Customer Program Advisory Group

July 2018
Agenda

3) Residential Electricity Monitoring and Electricity Bill Explorer Deep Dive

3.1) Existing Technologies and Program Experience

3.2) Opportunities and Motivating Factors for Residential Electricity Monitoring and Electricity Bill Explorer Adoption: Would You Sign Up for These?

4) Current Utility Programs Available to SVCE Customers
# Existing Technologies and Program Experience

<table>
<thead>
<tr>
<th>Residential Electricity Monitoring</th>
<th>Electricity Bill Explorer</th>
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<tr>
<td>1. Sense</td>
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*Silicon Valley Clean Energy*
## Residential Electricity Monitoring

### Title & Use Case
(Do “x” for “y”.)

Residential Electricity Monitoring
Facilitate appliance-level (disaggregated) electricity monitoring to increase energy literacy and reduce electricity use

### Specific Elements

- Customer site electricity monitoring with smart phone interface
- RFP process to select appropriate monitoring vendor
- Facilitate installation of devices
- Study to follow up on energy literacy and electricity usage after installation

### SVCE’s Role
(possible partners or collaborators)

- Conduct RFP for monitoring solution
- Bulk purchase and/or rebate for devices
- Connect customers to approved electricians able to install devices
- Provide online forum for customers to discuss project among themselves
- Possible partners: Sense Labs, Bidgely

### Success
(define success)

- Number customers participating in program
- Increased energy literacy for participants
- Reduced electricity usage for participants (lower bills & reduced carbon emissions)
Residential Electricity Monitoring

sense

Silicon Valley Clean Energy
# Residential Electricity Monitoring

## Functionality
Load disaggregation focused

## Usability
Installs in panel, available on iOS, Android and web apps

## Cost
$299/$349 (solar option)

## Uptake
1% would be high

## Offered by PG&E?
No
Residential Electricity Monitoring

https://rainforestautomation.com/
# Residential Electricity Monitoring

<table>
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<th>Functionality</th>
<th>Real-time consumption data</th>
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<td>Usability</td>
<td>Customers provision device with utility, view on web app (EAGLE connect to cloud/EM-2 connect to meter)</td>
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<tr>
<td>Cost</td>
<td>$99.99, plus SCE $25 rebate</td>
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*1% during BC Hydro program
Residential Electricity Monitoring

• BC Hydro Case Study
  • 9 month period program
  • Reached 1% of the entire customer base
  • 10x adoption rate outside the program (0.01%)
  • Pre-provisioned devices- “just worked” upon arrival
  • Heavy promotion via email (50% open rate) & earned media
Residential Electricity Monitoring

- Effective messaging:
  - Green
  - Saving money (less effective)
  - Efficiency/avoiding waste (tech savvy customers especially)
  - Customer empowerment and visibility (non-engaged customers especially)

<table>
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<tr>
<th>80%</th>
<th>80%</th>
<th>75%</th>
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<td>When surveyed, 8/10 customers ‘liked’ or ‘loved’ the device.</td>
<td>Customers would recommend devices to their friends and family. 85% conducted ‘experiments’ around the house to better understand their energy use.</td>
<td>Customers ‘agree’ or ‘strongly agree’ that the device has “provided new insights about how I am consuming electricity at home”. A similar number have taken real action as a result of those insights.</td>
</tr>
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Residential Electricity Monitoring
# Residential Electricity Monitoring

**TED**

- **Functionality**: Circuit level data, with solar add on (with manual disaggregation option)
- **Usability**: Hardware install, viewable on free cloud service or mobile app
- **Cost**: ~$300-400
- **Uptake**: Offered by PG&E? No
## Residential Electricity Monitoring

### Functionality
- Load disaggregation (platform solutions)

### Usability
- Bidgely HAN device, register through PG&E
- Stream My Data

### Cost

### Uptake
- “Thousands”

### Offered by PG&E?
- Pilot has concluded
Residential Electricity Monitoring

Bidgely

Consumer Engagement
Relevant, timely, personalized insights empower consumers and help build enduring relationships

Energy Efficiency
Insights into appliance-specific energy usage and costs empower consumers to save more

Audits & Surveys
Eliminate the challenges of traditional online surveys via a disaggregation-powered approach

Demand Response
Behavioral demand response generates results at lower cost and enables expansion to millions of homes

New Rate Adoption
Tools and insights to help educate and encourage consumers to adopt and accept new rates
### Residential Electricity Monitoring

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**Functionality**
- Circuit level data, with solar add on (with manual disaggregation option)
- Hardware install, viewable on free cloud service or mobile app

**Usability**
- Installs in panel, available on iOS, Android and web apps
- Hardware install, viewable on free cloud service or mobile app

**Cost**
- $299/$349 (solar option)
- ~$300-400

**Uptake**
- 1% would be high
- 0.01%*
- “Thousands”
Residential Electricity Monitoring

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<th>Model</th>
<th>Snapshot</th>
<th>Special Features</th>
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<td>Sense Energy Monitor</td>
<td>Excellent monitoring interface and appliance level detection</td>
<td>Amazon Alexa skill, small appliance monitoring, solar add-on</td>
</tr>
<tr>
<td>The Nuoro Home Energy Monitor</td>
<td>Best-seller with excellent monitoring, good fit if appliance-level monitoring is not a focus</td>
<td>Bill forecasting feature, smart phone monitoring app</td>
</tr>
<tr>
<td>CURB Home Energy Monitoring System</td>
<td>Good for connecting to smart home controls and solar systems</td>
<td>Appliance level detection, integration with SmartThings, can control electronics</td>
</tr>
<tr>
<td>EyeDro Home Electricity Monitor</td>
<td>Low cost alternative with only the basics</td>
<td>Online monitoring</td>
</tr>
<tr>
<td>Smartpe Home Energy Monitor</td>
<td>Good monitoring, but appliance-level detail is lacking</td>
<td>Solar add-on, smart phone app, free “comfort plug”</td>
</tr>
<tr>
<td>Ted Pro Home Electricity Monitor</td>
<td>Prickle model compared to models with similar features</td>
<td>Circuit-level detail, solar add-on option, connects to Alexa</td>
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Our Summary Recommendation

Our recommendation for most consumers, particularly those that want a solar add-on is the Sense Energy Monitor. The Sense Energy Monitor uses machine learning to automatically identify and monitor appliances in your home. The earlier versions of the Sense had issues with the device-level monitoring, but the company has significantly improved these capabilities. In addition, Sense has recently added integration with Alexa and IFTTT to enable voice commands and communication with other smart home devices. Sense also comes with a cool interface to show you which devices are on in real-time and timeline throughout the day. Sense stands out as the most innovative model in the market and costs about the same as its main competitors. We expect Sense to continue to release more features targeted at energy savings and smart home integration in 2018. If you just want the basics at a low cost, however, we think the EyeDro Home Electricity Monitor at under $130 offers the best value with an easy installation.

Source: www.ohmhomenow.com
# Electricity Bill Explorer

## Title & Use Case
(Do “x” for “y”.)

**Electricity Bill Explorer**
Make bills easy to understand and show how customers can reduce their bills and/or reduce carbon emissions

## Specific Elements

- Import bill data (GreenButton standard or direct from PG&E)
- Show how different rate plans would impact customer bill
- Provide personalized comparisons of customer’s usage with norms, peers, and customer’s own past patterns to inform outliers and alert changes in usage.
- Show how much money & CO2 emissions SVCE saves
- Show how little it would cost to switch to GreenPrime (if not already a GreenPrime customer)

## SVCE’s Role
(possible partners or collaborators)

- Develop system

## Success
(define success)

- Number of customer bills analyzed by system
- Number of customers upgrading to GreenPrime after using system
- Customer feedback
Electricity Bill Explorer

HOME ENERGY ANALYTICS

SILICON VALLEY CLEAN ENERGY
Electricity Bill Explorer

Oracle and Opower

Oracle Buys Opower

On May 2, 2016, Oracle announced that it entered into a definitive agreement to acquire Opower, the leading provider of customer engagement and energy efficiency cloud services to utilities. The transaction has closed.

Opower’s solutions enable over 100 global utilities, such as PG&E, Exelon and National Grid to deliver a modern digital customer experience. Opower’s big data platform stores and analyzes over 600 billion meter reads from 60 million utility end customers, enabling utilities to proactively meet regulatory requirements, decrease the cost to serve, and improve customer satisfaction.

Oracle Utilities offers a complete suite of operational applications and cloud services for global electric, gas and water utilities that automate core operational processes and enable compliance. Together, Oracle and Opower will provide the industry with the most complete, modern and integrated cloud platform for the entire utility value chain, from meter to grid to end-customers.
Electricity Bill Explorer

PG&E Rate Comparison Tool

Electric Rate Plan Comparison

Your lowest cost rate plan
Based on your electricity use history, you’ll save the most on the Time of Use (Peak Pricing 4-9 pm Weekdays E-TOU-B)

Your Current Rate
Time-of-Use (Peak Pricing 3-8 pm Weekdays E-TOU-A)

- Peak hours: The price you pay changes based on the time of day, day of the week, and the season.
- Off Peak Pricing (lowest price) before 3 pm and after 9 pm, weeknights, all hours on weekends, and most holidays.
- The price you pay will be lower for your summer months (June, July, and August).

$1,540
Estimated cost per year

CHOOSE YOUR RATE PLAN

Lowest Cost / Save $90
Time-of-Use (Peak Pricing 4-9 pm Weekdays E-TOU-B)

- Peak hours: The price you pay changes based on the time of day, day of the week, and the season.
- Off Peak Pricing (lowest price) before 3 pm and after 9 pm, weeknights, all hours on weekends, and most holidays.
- The price you pay will be lower for your summer months (June, July, and August).

$1,450
Estimated cost per year

CHOOSE YOUR RATE PLAN
Would You Sign Up for These?
Questions?
Current Utility Programs Available to SVCE Customers
Top Program Briefs

- **Residential Electricity Monitoring**  
  Monitoring and analytics to provide customers with real-time consumption data via smart phone and to reveal individual loads

- **Electricity Bill Explorer**  
  Bill data analytics to provide customers with personalized use comparisons against benchmarks and peers, fit with rate options

- **Residential BE Ready**  
  Self-assessment tool and resources to ease electrification conversion

- **MF EV Charging**  
  EV charging infrastructure for multi-family residences

From June 13, 2018, CPAG Progress Update to SVCE BOD.
## Top Program Briefs

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<td>• PG&amp;E’s EV Charge Network</td>
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*Covered in Prior Presentation, Under Agenda Item #3*
## Top Program Briefs

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Next Highest-Ranked Program Briefs

- **Residential Storage**
  Expand the use of residential storage to reduce duck curve impacts

- **BE Smart Upgrades**
  Mass Beneficial Electrification for residential buildings

- **Used EVs and Smart Chargers**
  Incentives or rebates for used electric cars and smart chargers

- **MF Energy Efficiency and Electrification**
  Program to reduce cost of living to residents and to reduce GHGs

From June 13, 2018, CPAG Progress Update to SVCE BOD.
# Next Highest-Ranked Program Briefs

## Non-SVCE Program Offerings Available to SVCE Customers

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<td>Used Evs and Smart Chargers</td>
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<td>MF Energy Efficiency &amp; Electrification</td>
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*Covered briefly in prior CPAG meeting*
## Next Highest-Ranked Program Briefs

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                                                                 • SVCE’s BAAQMD grant for HPWHs covers elements of the program brief, specifically MF electrification |
Offerings in Un-Ranked Program Areas

• Do-It-Yourself Home Energy Saving Toolkit
  DIY kit to help residents identify energy savings. Users can check out a toolkit at most library branches across Santa Clara County. They can keep installed materials like light bulbs and low-flow showerheads. The toolkit has a user guide, and new and updated marketing.

• 2017 Program Statistics
  365 check-outs total
  
  San José    216  
  Sunnyvale   83   
  Milpitas    31   
  Cupertino   18   
  Los Altos   7    
  Morgan Hill 4     
  Campbell    3    
  Gilroy      3     

  2018 Q1 tally: 149 check-outs

From Silicon Valley Energy Watch, 2017 Annual Report
Offerings in Un-Ranked Program Areas

- **Energy Upgrade California** (multiple programs)
  Suite of programs under the Energy Upgrade California umbrella brand, including Home Upgrade (up to $5,500), home energy assessment, appliance rebates, financing, home improvements, etc.

- Example program:

  ![Home Upgrade California](https://www.bayareaenergyupgrade.org/)

  Summary: Assistance developing efficiency upgrade projects, with up to $5,500 in rebates.

<table>
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<th>Program Details</th>
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</tr>
<tr>
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</tr>
<tr>
<td>Oversight</td>
</tr>
<tr>
<td>Funding source</td>
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High-Level Synthesis

- **Numerous existing program offerings** address CPAG’s top-ranked program areas

- **Non-SVCE programs primarily administered by PG&E**, but other program admins exist (e.g. BayREN)

- **Building electrification ignored** by existing, non-SVCE programs

- **Existing program offerings may have limitations** not reflected in prior summary tables (e.g. EV Charge Network serves limited market segments)

- **Currently compiling add’l information** on program details, budgets, uptake, success
Questions for CPAG’s Consideration

- How could SVCE prioritize program development given existing non-SVCE program offerings?
- Under what circumstances should SVCE consider offering a program that overlaps in its objectives to an existing, non-SVCE program offering?
- What role could SVCE have in promoting non-SVCE administered energy efficiency programs?