Inergy Systems - Home Energy Management Systems
Demand and Distributed Resource Management

Presenter:
Nick Wold, Director of Business Development
Who We Are

Inergy Systems

- Inergy Systems, an Arizona Company, formed in 2012 designs and manufactures fully integrated Energy Management and Power Control Systems which provide real-time meter precision monitoring, load and resource management to optimize demand.

- Electrosem, our affiliate company is a vertically integrated design and manufacturing company with ISO 9000 certification. Electrosem has been developing and manufacturing energy control systems for over 35 years.

- The combined capabilities of both companies includes all aspects of design and development. We proudly manufacture our products in our 15,000 sf facility located in Tempe, AZ.

- The Smart Panel™ 3000 represents our 5th generation system and includes a vast number of features that have been developed and improved over the years to benefit both the energy consumer and the utility provider.

- The team at Inergy Systems is committed to developing and providing advanced energy management systems which are a part of the Smart Grid initiative to help ensure clean, reliable and cost-effective energy.
What We Do

Energy Demand and Distributed Resource Management

- We have 35+ years experience in providing Demand Control systems and customer support.
- We use industrial grade components and steel outdoor enclosures that withstand 10+ years of Arizona heat and result in high reliability.
- We fully understand utility rate structures and dynamically optimize energy usage without sacrificing comfort.
- We provide great customer service and with our remote support capability, which frees the Solar Dealer from service calls.
- We design our products with customer convenience always in mind and utilize the latest technology such as phone applications to keep them engaged, in control and informed.
Autonomous Demand Management

Automatic Demand Reduction
Smart DR or Autonomous DM

Uncontrolled Day
9 kW Peak Demand

On-Peak Hours 1PM-8PM

Controlled Day
5.5 kW Peak Demand

Off-Peak Day  On-Peak Day  Demand Limit (kW)
Educating the Customer on Options

Utility companies realize they have a critical role in customer education. Their customers look to them for information and options. This public video (on youtube.com) is a great example of how SRP is helping to educate their customers.

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Autonomous Demand Management System

- iOS/Android Mobile Apps
- Optional Wifi Thermostats
- Typical Controlled Loads
- Typical Monitored Load
- Smart Panel Demand Controller
- Service Entrance Section (SES)
- Solar System
- Solar CT
- Mains CTs
- EV Charging

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Demand Management System

Typical Arizona Installation

Demand Limit of 4.0 Met

No Impact to Comfort Main Tstat

No Impact to Comfort Master Tstat

108 F Outside Temperature

Demand Control in Action
Demand Management is a Win for the Utility

10 Homes - 17kW Reduction in 15-Minute Average Demand - 30% Demand Reduction

- 100°F Outside Temp, NO Demand Control (Sunday)
- 103°F Outside Temp, 1-8PM Demand Control (Monday)
Perfecting the Customer Experience

Web

Mobile

At Home

More Control
Override Operation

Less Control
Automatic Operation
By the Numbers – APS & SRP

APS Winter Rate Comparison
TOU-E Compared to R-3

SRP E-26 TOU to E-27 Demand Rate Usage Charge Savings
SRP E-26 to E-27 Comparison Savings | Off-Peak kWh | On-Peak kWh | 80% Off-Peak Blend
--- | --- | --- | ---
Summer (May, Jun, Sep, Oct) | 49% | 75% | 54%
Summer Peak (Jul, Aug) | 42% | 71% | 48%
Winter (Nov-Apr) | 45% | 58% | 48%

APS TOU-E to R-3 Demand Rate Usage Charge Savings
APS TOU-E to APS R-3 Comparison Savings | Off-Peak kWh | On-Peak kWh | 90% Off-Peak Blend
--- | --- | --- | ---
Summer (May-Oct) | 52% | 64% | 60%
Winter (Nov-Apr) | 52% | 72% | 61%

Winter Comparison 90% Off-Peak Usage 3pm-8pm M-F

Rates in effect July 2017
Energy Advisor Dashboard
What Does Success Look Like?

- Early to Mid Morning - Solar energy is directed to charge the battery system, augmented by off-peak grid power.
- Late morning and early afternoon - The battery is charged, solar energy continues to supply household loads and increasing HVAC load. HVAC and discretionary loads are managed to utilize the solar energy augmented by off-peak grid power.
- Late afternoon - Heat load in summer is reaching a maximum, solar energy is dropping, demand is managed to minimize grid demand peaks.
- Early and mid-evening - Solar energy has dropped off. Demand is managed to minimize peaks. Battery output is dynamically controlled to assist in keeping demand as level as possible. Grid power is used as needed to supplement battery output.
- Late evening - Battery is depleted, off-peak grid power is used to meet household demand.
- Nighttime - HVAC and household energy needs reach their minimum, EV charger is turned on and when finished, the storage battery starts charging at a nominal rate.
What Hurdles are Left to Tackle?

- Solar inverter and battery storage companies are readying expanded Modbus capabilities to include control registers.
- SunSpec standardization will come about in time, but in the meantime, each company will continue to roll out custom register definitions.
- Household LAN reliability continues to be problematic and traditional solar/energy companies are not networking companies. The energy system (management controller, solar inverter, battery storage, HVAC controls, large load controls) must have reliable connectivity to function properly.

The Good News

- DERMS is on the radar screen of utilities and pilot programs are moving forward to test and prove out leading edge technologies.
- Inergy Systems is actively involved in DERMS programs and plans to have fully controlled systems proven during the next 12 months.