WEBINAR

The Future for Heavy-Duty Vehicles in the Pentalateral Region: Integrating Electromobility in the Energy Transition

Moderated by:
Claude Turmes, Luxembourg Minister of Energy and Spatial Planning

THURSDAY, 22 October 2020 • 15:30 – 18:30 CEST

Welcome Remarks

Claude Turmes

Minister of Energy
Minister of Spatial Planning
Luxembourg

IRENA International Renewable Energy Agency

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Énergie et de l'Aménagement du territoire
Département de l'énergie

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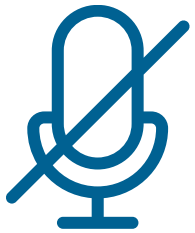
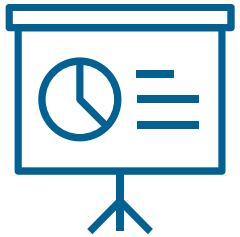
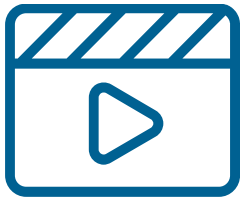


All microphones are **muted**

Use the **Chat** feature to introduce yourself and talk to other attendees

If you have **Questions** to the speaker please use the dedicated **Q&A** tab





The slides and recordings will be shared via email after the end of the webinar

Tell us how we did
in the survey to help us improve

AGENDA

15:30 – 15:45	**Introduction**
15:45-16:15	**Panel I -** What comes first: charging points vs. e-HDVs
16:15-16:45	**Panel II -** How to build a business case for e-HDVs: Financial models and public incentives
16:45-17:00	Digital Break
17:00-17:45	**Panel III -** The impact on the energy network: Nexus between, HDV, power systems and renewables
17:45-18:15	**Panel IV -** The role of regional cooperation: The Pentalateral Energy Forum within the EU legal framework
18:15-18:30	**Next Steps and Closing Remarks**

Introduction

Sandor Gaastra

Director-General Climate and Energy – Ministry of Economic Affairs
Penta Presidency (NL)

Keynote Presentation

Dolf Gielen

Director – Innovation and Technology Centre
IRENA

The Nexus Between Freight Transport and Electricity Sectors

IRENA International Renewable Energy Agency

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Key insights from 2019 Pentalateral ministerial event on electromobility

Electric passenger cars

- Europe has become the largest EV market in the world
- Ample attention on EV sales support and public charging points
- Lack of attention on smart charging and power systems integration
- Most attention is focused on passenger cars and city buses

Next discussion needs to look into heavy duty vehicles

- Global road freight activity and CO_2 emissions is dominated by heavy trucks (>15 t)
- Still unclear if trucks should go the same way as passenger cars

The case for Battery Electric Trucks – four points on recent progress

1. Energy efficiency and cost

Pathway	Range (km/100 kWh)	Cost (EUR cents/km)	Efficiency (well-to-wheel)
E-truck charged by electric road system	60	19	77%
Battery e-truck	48	20	62%
Hydrogen fuel cell truck	24	55	29%
Power-to-gas CNG-truck	17	70	20%

Source: Siemens (2018) eHighway SoCal

2. Drive range

- In Europe between 60% to 70% of road freight journeys are within distances of **under 500 km/journey**
- Truck manufactures like Daimler, Volvo, Xos, BYD and Cummins offer e-trucks within that range
- Nikola and Tesla announced e-trucks with higher ranges than that

Source: Transport & Environment and Atlas Policy

The case for Battery Electric Trucks – four points on recent progress

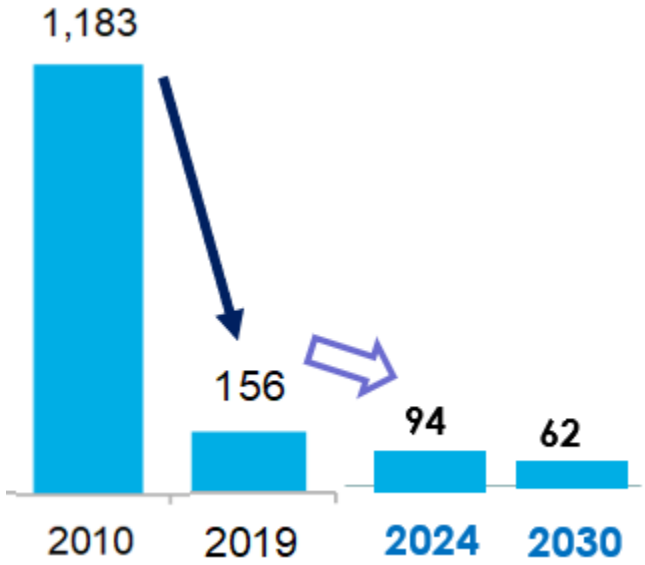
3. Weight of battery electric trucks

- The battery is heavier than diesel fuel but the **electric drive train is much lighter**
- Drive train **weight savings** of around 1 t + diesel fuel 0.5 t
- Today best-in-class **battery packs store 200 Wh/kg** - this may double or triple in the coming decades
- **1.8 kWh/km** for a truck with 25 t payload in realistic driving conditions – 4.5 t battery weight for 500 km - net weight increase around 3 t

Source: Hoekstra (2020) Electric trucks: economically, environmentally desirable but misunderstood, and https://omev.se/2019/09/26/analysis-of-advanced-battery-electric-long-haul-trucks/

4. Battery demand growth and cost reduction

- Cost reduction li-ion batteries (USD/kWh)



- Today ~ **200 GWh/yr li-ion batteries production**; ~ 50% for e-mobility sector
- If 30% of HDVs in EU go electric -> additional production capacity **~ 80 GWh/yr**

Dutch charging forecast for commercial vehicles (similar for other countries in Pentalateral Region)

Depot charging will dominate, need to consider smart charging strategies

Location	Forecast total number of charging points (mid scenario)			Avg. connection power per charging point (kW)	Expected power demand in MW (mid scenario)		
	2025	**2030**	**2035**		**2025**	**2030**	**2035**
Depot charging points	1,362	11,707	38,862	50	68	585	1,943
Shared charging hubs	60	1,208	6,519	50	3	60	326
Truck parking areas	45	403	1,397	70	3	28	98
Rest areas	28	253	878	650	18	164	570
Total	**1,495**	**13,571**	**47,656**	-	**93**	**838**	**2,937**

Source ElaadNL, 2020

Impact of Charging E-trucks on Power Systems

Some aspects to consider

- A 1MW charging point for e-HDV = the **peak load of 1,500 households**.
- Enedis (France) estimated that supplying additional 5 MW capacity (~ 15 x 350kw CP) to a truck service station along highways requires average **> 1 M EUR investment.** 400 stations in France around half a billion EUR (cables and posts)
- Time needed for the work ~ **1 to 3 years**
- E-trucks might not be so sensitive to changing charging behavior via **compensation such as ToU tariffs**
- More difficult to avoid **simultaneous charging**
- Charging mainly **concentrated in hubs**

	E-car	E-truck
Location charging points	Scattered locations (~ 80% home charging)	Clustered: mainly in Depot areas, charging hubs and rest areas along highways
Nominal capacity per charging point (kW)	3.6 – 120 (slow to fast charging)	150 – 350 (today) 650 – 3 000 (future)
% time vehicle is parked	> 90%	< 60%

Source: IRENA Innovation Week 2020 and Regulatory Energy Commission of France

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Smart charging for E-trucks – how would it look?

Considerations for smart charging of e-trucks

- Need for a better understanding on **approaches to adapt charging patterns**
- Possible solutions may rely less on price signals (tariffs) and more on **infrastructure solutions** (digital & electrical)
- Stationary **batteries as buffers** to manage peak demand
- Charging hubs combined with **on-site RE generation**, E.g.:
  - Frito Lay in California: e-trucks + on-site PV generation + stationary batteries
  - Kallista Energy in France: service stations along highways with on-site wind power generation
- **Proper long-term planning** involving CPO, utility and energy authorities is crucial

Source: IRENA Innovation Week 2020

Key takeaways

- Heavy freight trucks >15 t dominate total commercial vehicle fuel use
- Bulk of European freight transport takes place over a distance of less than 500 km
- Extra weight of batteries is minor, therefore electric is the way forward
- Continued cost reduction and performance enhancement of batteries
- Mobile batteries will dwarf stationary batteries – renewable energy integration opportunities
- Significant peak load, charging profile is different from cars
- Significant opportunity to contribute flexibility but need to understand how ‘smart charging’ for trucks would look. Long-term planning is key

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Thank you

Free download at:
www.irena.org/publications

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Panel I

What Comes First: Charging Points vs. e-HDVs

30 min

PANEL I

Magnus Broback

Director Charging Solutions

Volvo Group

Ricky van Soest

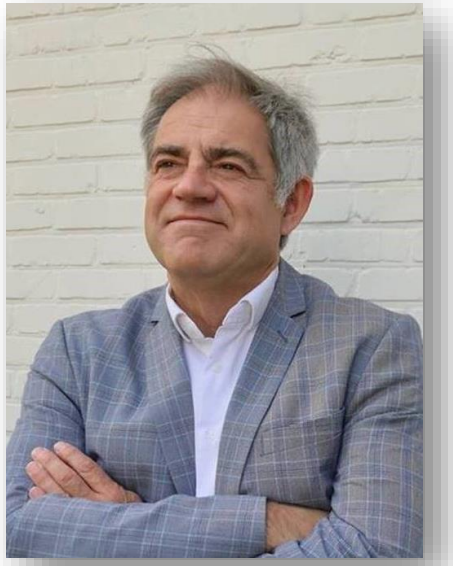
Project Lead, in charge of Flex EV project in Rotterdam

DHL Express

Leah O'Dwyer

Head of Head of eBus Solutions Charging

ChargePoint



Johan Peeters

Head of e-Mobility Solutions Development

ABB

Presentation

Magnus Broback

Director Charging Solutions

Volvo Group

The future for heavy-duty vehicles in the Pentalateral Region:

Integrating electromobility in the energy transition

Magnus Broback and Henrik Engdahl – 2020-10-22

henrik.engdahl@volvo.com

The first wave is already here

Scania launches fully electric truck with 250 km range

2020-09-15

Scania now launches its first fully electric truck. With a range of up to 250 km, the Scania electric truck can

BRANDS & PRODUCTS › TECHNOLOGY › CLASSIC

Actros test phase gathers spe
electric truck starts work at R
Cologne

- As part of the second test phase another battery-electric Mercedes-Benz eActros starts work at Remondis.
- First vehicles from the second test phase already involved in customer operations in the Netherlands and Leipzig.

Press release

Volvo Trucks launches sales of electric trucks for urban transport

11/6/19

AB Volvo

Volvo Trucks announces the start of sales of its Volvo FL and Volvo FE electric trucks in selected markets within Europe, meeting the increasing demand for sustainable transport solutions in city environments.

In the absence of exhaust emissions and with reduced noise levels from electric trucks offer huge potential in urban areas. First, the reduced noise levels make it possible to carry out deliveries and refuse collection in early mornings, late evenings or even at night, helping to improve transport logistics and reduce congestion during peak hours. Second, with better air quality and less noise, electric trucks create new opportunities for city planning and road infrastructure. An electric truck

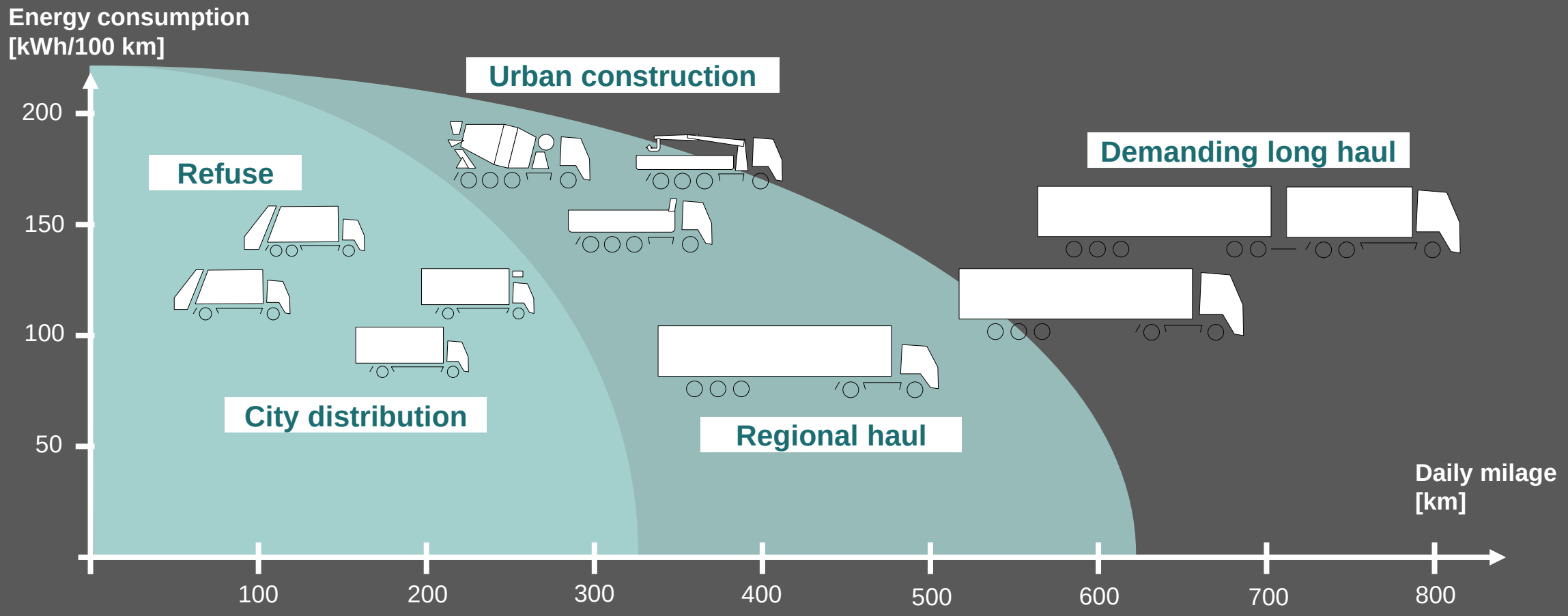
Typical specs:

150-250 km range (configureable)

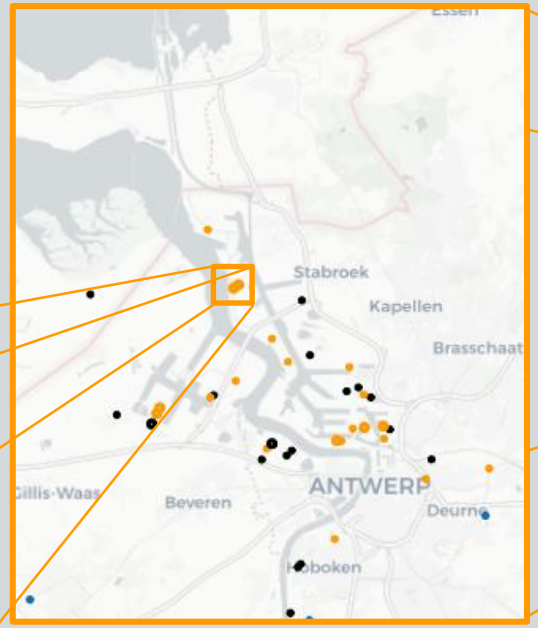
150kW of CCS charging

No major payload penalty

Electric vehicle applications



Potential charge station locations throughout Europe



Legend

- 90% of stops are between 45 min and 3 h
- 90% of stops are longer than 3 h
- Mixed long and short

Presentation

Ricky van Soest

Project Lead, in charge of Flex EV project in Rotterdam

DHL Express

DELIVERING EXCELLENCE

Go Green Journey

Flex EV

DHL Express Netherlands

Green Journey – NL Actuals

DELIVERING EXCELLENCE

Zero eMission 2050

14 City's zero eMission – Green sollutions

*More to come

City Hub opportunity's (Now 16 City Hubs total in NL)

Amsterdam - Expansion

The Hague - Expansion

BREEAM Facility's

3 BREEAM Facility's – RDH, ZWO & MST

Cargo Bikes

New Cargo Bike pilot

In total 77 new added Green vehicles in 1 year

Nissan ENV 200

15 ENV's implemented

BD eDucato

50 BD's implemented

Emoss

2 eTrucks implemented

eBullit - eParcycle

10 eBullits implemented

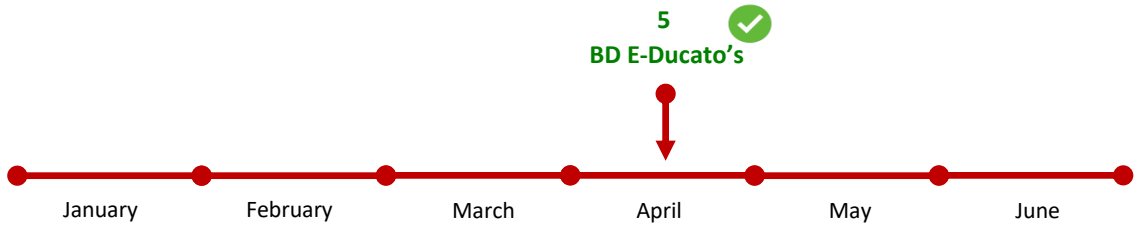
	Diesel	Green incl. CNG	Total
Trucks	32	3	35
Large vehicles	306	75	381
Small vehicles	14	15	29
Cargo bikes	-	89	89
Total	352	182	534
%	66%	34%	100%

*Possibilty's of growth on Cargo Bike with new CH Locations in Amsterdam & The Hague

Journey 2016 - 2020

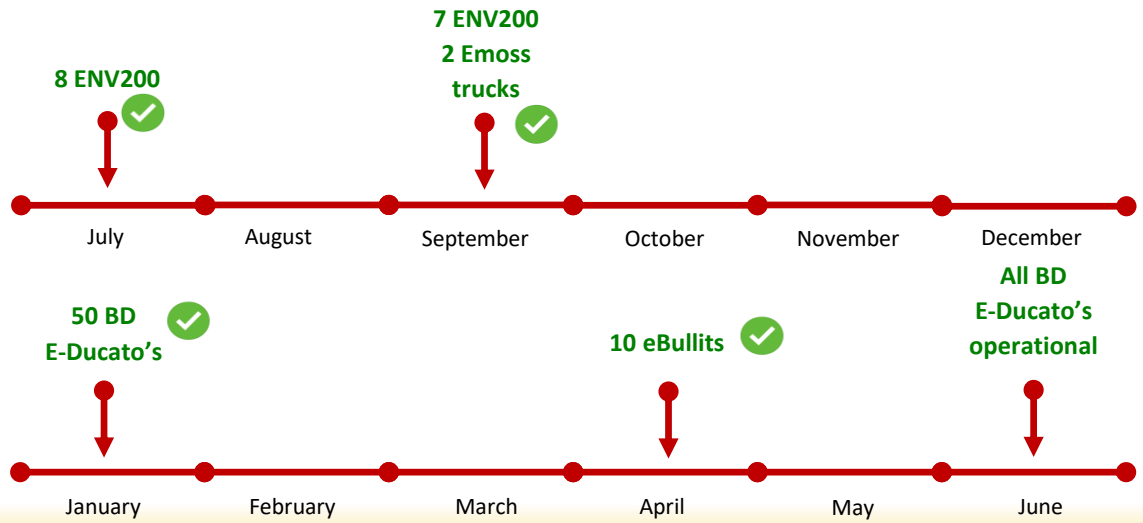
DELIVERING EXCELLENCE

2016



BD eDucato
5 BD's implemented

2019 - 2020



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Flex EV

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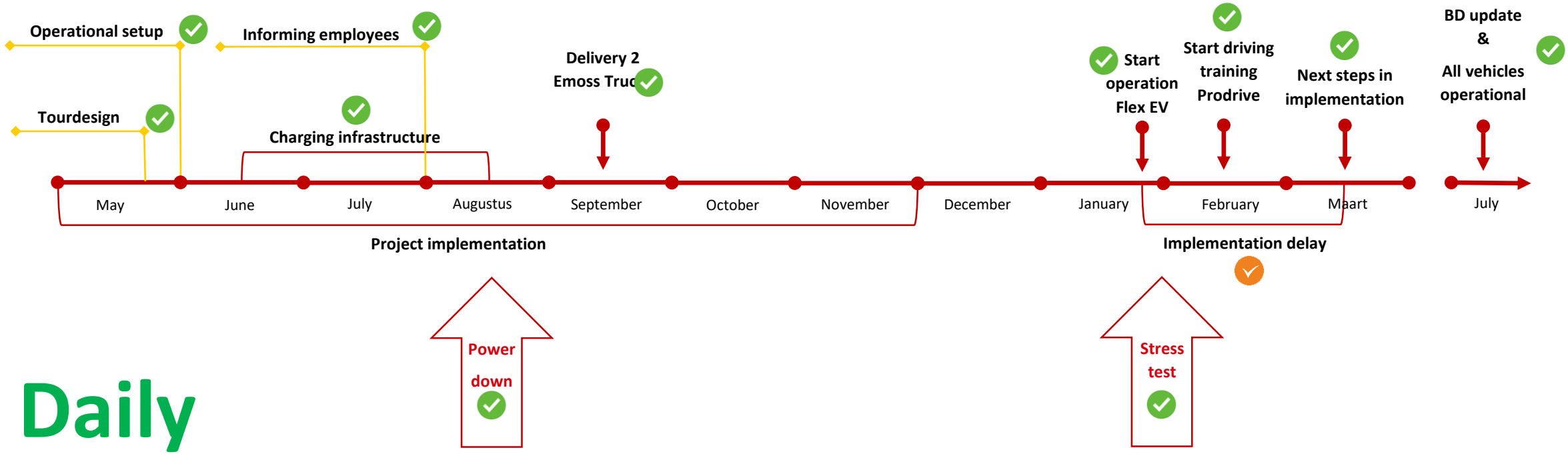


Daily

34 BD eDucato's & 2 eMoss Trucks on route

Flex EV - Road to succes

DELIVERING EXCELLENCE

Successes

- Project Work stream approach
- Classroom training; Driving behavior
- ProDrive academy
- Creating ambassadors
- Standards on training employees
- Extend experiences within the Netherlands
- Range overview
- Fast chargers overview NL

Challenges

- Range without training
- Driving behavior (range anxiety)
- Charging on Route
- Fast chargers in route
- Fast chargers – personal transport - vehicles
- Malfunction vehicles
- R&M
- +8 Days not operational
- Dealer footprint
- 3th party outside NL

DELIVERING EXCELLENCE

THANK YOU

Presentation

Leah O’Dwyer

Head of Head of eBus Solutions Charging

ChargePoint

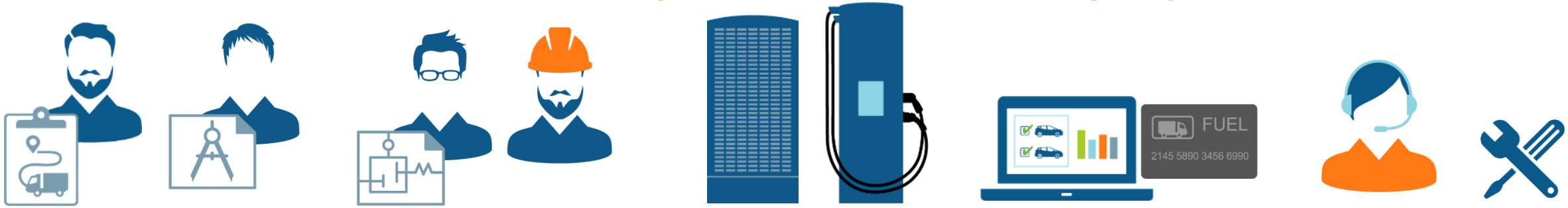
Pentalateral Forum Webinar

"The future for heavy-duty vehicles in the Pentalateral Region:
Integrating electromobility in the energy transition"

Leah O'Dwyer, eBus Solutions, ChargePoint

October 22 2020

eTruck infrastructure requires end to end project solutions



Consulting	Design & Build	Charging Hardware	Operational Software	Service & Maintenance
• Analysis • Modelling • Surveys • Cost Impacts • Energy Impacts	• Site Surveys • System Design • Permitting • Construction • Installation	• Power Link • Power Block • Power Hub • Vehicle Connection • Commissioning	• Charger Control • Vehicle Mgt. • Energy Mgt. • Depot Mgt. • Integration/API's	• SLA's • Spares Mgt. • Training • Remote Monitoring

Intelligent Charging Requirements for Roaming eTrucks

Route Planning

+ **Real Time Charger Availability** along regional and cross border routes

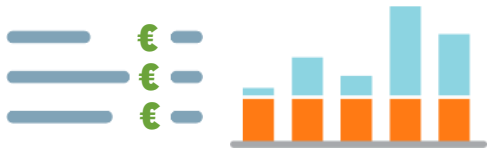
Reservation

+ **Charger Booking** at truck stops, logistic centers and OEM service locations

ChargePoint® Waitlist

Cost

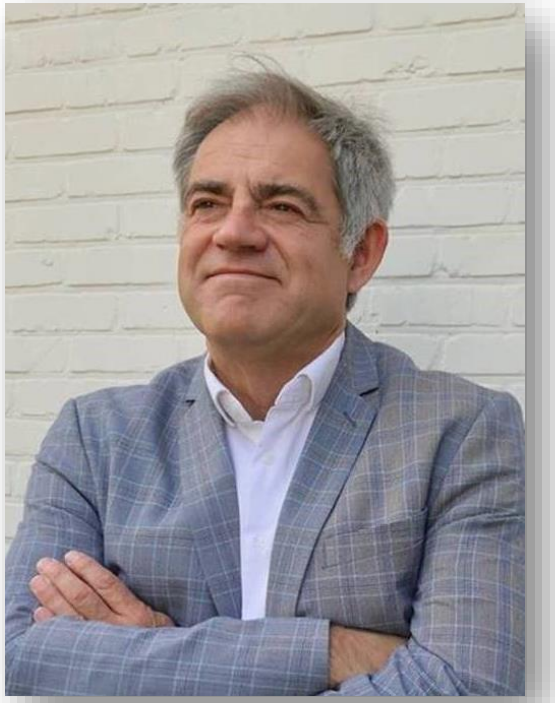
+ **Cost of Power and Access** at third party locations including variable tariffs and capacity limitation



Digital Trust

+ **Secure Use Case Appropriate PKI** to communicate, authenticate and exchange data safely

Presentation



Johan Peeters

Head of e-Mobility Solutions Development

ABB

OCTOBER 22, 2020 – PENTALATERAL FORUM

Deployment of Megawatt Charging Systems (MCS)

Johan Peeters, VP eMobility Solutions Development

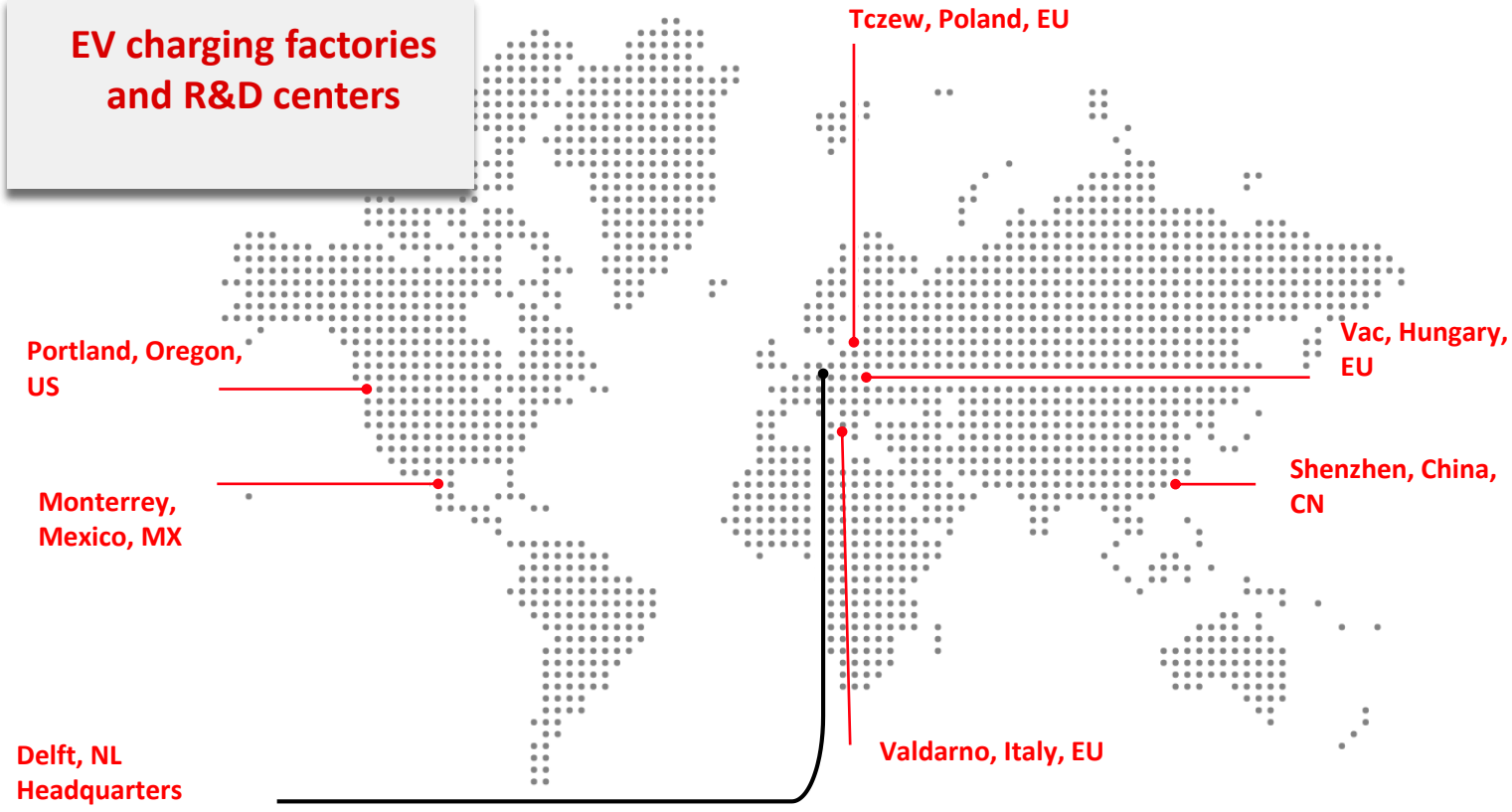
ABB writes the future of sustainable mobility… globally

A decade in proven technology, sold in over 80 countries

More than 17.000 units of DC fast chargers sold globally

E-mobility Innovation Lab – Opening Sept 2019

EV charging factories and R&D centers



Standardization

EV DC fast charging and global standardization

ABB leading in major developments this decade

2010
Founding of CHAdeMO
ABB was involved from the start

2010
Launch Terra 51
50 kW CHAdeMO charger

2012
Founding of CCS alliance
ABB involved from the start, basis for IEC standard

2013
Launch CCS & multi-standard Terra 53
CCS + CHAdeMO + AC

2013-2015
Launch global variants Terra 53
China, USA, APAC

2016
First eBus chargers
Global partnerships with bus OEMs

2018
First eTruck chargers
Global partnerships with Truck OEMs

2019
DC Wallbox
24kWp, 920V

2021
MCS
4MW

CHAdeMO — **CCS alliance** — **Multi-standard** — **E-bus** — **Higher power** — **MegaWatt**

Pilots — **First EV's** — **IEC 61851-23** — **Global EV spread** — **OppCharge** — **DC V2G home**

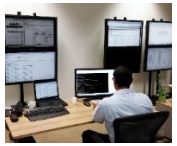
2010
First EU 50 kW charger
Proprietary standard, no consumer EV's available

2010
First EV's with DC charging
Nissan Leaf & Mitsubishi iMieV

2012
First demo of CCS charging
ABB & CCS alliance at EVS26 Los Angeles USA

2012 - 2013
First nationwide DC networks
ABB in Estonia, Denmark Netherlands

2012 >
ABB leading Connectivity & uptime
ABB has industry leading uptime by remote mnmnt



2014 >
DC networks spread globally
Europe, USA, Asia

2017
Launch of high power for cars
150-350kW fast charging for next generation EV's

2018
Gen2 charge post and Terra 54HV
Next steps in High Voltage charging

2020

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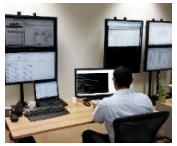

E-bus — **Global EV spread**

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E-bus — **OppCharge**

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Higher power — **OppCharge**

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Next steps in High Voltage charging

MegaWatt — **DC V2G home**

2020

New segment: electric trucks

Many different use cases, different needs from medium power depot to ultra high power on-road

New segment: electric trucks

Different use cases, short range intercity eTruck can use existing 175 – 350kW CCS2 920V car chargers

Long range trucks need much higher power

New standard in development to support 3-4MW

MegaWatt Charging System (MCS)

New standard in development

1000V and 3000A
1250V optional

CCS2	ChaoJi	MCS
350-450kW	900kW	3MW
		Under Development
920V x 500A	1500V x 600A	1000V x 3000A 1250V optional
		
175/350kW 500A	1MW pilot 1000A	3MW 3000A
2019	**2021**	**2022**

MCS Liquid Cooled Cable, Connector and Inlet

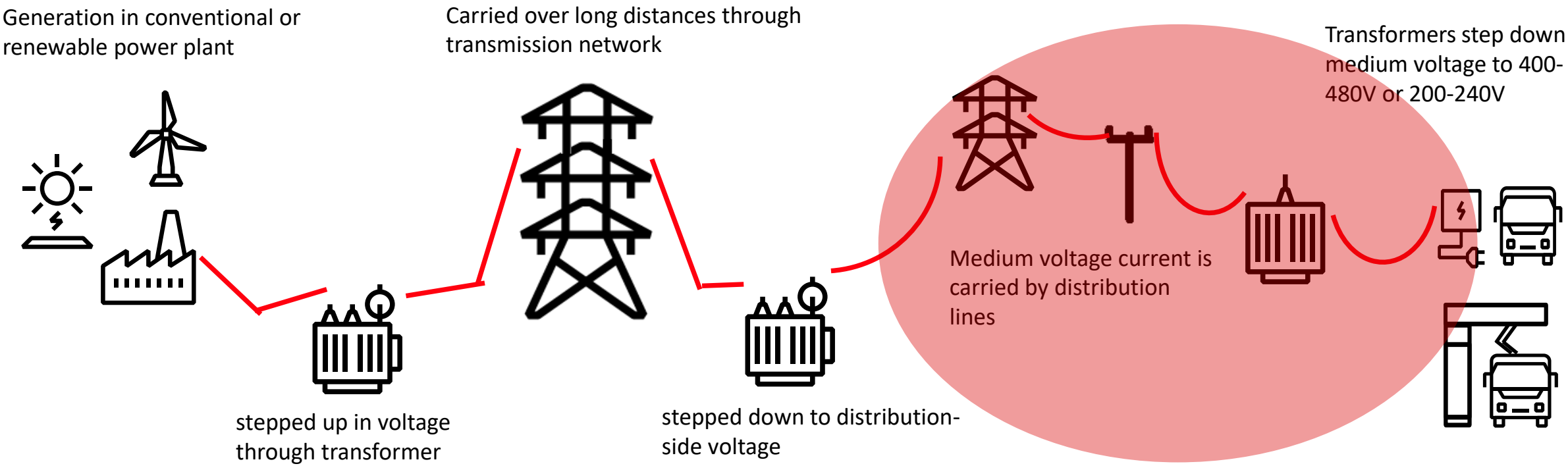
Three power levels pending connector and inlet cooling mode

	Plug-uncooled	Plug-liquid cooled	Plug-liquid cooled
Inlet - uncooled	350A		
Inlet - uncooled		1000A	
Inlet – cooled			3000A

What does this mean for the grid ?

The challenge: what does charging mean for the grid?

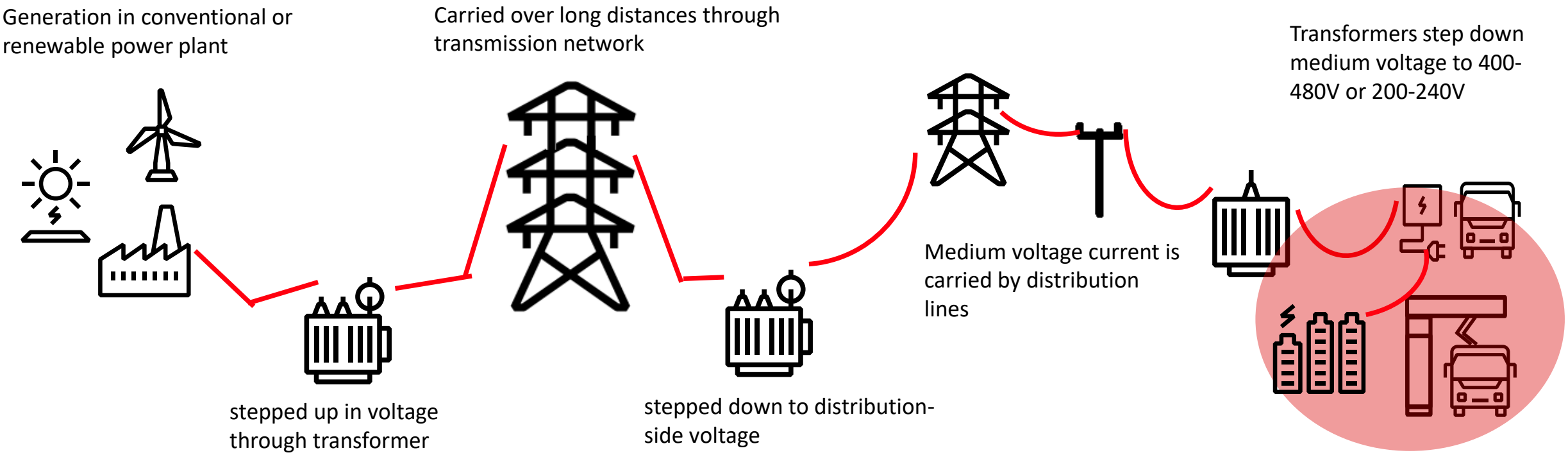
Upgrading of infrastructure will often be required: current



Distribution systems, MV Switchgear and final transformers are the most likely candidates that require upgrading……

The challenge: what does charging mean for the grid?

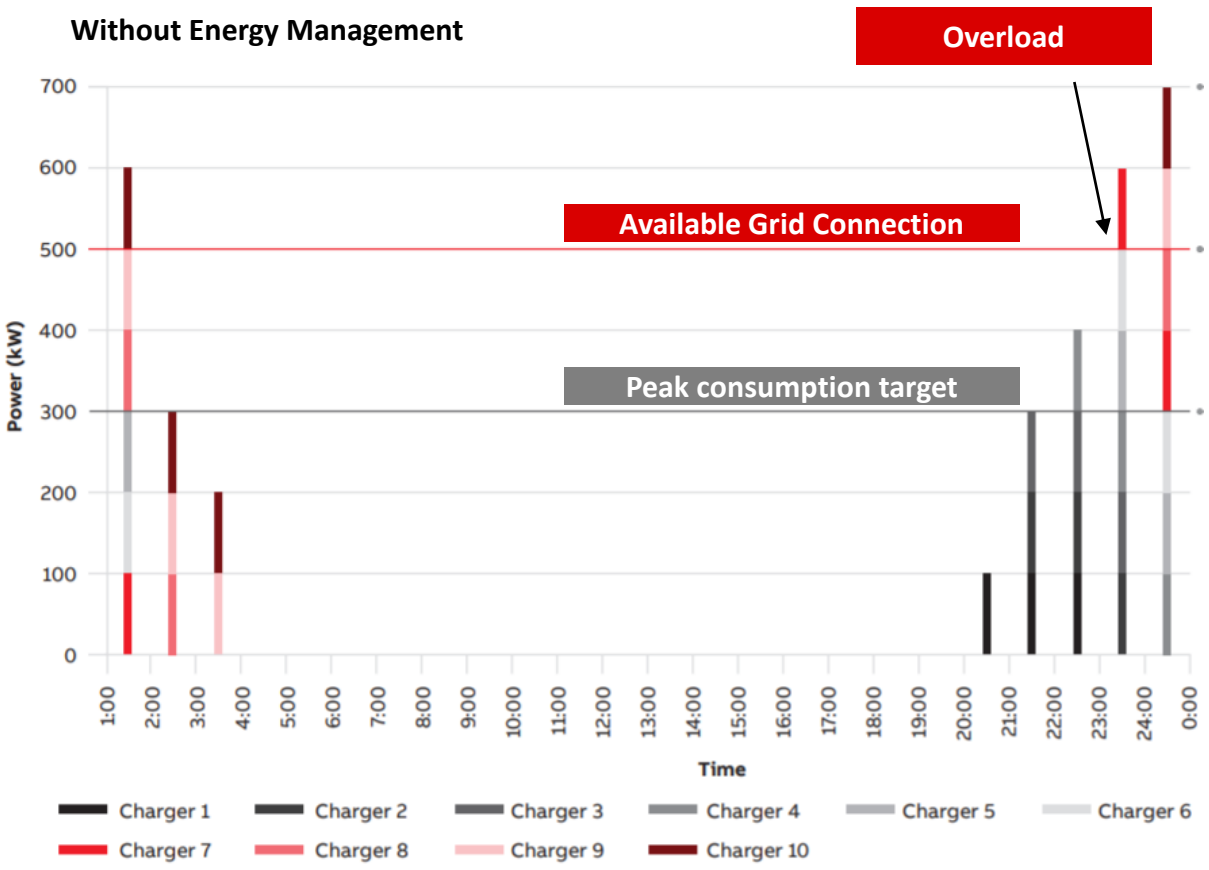
Upgrading of infrastructure will often be required, unless…



Energy storage systems and load management reduce the need for MV grid and transformer expansion

Need for Local Load Management

Example EVSS 100: Bus Depot, 10 buses, 300kWh Battery, 10x 100kW chargers



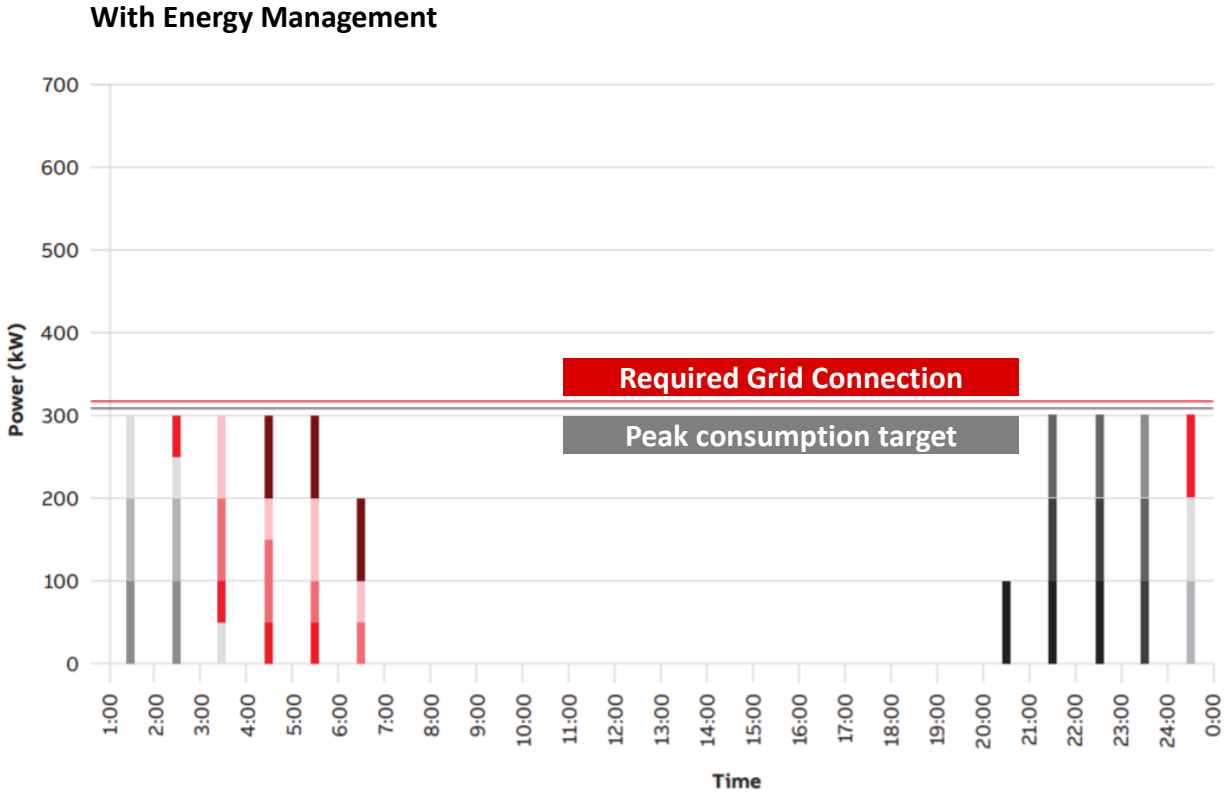


ABB Charging Infrastructure supporting Grid Stability

EV Site Solution Control 100 (EVSS 100)

Reduces costs

- Reduce or eliminate necessary grid upgrades when installing more charging capacity (CAPEX savings).
- Avoid penalty costs for energy demand peaks (OPEX savings).

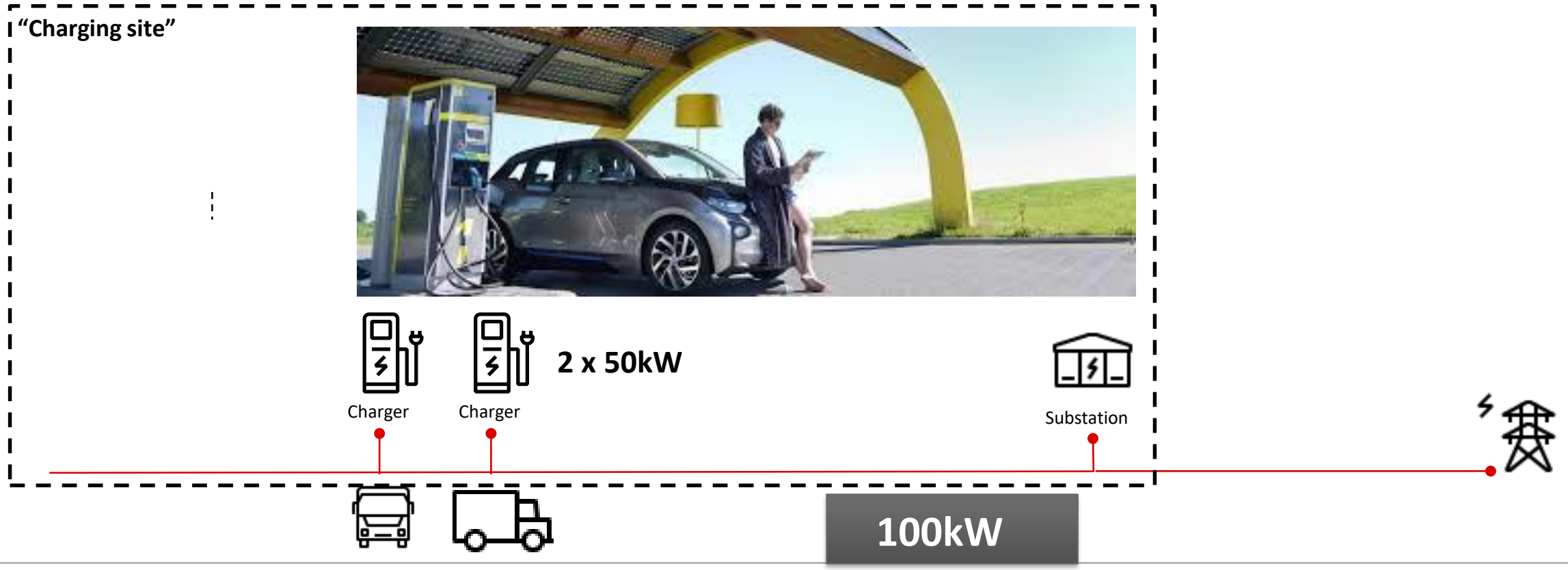
Highest charger availability

- Prevents site power outages as a result of total charging power exceeding the site's grid connection limit.
- Increase the number of charge points on site and optimize the energy usage among outlets.

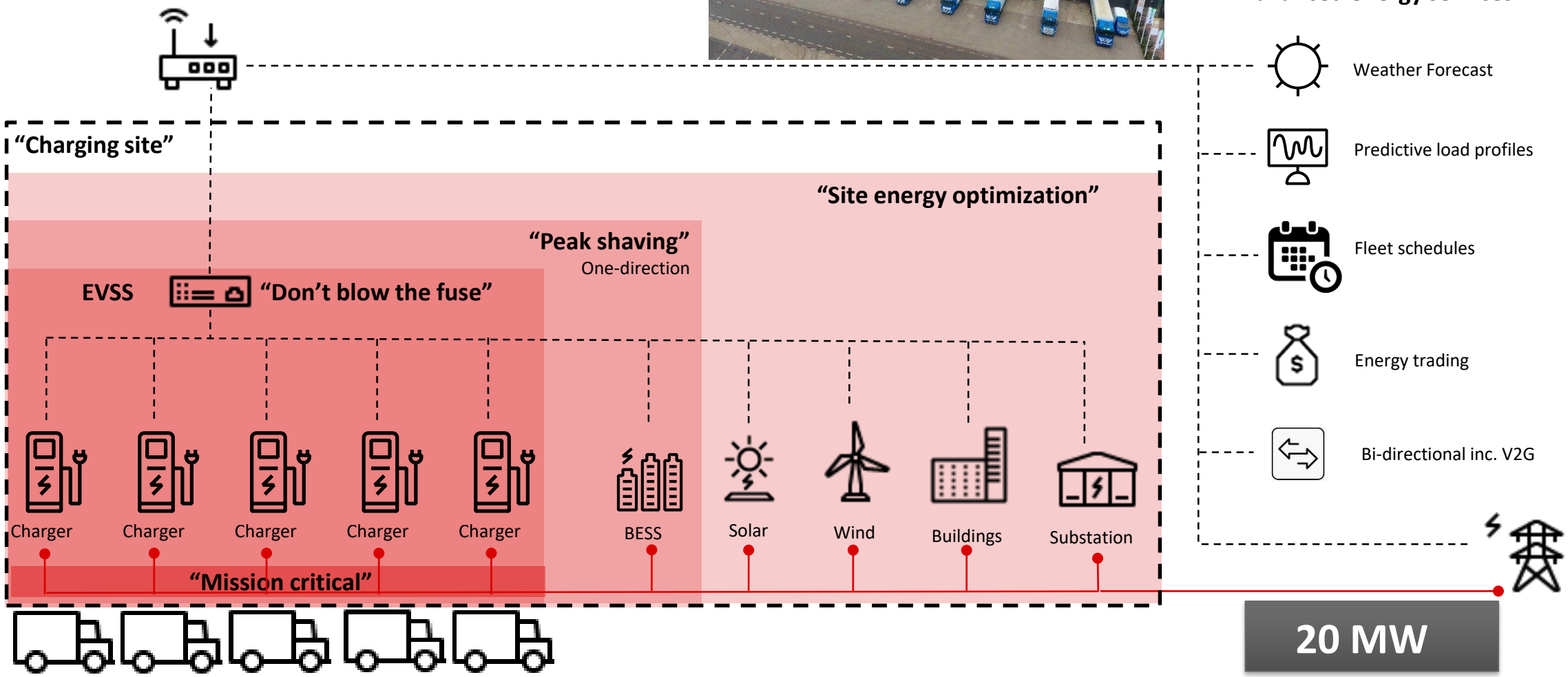
Future proof

- Scalable by design. Can be upgraded in the future to support up to 50 EV chargers per EVSS unit. There is no limit to the number of EVSS that can be used on a site.
- Over-the-air software updates enable new optimization features and services as they are developed.

Evolution of the EV Charging site



Evolution of the EV Charging site



Contact information

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E: johan.peeters@nl.abb.com

I: http://www.abb.com/evcharging

Q&A

Magnus Broback

Director Charging Solutions

Volvo Group

Ricky van Soest

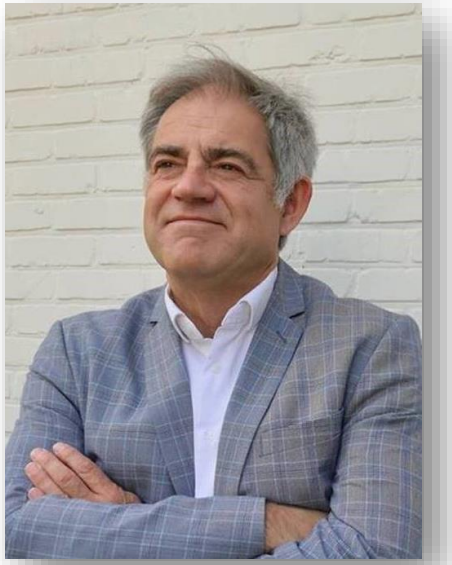
Project Lead, in charge of Flex EV project in Rotterdam

DHL Express

Leah O'Dwyer

Head of Head of eBus Solutions Charging

ChargePoint



Johan Peeters

Head of e-Mobility Solutions Development

ABB

Panel II

How to Build a Business Case for e-HDVs: Financial models and public incentives

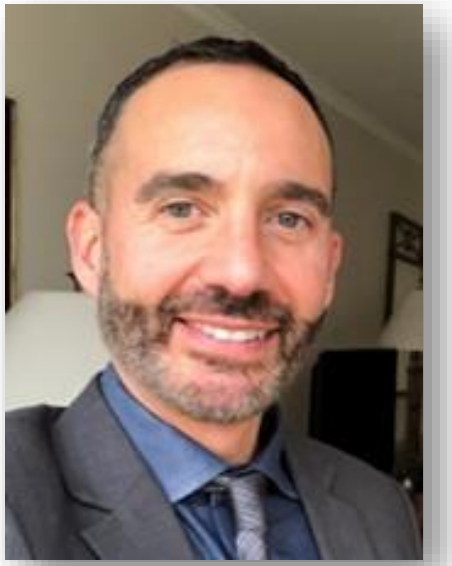
30 min

PANEL II

Marc Frank

Director for Strategy and Innovation

DPD Switzerland



Cristiano Façanha

Global Director

CALSTART

Axel Volkery

Team Leader for Clean Transport DG MOVE

European Commission

Presentation

Marc Frank

Director for Strategy and Innovation

DPD Switzerland

eHDV in Switzerland

The future for heavy-duty vehicles in the Pentalateral Region: Integrating electromobility in the energy transition

Marc Frank, October 2020

Parcel delivery network of GeoPost

A network bringing together domestic champions in Europe

Aiming at being the best delivery partner to work with,

through our brands DPD, Chronopost, SEUR and BRT.

DPDgroup in Europe – a robust nr 2

A key player in Europe

Presence in

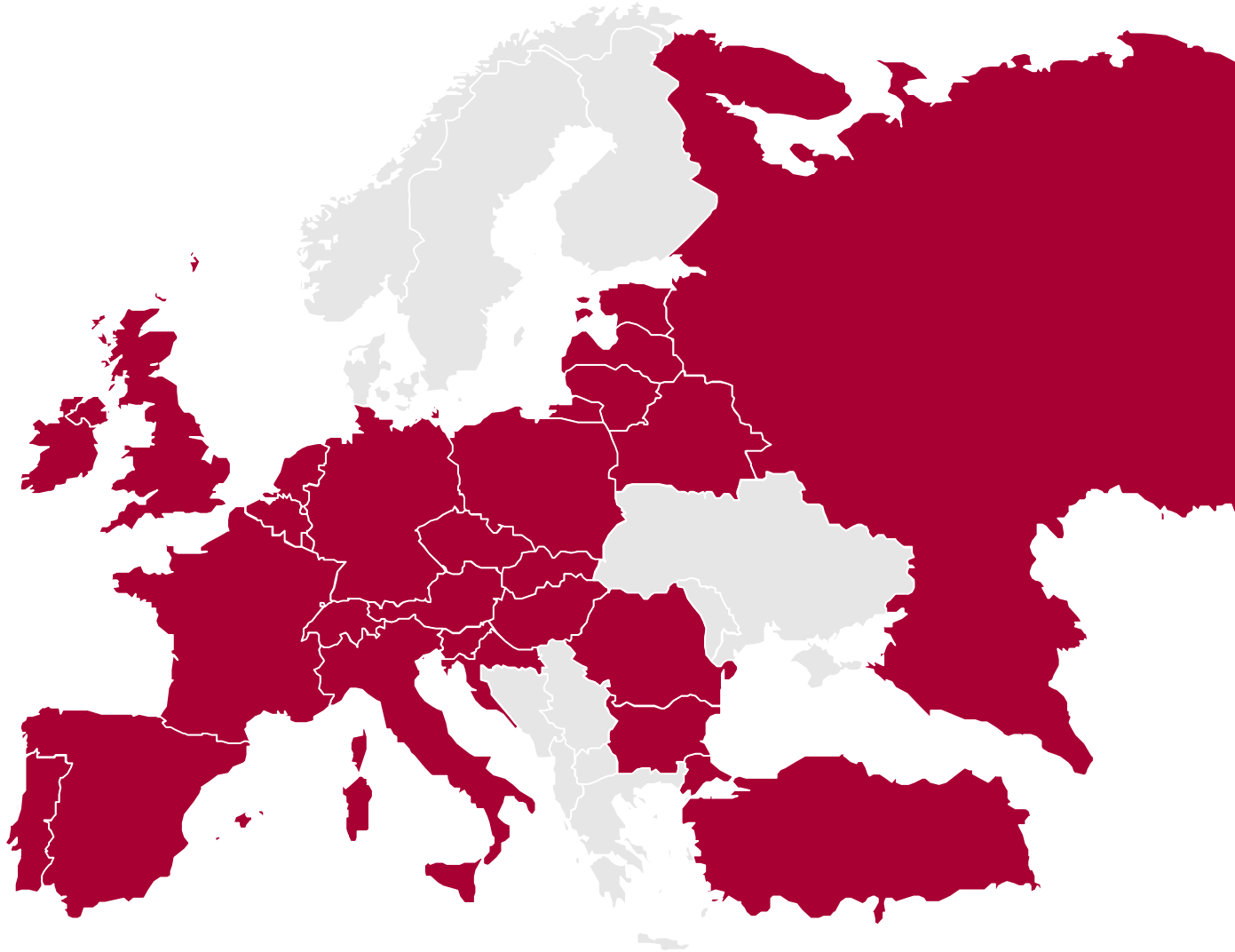
23
countries
in Europe

12.6%
Overall European
CEP market
(in value, 2018 figures)

+13.5%
2018 intra-European
volumes growth

1st
cross border road
network in Europe

EUROPEAN CEP MARKET POSITIONING



Committed to sustainable delivery

- Become the reference player in sustainable delivery
- By 2025:
  - 30% reduction CO2/parcel
  - Low emissions delivery in 225 cities
- Air quality monitoring
- Technology = Succeed our first attempt Delivery

Today

Carbon neutral delivery since 2012

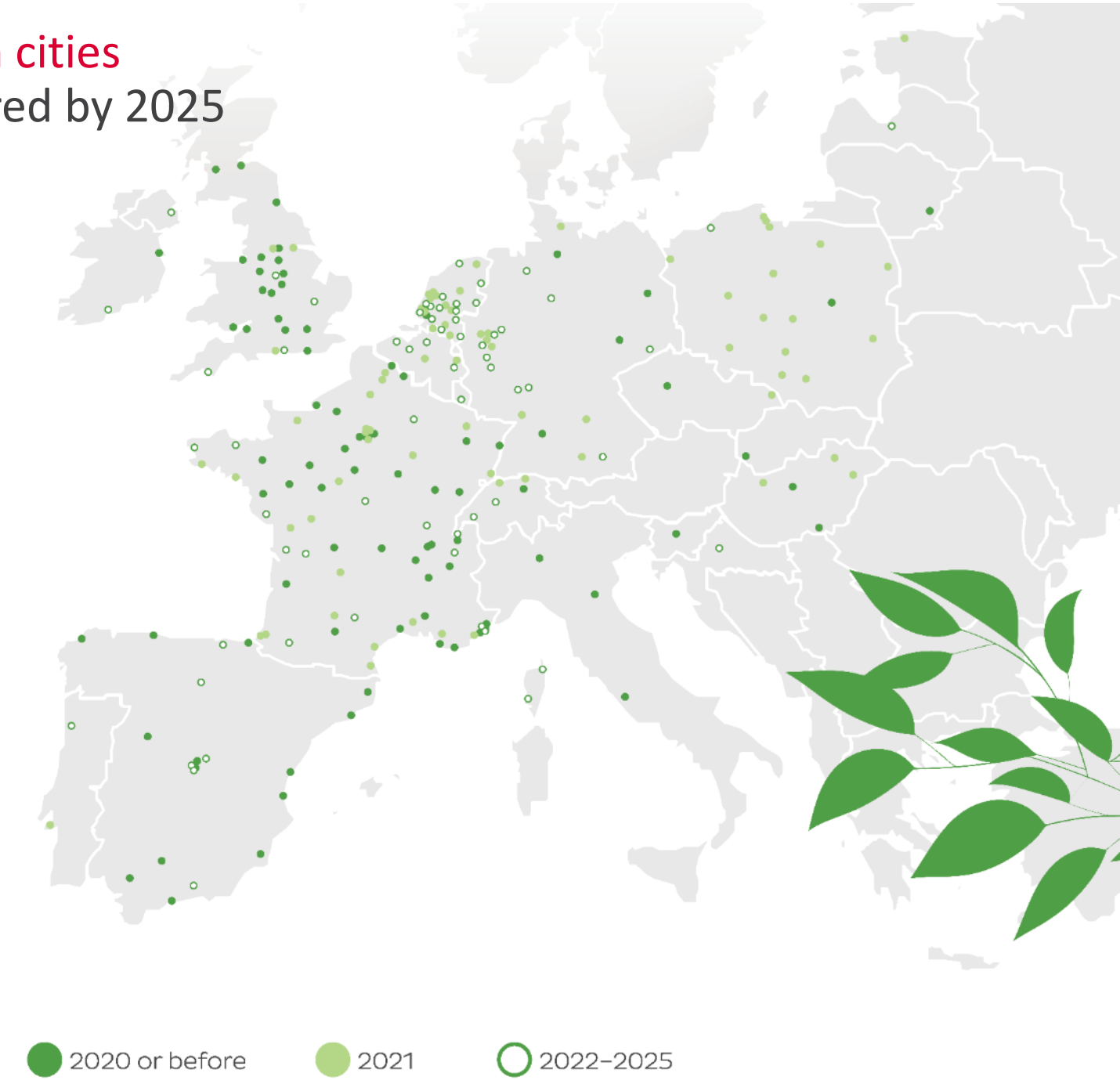
+1,600 low emission vehicles

0.83 kg CO_2 per parcel in 2019

Low emissions delivery in 225 European cities

20% of the European population delivered by 2025

- 225 European cities
- 80 million inhabitants
- 260 million parcels/year
- 7,700 new alternative vehicles
  (Electric, gas, cargo bikes, …)
- 80 new urban depots
- 3,600 charging points
- 200 M€ investment



Changing world

But

There is more than that

DPD Switzerland

«Linehaul» Service as the backbone of the network

- DPD Switzerland as part of DPDgroup operates in 11 sites
- The parcel flow between these sites is mainly organized with HDV-connection: «Linehaul»

For Linehaul in Switzerland:

1.3 Mio

Linehaul km / year

1/3

Swiss CO_2e p.a. in Linehaul

The DPD Switzerland e-HDV Project

1st Line planned to operate in January 2021

680 kWh
Electric battery

80k km p.a.
Minimum mileage planned

700 km
Max. expected range

70t CO_2e
Min. emission savings p.a.

100% Green Electricity
To charge the truck

Innovation Meets Reliability

The truck is based on a VOLVO chassis. Electrification is realized by Swiss-based company DESIGNWERK

Electric Truck

The 3 pillars for an economic use of long-distance trucks

Freight / Weight

The additional weight of the battery (approx. 4.5 tons) limits the potential usability

For parcel distribution weight is not the limiting factor

Charging / Network

To run an eHDV in an operational network charging must be secured

A network of sites is beneficial to secure continuity in service

Financial Support

The investment in an e-HDV is about factor 2-3 compared to conventional trucks

Main driver for a ROI:

I Reduced road toll

II Energy costs vs. Diesel

DPDgroup manifesto

Our corporate vision

There's a movement happening.
A global community demanding cleaner air.

At DPDgroup we recognise we're part of the problem.
But we are also in a unique position to help.

We want to do our part. Conscious of our responsibility towards the planet and its people.

Through our fleet and our depots.
With each and every delivery.

We are committed to reduce our emissions.
Because it makes our planet a better place.

We measure continuously our progress.
Because information inspires action.

We simply act.
Because… we all share the same address.

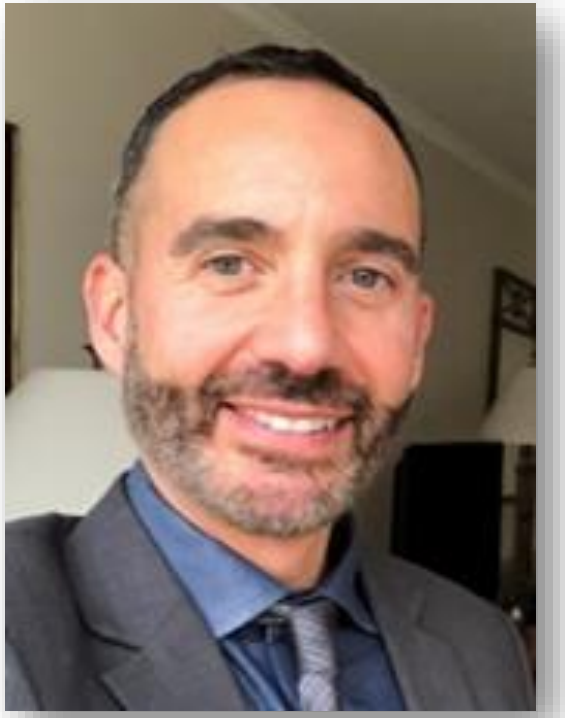
Discover more on DPDgroup's CSR programme

Download our 2019 CSR Report

Click here to visit our sustainability page on our website


dpd group

Presentation



Cristiano Façanha

Global Director

CALSTART (California)

GLOBAL COMMERCIAL VEHICLE DRIVE TO ZERO | A PROGRAM OF CALSTART

ADVANCED CLEAN TRUCKS (ACT) RULE
RECOMMENDATIONS FOR OTHER GLOBAL REGIONS

Cristiano Façanha, PhD

The future for heavy-duty vehicles in the Pentalateral Region:
22 October 2020

Drive to Zero is an international multi-stakeholder initiative to accelerate the growth of zero-emission commercial vehicles

GLOBAL COMMERCIAL VEHICLE DRIVE TO ZERO

A PROGRAM OF CALSTART

2025

Near- and zero-emission commercial vehicles cost-competitive and commercially viable in first-success applications and early-mover regions by 2025.

2040

Zero-emission commercial vehicles achieve 80% of new vehicle sales in early-mover regions by 2040.

ACT follows the “beachhead” strategy recognizing that zero-emission vehicles will come in waves

Wave 1 Transit

ZE transit buses
Available now

ZE industrial lifts
Available now

Wave 2 Delivery

Chanje Class 5 Delivery Van
Available now

Fuso ECanter
Available now

Orange EV yard tractor
Available now

Wave 3 Medium Freight

E-Fuso Vision One
Announced 2021

Freightliner eM2
Demo now
Announced 2021

Wave 4 Heavy Regional Freight

Freightliner e-Cascadia
Demo Now; Announced 2021

Volvo VNR
Demo now; 2019 Europe; 2021 NA?

Mack e-Refuse
Demo 2020;
Coming 2022?

Tesla demo
Coming 2021?

Corridor Longhaul

Hyundai FC tractor
Coming 2023?

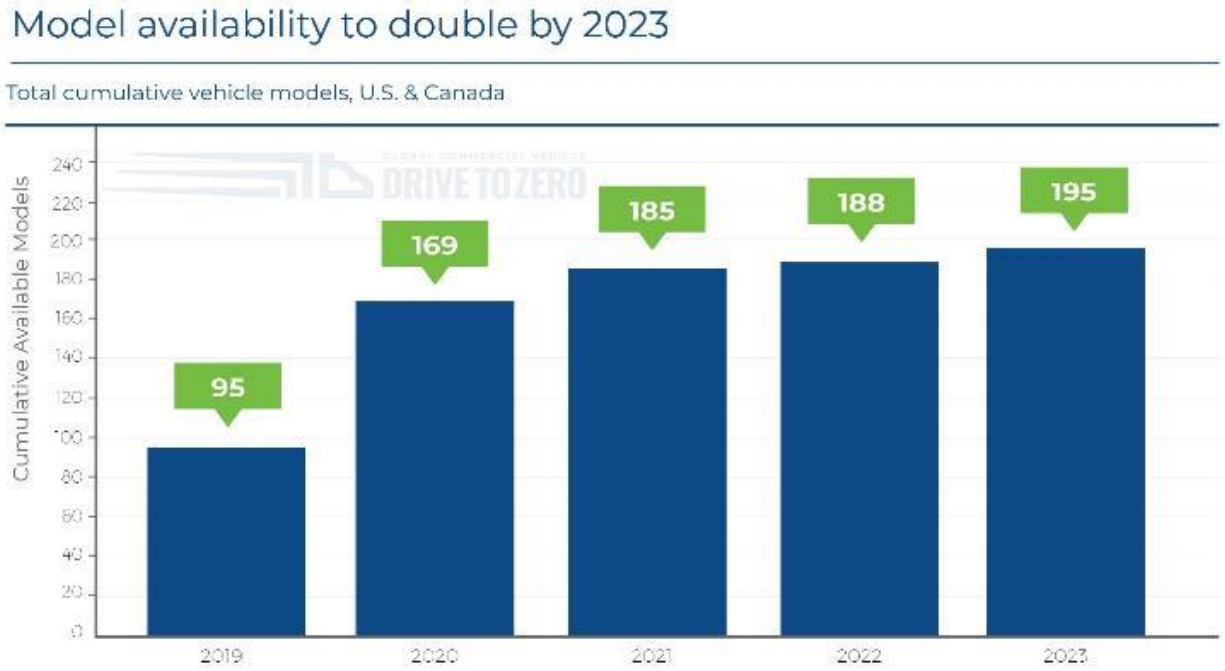
Similar drivetrain and component sizing can scale to early near applications

Expanded supply chain capabilities and price reductions enable additional applications

Steadily increasing volumes and infrastructure strengthen business case and performance confidence

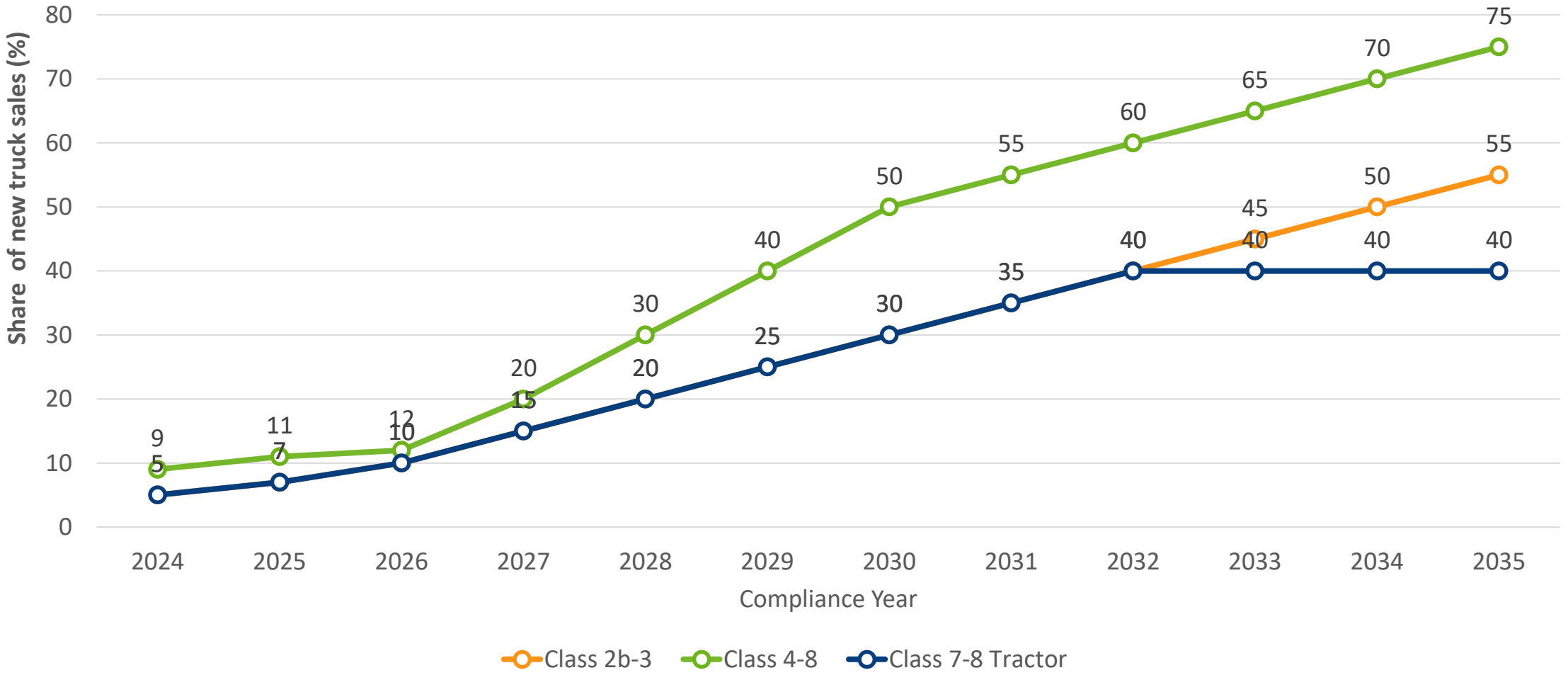
2019 2020 2021 2022 2023

Model availability is increasing rapidly



Source: https://globaldrivetozero.org/tools/zero-emission-technology-inventory/

California and 14 other U.S. states are sending strong market signals supporting zero-emission trucks



Leading regions should adopt “ecosystems” of complementary, aligned regulations, incentives and investments

Sales requirements for zero-emission trucks

Fleet purchase requirements that mirror sales mandates

Incentives for vehicle up-front costs

Infrastructure investments to match vehicle incentives

Development of zero-emission zones for delivery vehicles

GLOBAL COMMERCIAL VEHICLE
DRIVE TO ZERO

A PROGRAM OF CALSTART

Thank you!

Cristiano Façanha
Global Director
cfacanha@calstart.org

For more information:
www.globaldrivetozero.org

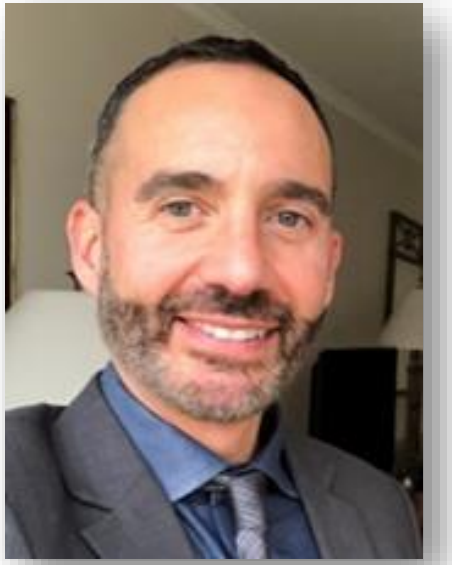
@TeamDriveToZero

Q&A

Marc Frank

Director for Strategy and Innovation

DPD Switzerland



Cristiano Façanha

Global Director

CALSTART

Axel Volkery

Team Leader for Clean Transport DG MOVE

European Commission

Digital Break
15 min

Panel III

The Impact on the Energy Network: Nexus between HDV, Power Systems and Renewables

45 min

Introductory remarks

Laurent Schmitt

Secretary-General

ENTSO-e

PANEL III

Onoph Caron

Director

Elaad.NL

Uroš Salobir

Vice-Chair, *Research, Development and Innovation Committee, ENTSO-e*;

Director of Strategic Innovation Department, *ELES*

Ed Pike

Senior Utilities Engineer

California Public Utilities Commission

Bastian Pfarrherr

Head of Innovation Management

Stromnetz Hamburg

Presentation

Onoph Caron

Director

Elaad.NL

ElaadNL

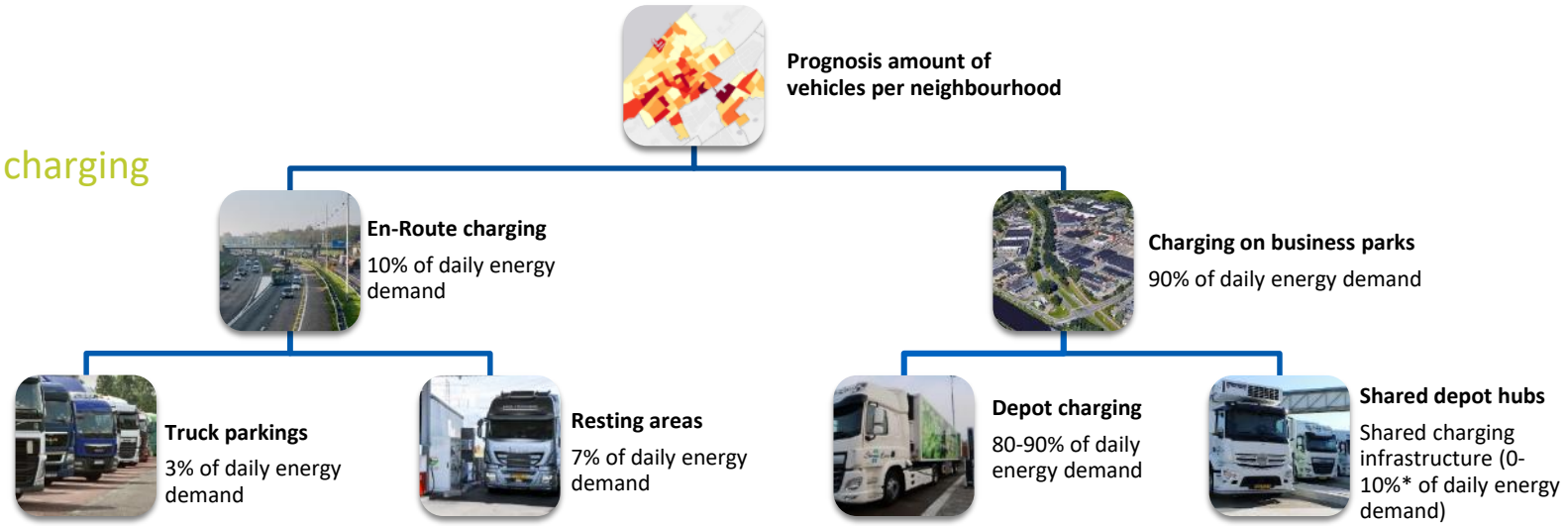
The knowledge and development center for electric mobility and smart charging,
Founded and funded by the Dutch Grid operators.

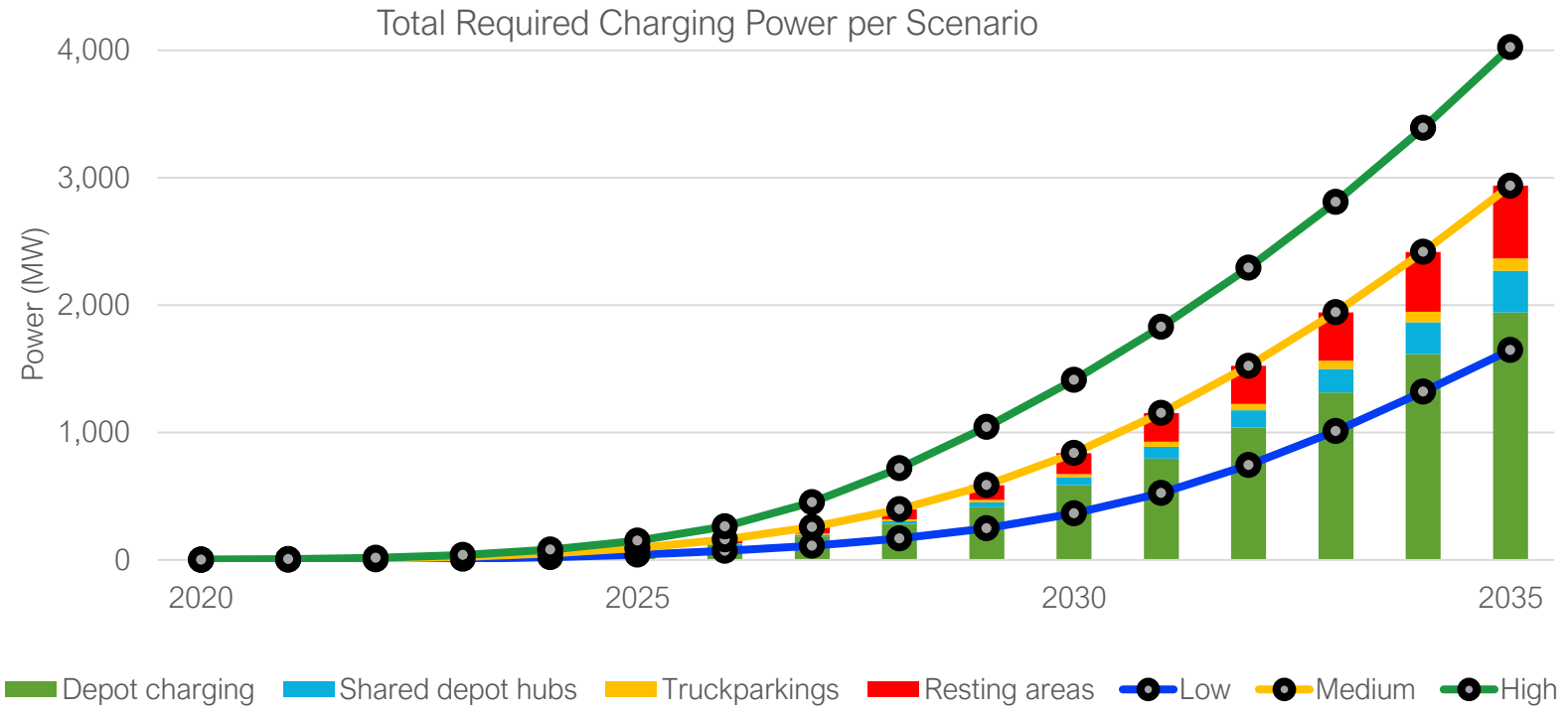
Onoph Caron – 22 October 2020

Where do HDVs charge?

Focus on depot charging, but don't forget public charging

- Main charging locations: Overnight charging @ depot (80%-90%).
- En-Route charging part is only +/- 10% but very important to scale up to longer distances and wider employability of electric trucks.
- Hard to find investors for public chargers for trucks. Existing CPO's rather invest in more chargers for personal vehicles since demand is already there.





Source: ElaadNL Outlook 'Truckers komen op stroom' 2020

Impact on DSO's

Rapid Growth = Challenge for Grid Operators:

- Rapid growth as soon as TCO becomes attractive.
- Smart Charging as default charging method for depot charging, still..
- Many potential charging locations require a larger grid connection to charge a fleet of electric heavy duty trucks.
- Dutch grid is historically very efficient and has little overcapacity. Local substations can be 'full' very quickly as electric trucks getting more popular.
- Hence, in many cases grid reinforcements are needed and these require time. Up to many years! Prepare now!

1,75-10 MVA
Depot < 200 trucks
/ public fast chargers

0,175-1,75 MVA
< 35 trucks

< 0,175 MVA
< 4 trucks

stations	ruimtebeslag	doorlooptijd	kosten in €, excl grond
EHS/HS station EHS naar HS omzetten Vermogen: >500 MVA	40.000 - 100.000 m2	7 - 10 jaar	10 x 10 zakjes > 100.000.000
HS/TS station HS naar TS omzetten Vermogen: 100-300 MVA	15.000 - 45.000 m2	5 - 7 jaar	2,5 x 10 zakjes > 25.000.000
HS/MS station HS naar MS omzetten Vermogen: 100-300 MVA	15.000 - 40.000 m²	5 - 7 jaar	2,5 x 10 zakjes > 25.000.000
TS/MS station TS naar MS omzetten Vermogen: 20-100 MVA	2.000 - 10.000 m²	2,5 - 5 jaar	1.500.000 - 10.000.000
MS station koppelt LS netten en distributiefunctie Vermogen: 10-40 MVA	200 - 4.000 m²	2,5 - 3 jaar	1.300.000 - 6.500.000
MS/LS station MS naar LS omzetten, per station ca. 50-250 huishoudens op aangesloten Vermogen: 0,2-1 MVA	10 - 35 m²	0,5 - 1 jaar	35 - 250

Elaadnl

How to prepare for electric trucks?

3 key insights from a grid operator's perspective

1. Grid operators: integrate EV growth including heavy duty trucks in investment plans. Proactive approach needed!
2. Local governments: work together with the local grid operator in the energy transition to integrate grid reinforcements and substations in destination plans, especially close to logistic areas. Combine with sustainable electricity production (wind/solar) if possible.
3. European and National governments: strategic approach needed for a public fast charging network for electric trucks. Include an efficient grid integration that supports growth over time.

More info, including the ElaadNL Outlook for electric trucks (in Dutch): https://www.elaad.nl/projects/elaadnl-outlooks/

Want to work together on this topic?

Please contact Onoph.caron@elaad.nl

Q&A

Onoph Caron

Director

Elaad.NL

Uroš Salobir

Vice-Chair, *Research, Development and Innovation Committee, ENTSO-e*;

Director of Strategic Innovation Department, *ELES*

Ed Pike

Senior Utilities Engineer

California Public Utilities Commission

Bastian Pfarrherr

Head of Innovation Management

Stromnetz Hamburg

Panel IV

The Role of Regional Cooperation: The Pentalateral Energy Forum within the EU Legal Framework

30 min

PANEL IV:

Tiziana Frongia

Director Freight

Transport & Environment

Mariette van Empel

Director Sustainable Mobility and Transport

Dutch Ministry of Infrastructure and Water Management

Artur Runge-Metzger

Director Climate Strategy

DG CLIMA

European Commission

Presentation

Tiziana Frongia

Director Freight

Transport & Environment

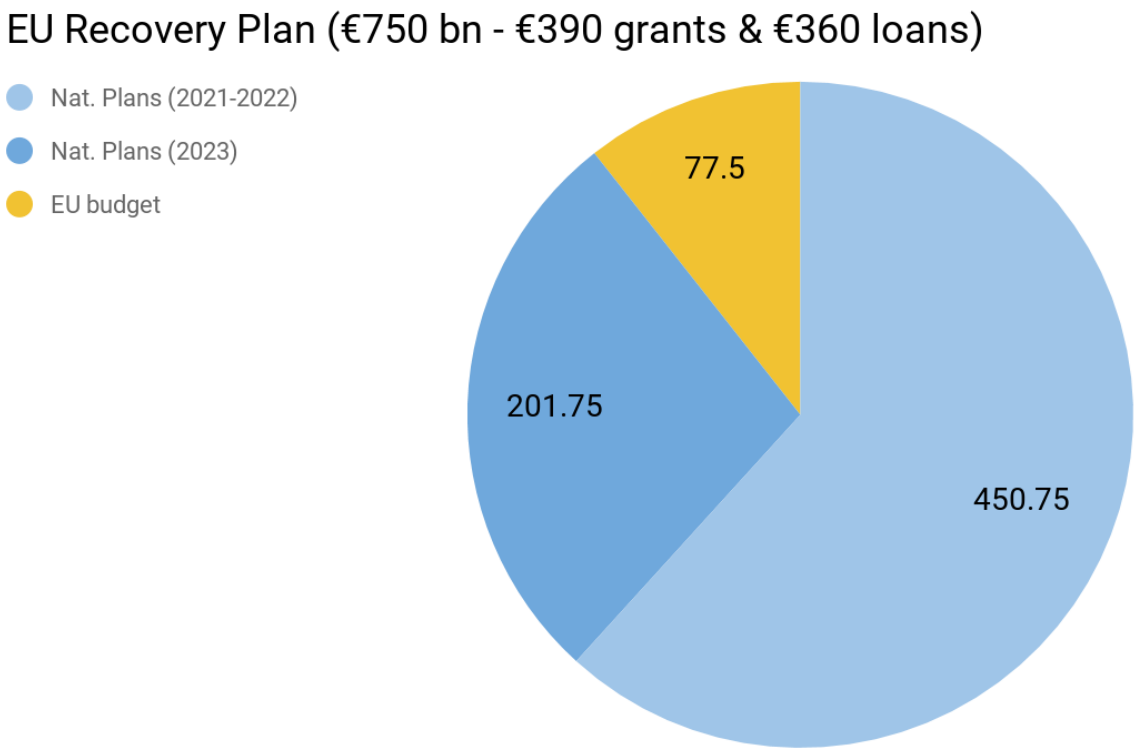
Getting e-trucks on the road

Webinar - The future of electric HDVs in the Penta region

Tiziana Frongia, Freight Director

TRANSPORT & ENVIRONMENT

The money is there!

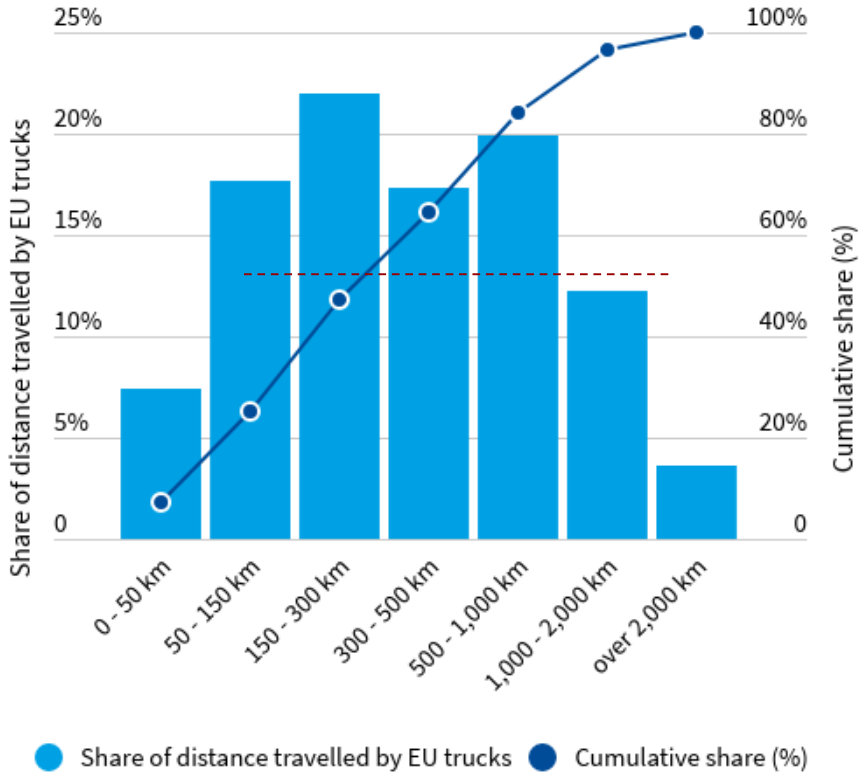


National Recovery Plans

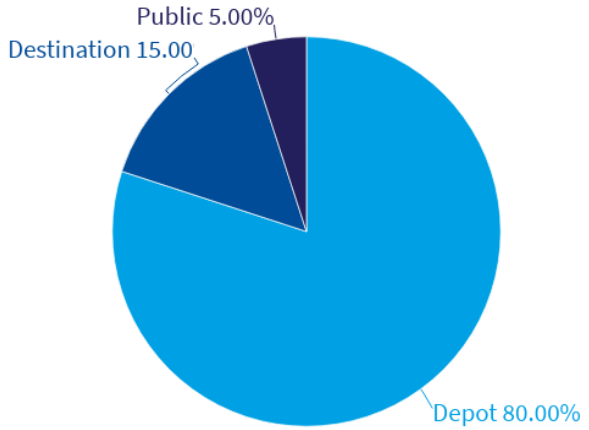
- Focus on zero-emission technologies
- Ideal opportunity for pilot projects: zero-emission zones for freight & deployment of charging infrastructure
- Support the purchase & production of zero-emission heavy-duty vehicles

Let's get started

- Half of distance covered by trucks in the EU is over trips of less than 300 km



- Maturing market
- TCO parity in the early 2020s
- Focus in and around cities
- Reasonable levels of public charging



Where to deploy truck charging infrastructure *first*

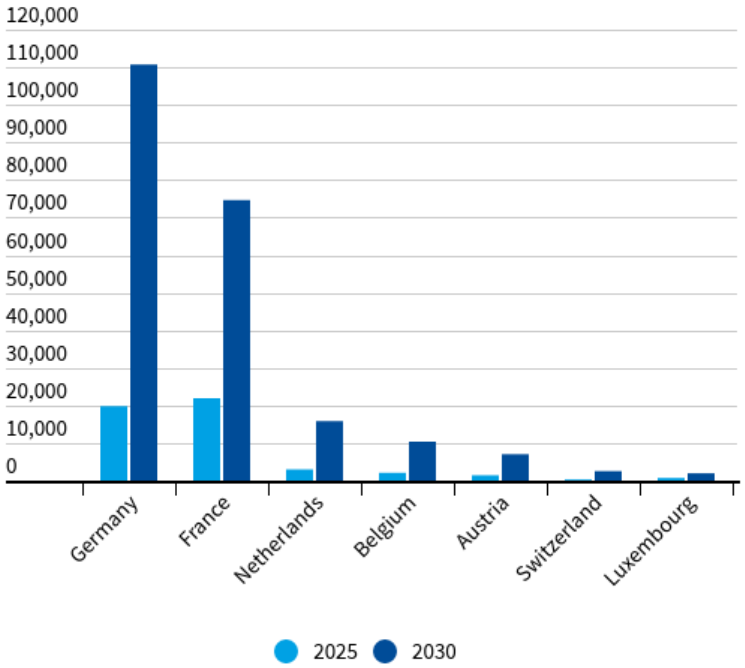
Urban nodes for freight activity

Scope: Benelux + FR + DE + AT

53 urban nodes selected based on the commercial vehicle activity for short and medium trips

How many truck chargers?

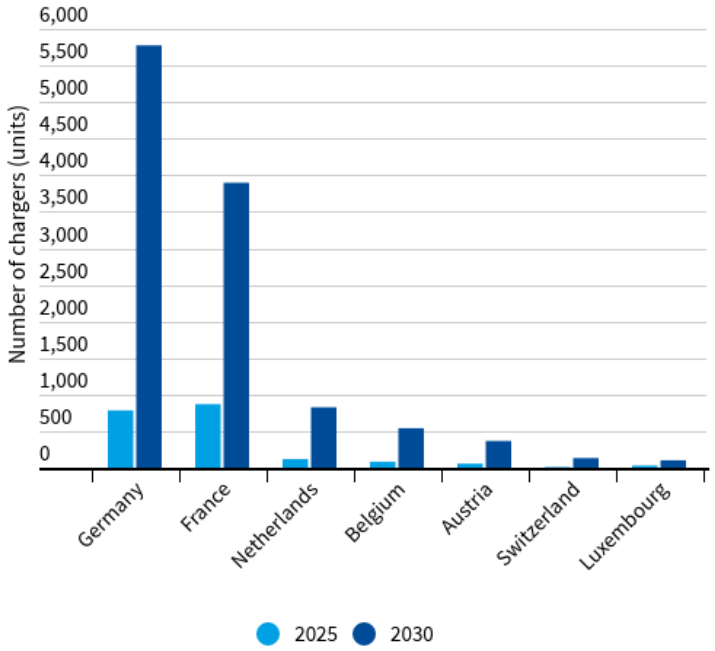
Number of e-trucks on the roads (urban and regional deliveries)



Source: T&E in-house analysis of EU truck flows. Road-2-Zero scenario (10% sales in 2025 and 30% in 2030). See more in full report: https://www.transportenvironment.org/publications/unlocking-electric-trucking-eu-recharging-cities

Number of chargers on the roads

(public and destination chargers)



Only covers chargers for urban and regional deliveries (under 400 km trips).
Source: T&E in-house analysis of EU truck flows. Road-2-Zero scenario (10% e-truck sales in 2025 and 30% in 2030). See more in full report: https://www.transportenvironment.org/publications/unlocking-electric-trucking-eu-recharging-cities

TRANSPORT & ENVIRONMENT transportenvironment.org

Thank you!

Remarks

Mariette van Empel

Director Sustainable Mobility and Transport Programme

Dutch Ministry of Infrastructure and Water Management

Remarks

Artur Runge-Metzger

Director Climate strategy (DG CLIMA)

European Commission

Q & A

Tiziana Frongia

Director Freight

Transport & Environment

Mariette van Empel

Director Sustainable Mobility and Transport

Dutch Ministry of Infrastructure and Water Management

Artur Runge-Metzger

Director Climate Strategy

DG CLIMA

European Commission

Next Steps and Closing Remarks

7 min

Next Steps

Jan Molema

Director
BENELUX General Secretariat

Closing Remarks

Dolf Gielen

Director – Innovation and Technology Centre
IRENA

Closing remarks

Claude Turmes

Minister of Energy
Minister of Spatial Planning
Luxembourg

IRENA
International Renewable Energy Agency

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Énergie et de
l'Aménagement du territoire
Département de l'énergie

Benelux
SECRETARIAAT-GENERAAL
SECRÉTARIAT GÉNÉRAL

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THANK YOU FOR JOINING US!