

# The Grid of the Future Starts at Home

Fundamentals of Distributed Power Plants aka Virtual Power Plants



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# Commitment to Our Future, Together

We believe in a customer-led clean energy future

- 2007** Changed solar industry with solar-as-a-service model for home solar
- 2016** Batteries added as option to provide resiliency for homes & the grid
- 2019** Won bid for first residential virtual power plant in wholesale market
- 2021** Partnership to introduce V2H/V2G Ford Home Integration System
- 2023** Running VPPs across the country with tens of thousands of customers

## OUR IMPACT

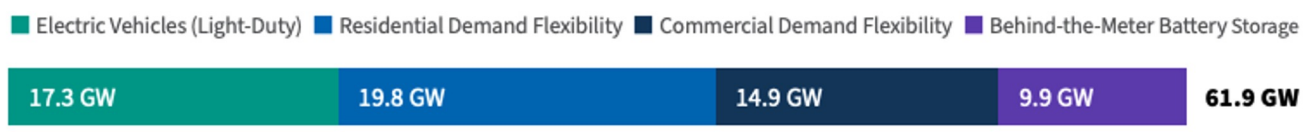
- **6.5 GW** installed solar capacity
- Installing **equivalent of 1 nuclear plant per year** starting in 2023
- Over **900,000** customers; **76,000+** solar+storage systems
- **22 states** plus DC and Puerto Rico



# VPPs unlock clean electrification - keeping costs down and reliability up

- As we electrify the economy, annual national kWh consumption will double. [ReWire America/Saul Griffith]
- If kW peaks continue to rise, then grid costs will grow exponentially.
- VPPs / flexible demand are necessary to smooth, shift, and chase these peaks on a daily, monthly, and yearly basis.
- **80-160 GW of VPPs by 2030 to help address national capacity needs could save on the order of \$15-35B in annual grid costs and will direct grid spending back to electricity consumers. [Brattle]**

## Peak Coincident VPP Capacity – 2030



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# Three Flavors of VPP: Open-Access, Wholesale Markets, Bi-Lateral Contracts; but really batteries/EVs on a timer!



## Open Access

E.g., ConnectedSolutions in MA, Efficiency Maine Trust BYOD pilot, Puerto Rico. Most robust, established VPP program design in country.

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## Wholesale Markets

E.g., ISO-NE capacity market. Very high friction, low value.



## Bi-lateral Contracts

E.g., PG&E Contract with Sunrun - fleet of more than 8,500 customers to provide nearly 30 MW of peak power daily. Peaked at 32 MW. August-October 2023, batteries discharged daily between 7-9 p.m.

2023



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