Facilities and Markets

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Introduction

- An Energy Manager must be able to…
  - Support facility mission(s)
  - Balance critical needs in support of mission(s)
  - Manage energy
    - Use, Conversion, Generation, Storage, Recycling
    - Resources and assets
  - Project energy use and make commitments
  - Tolerate diverse systems
  - Dynamically and rapidly reconfigure in the face of added, subtracted, failed, changing subsystems and devices
  - Interact with markets, prices, and requests

Interoperation

- Service Orientation
  - Just the information needed
  - Simple request-response
  - SOA needs simple data
- Use standard information exchanges
- Independent innovation behind simple exchanges
- Market interactions with the same method

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What Can You Offer?

- Similar to Base Energy/Generation Rates
  - Curtailment (Demand Response)
  - Distributed generation
    - Same effect as DR
  - Timing of storage draw down and fill up
    - One is equivalent to DR, the other is variable load
- "Fast DR" is more valuable
  - Shorter than 5-10 minute response
- Regulation (5-10x value of base energy)
  - Short request and response intervals down to 4s

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First Know Yourself

- Projection of Facility Needs
- Need to be able to project what you need to address your facility's mission(s)
- Compute the difference between what you need and what you have
- Offer the difference to markets

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Markets and Types

- Wholesale—Large scale (megawatts)
  - Work with aggregators to get to this scale
- Retail—typically controlled by utility feed-in
  - Type of generation/curtailment/storage may affect value
- Microgrid—More local
  - Fewer regulatory hurdles than Retail, smaller scale than wholesale
- Direct bilateral sales
  - Think of an office park with an industrial park

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Connecting to Markets

- Use the standard information models for Schedule, Price, and Product definition
  - OASIS Energy Market Information Exchange addresses markets in general (SGIP PAP03)
  - OASIS WS-Calendar addresses schedule (SGIP PAP04) and time streams
- Use standard DR and DER signals, reports, and transactive energy framework
  - OASIS Energy Interoperation (SGIP PAP09)

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OpenADR 2 and Energy Interoperation

- Energy Interoperation—OASIS
  - Finished December 2011
  - In Smart Grid Interoperability Panel reviews
- OpenADR Alliance
  - OpenADR2 Profile (part of) Energy Interoperation
  - Built on and with collaboration from Lawrence Berkeley Labs, many vendors
- Certified products in development
- Use the (Simple) Market profile of Energy Interoperation

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Conclusions

- Your managed facility can participate in markets at many levels
- Interacting with microgrids is similar
- In the near future easier to find a place to sell things related to your control capabilities
- Watch OpenADR2 as products roll out

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Questions

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Selected References

- OpenADR Alliance
  - http://www.openadr.org/
- OASIS Energy Market Information Exchange
  - Price and product definition/description
  - Transactional EMIX Notes
  - Committee Specification pending publication
  - http://www.oasis-open.org/committees/emix
- OASIS Energy Interoperation
  - Designed to work to, from, inside, and outside microgrids
  - Committee Specification ballot in process
  - http://www.oasis-open.org/committees/energyinterop
- OASIS WS-Calendar
  - For application see EMIX and Energy Interoperation
  - http://www.oasis-open.org/committees/ws-calendar
- William Cox Energy Talks & Papers