

# Successful Demand Response

Selected findings from the Respond 2010 project



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CEO, VaasaETT Global Energy Think Tank

E-Control Seminar: Smart Metering - ein Blick auf den Kundennutzen und die technischen Möglichkeiten, Vienna, 16 June 2010



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## Archive for the 'Respond 2010' Category

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oped ultimately over a period of 18 months. It is an thinkers in this field. It is a collection of the state-of-the-know is being done, planned and intended by the best eses what has been found in practice to drive customer art home, demand response and related issues. This pond 2010 project and is intended to guide strategy stimulate, challenge and support the visions of the what the future will look like in 2020 or the lead up to here leading opinion is heading, a vision for 2020 n technology, new or worsening environmental l trend adjustments cannot be accounted for by such try at large adopt a degree of flexibility and adaptability unties.

### Datashare Centre

Welcome to the VaasaETT Global Energy Think-Tank's Datashare Centre. The place to view and share information. Most of the following services are free and we will be adding lots of new information in the near future, so stay posted, this is just the beginning. Enjoy!

#### Recommended Events

Weekly updated list of vetted energy and utilities events around the world, covering various topics and conference providers.



[Yello Strom and 4 Continents to participate in Exchange 2010](#)

[2nd Global Demand Response Roundtable Conference, May 26-27, Copenhagen. More...](#)

[Demand Response in Europe Workshop](#)

[Hosted by European Commission and VaasaETT More...](#)

[Smart metering central & eastern europe](#)

[Warsaw, Poland, 20-21 April 2010 More...](#)

[Datashare Events - Archive »](#)

#### Knowledge Centre

Reports, articles, presentations and data, from VaasaETT and a wide variety of other sources from around the world. Free, to-purchase or to-subscribe. Updated weekly. If you would like to submit material for consideration to be placed here, please contact Sean Brennan at [firstname.secondname@vaasaett.com](mailto:firstname.secondname@vaasaett.com).

[Enter the Knowledge Centre here »](#)



[Vision 2020 The Future of Smart Home and Demand Response](#)

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#### VaasaETT Newsletter

News, current affairs and debate from VaasaETT Global Energy Think Tank network members.



#### Customer Switching Monitor

The world's only monitor of utility customer switch rates and trends in all fully liberalised energy retail markets globally.



[World Energy Retail Market Ranking](#)

[2010 spring edition to be published May 2010 More...](#)

#### Household Energy Price Index

Europe's only independent comparative monthly index of electricity and gas prices across the 'EU 15' states. Compiled by E-Control GmbH in cooperation with VaasaETT.



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COLLABORATIVE  
**projects**

“ Energy think-tank for global markets.  
Global knowledge, practical strategic solutions. ”

# hepi

Household energy price index for europe

Household energy price index for europe

# webi

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# projects

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UTILITY

## CUSTOMER SWITCHING

Research Project

*hold onto the leaves*

World Energy Retail Market Rankings  
5th Edition Available November 2009  
**Request your copy free now!**

Request your copy free now;  
5th Edition Available November 2009  
World Energy Retail Market Rankings





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# Respond 2010

*unlock Demand Response*

## Sponsored by

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npower

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DEPARTMENT OF ENERGY & CLIMATE CHANGE

PSE Operator S.A.

BC Hydro

Trondheim Energi

Israel Electric

HANSEN TECHNOLOGIES

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Schneider Electric

## Collaborators

**Microsoft**

Capgemini Consulting

there.

engage consulting limited

Sustainability first

UCPartners Energy & Utility Consulting

UNIVERSITY OF OXFORD ENVIRONMENTAL CHANGE INSTITUTE

ONZO

Home Automation Europe

Ruth Mourik Consultancy for sustainability

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INTERACTIVE INSTITUTE

DELTA Energy & Environment

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# Respond 2010



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Demand response round-table

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Global Demand Response round-table

*exchange* 2010

Copenhagen 26-27 May 2010

- 40 Reports
- 35 Expert writers from 18 Countries
- State-of-art best practice and visions

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# Understanding Risks



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# Smart Meter Risks

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We have had our electricity cut off and you make us buy a new meter?



Don't worry, it does not work



# Smart Meter Risks

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Aol. | MAIL | You might also like: Homes for Sale, Apartments and More

## HOUSING WATCH

Search housing news

Main Housing Market News Cities Home Design Economy Writers

Economy

Source: housingwatch.com

### Did California Smart Meters Gouge Homeowners?

By Aaron Crowe Jun 3rd 2010 @ 2:29PM  
Filed Under: Economy

0  
COMMENTS

PRINT Email Facebook Twitter LinkedIn Plus More

TEXT SIZE: AAA



Tom Raftery, flickr

The California power company Pacific Gas & Electric is receiving a lot of backlash due to the results of its smart meter installations. Smart meters are used to make electronic readings of meters instead of sending out meter-readers; they also are intended to help consumers monitor their energy use.

But homeowners have complained about inaccurate bills, some of which have doubled without warning. State energy regulators are investigating and will test some of the 5.7 million units installed at homes. During the four-to-six-month investigation regulators also will test the devices in a lab.

PG&E has said the soaring bills were caused by high electricity rates and heat waves, although an initial investigation found several recurring problems with the meters and their installation, according to the *San Francisco Chronicle*.

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# Potential of Demand Response



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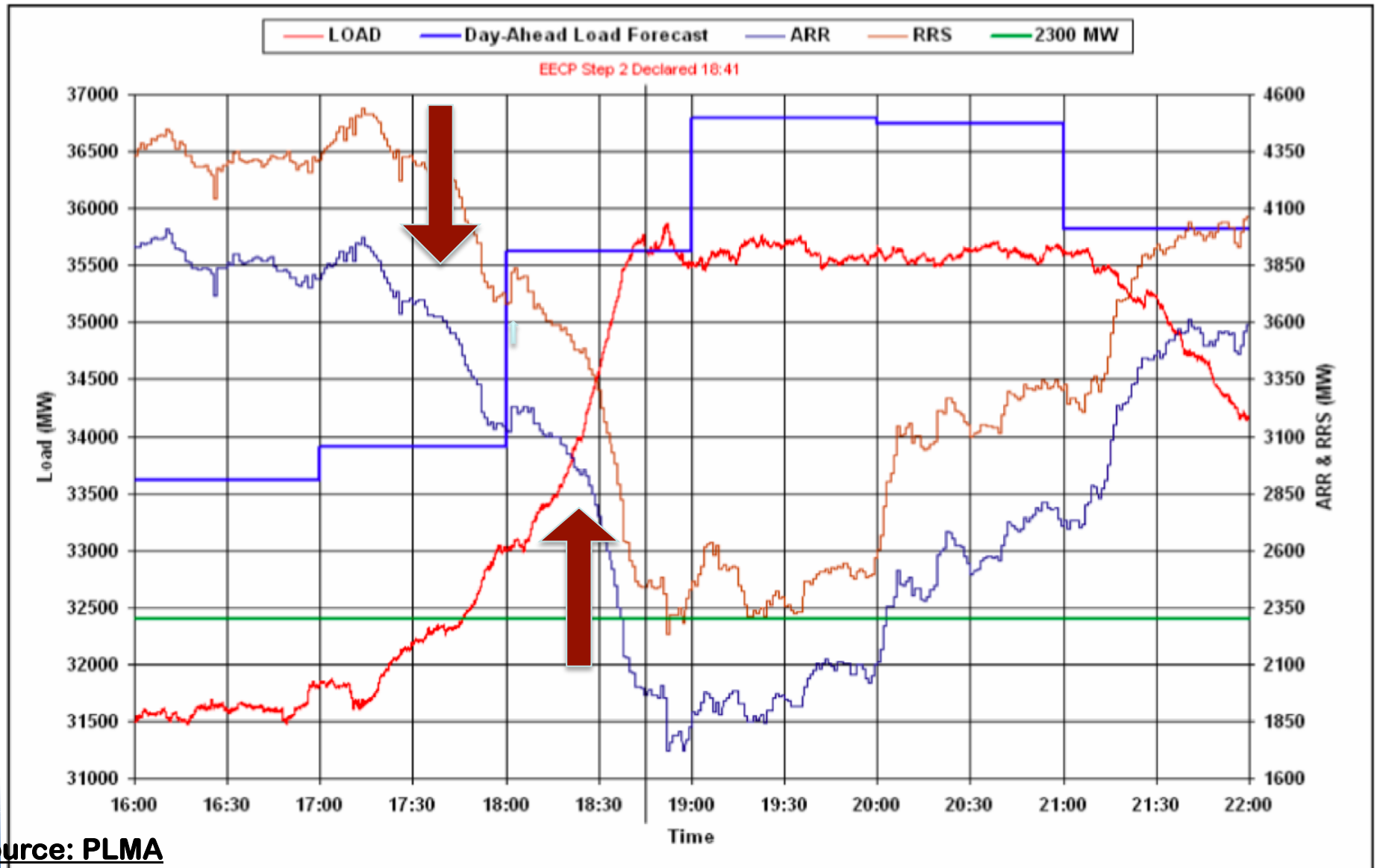
# USA

## Power of 5% peak reduction

625 power plants  
\$66billion over the next  
two decades. (at current prices)  
(Brattle Group)

# Stability

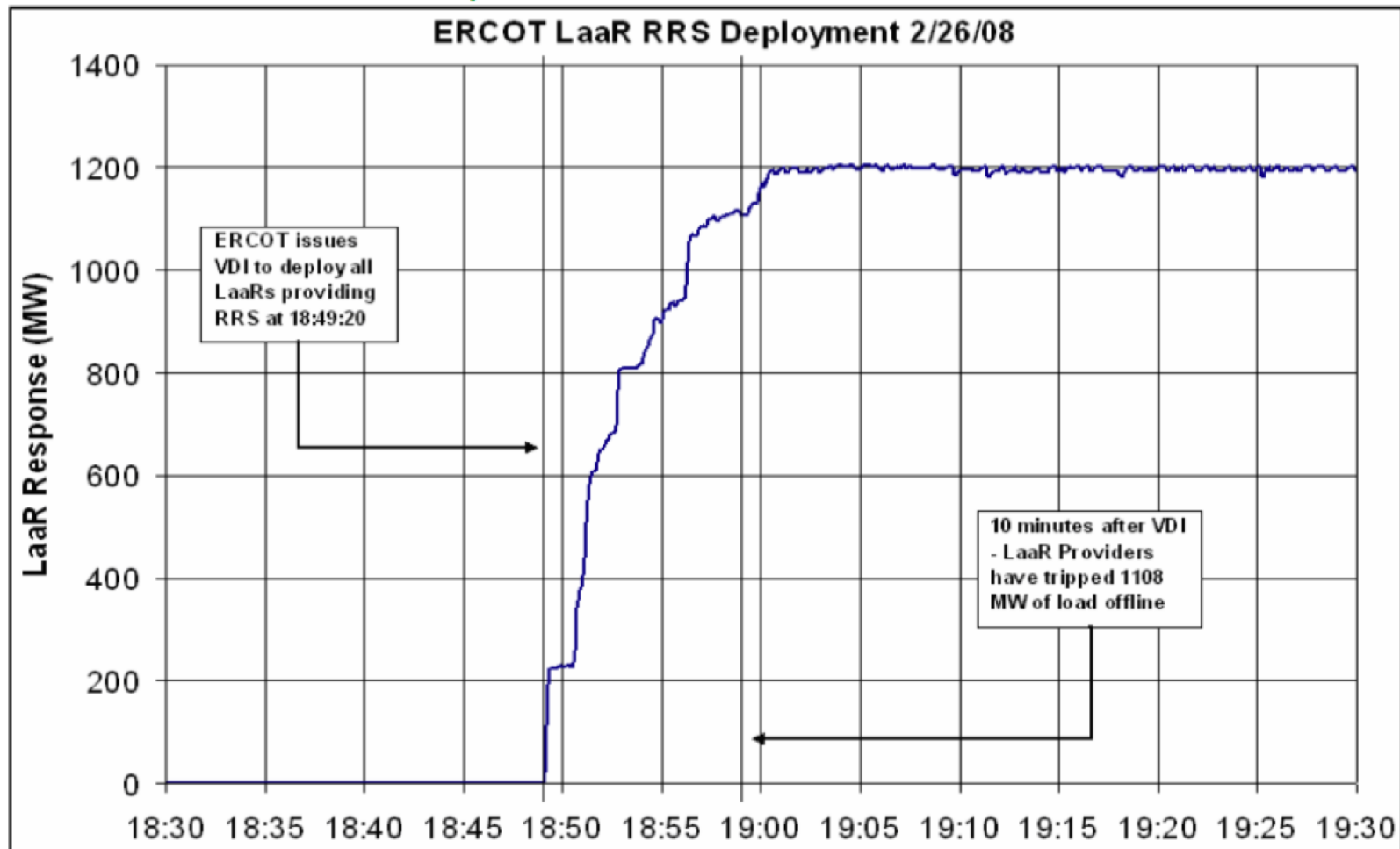
## Texas – The day the wind died (1)



Source: PLMA



# Texas – The day the wind died (2)



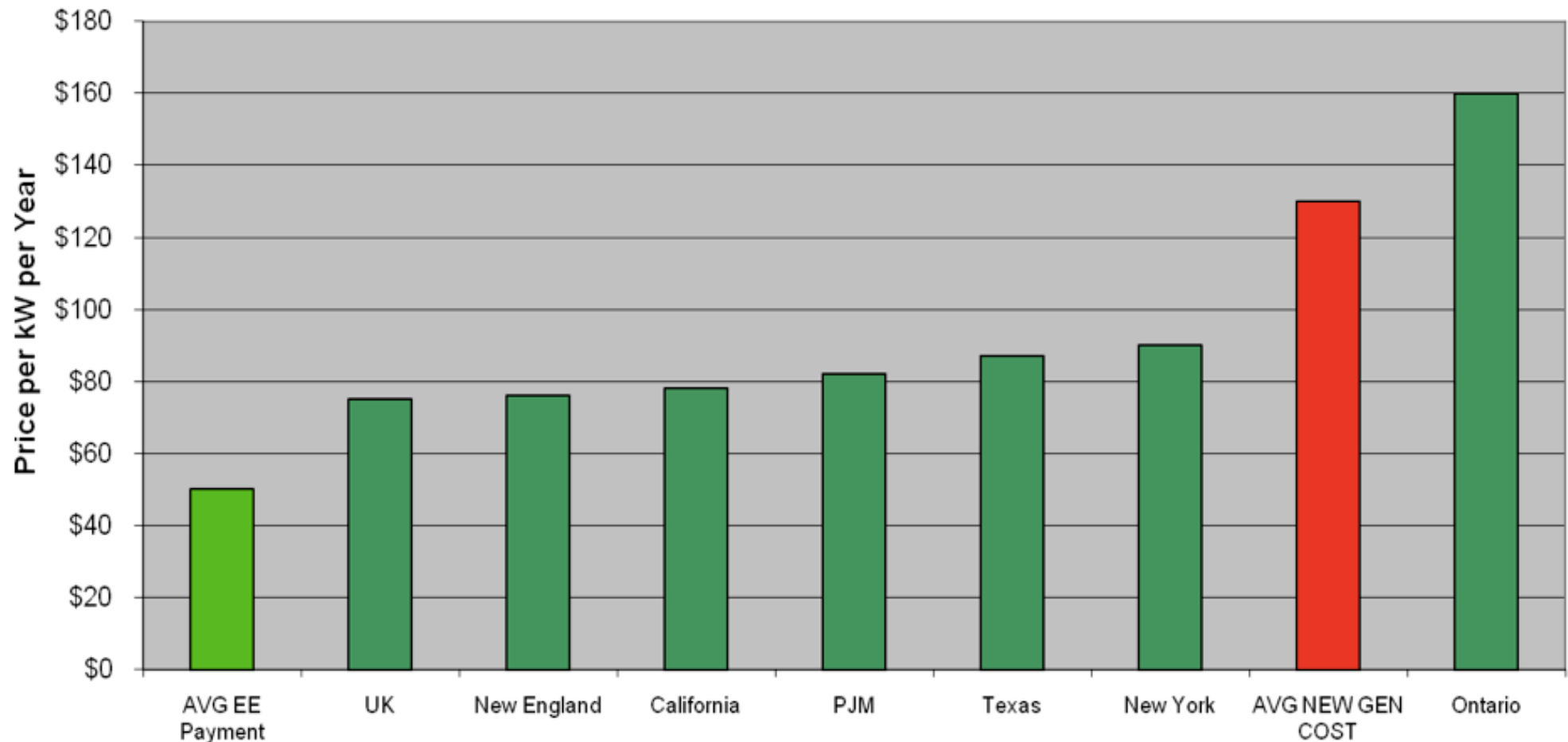
Source: PLMA

# Cost of building generation to back-up intermittent renewables + new base-load

## Faster, Cheaper Cleaner

### DR (Capacity) & Efficiency vs. New Generation

*(Applying highest potential price / cost)*



**Source: PLMA**

DR Program, Efficiency vs. Avg New Generation Cost



# Pilot Study Comparison

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## **INTERNATIONAL PILOT STUDY COMPARISON**

- 80 pilot studies reviewed
- 124 program breakdowns
- 15 factors

## **PILOTS VERSUS ROLLOUT**

## **MARKET DRIVERS AND MARKET OPENINGS**

- 23 Regions Reviewed
- 20 Market Drivers, Barriers, Enablers

# Pricing Programs

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**Two main types**

**TOU** = Time Of Use

**CPP** = Critical Peak Pricing

“Sliding Peak” price high on certain days.

Can be called a certain number of times

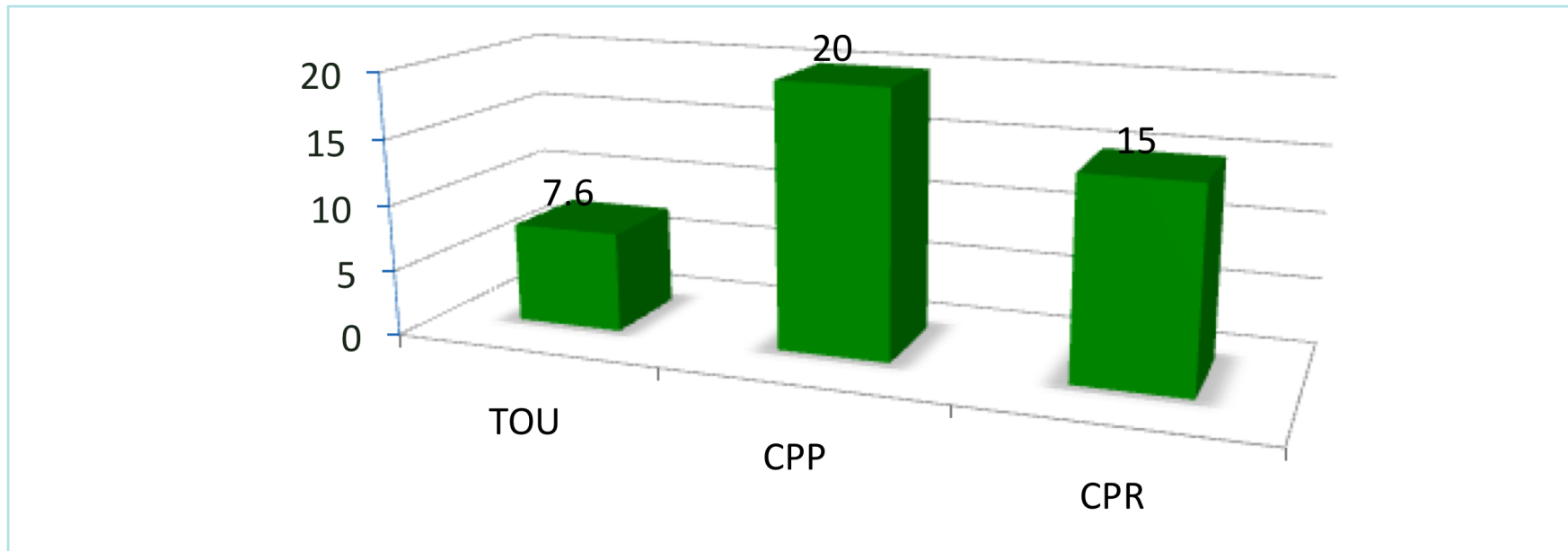
**CPR** = Pay people to lower consumption during peak hour



Savings

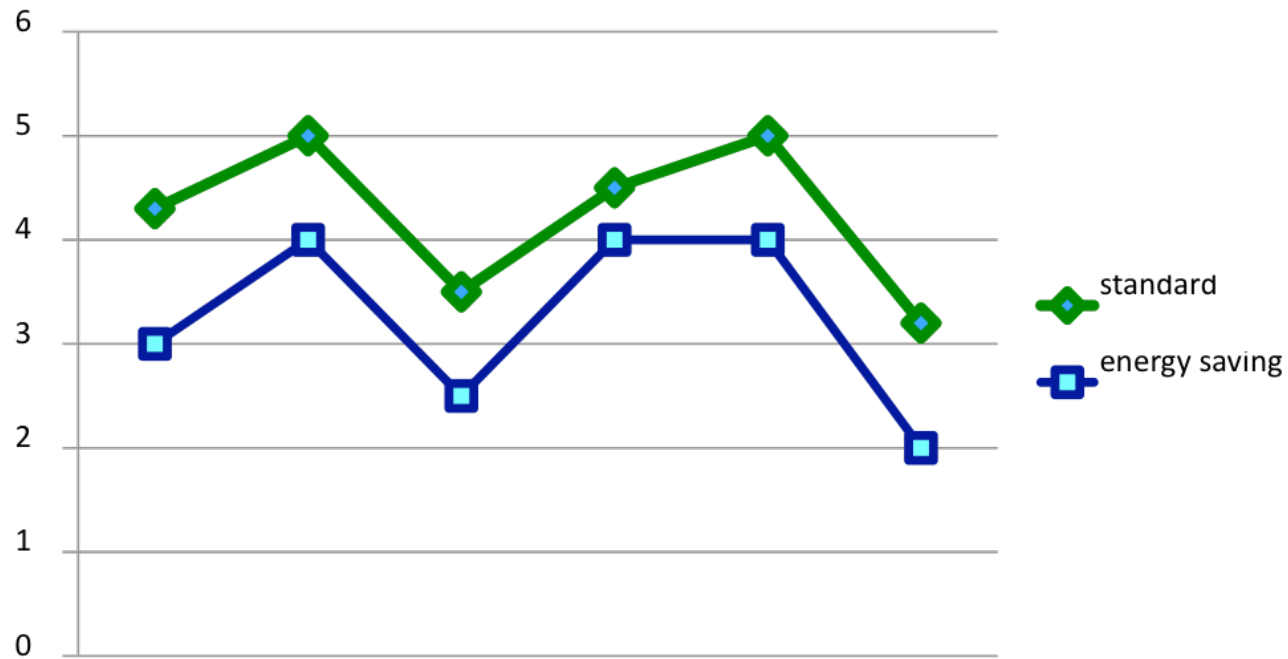
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## Peak Clipping Program Average Peak Savings



# Savings

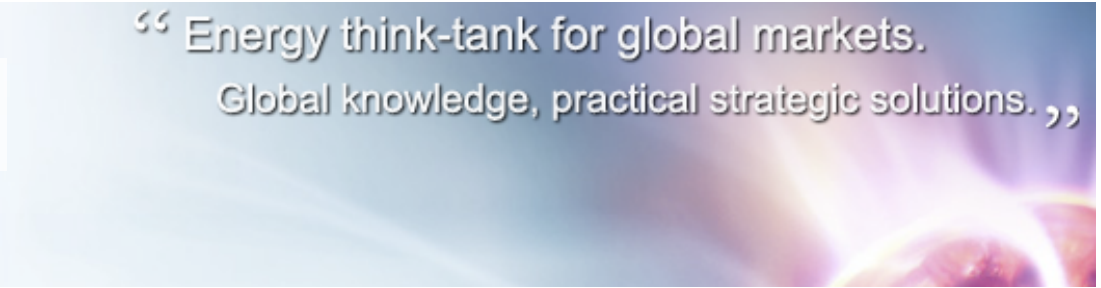
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Automation



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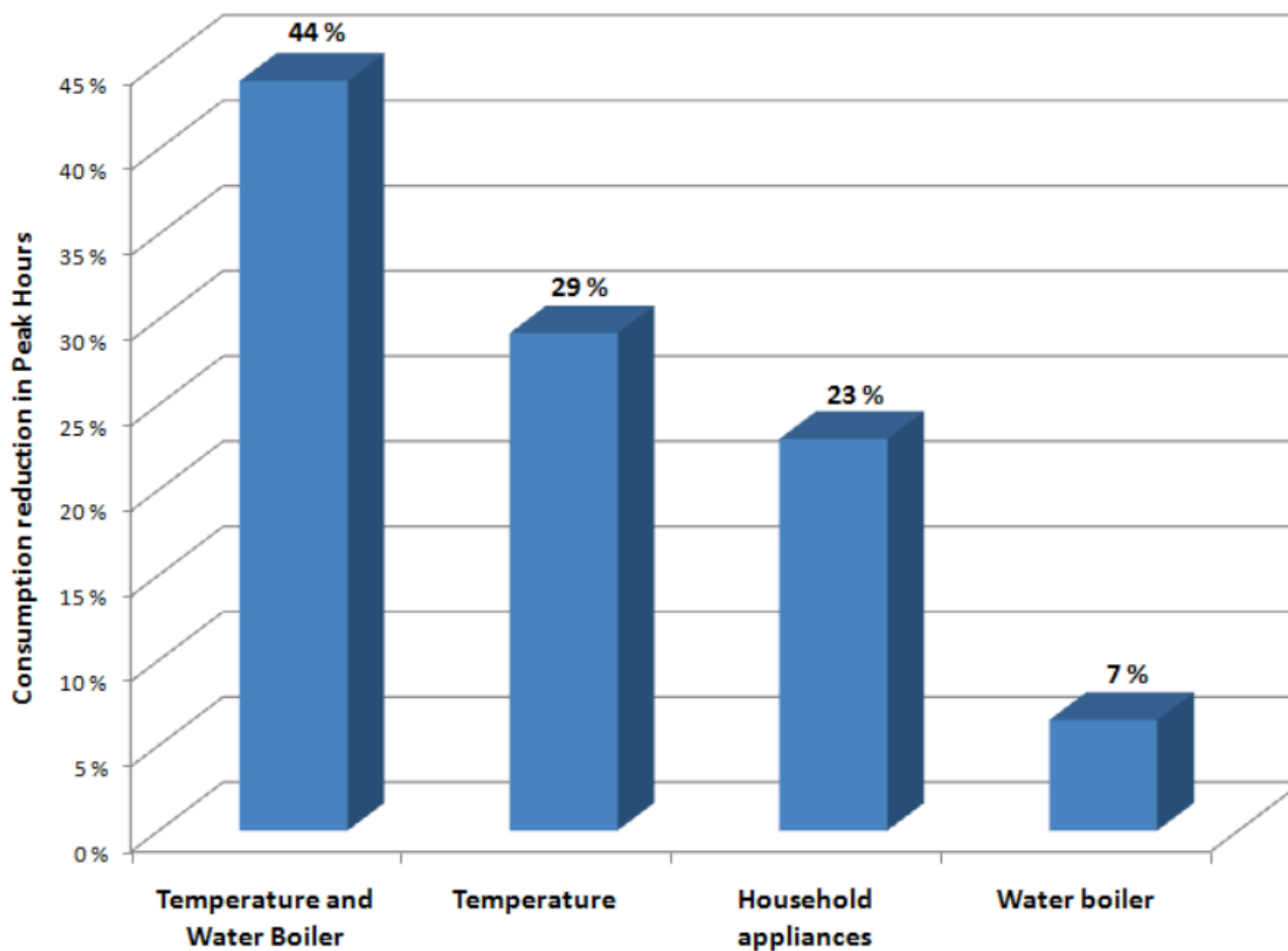
**Automation**  
**adds an extra 15 %**  
**to reductions**



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# Automation

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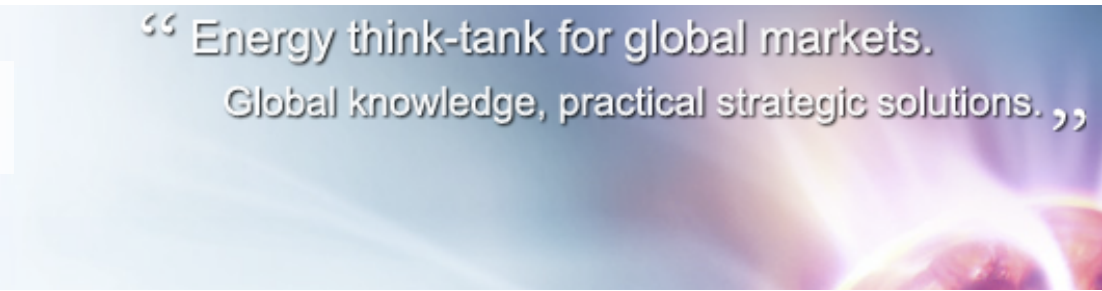
# Importance of Education



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Learning



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**Feedback = EDUCATION:**

**From the “*energy consumer*” to  
the “*energy citizen*”** *Dr. Sarah Darby*

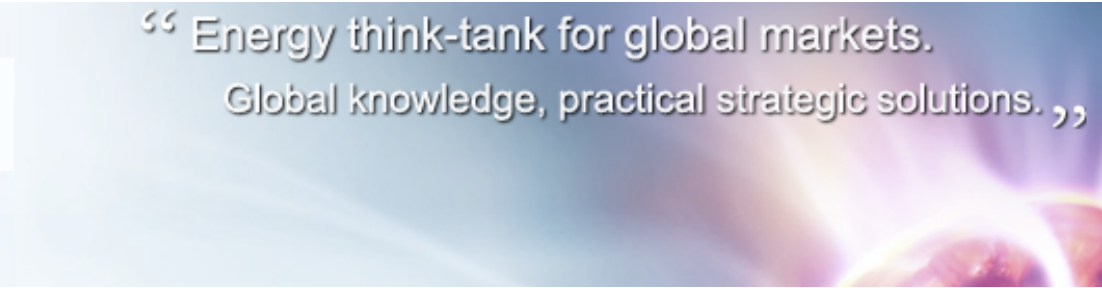


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## Learning



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Today: *Electricity is not only seen as a natural human right - but as a limitless, cheap and harmless natural human right*

Learning

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# Current Awareness of Consumption

Activity

- Center of focus

Electricity costs

- End of year
- End of month

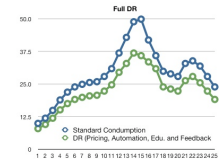
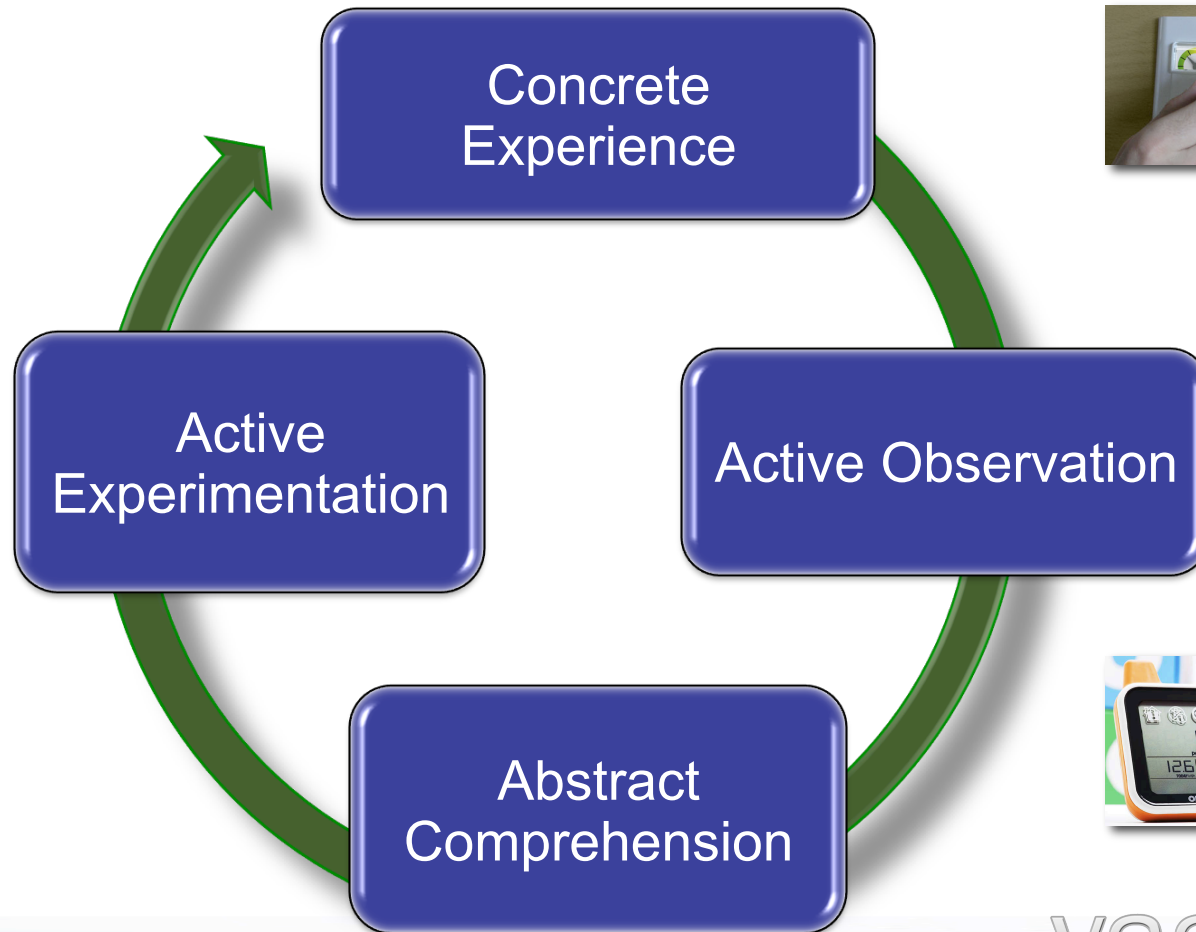
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# Experiential Learning Theory



E. Kolb

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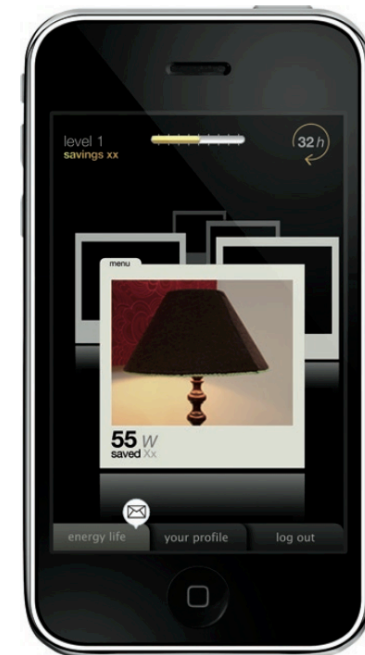


# Learning

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Source: BeAware



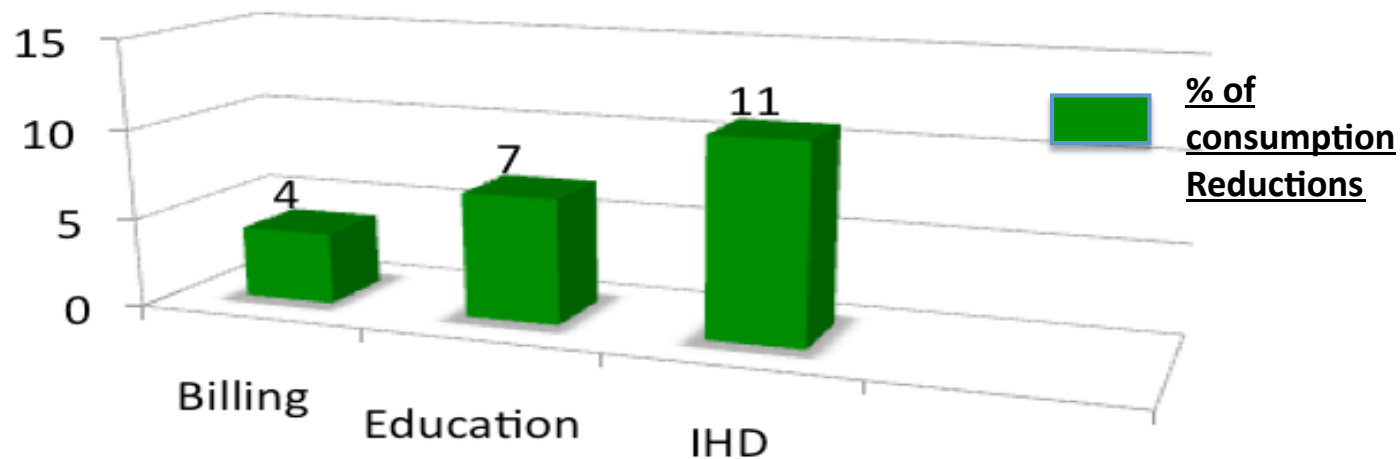
Energy Life

Learning

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## Feedback – Energy Efficiency

### Starting place for Europe



#### **Main Drivers:**

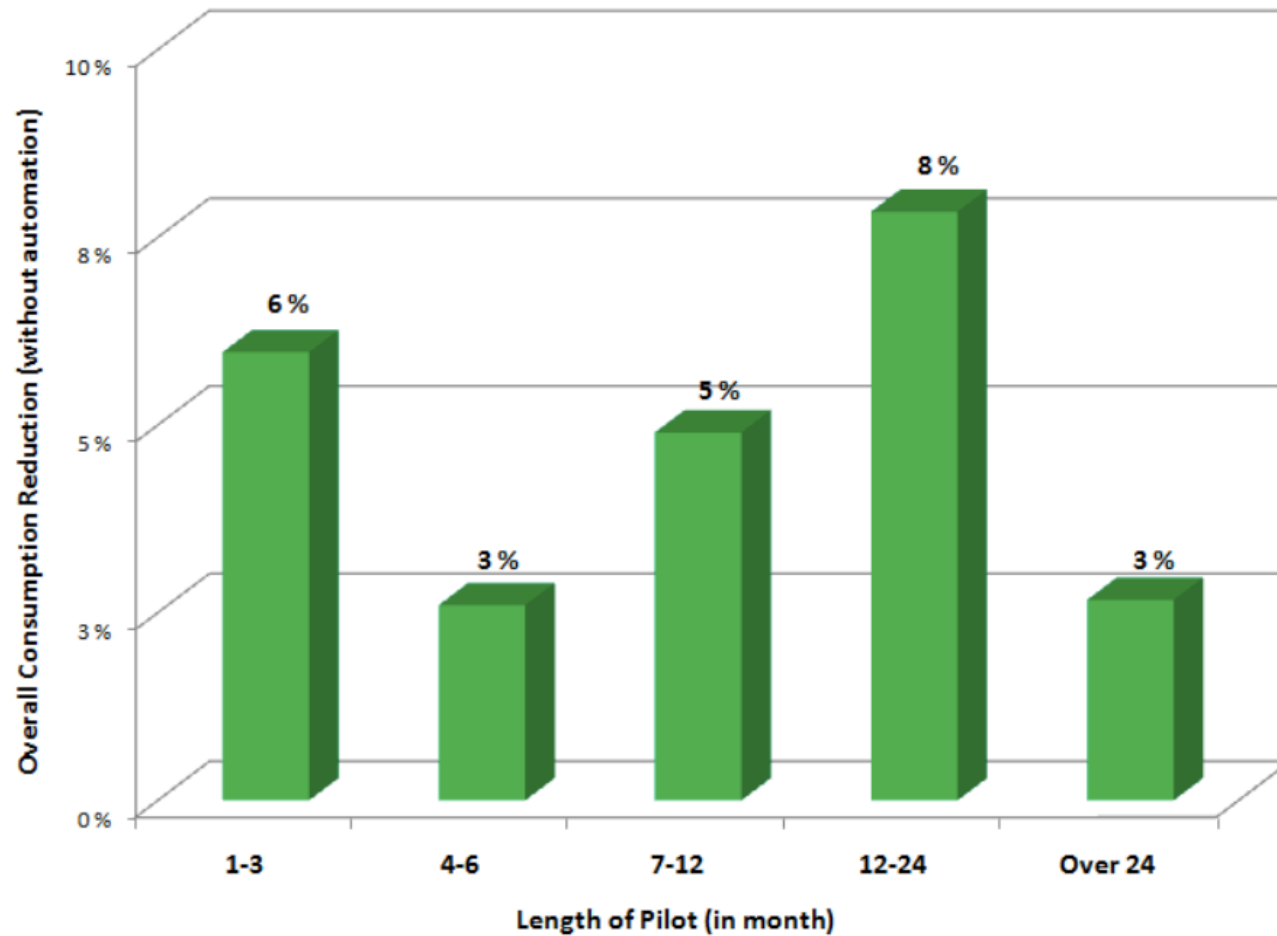
Low Capacity Margins  
Flat load profiles  
SM Rollout  
Regulation

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# Learning

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**Length of Pilot:  
2 years  
optimum**

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## The Social Impact of Commercial Demand Response



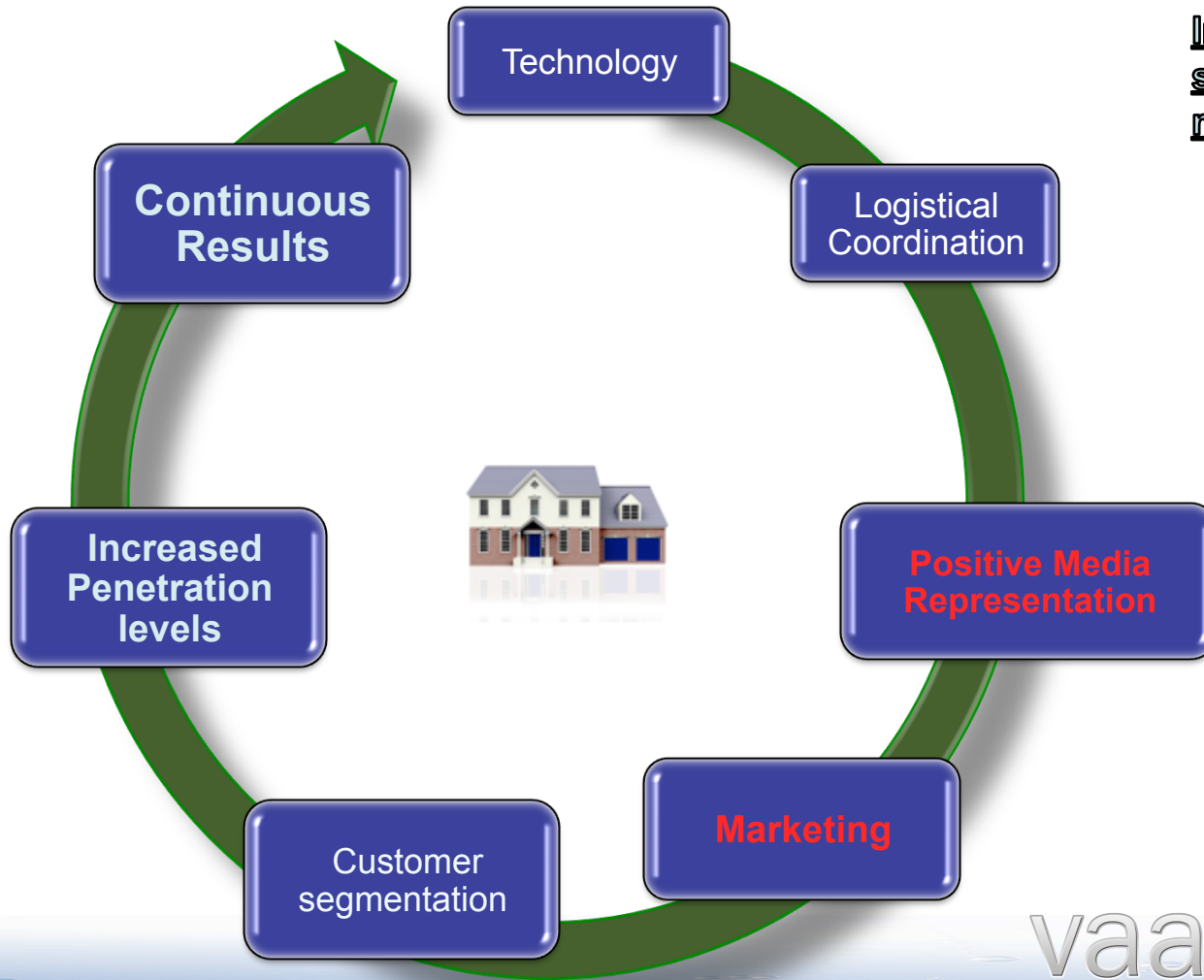
- Private school NYC
- Small amount manual load shifting 100 kW
- Now:
  - 300 kW automation
  - 95% maintenance products bio degradable
  - Buy green energy
  - DR data tracks total use
  - Students have goal reduce 14%
  - Investing in solar panels

*“Don't know where the light switch is” School in Norway*

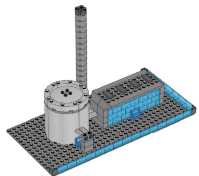
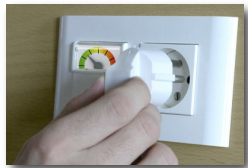
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# Successful Rollout Requires



Importance of system being replaced





# Understanding Psychology



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## Key Psychological Drivers for Utilities Customers

Fulfillment

Personality

Culture &  
Society

**lifestyle**  
**predictability**  
**fairness**  
**social appropriateness**

Opportunity

Awareness

Relativity

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## Key Elements of Customer Focus

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1. Customer Benefits
2. Involvement Pre-requisites
3. Inspiring Packages
4. Effective Interfaces
5. Appropriate Accessibility
6. Dynamic Partnerships
7. Appealing Revenue Models
8. Cost Effective Equipment
9. Motivating Feedback
10. Individualization

# Customer Drivers

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Diverse &  
Versatile



Sustainable

Cool, Stylish and  
Fashionable

Fun &  
Gaming



Source: Interactive Institute

Practical &  
mobile

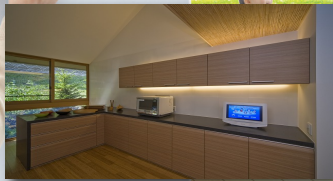


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Eco life

Eco life Health Care life Relaxation life Good Sleep life Secure life Safety life

Panasonic ideas for life





# Customer Drivers

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**Absolute Simplicity:**  
Service proposition clear and attractive in one sentence



**Ambient**  
**'One-Glance' Feedback**



**Not Just Based on Numbers and Graphs**



**Mass Customizable & Personalizable**

**Tariff/Pricing Incentives:**  
3 - infinite tariffs



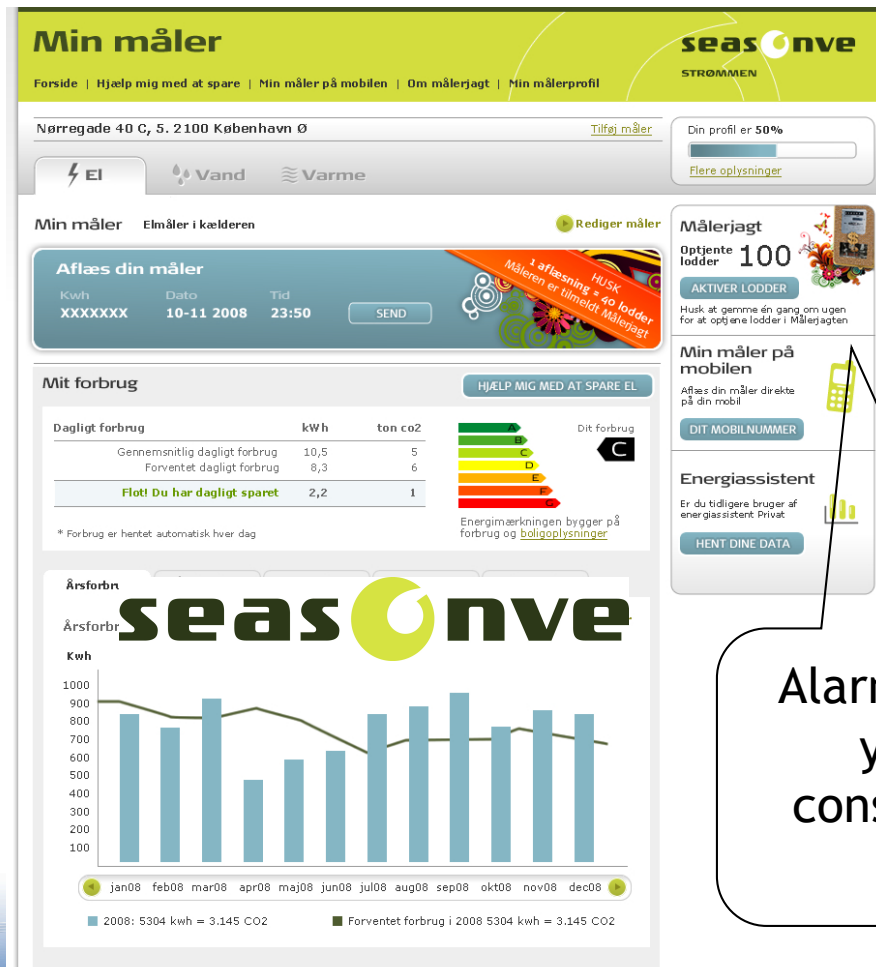
**Predictable Benefits (Subscription Based / Guaranteed Minimum Benefit or Refund)**

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## Timely, Customized Trusted Warnings / Advice



Panasonic ideas for life

Alarm via cell phone if  
your electricity  
consumption exceeds  
normal

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# Appealing Services



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## Automatic Security Suveillance



ex. Elisa 'Vahti'

## Smart Home Management



ex. EMC and Microsoft

# Ubiquitous Integrated-Life Services

## Supported Security Suveillance



ex. Securitas & Deutsche Telekom

## Entertainment, Health and Lifestyle



ex. Deutsche Telekom



Dashboard

Explore

PowerPoints

Electric Vehicle

Home Network

Events

User Profile

Current Status

History

NISSAN LEAF



**RANGE**  
30 out of 120 miles

**TIME COMPLETE**  
2:45 pm

Program

Custom

fastest

**CHARGE RADIUS** 120 miles  
**CHARGE FOOTPRINT** 160 lbs of CO<sub>2</sub>  
**FOOTPRINT EQUIVALENT** 63 gasoline miles  
 (57 GAS MILES SAVED)  
**PROGRAMMED COMPLETION** 2:45 pm

\$4.00

EDIT

ALERTS



**PEAK PRICE SAVINGS**

Delay your Electric Vehicle charging by 2 hours and save \$2.90.

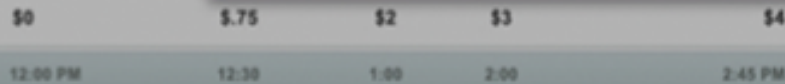
ACCEPT

DECLINE

VIN #: 2FMZUXX

TIME

miles



Alert History

Messages

- 1 2.27 DAILY UPDATE Today you drove 50 miles on 25% of your ... [VIEW](#)
- 2 3.01 SERVICE ALERT You have 1000 miles (est.15 days) before ... [VIEW](#)
- 3 3.06 GREEN NOTICE You saved 150 trees (50 gallons of gasolin... [VIEW](#)
- 4 3.11 HOME ALERT Today from 1-4pm we turned off your water... [VIEW](#)

Rules

- 2  Refrigerator
- 3  Washer / Dryer
- 4  Air Conditioning
- 5  Humidifier

NOT IN USE

- Computer
- Television
- Microwave

# Rewards Schemes

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The screenshot displays the Tendril Tracker website interface. The browser address bar shows the URL: <https://vip.tendridemo.com/ems/tracker/#Rewards>. The page header includes the Tendril logo, the tagline "The Power is Yours", and navigation links for "Tendril 50", "Log Out", and "Profile".

The main content area is divided into several sections:

- Overview**: Shows "CURRENT AVAILABLE POWERPOINTS: 971" with a "REDEEM NOW" button. Below this, it states "TOTAL POINTS EARNED SINCE ENROLLMENT: 7,000".
- TRANSACTION HISTORY**: A table listing recent transactions with columns for DATE, PROGRAM, DESCRIPTION, and POINTS.
- MY PROGRAMS**: A section for "Energy Management" with an "Enroll" button.
- YOUR POWERPOINTS CONGRATULATIONS**: A section listing rewards you qualify for, categorized by Electronics, Travel, Home & Garden, Charity, and Toys & Games.

DATE	PROGRAM	DESCRIPTION	POINTS
04.01.10	Energy Management	Installed a Smart Thermostat	
03.20.10	Redemption	Holiday Inn - One Night Stay	3,000
03.18.10	Energy Management	3 logins to Vantage Portal in 1 week	3,000
03.05.10	Energy Management	First login into Vantage Portal from a mobile device	2,000
02.18.10	Energy Management	Installed a Smart outlet	500
02.08.10	Energy Management	First login into Vantage Portal	1,000
01.01.10	Energy Management	Initial Enrollment Bonus	250

**Available Energy Management**

As a member of the rewards system, you may enroll in one or more programs. Each program offers easy ways to earn rewards points. The list at the right contains available programs that you may join. Enroll today!

PROGRAM NAME	DESCRIPTION	Enroll
Demand Response	Earn points during high demand periods.	Enroll
Energy Efficiency	Points accrue by using less than your baseline.	Enroll

**YOUR POWERPOINTS CONGRATULATIONS**  
HERE ARE SOME REWARDS YOU CURRENTLY QUALIFY FOR:

- ELECTRONICS**: AT&T DECT Phone answering system (32,000 points) - SEE MORE
- TRAVEL**: Caribbean Cruise (150,000 points) - SEE MORE
- HOME & GARDEN**: Sprinkler System (100,000 points) - SEE MORE
- CHARITY**: Global Education Fund (50,000 points) - SEE MORE
- TOYS AND GAMES**: Xbox 360 System (80,000 points)

Tendril

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## Central Feedback



ex. Tendril / Iphone



ex. VaasaETT / Ipad

## Supporting Feedback



ex. Tendril Clock



ex. ONZO

## Couch Data



ex. Tendril



ex. 'PowerPlayer' by Home Automation Europe

## Low Cost Feedback

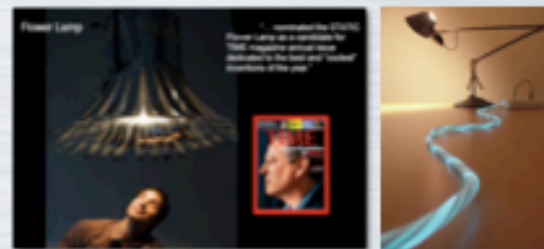


ex. Deutsche Telekom



ex. Tendril Vantage

## Stylish Ambience



ex. Interactive Institute

## Family Fun



ex. Nintendo DSi / Panasonic



# Ambient Feedback

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Interactive Institute

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# Customized Feedback

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Panasonic



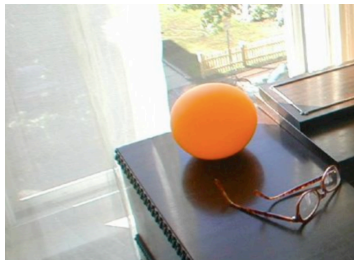
Electronic Housekeeper



GEO



ELV



The Energy Orb



Energy Aware



Wattcher



GEO





# Convenient Channels

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## What Google is Doing

Google PowerMeter receives information from utility smart meters and energy management devices and provides customers with their personal iGoogle homepage. We are currently testing Google PowerMeter with a number of [utilities](#) and plan to expand our rol



### Analyze:

Get better information about how you use energy and what you can do to be more efficient.



### Save:

Reduce your energy bills and carbon footprint by making smart decisions about your energy use.



### Share:

Strike up a little friendly competition to see how your energy consumption compares to your friends and neighbors.

# twitter



Source: Twitter

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Source: Google



# Individualization, Systems & CIS

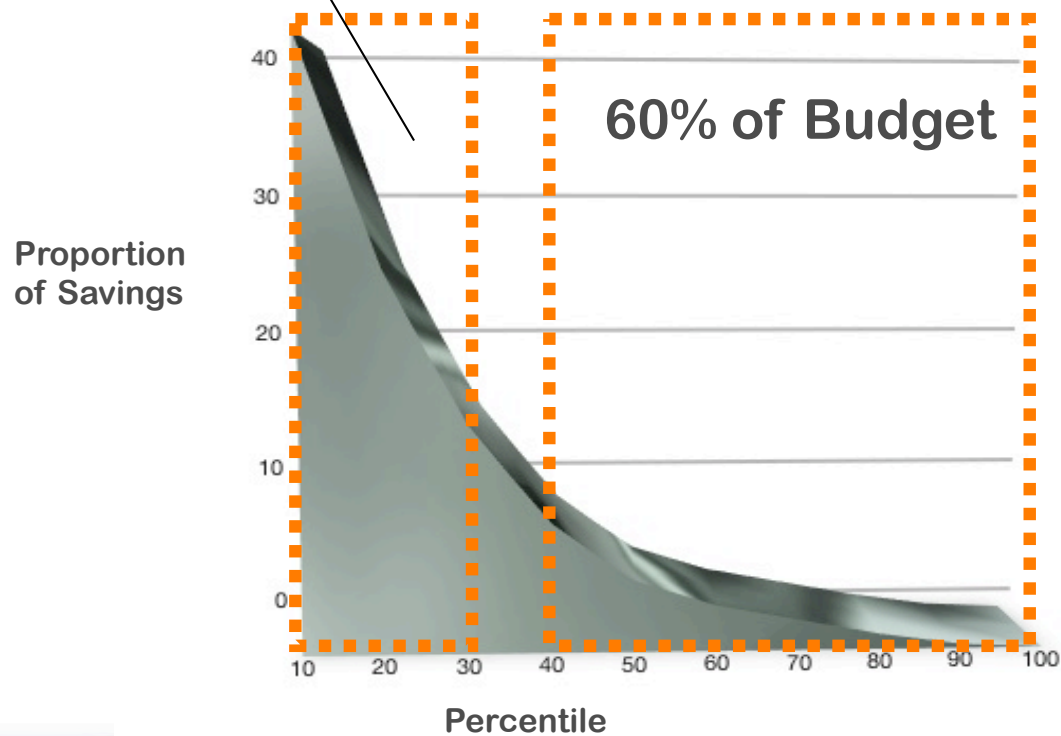


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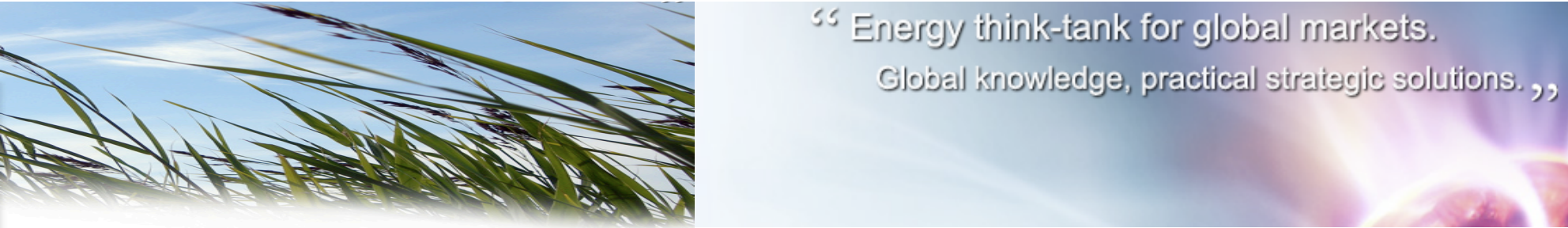
80% of Savings

California Pilot:  
All customers received SM, CPP  
and Feedback/Information



DR is not  
relevant to  
everyone






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**DR should be offered to the  
right customers, at the right  
time, in customized packages  
(product bundles)**

**This requires smart powerful  
CIS/MDM**



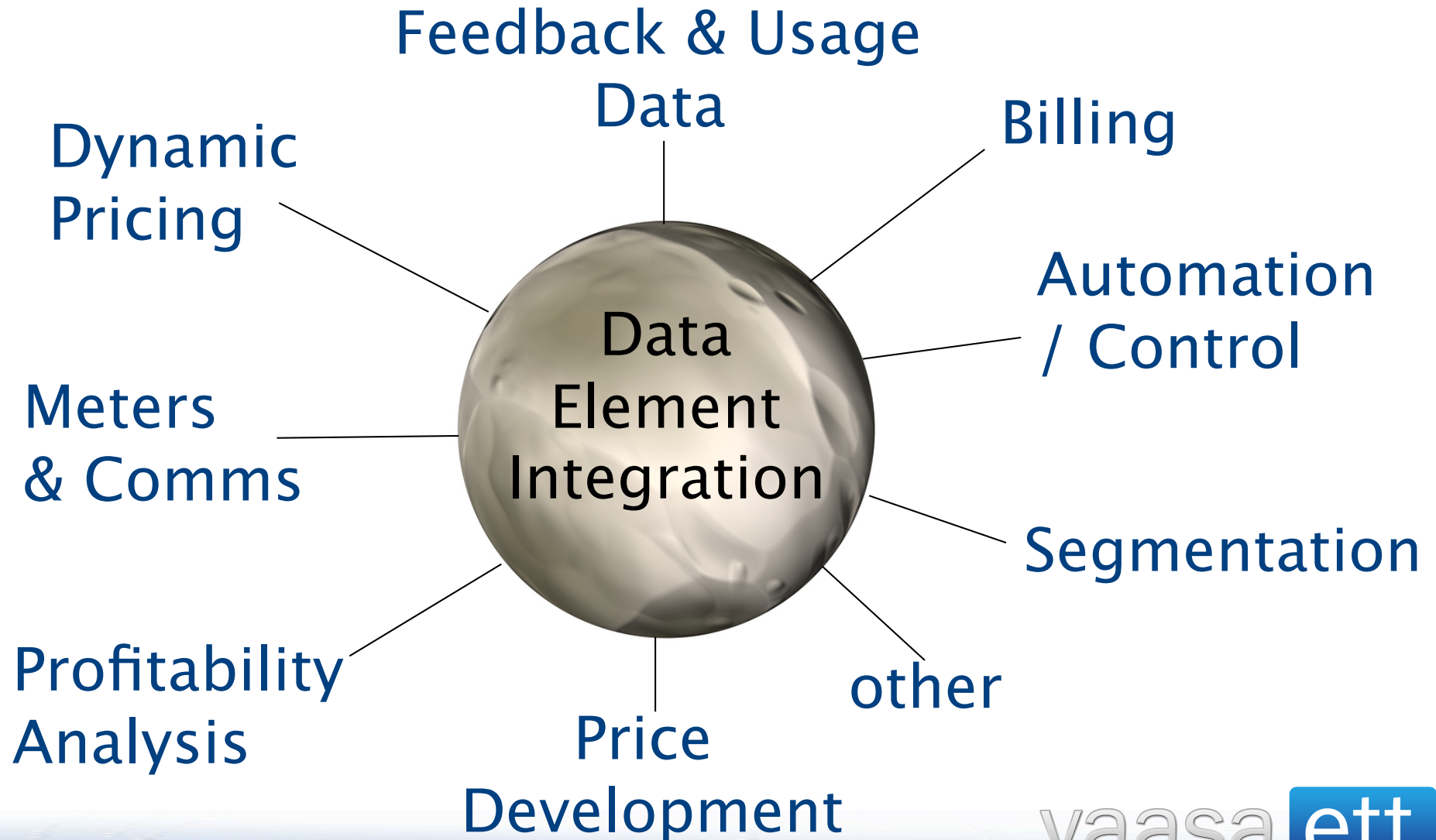
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CPP
PP
FB
HA
CPP+PP
CPP+PP+FB
CPP+PP+FB+HA
CPP+FB
CPP+HA
CPP+FB+HA
CPR+PP
CPR+PP+FB
CPR+PP+FB+HA
CPR+FB
CPR+HA
CPR+FB+HA
PP+FB
PP+HA
PP+FB+HA
FB+HA

**Different DR combinations suit different customers. >20 have been tested in pilots. Greater segmentation = greater DR**

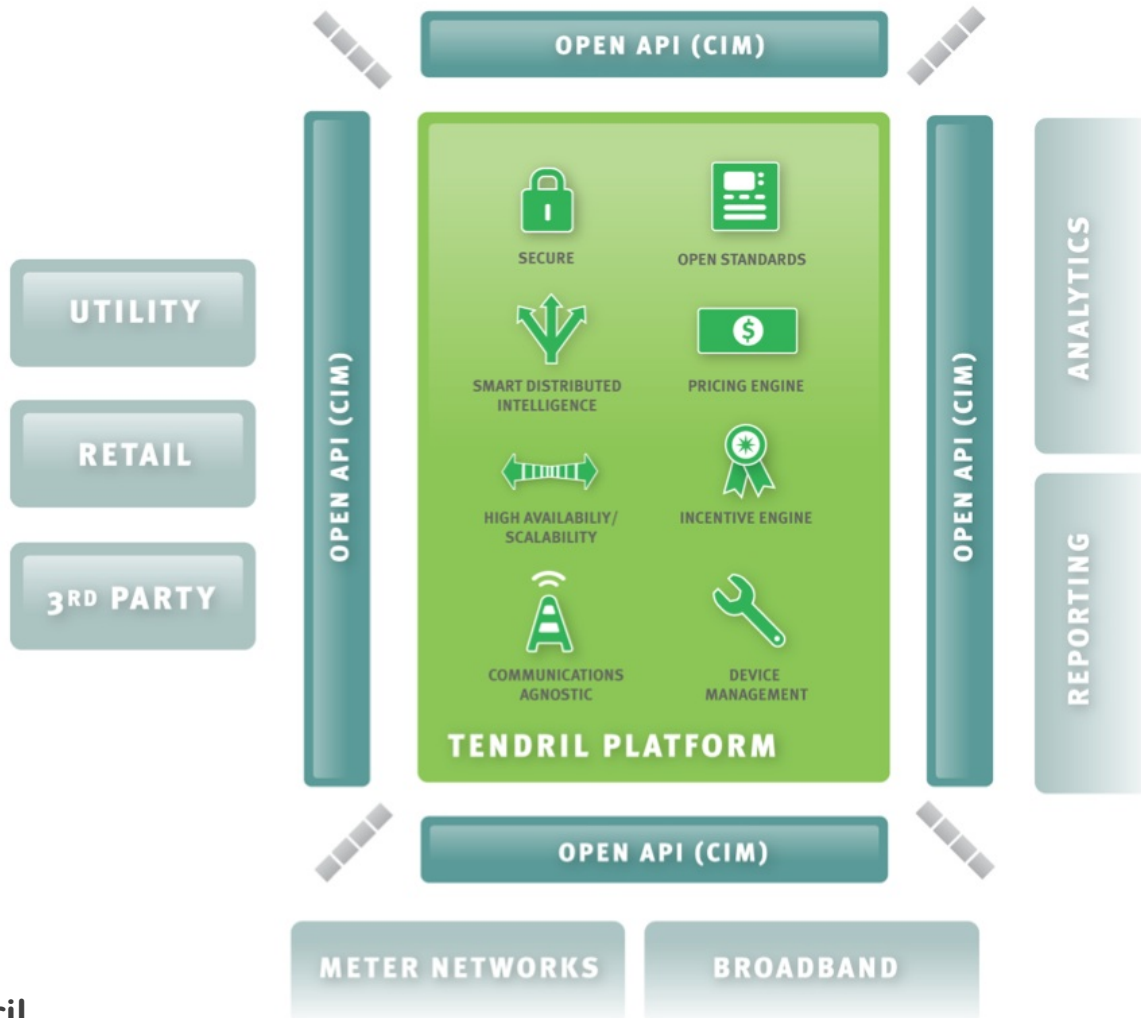


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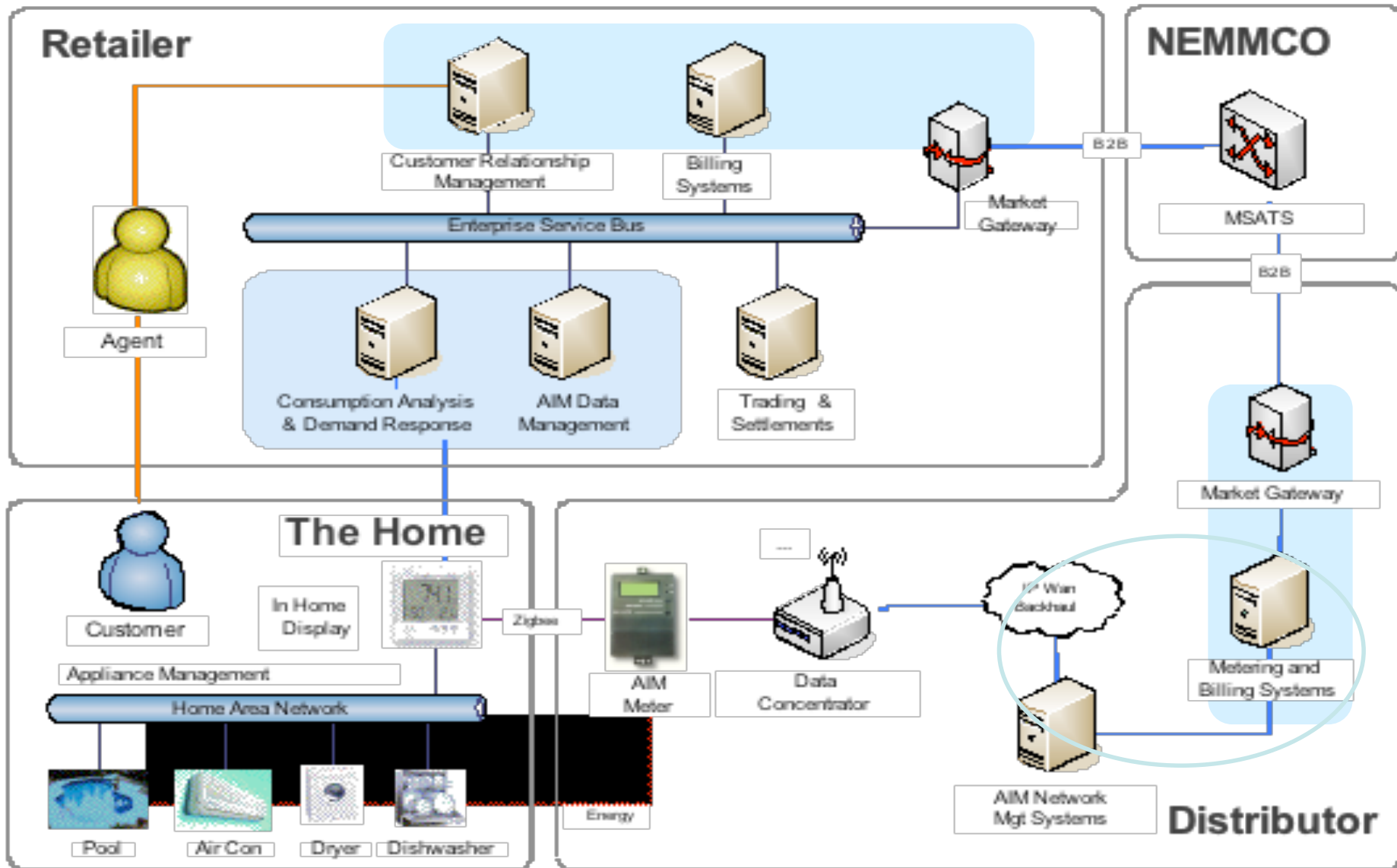


Source: Tendril

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# CIS/MDM Infrastructure (Hansen Technologies)



AMI mass rollouts, Demand response trials, SolarCity, Carbon (2011)  
 Comprehensive functionality, real-time 2 way comms, HH daily collection

# A Clear Vision & Strategy



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