
CHAKRATEC
Enabling EV fast-charging
Anywhere

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Power Booster – Enabling Fast-Charging Anywhere

Installed where grid is power-constrained

Charged during idle times

Enables up to x3 faster charging

Ultrafast Charging >200km in 15 minutes

Less waiting in line

Vast Deployment of Fast-chargers

Charge more cars

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Accelerating mobility Electrification

Flywheel based POWER BOOSTERS

EV Fast charging ANYWHERE

Boost Grid at power-constrained locations

Added Value for entire ecosystem

Innovative

Unique & Patented

Safe

CE & UL Certified

Sustainable

No toxic materials.
No re-cycling costs

Cost Effective

Lowest Lifetime Costs

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The EV revolution is accelerating…

Forbes
May 5th 2021

"Transportation contributes to about 28% of U.S. carbon emissions. To cut emissions by 50% by 2030, this sector will need to be rapidly decarbonized"

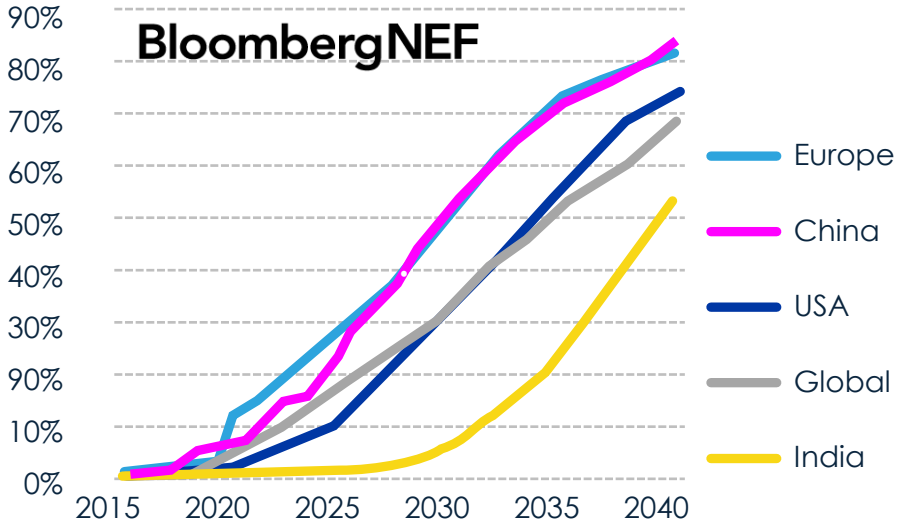
Mary Barra, chairman, and CEO of @GM
June 12th 2019

"The auto industry will change more in the next 5 to 10 years than it has in the last 50"

Forbes
May 5th 2021

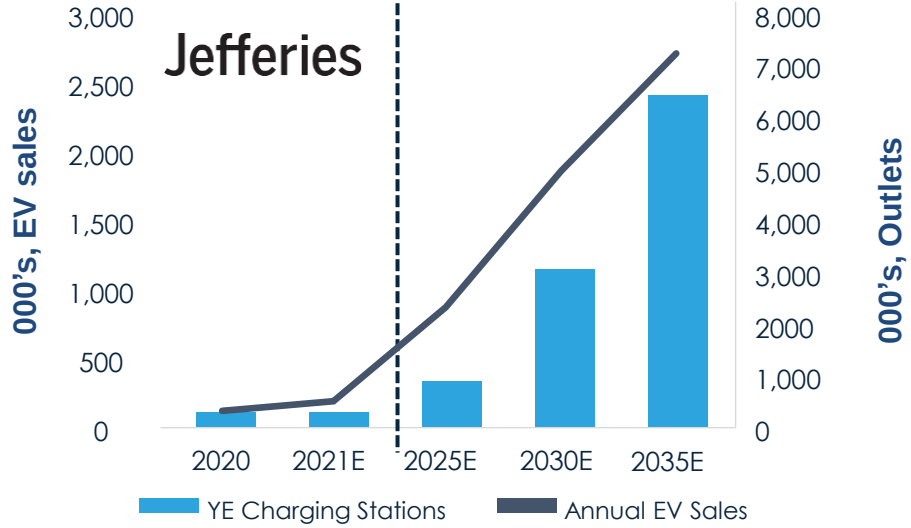
"EV owners must be able to charge their vehicles conveniently and quickly. Biden's plan provides for $15 billion to build 500,000 EV charging stations"

Global long-term EV share of new passenger vehicle sales



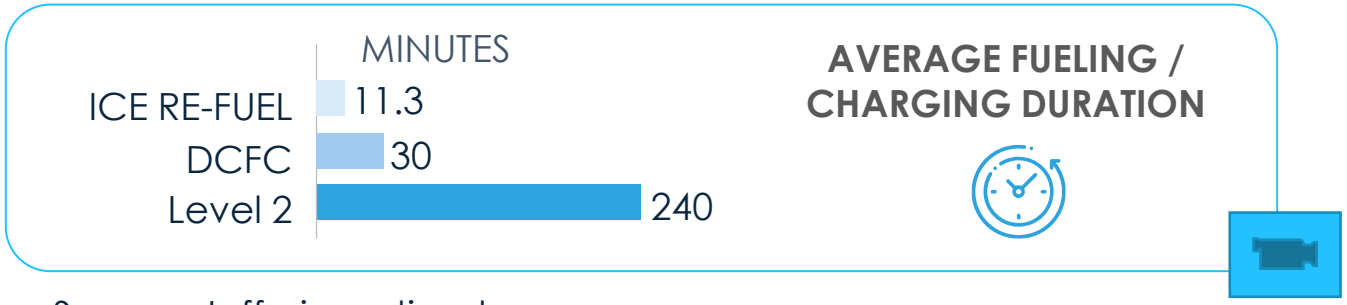
Charging Infrastructure is expected to grow in proportion to EV penetration rate

US Charging Station Outlet Market Growth vs. NA EV Sales



Source: Jefferies estimated US Department of Energy

Fast Charging is Critical for EV adoption



Source: Jefferies estimates

DCFC* not required Level 1	DCFC* a differentiator Level 2 / DCFC			DCFC* a MUST Level 2 / DCFC	
Private Home	Multi-Family	Work	Destination	On-The-Go	Fleet Depot
Over night	Multiple hours/day	4-10 hours	1-3 hours	< 0.5 hour	Minimal

Charging Time

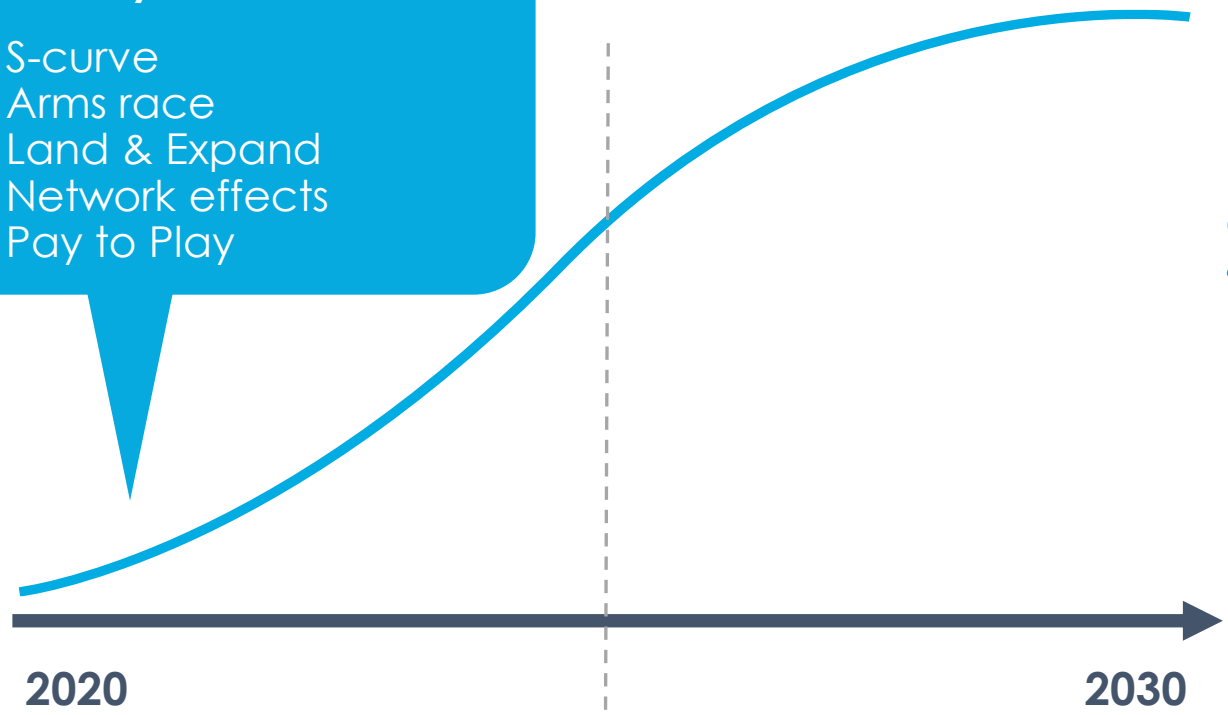
*DCFC – Direct Current (DC) Fast Charging

Charging Infrastructure – a fast moving market

- Public sector
- Utilities
- Elec. OEM
- Retail
- O&G
- Gas stations
- Car makers
- New players

Market dynamics in action:

- S-curve
- Arms race
- Land & Expand
- Network effects
- Pay to Play



Early days
Low penetration
Cherry picking
Install where grid is strong
Govt grants
Longer payback period

Mass Deployment
High penetration
Wide coverage
Install everywhere
Free market
Short payback period

McKinsey &Company
June 21st 2021

"Market leaders in **DC fast charging** can create stickiness by leveraging their know-how for brands, enabling software, and a seamless **customer experience**."

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Infrastructure Disruption

Gas Stations

Centralized Approach

- 100% refueling in public stations
- ‘Few’ ‘big’ gas stations, serving 100s vehicles a day
- Fast Refueling (5-10 min.) everywhere
- Amenities added around the station

Fast Charging

Distributed Approach

- 20%-40% charging in public chargers
- ‘Many’ ‘small’ Stations – 10s EVs/day/charger*
- Fast Charging is rare & not trivial
- chargers ARE the amenity

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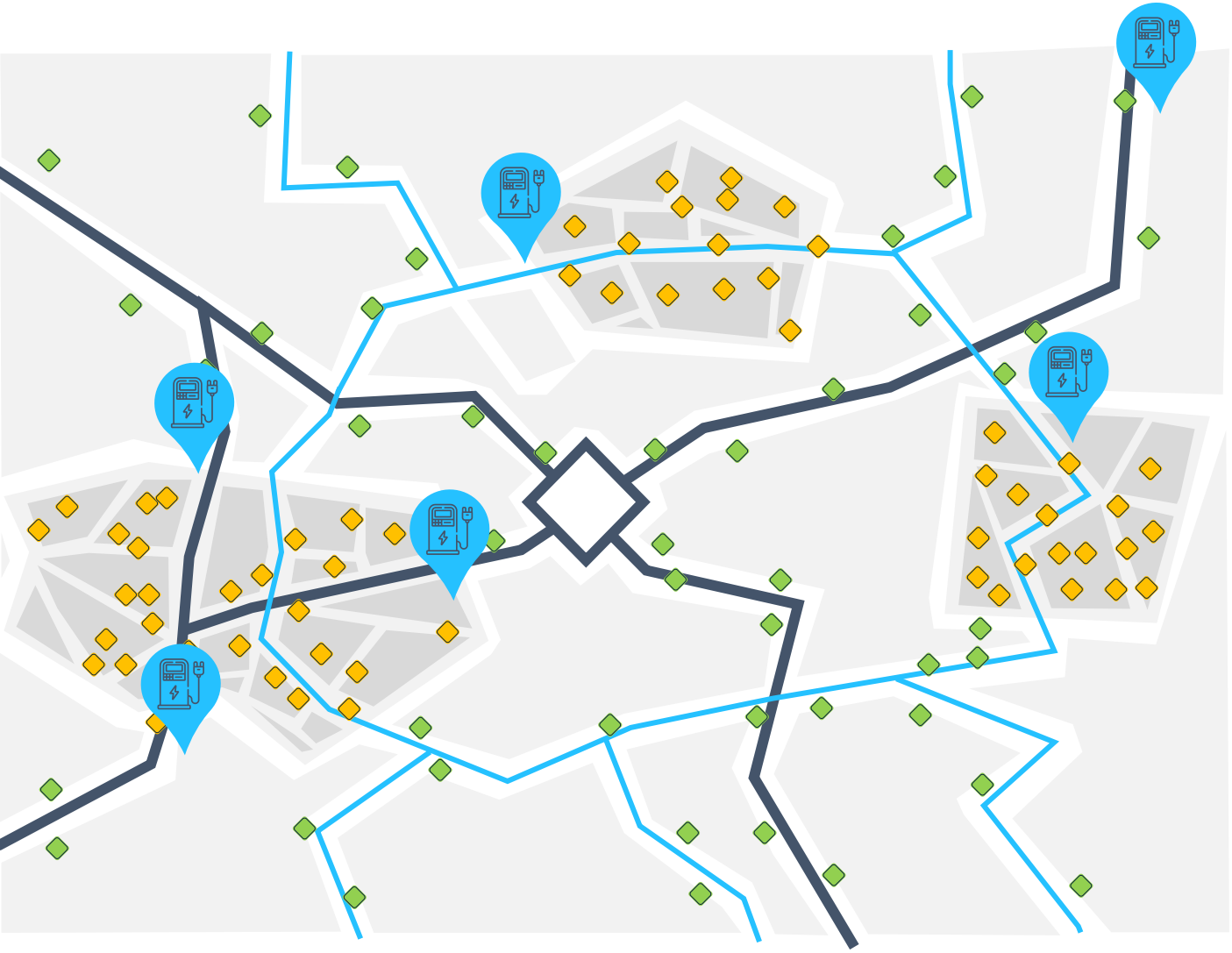
Distributed Fast Charging Vs Fast Charging Hubs



A Mixed-solution Infrastructure

Fast Charging Hubs

"gas-stations-like" – multiple FC ports,
Located where the grid is powerful

Small Distributed fast charging sites

- At destination (inside cities)
- On-the-go - every 30-50km

Legend

- Intercity Highway
- National roads
- Fast-Charging Hub (@ powerful grid)
- Destination distributed FC
- On-the-go distributed FC

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Existing Grid cannot support Fast Charging

Dilemma:

Accelerate DCFC roll-out
or
Defer investment

Grid upgrade challenges

Cost

Time

Complexity

"… some fleet operators are taking delivery of EVs only to find that **they face a long wait** to get the necessary charging equipment up and running"

EVs are here. Try to keep up.
CHARGED
ELECTRIC VEHICLES MAGAZINE

July 20th, 2021

DCFC can draw the **equivalent of a whole neighborhood's** electricity needs at once.

Large investments ...are required in transmission lines, substations, transformators etc.

Forbes

May 5th, 2021

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The Value of Power Booster - Example

EV Single charge
35kwh => 200km

Charging Time <
15 minutes

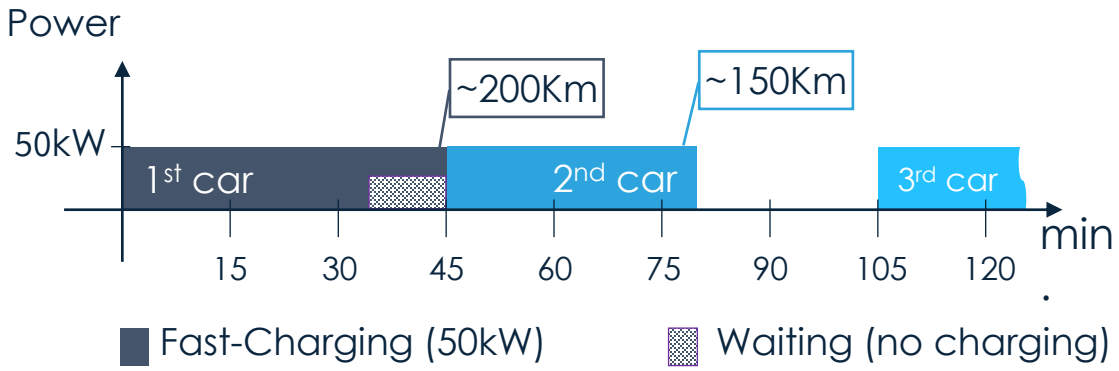
Cost To Customer
$0.6/kWh, ~$0.1/km

Full Charge Cost
~$21
(comparable to ICE fueling)

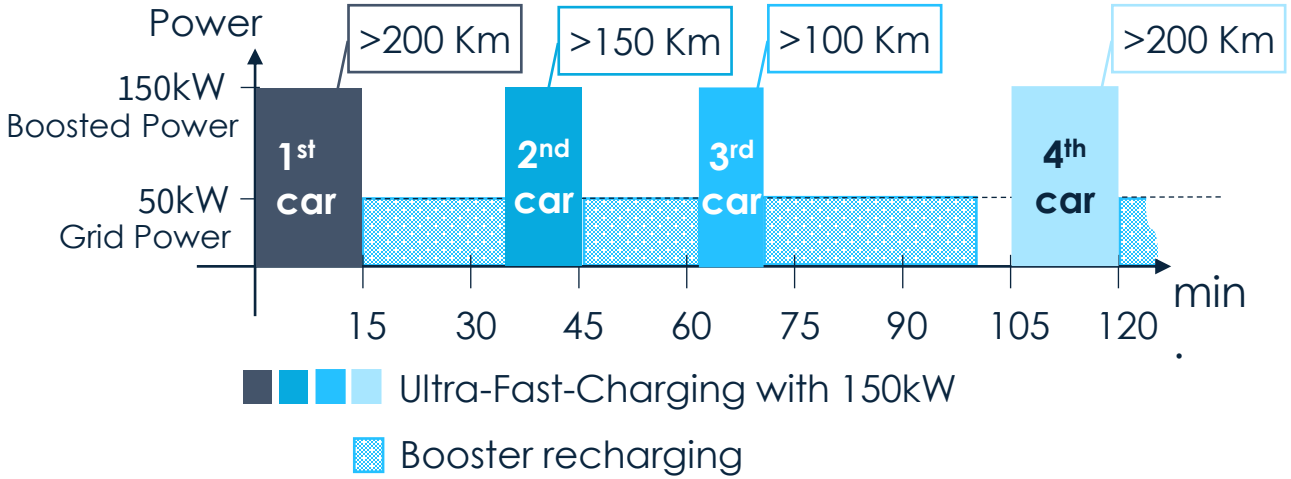
> Where they do have access to public charging stations, EV owners were most commonly vexed by **out of service** chargers and **long lines**, the 2021 U.S. Electric Vehicle Experience Public Charging Study found.

CNBC
18th Aug 2021

No booster

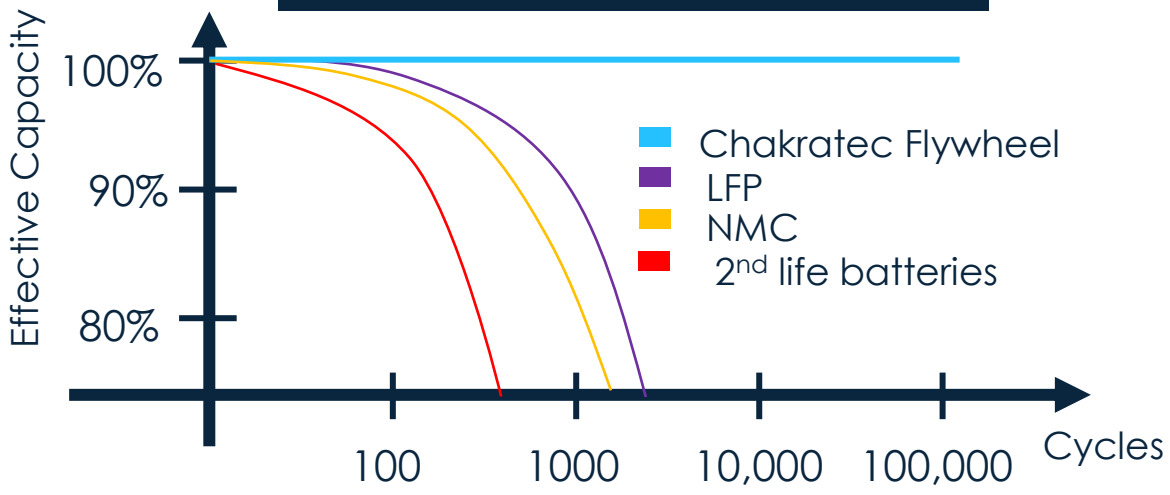


With booster

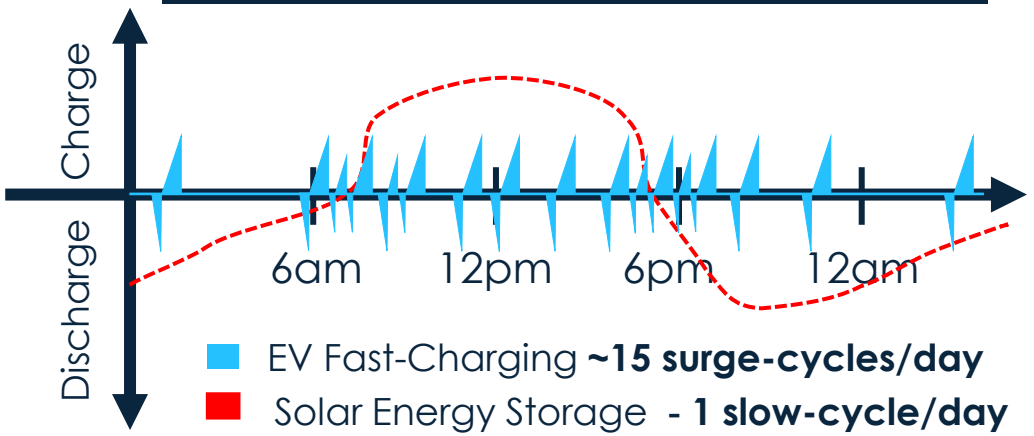


Energy Storage technologies are not created equal…

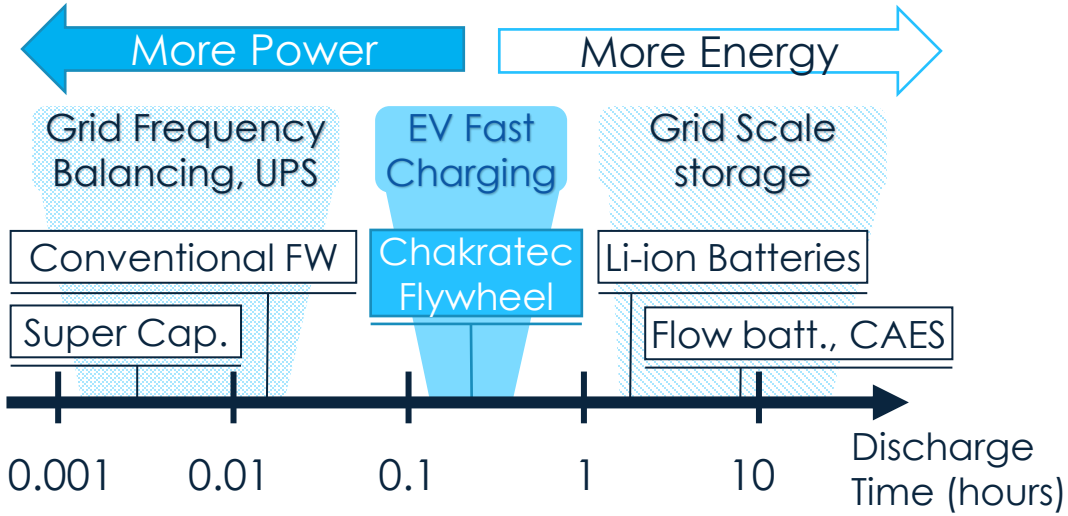
Reliability and Durability



Different applications' profiles



Technology gap



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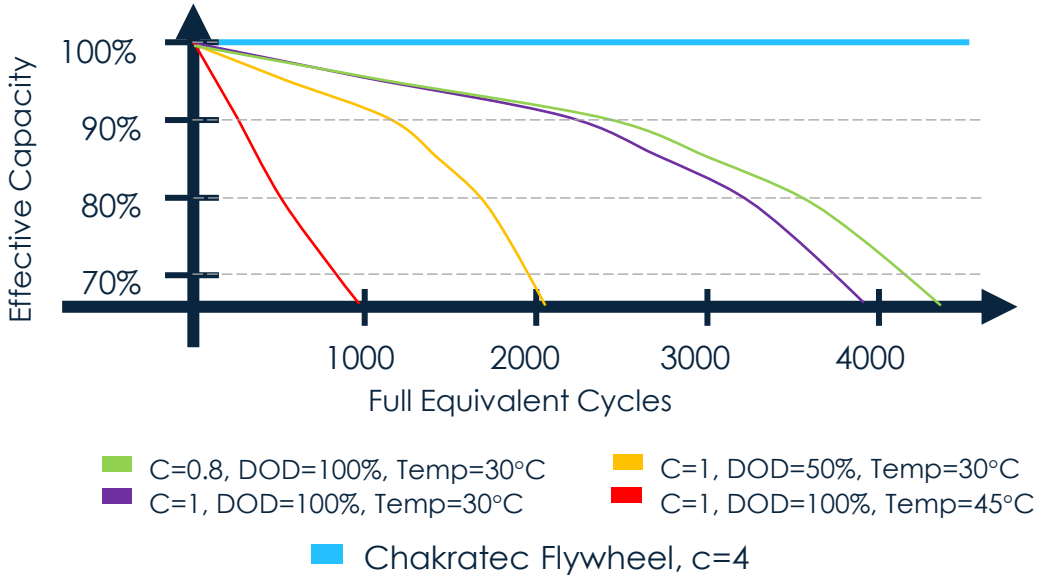
Kinetic Power Booster

Optimized for Fast-Charging needs

Li-ion Batteries shortcomings

Performance

Rapid Aging & Performance Degradation



Environment

Recycling Costs & Environmental footprint

Safety

Flammable & Toxic materials, Safety hazards & limitations

Not Cost-effective

Not Sustainable

Not reliable

Batteries are <u>Not Optimized</u> For Fast Charging

Chakratec Technology & Product

Core Technology – Flywheel (V8)

- Power > 12.5kW
- C-rate - 4 (for 15')
- Patent-protected
- Mature and robust
- Inherently Safe
- **>10 years guaranteed warranty**

x 8

Stand-alone Product – Kinetic Power Booster (KPB100)

- Power > 100kW (for 15')
- 200,000 charging cycles
- CE (EU) and UL (US) certification
- Optional Site Power Management (EMS) Software package
- **Enables Fast-Charging (>150kW) at power-limited grid (50kW)**

Innovative & unique, patented.

High Power

High - performance

Durable & Reliable

Cost effective

Flexible & Modular

Sustainable – Non-chemical

Safe (CE & UL Cert.)

Complementary Services

Turnkey **Fast-Charging Solution**

- Based on KPB100 product
- Including Chakratec micro-grid Power Management SW (EMS)
- Complementary HW, SW & Services (by partners)
- White label/ Co-branding

Professional Services – **lifetime support**

- ‘Make-ready’ support
- Installation support
- Relocation support
- Technical support
- O&M Support
- Professional O&M
- Extended warranty

Faster, better & lower cost than alternatives

Accelerate Deployment

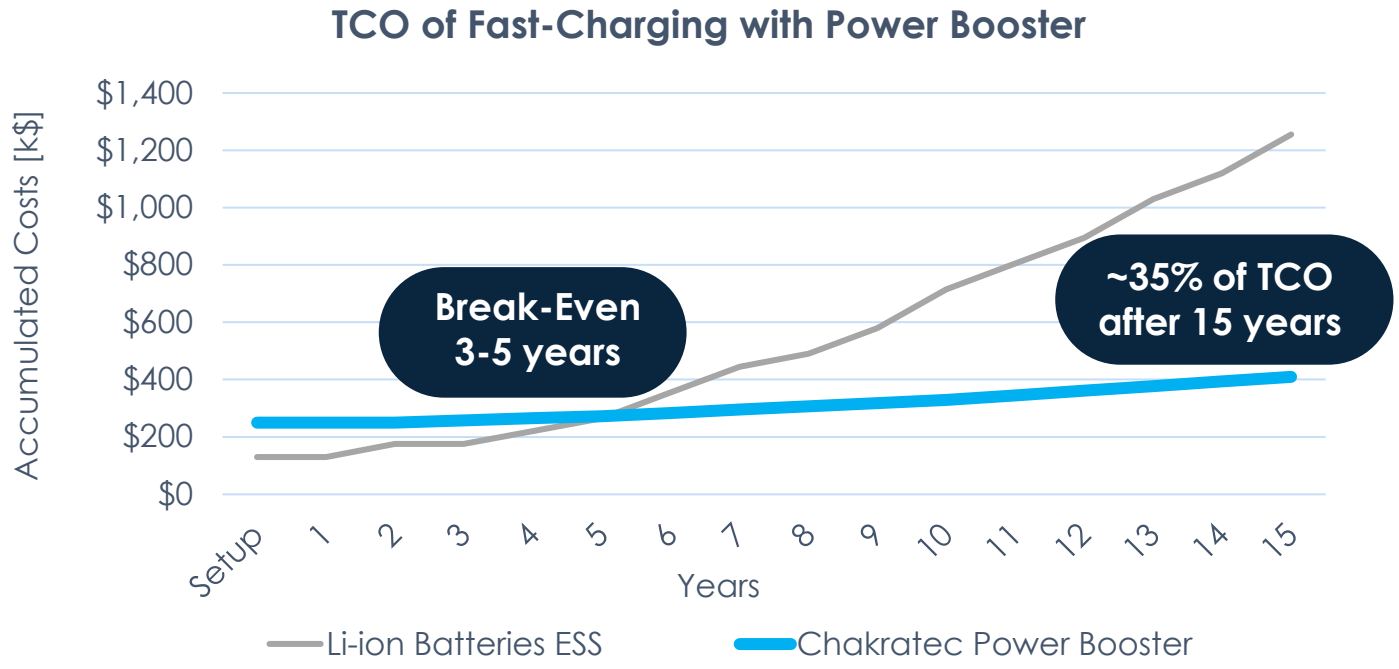
- ✓**Faster** alternative to grid-upgrade
- ✓**Safer & more flexible** alternative to Li-Batteries-ESS

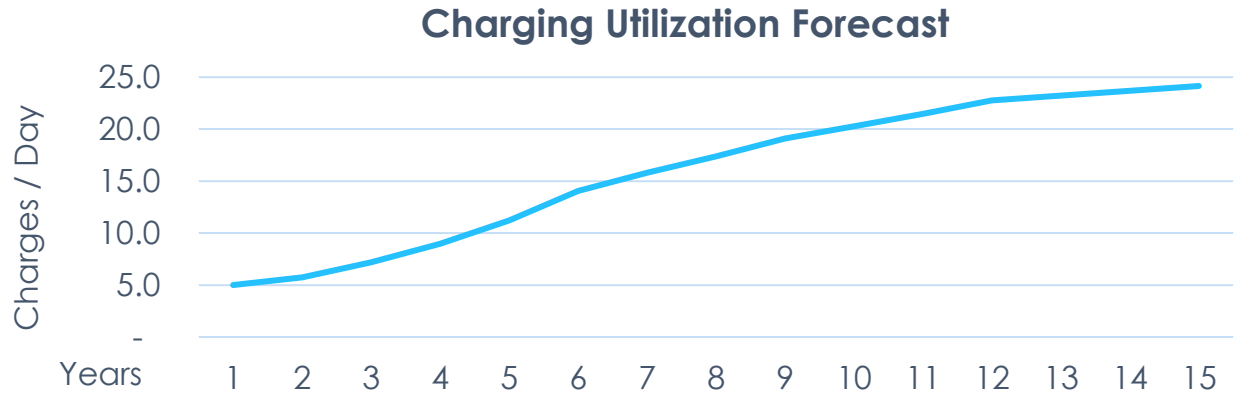
Boost Brand

- ✓**Better** availability and quality
- ✓**Innovative & sustainable**

Minimize Total Cost of Ownership

- ✓Defer Grid investment
- ✓Gradually increase investment
- ✓Avoid batteries replacement,
- ✓Avoid demand charges

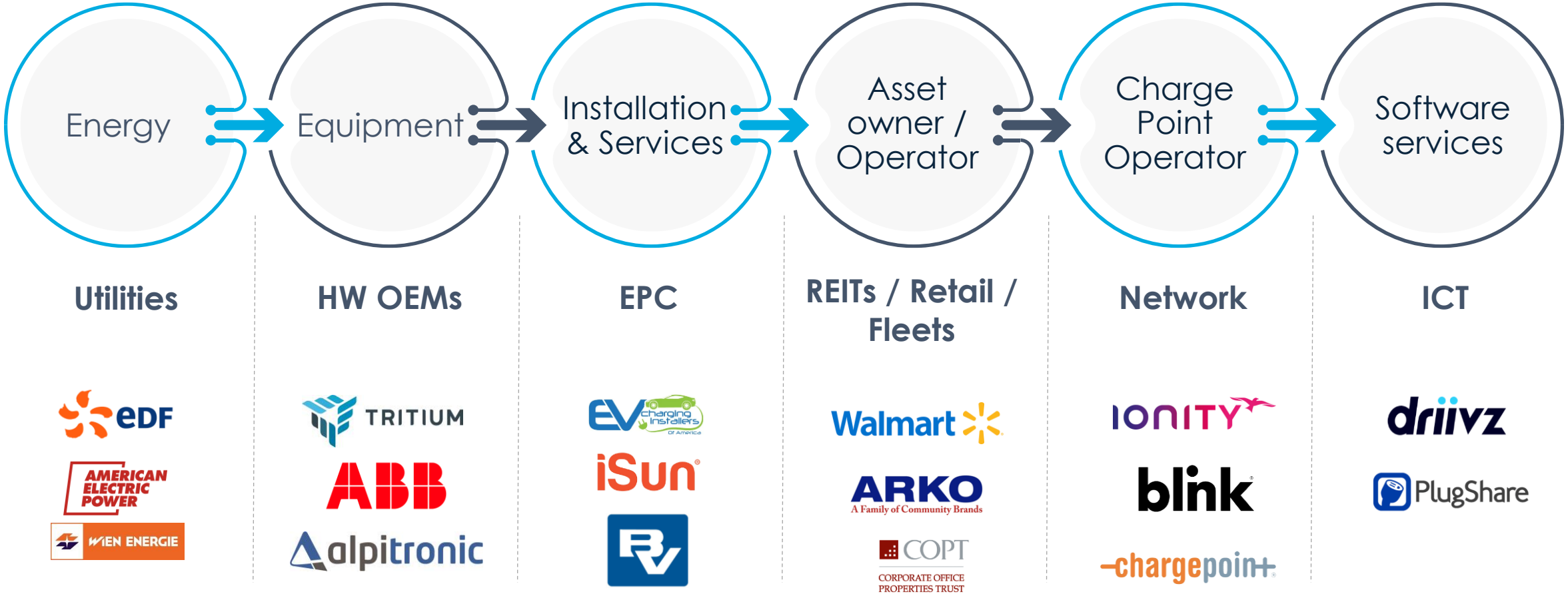




Assumptions of presented example (considering above utilization forecast example):

- Batteries lifespan of 3,500 cycles
- Batteries replacement cost ~33% of the initial system cost

A new Value-Chain is evolving



Benefits To All Stakeholders

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Energy → Equipment → CPO → Driver

Utilities

- Accelerate Electrification
- Comply with gov. climate targets
- Improve grid stability
- Defer investments
- Better service

HW OEMs

- Accelerate DCFC roll-out
- Increase market share
- Attract hesitant Customers
- Simplify ‘make ready’ process

Network

- Accelerate network deployment
- Better service with greater availability
- Gain remote locations market share
- Decrease TCO, avoid demand charges
- Enhance brand

Driver

- X3 faster charging
- Avoid queues
- Charge anywhere you go
- ICE-like user experience
- Eliminate Range Anxiety
- Benefit EV lower costs

Benefits To All Stakeholders

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Equipment → Installation & Services → Business owner / Operator → Fleet owner / Operator → Driver

EPCs

- Increase & accelerate roll-out of FC sites
- Accelerate & Simplify 'make ready' of sites
- Enable Modular & flexible configuration
- Maximize use of government incentives

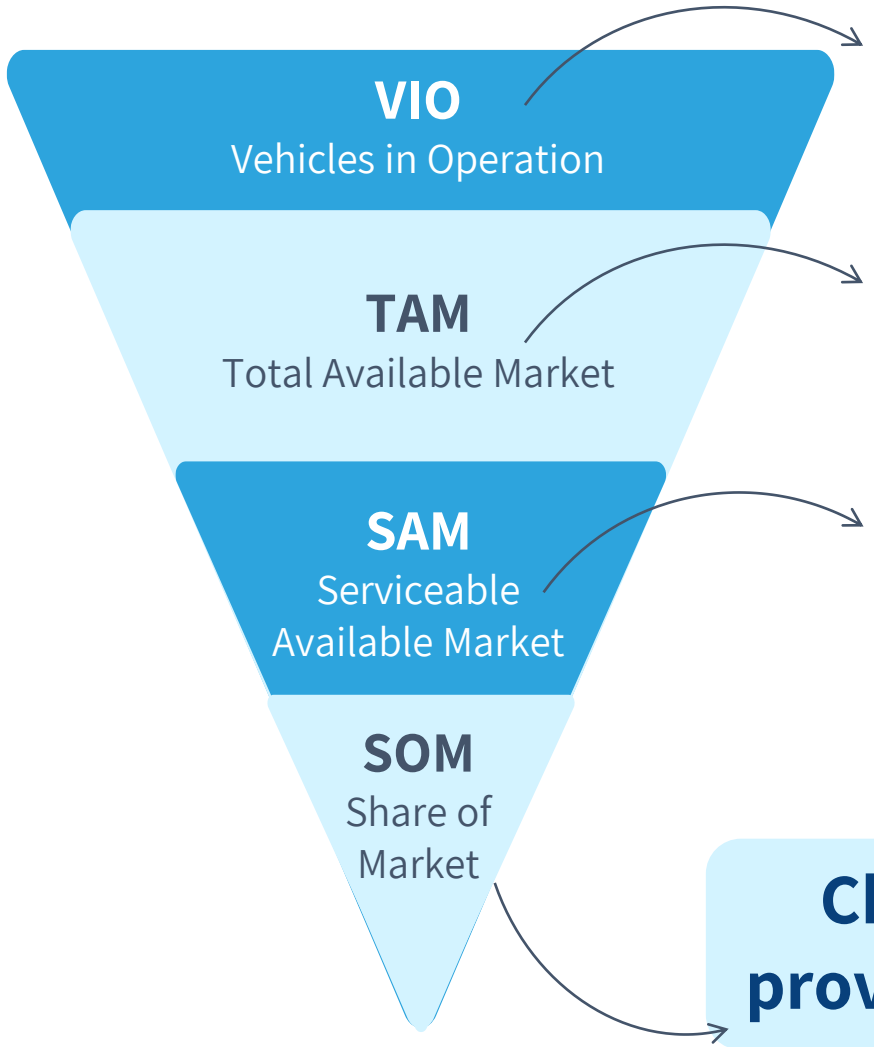
Retailer

- Accelerate FC service
- Attract EV-drivers to generate traffic
- Reduce CAPEX & OPEX, avoid demand charges
- Maximize use of government incentives
- Enhance business brand

Fleet Owner

- Accelerate fleet Electrification
- Improve Operational efficiency
- Decrease TCO, avoid demand charges
- Defer investments
- Enhance business brand

Huge Market Potential



>150 Million EVs

Forecasted to populate the roads , globally, by 2030

>1.5 Million Fast-Charging ports

- To enable 20-30% of total charging sessions

>400,000 Power Boosters

- Required to support power-constrained grid
- ~30% of Fast-charging ports

>$60B(*)

EV Fast-Charging Acc. Market Potential

Chakratec – First to market with a non-Batteries, proven, sustainable and cost-effective Power Booster

(*) Company forecast, of accumulated potential by 2030, based on equivalent-performance, Lithium-based power boosters, including CAPEX and excluding OPEX of batteries-based solutions.

Go-to-Market

Market channels:

Indirect:

- Charge Point Operators
- EPCs
- Equipment providers
- Local Distributors

Direct – Sales offices

Near-term Focus Territories

Territory Penetration & Expansion Strategy

Turnkey / Joint solution

Products & Services

Market Introduction

Generate traction:

- Market education
- Build First Pilots

2021: US, UK, Austria.
2022: expand EU penetration

Key Accounts & Channel Development

Enable scale:

- Build relationship w/ key accounts
- Sign agreements w/ channels
- Get into key tenders' consortiums
- Expand partnership / supply chain
- Expand installation / use cases

2021: Germany
2022: US, UK (& EU others)

Scale-up

Execute and expand:

- Sell through channels
- Focus on Products & Services
- Expand Customer base
- Expand customer support
- Scale-up supply chain
- Align roadmap & Expand offering

Increasing Market traction

2018

Vienna Airport WIEN ENERGIE

Operating since 2018
Over 700 vehicles charged
EU demo site

2019

Prague ŠKODA

Pilot **for use case analysis**
Over 1500 vehicles charged
Data Collection
System-level maturation

2020

Leipzig Premier Inn

1st commercial Sale
Underground parking use case
Operational since Dec. '20.
Discussions for **site expansion**

2022

Rockhill, SC ARKO A Family of Community Brands

Commercial DCFC pilot
Site construction in progress
Expected COD 2Q2022
Upon success –**+5 sites expansion** and enter **US distribution agreement**

2022

NY/CA blink

Joint R&D Funded by BIRD
Planned commercial DCFC pilot
Expected COD 2Q2022
DEV of **joint solution & marketing**

Customers across value chain

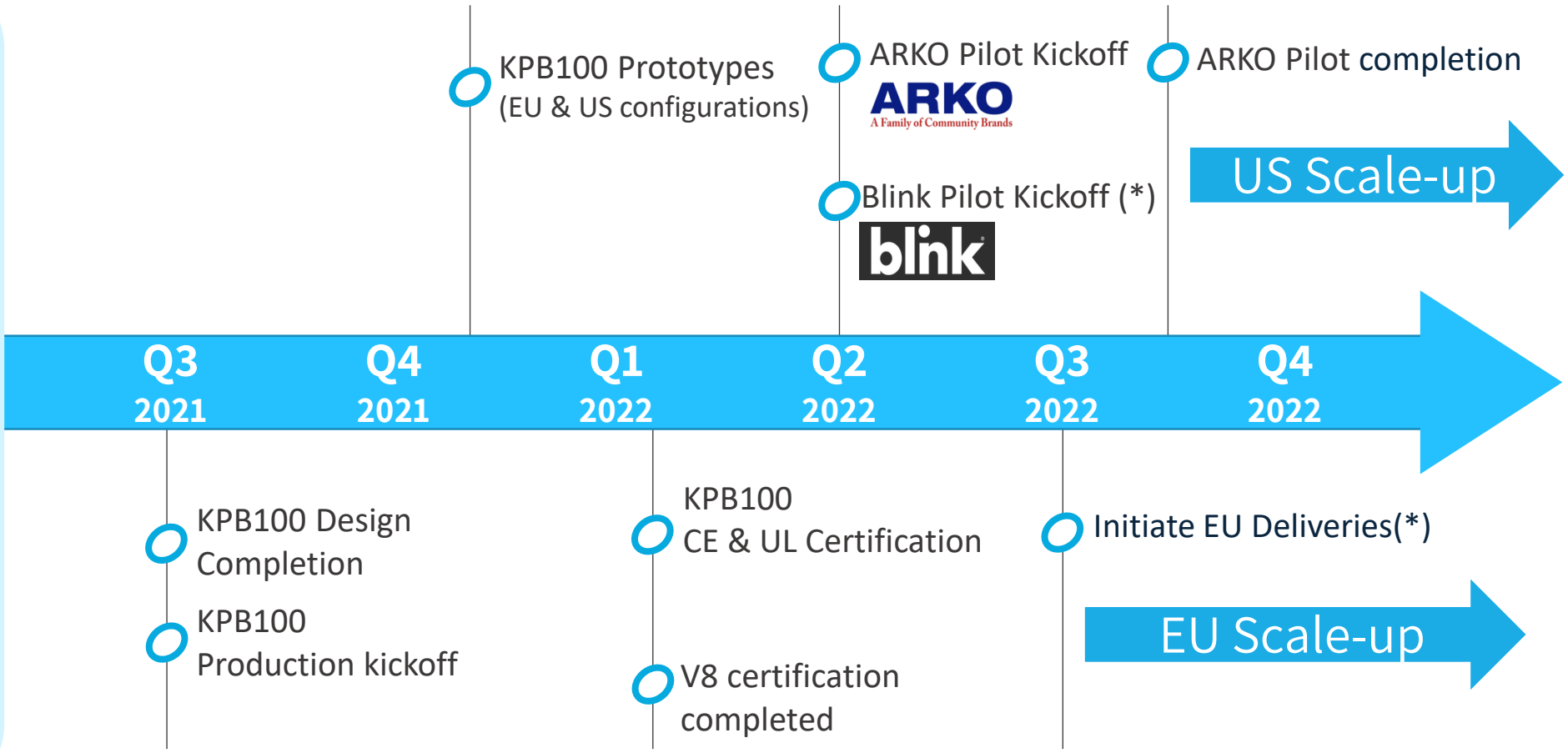
2022 Installations support EU expansion & US penetration

NextGen validation & SCALE

Recent Achievements & Short-Term Plan

Recent Achievements

- ✓ KPB100 Design completion & Production kickoff
- ✓ Significant progress in V8.1 Flywheel Verification & Certification process
- ✓ Build & training of Flywheel supply chain
- ✓ Cooperation agreement with Flex as the Serial Production partner.
- ✓ Company moved to new location to support expected growth.
- ✓ **Expansion of Marketing & Sales efforts in EU & US.**



Slight delays (~2 months) due to current supply chain challenges

(*) Company estimation – not finalized yet.
(**) The provided information is forward looking as defined in Securities Law, section 32A. It may not be materialized as presented, as detailed in slide 2 of this presentation.

Product Roadmap

KPB50

50kW prototype - Demos & R&D

V6 FW

KPB100

100kW serial product – for market penetration

V8 FW

X2 performance (vs. V6)

V9 FW *

X4 performance (vs. V8)

KPB250

KPB100v2
(lower cost)

250kW product *–
For distributed sites (Stand alone) or for Hubs (Hybrid)

- X4 capacity (vs KPB100)
- Similar size & cost

100kW ver2 product * –
for mass deployment at distributed FC sites

- 30% cost reduction
- 50% volume reduction

2018 2020 2022 2024

(*) Future products information is still preliminary and may change

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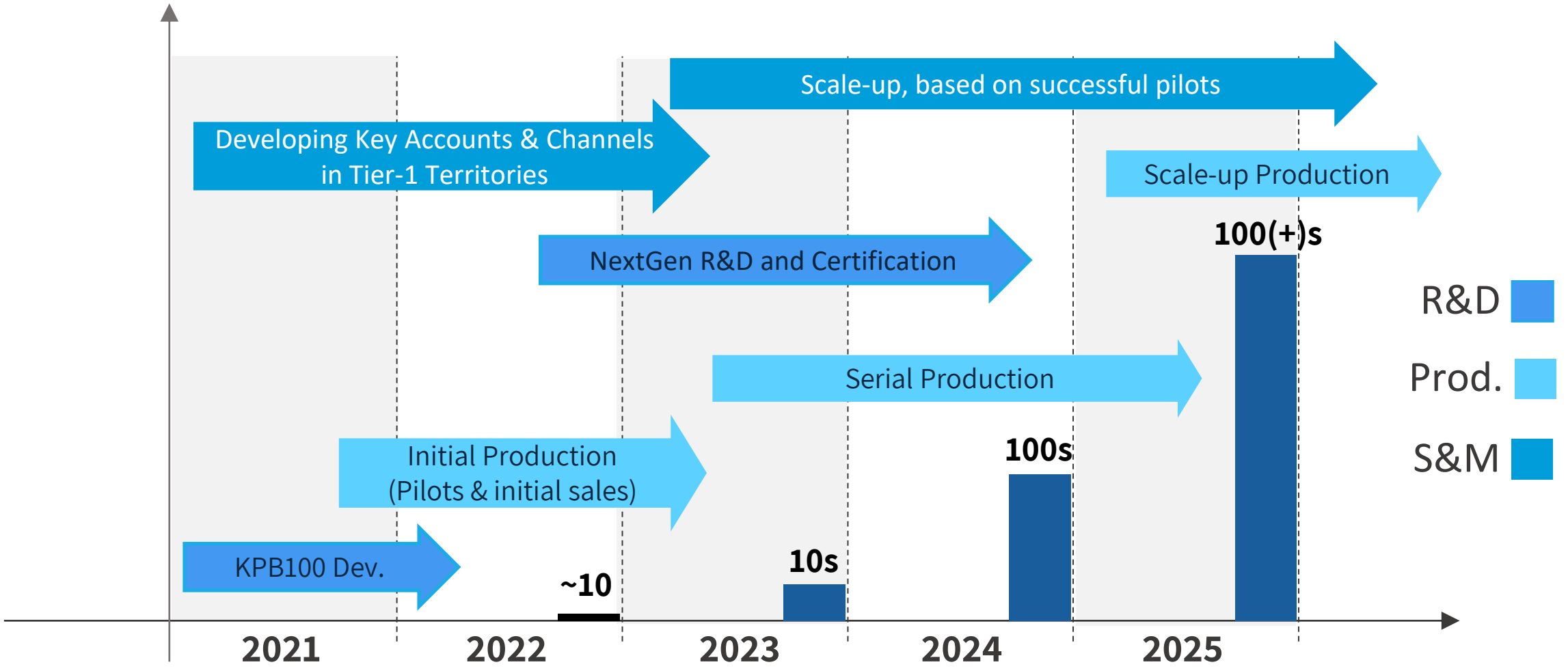
Charging Ahead –
Become a leading global supplier



Notes:
(*) Quantities refer to systems to be delivered to Customers, based on various business models, and therefore do not represent annual sales forecast.
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Thank You !

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Enabling EV fast-charging Anywhere

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Enabling EV fast-charging Anywhere

Appendix slides

Range Anxiety

THE WALL STREET JOURNAL.
WSJ

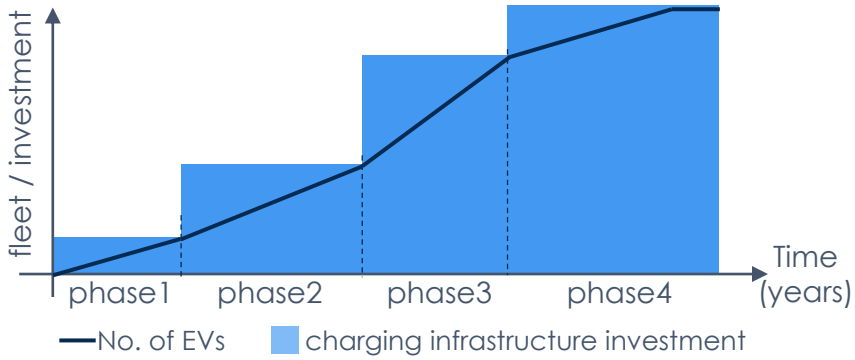
February 27th, 2021

> *… The road trips made one thing clear –*
> ***Range Anxiety is real, and it can be quite traumatic…***

The complete article:
https://www.wsj.com/articles/whats-missing-in-the-electric-vehicle-revolution-enough-places-to-plug-in-except-tesla-11614380406

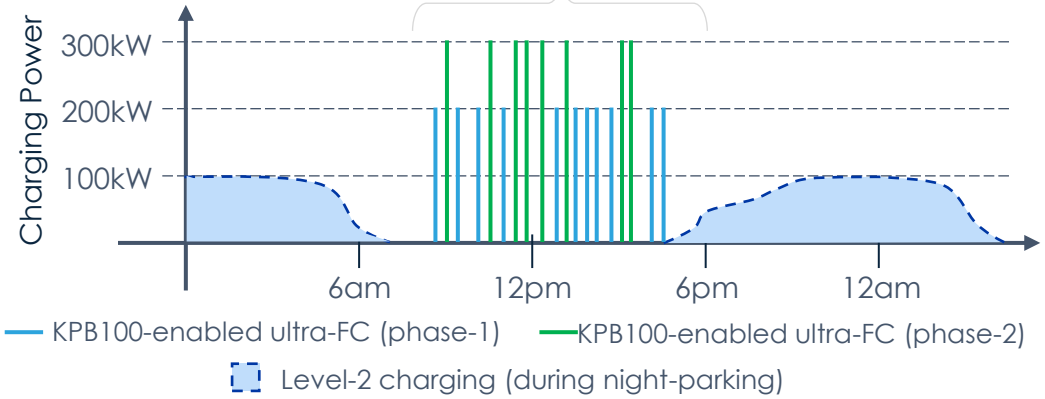
Maximize value of fleet electrification

- Accelerate fleet electrification
- Defer Grid upgrade investment
- Minimal TCO, Avoid demand Charges
- Gradually increase investment
- Operational efficiency and flexibility
- Boost brand with sustainability & innovation



Phase1 & 2 — Initiate Electrification, Defer Grid Upgrade

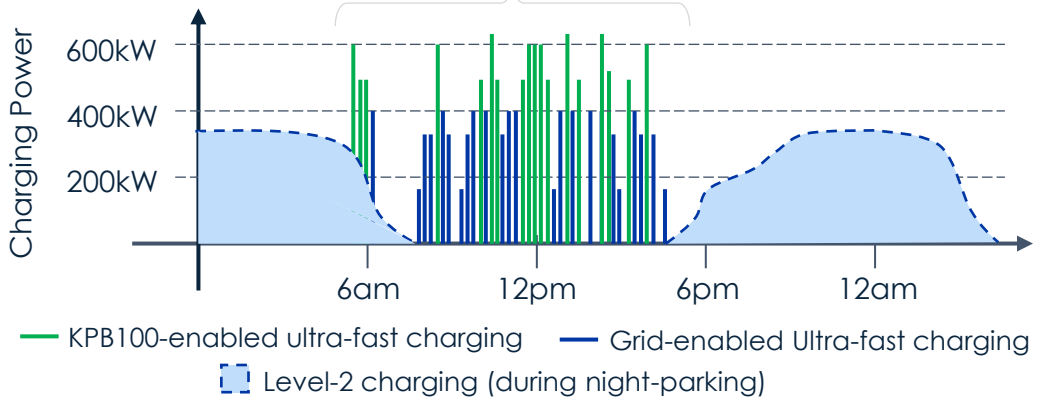
KPB100 enables ultra-FC, 3x over grid limit, avoiding demand-charges



Example Configuration: Fleet < 20 Evs, Grid power – **100kW,**
Equipment – L2 –chargers + **1DCFC + 1 KPB100** (phase-1) **/ 2 DCFC+ 2 KPB100** (Phase2)

Phase3 & 4 — Grow With Max. Flexibility & Min. OPEX

KPB100 enables ultra-FC, 50% over grid limit, avoiding demand-charges



Example Configuration: Grid power – **400kW,**
Equipment – L2-chargers + **4-6 DCFC + 2-3 KPB100**

Hybrid Booster to support Charging-Hub

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The Challenge

Hub Power consumption varies significantly

- At different times of day/year
- Multiple demand spikes

The Solution

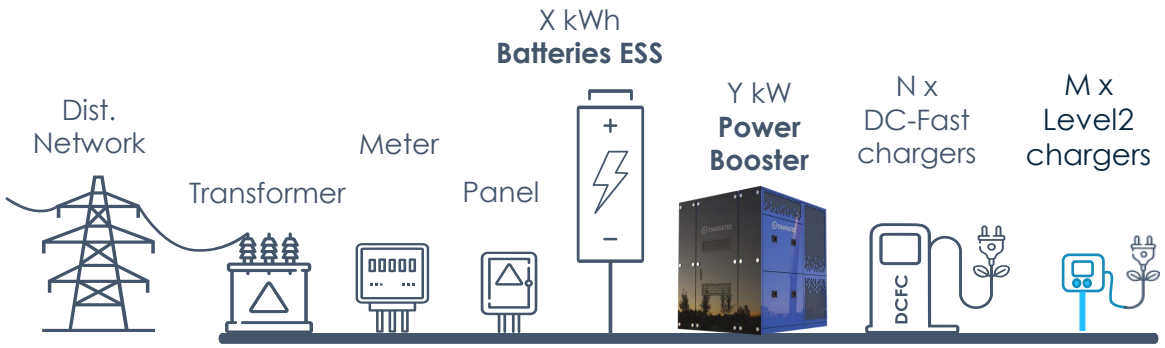
Maximizing the benefit of two technologies

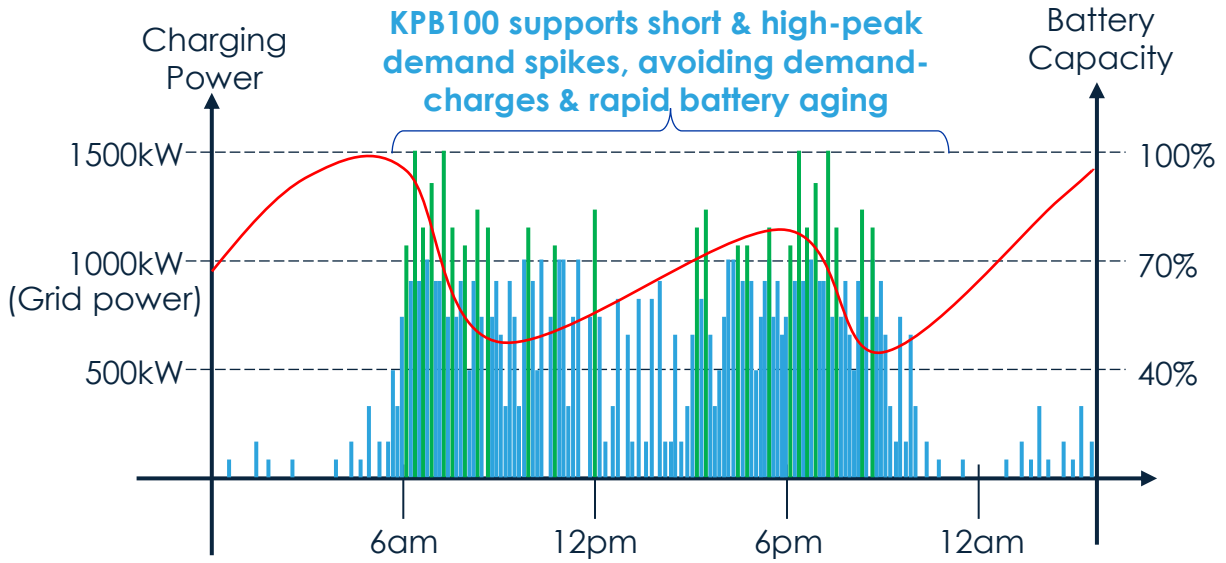
- **Kinetic Power Booster** (C-rate of ~5)
  - support frequent, short, demand spikes
  - multiple high-rate cycles per day
- **Li-Ion Energy Storage** (C-rate of ~0.5)
  - support grid during rush-hours' demand peak
  - 1 full equivalent cycle per day

The Benefits

Hybrid Booster can reduce CAPEX & OPEX

- Avoid / reduce demand charges
- Reduce grid upgrade costs
- Gradually increase CAPEX (ESS and KPB)
- Reduce batteries replacements costs





Example configuration:

- Grid power – 1000kW
- Battery storage – 600kWh, C-0.5
- Power booster – 250kW, C-5

Power consumed from grid
Boosted charging sessions
Battery capacity

Competition - Flywheel-based Solutions

	Chakratec	Beacon Power	Active Power	Amber Kinetics
Discharge Duration	**10-30 min.**	< 1 min.	< 1 min.	~4 hours
Focus application	**EV Fast-Charging**	Balancing		vable gy
Speed (rpm)	17,000			00-8,000
Rotor material (cost)	Steel Pl ($1.5		Steel (~$4/kg)	Stainless Steel (~$4/kg)
Installation	Over gro	Buried	Over gnd.	Buried
Charging Cycles	High (200,000)	High (175,000)	Low	Low (11,000)
Continuous Operation	Yes (air cooled)	Yes (liquid cooled)	No (require relax time)	Yes (low power)

Solutions not optimized for EV fast-charging
Closing technology & maturity gap will require significant R&D

Recently additional competitors announced Flywheel-based solutions targeting EV Fast-Charging application:
www.teraloop.org
www. levistor.com

According to Company's estimate - solutions are still immature

Payment plans

	Monthly Rent	Full Purchase	Purchase with Long-term service commitment
Benefit	Low upfront cost	Minimal total cost of ownership (TCO)	Moderate upfront cost + High certainty of OPEX
System Ownership	Chakratec	Site Owner/Operator	Site Owner/Operator
Commitment Period	Min. 36 months	-	Min. 36 months
Upfront Payment	$0 to little down	Full system cost	40%-70% of system cost
Monthly Payment	√	With BoostProtection	√
Warranty	√	√	√
Full Service	√	With BoostProtection	√

(*) Presented payment plans are examples and may be changed based on negotiation with various customers / channels

Cooperation with

ARKO
A Family of Community Brands

Pilot location – Rockhill, SC

- ✓ Delivery of Chakratec Power Booster and Setup of EV fast-charging infrastructure – Q2/2022
- ✓ Expected Pilot duration – 3 months
- ✓ Upon success –
  - ✓ +5 sites expansion
  - ✓ Enter US distribution agreement

Planned Site Opening
22.11.22

New site

ACRONYMS

Acronym	Meaning
EV	Electrical Vehicle
DCFC	Direct Current Fast Charger
CAPEX	Capital Expenditure
OPEX	Operational Expenditure
HW OEM	Hardware Originial Equipment Manufacturer
O&G	Oil & Gas
LFP	Lithium Ferrophosphate
NMC	Nickel Manganese Cobalt
EMS	Energy Management Software
CPO	Charge Point Operator
EPC	Engineering Procurement Construction
FW	Flywheel

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