How OpenADR can Compare with IEEE 2030.5 for California Rule 21

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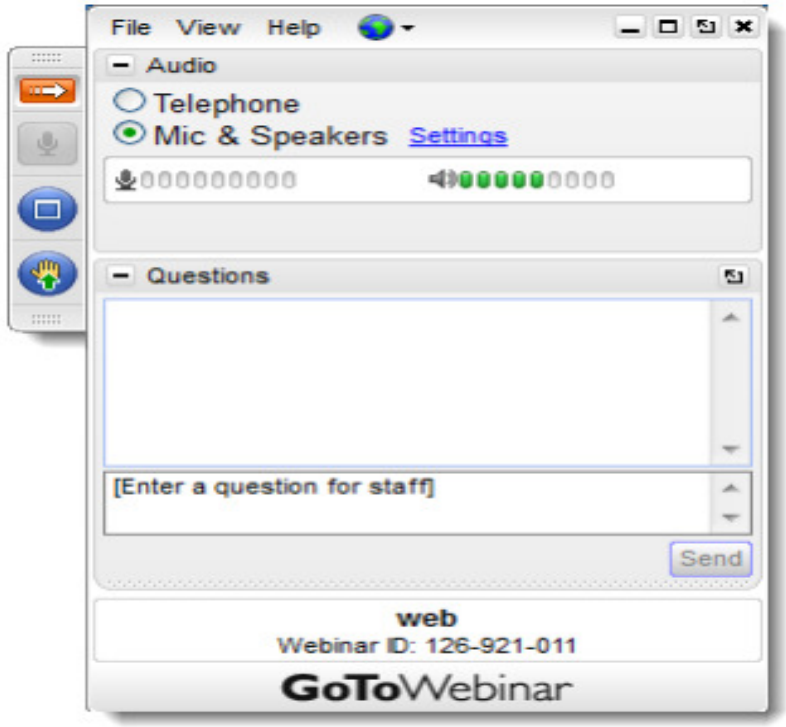


Welcome!

Thank you for joining today's webinar: How OpenADR can Compare with IEEE 2030.5 for California Rule 21

Today's Speakers:

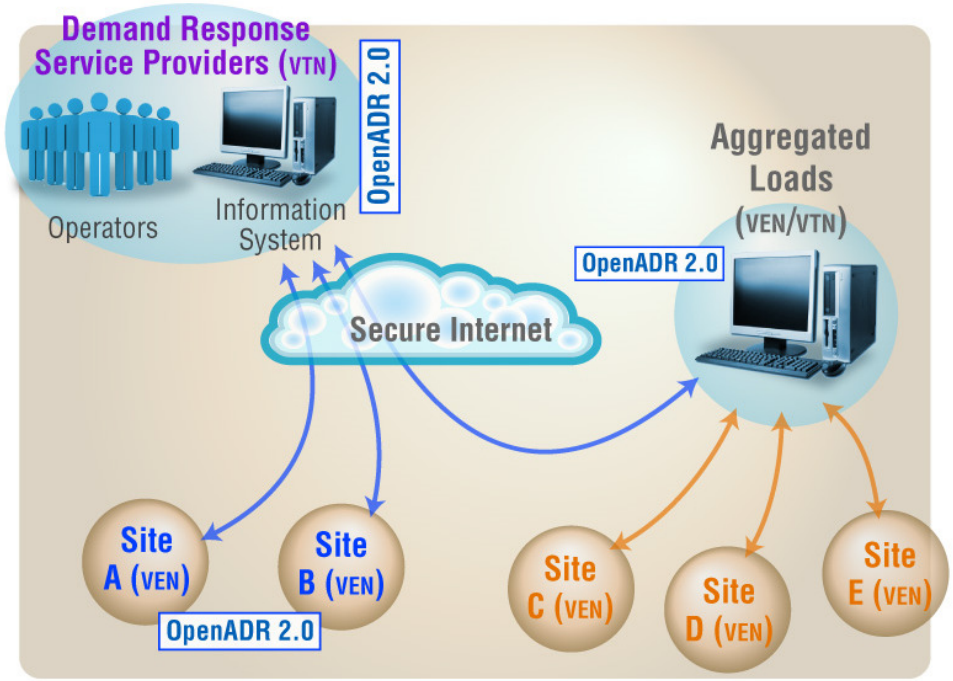
- Rolf Bienert, Managing and Technical Director, OpenADR Alliance

Overview:

- Intro OpenADR protocol
- From DR to DER
- Intro White Paper and DER Addendum

OpenADR in a Nutshell

OpenADR provides a non-proprietary, open standardized Demand Response (DR) & Distributed Energy Resources (DER) interface that allows DR service providers to communicate DR, DER, and TE (Transactive Energy) signals directly to existing customers using a common language and existing communications such as the Internet.



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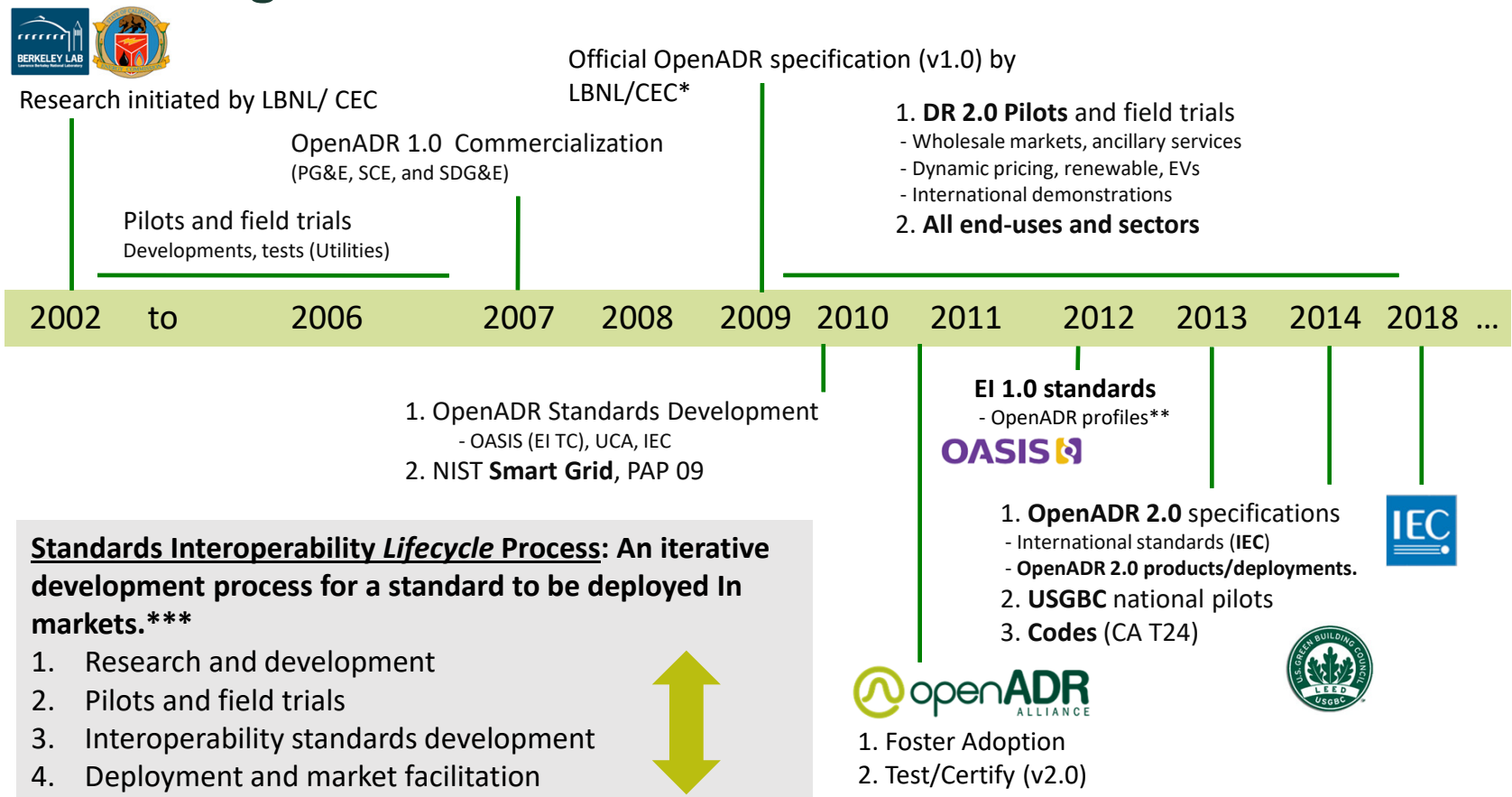
OpenADR Progression



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

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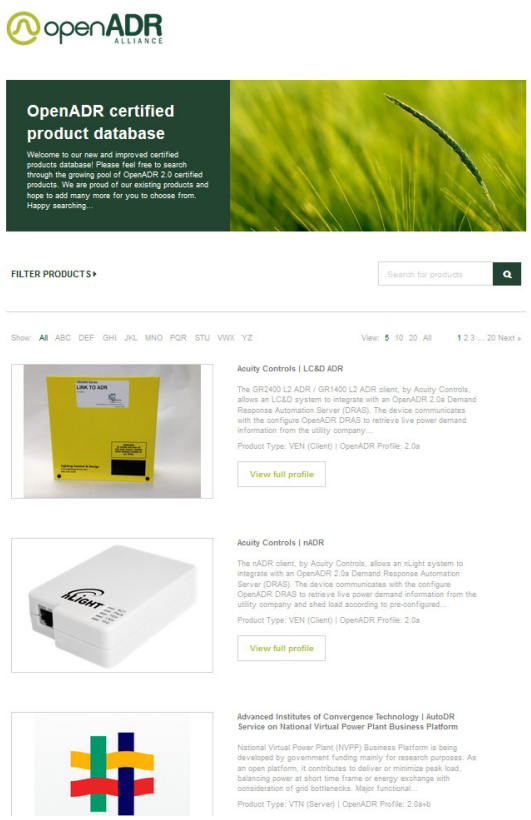
* **OpenADR v1.0:** http://openadr.lbl.gov/
** **OASIS EI 1.0 standards:** http://www.oasis-open.org/committees/download.php/45425/energyinterop-v1.0-cs01.zip
*** **Publication:** http://drrc.lbl.gov/sites/drrc.lbl.gov/files/LBNL-5273E.pdf

What is the OpenADR Alliance?

Vision: Facilitate the global deployment of OpenADR to reduce the cost of supplying and consuming electricity, while improving energy reliability and reducing environmental impact.

- California based nonprofit 501(c)(6) corporation comprised of 140 industry stakeholders
- Leverages Smart Grid related standards from OASIS, IEC, UCA and NAESB for OpenADR profiles
- Supports development, testing, certification, and deployment of commercial OpenADR
- Enables stakeholders to participate in automated DR, DER, dynamic pricing, transactive services, and electricity grid reliability

Where are we today?



- Two completed specifications
  - >7 years for 2.0a
  - >6 years for 2.0b
- 8 test houses validated
- > 200 certified systems
- ~ 155 member companies

International Standardization

- **2014**
  - International Electrotechnical Commission (IEC) approved the OpenADR 2.0b Profile Specification as a Publicly Available Specification (PAS) IEC/PAS 62746-10-1 as a basis for a new commission standard to be developed.
  - The level of international support for the PAS validates the global importance of the OpenADR smart grid specification.
- **2018**
  - The IEC Project Committee 118 (PC118) together with TC57 WG21 advanced the PAS to become an international standard.
  - OpenADR 2.0b is now published as IEC 62746-10-1 Ed.1 as of November 19, 2018. https://webstore.iec.ch/publication/26267
  - The technical requirements and functions are unchanged from OpenADR 2.0b.

The ‘Entities’ of OpenADR

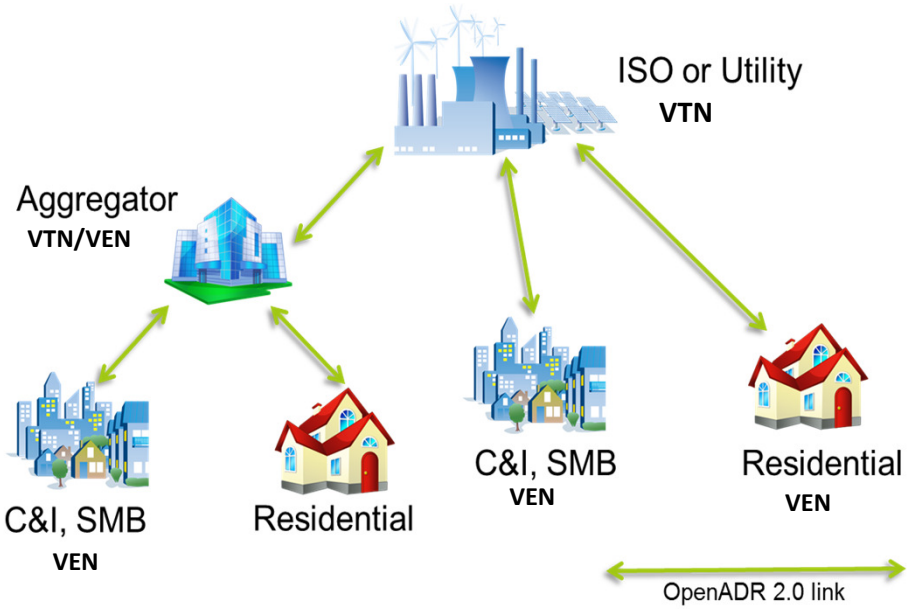
OpenADR is a message exchange protocol with two primary actors aka ‘entities’

Virtual Top Nodes (VTN)

- Manages Resources
- Creates/Transmit events
- Request Reports

Virtual End Nodes (VEN)

- Receive events and respond to them
- Generate reports
- Control demand side resources



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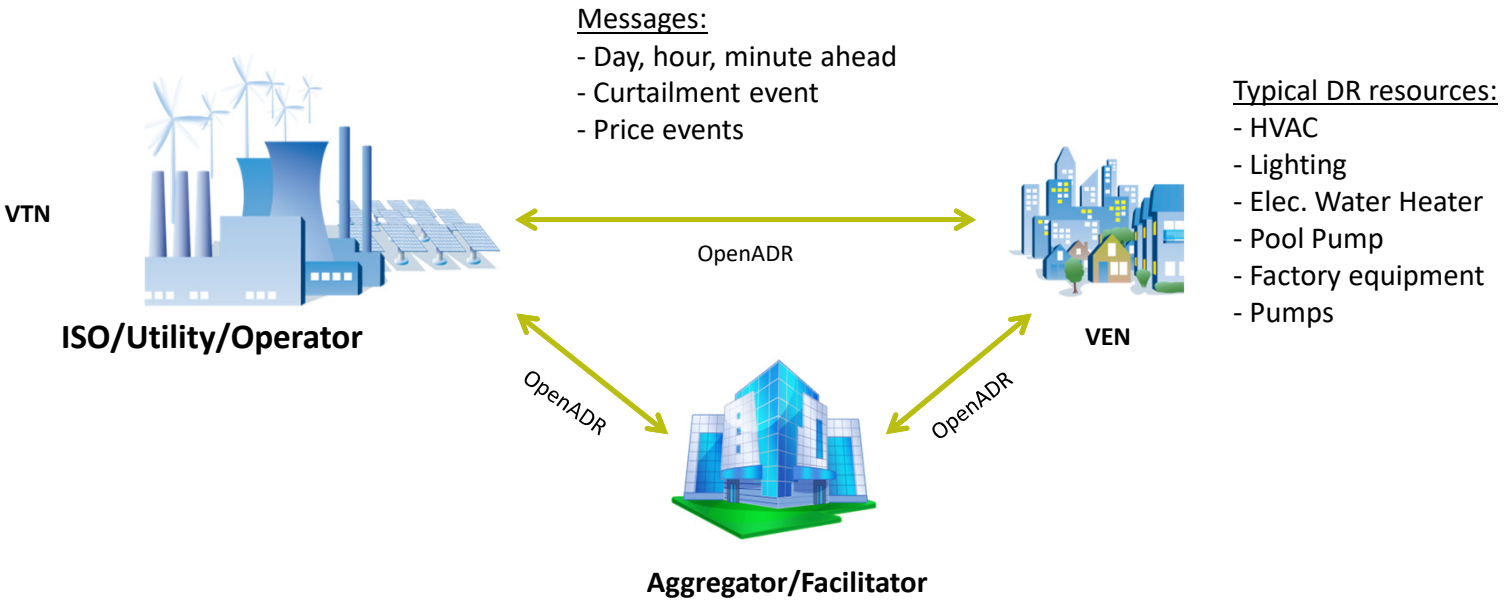
Transition from DR to DER

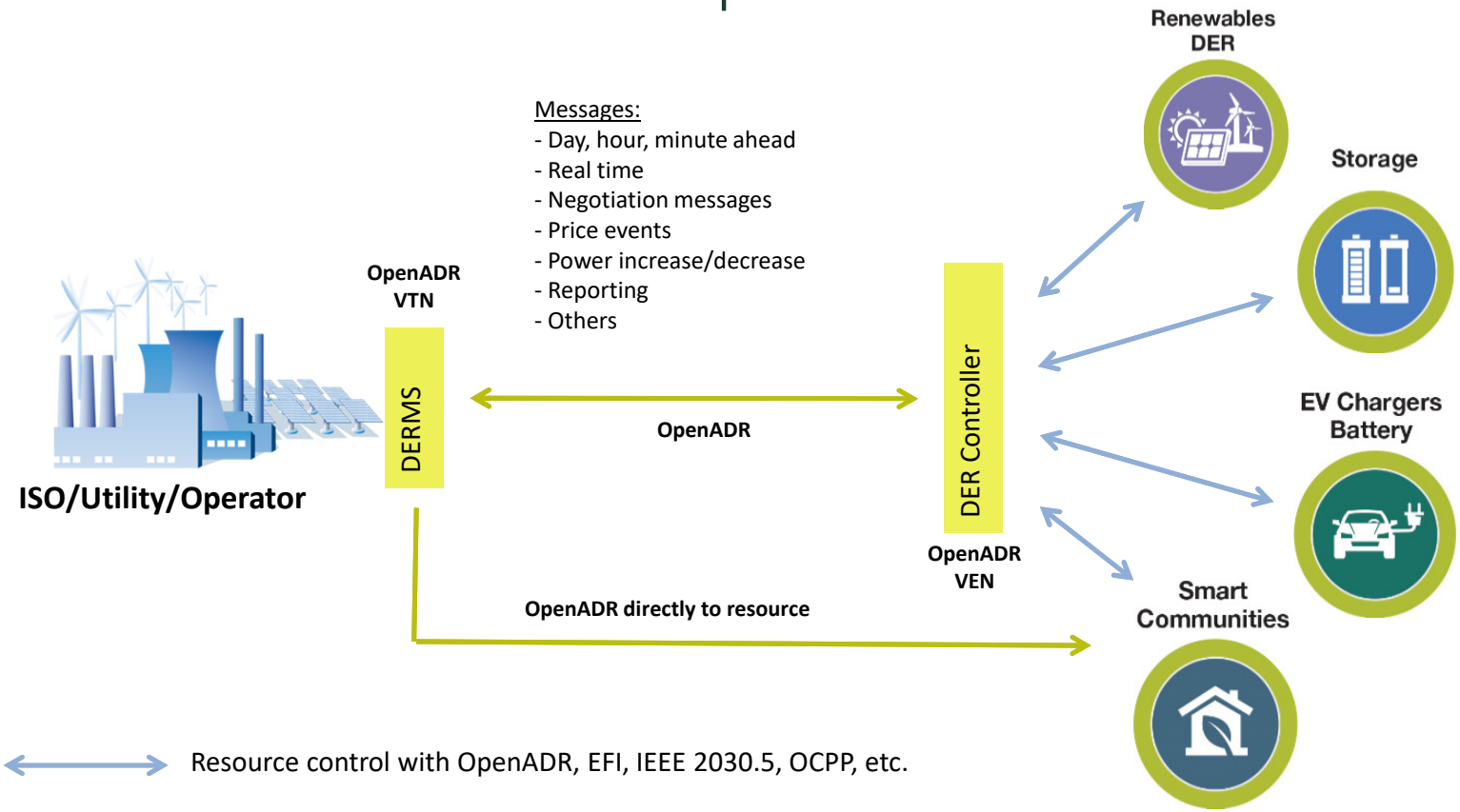
Demand Response (DR) is defined as "…action taken to reduce electricity demand in response to price, monetary incentives, or utility directives so as to maintain reliable electric service or avoid high electricity prices" (FERC 2007)

Traditional DR with OpenADR



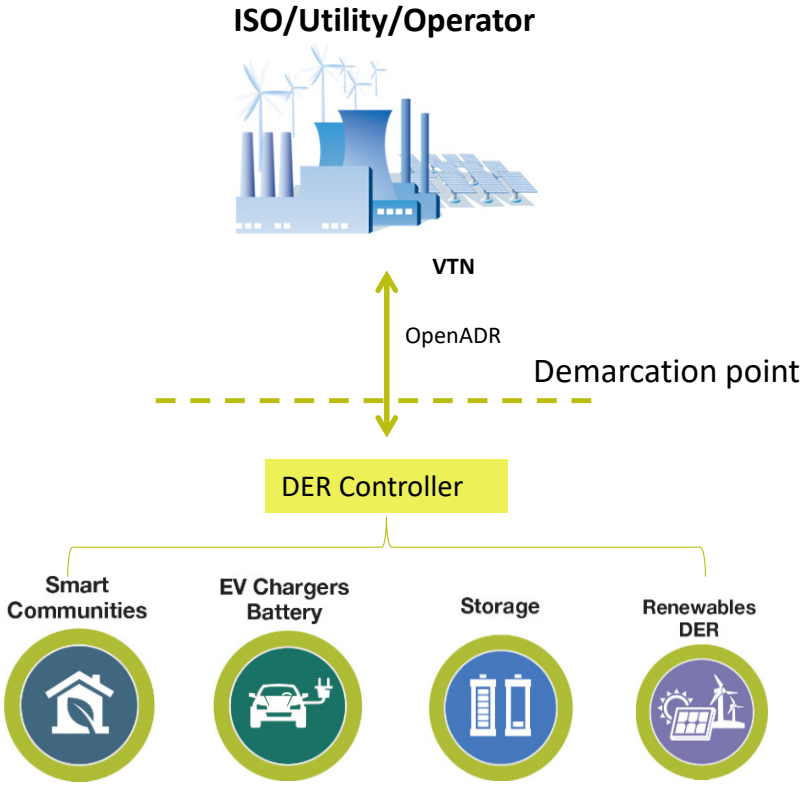
Addressing DERs

DERs as DR resources versus direct DER parameter control

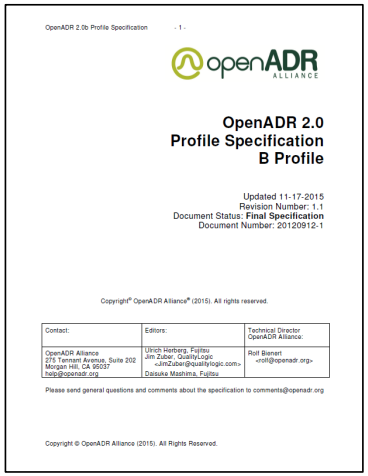


Advantages of OpenADR for DERs

- Provide targeted price and energy information
  - Target by area, zip code, resource ID, etc.
  - Bi-directional comms
- Receive reports (telemetry) from resources
- Transactive control planned
  - Include quotes, tender, delivery services
- Provides demarcation point
  - Separate utility controls from customer owned equipment



Specification Addendums in the works


OpenADR 2.0b Profile Specification - 1 -

OpenADR 2.0
Profile Specification
B Profile

Updated 11-17-2015
Revision Number: 1.1
Document Status: **Final Specification**
Document Number: 20120912-1

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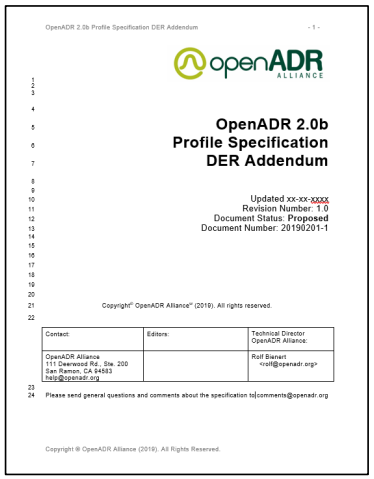
OpenADR 2.0b (IEC 62746-10-1)
Will remain unchanged


OpenADR 2.0b Profile Specification DER Addendum - 1 -

OpenADR 2.0b
Profile Specification
DER Addendum

Updated xx-xx-xxxx
Revision Number: 1.0
Document Status: **Proposed**
Document Number: 20190201-1

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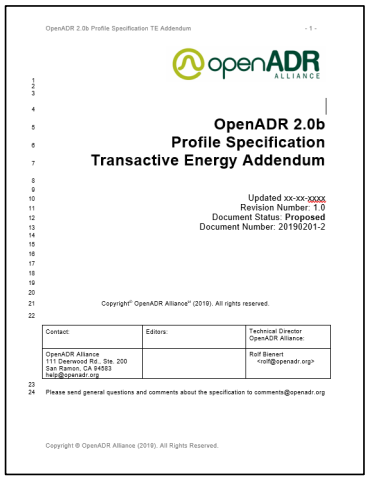
Addendum specifications for enhanced DER and TE functions – name and branding TBD
(See R.A.T.E.S program example)


OpenADR 2.0b Profile Specification TE Addendum - 1 -

OpenADR 2.0b
Profile Specification
Transactive Energy Addendum

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Document Number: 20190201-2

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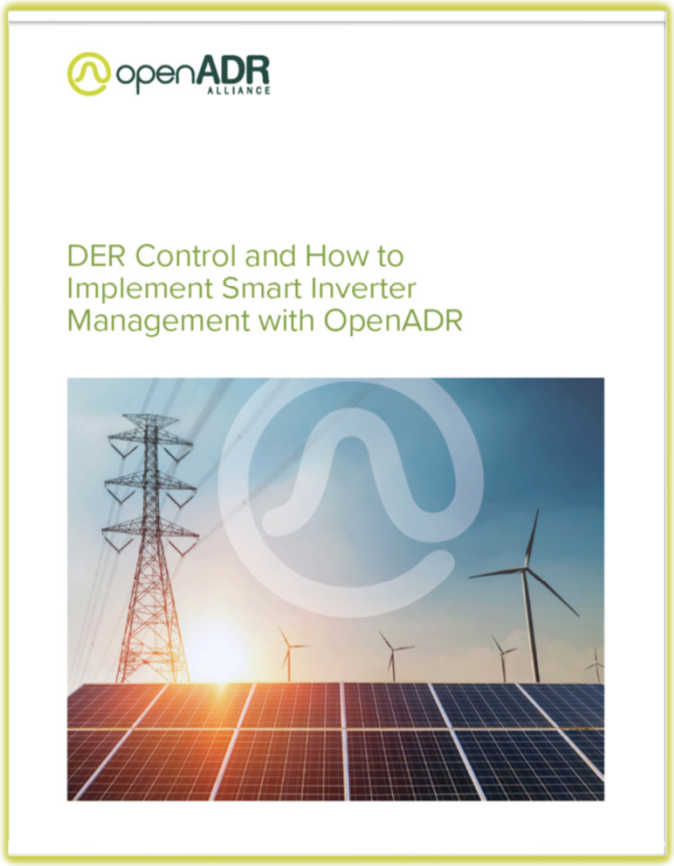
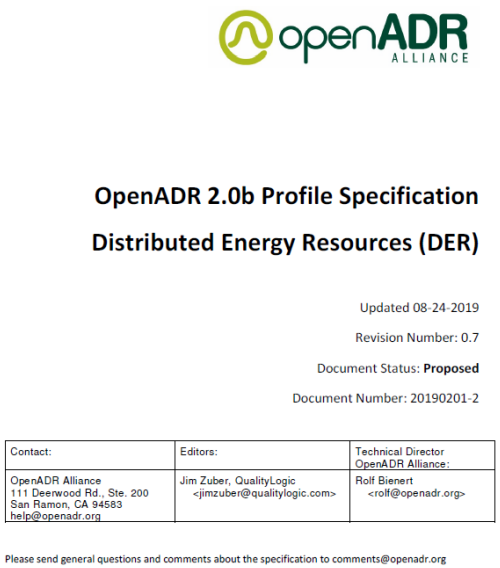


https://openadr.memberclicks.net/assets/OpenADR%20for%20Smart%20Inverter%20Control_final.pdf

Key Highlights

- OpenADR typically relies on a gateway device, building EMS, or aggregator to translate utility DR/DER requirements into specific device behaviors, while IEEE 2030.5's forte is to connect and directly control devices.
- Utilities throughout the world have invested in OpenADR infrastructure because the customer is and remains in control as the utility asserts control via motivation.
- The DER addendum is a "how to" guide defined by the CSIP Guidelines that are relevant to achieving the intent of Rule 21 and show how those requirements can be implemented using OpenADR to achieve grid stability, reliability and resilience in the face of rapidly expanding DER resources.
- Review and send comments to comments@openadr.org

Draft DER Addendum



OpenADR 2.0b Profile Specification

Distributed Energy Resources (DER)

Updated 08-24-2019

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Document Status: **Proposed**

Document Number: 20190201-2

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Please send general questions and comments about the specification to comments@openadr.org

- CSIP Guidelines that can be achieved through best practices recommendations, such as specific event signal definitions for communicating advanced inverter functions (Label: **BP**)
- CSIP Guidelines that are supported by OpenADR and require little guidance, such as the security infrastructure (Label: **INFO**)
- CSIP Guidelines that are unrelated to the general intent of Rule 21 such as requirement for pub/sub or access control list functionality. Or CSIP Guidelines that are outside OpenADR's usage model such that they would not make sense to implement. No attempt will be made to conform to these requirements.(Label: **NA**)

https://openadr.memberclicks.net/assets/OpenADR_California_Rule%2021_Guidelines_v0_7.pdf

Q&A

- Use the Questions tab to submit inquiries
- Recording and slides from this presentation will be available at www.openadr.org.
- The OpenADR Webinar Series will continue throughout 2020. More information on the Alliance and future webinar topics can be found on www.openadr.org.

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