OpenADR Webinar: How California's Senate Bill 49 will impact OEMs in 2025: Flexible load balancing for Pool Controls

March 18, 2025

Agenda

1. Housekeeping
2. Intro of the panelists
3. Overview of OpenADR and Demand Response
4. Introduction to the California Energy Commission
5. California Senate Bill 49 and what it means for OEMs, both now and in the future
6. Q&A session

Housekeeping

- The webinar is being recorded

- Slides and Recording will be made available on
  https://www.openadr.org/webinar-series

- All attendees are in listen only mode

- To ask questions, please enter them in the Questions tab of the Webinar Tool
  - We will field as many questions as possible at the end of the presentations

Q&A

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Today's panelists

Rolf Bienert
Technical Director
of the OpenADR Alliance

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Rolf Bienert is the Managing and Technical Director of the OpenADR Alliance. In this capacity, he oversees all aspects of the non-profit organization, including strategy, technical developments, and certification programs. Rolf has been an active member of many industry organizations since over 20 years, driving the development of new technologies with a specific focus on standardization, certification, and interoperability. Rolf holds a master's degree in EE.

Spencer Borison
US Lead, Renewables
Codibly

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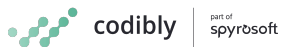
Spencer Borison is the US Lead for Codibly, a global IT services firm that has been supporting clients across the Renewable Energy and eMobility industries for over 13 years. Many of his projects focus on Demand Response, Grid Communication, Standards and Interoperability, and Smart Home Energy Management Systems (EMS). Codibly is a Contributing Member of the OpenADR Alliance and has relationships with many of the leading DR Aggregators.

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Codibly - expert in e-Mobility & renewable energy

Codibly is passionate about driving positive change in transportation and energy. The company brings together expertise in software development with an in-depth understanding of e-Mobility and Renewable Energy to offer innovative solutions that empower businesses and individuals to embrace eco-friendly practices.

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RENEWABLE ENERGY & ELECTROMOBILITY
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OpenADR in a nutshell

OpenADR (also IEC 62746-10-1) 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.
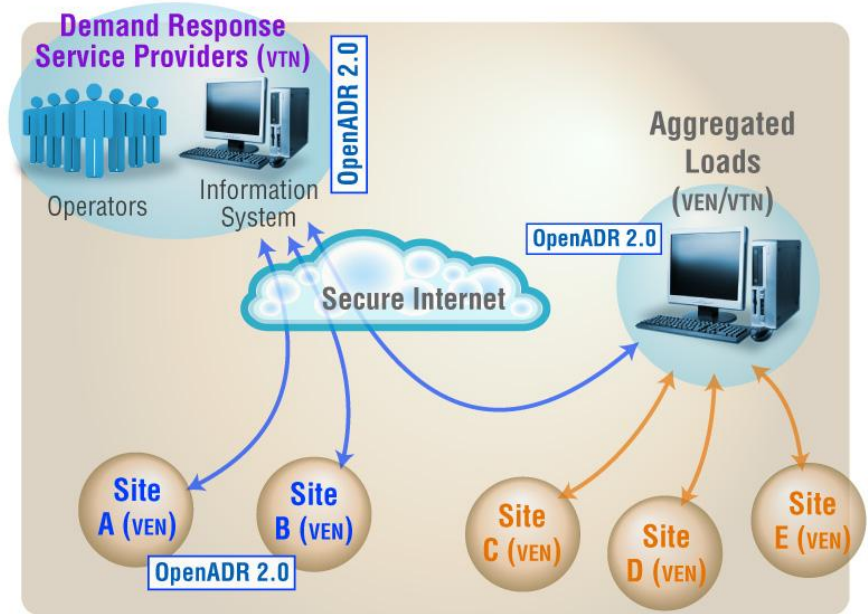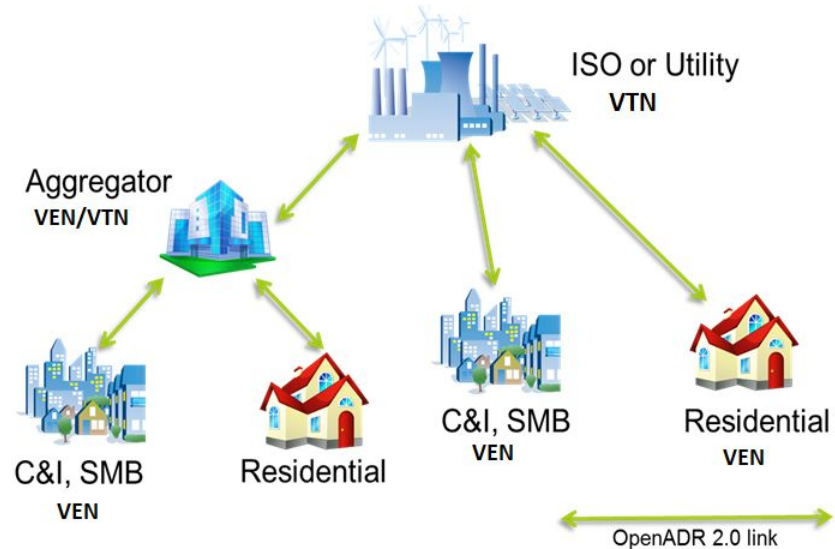
The 'Entities' of OpenADR

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

ISO or Utility
VTN

Aggregator
VEN/VTN

C&I, SMB
VEN

Residential

C&I, SMB
VEN

Residential
VEN

C&I, SMB
VEN

OpenADR 2.0 link

A new addition – OpenADR 3.0

- Created in addition, instead of changing the existing 2.0 standards
  - Maintain interop, 2.0 remains in place
- REST API for simpler implementation
- JSON
- Maintains concepts of OpenADR (inform & motivate) but simplifies and increases flexibility
  - E.g., could be resource server in building gateway
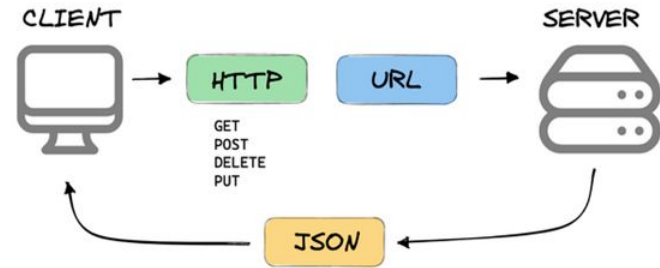
EcoPort™ in a Nutshell

- CTA-2045 modular communications standard approved 2021.

- EcoPort is the brand name for devices that passed testing to CTA-2045-B requirements

- First certified products – October 2021

- EcoPort Site: for information and certified products list: openadr.org/ecoport

Product Listing – some select listings
ecoport.openadr.org

Who is the California Energy Commission?

The California Energy Commission (CEC) is the state's primary energy policy and planning agency.

It focuses on advancing energy efficiency, renewable energy, and grid reliability while supporting climate goals.

The CEC develops energy policies, appliance and building standards, funds clean energy innovation, and ensures grid resilience.

Importantly for today's conversation, the CEC also enforces appliance efficiency regulations like Title 20, as well as Flexible Demand Appliance Standard (FDAS) authorized by SB 49.

Title 24 Section 110.12 mandates that buildings install certified demand responsive controls that support bidirectional communication and maintain functionality during outages. It specifies requirements for HVAC, lighting, electronic message centers, and controlled receptacles to enable remote load reductions and temperature adjustments per OpenADR 2.0 standards and related technical specifications.

The background for Senate Bill 49

In 2023, the California Energy Commission created the first-in-the-world flexible demand appliance standard for residential swimming pool controls.

Flexible demand technologies enable an appliance to schedule, shift, or curtail electrical demand with the consumer's consent.

There are over 1 million pools in the state, making pool controls an ideal candidate for load shifting to avoid emissions associated with electricity generation during peak demand.

The standards for pool controls will save ratepayers millions of dollars, improve the reliability and resilience of the electric grid, and improve air quality. This program will provide around 682 GWh of peak load shift and avoid 394,000 metric tons of CO2e emissions by 2035.

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The requirements for SB 49

Summary

Starting September 29th, 2025, new regulations require pool controls and related equipment sold in California to be capable of shifting energy usage to cheaper, cleaner periods.

Required certification

Manufacturers must pass certification for an approved standard. Examples are OpenADR 2.0b, as well as IEEE 2030.5 or CTA-2045.

These allow the pool controller to act as a VEN (Virtual End Node). This will allow the VTN (Virtual Top Node), the utility or aggregator, to send predefined signals to the VEN that will manage pool equipment to reduce energy usage during periods of peak demand, reducing strain on the grid.

For example: the pool shall be able to avoid use during 4-9 PM peak or run when solar abundance is highest (9am-3pm)

Utility (VTN)

Sending and receiving commands to facilitate demand flexibility

Pool Control (VEN)

What else to think about

Details

- California's Flexible Demand Appliance Standards mandate a default operational schedule that runs equipment during low-emission or off-peak hours. Software shall:
  - Provide a user-friendly fallback schedule (e.g., 9 AM–3 PM) if no aggregator signals are present.
  - Allow local overrides so homeowners or installers can shift times to accommodate pool usage or maintenance events, without forfeiting DR capabilities.
  - Handle event-based pausing (e.g., "flex alert" signals) to reduce consumption during urgent grid constraints.
- Pool OEMs shall also deliver solutions that:
  - Allow for wireless connectivity
  - Seek customer consent before gathering any data or utilizing it to make optimization decision
  - Provide cybersecurity protections to protect data

Wiring Hub

Mobile Phone

Relay

Control Pad

Other devices in the future

Next up

The commission is working on standards for **Thermostats, Electric Vehicle Supply Equipment (EVSE), and Water Heaters** now. There is no set date for when these will be completed or the order between them, subscribe to the Listserv on the CEC webpage to stay updated (link in slide 18)

In the future

The CEC has also outlined plans for other devices to follow these devices under development already, including:

Battery Energy Storage Systems and potentially Clothes Dryers & **Dishwashers**

Other states

- **Washington State and Oregon** already require a similar standard for water heaters
- **New York** is actively also considering this standard, which would be transformational if they became required

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Steps to follow for compliance

Given compliance will be required by September 2025 to continue selling pool equipment in California, it is critical that Pool Equipment leaders begin planning NOW

Step 1 - Assess whether your equipment currently meets full requirements for an approved standard (OpenADR 2.0b, IEEE 2030.5, etc.) for flexible demand capabilities.

Step 2 - Consider the trade-offs of from-scratch development versus pre-built solution implementation, based on your internal expertise and the capacity of your technical team

Step 3 - Build your development schedule to achieve certification from OpenADR Alliance no later than end of August, to leave yourself a month to complete final steps with California Energy Commission.

Step 4 - Begin development or licensing of necessary solution, leveraging a technical partner as needed.

Options for compliance

From scratch

IEEE 2030.5 and OpenADR 2.0b standards are publicly available. Development time ranges from 4-6 months for full solution requirements from scratch, assuming there are telemetry gathering and device control services in place. All code is yours to extend as needed in the future. Certification process with third-party testing lab takes 2-4 weeks.

Pre-built solutions

There are firms that have developed pre-built solutions for common protocols, like OpenADR and IEEE 2030.5. These solutions vary from 4-8 week solution implementation, and often are pre-certified (but not always) meaning that you can skip certification processes.

Code ownership varies, some solutions are a simple, restrictive license agreement, others offer full code base access and IP rights, meaning you can use the solution for other opportunities in the future.

Helpful links

- Documents and materials related to this standard, and Listserv subscription
  - https://www.energy.ca.gov/proceeding/pool-controls

- Final ruling text
  - https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I06016E70D23911EEB13EC5FE823ECF03&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)&bhcp=1

- OpenADR Alliance and Codibly websites
  - https://www.openadr.org/
  - https://codibly.com/

Q&A session

Thanks for joining!

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