

Outline

- Comverge Program Summary
- Comverge Megawatts under Management
- Residential Aggregation
- Best Load for Residential Aggregation
- Alternate Residential Approaches
- Alternate Curtailment Approaches
- Real time Monitoring



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Comverge's Unmatched Incumbency for Demand Response



500+ Utility Customers



2011- Comverge

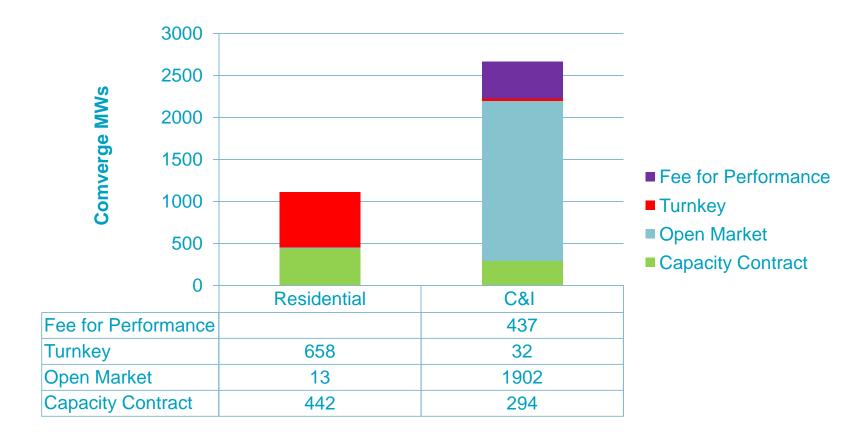
Wide Range of Services

Client Acquisition	Client Management	Load Control	Measurement	Analysis	Program Refinement
Prospect analysis	Call center	Control strategies	Event performance	System performance	Dynamic forecasting
Segmentation	Work order generation	Notification & alerts	M&V data	Network performance	Performance modeling
Marketing Channel	Customer tracking	Dynamic pricing	Device metrics Forecasting	Device heuristics	Grid impacts
management Messaging	Customer support	Event & device management	Performance baselines	Load analysis	Customer forecasting
Acquisition tracking	Accounts / customers	Constraints	Device operations	System forecasting	Weather impact Grid constraints
	System topology Rate & tariffs	Grid operations MW tracking	System operations	Customer	DMS dispatch
	Trouble ticketing	Event reporting		Segmentation	



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Comverge's Megawatts under Management



Comverge 10-Q - June 30, 2011



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Advantages of Residential Aggregation

- Geographically distributed
 - Easy to target specific areas
- Able to tailored reduction MWs to need
 - Vary Cycling Percentage
- Ability to tailor response profile
- Time to response
- Highly reliable
 - Statistical advantages of using more participants



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Air conditioning is the best residential load for DR

Peak DR 2.5 2 1.5 1 0.5 1 Central AC Riot Water Clothes washer Clothes washer

Clothes Washer .05 kW peak



Central Air Conditioning 2.0 kW peak



Electric Dryer .31 kW peak*



Electric Hot Water .376 kW peak*

*Technical Reference Manual, Pennsylvania PUC, June 2011



Flexibilityin Device De ployment

Digital Control Units (DCU)

- Features
 - Single device to control multiple loads and/or load types
 - Compatible with multi-stage HVAC systems
- Benefit to Utility
 - Cost-effective and easy to install



Thermostats

- > Features
 - Advanced user display
 - Display energy usage, price, tiers, control information, etc.
 - ZigBee-based communications
- Benefit to Utility
 - Energy Efficiency device in client's name
 - Extend brand into home

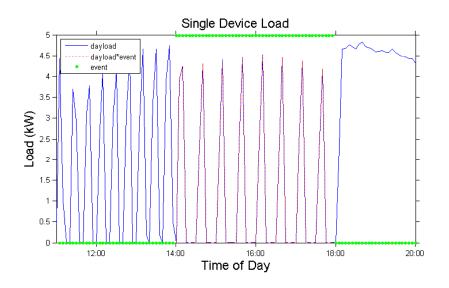


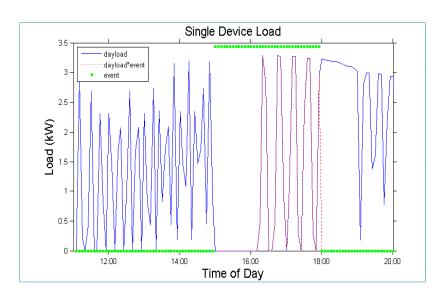




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Cycling vs. Temperature Offset





50% Adaptive Algorithm Cycling

3F Temperature Offset

Cycling:

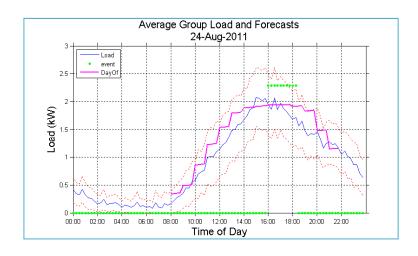
- •Enables a better ramp in by varying curtailment initiation time
- •Spreads kW reduction more evenly across response interval
- Provides DR from load use



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Real Time Load Measurement

- Best Practice:
 5 minute load profile data reported,
 processed and displayed every 30 minutes
 or better
- Near real time reporting enables verification during DR events
- •Near Real time load measurement enables good estimates of DR Potential
 - •Better than a "time temperature matrix"
- Actual measurements are the best estimate of the next few hours
- Dispatch should have access to this data
- 5 minutes enables analysis of response time

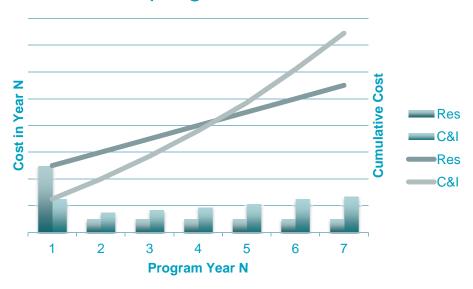




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Residential & Commercial Cost Comparison





- Both Residential and Commercial programs incur significant up front marketing costs
- Residential programs have in additional install cost
- Residential DR costs per kW are constant after initial install
- Commercial DR cost tend to rise each year
- Residential programs tend to be more cost effective after about four years, and continue for ten years or more

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Recommendations

- Encourage the broad deployment of interval meters all the way down to the residential levels
- Encourage time of use and critical peak pricing to enable price responsive demand response
- Support market rules in energy markets that encourage long term investments, five years or more, in equipment to enable effective demand response
- In non-market jurisdictions, facilitate rules to encourage long term investments in equipment to enable effective demand response



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