Integrating Demand Response and Peak Load Management with Microgrids and Integrated DSM

Moderated By:  Paul Miles, PECO

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Mark S. Martinez
Senior Policy Advisor
DSM Strategy and Policy
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An Edison International Company

- Southern California Edison (SCE), headquartered in Rosemead, California, division of EIX ($20B)
- Serves a population of more than 14 million in 15 counties in a 50,000 square mile area of Central, Coastal, and Southern California
- Service territory includes more than 180 cities and communities with over two dozen languages
- 9,000 MW of generating capacity from interests in nuclear, hydroelectric, and fossil-fueled power plants (this has changed recently…)
- Award-winning energy efficiency and demand response customer programs @ 1,300 MW
- Industry leader in renewable energy, electric transportation, smart grid, and smart metering
- Serving customers for 125 years
The Energy Marketplace is Changing

How people use energy is changing

How people manage their usage is changing

Where people get energy is changing

The network is changing
IDSM: Customer Energy Solutions Portfolio

Evolving IDSM Portfolio

Emerging Wholesale Markets
Proxy Demand Resource
Proxy Demand Resource – Ancillary Services
GHG/Carbon Markets and Requirements

Growing DG & Storage
DG & Back up Generation
Distributed Solar and Wind
Distributed Energy Storage

Enhanced Customer Relationships
Web Portal
New Delivery Channels
Enabling Technologies
Dynamic Pricing

SCE & Statewide IDSM Strategy
Managing Local Reliability
Deep Energy & GHG Reduction
Dynamic Lighting
Income Qualified
Water-Energy Nexus
Mrkts, Behavior, Economics
IDSM Policy & Integration
R.14-10-003 The “IDSM” OIR – new framework

- R.14-10-003 October 8, 2014
- Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Demand Side Resource Programs

“This proposed proceeding acknowledges that each customer’s relationship with energy use is unique. It seeks to incent the management of the utilities to meet the energy use needs of each customer in the cleanest and most intelligent ways possible.” Cmmr. M. Peevey
**DR’s Potential Benefits and Costs**

**DR B&C Categories**

The range of potential DR benefits and costs can be summarized into six broad categories.

1. Direct Financial Impacts
2. Customer & Regulatory Relationships
3. Power Pricing & Volatility (R&W)
4. Environmental Effects
5. Reliability & Risk Management

**DR Constituents & Stakeholders**

*DR benefits and costs impact a broad spectrum of SCE’s power system constituents and stakeholders.*

- SCE
- DR Customers & Aggregators
- General Ratepayers
- Suppliers
- CAISO & Wholesale Markets
- California and Society

* See Appendix A: “DR Benefits, Costs & Economic Transfers Matrix” for a detailed breakdown of potential DR benefits by category, constituent impacts, timing and relative scale.
DR OIR (R.13-09-011) organized into four phases:

- **Phase 1**: Bridge Funding
- **Phase 2**: Foundational Issues (Bifurcation, Cost Effectiveness, Cost Allocation, Back-up Generator Use)
- **Phase 3**: Future DR Programs (incr DR participation and capacity certainty; DRAM pilot, potential study)
- **Phase 4**: Development of a DR Roadmap

- D.14-01-004 established a two-year bridge funding period (2015-16) for current DR programs to ensure program continuity during the OIR timeline
- SCE filed its 2015-2016 DR program improvements on March 3, 2014 and budget request for continuing the three “funding buckets” for DR
- D. 14-12-024 decided the Phase 2 and 3 issues and set up working groups
- 2017 set up as transition year and 2018 the first year of “Bifurcation”
Guiding Principles for Future DR Program Policy

• **Customers First:** Think about how your customers will accept the programs, processes, and how they will scale effectively – “bounded rationality” – it’s a thinking person’s game.

• **Collaborate:** Bring your business leaders, technology teams, and ratepayer advocates to the table when designing your programs – participate, rather than litigate – see above.

• **Partnerships:** Develop effective collaboration with those strategic customers and business partners who share your vision and values (safety, reliability, and cost containment) – i.e. water.

• **Looking Forward:** Balance your program design between the capabilities of the existing legacy resources, the innovation of the market, and the road map of where you want to be for the future needs of the grid and the customer.
To Learn More

- SCE Demand Response Programs
  - [https://www.sce.com/drp](https://www.sce.com/drp)

- Help Desk
  - DRP@sce.com
  - 866-334-7827

- Auto-DR Help Desk
  - AutoDR@sce.com
  - 866-238-3605

- View SCE DR Programs Event Status & History
  - [https://www.sce.com/drp/events](https://www.sce.com/drp/events)

- Thank you!
  - mark.s.martinez@sce.com
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Philip Barton
Microgrid and DER Program Director
Schneider Electric
Idealized Multi Resource Microgrids:

- Multi-resource fit
- Hedging – reliability, economic

Graphic by Steve Pullins
Microgrid options vary in financial and technical complexity

Financial Complexity

Mix of 25 year PV and 15 year generator

1. CHP sized for thermal load
2. Size, type and mix harder
3. It’s hard to build in short term DSM with long term PV and CHP
Microgrid Controls Suite

- Predictive DER management
- Reactive DER management
- Ensure microgrid real time stability and reliability
- Management of connection/disconnection from the grid

- StruxureWare Demand Side Operation
  - Weather forecast
  - Energy market pricing
  - Demand response requests
  - API/ Web services / Open ADR 2.0b

- DER Box
  - Communication with StruxureWare DSO
  - Dispatching orders/ collecting DER data
  - Data storage for improving reliability

- Microgrid Controller
- Modbus, Bacnet etc
Thank you!
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