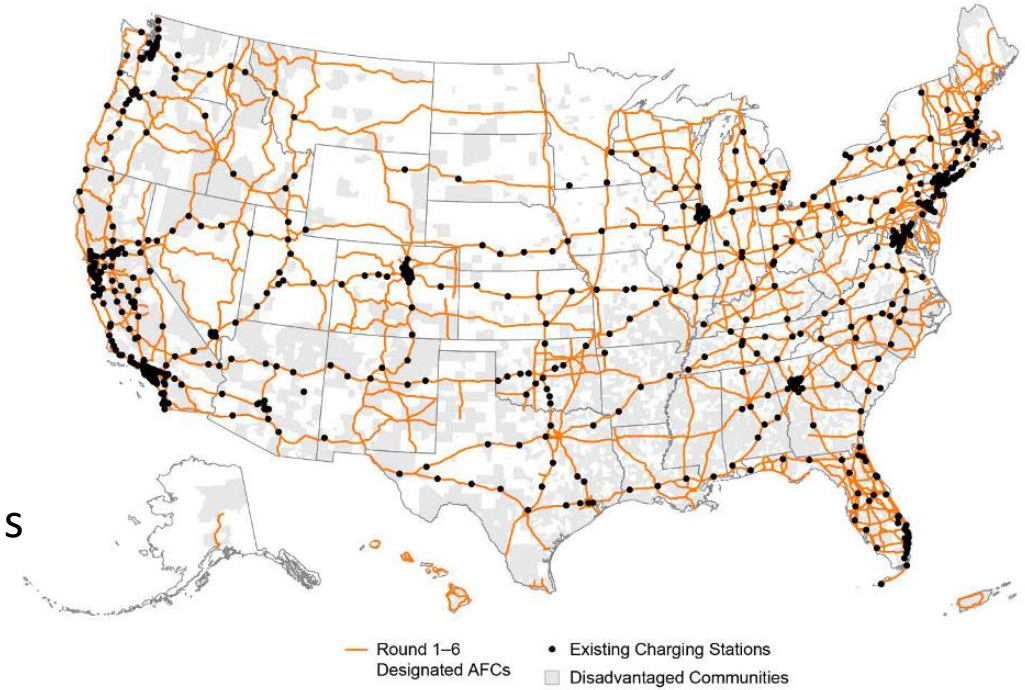
EV Industry Innovations

- **EVSE Network Expansion –** National charging networks provide convenience to owners. Scheduling, rate structures, and locating services ease owner transition to EV charging.
- **Energy Management Systems –** Multi-family housing, fleet charging, and public charging will utilize EMS to manage electrical demand and reduce infrastructure costs.
- **Solar + EVSE –** Solar carports help offset electrical demand on EV charging while offering protection from the elements.
- **ESS + EVSE –** Energy storage can reduce demand charges on facilities for large EV fleet operations.
- **V2X –** Stored energy in vehicles can provide back-up capabilities and grid services.

EV Network Expansion

National Electric Vehicle Infrastructure Program

- $5B Federal EV infrastructure incentive
  - Up to 80% of installation costs
  - Funding distributed as Grants by the State
- Requirements include:
  - Located within 1 mile of established AFCs
  - Not be more than 50 miles between stations
  - At least (4) 150 kW DC Fast Chargers
  - Conform to Open Charge Point Protocol
  - 97% or better uptime
  - Available 24/7 with site lighting dusk to dawn
  - EVITP Certified Electrician
  - Prevailing Wage for all associated work

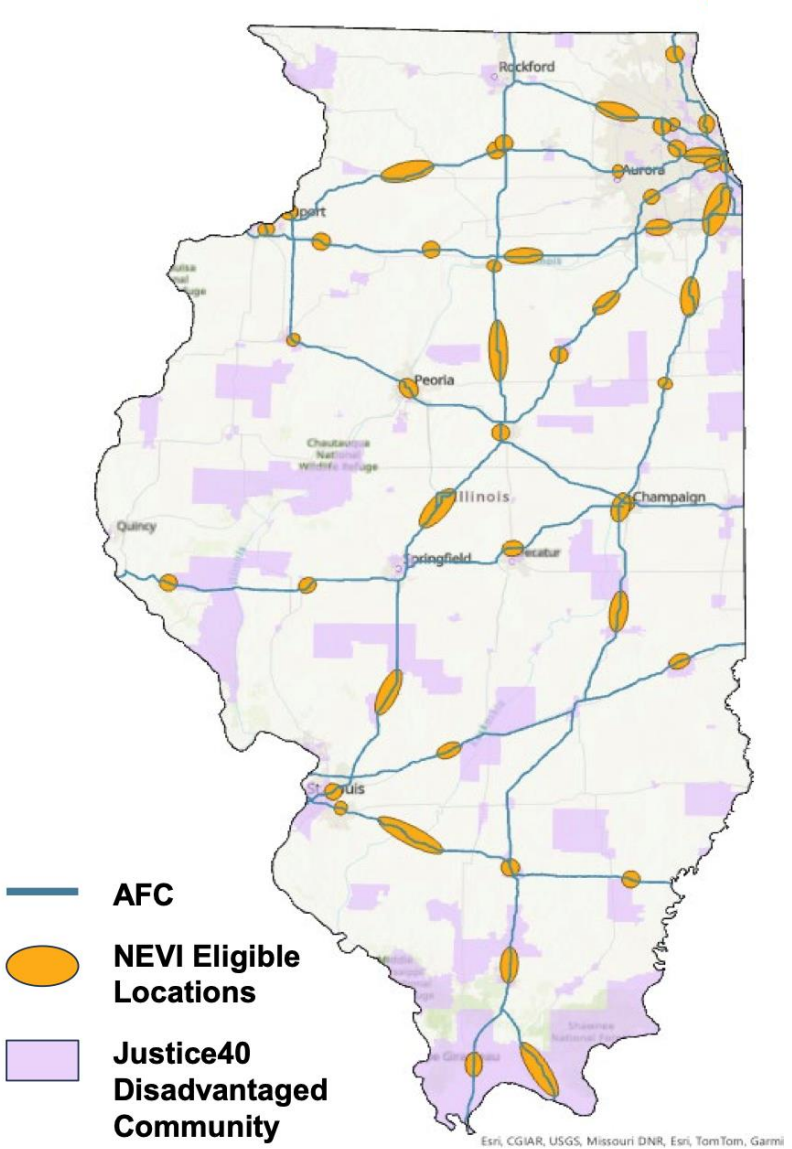


ILLINOIS IBEW RENEWABLE ENERGY FUND

EV Network Expansion

IL National Electric Vehicle Infrastructure Program

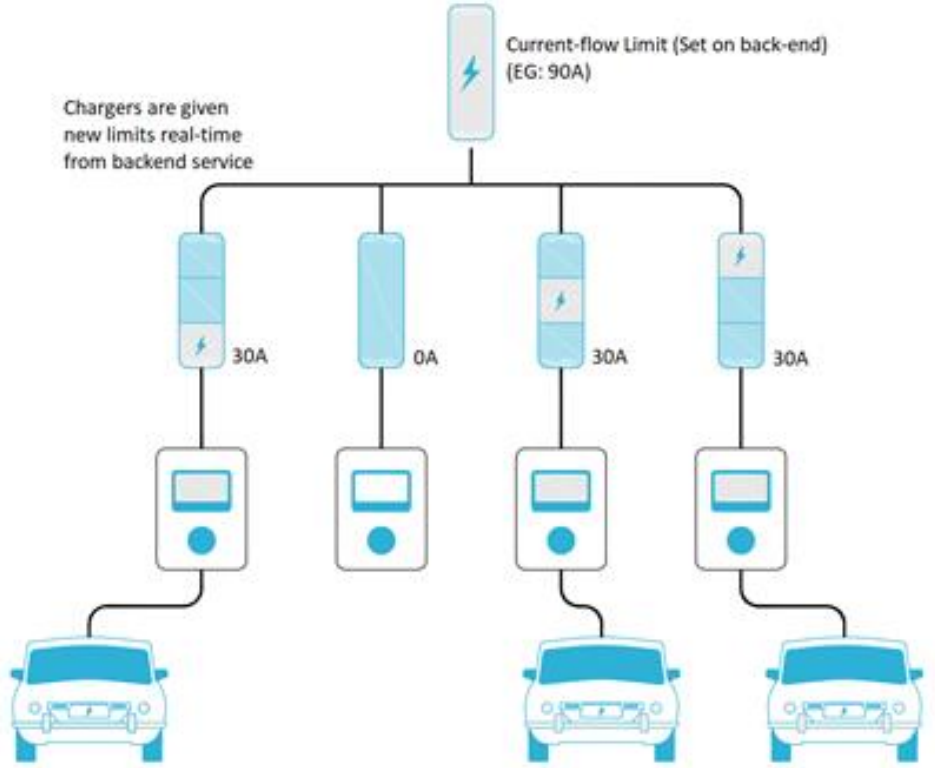
- $148M over 5 years for allocation
- 46 eligible locations identified
- Deadline for applications ended May 7th, 2024
- Initial award announcements by July 2024
- IL GATA training / Federal Grants registration
- All Federal requirements apply



ILLINOIS IBEW RENEWABLE ENERGY FUND

Energy Management Systems

- Energy Management Systems (EMS) are a solution for fleet charging, multi-family housing, and reducing infrastructure costs more multiple EVSE systems.
- Charging levels change based on usage, battery SOC, and available power.
- Several EVSE manufactures have local network control and billing capabilities integrated.



ILLINOIS IBEW RENEWABLE ENERGY FUND

Solar + EVSE

- Home EV charging is driving many consumers to consider adding solar to further offset the cost per mile by generating energy on site.
- Solar systems can be sized to cover the added electrical load based on daily driving habits.
- Solar enabled EV charging systems may be able to increase the level of charge when the solar is producing.
- When charging is performed overnight, ESS or net metering will be required to fuel up with the sun.
- With Electric Vehicle Power Export Equipment (EVPE), the vehicle can be used as an ESS during power outages.

ILLINOIS IBEW RENEWABLE ENERGY FUND

Solar + EVSE

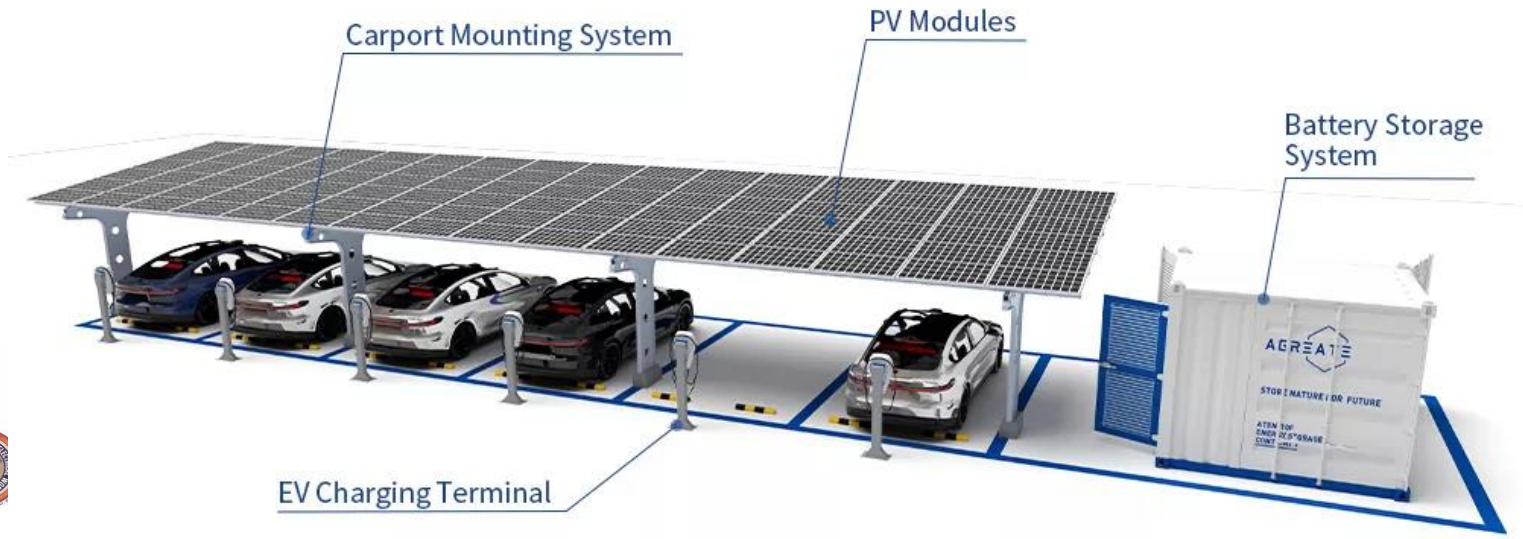
SolarEdge

- SolarEdge was first to market with an integrated EVSE connected to the disconnect on their inverters.
- This offers the ability to share the 40 Amp circuit breaker for both PV inverter output and EVSE usage.
- It also has the ability to “fill in” the remainder of the 40 Amps to the vehicle when the sun is shining.
- The SolarEdge Home EV Charger is a separate unit that can coordinate charging with utility pricing, available load, and Excess Solar Mode.
- SolarEdge recently launched a DC Coupled EVSE to fully integrate with Solar and ESS.

ILLINOIS IBEW RENEWABLE ENERGY FUND

ESS + EVSE

- Energy Storage Systems (ESS) paired with EVSE can offset utility demand charges when multiple vehicles are charging.
- ESS can offer limited charging when utility power is not available or reliable.
- ESS paired with Solar can support clean energy for EV charging.
- UL has released an Outline of Investigation (UL3202) to cover the testing and certification of ESS + EVSE equipment.



ILLINOIS IBEW RENEWABLE ENERGY FUND

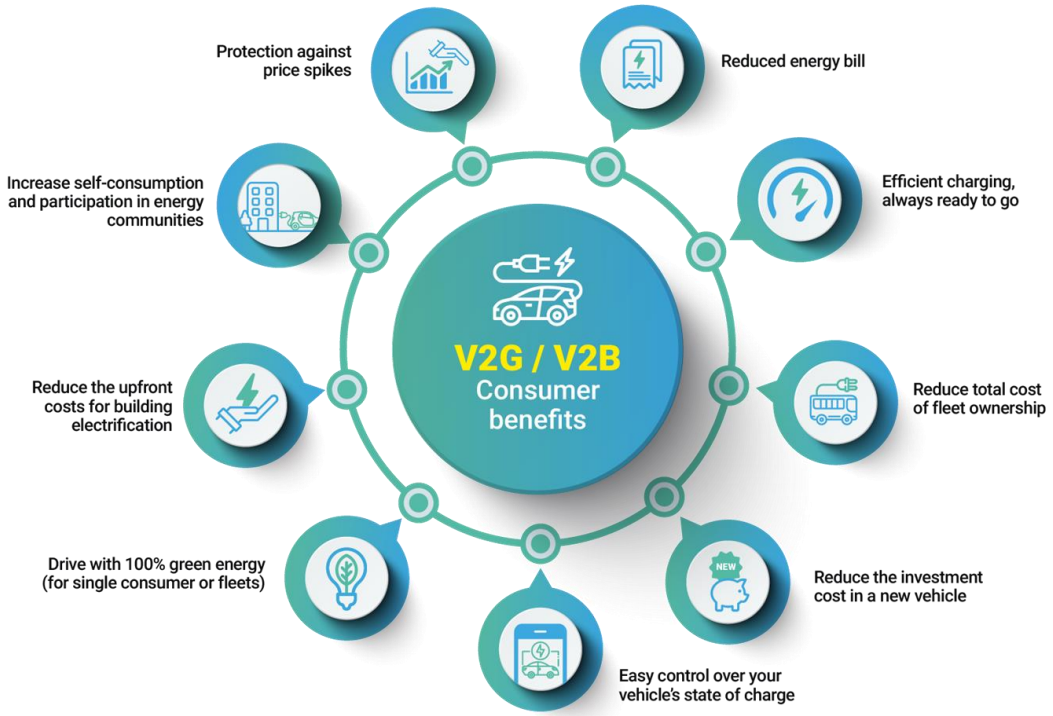
Vehicle to X

Vehicle to Home (V2H)

- EV can provide limited backup power to the home or building during an outage.
- EVPE readily available today.

Vehicle to Grid (V2G)

- Pilot projects have incorporated EV batteries to provide grid support services.
- Large fleets and parking structures are being evaluated for this application.
- Several entities have a stake in this market and will likely take time to establish guidelines.



ILLINOIS IBEW RENEWABLE ENERGY FUND

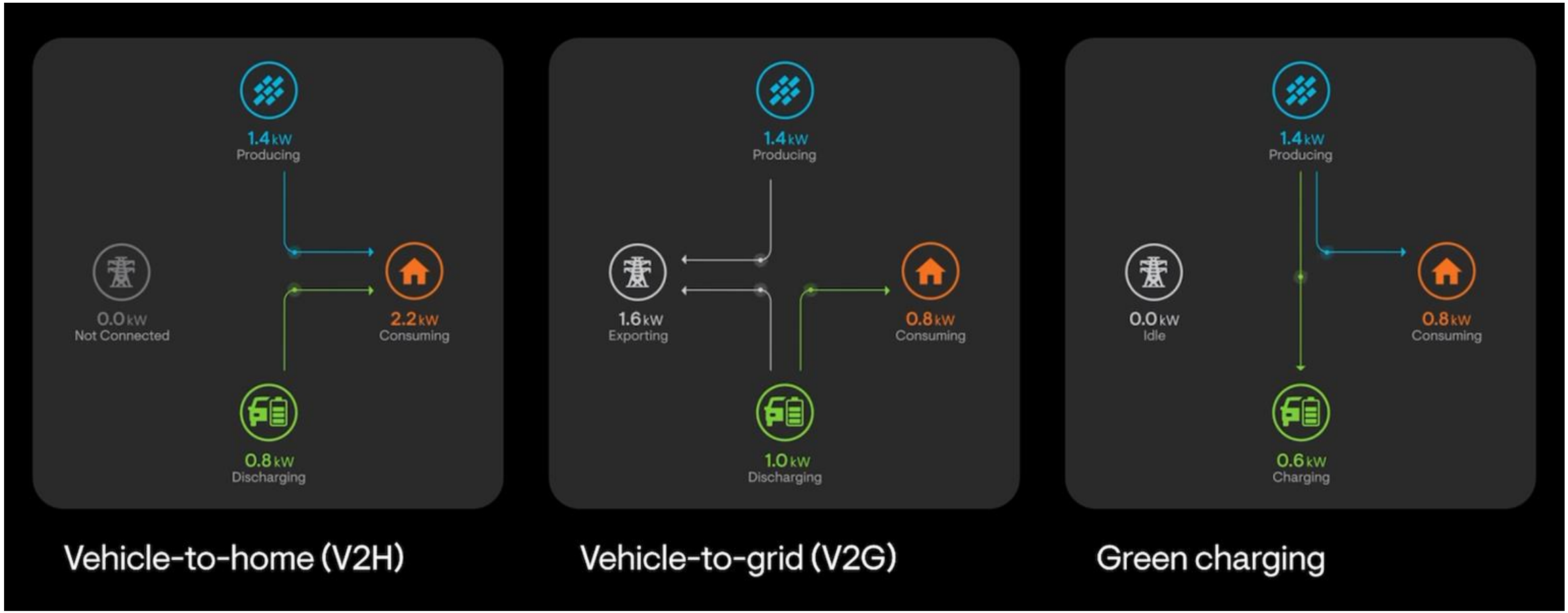
EV Charging Systems
Enphase

- Enphase purchased EVSE manufacturer Clipper Creek and is now releasing new product designed to interface with their microinverters and energy storage systems while providing efficient EV charging and reliability.
- Enphase EVSE will work with IQ ecosystem for load control and with the Enphase App on time of use scheduling.
- Enphase has announced a bidirectional DC EVSE that will provide several features including Green Charging that will only charge the vehicle from the connected solar system.

ILLINOIS IBEW RENEWABLE ENERGY FUND

EV Charging Systems

Enphase



ILLINOIS IBEW RENEWABLE ENERGY FUND