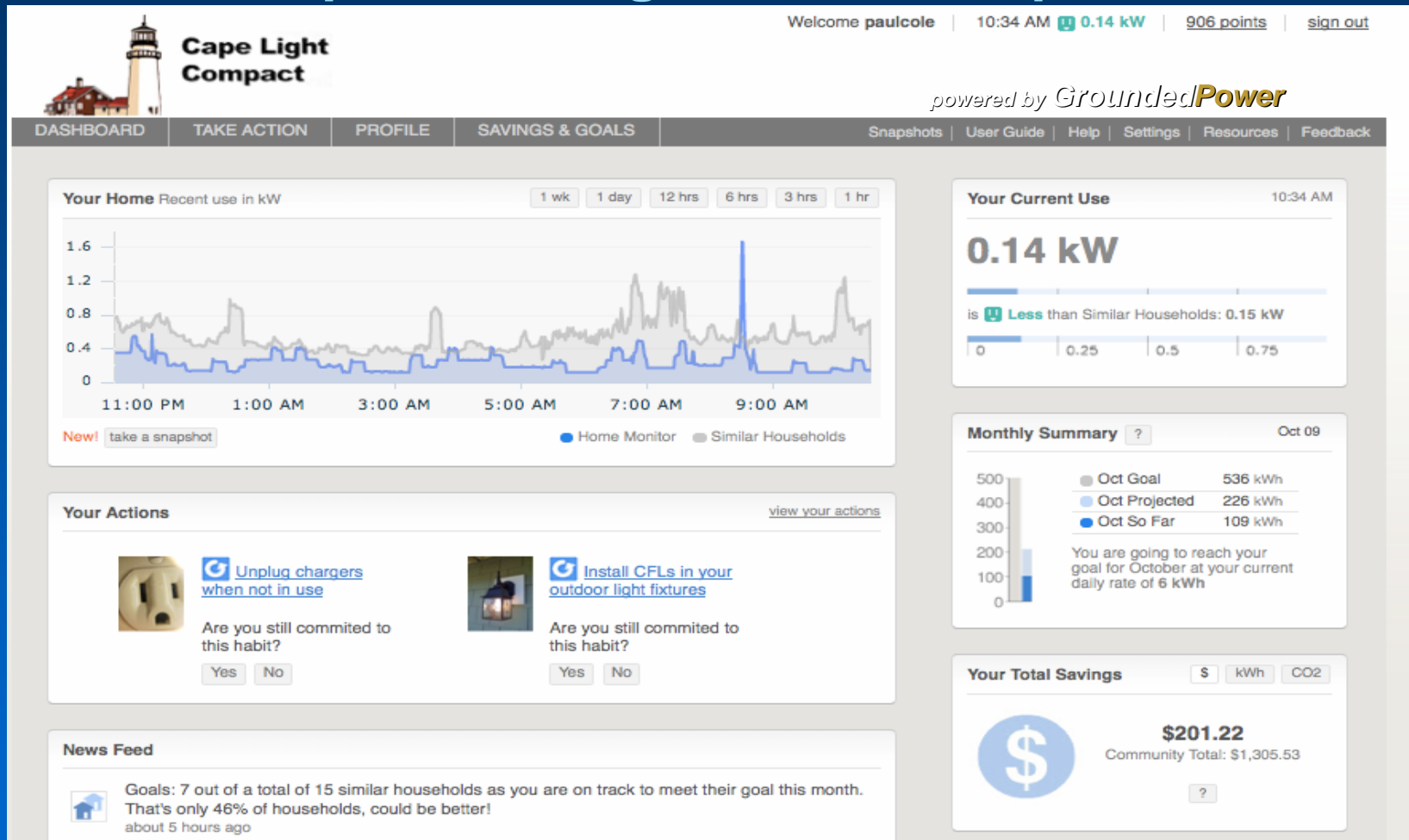
Residential Smart Home Energy Monitoring Pilot Project – Phase 1

- February, 2009: recruitment via media
- May, 2009: 100 participants selected
 - 75 on Cape Cod and 25 on Martha's Vineyard
 - Minimum of 1-yr prior use and >600 kwh/mo
- July – Sept, 2009: systems installed
- July – current: active participation
- August, 2009: kick-off evaluation study
- March 31, 2010: study results

Behavior and Energy Efficiency

- R&D is advancing rapidly
 - Technology: price and availability
 - Access: high speed connectivity
 - Funding: smart grid and more
 - Design protocols are taking shape
- Multiple vendors
- Standards are coming
 - Interoperability
 - Evaluation, measurement & verification

Residential Smart Home Energy Monitoring Pilot Simplified, Integrated User Experience



Displays real-time consumption vs. similar houses, progress toward goal, savings to date and featured info including announcements, task updates, stories and snapshots.

Ever wonder what your electric usage looks like?

Browse Snapshots

Your Snapshots

Public Snapshots

Search Snapshots

Go

lewis.cape's snapshots

 Snapshot 3

 Mystery spikes

[view all](#)

Snapshots by Type

Lighting

Heating & Cooling

Kitchen

Home Electronics

Misc Appliances

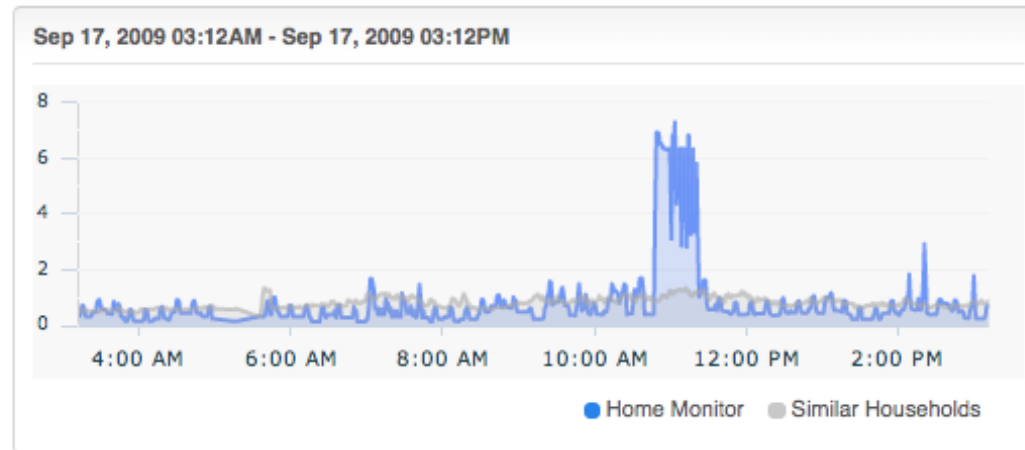
Popular Tags

oh that
dehumidifier
refrigerator cycle
dryer dishwasher
fridge dehumidifier water
heater vacuum mice
washing machine dishes
laundry microwave boiler
Keurig AC Space Heater
baseboard heating

Snapshot 2

Created by [lewis.cape](#) on Sep 17, 2009

Type [Misc Appliances](#) Tags None



The wide spike represents a load of laundry in the washer and then the dryer. What is the significance of the intense blue versus the regular blue?

Post a comment or ask an expert 1 Comment



expert

[emilyw](#) posted 27 days ago

Hello! When your dryer is on, it does not use a constant amount of electricity, it cycles on and off, using more and then less electricity. This is what you are seeing with this spike. There is really no difference between the light and dark blue. In this view, this quick cycling on and off appears as a darker blue shaded region - it is actually the dark blue line that shows your electricity use going up and down over and over again (imagine drawing lines very close together with a thick marker - they would blend together). If you were to look at this zoomed in close, it should look more like a bunch of small peaks that are very close together, not a solid region.

Home Area Network & Display Solutions



CT 500 Real-time Monitor

- Supports legacy metering for houses and apartment units.
- Reports real-time electricity consumption
- Measures AC current via non-contact sensors, no interruption of service to install.



Glance In-Home Display

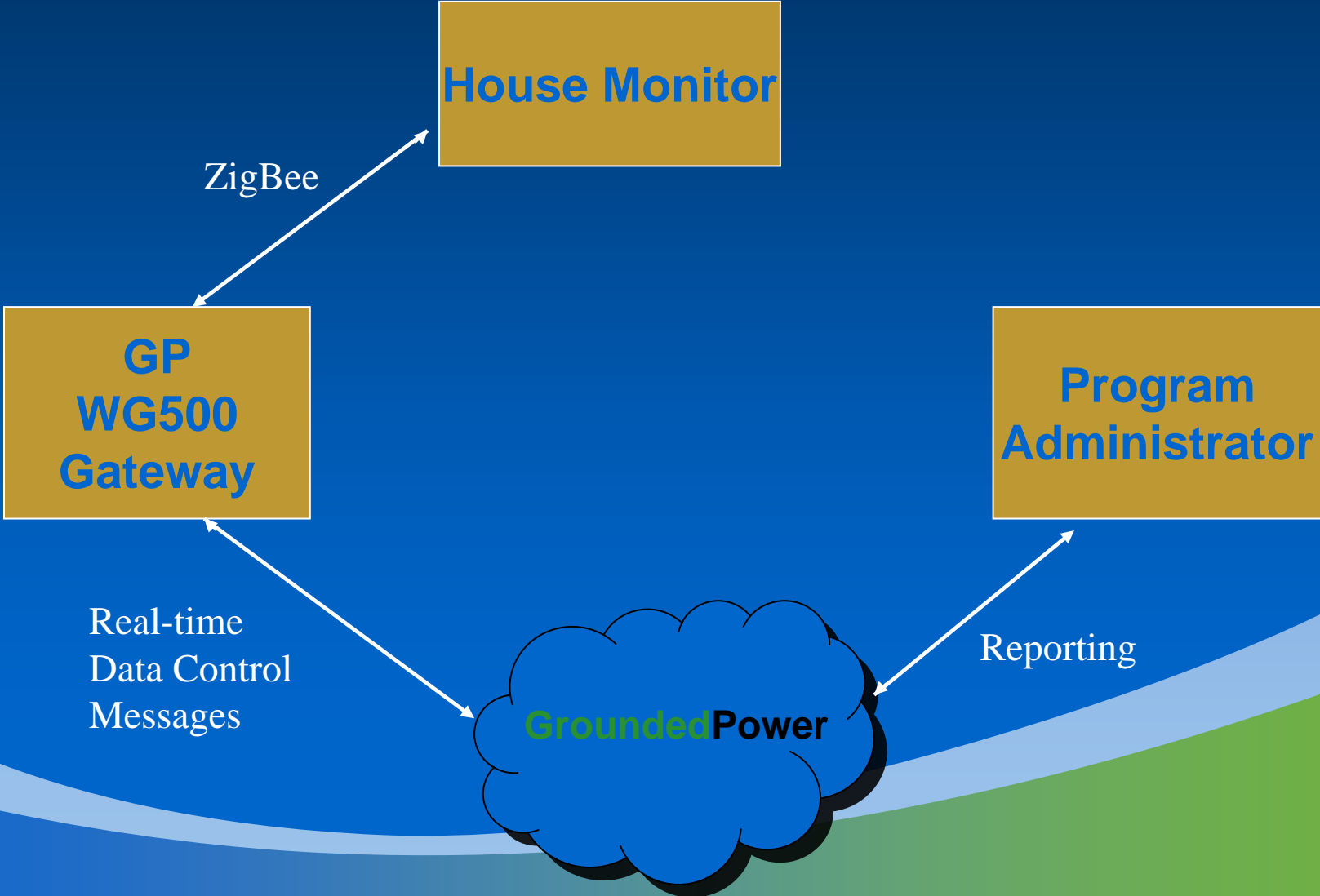
- Immediate and glanceable view of real-time energy use data.
- Supports any meter environment
- Status indicators- DR, TOU, progress vs. goals, ranges set by utility or user.
- Desk or wall mountable

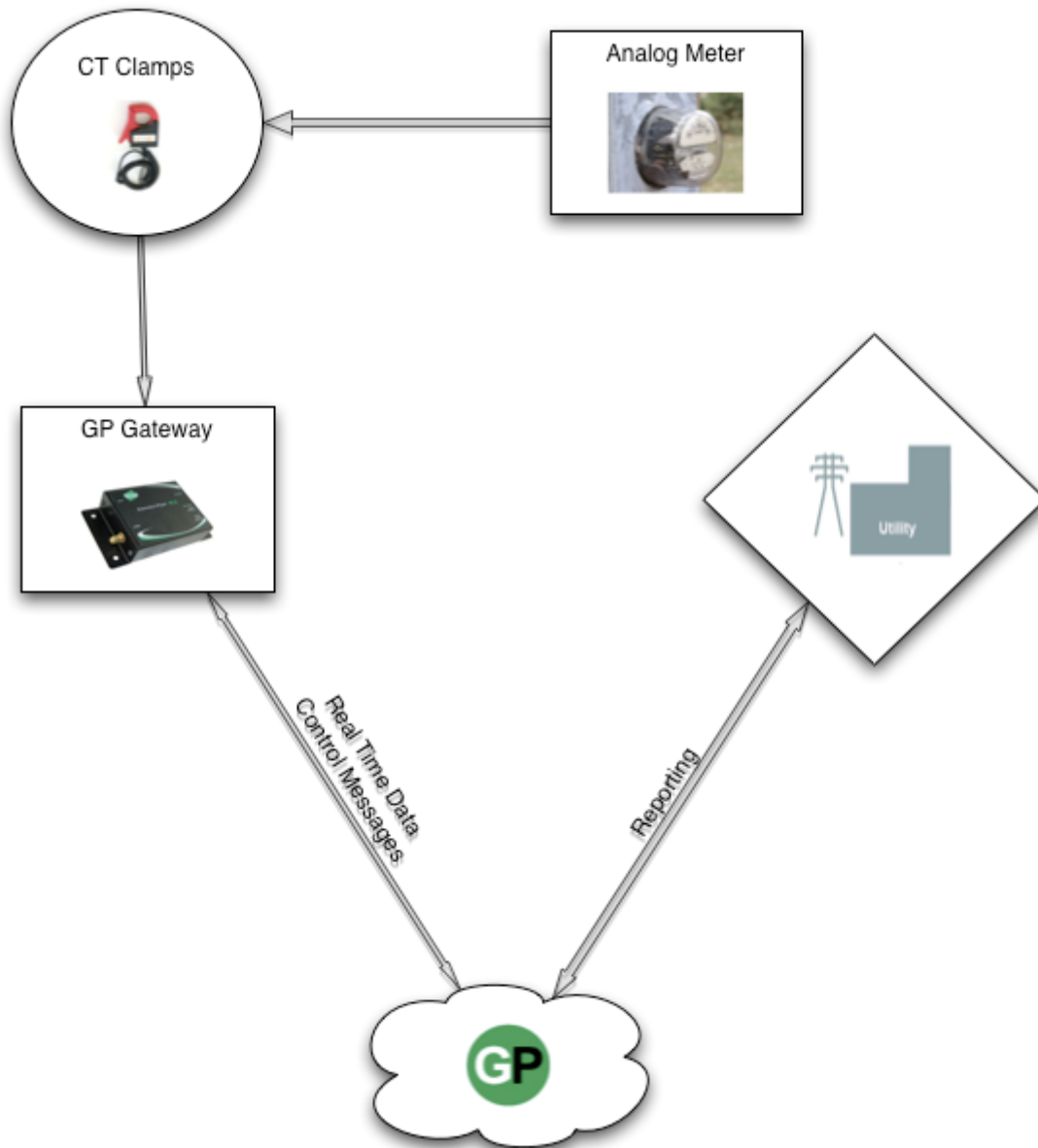


WG 500 Wireless Gateway

- Gathers and reports real-time energy use for houses and apartment units with legacy metering.
- Utilizes ZigBee protocol
- Automatic SW updates

How it Works





System Configuration

The house monitor measures current on the main feeds in the electrical panel and communications wirelessly via ZigBee radio to the gateway, which uploads data through a local internet router to the GroundedPower web server

Impact Evaluation Study

- PA Consulting analyzed the program, data and reported the impact the pilot project had on energy consumption and behavior
 - Pilot participant group
 - “Interested” group of non-participants
 - “Blind” group of similar households
- Final Report Issued March 31, 2010
 - <http://www.capelightcompact.org/report/other-reports/>



Pilot Evaluation Overview

Participants

Pilot Group

- **N = 86**
- *Selected as pilot participants (received household monitoring system for one year)*

Non-participants

Interested Group

- **N = 207**
- *Expressed interest in pilot participation, but not selected*

Blind Group

- **N = 400**
- *Stratified random sample of households (by geography and monthly kWh usage)*

Evidence of system usage:

- *Logins consistently high (sustained over past three months)*
- *Activity with online actions and habits*

Telephone surveys completed in Jan/Feb 2010

Completed telephone surveys with non-participants in October

- 96 "Interested"
- 100 "Blind"

Results used as baseline comparison against pilot group

Quantitative comparison of kWh usage against pilot group completed in March 2010



Customer Response

- Increased Program Awareness
- Enthusiastic Responses
- Real-time view through web-based dashboard
 - easy & effective
- Customers like peer group comparison
- Customer care makes a difference
- Behavior technology complements ***existing offerings*** to increase overall customer benefits

Residential Smart Home Energy Monitoring Pilot Summary Results

- Reduced electricity consumption by 9.3%
- Implied Average Annual Savings 997 kWh
- Results have informed Phase 2 of pilot
 - Increase offering to Small C&I and Residential
 - Determine cost effectiveness and persistence of savings that may support scale-up

Residential Smart Home Energy What's Next?

- Phase 2 launch is currently underway
- 500 homeowners
- Tendril Energize™
 - Home Area Network, Transport Gateway and Translate bridge
 - Near real-time energy use data
 - No need to access electric panel
 - Interactive web-based displays
 - Goal setting customer engagement

Phase 2 Devices and Website



Translate (Meter Bridge)



Insight In-home display



Transport (Gateway)

TENDRIL Energize WELCOME CARL | MESSAGES (1) | PROFILE | POINTS | SETTINGS | HELP | SIGN OUT

CURRENT ENERGY USE (kW) **8.0** CURRENT RATE **Off-Peak** APPLIANCES **☆☆☆☆** OUTSIDE TEMPERATURE **43°** CURRENT MODE **Home**

DASHBOARD | YOUR HOUSEHOLD | RECOMMENDATIONS | YOUR COMMUNITY | PRICING PLAN | ASK AN EXPERT

Goal Progress

This Week | Billing Period | Year to Date

Your Goal This Billing Period: \$97

Estimated Cost To Date **\$52 of \$97**

Projected Cost This Period **\$102 of \$97**

! You need to save \$6 in the next 4 days to make your goal this week.
[Edit your 15% goal](#) | [How is this calculated?](#)

Meet your goal! Add these to your checklist:

- add** Save up to \$15 per year Use your dishwasher's Economy mode
- add** Save up to \$10 per year Buy an EnergyStar Freezer
- add** Save up to \$10 per year Install powerstrips on your home entertainment center

[Get more recommendations](#) | [Your Checklist](#)

Acknowledgments

- Kevin Galligan, Cape Light Compact Energy Efficiency Program Manager
- Paul Cole and Pat Milner, Tendril
- Tetra Tech Evaluation Team
- Pilot Program Participants
- Massachusetts Energy Efficiency Advisory Council and the DPU
- Cape Light Compact Governing Board

Thank You – Q&A



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