

EVONITY

Elegant Power

Murat Sozen

26/9/2023



PRESENTATION OVERVIEW

Presentation Overview

- **Part 1: Who is Evonity?**

- Evonity Team Background
- Why EV Charging?
- Timeline
- What makes Evonity different?

- **Part 3: Evonity Products Range**

- Product Range
- New Developments & Goals
- Success Projects



- **Part 2: Market**

- Projected Market Analysis
- Market Segmentation
- Main challenge with DC Charging and our solution

WHO IS EVONITY?

The Foundation: 15+ Years in Industrial Automation

- Our team boasts an extensive 15-year track record in Industrial Automation. We specialize in crafting turn-key solutions for mass production lines and robotic systems, mainly with a focus on serving the automotive and food industry.



Switch to EV Charging Business

- While being actively engaged in building mass production lines for the automotive sector in China.
- Witnessed the industry's pivotal shift towards electric vehicles firsthand.
- Encountered the emergence of new hybrid transmissions and discussions on upcoming EV projects.
- Recognized the potential and decided to explore how we could contribute to this burgeoning revolution.

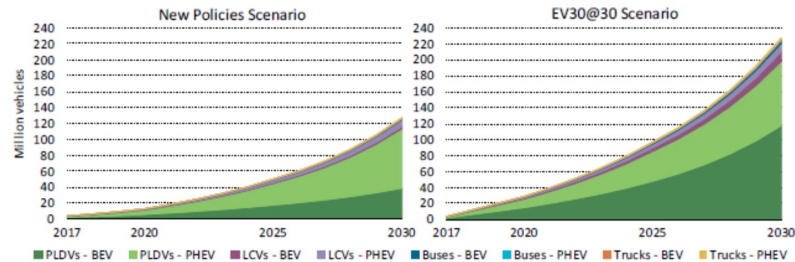


What we found out during our analysis

These diagrams about market trends and future:

- The electric vehicle (EV) market is experiencing exponential growth, propelled by a worldwide push for cleaner, more sustainable forms of transportation.
- According to recent studies, there could be up to 145 million electric vehicles on the road by 2030.
- This rapid adoption creates an immediate need for an extensive and reliable charging infrastructure.

Figure 6.1 • Global EV stock by scenario, 2017-30



Notes: PLDVs = passenger light duty vehicles; LCVs = light commercial vehicles; BEVs = battery electric vehicles; PHEV = plug-in hybrid electric vehicles.

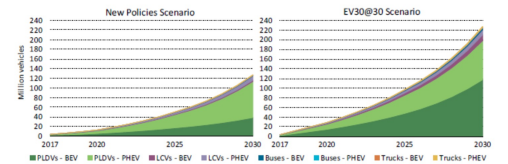
Source: IEA analysis developed with the IEA Mobility Model (IEA, 2018a).

Key point: The EV30@30 Scenario sees 228 million EVs (excluding two- and three-wheelers), mostly LDVs, on the road by 2030. This is about 100 million more than in the New Policies Scenario.

What we found out during our analysis

Predicted EV Stock

Figure 6.1 • Global EV stock by scenario, 2017-30



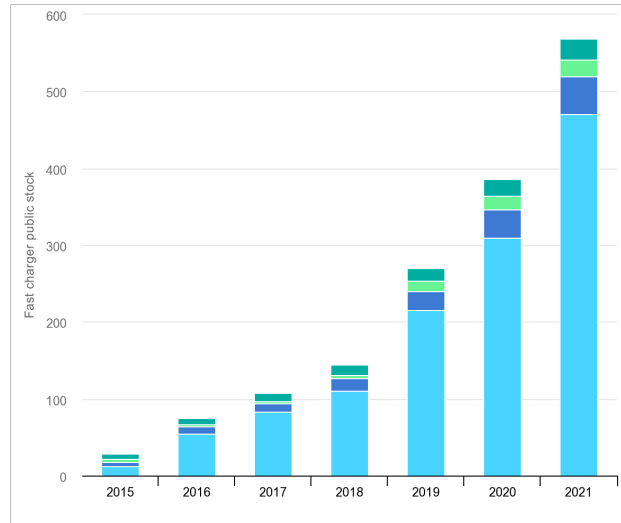
Notes: PLDVs = passenger light duty vehicles; LCVs = light commercial vehicles; BEVs = battery electric vehicles; PHEV = plug-in hybrid electric vehicles.

Source: IEA analysis developed with the IEA Mobility Model (IEA, 2018a).

Key point: The EV30@30 Scenario sees 228 million EVs (excluding two- and three-wheelers), mostly LDVs, on the road by 2030. This is about 100 million more than in the New Policies Scenario.



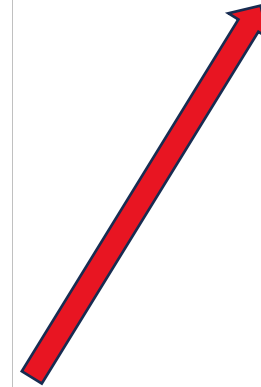
Increase in EV Charging



<https://www.iea.org/data-and-statistics/charts/fast-publicly-available-chargers-2015-2021>

65.000.000 chargers by 2035

EU expects the need for 65m chargers by 2035



Result of investigation

Let's address the growing need!



Mission

To revolutionize the EV charging landscape by leveraging our deep expertise in automation and manufacturing, aiming to make EV charging faster, more efficient, and universally accessible.

Vision

To be a global leader in EV charging solutions, shaping a more sustainable and efficient future for transportation worldwide.



EVONITY
ELEGANT POWER

OUR TIMELINE

2020

Capitalizing on our strong technical know-how, we initiated the R&D phase for our AC Chargers.

2022

Moved to a new location, Delivered our first units (+30 DC Charging Points and +140 AC Charging Points),

Expanded:

- Our product portfolio
- Marketing and Sales force
- Local and Global Partnerships

we began our in-depth market investigation and business case study analysis to identify gaps and opportunities in the electric vehicle (EV) charging sector.

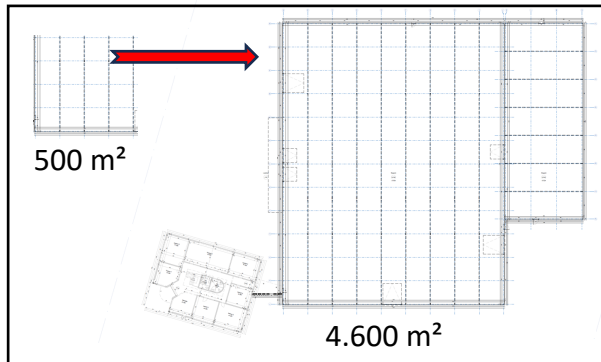
2021











We expanded our product portfolio by starting R&D on DC Chargers.

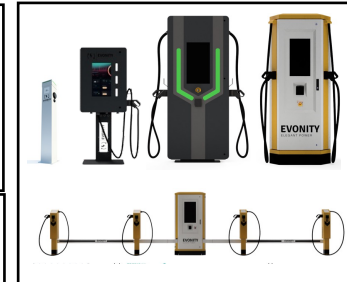
2023

In September 2022:

We took a significant step by launching Evonity® as a separate entity, coinciding with the product launch of our pioneering CF8 charger.



 + 30 DC	
 +140 AC	
 	    



WHAT MAKES EVONITY DIFFERENT



IN-HOUSE ENGINEERING

- Industrial system experience
- Robust and reliable systems
- Mechanical and electrical expertise
- Proactive to market changes
- Quick, innovative solutions
- Customer-centric approach



STANDARD PRODUCTS

- Perfect fit for various market segments
- Detailed coverage later in the presentation



PARTNERED SOLUTIONS

- Advanced developments with partners
- Examples to follow later in the presentation

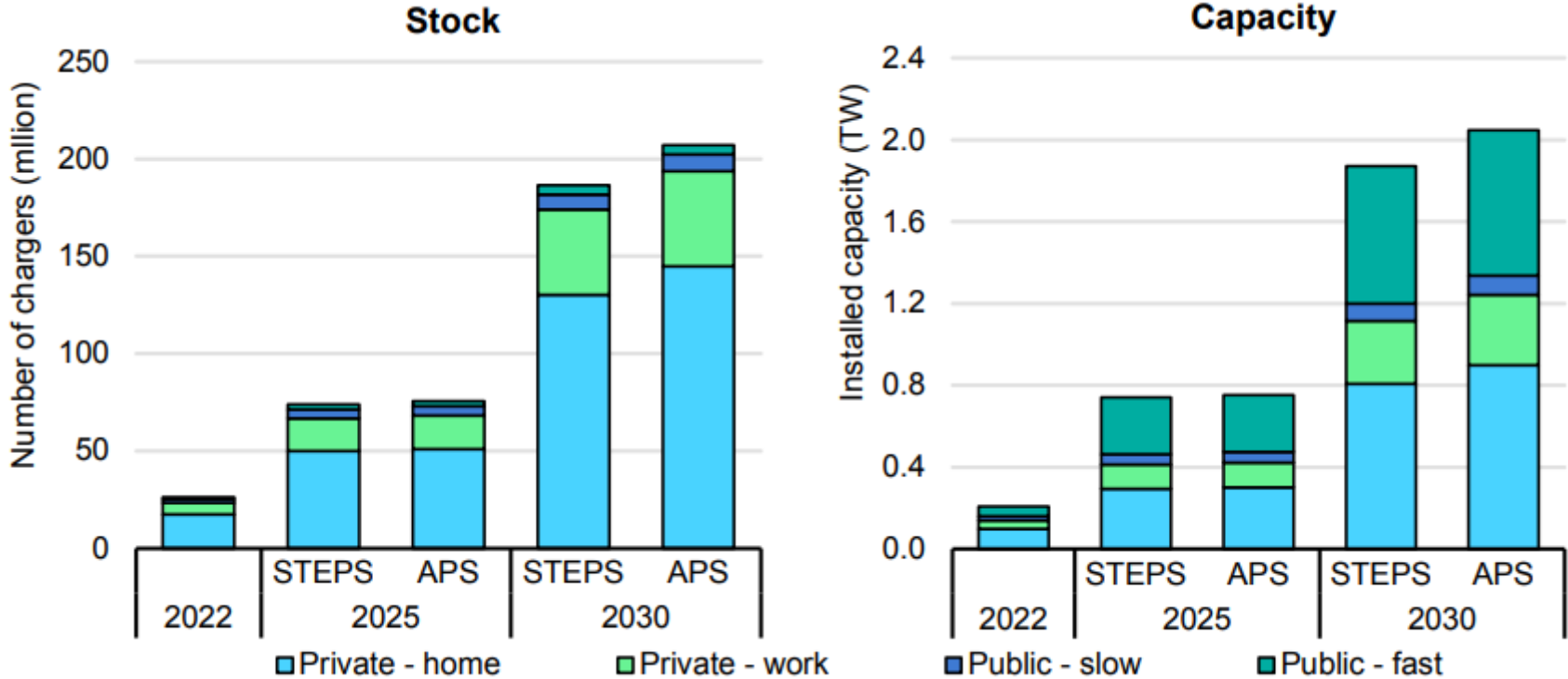


ONE STOP SHOP

- Turn-key solutions for our customers
- Comprehensive service offerings

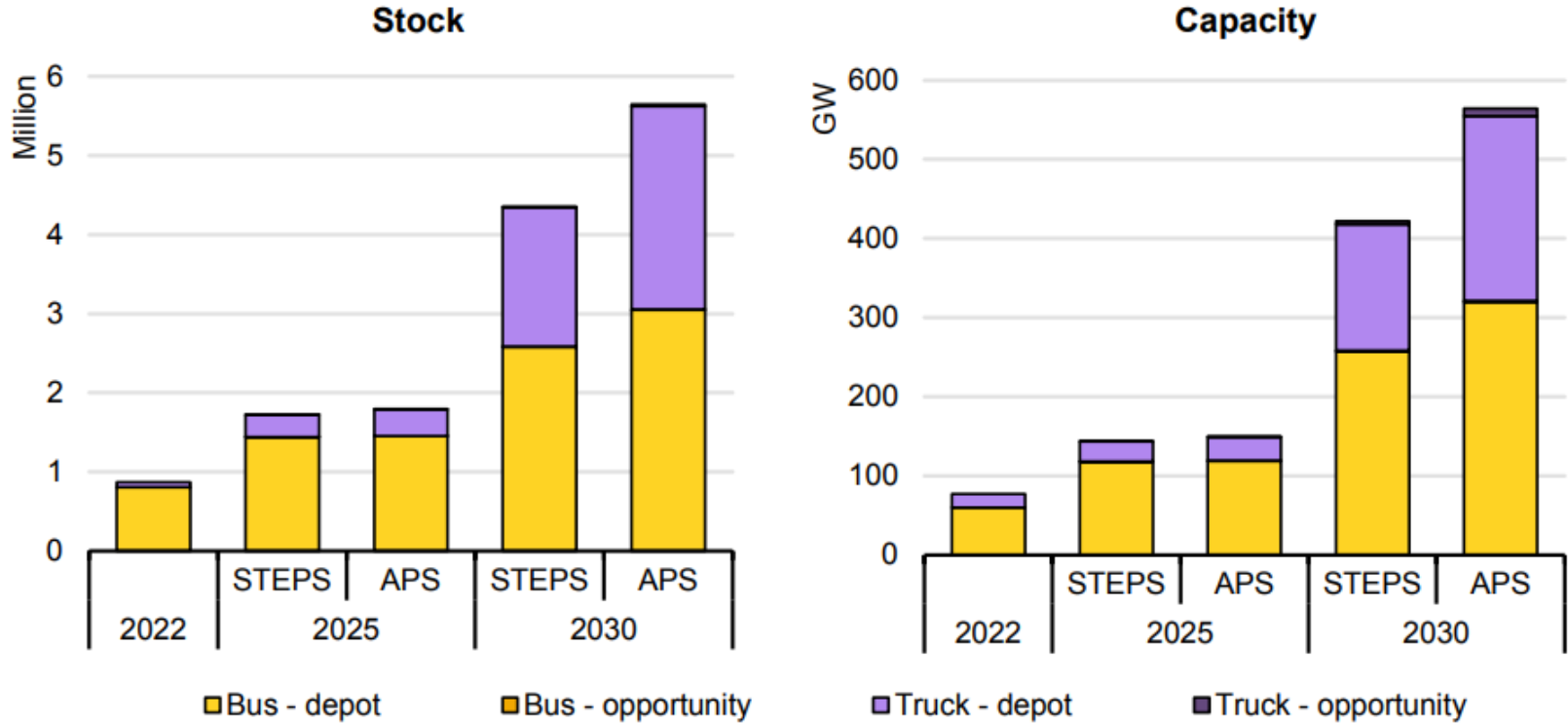
MARKET ANALYSIS

Slow Chargers VS Fast Chargers Market Share



Light-duty vehicle charger installations by number and capacity, 2022-2030

Slow Chargers VS Fast Chargers Market Share



Heavy-duty vehicle charger stock and capacity by type, 2022-2030

AC and DC Charging: Opportunities and Focus

1. Market Dynamics

- Slow charger prevalence
- Fast charger growth potential

2. Innovation Landscape

- DC charging: A realm of possibilities
- AC charging: Smart services and capabilities

3. Our Strategic Focus

- DC charging: Leading in fast, versatile solutions
- AC charging: Leveraging a vast market

4. Vision

- DC Market: Quick 'charge and go' infrastructure
- AC Market: Smart charging services

5. Conclusion

- Tailored solutions for every business case
- A dual-focus approach for market leadership

MARKET SEGMENTATION

EV Charging Market Segmentation



Residential Charging



Commercial Charging



Public Charging



By Charging Speed

By User Type

By Business Model

Market segmentation – Residential Charging

• **Where?** - Private homes, multi-unit apartments

• **Business cases:**

- **Charging speed:** Preference for slow charging
- **User type:** Individuals, families, residential buildings
- **Business model:** Private ownership, subscription services



• **Charger Type:**

Charger Type	Power	Pros	Cons
Level 1	< 2,5 KW AC	Ease of installation; Cost-effective	Slow charging speed
Level 2	up to 22KW AC	Faster charging speed	Higher installation cost

Market segmentation – Commercial Charging

• **Where?** – Businesses, Workplaces

• **Business cases:**

- **Charging speed:** Fast charging solutions, both AC and DC



- **User type:** Employees, commercial fleets

- **Business model:** Organization-owned, charging-as-a-service, EV Charging networks



• **Charger Type:**

Charger Type	Power	Pros	Cons
Level 2	up to 22KW AC	Moderate charging speed; Cost-effective	Slower than DC fast chargers
DC Fast Chargers	> 50 KW DC	Rapid charging; High throughput	High installation and operational costs

Market segmentation – Public Charging

• **Where?** – Shopping malls, highways, municipal locations



• **Business cases:**

- **Charging speed:** Variety from fast AC chargers to Super Fast DC
- **User type:** Everyday EV owners, car-sharing services, commercial Fleets, rental
- **Business model:** Pay-as-you-go, membership models, government-sponsored

• **Charger Type:**

Charger Type	Power	Pros	Cons
Level 2	up to 22KW AC	Widespread; Cost-effective	Slower charging than DC Charging
DC Fast Chargers	> 50 KW DC	Quick charging; High utility	High installation and operational costs

DC CHARGING CHALLENGES

Mitigating Challenges of DC Fast Charging with Battery Storage Systems

•Challenges of DC Fast Charging

- High Installation and Operational Costs
- Grid Capacity and Stability due to high load
- Regulation limitations based on location

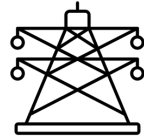
•Solutions through Battery Storage Systems

- Cost-Efficiency
- Grid Support
- Renewable Integration
- Grid Power Utilization
 - Low-Peak Charging for Storage
 - High-Power Vehicle Charging



Mitigating Challenges of DC Fast Charging with Battery Storage Systems

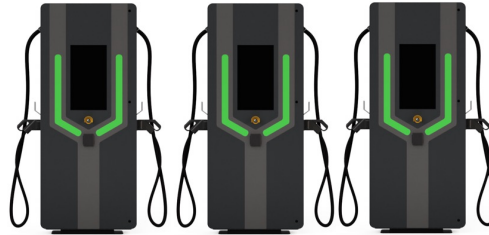
Energy Harvesting



Energy Storage

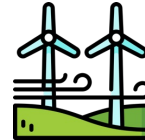
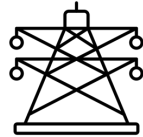


Energy Utilization

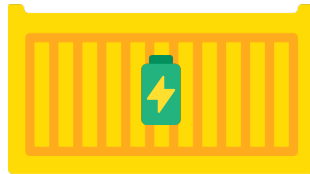


Mitigating Challenges of DC Fast Charging with Battery Storage Systems

Energy Harvesting



Energy Storage



Energy Utilization



PARTNERED SOLUTIONS

EVONITY PRODUCTS

Evonity Product Range

PDS

Pro Duo S
Pro Uno S
HD Uno S
HD Uno C
...



AC – 22KW

CFM

ChargeFaction M



DC – 40KW

CFY

ChargeFaction Y



DC – 200KW

CFC

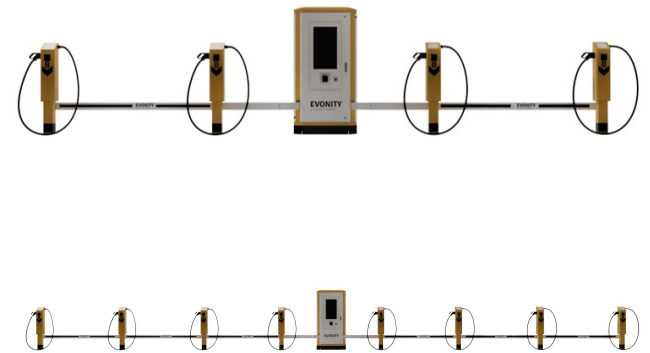
ChargeFaction Compact



DC – 320KW

CF

ChargeFaction



DC MULTI SLOT – 320KW



Residential Charging



Commercial Charging



Public Charging

Evonity Product Range

PDS

Pro Duo S
Pro Uno S
HD Uno S
HD Uno C
...



AC – 22KW

CFM

ChargeFaction M



DC – 40KW

CFY

ChargeFaction Y



DC – 200KW

CFC

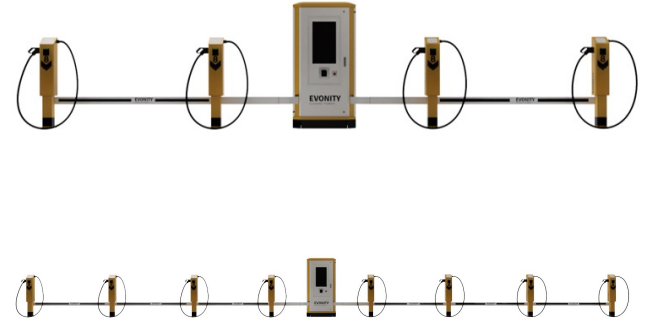
ChargeFaction Compact



DC – 320KW

CF

ChargeFaction



DC MULTI SLOT – 320KW

FURTHER DEVELOPMENT RESULT

AC – 44KW

DC-Link

DC-Link

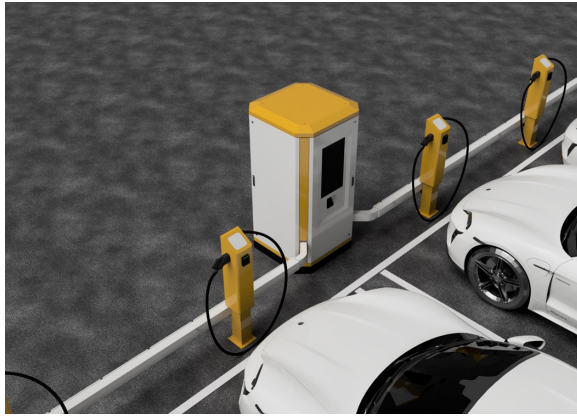
DC – 520KW

DC MULTI SLOT – 840KW



Evonity Standard Products - CF

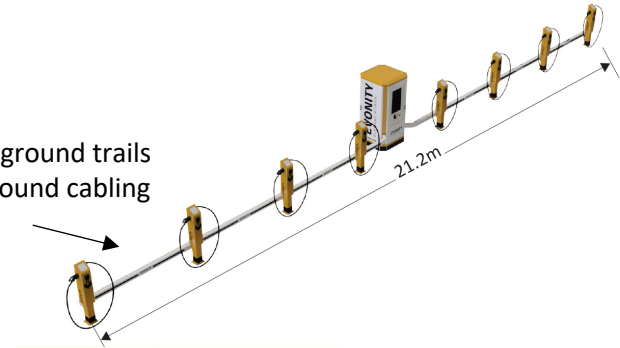
ChargeFaction-8 (320 -> **840KW**)



https://www.youtube.com/watch?v=Rt4XH_A0uXQ

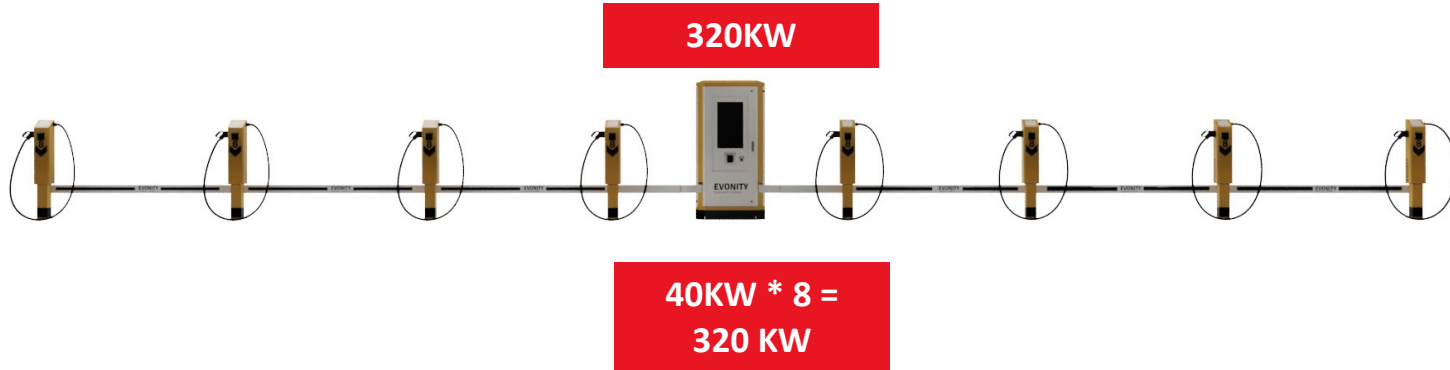
Cabling:

- Possible to use above ground trails
- But also possible in-ground cabling



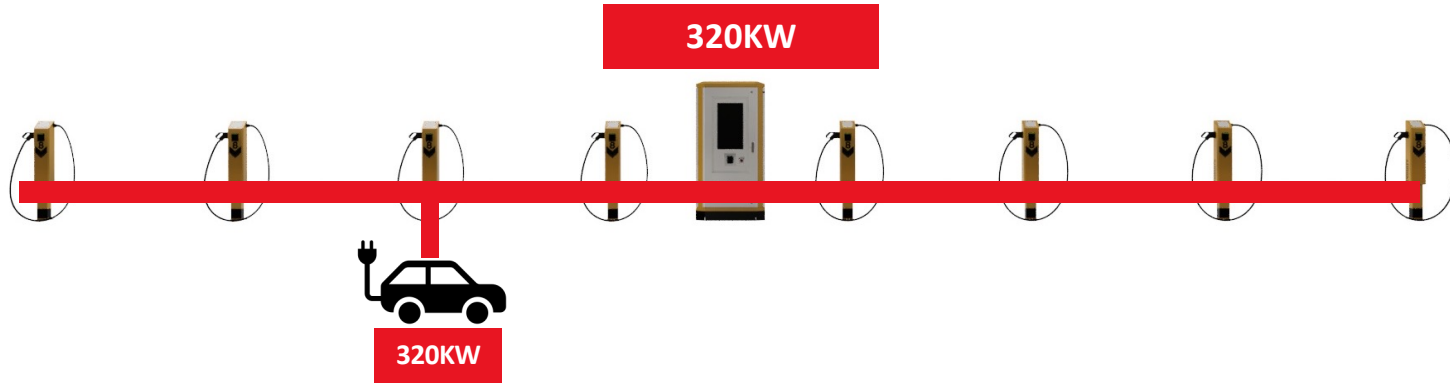
Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



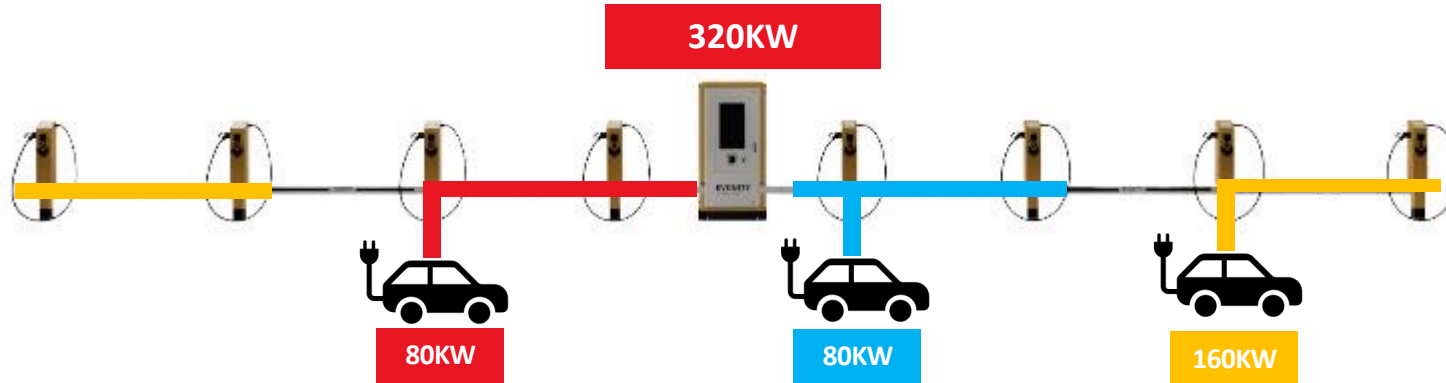
Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



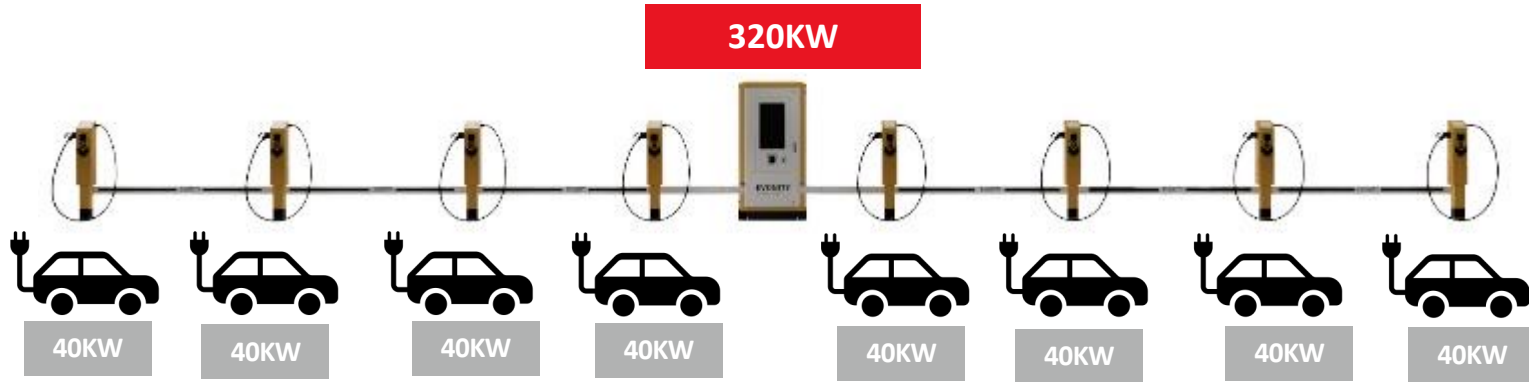
Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



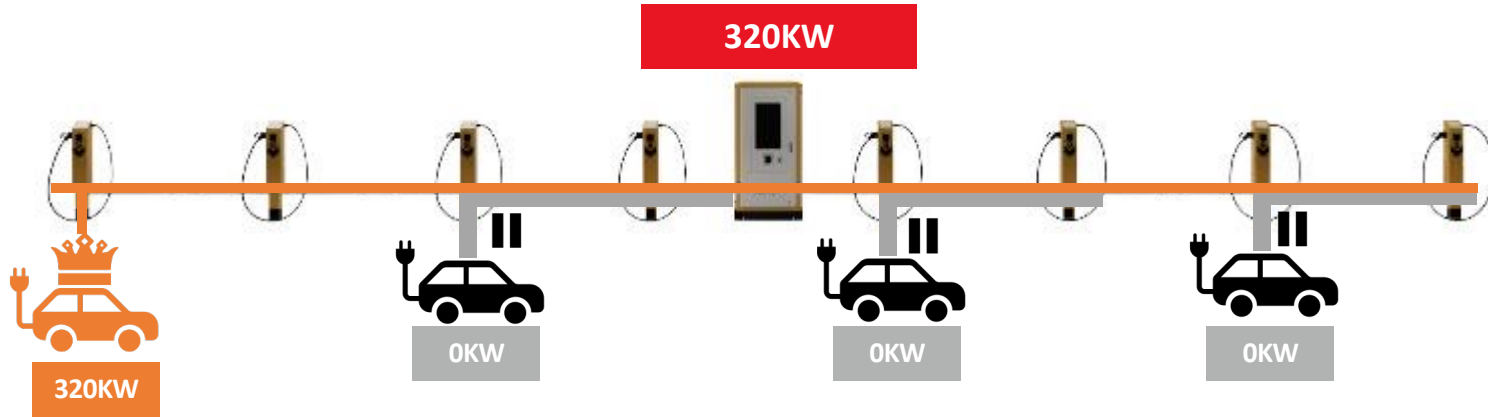
Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



Evonity Standard Products - CF

ChargeFaction-8 built-in automatic power distribution



Evonity Standard Products - CFC

ChargeFaction-2 Compact (320 -> **520KW**)



Product specifications

GENERAL

OPERATING TEMPERATURE:	-25°C / +55°C (output derating > 45°C)
RELATIVE HUMIDITY:	0% - 95% (non condensing)
ELECTRICAL SAFETY CLASS:	I
DEGREE OF PROTECTION:	IP54
MECHANICAL IMPACT:	IK10
INSTALLATION SITE:	Indoors and outdoors
INSTALLATION ALTITUDE:	No de-rating below 2000m a.s.l
COOLING:	Forced air cooling
STANDBY POWER CONSUMPTION:	± 150 W (depends on configuration and options)
NOISE EMISSION:	≤70 db

CERTIFICATIONS/STANDARDS

CE COMPLIANT:	✓
ISO 15118 COMPLIANT:	✓

ELECTRICAL

EFFICIENCY:	≥ 95 %
CHARGING CAPACITY:	80kW – 320kW (in steps of 40kW)
DC OUTPUT VOLTAGE:	350 – 1000VDC
DC MAX. OUTPUT CURRENT:	250ADC
NOMINAL VOLTAGE:	399V-11 400VAC +/- 10%
NOMINAL CURRENT:	75A – 375A
NOMINAL FREQUENCY:	50Hz
CONNECTION TYPE:	CCS2 ¹
CHARGING CABLE LENGTH:	Standard 3,5m ²
RESIDUAL CURRENT DETECTION:	AC 30mA for internal components ¹
OVER VOLTAGE PROTECTION:	✓
UNDER VOLTAGE PROTECTION:	✓
OVER LOAD PROTECTION:	✓
SHORT CIRCUIT PROTECTION:	✓
EARTH LEAKAGE PROTECTION:	✓
OVER TEMPERATURE PROTECTION:	✓
SURGE PROTECTION:	✓

Evonity Standard Products - CFM

ChargeFaction-M (40KW)

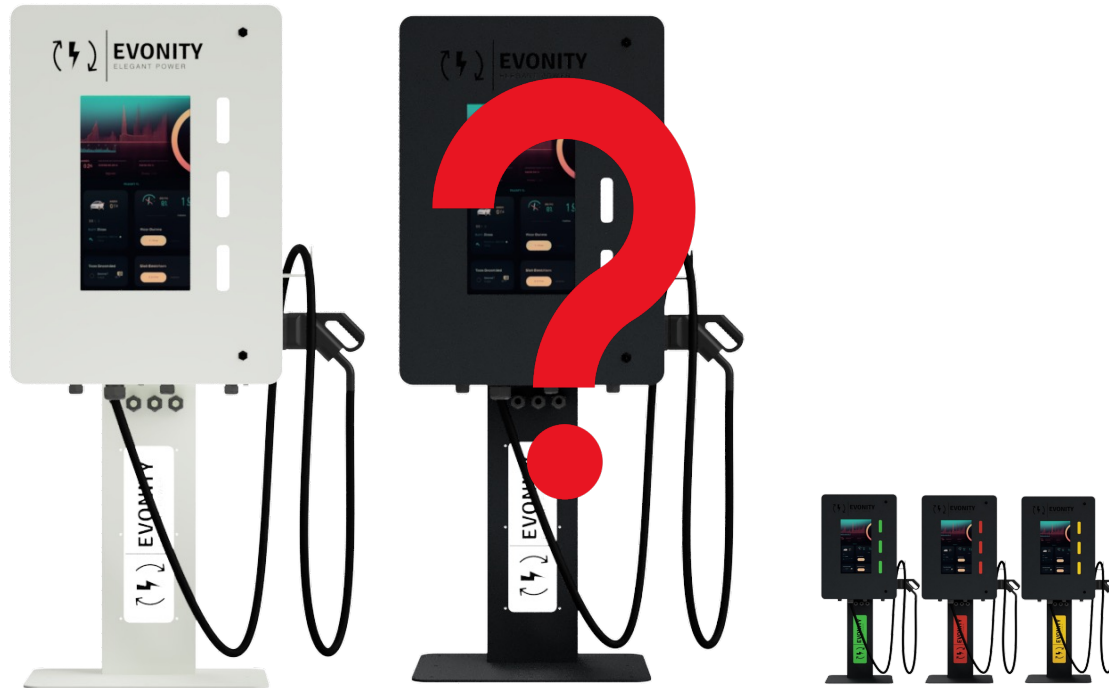


GENERAL	
OPERATING TEMPERATURE:	-25°C / +55°C (output derating > 45°C)
RELATIVE HUMIDITY:	0% - 95% (non condensing)
ELECTRICAL SAFETY CLASS:	I
DEGREE OF PROTECTION:	IP54
MECHANICAL IMPACT:	IK10
INSTALLATION SITE:	Indoors and outdoors
INSTALLATION ALTITUDE:	No de-rating below 2000m a.s.l
COOLING:	Forced air cooling
STANDBY POWER CONSUMPTION:	± 120 W (depends on configuration and options)
NOISE EMISSION:	≤70 db
CERTIFICATIONS/STANDARDS	
CE COMPLIANT:	✓
ISO 15118 COMPLIANT:	✓
ELECTRICAL	
EFFICIENCY:	≥ 95 %
CHARGING CAPACITY:	40kW - 320kW ¹
DC OUTPUT VOLTAGE:	350 - 1000VDC
DC MAX. OUTPUT CURRENT:	130ADC - 360ADC ²
NOMINAL VOLTAGE:	3PH+N 400VAC +/- 10%
NOMINAL CURRENT:	75A
NOMINAL FREQUENCY:	50Hz
CONNECTION TYPE:	CS2 ³
CHARGING CABLE LENGTH:	Standard 3.5m ⁴
RESIDUAL CURRENT DETECTION:	AC 30mA for internal components ⁵
OVER LOAD PROTECTION:	✓
SHORT CIRCUIT PROTECTION:	✓
EARTH LEAKAGE PROTECTION:	✓
OVER TEMPERATURE PROTECTION:	✓

¹ Up to 120kW if more inlets are used (linked together with DC-link) only.
² Depending on version of device DC linked together and environment and conditions and maximum DC link length between. This data is not intended for use in a vehicle.
³ CS2 is not available in all countries.
⁴ 3.5m and 7.5m optional.
⁵ See and 7th option.
⁶ Standard type B (AC) required (see for details optional).

Evonity Standard Products - CFM

ChargeFaction-M (40KW)



Evonity Standard Products - CFM

High speed charger > 300KW



ChargeFaction-M (40KW)



VS



Grid limitations?



Budget limitations?



Different use-case?



gas station like along highways



Super markets, business parking lots ...

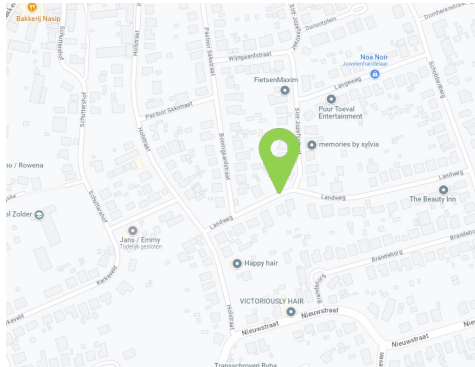
Evonity Standard Products - CFM

Today

ChargeFaction-M (40KW)



Our customer

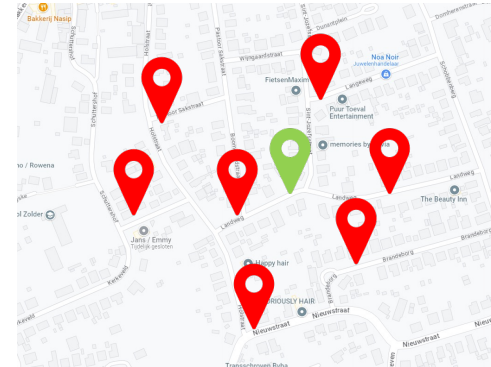


Future

High speed charger > 300KW

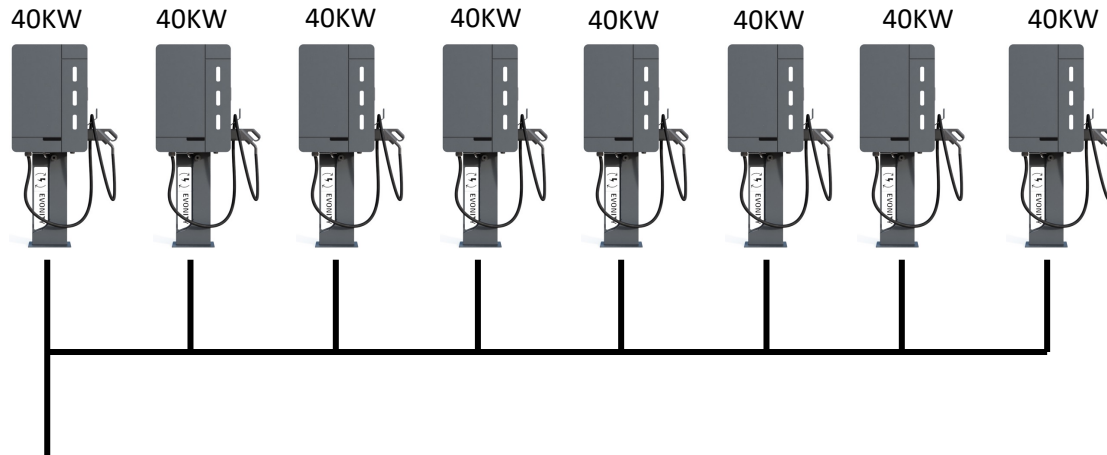


Our customer



Evonity Standard Products - CFM

DC-Link



Power combination > $8 \times 40\text{KW} = 320\text{KW}$ available on each slot*
* 320KW available depending on external conditions and unit configuration

Evonity Standard Products - CFM

Today

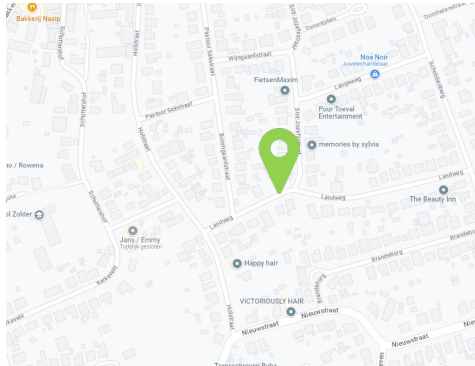
ChargeFaction-M (40KW)



DC-Link Option



Our customer

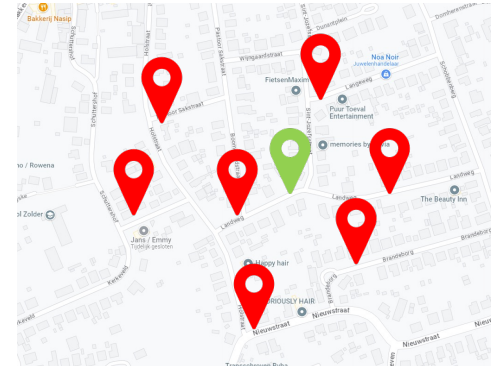


Future

High speed charger > 300KW



Our customer

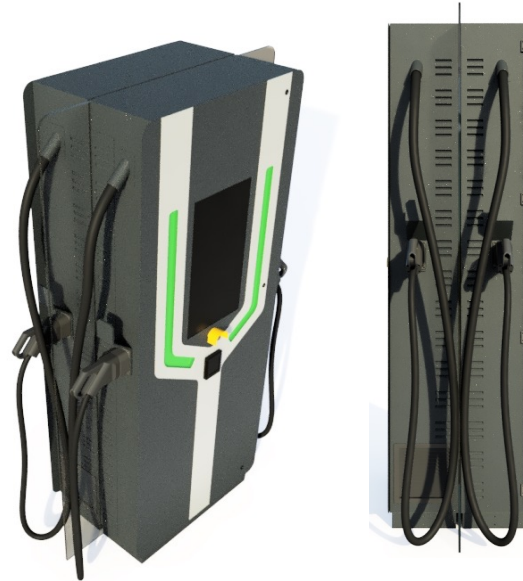


Evonity Standard Products - CFY

ChargeFaction-2Y



ChargeFaction-4Y



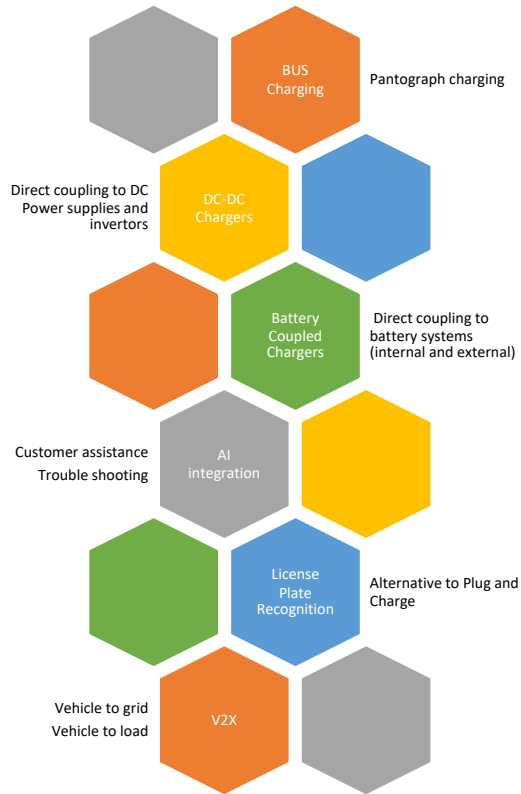
DC-Link Option

4 Slots

400KW

NEW DEVELOPMENTS & GOALS

NEW DEVELOPMENTS



FUTURE GOALS

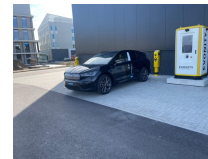
- **Our future goals:**
 - Keep expanding our sales network
 - Keep expanding our partner network
 - Finish current new developments
 - Keep track of market trends and regulations to be able to opt-in as soon as possible into these new regulations and trends
 - Further automate our production lines
 - Keep optimizing our production process in Belgium



PAST SUCCESS PROJECTS

Evonity Standard Products

CF8-320KW



https://www.youtube.com/watch?v=Rt4XH_A0uXQ

Evonity Standard Products

CF4-160KW



Evonity Standard Products

CF2C-320KW configuration



Evonity Standard Products

CF2C-320KW configuration



Evonity Standard Products

CFY2-120KW configuration



Evonity Standard Products

CFY2-80KW configuration



Evonity Standard Products

CFY2-120KW configuration



Evonity Standard Products

CFM-40KW configuration



Evonity Standard Products

2x Pro Duo C Pile – 2x22 KW



Evonity Standard Products

2x Pro Duo S Pile – 2x22 KW



Thank you
for your attention

Check our website

www.cet-power.com

Follow us

