

# BCIT NRCan EVID Project Workshop Session 4: Utility Demand Response

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# Agenda:

- What is Demand Response?
- What is OpenADR?
- How does this relate to EV Charging?
- Our Demonstration
- Q&A

AGENDA



# What is Demand Response?

- Wikipedia definition: a change in the power consumption of an electric utility customer to better match the demand for power with the supply
- Also called 'peak shaving' and 'load shifting'



# What is Demand Response?

- Not everywhere has the luxury of hydro generation
- In many jurisdictions, power is generated using coal or nuclear, which do not “throttle” well to match demand
- Varying output of these plants can cause thermal issues that reduce the longevity of the (very costly) plant



# What is Demand Response?

- If electricity generation (supply) is constant, but demand fluctuates, it can pose a problem
- Demand Response (DR) helps better match supply and demand by curtailing certain loads when demand on the grid is high



# What is Demand Response?

- Some electric utilities use time-of-use tariffs to do Demand Response
- Tariffs are high during peak demand events, and reduced for off-peak hours



# What is Demand Response?

- Typically, utilities enter into agreements with large commercial customers
- Customers receive a financial incentive to respond to Demand Response events



# What is OpenADR?

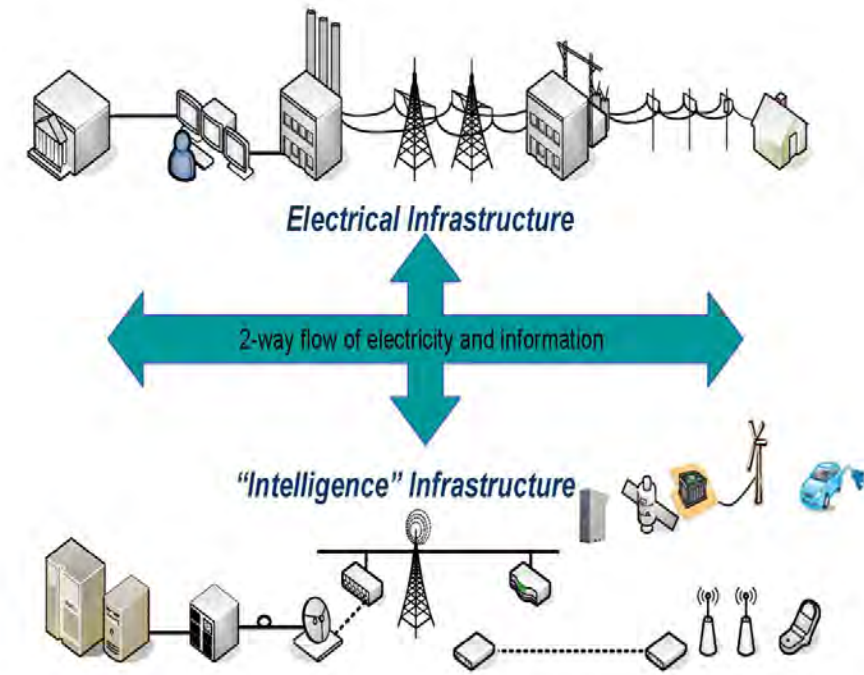
- Stands for Open Automated Demand Response
- A research and standards development effort for energy management led by the OpenADR Alliance
- Open, highly secure, two-way information exchange model and global Smart Grid standard



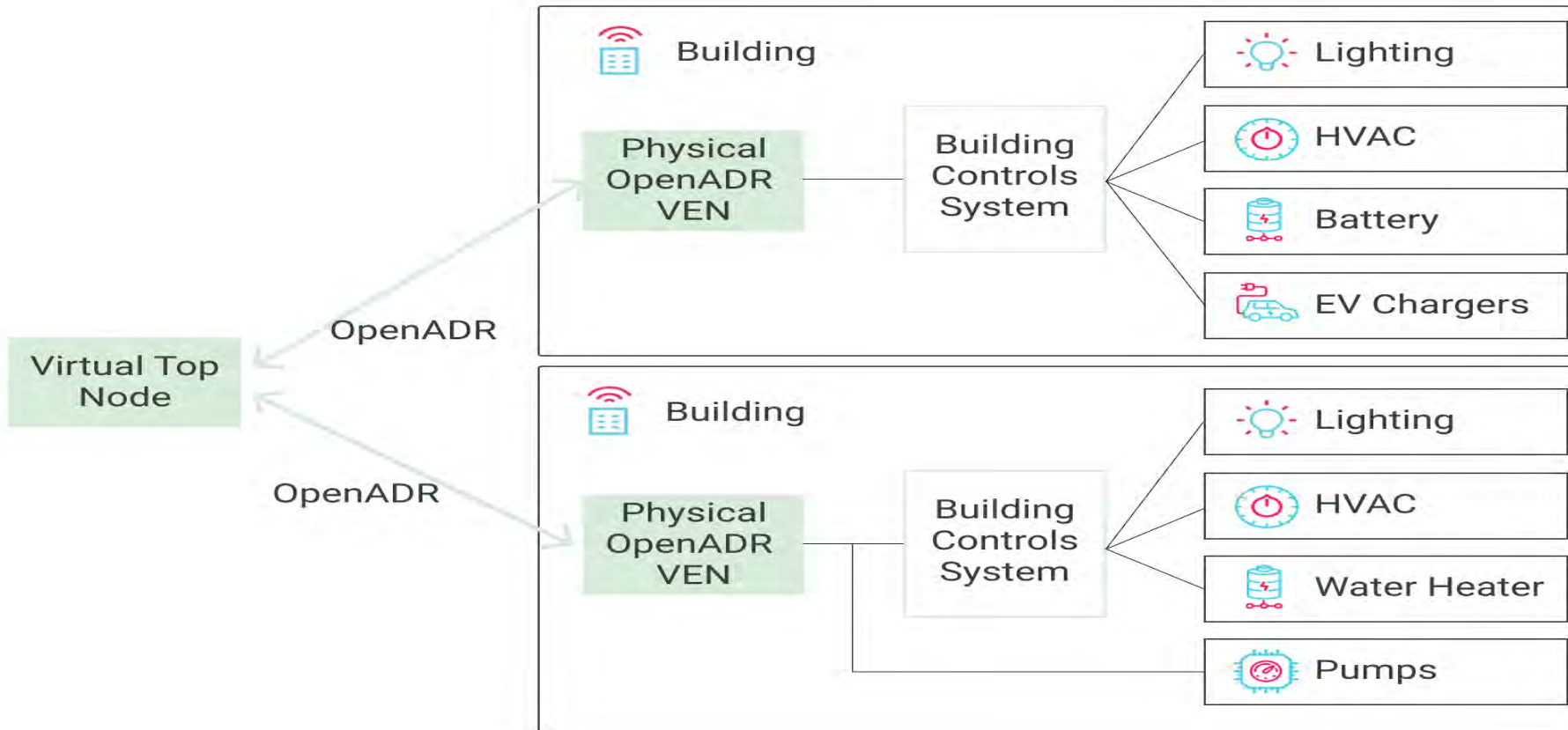


# What is OpenADR?

- Sends information and signals to cause loads to be curtailed during peak demand
- Allows utilities visibility into the demand side of the equation, and the ability to reduce demand



# What is OpenADR?



# How does this relate to EV charging?

- Collections of EV chargers can represent significant load on the grid
- EV adoption is expected to grow significantly in the future, especially with the coming ZEV mandates
- Ability to construct new generation plants takes a long time, where DR for EV chargers can be implemented now



# Our DR Demonstration

- BCIT used our collection of ten EVSEs in our 'Energy OASIS' system as a test bed for Demand Response
- Our software development team created an OpenADR "Virtual End Node" (VEN) component in our EV Network Management System (NMS)



# Our DR Demonstration

- Our local utility, BC Hydro, scheduled OpenADR events
- Initially, BC Hydro would email us the day before an event, and we would opt in or out, and use Nebland (now Gridfabric.io) OpenADR software as a “Virtual Top Node” (VTN) to generate the events and send them to our OpenADR VEN

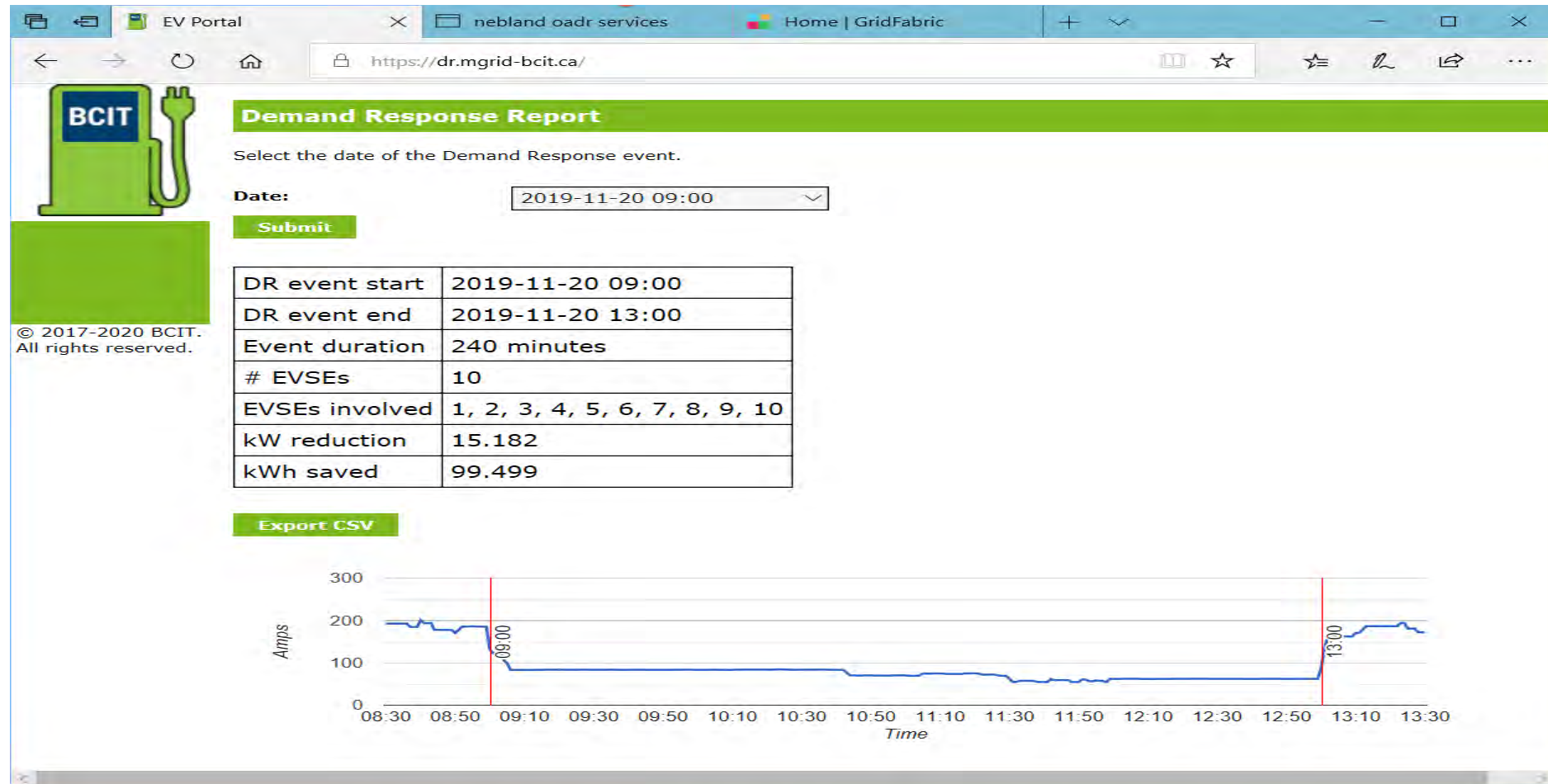


# Our DR Demonstration

- In the second year of the demonstration, BC Hydro used their own Gridpoint software to automatically generate and send the events to our VEN
- BCIT's NMS would receive the events, and throttle the EVSEs to roughly half the baseline load recorded in the half-hour before the event



# Our DR Demonstration



# Our DR Demonstration

- In the first year of the demonstration, BC Hydro created 15 DR events
- BCIT participated in all 15 events
- Total reduction in demand of 1,088 kWh
- In the second year, BC Hydro created 38 DR events, with a reduction of 463 kWh
- 2<sup>nd</sup> year was greatly affected by COVID





# Q&A on Utility Demand Response

