



Electric Vehicle Infrastructure Planning





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31 YRS
Industry
Dioxide Experience
Reduced

\$1.7 BIL
Energy Saving
Projects

1,000s
Buildings
Optimized

600+
Veregy
Professionals

8 BIL
kWhs of
Energy Saved

20 BIL
Gallons
Water Saved

12.4 BIL
Carbon
Pounds



Key Steps To Transition Fleets to Zero Emission Models

- ✓ Opportunities coming to transition fleets to battery electric models
- ✓ Cost benefits associated with EVs compared to gas/diesel counterparts
- ✓ Fleet Transition and Infrastructure Assessment Plans
- ✓ Grants and the importance of the grant writing process
- ✓ Infrastructure Planning and Potential Costs
- ✓ Solar, battery storage and other grid resiliency options

Goals of the BID

- Accelerate the adoption of Electric Vehicles (EVs) & enable 50% of new vehicle sales to be electric by 2030
 - 20% of school buses will transition to zero emission models (95,000 buses)
- Reduce transportation-related emissions & put America on path to net-zero emissions by 2050
- Position U.S. industries to lead global transportation electrification efforts and create good jobs
- Targeted equity benefits for disadvantaged communities, reducing mobility and energy burdens

Unprecedented Federal Investments in Zero Emission Technologies

- Transit (\$7B)
- Clean School Bus Program (\$5B)
- National EV Infrastructure Formula Program (\$5B)
 - Illinois will receive \$149M in formula funds for public charging stations
- Charging Infrastructure Competitive Grants (\$2.5B)
 - Community EV Charging Stations
 - Corridor EV Charging Stations

ZEVs reduce Green House Gas emissions by 50% compared to ICE counterpart (energy.gov)

Cost to charge a ZEV is 60% cheaper than ICE counterpart (energy.gov/maps/egallon)

Average cost per mile to maintain a ZEV is 40% less expensive than ICE counterpart (energy.gov)

- BEBs do not require a mid-life overhaul
- Fewer moving parts and less fluids to change
- Extended brake life due to regenerative braking systems



Infrastructure

Smart
Charging

Utilities

Pilots

Chargers

Training

Telematics

Financing

Charge at
Home

Workplace
Charging

Microgrids

Cost to Entry

Fuel and
Maintenance
Savings

Cyber Security

EZ Button to EVs

Veregy simplifies the process of transitioning to Electric Vehicles

Turnkey EV Design Build Services:

- EV Charger Design Services
- Electrical Infrastructure Assessments & Upgrades
- General Contracting and Construction Management
- Operations and Maintenance Services
- Software Platform Integration Services
- EV Charging as a Service Financing Models Available Upon Request

Administrative/Consulting Services:

- Fleet Transition Planning
- Grant Writing Services

Distributed Energy Resource (DER) Solutions:

- Solar
- Battery Storage
- Microgrids

Road to EV Adoption

Plan

- Start the EV planning process now
- Work with experts in EV infrastructure to develop infrastructure plans
- Think long term

Secure Financing

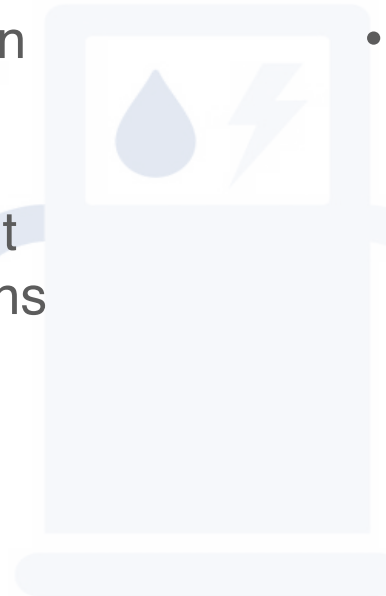
- Invest in grant writing services
- Utilize plan to bolster federal or state grant applications
- Line up matching funds

Pilot/Implement

- Conduct a pilot when applicable
- Implement a phased approach -- infrastructure is tied to fleet replacement schedule

Adopt

- Work toward full EV adoption & integration
- Track EV performances and progress toward sustainability goals
- EV adoption is a journey not a destination



- Fleet & Operations Summary
- Infrastructure Assessment & Energy Audit
- Potential Funding Sources
- Fleet Replacement Quantities & Timeline

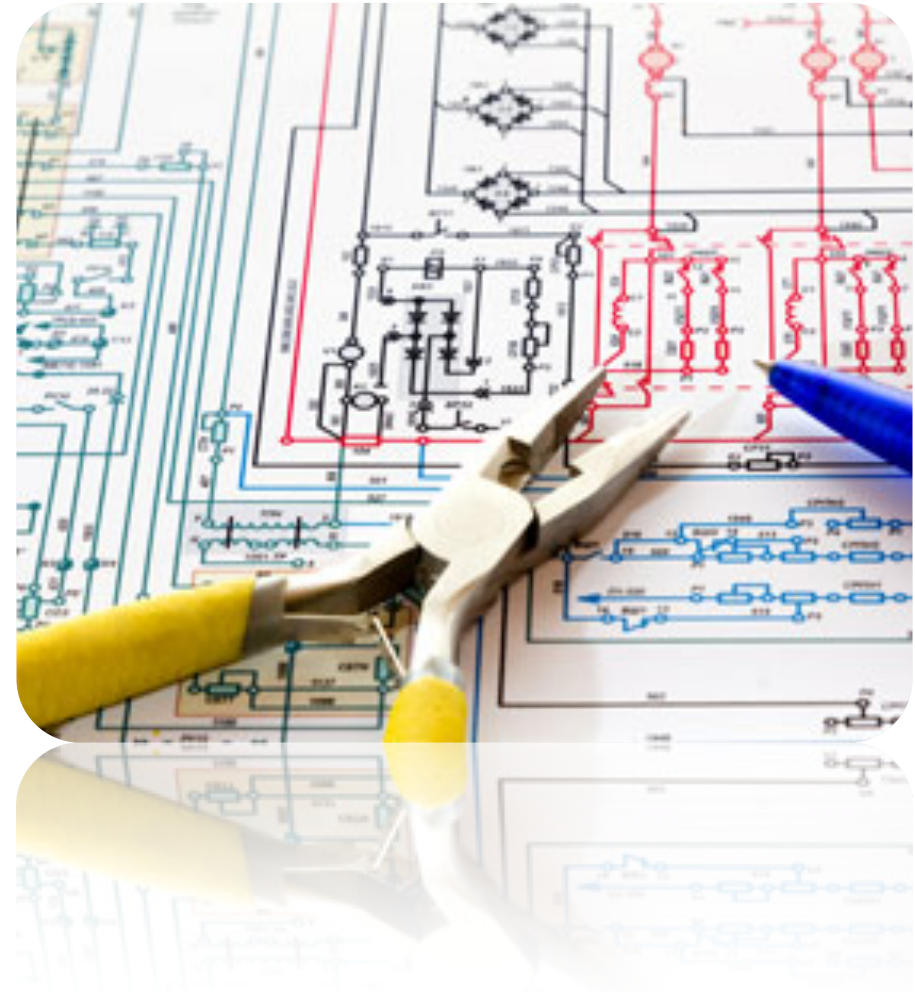


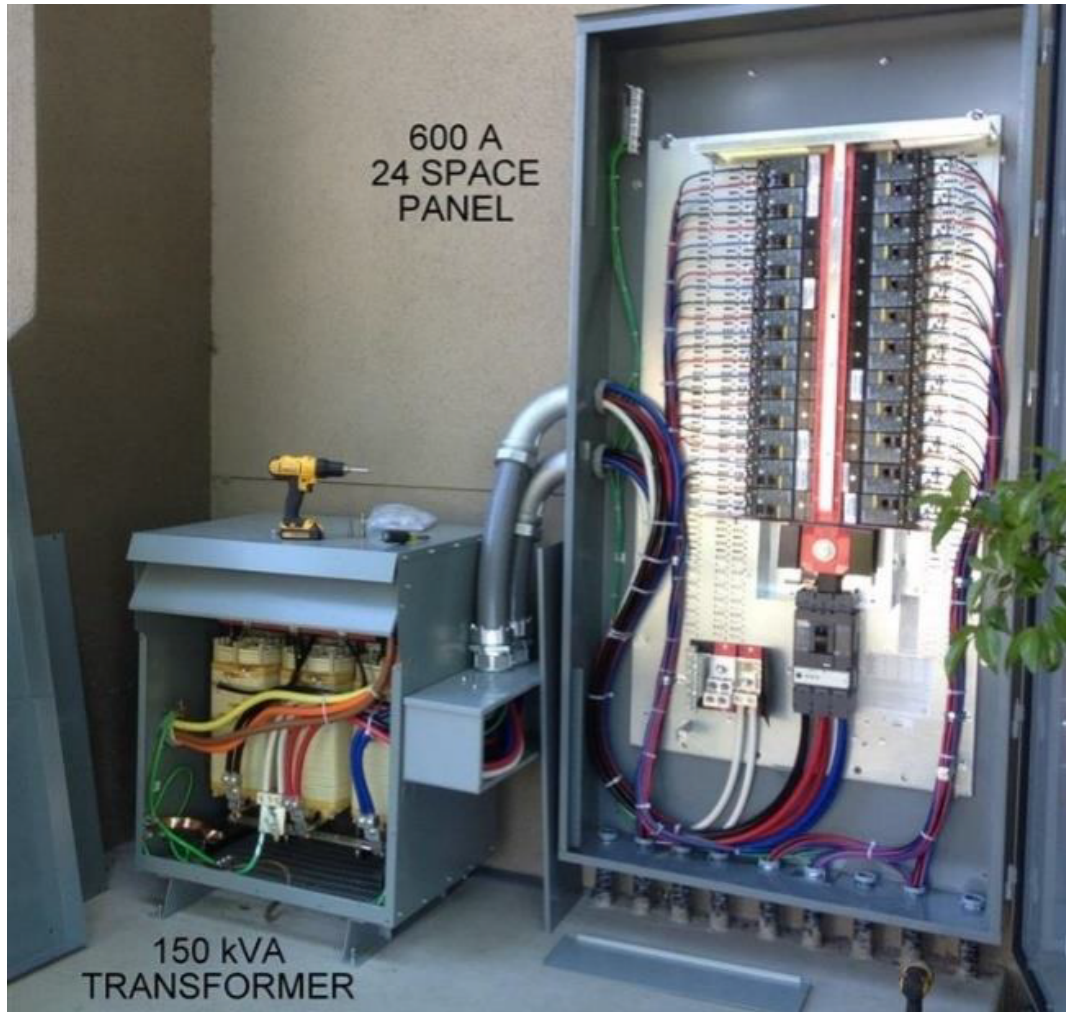
- Infrastructure & charging designs that support fleet & public charging stations
- Rough Order of Magnitude cost estimates for Fleet & Infrastructure
- Phased Implementation Plan that Matches Fleet Deliveries



Infrastructure Planning

- Start infrastructure phase before you order vehicles
 - Allow a minimum of 9-12 months from contract award to completion
- Steps include design, bids, permits, construction, and commissioning
- Make sure your plan includes operator and mechanic training
- Completion of project should align with arrival of first ZEV





Battery Chargers

Level 2 (AC) Chargers

Workplace, retail, parking lots, fleet & bus depots

- Single or dual port dispensers
- 7.2kW to 19.2kW charging loads
- Each port requires 30A to 100A branch circuits
- 208 V /240V 1-Phase AC
- 480 V service requires transformer to step down power
- 10 to 25 miles of range per charge hour

Level 3 (DC) Fast Chargers

Public charging stations, bus & truck depots

- Single or dual port dispensers
- 60kW to 200kW
- Each port requires 100A to 200A branch circuits
- 480V 3-Phase AC
- 60 to 150 miles of range per charge hour



Potential Infrastructure Costs

Rough Order of Magnitude to charge 10 ZEVs (\$500,000)

- Electrical Equipment Upgrades (\$300,000)
 - Service Entrance Section (Electrical Panel)
 - Transformer(s), switchgear, breakers, controls
 - Electrical conduit, wire, connectors, and charging installation
- Concrete and/or underground boring (\$50,000)
- Chargers (\$100,000)
 - 5 Dual Port Level 2 chargers
 - 1 single port DC Fast charger
- Miscellaneous Fees (\$50,000)
 - Engineer/design
 - Permits
 - Project Management



Do you have a good grant writer on staff?

- Grant writing is often overlooked and delegated to inexperienced staff members
- Investing in the grant development process is critical to maximize funding opportunities
- Consider hiring experienced consultants to increase your odds. Veregy offers free grant writing for our clients.
- Always include your fleet transition plan with your grant applications

Conduct Electric Vehicle Pilot

When time and funds are available:

- Purchase small quantity of ZEVs (1-5)
- Operate on a variety of duty cycles
- Evaluate performance (range, state of charge, comfort, features, maintenance & fuel costs)
- Gather feedback from operators, mechanics, staff, and stakeholders



Full Fleet Adoption

Work Toward Full Fleet Adoption of EVs:

- Integrate and optimize EV performance by investing in telematics and smart charging software
- Track progress toward sustainability goals and achievements
- Revisit progress and update your EV plan regularly
- EV adoption is a journey not a destination
- Continue to evolve and grow your efforts over time

Long-Term Strategies

- **Solar** array can provide a large percentage of energy needed to electrify buildings and future EV Fleets
- Clean form of renewable energy source
- Multiple financing options available to municipal customers



Battery Storage & Microgrids

- Microgrids are independent energy systems that combine an off-grid system, an on-grid inverter system, and battery backup (for peak demand, nighttime, and/or off-grid use).
- Designed to operate either in grid-connected or off-grid mode.
- Grid-connected microgrids can also disconnect themselves completely during utility disturbances, a feature called “island mode.”



Benefits of Regional Planning

- EV Infrastructure is new and it is a rare opportunity to build a network from scratch
- The benefit of this group is planning **TOGETHER** as a region
 - Appoint leads from each agency
 - Look for an expert partner to assist in leading the process
- Share charging stations with neighboring governments
 - Reduce costs (short and long-term)
 - Joint grant applications more attractive
- Look for locations that can be shared with the public during the day
 - Make EV attractive to residents
 - Revenue source

- Start the EV planning process now; plan for the long-term
- Work with experienced professionals to maximize opportunities
- Take advantage of grants and rebates
- Work with your neighbors to reap benefits of regional planning
- Implement a pilot when possible
- Develop a phased infrastructure approach to ensure success
- Work toward full fleet adoption & track performance and progress

Interested in working with Veregy to develop EV Infrastructure Solutions?

✓ Complete the Municipal Fleet Questionnaire and return it to Jennifer Maltas a jennifermaltas@outlook.com



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THANK YOU!



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