FREEWIRE

Modernizing the Grid
EV Charging and Energy Storage

Drive Electric PA Coalition Meeting
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FreeWire Technologies

Leading manufacturer of battery-integrated Direct Current Fast Chargers (“DCFC”)

Who	FreeWire was founded in 2014 in San Leandro, California
What	Flexible, turnkey EV charging & power solutions w/ energy storage
Customers	Retail, fleets, public, utility, automotive, workplace, local gov

Investors include:

BlackRock, bp, RIVER STONE, Energy Innovation Capital, ABB, BLUE BEAR CAPITAL, GLy Capital Management, OCTAVE VENTURES

Customers include:

Phillips 66, Road Ranger, TA, American Electric Power, American Red Cross, DUKE ENERGY, massDOT Massachusetts Department of Transportation, TRI-STATE, Rotten Robbie, meijer, Google, NETFLIX, LinkedIn, LA DWP Los Angeles Department of Water & Power, New York Power Authority, MACK

Boost Charger™ in Lodi, CA

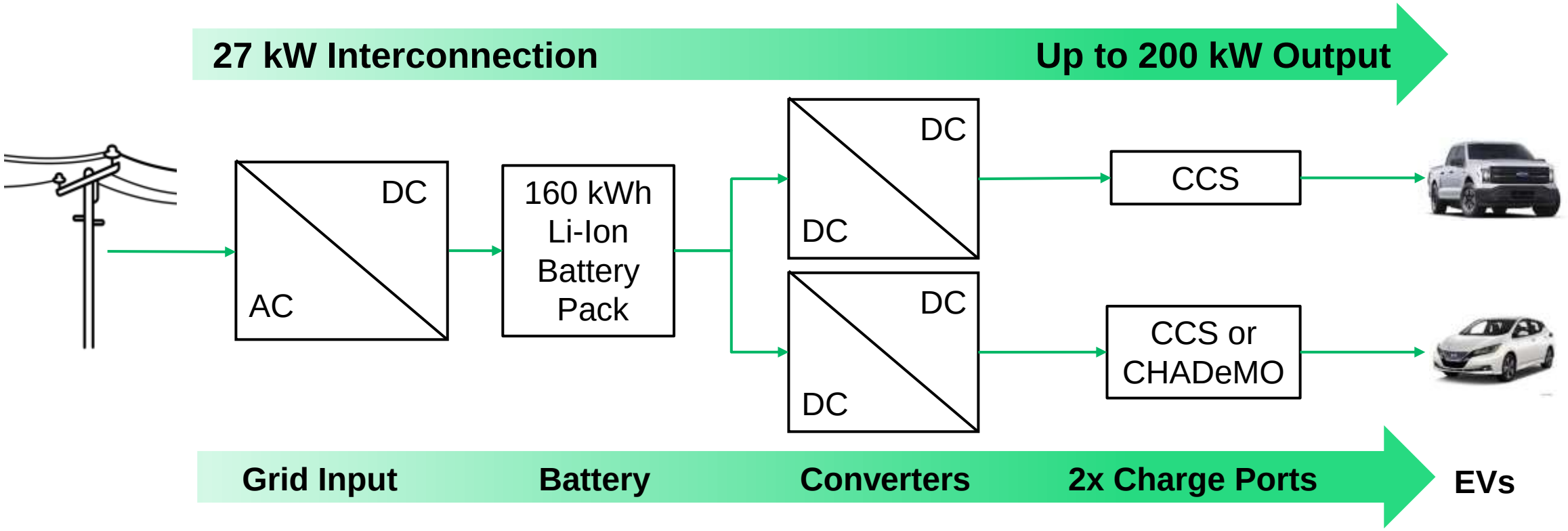
- 150+ units deployed
- 15+ states
- 4 countries

- 27 kW input
- 200 kW output
- Low voltage connection
- 160 kWH energy storage

- Cost effective TOC
- Rapid deployment < 6 months
- Low grid impact

- Demand charge mitigation
- Site and grid power
- Grid down charging

High-power output from battery, buffering the grid

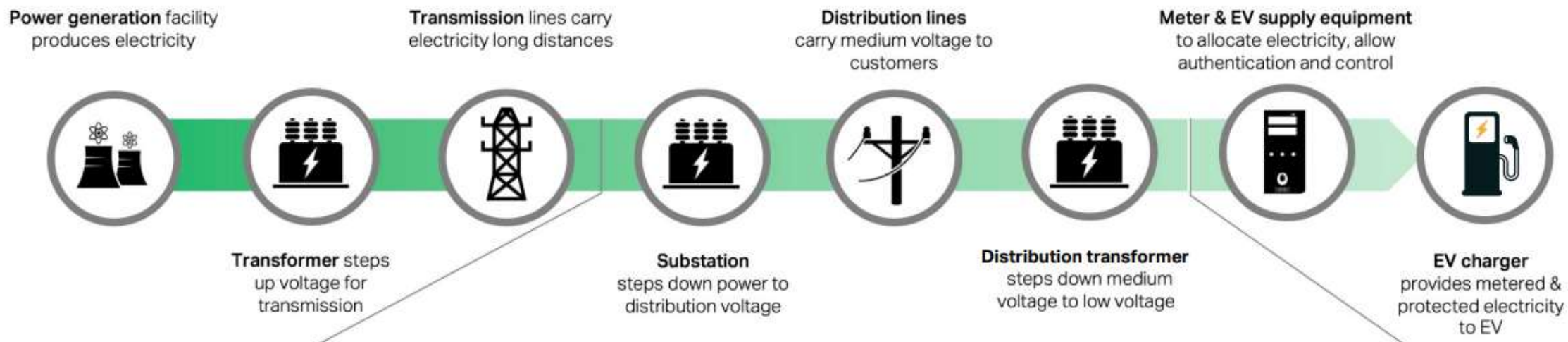


Can charge EVs up to 200 kW with 87% less grid power

Ready for speedy deployment using existing grid infrastructure

Charging Type	Voltage	Amperage	Output Power Range
Level 1	120 volts	15 amps	1.4 kW
Level 2	240 volts 208 volts	32 amps	3 - 19 kW
FreeWire Battery-Integrated EVSE	240 volts 208 volts 480 volts	150 amps 100 amps	200 kW
Conventional Level 3 / DC Fast Charging w/o ESS	480 volts	200 - 300 amps	100 - 350 kW

EV charging using widely available, existing 208 or 240-volt service



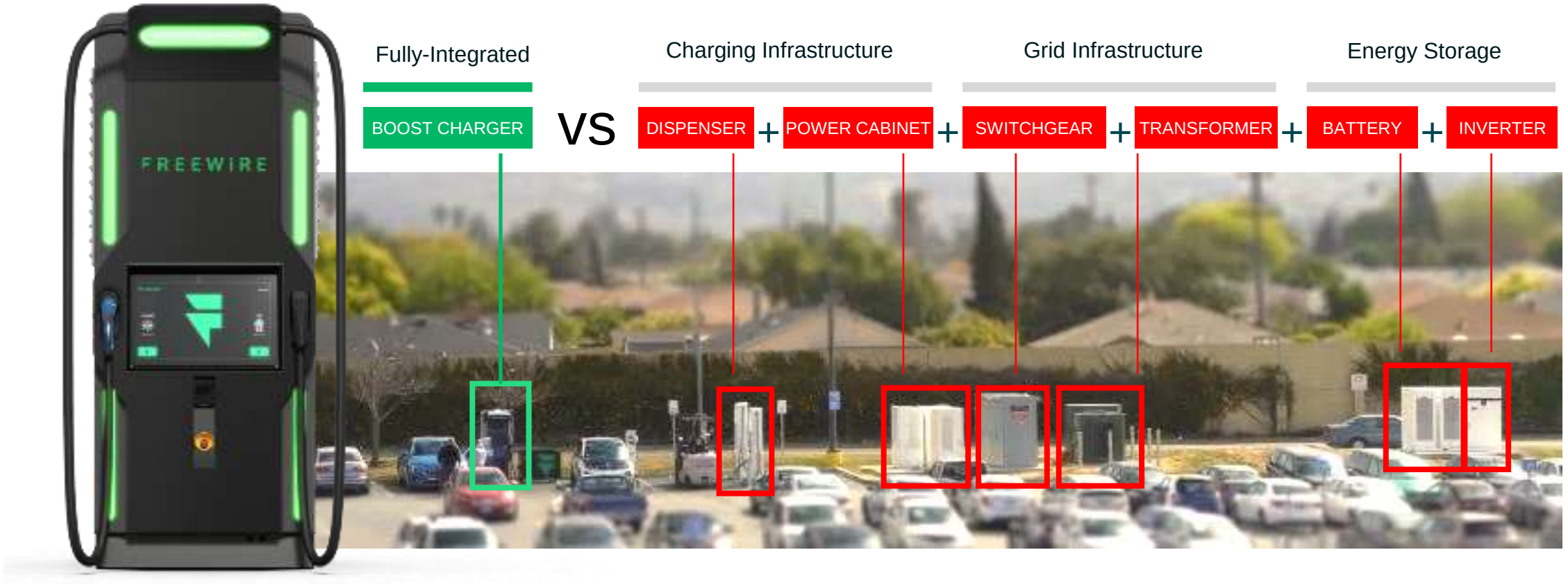
Cost and time of grid upgrades can hold back electrification

COMPONENT	Distribution Substation	Distribution Substation	Distribution Feeder	Distribution Feeder
UPGRADE	Build New	Upgrades	Add Feeder Breaker	Extend or Upgrade
WHAT TRIGGERS UPGRADES	>3-10 MW Added	>3-10 MW Added	>5 MW Added	>5 MW Added
TYPICAL COST	$4-35 Million	$3-5 Million	$400 Thousand	$2-12 Million

COMPONENT	Build New Substation	Upgrade Existing Substation	Add Feeder Breaker	Distribution Feeder Extension / Upgrades	Distribution Transformer
TYPICAL TIMEFRAME (MONTHS)	24-48	12-18	6-12	3-12	18-24

Source: NREL

Fully integrated DCFC solution eases complexity and cost



FreeWire's approach delivers same output with a smaller footprint due to minimized on-site make ready infrastructure

Technology solution to mitigating demand charges

Traditional Charger

Boost Charger

Integrated batteries reduce demand charges and can respond to TOU or other energy pricing mechanisms

Vehicle-to-Everything (V2X)

Vehicle-to-Grid & to-Building (V2G / V2B)

Mobility or backup power, but not both

Charger-to-Everything (C2X)

Charger-to-Grid & to-Building (C2G / C2B)

Resilient charging during power outages

Market and policy recommendations

Recommendation	Benefits	Implementation	Examples
1) Prioritize shovel-ready projects	Quicker deployment of DCFC Accelerated adoption of EVs	Program criteria, scoring, and evaluation	California – CALeVIP
2) Encourage approaches that minimize grid upgrades and impacts	Integration of growing EV load Grid-resilient EV charging	Incentives for load management and DER Commercial managed charging programs	Colorado – EV Fast Charging Plazas (NEVI) New York – NYSERDA DCFC Program, Jan 19th PSC Decision
3) Establish market/policy foundations that support widest range of technology solutions	Increased customer choice Drive cost effectiveness and technology development	Ensure that make-ready and demand charge policies do not distort price signals for innovation	Massachusetts & New Jersey (proposed) – ESS eligible for make-ready programs

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