



Mid-Atlantic Distributed Resources Initiative (MADRI) Experience

NARUC-FERC Demand Response Collaborative

Washington, D.C.

February 18, 2007

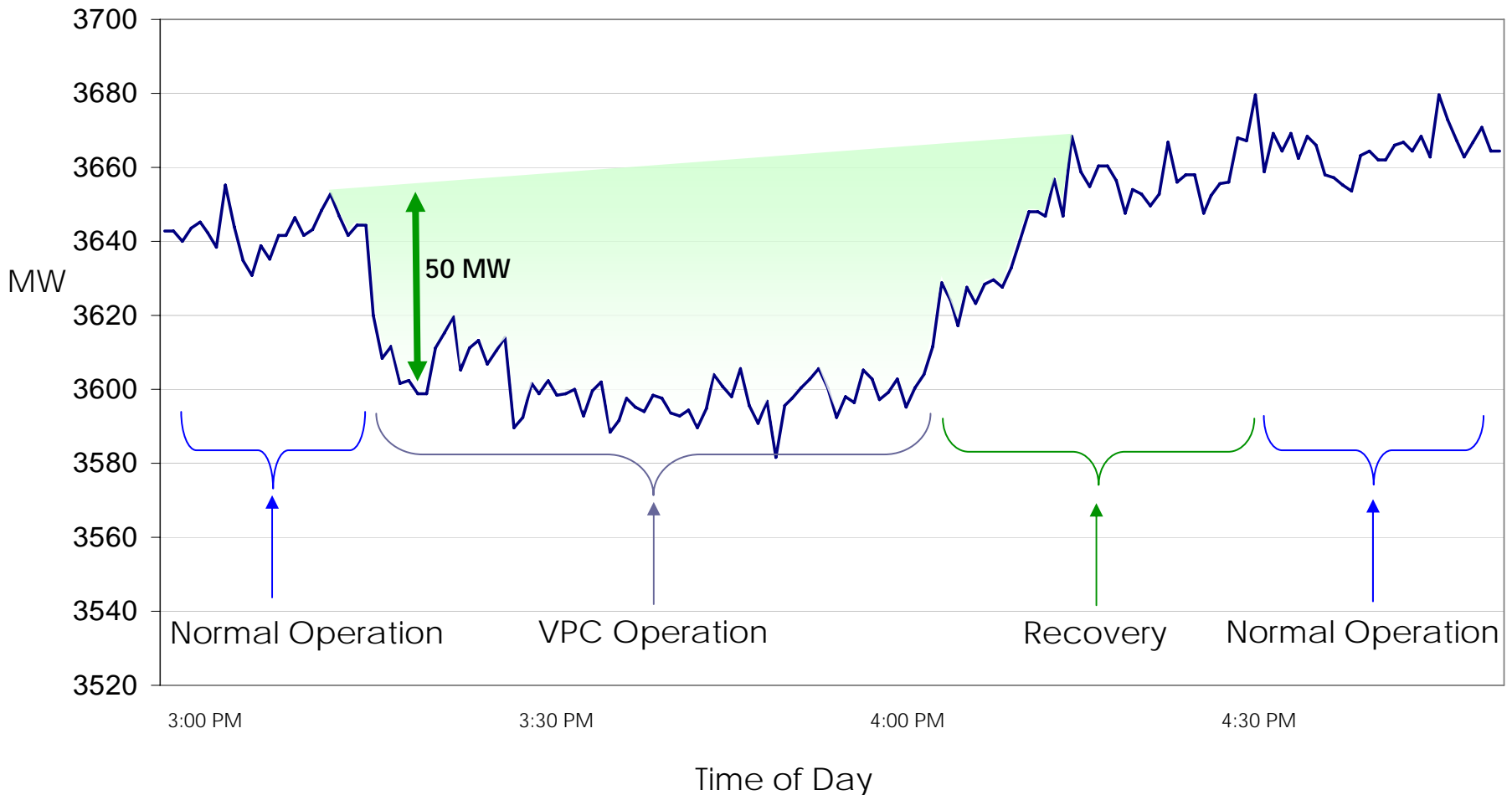
Defining Demand Resources

Demand **Resources** result when electricity customers in both retail and wholesale electricity markets choose to respond to dynamic or time-based prices or other types of incentives by reducing and/or shifting usage, particularly during peak periods, such that these demand modifications can address issues such as pricing, reliability, emergency response, infrastructure planning, operation and deferral.*

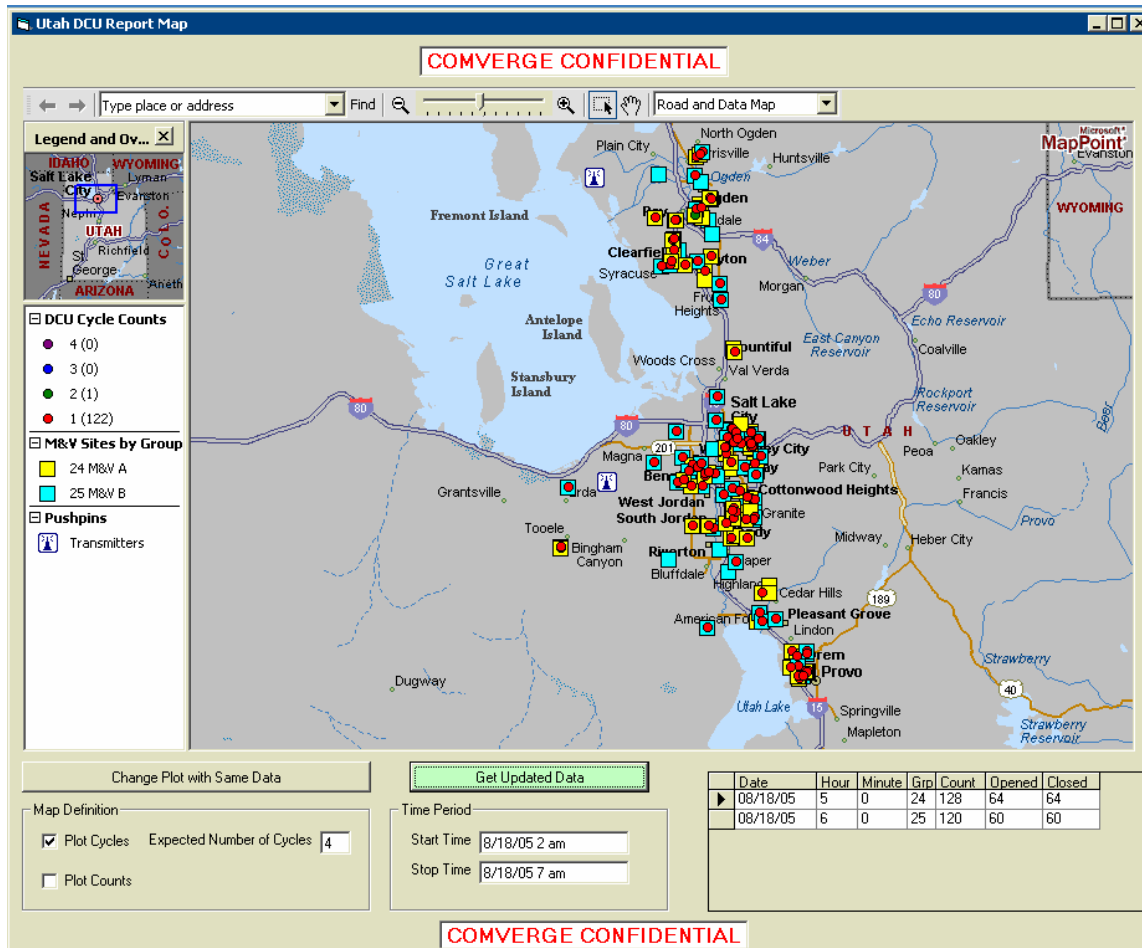
*U.S. Demand Response Coordinating Committee

Comverge Proven VPC Track Record

Rocky Mountain Power Sheds Load: 50 MW in 50 Seconds



Measurement and Verification



- Measure and report directly with end use metering
- Verify near real time demand-response
- Estimate near real time load reduction
 - Report to client systems
 - Analyze all curtailment events
 - Correlate with key factors e.g. temperature & humidity
- Verify field status of equipment operation

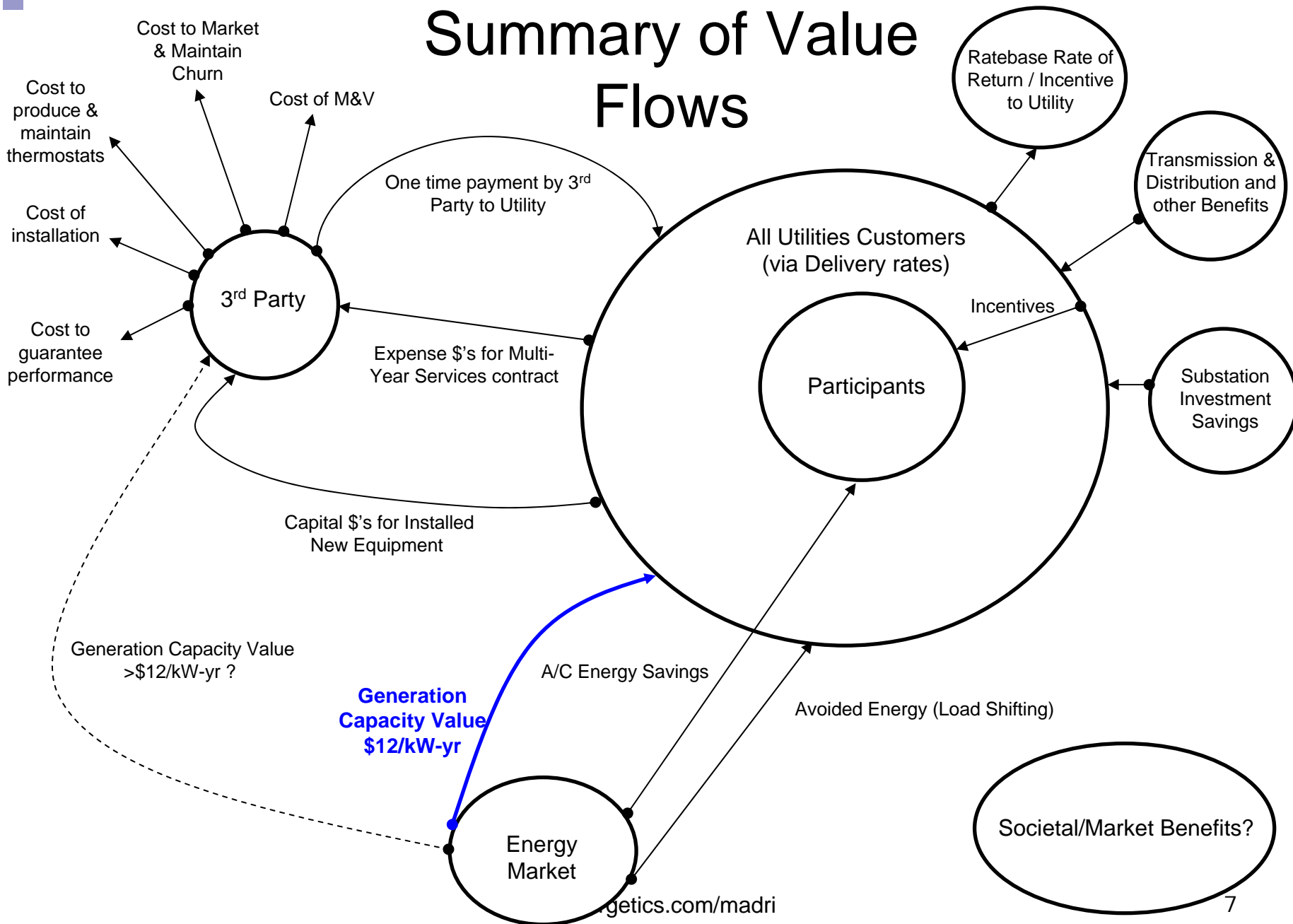
PJM Markets' Opportunities for Demand Resources vs. Generation Resources

Revenue Opportunity	DSR with recent Changes	Central Station Generation
Real-Time/Spot Energy Sales	Yes	Yes
Day-Ahead Energy Sales	Yes	Yes
Forward Capacity Sales	Yes; Proposed RPM auction fixes small volume problems	Yes, Bi-lateral market liquid up to 3 years
Energy & Capacity payment for emergencies	Yes; Emergency program changes ensure payment	Yes; always
Ancillary Services	Yes; Spin & Regulation	Yes; Spin, regulation, black start, etc...

MADRI Business Case Links Wholesale and Retail

- Fragmented Value Chain
 - Capture wholesale value
 - Capture value to distribution
 - Retail rates that inform customer behavior
 - Reach and aggregate smaller end use customers
- Disincentives for Distribution
 - Thru-put rates
 - Cost recovery uncertain, no party with wires investments
- Current infrastructure aging and degrading
- Current Measurement and Verification method outmoded
- Critical peak pricing infrastructure costs and behaviors vary

Summary of Value Flows



Demand Response Valuation and Measurement Methods

- “Cost-effectiveness tests that have been used by regulators must be improved to reflect changes in the industry, especially in organized markets.”*
 - The Brattle Study
 - <http://www.energetics.com/madri/pdfs/BattleGroup/report.pdf>
 - 3% MADRI goal
 - Pilots in New Jersey and the District of Columbia

*Assessment of Demand Response and Advanced Metering” FERC staff report to congress

Benefits of Voluntary Customer Load Reduction during Peak Usage Period July 31, 2006 through August 3, 2006

Quantity of fuel displaced by voluntary Load Reduction July 31, 2006 through August 3, 2006

- Coal



1367 Tons

- Oil



15,855 Barrels

- Natural Gas



227,965 MCF



Benefits for Customers of New Technology

- Bill Savings/Management
- Understanding the value of the product
- Knowledge when buying appliances
- Quick, simple feedback

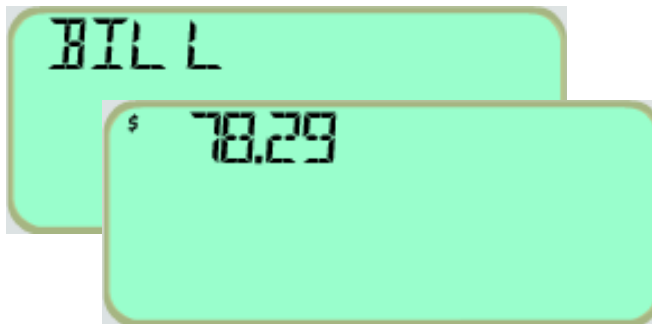
SuperStat® In-Home Display



Normal Screen showing day, period, tier, clock (or setpoint temperature), room temperature, cool mode



Energy Usage Screen showing KWh* used since last billing period



Billing Screen showing dollar* amount since last billing period

** Info sent from Utility*

SuperStat[®] - Web Based Programming

Comverge SuperStat - Mozilla Firefox
 http://xtranet.burnsmarketing.com/comverge/other/v3/heat.html

SuperStat[®] Remote Programming Console
 provided by comverge
 Current Mode: HEAT

Current Time: 12:00:34 PM
 Last Updated: 12/25/05 12:13:12 PM
 This is a message to be edited... **Apply**

Heat Mode SETTINGS | **Cool Mode** SETTINGS | **Vacation Settings** FOR HEAT AND COOL MODES | **Control Override** FOR HEAT AND COOL MODES

Start Times & Temperature Set Points
 Use the form below to set the start time of each time period and input the desired Set Point

Thermostat 1 **SET**
 Select a Day: All Weekdays

Morning	Day	Evening	Night
Time: 1 : 00 AM	Time: 1 : 00 AM	Time: 1 : 00 AM	Time: 1 : 00 AM
Set Point: 65 °F	Set Point: 65 °F	Set Point: 65 °F	Set Point: 65 °F

Thermostat 2 **SET**
 Select a Day: All Weekdays

Morning	Day	Evening	Night
Time: 1 : 00 AM	Time: 1 : 00 AM	Time: 1 : 00 AM	Time: 1 : 00 AM
Set Point: 65 °F	Set Point: 65 °F	Set Point: 65 °F	Set Point: 65 °F

Price Responses
 Set the desired offset temperatures and control your device settings for each pricing tire below

	THERMOSTAT 1	THERMOSTAT 2	WATER HEATER	APPL1	APPL2
Critical	0	0	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
High	0	0	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No
Medium	0	0	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No
Low	0	0	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No

SET