OpenADR for Everyone
Bruce Nordman, LBNL

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bnordman@lbl.gov
nordman.lbl.gov
Context

- Time-varying rates are here - CPP, TOU, & more dynamic
- Many devices in buildings could/should be price-responsive
- Things change
  - Rates and periods
  - Weekends and holidays
  - Daylight saving time
- More dynamic prices better for grid, economy, environment
- Devices need to get rate information automatically
- “OpenADR” should be core to this
Every day is different

- Peaks and valleys shift
- Shapes change
- Magnitudes change

(black dots are 250 highest hours)

OpenADR and Pricing

- OpenADR is sometimes perceived to be complex; and it can be!
- Most uses of OpenADR today use a small fraction of capability
  - Pricing extends this trend
- Devices that only need to send or receive prices are burdened
- Price broadcast requires only 1-way communication
  - Utility meter readings provide measurement/verification
- Should also include basic DR commands already in wide use, e.g. Shed

- A defined subset of OpenADR 2.0 could
  - Reduce vendor costs
  - Simplify explaining OpenADR to new or skeptical groups
  - Have simple branding to identify the limited capability
How to get prices to end-use devices?

**Direct:**
Grid $\rightarrow$ Device

**Indirect:**
Grid $\rightarrow$ Building Central Entity*
BCE $\rightarrow$ Device

*EMS, Gateway, Bridge, …  
(adjacent to meter)
Why Indirect Price Distribution?

- (Many) Fewer devices listen to grid directly
  - Easier to change physical or application layer
  - Technology can vary by region
  - Can enable multiple channels (e.g. Internet, cellular, FM radio, …)

- Can broadcast in multiple protocols in building
  - OpenADR, Zigbee, Z-wave, Ethernet, ….

- Can create ‘local prices’
  - Value of electricity in building can differ from grid value (price) …
  - … particularly when have local storage and/or generation

- In-building price distribution protocol can be a “Local” version of OpenADR
  - Could use different security, transport, …
Technical approaches

- Strictly subset 2.0a or 2.0b
- Define a new limited profile
- Define a strictly one-way method
- Consider data encodings and other mechanisms
- ...
Considerations

Ensure no disruption to existing OpenADR Ecosystem

- Vast majority of future VENs do not yet exist
- VEN burden from OpenADR should be minimized

- Key: Maintain/leverage OpenADR brand
  - Protocols details can/should evolve
  - Devise clear nomenclature to avoid confusion
Expected outcomes

- Huge future success of OpenADR
- Wide recognition of protocol
- Easier to incorporate into building central entities
- Easier to require in voluntary programs
- Easier to require in mandatory standards
- More effective price-response in buildings; sooner
Thank you
Possible technical approaches

- Strictly subset 2.0a or 2.0b
- Define a new profile
- Define strictly one-way method
- Define limited two-way method
- Add new option for data encoding (e.g. JSON instead of XML)
- Consider other Energy Interop mechanisms for moving prices
- Consider role of registration
- Consider how multiple rates communicated
Some reasons for local prices

Differential buy/sell prices
Carbon valuation
DC circuits
Peer-to-peer exchange
Microgrids
Capacity constraints
Battery management