



The Evolving EV Charging Landscape

Megan Hoyer, Chief Development Officer, ZEF Energy

Kevin Lindley, Product Manager – North America, Kempower

Host: Richard Saipienza, Director Industry Partnerships, NC Clean Energy Technology Center

Format

- Q&A at the end
- Submit questions and comments to “panelists”
- Scheduled for 2:00p-3:00p
- Handout
- Recording





Sessions March-December 2024



Durham Convention Center August 13-15, 2024 Summer

<https://www.sustainablefleetexpo.com/>





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NC Clean Energy Technology Center
Clean Transportation Program

www.cleantransportation.org

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+ About Us



Megan Hoye
ZEF Energy
Chief Development Officer

- 20 years of experience working in EV charging, energy efficiency and construction
- Background working with utilities and local governments on innovative energy planning, EV charging program needs, and public policy improvements
- Lead business development and marketing strategy for ZEF Energy

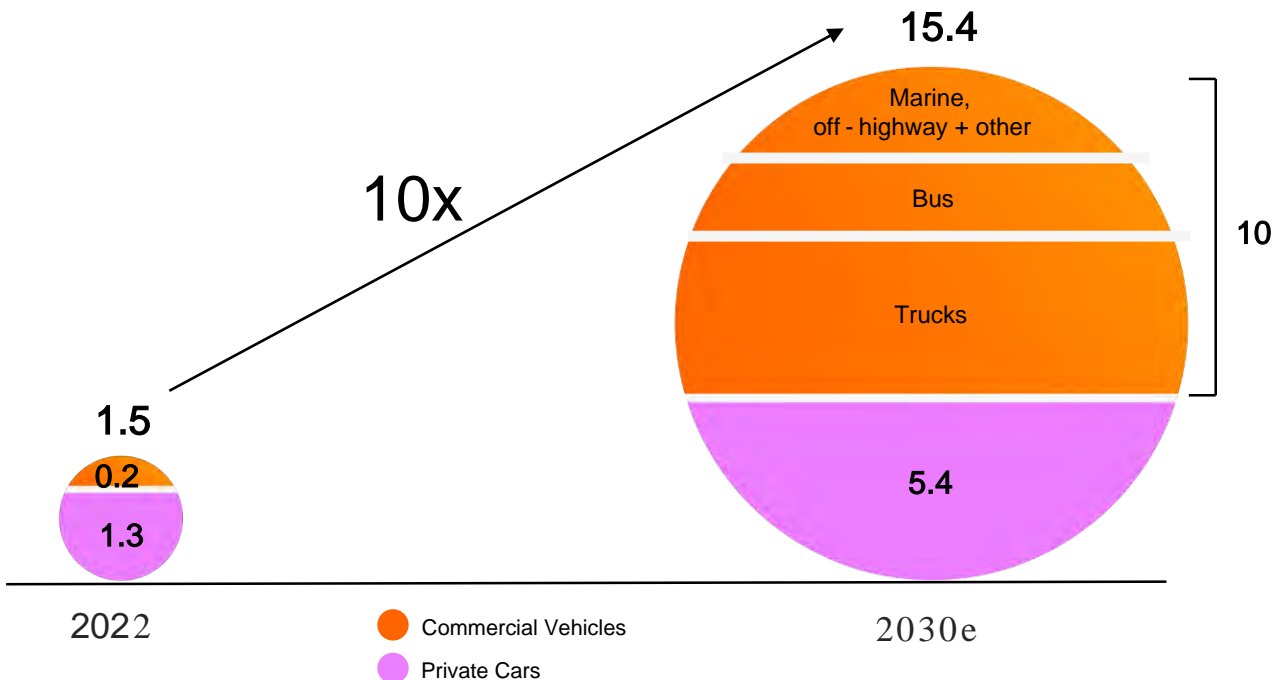


**Kevin Lindley
Kempower**
Product Manager,
North America (HW focus)

- 15 years of experience supporting power conversion products and critical power applications
- Former Technical Leader & Scientist at the Electric Power Research Institute (EPRI)
- Experience in the EV charging industry since 2021, with a focus on DC charging

+ Commercial Vehicles to Become the Largest DC Charging Segment by 2030 in Europe and North America

DC charging market, billions of dollars





Key US Federal Funding Programs for EVs & EV Charging Infrastructure

IIJA/BIL EV- Relevant Funding (over 5 years)

Funding is dedicated to EV Charging Infrastructure

Funding for low/no emission vehicles + EV charging infrastructure

PUBLIC CHARGING

TYPICALLY PRIVATE/DEPOT FLEETS

IIJA: NEVI Formula Program (\$5B)

IIJA: Transit Bus + Facility Grant program (\$5.5B)

IIJA: CFI Grant Program (\$2.5B)

IIJA: School Bus (\$5B)

IIJA: Marine (\$250M)

Inflation Reduction Act (IRA)

- Includes tax credits of up to \$7,500 for individuals and families purchasing an EV
- Includes tax credits for businesses to purchase electric vehicles and EV charging infrastructure

Buy America is compliance required for all IIJA/BIL programs

+ Challenges



Investment

- Can I afford to install what I need?
- Will I make a return on my investment?



Availability

- Are chargers available when I need them?
- Can I meet my charging business needs?



Flexibility

- How do I scale charging with my (EV) deployment?
- Can I support multiple vehicle types and use cases at the same time?

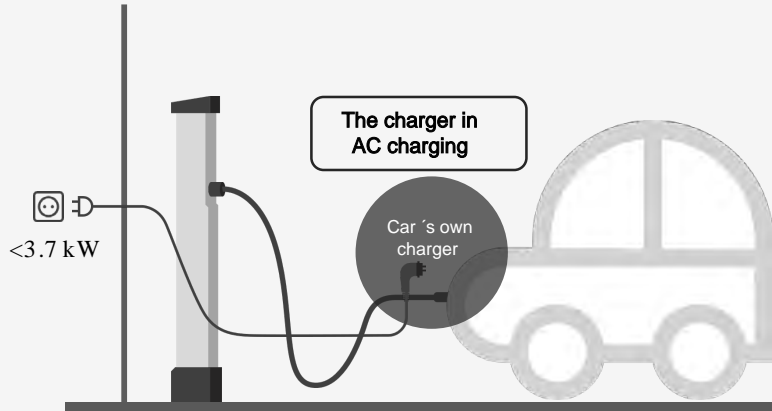


Charging Strategies



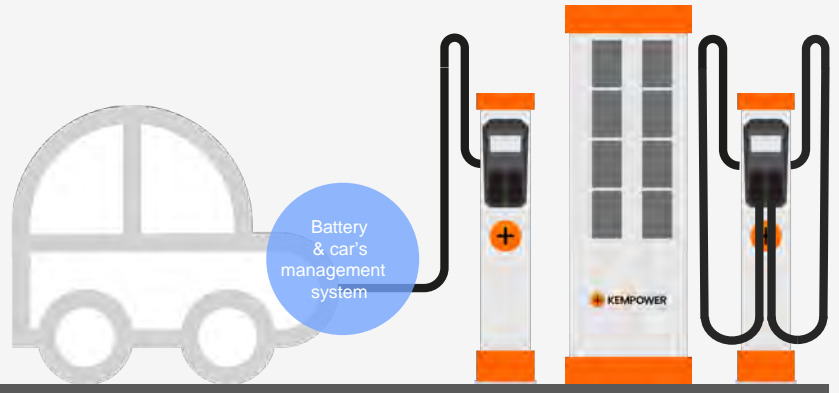
+ AC vs DC Charging

2–22 kW AC charger



Estimated charging time is several hours

50-600 kW DC fast charger



Estimated charging time is minutes, less than an hour

+ DC Fast Charger Types

Standalone / All-in-One



Kempower Station Charger

Distributed Charging System



Kempower Power Unit

+



Kempower Satellite



ZEF ENERGY

Experience from the Field

ZEF Experience

Since 2014 | Minneapolis HQ

>> Driven by Quality,
Reliability & Transparency

>> Nationwide Partnerships
& Deployments

- Employee & Utility Owned
- US-Based Support
- Nationwide Network of Install Partners, Developers & Distributors



155+

Utility Customers



5,500+

Reported Installations

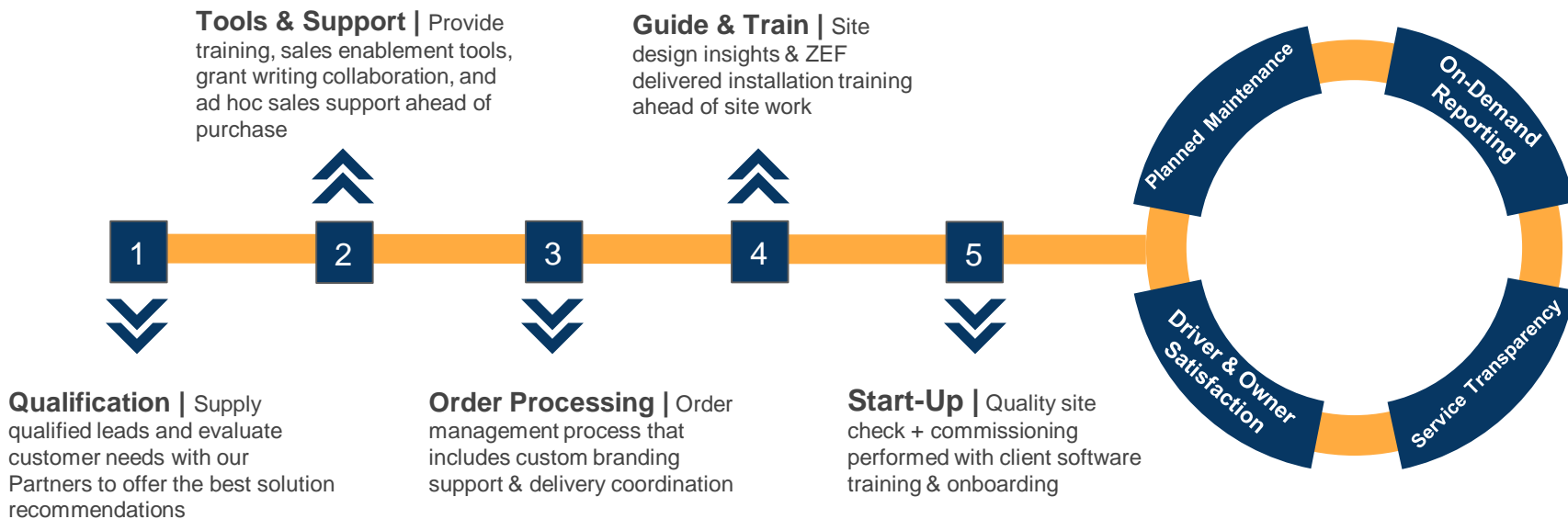
DCFC Target Applications

- Convenience Stores
 - High Utilization Rates through granular power sharing
- Car Dealerships
 - Scalable as their facility & needs grow
- Highway Corridor Projects
 - Major hwy installations (e.g. NEVI)
- Fleets
 - High reliability through redundant architecture & long warranties
- Hospitality
 - Applicable to many use cases (ex. Hotels, Casinos, Retail)
- Healthcare
 - Important to patient experience



The ZEF Difference

Partnership Defined By Quality & Collaboration



5 YEAR ADVANTAGE™

Included with Each
Equipment Purchase

- **5-Year Product Warranty**
- **5-Year Cellular Connectivity**
 - AT&T, Verizon, T Mobile, Sprint & US Cellular
 - Multi-network Failover
- **5-Year ZEFNET Software License**
 - Annual Subscription starting at year 6 - \$13/month /plug
 - Subscription starting at year 6 - \$600 Annually / DCFC Plug
- **5-Year US-based 24/7/365 Tech Support Line**
 - Technical, Software, Driver App, & Partner Support

Installation Nelson's Auto World

Minneapolis, MN

Project Highlights

- 200kW double cabinet
- 4 CCS plugs across (2) satellites - with CC & RFID
- Autobody and fueling station in residential Minneapolis near U of MN campus
- Long-run conduit pull condition
- Want to be able to expand power capacity over time



Installation Fas Mart

Central, WI

Project Highlights

- 100kW single cabinet
- 2 CCS plugs with payment
- Used full precast concrete vault for cabinet and satellite
- Pad is the top to the vault



Installation

Acura Dealership

New York City, NY

Project Highlights

- 100kW single cabinet-D8
- 4 CCS plugs across (2) satellites - with CC & RFID
- Installed to meet auto OEM charging requirements
- Operations and public facing
- Power-sharing key for customer - quick fill & top-off (can charge 4 EVs simultaneously)



Service Level Agreements	Standard Series (1 Year SLA)	Pro Series (5 Year SLA)	DC Fast Chargers (5 Year SLAs)	
	Tier 1 SLA	Tier 2 SLA	Tier 3 SLA	FLEX SLA
Performance Benchmark	95% Uptime	95% Uptime	95% Uptime	98% Uptime
Remote monitoring	✓	✓	✓	✓
On-site troubleshooting	✓	✓	✓	✓
Annual Preventative Maintenance (per OEM specs)		✓	✓	✓
72-hour on-site response once field service need is identified		✓		
48-hour on-site response once field service need is identified			✓	
24-hour on-site response once field service need is identified				✓
Regional Stocking of spare parts		✓	✓	
Spare parts held locally (<i>Typ. with local service partner</i>)				✓

Advanced Performance!

Power K-Series (DCFC): Gen 2022-23
 Report Period: 06/19/2023 - 12/19/2023 (past 6 months)



Uptime Report

Uptime Details:

Commissioning Date	Serial No.	State	SLA Type	Uptime %	No. Sessions
January 12, 2023	K0023611	MI	Tier 4	99.99%	48
March 30, 2023	K0023610	MN	Tier 4	99.99%	299
November 10, 2023	K0026199	NY		99.99%	8
November 8, 2023	K0024963	SC		100.00%	6
June 22, 2023	K0023612	WI	Tier 4	99.99%	144
July 27, 2023	K0023613	MN	Tier 3	99.99%	72

Coming Soon Installations!

- **5+ Commercial Projects (2 NEVI Installs)**
Various Locations, TN
- **1 Community Charging Site**
Bend, OR
- **45+ Corridor Sites**
Various Locations, MN
- **5+ Community Sites**
Southern AZ

ZEF*Partner Program*

AUTHORIZED RESELLER

(Full-Service EVSE Sales)

- EV Charger Developers | Electrical Contractors | Energy Performance Managers

PREFERRED INSTALLER

(Install & Service Chargers)

- EV Charger Developers | Electrical Contractors

DISTRIBUTOR

(Stocking & Feedstock)

- Electrical | Fueling | Electronic | Parts

UTILITY

Retail or Wholesale Power Providers

- Cooperative | MUNI | PUD | IOU | CCA

SERVICE PRO™

(24/7 Reliable Techs w/
rolling Trucks)

- HVAC
- Home Tech
- Security
- Electrical
- Utility

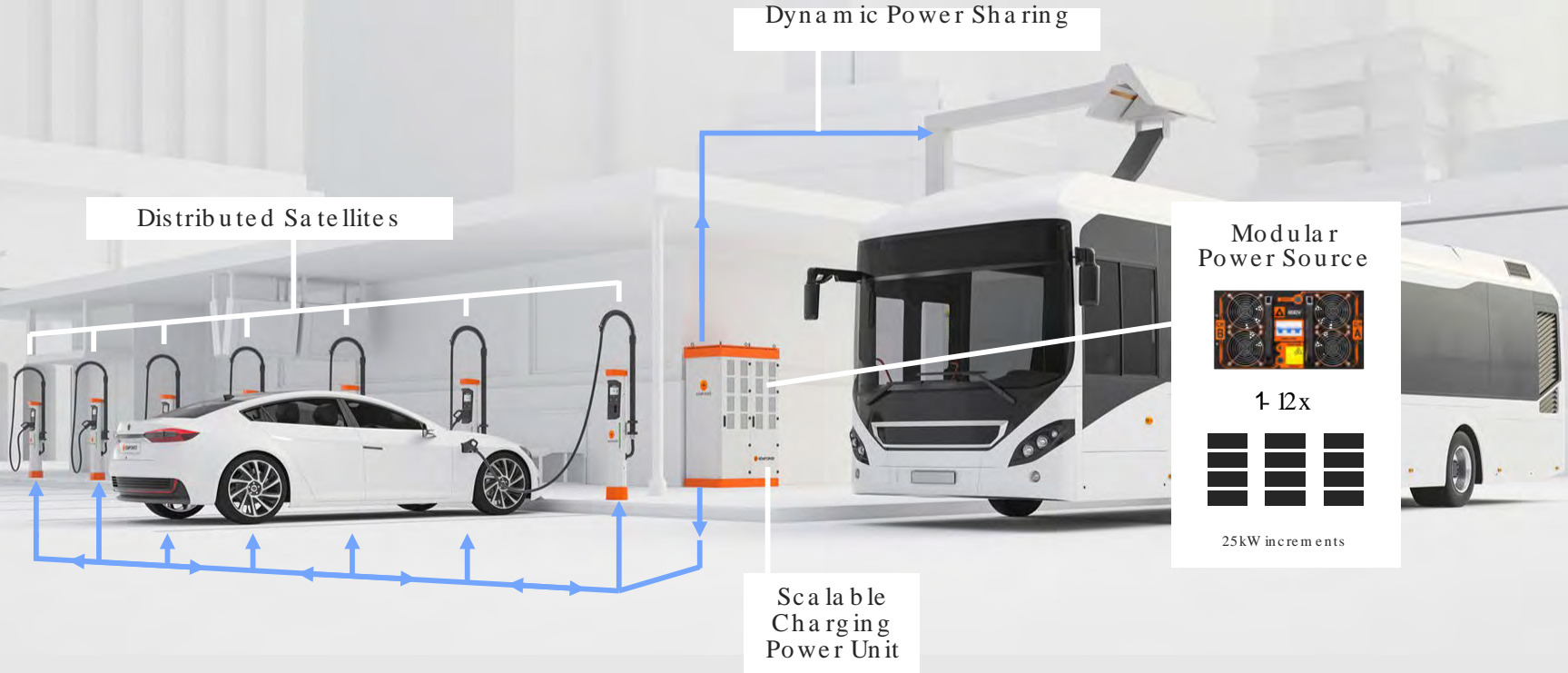


How Do I Get Started?



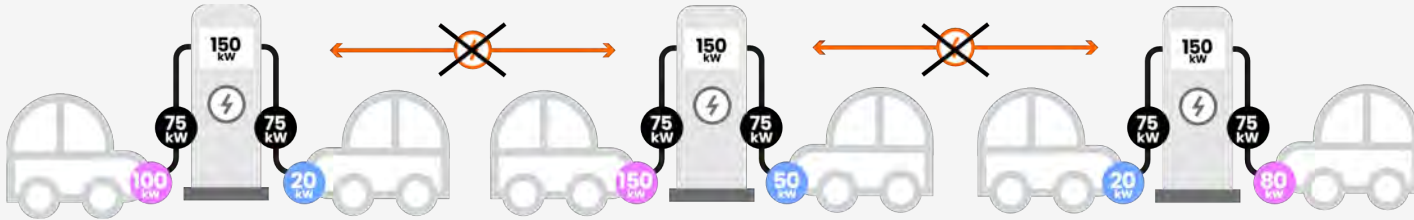


+ Flexibility



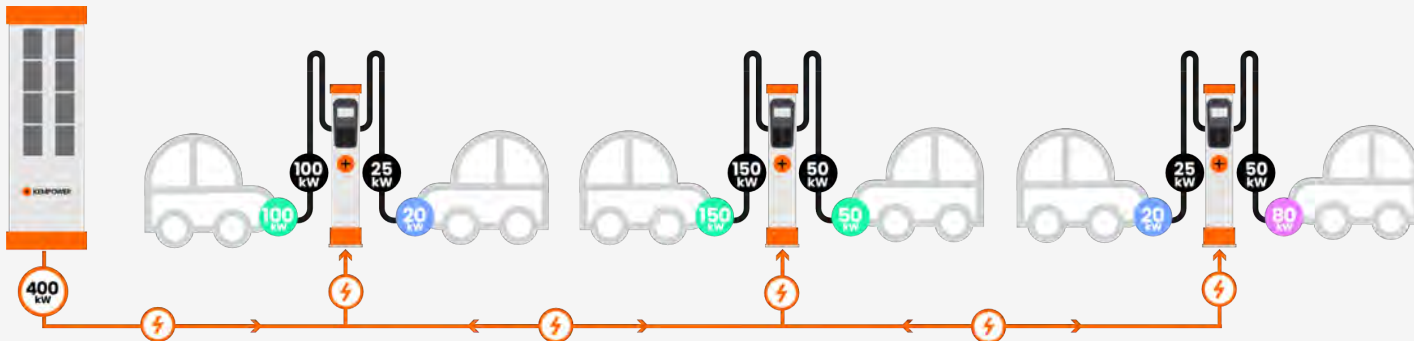
+ Standalone vs Distributed Charging

Traditional "Standalone" Charging System



→ 315 kW of charging can be delivered from three 150 kW power modules (450 kW total) leaving 135 kW idle power

Distributed System: more power, less idle time, & smaller grid connection



→ 390 kW of charging can be delivered from a 400 kW power module, leaving 10 kW idle power

● EV is getting **all** of the requested power

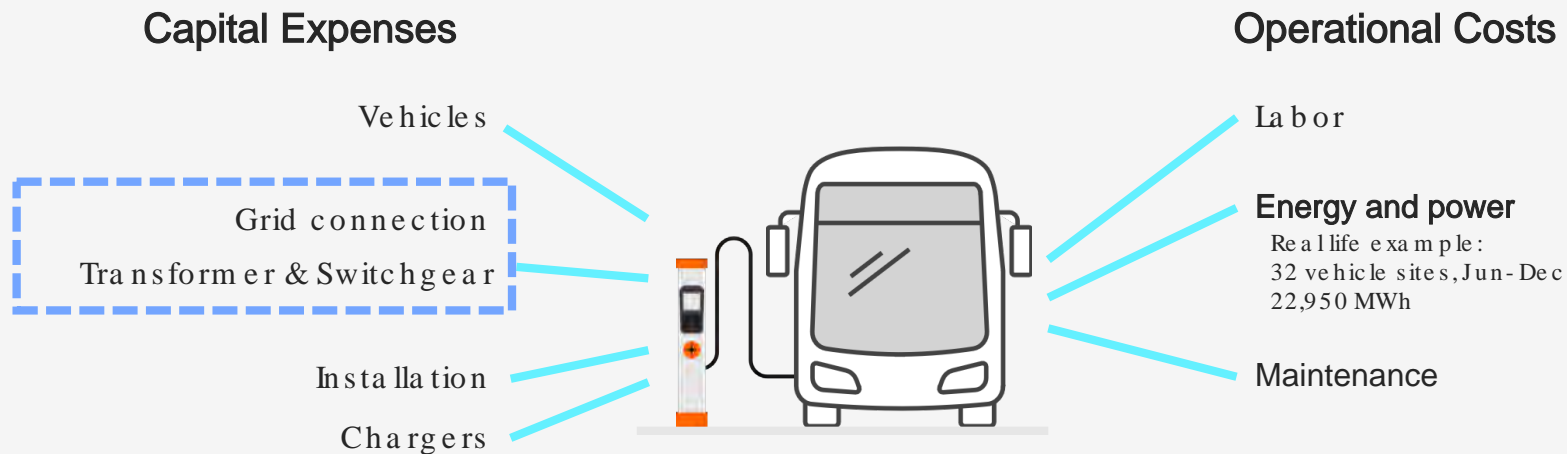
● EV is getting **less** than the requested power

● EV is **reserving more** power than can be used





Why is it Important to Optimize Charging?



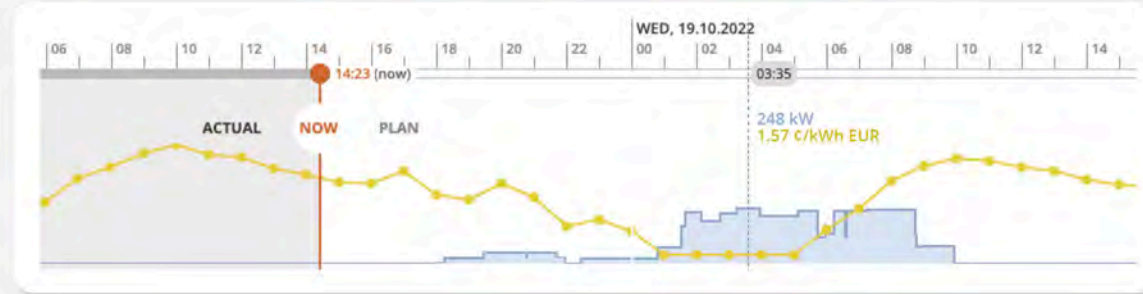
Power and Energy constitute a significant portion of CAPEX and OPEX

+ Cost Savings

10 vehicles with a total energy of 3432 kWh



Without a charging management system
Energy costs \$412



With ChargeEye Depot Master
Energy costs \$167

Yearly savings
= \$61,000
(assuming 250 working days)

60% lower energy costs

+ Solutions



Investment

- Federal, state and utility incentives exist
- Energy management can help optimize OPEX



Availability

- Charger architecture can influence availability
- Remote management an issue resolution



Flexibility

- Scalable charging systems grow with your needs
- Multiple use-cases can be supported by a single system



Thank You.

zefenergy.com
[kempower.com/ america /](https://kempower.com/america/)

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Oyj,

More Resources

Visit: www.zefenergy.com/resources

Solutions

FUTURE PROOFING
Kempower solutions are designed so that your charger network can be effortlessly scaled to grow when needed. 15kw solutions are available so you can start smaller and still power later. Simply add devices to the one available power cabinet, one at a time and have on total project cost. This product is highly configurable with a range of charger sizes and capabilities.

Charger Sizes / kW
15kW | 30kW | 60kW | 90kW | 120kW | 150kW | 200kW | 250kW | 400kW | 450kW

QUALITY & SERVICEABILITY
Kempower products are sturdy, yet functional and are built to last with over 100,000 hours of testing in the harshest environments. All of our challenges can be solved with just 4 parts, with remote diagnosis, no on-site architecture and modularity of parts, Kempower chargers are simple to service.

SCALABLE
Electric vehicles (EVs) are growing rapidly. To meet this demand, you need a scalable, user-friendly charging solution. Flexible, weatherproof, plug-in the output of each station.

DCFC OPTIONS: KEMPOWER

POWERED BY ZEF ENERGY:

- 5-YEAR ADVANTAGE™
- ZEFNET™ SOFTWARE INTEGRATED
- SHORT LEAD TIMES
- NEVI PROGRAM COMPLIANT

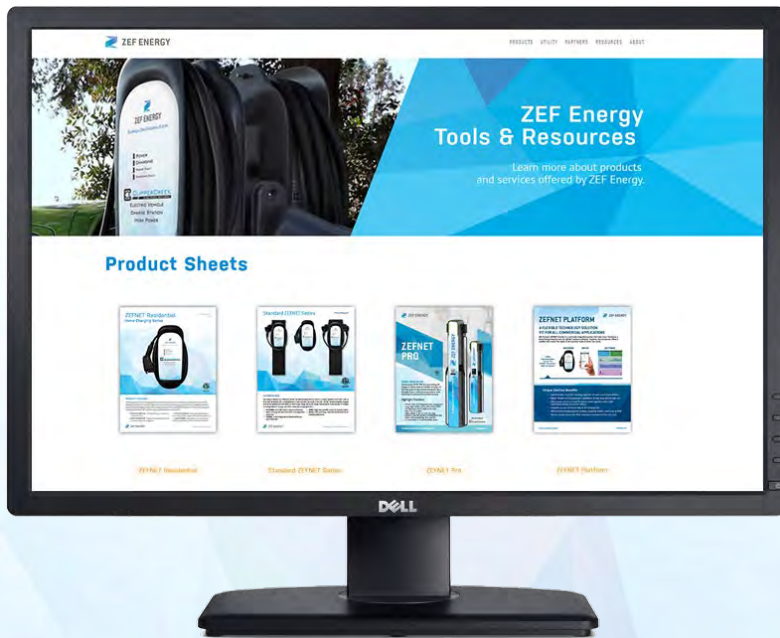
"Kempower's products reflect many of the same values we hold dear here at ZEF Energy. Quality hardware with the versatility to be applied to a wide range of projects." - Matthew Blackler, CEO of ZEF Energy

ZEF ENERGY 5-YEAR ADVANTAGE™

- 5-YEAR PRODUCT WARRANTY
- 5-YEAR SERVICE LEVEL WARRANTY
- 5-YEAR CELLULAR CONNECTIVITY
- 5-YEAR ZEFNET™ SOFTWARE LICENSE
- 5-YEAR US BASED 24/7/365 TECH SUPPORT

CONTACT ZEF ENERGY TODAY!
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ZEF ENERGY | 1.877.668.4466 | SOLUTIONS@ZEFENERGY.COM



solutions@zefenergy.com
Contact Your ZEF Energy Sales Member Today

NEVI Applications | 600kW

- Triple Cabinet Power Unit
- (12) 50 kW Power Modules
- D4 Option
- (2) Satellites Dual Plug Dispenser
 - 300A Cord
 - (4)CCS
 - Credit Card Module
- Compliant with NEVI specifications



National Electric Vehicle Infrastructure (NEVI)

Federal funded program to build out DCFC network across the county. 80% project rebate.

Sign up here to learn more →