

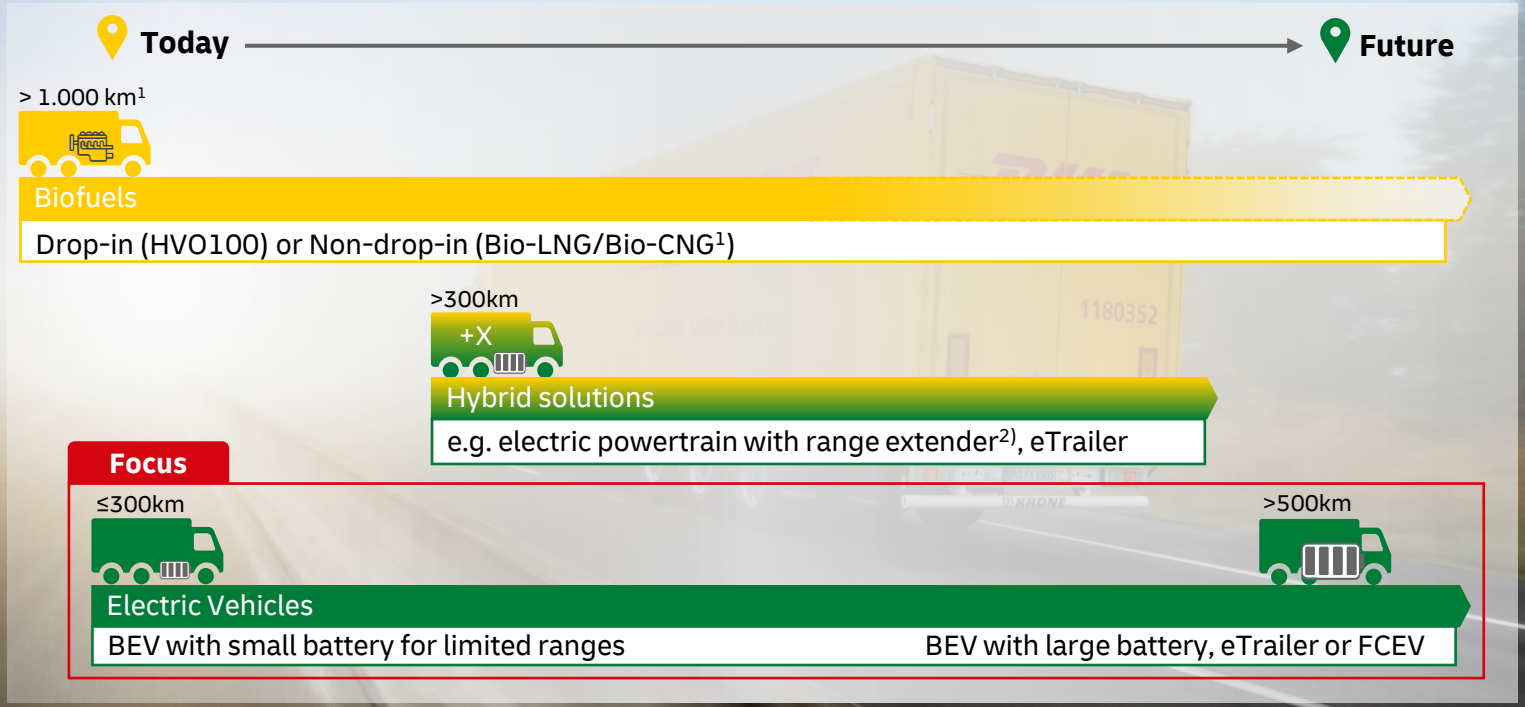
THE GREEN CORRIDOR CHALLENGE

Piotr Szarek
DHL Supply Chain

DHL Group

Zero emission technologies for trucks are not yet fully available; bridging technologies unavoidable to reach short to mid-term decarbonization targets

DECARBONIZATION TECHNOLOGY ROADMAP FOR LINEHAUL



Pathway to Zero

- Less CO_2 -70-100%
- Less emissions
- No emissions

1) CNG range appr. 600 km; HVO: Hydrotreated vegetable oils, BEV: Battery-electric vehicle, FCEV: Fuel-cell-electric vehicle; 2) e.g. diesel generator currently not pursued by OEM or fuel cell

Green corridors for ZE-MHDV: why do we need to work with it now?

Green Corridors for ZEV can help overcome some key disadvantages of the current product portfolio and accelerate a proactive decarbonization approach

DHL as a source of important information from its logistics operations





GoGreen

Demand and collaboration have the power to make this possible



Allows OEMs to confidently **scale-up production volumes** based on clear sales outlook



Empowers charge point operators to confidently **invest in (semi) public charging** sites



Opens the door to **new financing solutions** that often require large-sized investments



Enables stronger engagement with policymakers for **supportive regulations and incentives**

Source: Smart Freight Center

Energy management & MHDV charging



Charging trucks at DHL sites will not only have a major impact on the grid capacitiy and peak power, but also on the overall electricity consumption

Increasing electricity demand of an example building

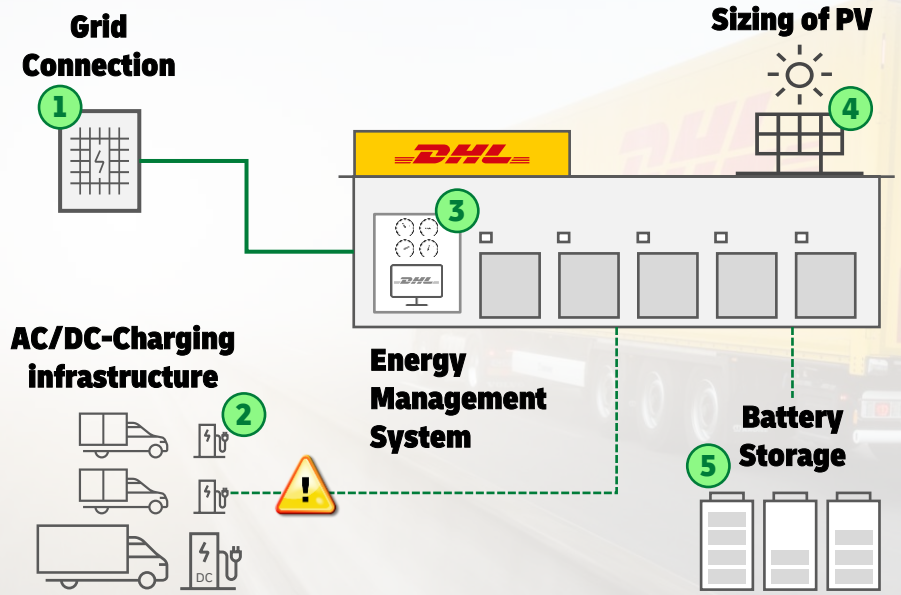


! Charging **MHDV** at our sites will have a **massive impact** on our future **electricity consumption**. For example, **one MHDV truck** requires as much electricity as **60 PuD vans,** due to **higher mileage** and average electricity **consumption**

Calculation based on the following assumption: Average electric consumption PuD van 30 kWh/100 km, 10,000 km annual mileage. Average electric consumption LH truck 160 kWh/100 km, 100,000 annual mileage. Both charged 100% at DHL site.

Energy management needs to be implemented along 5 key questions

FIVE MAIN AREAS TO DECIDE



KEY QUESTIONS

1. **Grid connection**
   - What is the right sizing of Grid connection for the vehicles?
2. **AC-/DC Charging infrastructure**
   - Charging power: How many kW?
   - How many vehicles per Charging Point?
3. **Energy Management Systems**
   - What needs to be controlled?
4. **Sizing of PV**
   - How to size the PV system on the building?
5. **Battery Storage**
   - Is a storage economically favorable?

Case Studies for BEV – DHL examples





Case Study
Battery electric vehicle used for pickup & delivery in Erlensee

DHL Freight | **Germany** | **CO2e emission saved per year: 28t[1]**

Use Case



- Two vehicles used in the area of Erlensee for pickup & delivery of shipments
- Around 150km daily mileage around the site

Vehicle



- Volvo FL Electric
- Powertrain: 185 kW electric motor
- Energy storage: 4 Batteries, 265 kWh
- Range: 200 - 220 km
- kg GVW: 16,7 t

Charging Scenario



- Own charging infrastructure for fast charging DC 150kW, also AC charger available
- Quick daily DC charge approx. 2 hours
- Night charge up to 10 hours with AC charger

1) WtW approach & CO2e emission saving per one vehicle

Case Study
Five Battery electric vehicles conducting pickup and delivery in Malmö city

DHL Freight | **Sweden** | **CO2e emission saved per year: 13 t[1]**

Use Case



- Since 2022 five vehicles used in Malmö area in southern Sweden, with standard pickup & delivery shipments
- B2B & B2C parcels and pallets (LTL)
- Around 70 km daily mileage

Vehicle



- Scania P25 Electric
- Powertrain: 165 kW electric motor
- Energy storage: 4 Batteries, 265 kWh
- Range: 200 - 220 km
- GVW: 16,7 t
- Load capacity 5,7 tonne

Charging Scenario



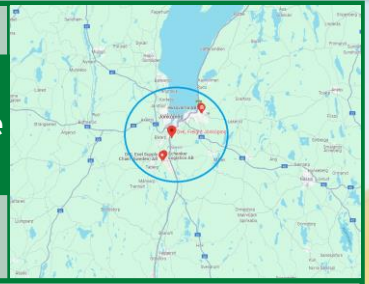
- Charging infrastructure for fast charging Kempower DC 320 kW
- If needed, large charging park located at Bernstorp in Malmö with 22 charging points for both heavy duty trucks and passenger cars
- Quick DC charge approx. 2 hours

1) WtW approach & CO2e emission saving per one vehicle

Case Study
Battery electric vehicle operating daily milkrun in the Jönköping area

DHL Freight | **Sweden** | **CO2e emission saved per year: 33 t[1]**

Use Case



- One vehicle used in daily local operations in Jönköping / Huskvarna area for pickup & delivery of shipments between Husqvarna different sites e.g. factory, warehouse
- Daily mileage around 140 km

Vehicle



- Volvo FM Electric
- Powertrain: 600 kW electric motor
- Energy storage: 6 Batteries, 540 kWh
- Range: 250 km
- GCW: 42 t

Charging Scenario



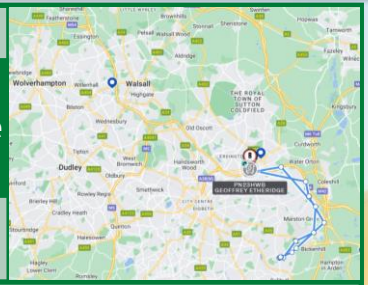
- Charging infrastructure for fast charging (DC 320kW) at DHL Freight terminal in Jönköping
- Quick DC charging approx. 1,5 hours
- Night AC charging up to 10 hours

1) WtW approach & CO2e emission saving per one vehicle

Case Study
Battery electric vehicle operating in local manufacturing supply chain in UK

DHL Supply Chain | **United Kingdom** | **CO2e emission saved per year: 80 t[1]**

Use Case



- Battery electric vehicle operating on local inbound to manufacture supply chain
- Car parts for manufacture delivered into a customer 4-5 times per day
- Each round trip 50 km
- ~ 250km daily distance

Vehicle



- Volvo FM Electric
- Powertrain: 490 kW electric motor
  666 HP equivalent
- Energy storage: 6 Batteries, 540 kWh
- Range: 250 - 300 km
- kg GCW: 40 t (payload of 18t)

Charging Scenario



- Currently operating on AC 43 kW charging as operational requirements can be met at lower rate
- Typical lowest SOC daily: 30-40%
- 9-10 hours AC charge time from low SOC
- Quick charge approx. 2.5-3 hours (250 kW DC) also available

1) WtW approach & CO2e emission saving per one vehicle

Case Study
Battery electric vehicle as part of an intermodal solution between PL and UK

DHL Supply Chain | **Poland** | **CO2e emission saved per year: 70 t[1]**

Use Case



- Goods delivery from Gorzów through Poznań in Poland to UK or Italy
- 5 Trucks
- ~ 350 km daily distance (2 x 175 km)
- In Poland pre-carriage by road via heavy duty EV trucks
- Road/Rail/Ferry transport between PL-UK and PL-IT

Vehicle



- Volvo FM Electric 4x2
- Powertrain: 490 kW electric motor
- Energy storage: 6 Batteries, 540 kWh
- Range: 300 km
- kg Gross combination weight: 42 t

Charging Scenario



- 2 x 350 kWh DC superchargers in two locations
- Charging time from 40% to 100%: ~ 2 hours with DC super charger of 350 kW power
- 5 x 43 kWh AC chargers

1) WtW approach & CO2e emission saving per one vehicle

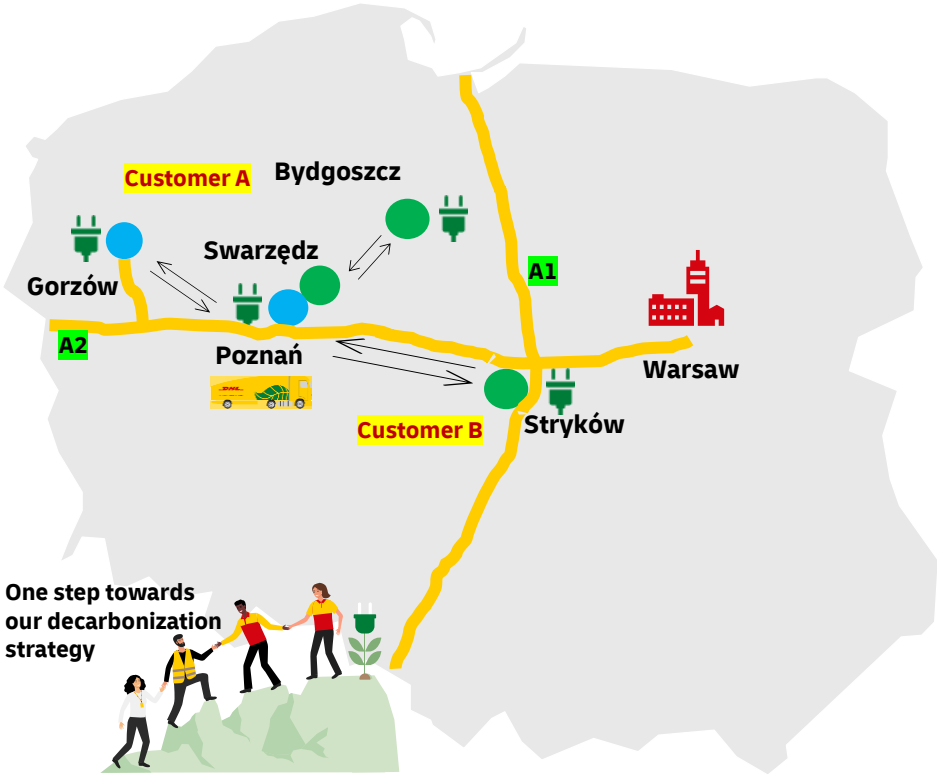
Case study
EV routes overview DHL Supply Chain in Poland - 2025

GOGREEN

One connected solution

5 x tractor unit Volvo FM Electric 42 T	**11-14 drivers**
65 Box trailer	**Over 350 roundtrips per month**
2 x own fast DC chargers 350 kW	**100 % reduction of CO2e** emissions vs diesel road transport

GOGREEN



Questions & Answers



Using our scale and expertise to make a **difference** for the **planet** and **people**



Piotr Szarek
EMEA Transport Decarbonization Lead
DHL Supply Chain

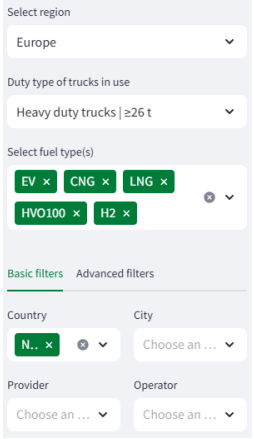
Green corridors – Green Fuels Route Planner (GFRP)



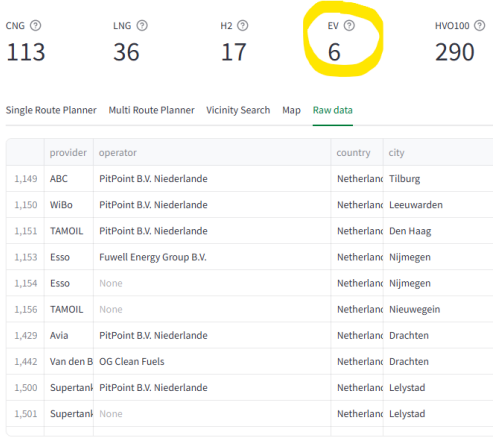
The Green Fuels Route Planner helps identify customer routes with existing infrastructure for sustainable fuels and technologies

[Green Fuels Route Planner (dhl.com)]

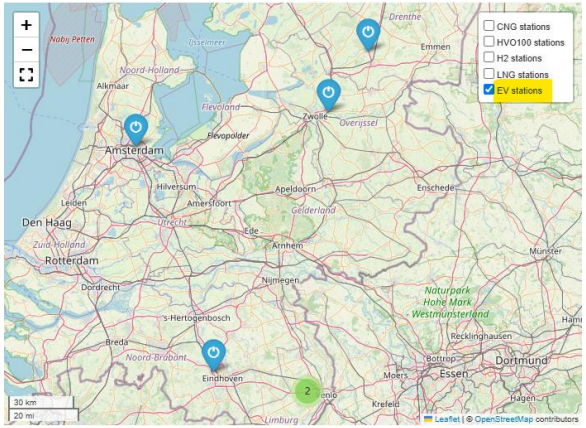
1 Search criteria



2 Process results



3 Show locations and details



Green Fuels Route Planner

- Enter customer lane Information (e.g., Tender Information) via standardized Excel template

Analysis

- Automatic processing and verification of lane information with daily updated fuel provider data

Visualization

- Feasibility route check for alternative fuels via Excel & Map
- Detailed lane and routing data

DSC GFRP Analyzer: CO2 Reduction & Premium (Country)

GoGreen

DHL Supply Chain

Region
All

Start Country
All

Start City
All

Start Zipcode
All

Destination Country
All

Destination City
All

Destination Zipcode
All

Fuel
All

Scope 1 or 3
All

FTL/ LTL
All

Carrier ID, Carrier
All

Shipments
1 28842

Distance
1.00 1,689,903.00

Financials - Lowest Premium
€ 6.25M

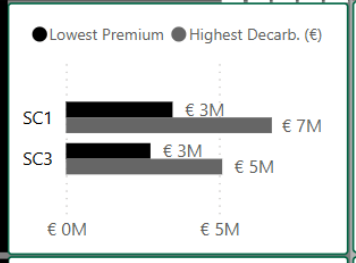
CO2 Reduction kg (Lowest Premium)
39,229

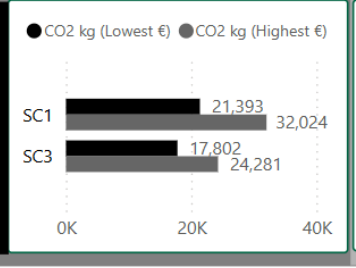
Page under development

Highest Decarbonization - Premium
€ 11.84M

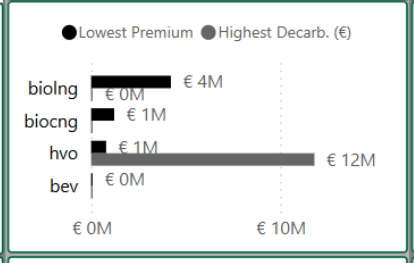
CO2 Reduction kg (Highest Decarbonization)
56,354

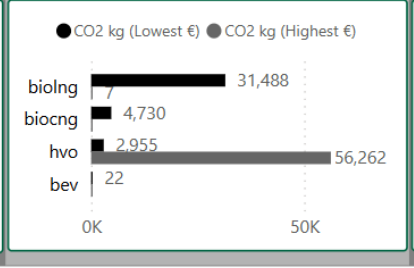
Scope



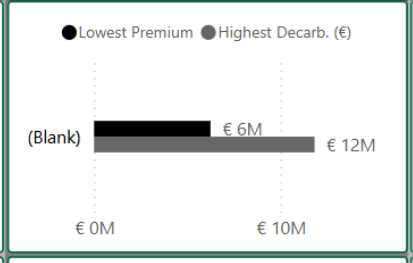


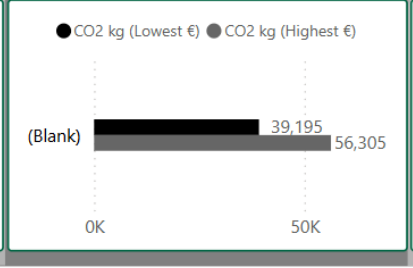
Fuel



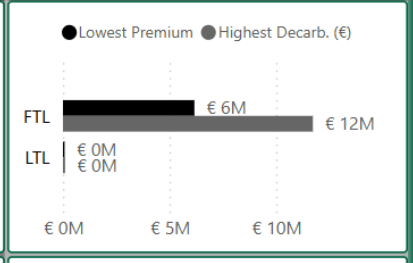


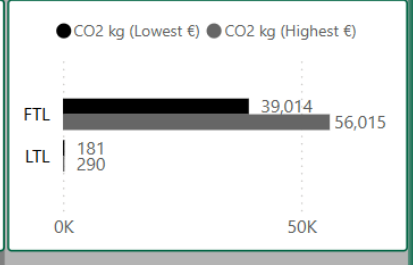
Carrier





Mode





Scope	Carrier ID	FTL/ LTL	Origin Country	Origin Zipcode	Destination Country	Destination Zipcode	Fuel	Shipments	Lane Coverage %	Total Distance (km)	CO2 Reduction kg	Premium
SC3		FTL	GB	GL16 8JB	GB	S80 3FY	hvo	5137	75%	1,342,584	1,652	€ 330,355
SC3		FTL	GB	GL16 8JB	GB	S80 3FY	biocng	5130	75%	1,338,930	1,596	€ 300,031
SC3		FTL	GB	GL16 8JB	GB	S80 3FY	biolng	5137	75%	1,342,584	1,467	€ 173,236
SC1		FTL	GB	NP44 3YL	GB	L11 0JA	hvo	2917	67%	865,614	1,355	€ 270,943
SC1		FTL	GB	NP44 3YL	GB	L11 0JA	biocng	2917	67%	865,614	1,311	€ 246,413
SC1		FTL	GB	NP44 3YL	GB	L11 0JA	biolng	2914	66%	864,694	1,203	€ 141,912
SC1		FTL	GB	DN15 9YA	GB	BS35 4DF	hvo	2511	100%	1,689,903	941	€ 188,235
SC1		FTL	GB	DN15 9YA	GB	CM20 2DW	hvo	2921	100%	1,495,552	923	€ 184,613
SC1		FTL	GB	DN15 9YA	GB	BS35 4DF	biolng	2511	100%	1,689,903	836	€ 167,146