

NIAGARA SUMMIT

CONNECTING THE WORLD

Niagara EV Charge Control

Andy Abrams – Control Dynamix



EV Acceptance Growing

- Becoming Cost competitive
- Less projected maintenance cost
- Lower fuel cost
- Environmentally friendly
- Growing fleets Busses, route delivery, local service vans



Comparison assumes a 27 mpg gasoline vehicle (average compact fuel efficiency) and an electric vehicle efficiency of 0.34 kWh/mile (Nissan Leaf). Sources: EIA 2013a; EIA 2013b; EIA 2013c. © Union of Concerned Scientists 2013; www.ucsusa.org/htobenefits







Load Curve

The controlled variable:

- Square
- Charge then trickle
- Vary by vehicle manufacture





TRIDIUM 4

Fleet Load Curve







Utility Tariff Considerations

- Significant additional load to facility
- Existing tariff may not match EV loads
- Tariffs often include factors for:
 - Kwh consumed
 - Time of day
 - Peak Kw
 - value and time of day
- Location of facility matters
- No payback / no controls



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User considerations

- Range anxiety trumps all
- Operators:
 - Don't care about peak kW charges
 - Make mistakes damage cords, forget to charge, park at different EVSE
 - May prefer other vehicles
- Inconsistent schedules vary by day, weather, route, special events, HR







Control Goals - EvMetrix / EvAuto

- Ensure vehicles are charged when needed
- Alert users about charge issues
- Peak Load Management
- Shift charge time to off peak
- Provide data tariff selection, fleet management
- Demand Response
- Assist with maintenance diagnostics







3 Generations of Niagara Controls

2010 - 2018





First Generation

- Lynxspring JENE 6000
- Veris 8100 meter
- NRIOs 2 EVs per device
- Customer Network









Second Generation

- Soft JACE on Lanier Industrial Solid State PC
- EasyIO 30P 4 EVs per device
- DENT PowerScout 24
- Cellular connection







Current Version

- Lynxspring Edge 534 / Onyx 3410
- DENT PowerScout 3037 located inside distribution panel
- 5 Vehicles on JACE and 5 per I/O Panel
- Hawkeye CT
- Cellular Modem







Summary

- Cost control is significant:
 - Locate in 1 cabinet
 - Design for installation by site electrician
 - Remote Commission
- Gather significant data to support Tariff analysis:
 - Power and Energy kW, kWh, Daily peak
 - Time Arrival, Departure, Loading, Charge duration, trickle duration, daily peak kW time
- Alarming No-charge alarm / EVSE fault / Power Loss
- Scheduling doesn't work, but sequencing does
- Similar requirements Fleet cars, apartment and office parking garages







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