

Demand Response and Integrated Resource Planning

A Winning Combination

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Powering forward. Together.



Key Attributes of the New DR

- Automated
- Ease of Use
 - Forecasting
 - Dispatch
 - Allocation of Resource (Economic, Reliability)
 - Visibility of Location and Availability of Resource
- Capability to deliver high value resources, by providing rapid response, and communicating real time price and control signals
- Technologies leverage open standards
- Platforms are highly scalable and flexible
- Track DR resources for reporting
- Cyber security is built and tested

Key Attributes of the New DR

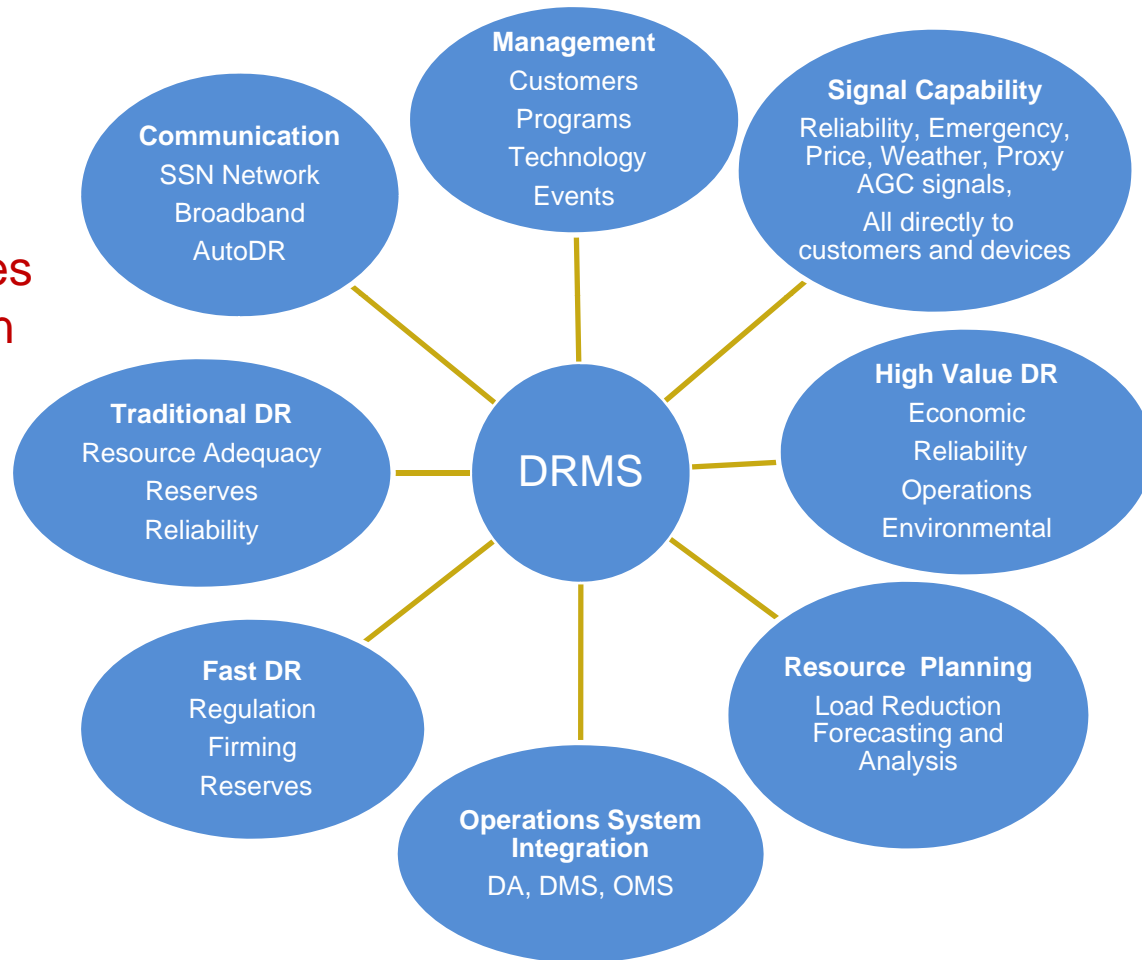
- Today's demand response is integrated to many of SMUD current business systems
 - SSN, MDMS, EMS, GIS, SAP
 - Future can be ACLM, DA, DMS, OMS
 - Future of DR is automated and machine to machine
 - DRMS AutoDR uses the Internet to interface directly with customer systems
 - DRMS uses SSN and Broadband to interface directly with customer systems
 - DRMS can ultimately support all DR including legacy DR such as ACLM, VECP and contracts
 - DRMS can be integrated with DA, DMS, and OMS

Common Issues with DR

- Trust in the availability and reliability of the resource
- Uncertainty in the sustainability of the resource
- Alignment and competition with traditional resources (cost and capability)
- Need for investment before the program is needed
 - Requires an 18 to 36 month lead time for full program capability
 - Steps include:
 - Build the infrastructure
 - Design and conduct pilot programs
 - Establish resource capability, characteristics, and value
 - Demonstrate viability of programs and value of resources

Demand Response Management System (DRMS) Capability

Many Varieties
of Eggs are in
the DRMS
Basket



DR – Meeting Needs and Providing Solutions

▪ Needs

- Resource Adequacy
- Reserves
 - Non-Spin Reserve
 - Spinning Reserves
- Regulation
- Renewable Firming Resource
- Call Options
- Load Reduction
- Location/Substation/Feeder/Transformer Options for load growth, EV and renewable integration
- Transmission/Distribution Investment Alternative
- BANC

▪ Solutions – Menu Approach

- AutoDR
- Pricing: TOU and CPP
- Thermostat Programs
- Direct Load Control
- Weather Independent Solutions
- Storage (Thermal/Electrical/Other)
- Adjustable Customer Load (Up/Down)
- Special Contracts
- Voluntary Emergency Curtailment (VECP)
- BANC Resources

Overall Goal for 2014 and Beyond

- Integrate DR from a variety of sources into SMUD business operations as a committed, on-going, long-term activity
- Obtain funding commitments to:
 - Leverage Smart Grid projects to develop new Commercial, Industrial, and Residential programs to serve IRP objectives
 - Technology enhancement to the DRMS, Silver Springs, metering platforms and others as required
 - Exploring integration of DR into the future Distribution Management Systems

Overall Goal for 2014 and Beyond

- Develop AutoDR to its potential – 40 MW (or more) is a realistic goal
- Develop Small Commercial and Residential DR to its potential
 - Technology is not yet ready for large deployment
 - Customer response to program designs and technology options requires further study
 - Migration of customers from ACLM to a new model will require a few more years as technology standardizes and matures
- Deliver a DR portfolio that is reasonable and achievable
 - Current projections show 295 MW or about 9% of system load by 2021 is possible with a sustained commitment to DR

SMUD Implementation of the New DR

- The new DR is a multi-dimensional platform
- Business processes, technology, policy, and program design all being built to work together and integrated across the organization
 - This is a continuing work-in-progress and on-going learning opportunity
- Concurrent development of process, technology, policy, and programs is required to meet aggressive schedules
- SMUD has just begun to explore the capability its new DR systems, processes, and technology can provide
 - “We built it, now we have to learn how to use it.”

2013 PowerDirect® AutoDR Pilot Program

- **Program Design Goals**
 - Provide a reliable, predictable and sustainable load reduction
 - Offer ease of compliance
 - Encourage maximum performance
 - Provide customer choice with four program options to meet customer and SMUD business needs
- **Basis for the long-term PowerDirect® AutoDR program**
 - Economic – Considered along with SMUD supply-side resources
 - Reliability – Planned as required into the SMUD resource portfolio
- **Program Features**
 - Designed to accommodate shorter, more frequent dispatch in addition to longer duration events up to four hours
 - Automated notification, dispatch, and settlement
 - Voluntary customer participation
 - Performance bands for capacity-contract based programs

Start the Discussion

- What opportunities does the new demand response capability present?
- How will the customers, utilities, regulators, industry, research, and all other parties work together to explore the possibilities and opportunities?
- How can we build demand response that is reasonable, achievable, and cost-effective to meet a variety of business and resource needs?
- What is needed to gain a long-term commitment to develop the new DR?