Cover Page

Company: People Power Company  
Title: The Lean, Green Energy Controller Machine  
Grant Award #: DE-SC0003592

Final Report
Problem/Opportunity Identification

The Problem, and Its Significance

The residential sector consumes 38% of the total energy in the United States\(^{54}\). This is more than the industrial sector (32.5%), and more than the commercial/service and non-household transportation sectors combined\(^{54}\). The 'residential sector' is defined as 'households, individuals at home, and in non-business travel'. Furthermore, residential energy consumption is growing, increasing to 38% from 32.4% of total US energy in 2000. Clearly, the residential consumer's energy footprint is a significant factor in our energy landscape, and creative and innovative solutions are needed to make it easy for homeowners to both understand their energy consumption, and find simple and convenient ways to reduce it. Automated Metering Infrastructure (AMI) deployments by utilities are in their early stage, and will result in the installation of 'smart meters' on the side of US homes. However, these deployments will be slow and uneven in their deployment -- less than half of US homes will have smart meters installed by the end of 2015. Furthermore, smart meter deployments do not solve the "last mile" problem – getting beyond the smart meter installed on the outside of the home, to measuring, monitoring, and controlling energy consuming devices inside of the home. Providing simple, reliable, easy-to-understand energy-efficient solutions for consumers is a critical part of solving our country’s energy issues.

In addition, early stage wireless network solutions that are starting to emerge in the home are based on 2.4 Ghz – a technical solution that limits communication to 30-40 feet, by spec. Most smart meters, devices, Internet hubs, and appliances are further than 30-40 feet apart, and require multiple repeaters in the home. Furthermore, solutions at less than 2.4 Ghz result in less interference – walls, fireplaces, or other natural barriers that interfere with a wireless solution make the 2.4 Ghz solutions less reliable.

Finally, the business opportunity for providing a simple, reliable Home Area Network solution that solves these issues is massive. If every home in the US reduced achieved a 20% reduction in their gas and energy use, this would result in annual savings of $56Bn a year\(^{52}\). In addition, there are 25 MM homes in the U.S. that have bills over $250/month in electricity alone during high cost period\(^{93}\). These homes would be very interested in a simple, reliable solution.

Our Technical Approach

During SBIR Phase I, we developed the SuRF\(^{tm}\) Developer's Kit and the Open Source Home Area Network\(^{38}\) (OSHAN\(^{51}\)), to provide a standards-based platform for the development of innovative energy efficiency solutions for the residential market.

People Power is now bringing to market innovations in ultra-low power, long range sensor and actuator edge devices. Building upon the OSHAN\(^{51}\) platform, we are creating products and
services that are simple and reliable and enable real-time monitoring and control, to the device level, that would work with or without a smart meter installed on the side of the house. In addition, these services offer actionable intelligence – analysis of detailed energy data, and recommendations for energy efficiency that are easy to act on. These products and services include the GreenX™ Hub -- an innovative energy controller machine with multi-modal communications that will gather detailed energy information in the home, and send it to the internet. We will be able to analyze and present the information to the user to drive consumer engagement and empower the consumer with actionable intelligence. These innovations are provided at a cost point that enables broad deployment of this unified platform at the energy infrastructure’s residential edge.

In addition to the deployment of a multi-modal platform that complies with Smart Grid interoperability standards and architectural principles, we will create a software service called GreenX™ HANalytics – a service that aggregates information into a unique value proposition for the energy consumer, providing detailed analysis, and recommendations for energy savings in the home. Actionable intelligence brings to the energy consumer the ability to track their daily energy management decisions that in turn affect the overall impact of their lifestyle choices.

Finally, we're building a low-cost, simple-to-install device to measure and break down energy use within the home. The GreenX™ Meter, which utilizes non-intrusive monitoring, will capture and analyze what we call "Power Prints" -- the real-time footprint of energy use in the home, broken down by source. We'll use real-time transient analysis with Fast Fourier Transform (FFT) algorithms on commercial digital signal processing (DSP) platforms, and will integrate the solution with the People Power SuRF™ Block.

The total energy footprint is managed first through efficiency gains, and secondly through monitoring, measurement and feedback, both at the individual and group/community levels. We expect the major gains in efficiency to be realized through some of the simplest means. As articulated by Gardner and Stern, "Not only is efficiency generally more effective than curtailment, but it has the important psychological advantage of requiring only one or a few actions. Curtailment actions must be repeated continuously over time to achieve their optimal effect, whereas efficiency boosting actions, taken infrequently or only once, have lasting effects with little need for continuing attention and effort."

Curtailment, through active and dynamic DR facilities, is also a motivator for the innovations People Power is bringing to market. Residential electrical consumers have the potential to provide 40% of the DR potential of the entire country. A standards-based, readily available Energy Management System (EMS), combined with a cluster of smart controllers embedded into appliances and consumer electronic devices, will enable this potential to be fully realized.

The People Power residential EMS is a platform that will enable this energy future. It will bring the Enernet (Energy information and control over the Internet) to the consumer market, providing a low-cost "Smart Grid for the Rest of Us." This platform supports clusters of devices within the household, presenting a coordinated and comprehensive view to energy management
People Power's strategy to bring these innovations to market, was to package them in the form of the "GreenX™ PowerStat," a complete and affordable introductory home solution widely available to consumers. The GreenX™ PowerStat consists of the GreenX™ Hub, the GreenX™ Powerstrip, the GreenX™ Thermostat, and software services that provide ongoing analysis and actionable intelligence on the energy choices they make in the home. This strategy proved ineffective as we failed to overcome the design challenges of the GreenX Powerstrip. Our commercial entry changed focus to partner with other players and bring our software, both mobile and server, products to market under both the People Power brand and our Partner brands.

These services will also be available via a smart phone, as well as via social media such as Facebook to engage the consumer and enable a light, bright and sustainable energy future for us and our children.

**Anticipated Public Benefits**

Public benefits from deploying the People Power Energy Services Platform are derived from the inclusion and integration of the residential consumer segment with the overall Smart Grid infrastructure. Single family dwellings, as well as higher density living environments are all within our scope. The provisioning of a low-cost energy management platform provides low income entry to consumer-facing services and benefits. Additionally, electricity costs to the consumer will be reduced as efficiency increases due to the ubiquity of standardized management and control capabilities at the residential edge of the Grid.

The availability of smart controllers in the household is a prerequisite for the management of the residential energy consumption footprint, which represents 38% of the total electrical consumption in the United States. Managing the peak loads of that footprint supports the public goals of energy independence, national security, reduced carbon emissions and economic expansion.  

An additional benefit to the energy consumer comes from the company's unique business model. Market entry strategy is based upon very low-cost, extremely reliable, long-range energy monitoring and control (suitable for multi-occupancy dwellings), with energy savings providing an immediate return on investment (ROI) to the consumer. This relationship is expected to become revenue positive for the consumer as People Power markets the aggregated consumer DR into the national energy market.  

Finally, the deployment of the People Power products and services will empower local communities, through social networking, compare & compete games and interactive media, that can all take advantage of energy efficiency programs. In addition, green jobs will be created, as People Power will incorporate the installation of the GreenX Thermostat into its value proposition, and will create a network of certified installers to install the thermostat.
Phase I Demonstration of Technical Feasibility

The 6 Month SBIR Phase I project resulted in significant technological advancements within People Power. The proof of concept and design objectives outlined in the Phase 1 Project Narrative provided the basis for this progress.

The GreenX™ Hub has been created and has been tested in full end-to-end communications through the GreenX™ Server to the associated People Power mobile applications running on the iPhone and iPad. The ultra low power and highly reliable, open source Home Area Network technology has been designed, implemented, and shipped to customers as the SuRF™ Developer's Kit. All of the tasks and milestones defined in the Phase I Project Narrative have been completed successfully.

Beyond those accomplishments, People Power branding in the marketplace has commenced. Active participation in the Smart Grid standards and specification process has occurred and People Power has created jobs, growing to 70 people over the course of 6 months.

The first People Power product has been designed, tested, manufactured, and delivered during this period. The People Power SuRF™ Developer's Kit has been delivered as well as the Open Source Home Area Network (OSHAN™) wireless network stack. In addition, the SuRF™ Block deployment platform, which provides a common building block for the Smart Energy platform and product family, has been designed and sent to manufacturing.

The GreenX™ Distributed Smart Controller Devices

The GreenX™ devices are modular, configurable, monitoring and control devices with a standardized communications capability. Uniformity and modularity allow maximal reuse of the common design elements.

The Base SuRF™ Platform

People Power has selected the Texas Instruments CC430 as the basic component of the GreenX™ platform as it best exemplifies the cost, capability, and performance characteristics that current remote sensing and control applications require. The CC430 is unique in that it has a processor and radio on a single device. The CC430 will execute the Open Source Home Area Network (OSHAN) Ultra Low Power and Extreme Distance radio frequency (RF) network. All GreenX devices will contain this base platform to support dynamic cluster association and operability.
In the public purview, People Power has taken an active role in the national dialogue that is shaping the future of our electric energy infrastructure. Participation has driven and refined our product definition, and helped to shape national policy with respect to advocating for the consumer to participate in their energy future. The following section highlights our participation and contributions with the intent of providing insight into our committed engagement to cultivate mindshare with our marketspace and ecosystem partners we are developing.

**Lessons Learned**

- **Technical**

  It is possible to implement an extremely reliable, long range, and ultra low power sensor network using off the shelf components. Our leading edge designs have been referenced by Texas Instruments (TI) as "best of" in their developer community. Our release of the open source, public license implementation OSHAN to the TinyOS has proven to be a valuable lever for entering a complex and competitive market. It provides needed network performance metrics and low power operating profiles are key enablers for reliable and long range home area networks.

  We have learned that we must monitor and control the primary energy consumers in the home. We have adjusted our product plans to accelerate delivery of controls directly targeted to HVAC and home heating/cooling applications.

- **Standards**

  People Power has been building its expertise in OpenHAN, Smart Energy Profile 2.0, and IEEE 802.15.4g. People Power recently joined the ZigBee Alliance to increase its level of participation and influence in the Smart Energy Profile 2.0 standardization and adoption process.
Business

People Power is focused on a marketplace that has historically been serviced by a regulated set of utilities. We have learned about the unique landscape of working in a traditionally regulated market, and have therefore progressed our market and channel plans to ensure that we leverage the relationships consumers have with their energy providers, but also work through other strategic channels to deliver solutions to our customers. We are positioning our solutions to help both the consumer and the utilities through the industry's transformation. With this new positioning, we will become the People's Power Company as we follow a business model that supports the consumers' ability to monetize their advances in efficiency and their ability to shift load within the needs of the broader Demand Response programs of the energy providers of tomorrow.

Strategic

Our business relationships are developing into assets that drive business growth. We have learned that rather than selling direct to utilities, we have learned that it will be more efficient to leverage utilities as a channel, and pay them for acquisition. We have also shifted our focus to helping Original Equipment Manufacturers (OEM's) and Service Providers (SP's) offer smart devices and energy management services to their customers.

Market Evolution

There is a huge opportunity to bring the Enernet -- energy information and control over the Internet -- to every home and building. Utilities are making massive investments in upgrading their networks, but this is not addressing the need to create an Enernet within the home. Enabling a "Smart Grid for the Rest of Us" -- bringing the ease, simplicity, and immediacy of the Internet to energy usage inside the home -- will reduce carbon pollution, create thousands of green jobs, and save consumers money.

Energy consumers are becoming financially motivated to improve the "wellness" of their individual and collective energy and carbon footprint. While electricity prices are predicted to raise a modest 1%/year through 2035, the overall social and economic climate is focusing more consumer attention on this household budget expenditure.

The need for residential energy management is thus driven by consumer budgets on the one hand, and on the need to control our National Energy Destiny on the other. People Power Company is bringing products and services to the consumer that will make it easy for every home -- with either "dumb" or smart meters -- to see and control the energy use at the device level in their home, to automatically turn off appliances that are not in use, get recommendations for further reductions and efficiency, with a vibrant social experience that brings friends and neighbors together. These products and services enables true bi-directional energy control. The potential for energy savings and carbon reduction across the US is massive.
Phase I Project Results

Our Phase I Project results indicate, in clear and certain terms, that our Phase I objectives were technically feasible and all critical success factors were exceeded. Our accomplishments and results further validate the degree to which our technical approach, rooted in experience and pragmatism, succeeded. These factors are reasonable and realistic indicators for success going forward with our Phase II Project goals and technical objectives.

Our Phase I Project results follow.

- **GreenX™ Hub Prototype**
  - GreenX™ Home Marketing Requirements Document (MRD)
  - GreenX™ Home Functional Requirements Document (FRD)
  - GreenX™ Hub to Server Protocol Specification
  - GreenX™ Hub Emulator Platform Created in the Amazon Cloud
  - GreenX™ Hub Operational Prototype

- **SuRF™ Developer Kit Version 1.0 Product Release**
  - SuRF™ RD
  - SuRF™ FRD
  - SuRF™ Block Prototype
  - SuRF™ Developer's Kit Open Source Schematic
  - SuRF™ Developer's Kit Test Fixtures

- **OSHAN51 Source Forge Code Repository**
  - IPv6 .x. 6LowPAN Adaptation Layer Implementation
  - Open Source Home Area Network (OSHAN) implementation and public release

- **GreenX™ Home Manufacturing Plan**
- **GreenX™ Home Marketing Materials**
- **UnPlugIt Facebook Application**
- **www.peoplepowerco.com public web-site**
- **www.peoplepowerco.com/shopping e-commerce web-site**
- **PeoplePower GreenX™ Mobile iPhone and iPad application Prototype**
- **People Power GreenX™ Server Beta Release**

Standards and Specification Activities

People Power efforts during Phase I resulted in productive levels of participation in the standardization of the Framework and Standards for Interoperability in the Smart Grid. We have
tracked and participated in a number of relevant activities. People Power is a member of the Smart Grid Integration Panel (SGIP) and is a participant in the Priority Action Plan (PAP) groups. Specific areas of specification and standards that directly relate to the People Power business objectives have been followed as well. An overview of groups and tasks undertaken in support of the People Power business objectives follow.

Smart Grid Interoperability Framework and Roadmap activities:

SGIP - Membership
PAP 02 - Observation
PAP 03 - Observation
PAP 09 - Observation
PAP 10 - Participation

Standards and Specification Activities:

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<tr>
<td>OpenSG OpenHAN TG  M1</td>
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<td>OpenAMI SG WG 44</td>
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<td>U-SNAP M8</td>
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<td>ZigBee Alliance Smart Energy Profile 2.0 TRD M9</td>
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<td>ZigBee Alliance Smart Energy Profile 2.0 Specification M10</td>
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<td>NEASB PAP 01 WG M15</td>
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"Free Market Choice for Appliance Physical Layer Communications"[^61], co-written by People Power, is a significant contribution to the Home2Grid task force. People Power also contributed in the OpenHAN SRS 2.0[^62] and the ZigBee Alliance Smart Energy Profile 2.0 TRD drafts by submitting comments and participating in draft meetings. People Power gave a much-needed residential consumer perspective and helped expand standards to support a diverse set of MAC/PHY technologies.

**Contributions to the Public Discourse**

During the period of the Phase I SBIR, People Power staff have made significant contributions to the public discourse through responses to formal Requests for Information (RFI) as well as requests for comment concerning the consumer's role in our future energy infrastructure. Through these efforts, we brought a consumer focus to the policy initiatives put forth by the Department of Energy and the White House Office of Science and Technology. We also provided input to Department of Energy programs focused upon innovation and transformation in the energy space.

Our contributions to the DoE ARPA-E RFI contributed our insight into specific bottlenecks of the Smart Grid initiative, as well as the opportunities for innovation through the application of machine learning and analytics to the dense information space that our edge sensor and actuator technologies enable:

- ARPA-E RFI - Future Grid: Category 2
  - John Teeter - Machine Learning Systems for the Smart Grid Information Space
  - John Teeter - Open Source Strategies for Accomplishing Grid Interoperability

Multiple Contributions to the National Institute of Standards and Technology (NIST) Forum on Strategies for Residential Consumer Integration into the Smart Grid have been made, each contributing to the public input for policy regarding the consumers' role in the Smart Grid.

**Business Presence in the Market Place**

People Power has, during the course of Phase I, initiated our marketing campaign to the public. Our business strategy encompasses bringing people together to engage in the energy transformation that is happening throughout the country. Our marketing organization has identified our brand and the technologies in the view of the marketplace. Three primary initiatives have been undertaken to meet the objectives of establishing People Power as a credible market participant:

(i) The announcement and release of the OSHAN[^51] open source, public license implementation of core wireless standards for the Home Area Network. This implementation enables a low cost IPv6 and 6LoWPAN to be deployed easily throughout the industry.
(ii) The SuRF™ Developers Kit provides a low cost prototyping capability for developing low power, ultra long range 900mHz wireless networks, with the software and the hardware for organizations to undertake product development in the residential segment. As referenced in the SBIR Phase II project, both of these Phase I successes are setting the stage for further platform deployments by People Power.

(iii) The initiation of competitions that engage the consumer. The People Power UnplugIt™ campaign starts the strategic thrust that will lead to the GreenX™ Games and Social networking efforts. A key to our business innovation is the integration of crowd source efficiency and consumption data from the residential space. The UnplugIt campaign on the Facebook platform, along with our presence on stage at the Capital Mall for the 2010 40th anniversary of Earth Day, was an appropriate launching of People Power into the public eye.

A list of press references and videos that seed this growing marketing effort follow.

**Company Press Clippings**

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<td>6/14/2010</td>
<td>Wired.com</td>
<td>Miran Pavic</td>
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<td>4/16/2010</td>
<td>Palo Alto Weekly</td>
<td>Gennady Sheyner</td>
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<td>4/13/2010</td>
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<td>eMediaWorld</td>
<td>Press Release</td>
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<td>GigaOm</td>
<td>Katie Fehrenbacher</td>
<td>Announcing the GreenNet 2010 LaunchPad Winners</td>
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<td>3/15/2010</td>
<td>Venture Beat</td>
<td>Robert Mullins</td>
<td>People Power releases SDK for wireless home energy sensors</td>
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<td>3/15/2010</td>
<td>InfoWorld</td>
<td>Paul Krill</td>
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<td>3/15/2010</td>
<td>ZDNet</td>
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<td>Build your own smart grid device with new open source development kit</td>
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<td>3/15/2010</td>
<td>Earth2Tech</td>
<td>Katie Fehrenbacker</td>
<td>Get Your Open Source Home Energy Developer Kit</td>
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<td>3/15/2010</td>
<td>MarchEarthTechling</td>
<td>David Craddock</td>
<td>Surf Smart Grid Kits Lets You Develop Your own Smart Grid Device</td>
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<td>3/15/2010</td>
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<td>People Power Announces SuRF Developers Kit for Home Area Networks</td>
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<td>3/15/2010</td>
<td>Got2BeGreen</td>
<td>Press Release</td>
<td>People Power Company Launches to Develop First Open Source Home Area Network Empowering Consumers to Save Money and Reduce Electricity Usage</td>
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<td>1/26/2010</td>
<td>Social Media Portal</td>
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<td>People Power Announce Unplug for Earth Day 2010 Campaign on Facebook</td>
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<tr>
<td>11/9/2009</td>
<td>VentureBeat</td>
<td>Camille Rickets</td>
<td>People Power launches into crowded home energy monitoring field</td>
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Links to all articles can be found at [http://www.peoplepowerco.com/news/](http://www.peoplepowerco.com/news/).

**Public Speaking Engagements**

**EarthWeek on Washington Mall, Washington DC, April 17, 2010.** People Power exhibited in Earth Week conference, and also band invited to play on Washington Mall.

**Smart Grid Council of Silicon Valley. Sunnyvale, CA, April 21, 2010.** Yvan Castilloux of People Power and Mike Coop, consultant to People Power, spoke on "Empowering Consumers to Go Green". [http://www.eventbrite.com/event/648307104/?ref=estw](http://www.eventbrite.com/event/648307104/?ref=estw)

**End to End Smart Grid Seminar, San Francisco, CA. April 26, 2010.** Gene Wang, CEO, spoke on the "Smart Grid Funding" panel with PG&E and CalCEF Clean Energy Angel Fund. Dr. George Arnold, National Coordinator for Smart Grid Operability, National Institute of Standards & Technology (NIST) delivered keynote at the conference.

**GreenNet 2010 Conference. San Francisco, CA, April 29, 2010.** People Power was selected as one of 10 start-ups in the annual "LaunchPad" competition. Each company gets 4 minutes to talk about their company, and then is given a score based on 1-10 by a panel of 3 venture capitalists. People Power tied for second place in this competition (see [GreenNet: LaunchPad articles above for details: http://earth2tech.com/2010/04/29/greennet-launchpad-ecoatm-soneter-win/](http://earth2tech.com/2010/04/29/greennet-launchpad-ecoatm-soneter-win/)).

Connectivity Week Conference. Santa Clara, CA May 24-27, 2010. Gene Wang, CEO, spoke on the panel, "Intersection of Ecosystems in Silicon Valley". John Teeter spoke on panel, "How will we make this thing work?"

Smart Grid Technology Expo. San Diego, CA June 2-3, 2010. Gene Wang, CEO, spoke on a panel, "Creating customer value with usage data and in home displays"

People Power Video Channel

http://www.youtube.com/user/PeoplePowerCo

People Power has produced messaging videos to further the establishment of brand and the dissemination of marketing messages through the currently evolving electronic media. The following is an index of the video messages produced during the course of the Phase I SBIR:
Capitalization and Business Plan

The successes of SBIR project have been leveraged dramatically through efforts to further the capitalization of the company through private sources. While the Phase I funds have provided much appreciated non-equity funding for the company, the private capital raised and the effort required to realize success in the current venture capital market, has greatly focused and accelerated our business formation and growth. Concurrent with the efforts taken to shape the SBIR Commercialization Plan.

Phase II Project

Phase II of the People Power SBIR Project was a continuation of the Phase I activities. Phase II was shaped by lessons learned from Phase I including a more evolved understanding of the market, business, and competitive environment.

The SBIR Phase II objectives were framed with respect to market conditions, where there were virtually no solutions in the market with all of the following characteristics:

- Solutions that measure current energy usage in real-time
- Easy to use solutions that enable disambiguation -- the ability to see real-time energy use of the different appliances and devices in the home
- Solutions that have a wireless solution that is reliable and work over a long range, without repeaters
- Solutions that enable the ability to control (turn on and off), and set rules for appliances so, for example, they automatically turn off at night
- Solutions that enable the viewing and control of appliances from any device -- in-home display, computer via the Internet, iPhone, iPad or other smartphone or tablet
- Solutions that are social and that are integrated into third-party social networking sites such as Facebook, and make it easy to share and compare energy use with friends
- Solutions that analyze energy use, and provide recommendations for how to easily reduce energy use
- Notifications and Alerts that inform the consumer of opportunities for efficiency and changes in pricing

Technical Objectives

People Power’s intent to deploy products and services that engage the residential consumer in their energy utilization management was met through three distinct activities. In our Palo Alto City Utility trials, the consumer was provided with "wellness" metrics that support achieving a more energy efficient and sustainable lifestyle. The energy consumer was incentivized to participate in load control programs during the pilot. Further efficiencies were gained through the pilot, including an overall reduction of load in test homes of greater than 12%.
The bottom line of our Phase II activities resulted in an essential business pivot on our part. We realized that we are primarily a software development organization with particular skills in scalable, cloud based services as well as the development of award winning User Experiences on both mobile and desktop platforms. We reached the understanding that our primary skills are not in the design and development of hardware and that our primary business opportunity was to partner with other groups that needed our particular capabilities to bring their products to market. As such, we have release products over the intervening time and have collaborated with numerous, global scale, organizations to merge our technologies, as white labeled services, into their product lines. This is best exemplified by the following product releases:

Monster Power Central is one commercial brand through which our technologies have been release. The Monster Cable brand is a consumer brand targeted at high end audio visual equipment market. The addition of real-time control and energy management to this brand has been a significant addition to the Monster product family.
The above application was selected “Best of Show” for the 2013 Consumer Electronics show and was awarded the AT&T Energy Application of the Future at the 2012 Consumer Electronics Show.

This packaging of the core People Power technologies exemplifies the ability of our cloud services approach and implementation to integrate both within the technologies of ecosystem partners, but also within the business lines of those partners.

People Power has continued that business thrust to achieve numerous other embedded product wins. This includes the recent Innovolt integrated solution:
The Most Powerful Electronics Protection Available. Period.

Discover the limitless potential from Innovolt® patented electronics protection technology
We have addressed the OEM channel and provide, as shown above, white label, brandable services that integrate manufacturers’ solutions into integrated, consumer facing services.

Our business continues to grow and to extend beyond energy solutions. We are integrating additional sensor devices into our Internet of Things Application Programmers Interface (API) to enable the rapid growth of an ecosystem for consumer engagement deployment.

People Power Developer API
http://developer.peoplepowerco.com
Hello World: Connect to the Internet of Things

This developer site will enable you to cloud-enable your connected things - real or virtual - and manage them from anywhere in the world.

This is the same very powerful cloud service enabling large manufacturers and service providers to bring appplications to millions of people.

This example shows how to quickly get connected:

1. Sign Up
   You can Sign Up for Free!

2. Log In
   Log In to obtain your API key.

3. Obtain your Location ID
   Use your API key to obtain your Location ID.

4. Activate your sense point
   Activate your sense point. This links your device with your account, allowing your device to upload measurement data and receive commands. Use device type 3 as a sandbox device to send measurements and receive commands.

5. Upload data
   Use the Device API to send data and receive commands from the sense point. You can send any registered parameter, and feel free to contact People Power to request any specific parameters or units of measurement you need for your application. We support XML and JSON.

   **DIY Command Line:**
   ```bash
curl --request POST
   -H "Content-Type: application/xml"
   -d "<xml version="1.0" encoding="utf-8" >
   <d2 ver="2" hubId="(globally unique device ID)" sop="2">
   <measure deviceId="(globally unique device ID)">
   <param name="model">Hello World</param>
   <param name="power">84</param>
   <param name="outletStatus">ON</param>
   </measure>
   </d2>
   ```

   http://developer.peoplepowerco.com/device/is/tn

6. Obtain your devices' latest readings

   **DIY Command Line:**
   ```bash
curl http://developer.peoplepowerco.com/espn/rest/DeviceParameters/(key)/(location id)/true
   ```

7. Obtain a history of readings

   **DIY Command Line:**
   ```bash
curl http://developer.peoplepowerco.com/espn/rest/deviceReadings/(key)/(location id)/(globally unique device id)/(2010-06-07T12:03:42)
   ```

   Easy huh? Now check out the Device and Application API documentation to tap into advanced functionality. Or check out some more examples.

This provides our ecosystem with a full API to engage their devices in our cloud based solution. We are providing support and engineering services to further encourage the growth of this ecosystem.
In addition to the above commercial activities, People Power has engaged the open standards and open source community with our energy focused open source initiatives. The EnergyOS.org initiative has fully engaged to support the national Green Button initiative through our OpenESPi work:

http://www.energyos.org
http://www.openespi.org
The Energy Services Provider Interface (ESPI) provides a way for Energy Usage Information (EUI) to be shared, in a controlled manner, between participants in the energy services markets.

The OpenESPI project provides support for the development of deployable ESPI components that will help to rapidly and consistently engage the community with this exciting and enabling technology. Please read the OpenESPI Project Description and OpenESPI FAQ for further information. In addition:

- Description of the Open ESPI Project (DOAP)
- NAESB ESPI Workarea
- Order a Copy of the ESPI Standard (PDF)
- Green Button SDK Repository
- GitHub Source Code Repository
- Virtual Machine - Pre-Loaded Ubuntu/Eclipse Development Environment
- OpenESPI Project Overview and Status Presentation
- Background on Frameworks Used in OpenESPI

The UC/IAug OpenADE Task Force submitted a request for the initiation of NAESB Model Business Practices on July 29, 2010 to standardize the interface which allows for the exchange of energy usage information between designated parties.

These Model Business Practices, building on the NAESB Energy Usage Information (EUI) Model, enable Retail Customers to share energy usage information with authorized Third Parties. This Energy Services Provider Interface (ESPI) provides a consistent method for Retail Customers to authorize a Third Party to gain access to energy usage data. Doing so will enable Retail Customers to choose Third Party products to assist them to better understand their energy usage and to make more economical decisions about their usage. ESPI will contribute to the development of an open and interoperable method for Third Party authorization and machine-to-machine exchange of Retail Customer usage information.
The open source activities sponsored by People Power have resulted in catalyzing a national collaboration to support the rapid rollout of Green Button technologies. Further projects to engage open source Automated Demand Response and full Virtual Power Plant communities are currently underway!

People Power continues to expand in both market and customer through additional services and products. Our recently delivered People Power Presence mobile application augments the device/sensor world with two way, real-time video based upon emerging international standards. This mobile platform is paving the way to integrated services delivery based upon aggregated information and control across a diverse device space. Our reach through this expansion is global and our services delivery channels are now fully exposed through both the device manufacture channels and the end user residential channels:
People Power Presence provides the basis for our next wave of consumer and devise services delivery. We will continue to provide ongoing support for our existing products, grow those products into flourishing ecosystems and will emerge in the marketplace as a leader in integrated services delivery in the residential marketplace. All based upon our initial focus on energy, our ability to grow into the market and to rapidly pivot to the opportunities our business evolution has provided.