OpenADR++ User Conference
June 6+7, 2023
London, UK
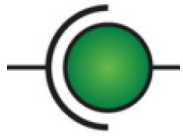
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An EV Energy Services Exchange (ESX) with OpenADR 3.0

Raymond Kaiser, LEED AP
Chief Innovation Officer

Smart Electric Power Alliance

The Genesis

ENERGY SERVICE INTERFACE TASK FORCE

David Holmberg, co-chair, NIST
Raymond Kaiser, co-chair, EVoke Systems

- **What DER resources are available?**
- **Where?**
- **When?**

Standard information exchange

Who
service requester

service provider

Where
Location

How
Event or Price Signal

What
Requested Service

How Much
Quantity

Cost

When
Start Time/Duration

Response Time

Shift to EV Managed Charging

2021 Published EV Managed Charging Framework.

Smart Electric Power Alliance

WORKING GROUPS

An EV Managed Charging Framework:
Simplifying Managed Charging
with Energy Service Contracts

March 2021

Published by the SEPA Energy Services Interface Task Force

Raymond Kaiser, Evoke Systems, Co-chair
David Holmberg, NIST, Co-chair

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ESX
Energy Services Interface

Constraints to EVs @ Scale

- Power capacity constraints at the site and distribution level.

- Seasonal and daily peak capacity challenges on certain feeders and circuits can delay interconnecting new capacity.

- High capital cost and long lead time to add new capacity to meet rapid increase in potential demand.

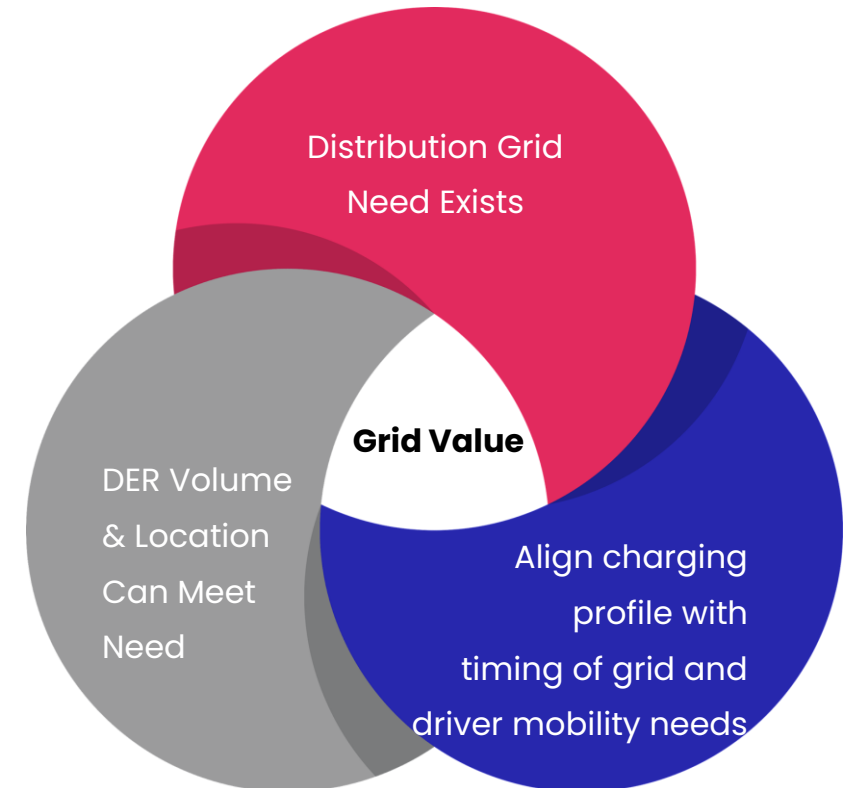- No standard for load management on both sides of the meter.

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OpenADR 3.0

- API based – more developer friendly
- Websockets – push not pull
- More scalable
- Lower latency – supports real time operations
- More flexible

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Accelerate the standardization of real time DER interoperability at the distribution level

Increase EV charging hosting capacity, reduce congestion, & enhance demand response

- Know the location and capacity on the distribution grid

- Make resource availability visible in real-time

- Coordinate EV charging schedules

Monetizing Power Flow

Distribution Grid Need Exists

DER Volume & Location Can Meet Need

Grid Value

Align charging profile with timing of grid and driver mobility needs

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ESX overview

ESX enables grid operators, DER service providers Charge Network and Charge Station Operators to dial down demand within a distribution zone via an open API.

Deliverables include:

- A hosted energy services exchange
- A public set of open APIs
- Standardized report types, in the form of energy service contracts, to provide:

  - real time EV charging load
  - short-term (next day/same day) forecast
  - resource availability
  - resource commitment
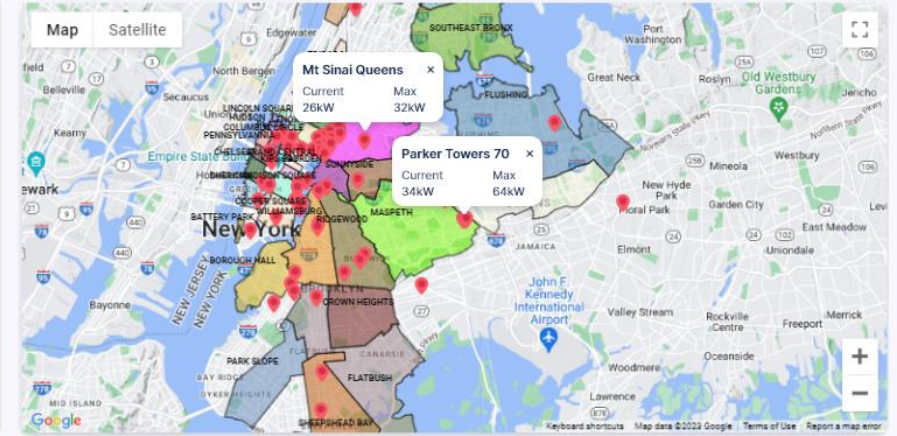 - proof-of-service delivery
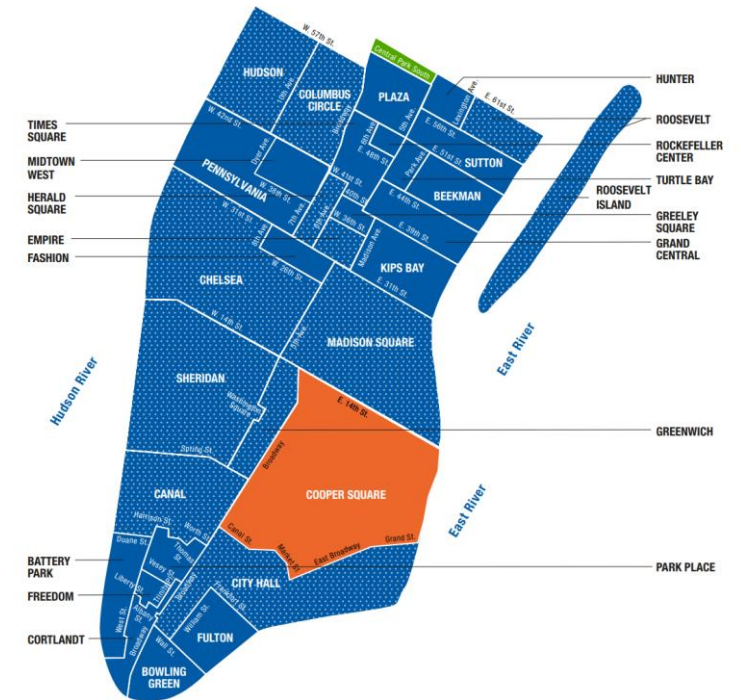
ESX POC Deployment

conEdison

- 1,100+ EVSEs

- 7+ MW Max Power

- Aggregate load in 82 Zones every 15 min

- Based on OpenADR 3.0

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Constraints Liberate, Liberties Constrain

Runar Bjarnason

ESX extensions of OpenADR 3.0
Constraints that liberate

- Standardized report and payload types
  - What resources are available where and when
  - 5 report types: Demand, Forecast, Availability, Commitment, Proof-of-Service (M&V)
  - Common payload structure mirrors SCE/National Grid EV charge session reporting requirements
- Match resources to the grid topology
  - Coordination Node is a geospatially defined area. It is both a Parent (VTN) and Child (VEN)
    - Can support granular resource visibility – at a substation, feeder, or circuit level
  - A VEN a local coordination node at a PCC/POI
- Clarify roles across the value chain
  - DER Service Providers, Charge Network Operators (CNOs) and Charge Station Operators (CSOs) publish their data collection in real-time aggregated by zone (Coordination Node)

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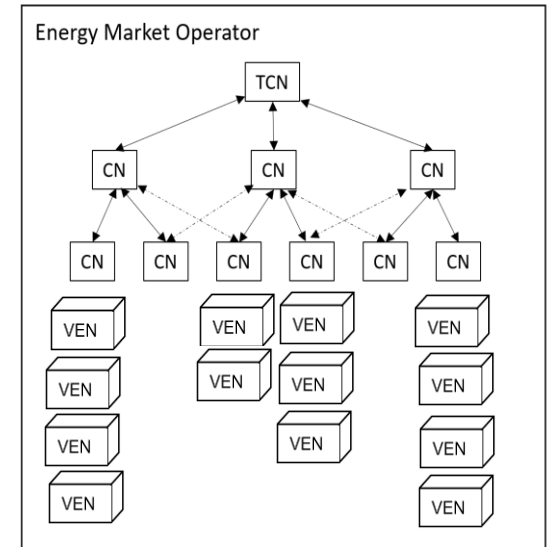
EV Charging & The Grid

01 **EV Growth** New demand can increase faster than the local utility infrastructure.

02 Shift to renewables – greater supply variability.

03 Managed charging can meet the challenge.

04 Generate additional revenue for charge station operators.

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