



ELECTRIC POWER
RESEARCH INSTITUTE



Options for OpenADR

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OpenADR Alliance

OpenADR Progression



Research initiated by LBNL/ CEC

OpenADR 1.0 Commercialization
(PG&E, SCE, and SDG&E)

Pilots and field trials
Developments, tests (Utilities)

Official OpenADR specification (v1.0) by
LBNL/CEC*

1. **DR 2.0 Pilots** and field trials
 - Wholesale markets, ancillary services
 - Dynamic pricing, renewable, EVs
 - International demonstrations
2. **All end-uses and sectors**

2002 to 2006 2007 2008 2009 2010 2011 2012 2013 2014 ...

1. OpenADR Standards Development
 - OASIS (EI TC), UCA, IEC
2. NIST **Smart Grid**, PAP 09

EI 1.0 standards
- OpenADR profiles**



1. **OpenADR 2.0** specifications
 - International standards (IEC)
 - OpenADR 2.0 products/deployments.
2. **USGBC** national pilots
3. **Codes** (CA T24)



1. Foster Adoption
2. Test/Certify (v2.0)



Standards Interoperability Lifecycle Process: An iterative development process for a standard to be deployed in markets.***

1. Research and development
2. Pilots and field trials
3. Interoperability standards development
4. Deployment and market facilitation



* OpenADR v1.0: <http://openadr.lbl.gov/>

** OASIS EI 1.0 standards: <http://www.oasis-open.org/committees/download.php/45425/energyinterop-v1.0-cs01.zip>

*** Publication: <http://drdc.lbl.gov/sites/default/files/LBNL-5273E.pdf>

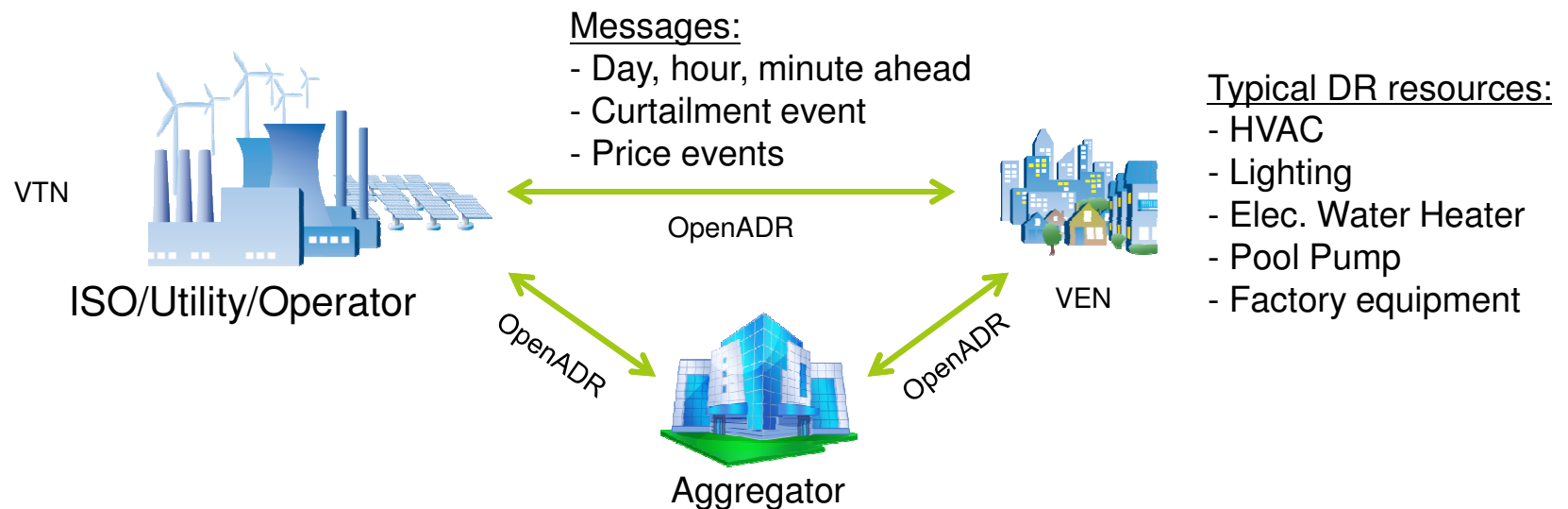


OpenADR Alliance/EPRI DER Protocol Workshop

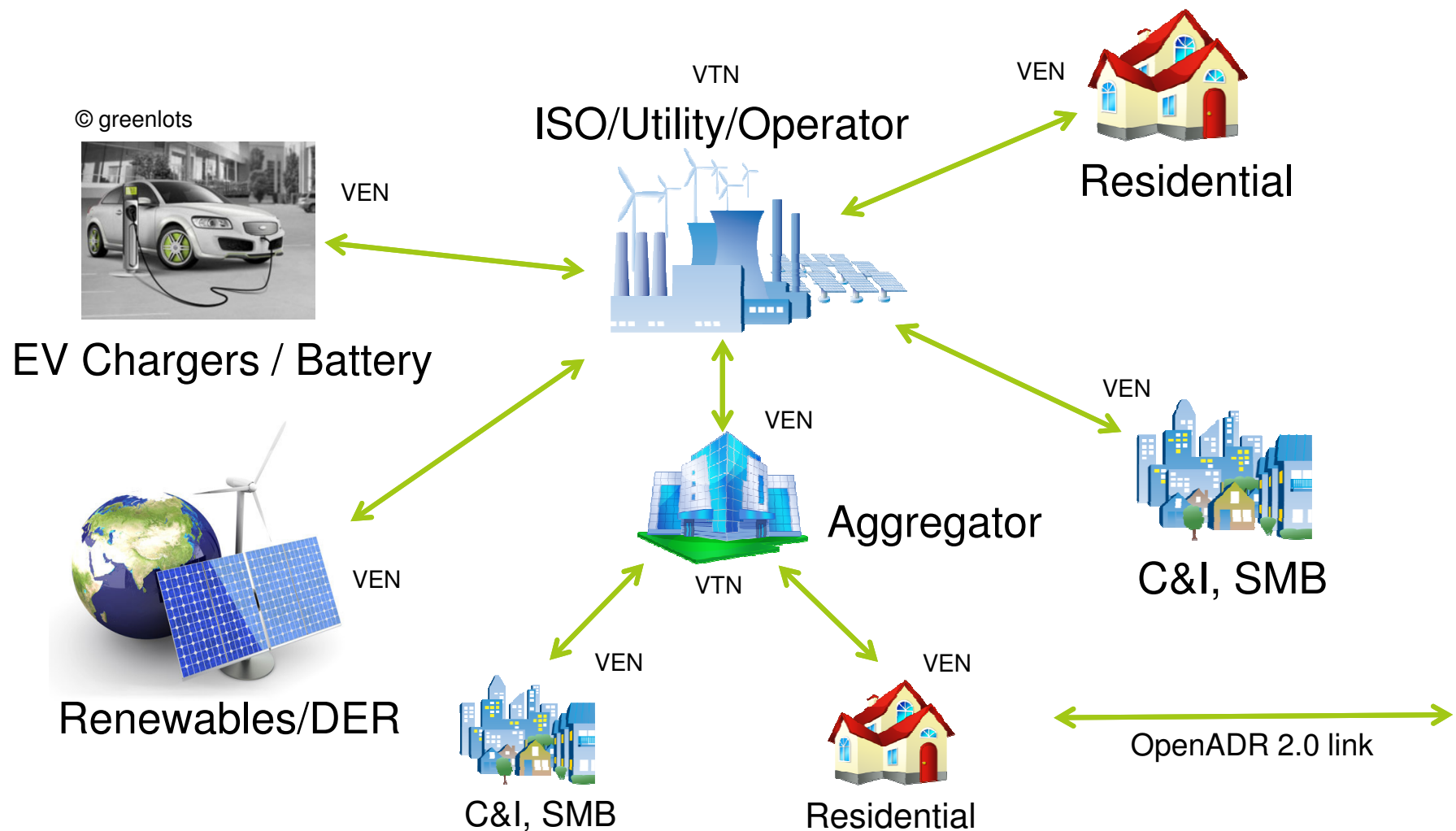


Demand Response with OpenADR

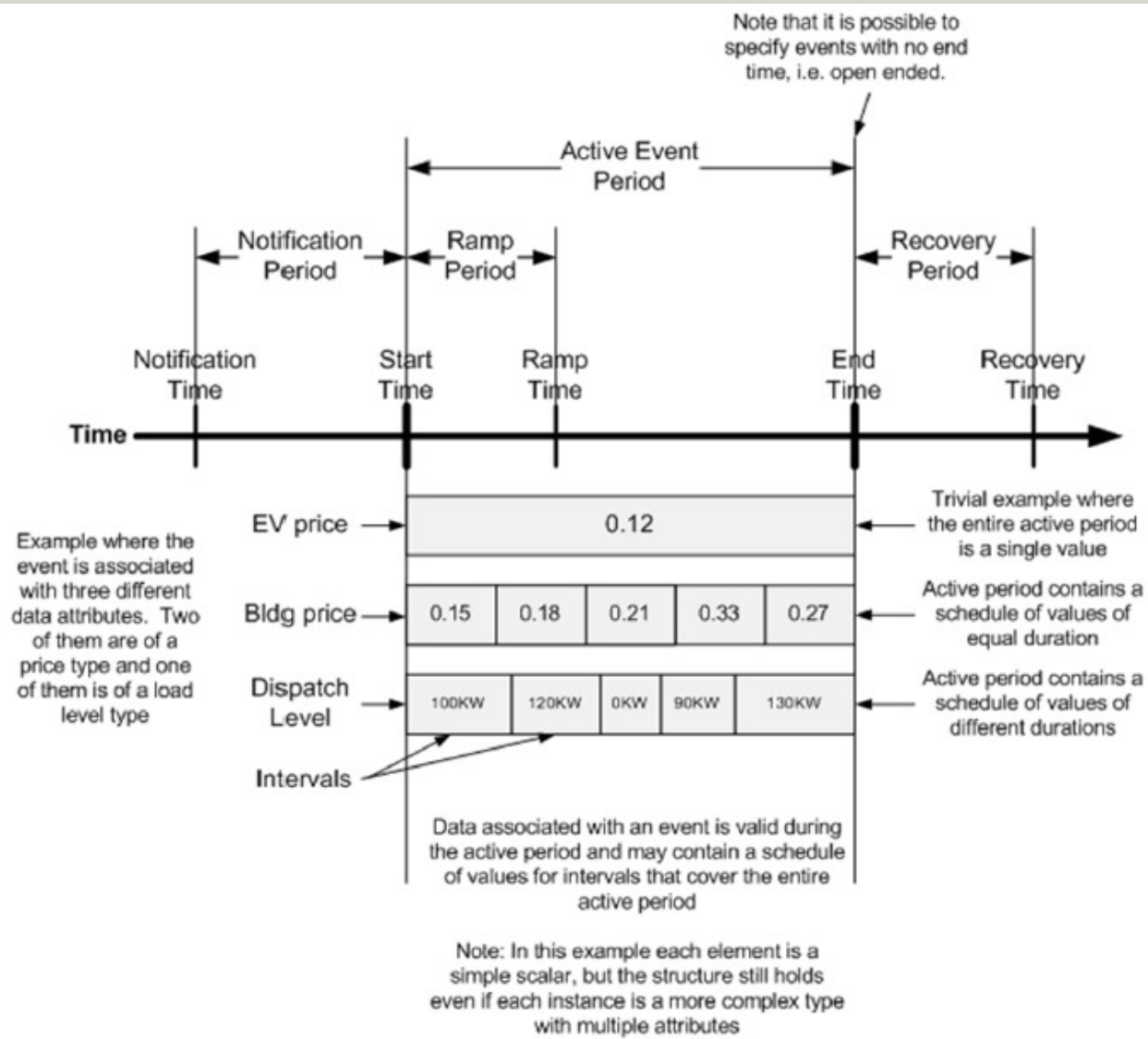
- Original Demand Response (DR) is defined as “...action taken to reduce electricity demand in response to price, monetary incentives, or utility directives so as to maintain reliable electric service or avoid high electricity prices” (FERC 2007)



Implementation Scenarios



OpenADR 2.0 Application



*Figure Source: OASIS Energy Interop Draft Standards (OpenADR Alliance/EPRI DER Protocol Workshop)

OpenADR framework

- OpenADR 2.0 Profile Specifications
 - Services, transport, security, conformance statements
- OpenADR 2.0 Test Specifications
- OpenADR Program Guide
- OpenADR Protocol Implementation Conformance Statements (PICS)
- OpenADR test harness
- OpenADR appointed test houses
- OASIS Energy Interoperation

Options for OpenADR

- Creating new Program Guide Implementation scenarios
 - Currently 7 programs; e.g. CPP, EV, high level DER
 - Option: Create additional scenarios for specific DER applications
- OpenADR 2.0 Profile Specification modifications
 - Simple: Add signal types, add service descriptions, add report types based on existing report functions
 - Extended: Create specific functions as extension of the schema; add existing Energy Interoperation services for bidding and operations

- OpenADR can help managing resources using classical DR messaging and enhanced DER and Transactive Energy (TE) signaling



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