Home Hub
Outline

- Home Hub
  - What is?
  - What’s inside?
    - Hardware
    - Software
    - Communication
  - Benefits
Home Hub – What is?

Smart Dim Fuses
Loads
Cloud Coordinator
Limited info exchange
Utilities, Markets...
User Preferences and Feedback
Home Hub – What’s inside?

- Hardware
Home Hub – What’s inside?

- Software

- Algorithms

- Control and Optimization
  - Real-Time load scheduler
  - Power Sharing

- Learning Algorithm
  - Deep Learning for Power Data (i.e. LSTM)
  - SVR, Adaptive AR, Linear Regression, FFNN
Home Hub – What’s inside?

- Communication/Messaging Layer

Diagram:

- Learning, Identification
- User Interface Dashboard
- Rules Engine, Algorithms
- CC Power Set-Point, Price, Reg/Ramp Signal

Common Messaging Layer (OpenFMB, PubNub, ...)

- Volttron
- Custom

Device Agents/Gateways

- Smart Plugs/Appliances
- Smart Dimmer Fuse
- DER
Home Hub – Benefits

- **Homeowners**
  - Increased value of residential DER;
  - Ability to participate in ancillary services market;
  - Insightful analytics – energy use pattern, anomaly behavior, comparative analytics;
  - Autonomous operation constrained by user preference and rates;
  - Reduce electricity bill.

- **Grid/Utility/Aggregator**
  - Increased value of residential DER;
  - New resources to help maintain stability, resilience and reliability;
  - Localized information about network health;
  - Localized assets for grid support;
  - Faster fault and outage detection.
Cloud Coordinator – What is?

- **Functionalities**
  - **Algorithms:**
    - Cost Minimization*;
    - Ramp Following*;
    - Regulation*;
    - Load forecasting*.
  - **Comms:**
    - Able to interface Home Hubs;
    - Able to interface grid (utility, ISO);

* More details during Algorithms presentation
Cloud Coordinator – What’s inside?

- Architecture
Questions? Feedbacks?