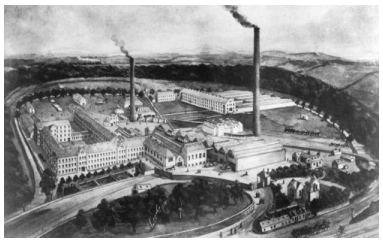
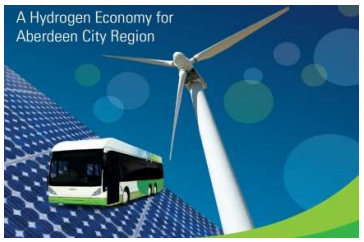
APSE Transport Seminar 2020

Aberdeen Fleet Services

Willie Whyte, Fleet Manager

11th November 2020





ABERDEEN CITY COUNCIL
FLEET SERVICES

Local Authority Fleet Operator Of The Year
2020
The most improved performer awards Finalist
December 2017
Fleet Category Silver Award Winner APSE Awards
May 2018
H2 Aberdeen shortlisted for National Transport Award 2018
“Contribution to Sustainable Transport”

Public Sector Fleet

Ultra-low emission public sector fleet and buy-in by private sector partners by 2025

- Engaged with vehicle manufacturers to map out real world, commercially available solutions
- Undertake fleet renewal programmes and establish H2 demand for various vehicle categories
- Develop a Joint Procurement Framework with interested public sector partners for fuel cell electric vehicles.
- Profile of additional demand that regional private sector partners – such as for heavy goods vehicle refuelling

SMART HY AWARE
Interreg Europe
European Union
European Regional Development Fund

NHS Grampian
Scottish Enterprise
North East Scotland College
cenex
Moray Council
Scottish Water
Trusted to serve Scotland
ONE
OPPORTUNITY NORTH EAST
Aberdeen City Council
Aberdeenshire Council
SEPA
Scottish Environment Protection Agency
Angus Council
Comhairle Aonghais
RGU Aberdeen
The Highland Council
Comhairle na Gàidhealtachd
Scottish Natural Heritage
All of nature for all of Scotland
Royal Mail

RESOURCES

The Service operates from Kittybrewster Depot and employs 45 staff and is responsible for 5 Operating centres and currently one workshop with one satellite workshop.

The services carries out:

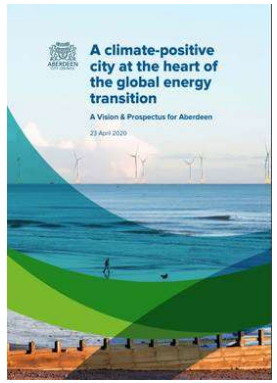
- Approx.13,500 scheduled MOT,s, services and repairs to own fleet per annum
- Approx. 4,000 taxi tests per annum
- Approx. 300 private MOT's and servicing per annum.

FLEET BREAKDOWN

- A fleet of 1,527 consisting of:
- 99 Large Goods Vehicles (“O Licence”)
- 44 Large Goods Vehicles (“O Licence” exempt)
- 314 associated vans, tippers, flatbeds & pickups.
- 59 Welfare and minibuses
- 6 Cars
- 1 Limo
- 290 mobile plant
- 631 plant ancillary
- 113 hand plant
- *Currently we have 39 vehicles which are electric, hydrogen or hybrid*
- *(including diesel hybrids)*

Aberdeen Context

- Aberdeen at the forefront of UK energy transition
  - Recently approved a Net ZeroVision to become a climate positive City & a Strategic Infrastructure Plan to support this vision – Hydrogen key
  - In March 2020 Aberdeen City Council approved plans to replace all fleet vehicles with alternative powered vehicles
- High level of development in offshore wind off the north east coast
- Highly skilled North Sea workforce facing an uncertain future as fossil fuels are phased out
- Aberdeen is an established centre of excellence for hydrogen and fuel cell technologies



DUAL FUEL VEHICLES

Transition: Dual Fuel Vehicles

Dual Fuel vehicles - HyTime Project – Key Project Details

- Project partners: ULEMCo Ltd (lead), London Fire Brigade, Wiles Greenworld, Aberdeen City Council, Westminster City Council, Veolia, Ocado & the Yorkshire Ambulance Service
  - Trial vehicles: 11 vehicles from 5 different OEMs (4 x vans; 4 x RCV; 1 x road sweeper; 1 x chassis cab; 1 x patient transport ambulance)
  - Duration: 12 months from January 2018

- The project trialled a range of vehicles and associated duty cycles with hydrogen dual-fuel technology **(H2ICED®)** in order to provide evidence of the carbon reduction and air quality improvement of this world leading unique approach.

- The project was led by ULEMCo, the technology provider in partnership with vehicle operators The London Fire Brigade, Wiles Greenworld, Aberdeen City Council, Westminster City Council, Veolia, Ocado & the Yorkshire Ambulance Service that provided the vehicles, the fleet operations experience and their fleet management systems to support data gathering.

Transition: Dual Fuel

- The project provided value for money by incorporating a range of vehicles, duties and operators who got hands on experience of the benefits of the dual fuel technology that largely make use of the existing hydrogen refuelling stations, with a temporary facility installed for Westminster City Council.
- It aimed to show that between a 40-70% reduction in tailpipe C02e is possible by displacing diesel, alongside improving real world air quality relative to the MY16 standards, and WtW of 5%-60% depending on the source of hydrogen.

SYSTEM DESCRIPTION DUAL FUEL CONVERSION HYDROGEN – DIESEL

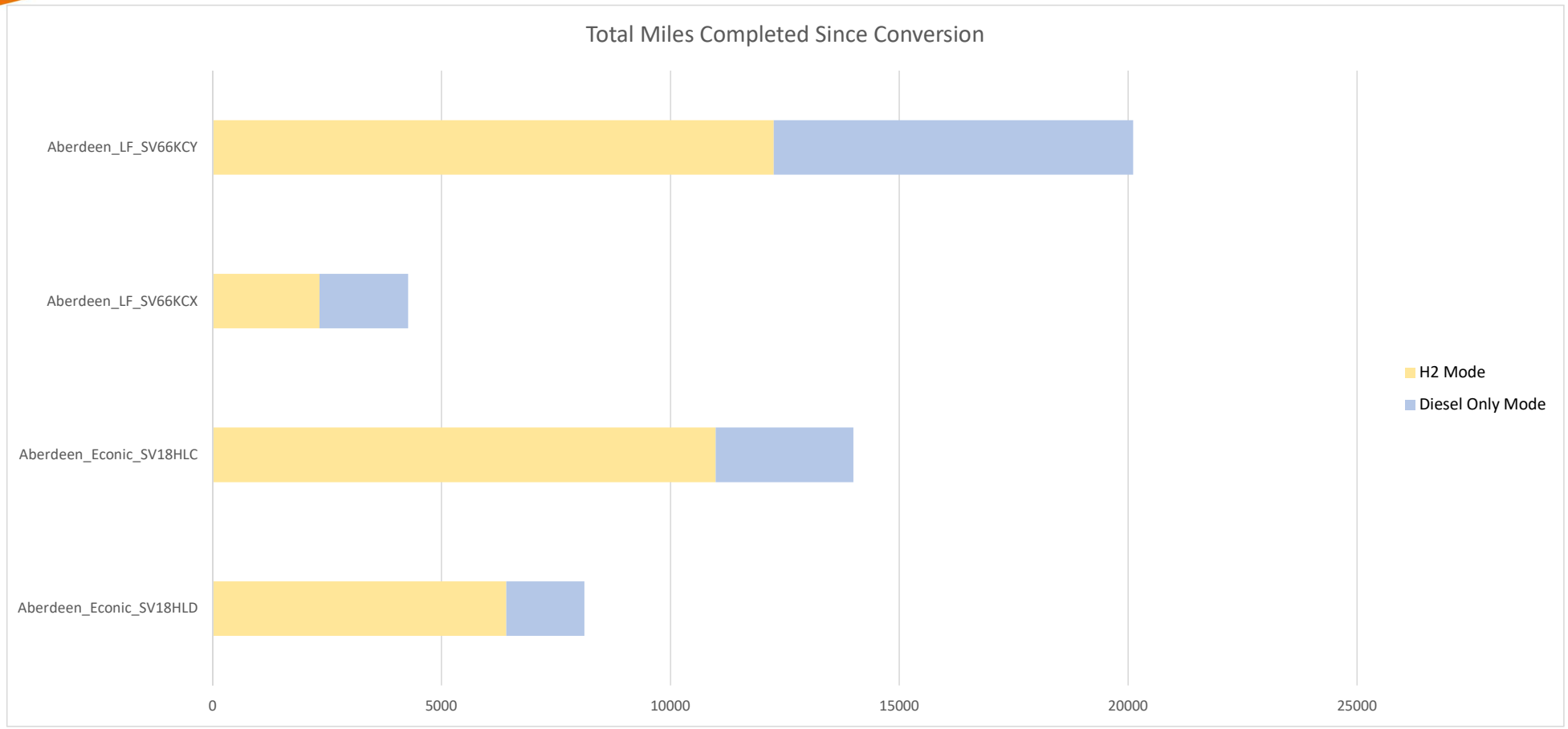
Operation of H2ICED Hydrogen Internal Combustion Engine Diesel

- The system is a Dual-Fuel system that relies on diesel injections to ignite a mixture of Hydrogen and Air in the cylinders
- The amount of Hydrogen that is injected is controlled in response to Actual Engine % Torque.
- Due to its small molecular size, hydrogen is fully mixed with the air by the time it enters the cylinders.
- The Hydrogen Injector Rail has a Pressure and Temperature sensor.
- If a leak is detected the Solenoid Valves are closed, and the vehicle runs on diesel until the fault is cleared.
- The engine always starts on 100% diesel. Dual-Fuel operation (when selected) commences when engine coolant temperature reaches a desired value (provided there are no active H2 System faults and no MIL lamp)

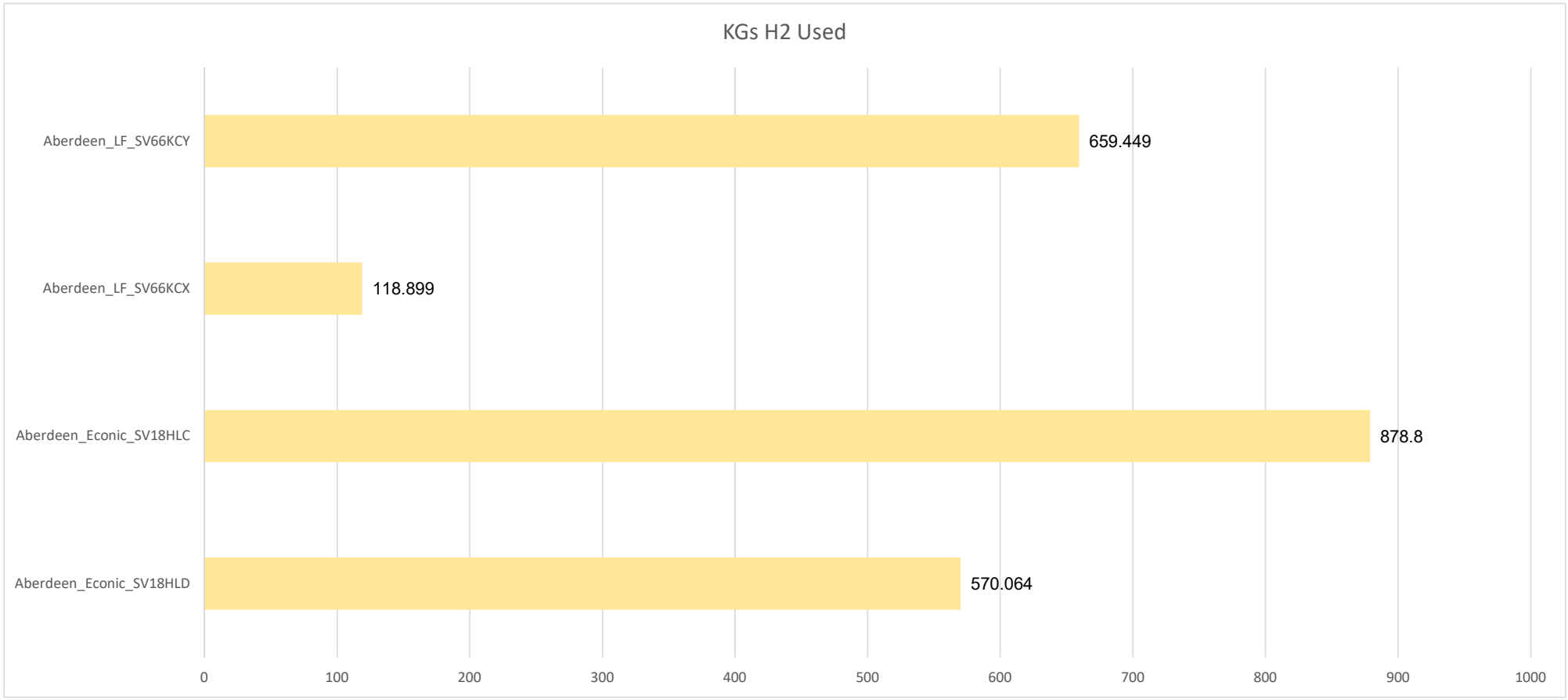
HyTime KPIs

Total KGs of H2 Used	2227.21				
Total Miles in H2 Mode	31998				
Total Miles Diesel & H2	46498				
Total Co2 Emissions Saved	19870.4				
	Total KGs of H2 Used	Total Miles in H2 Mode	Total Miles in Diesel Only Mode	Total Miles Diesel & H2	CO2 Emissions saved (kg)
Aberdeen_Econic_SV18HLD	570.064	6415	1709	8124	5085.91
Aberdeen_Econic_SV18HLC	878.8	10991	3004	13995	7840.35
Aberdeen_LF_SV66KCX	118.899	2336	1938	4274	1060.78

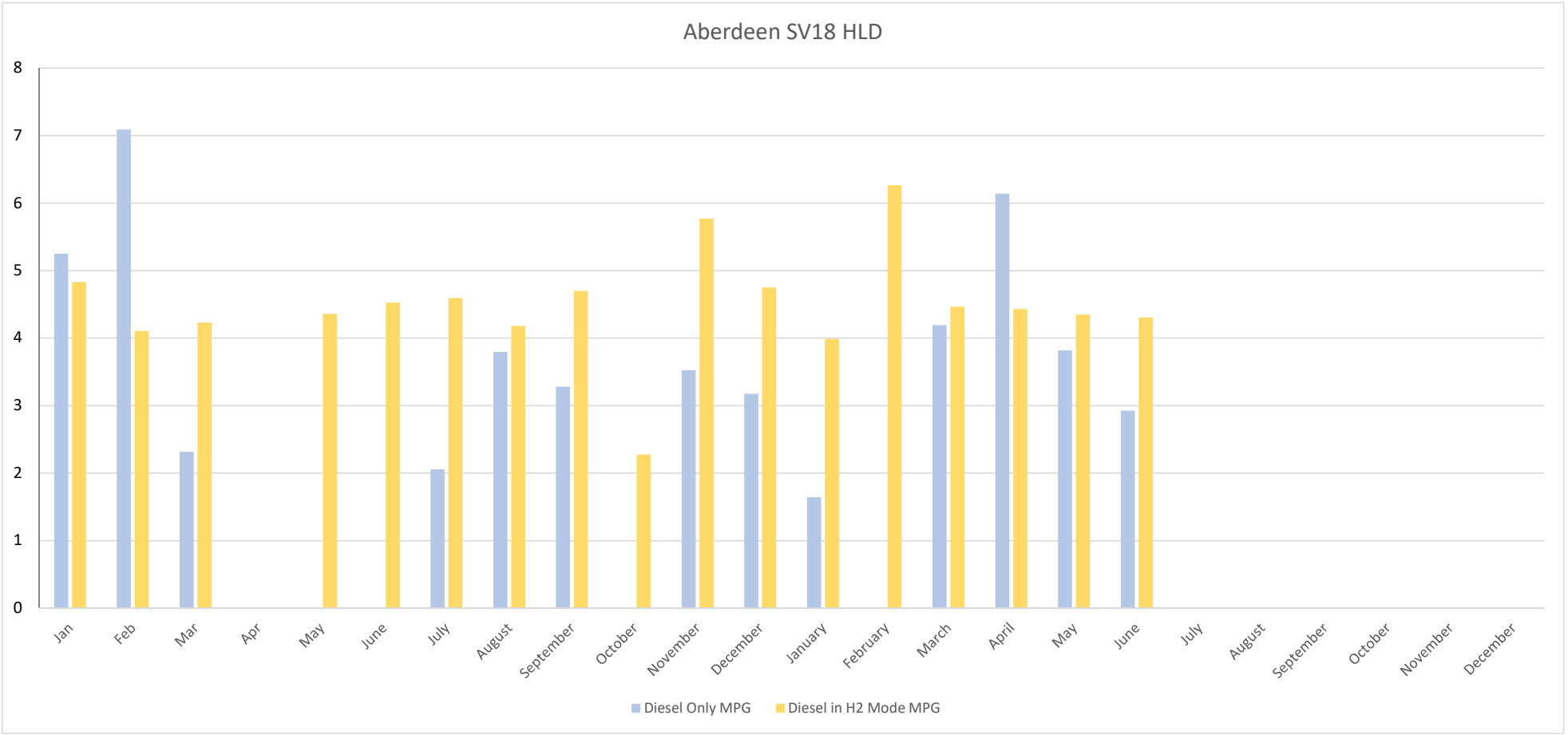
TOTAL MILES COMPLETED SINCE CONVERSION

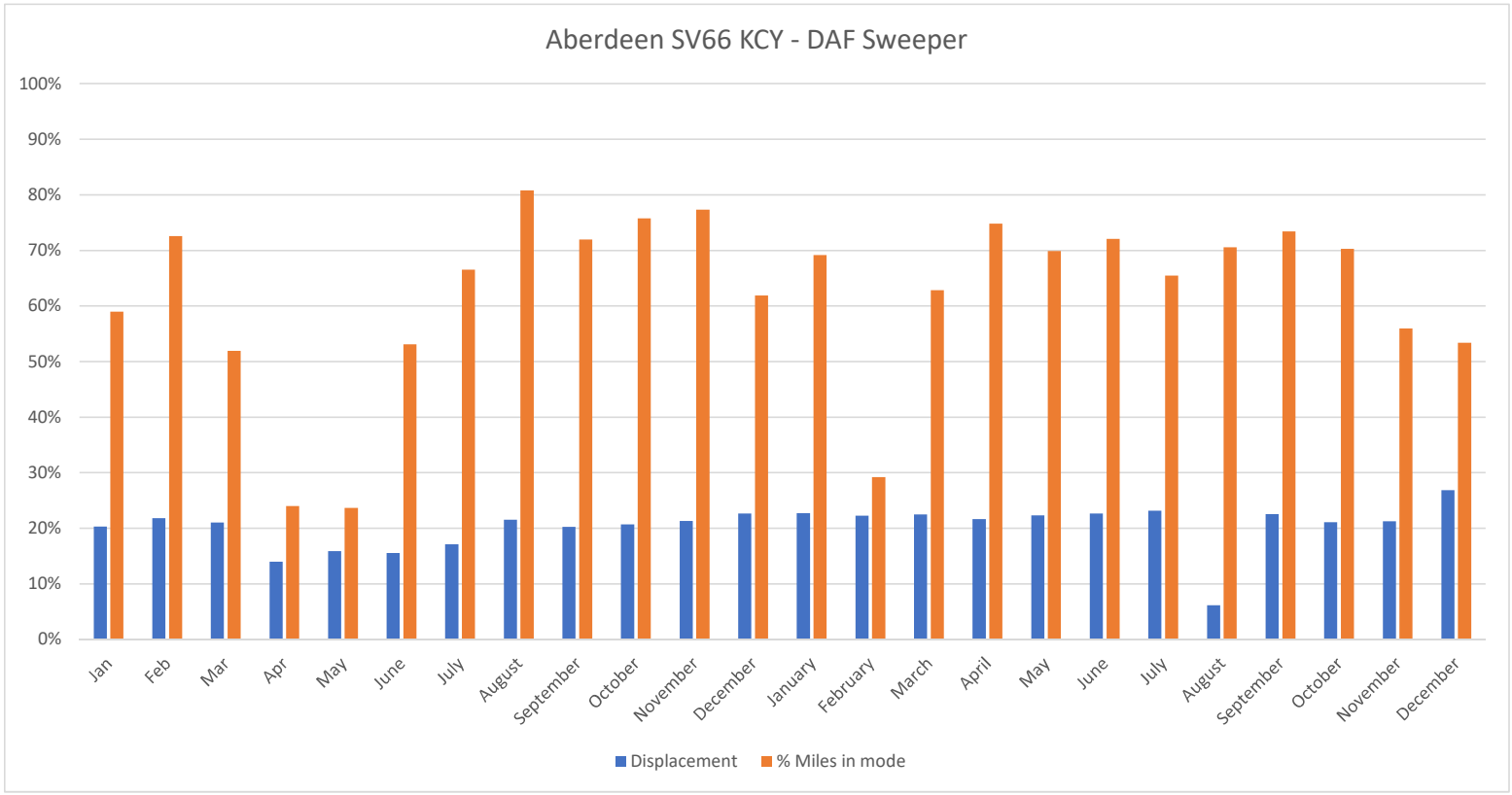


HyTime: KGs H2 Used

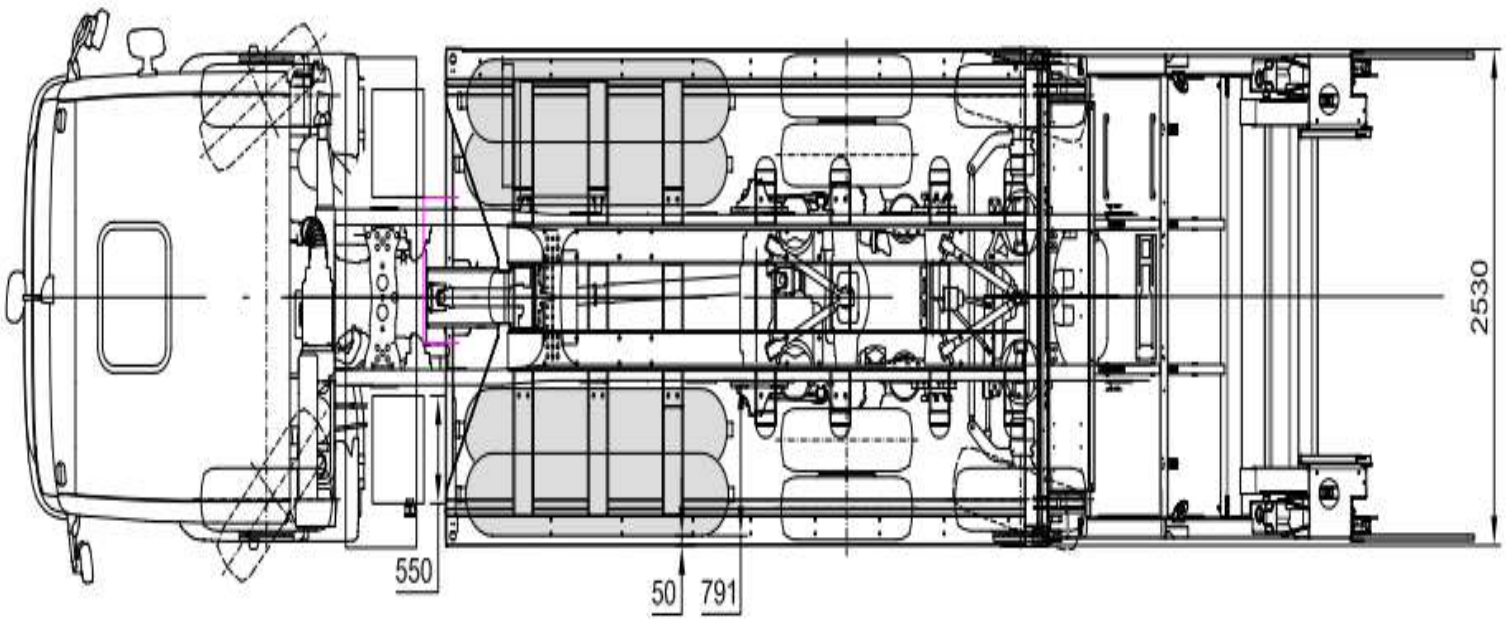


MPG Diesel v Dual Fuel H2

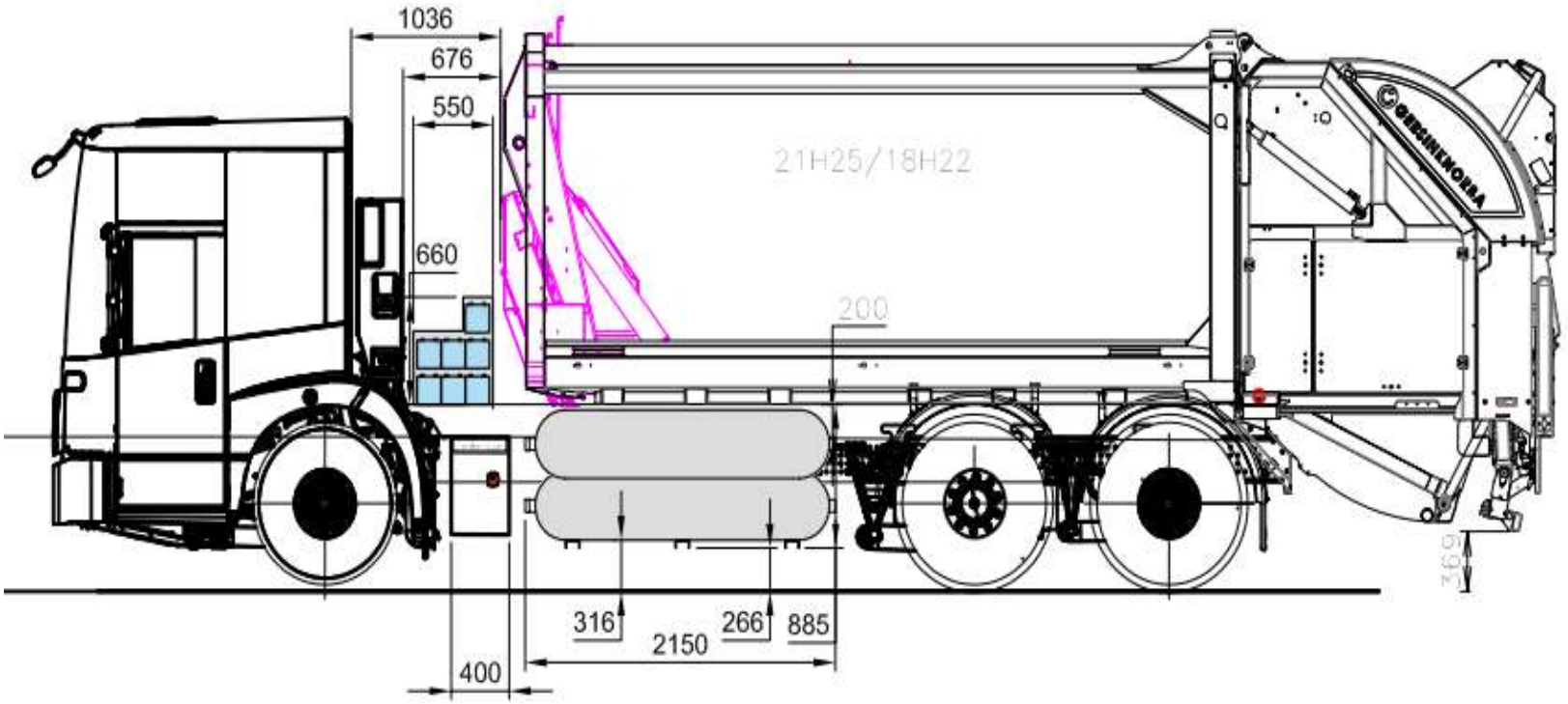



Aberdeen SV66 KCY - DAF Sweeper
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jan
Feb
Mar
Apr
May
June
July
August
September
October
November
December
January
February
March
April
May
June
July
August
September
October
November
December
Displacement
% Miles in mode

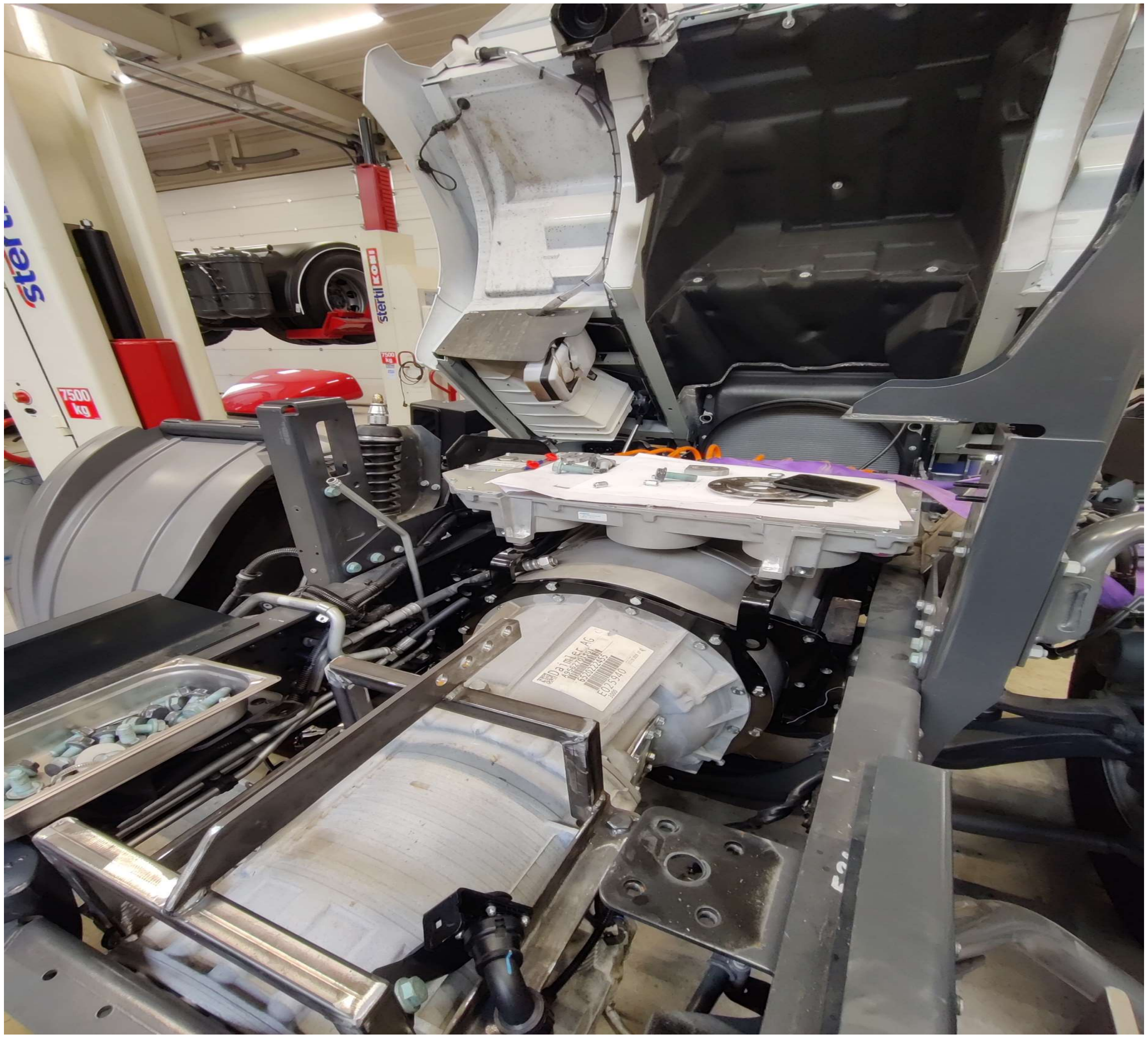
Hydrogen Fuel Cell Refuse Collection Vehicle
The First One in Britain

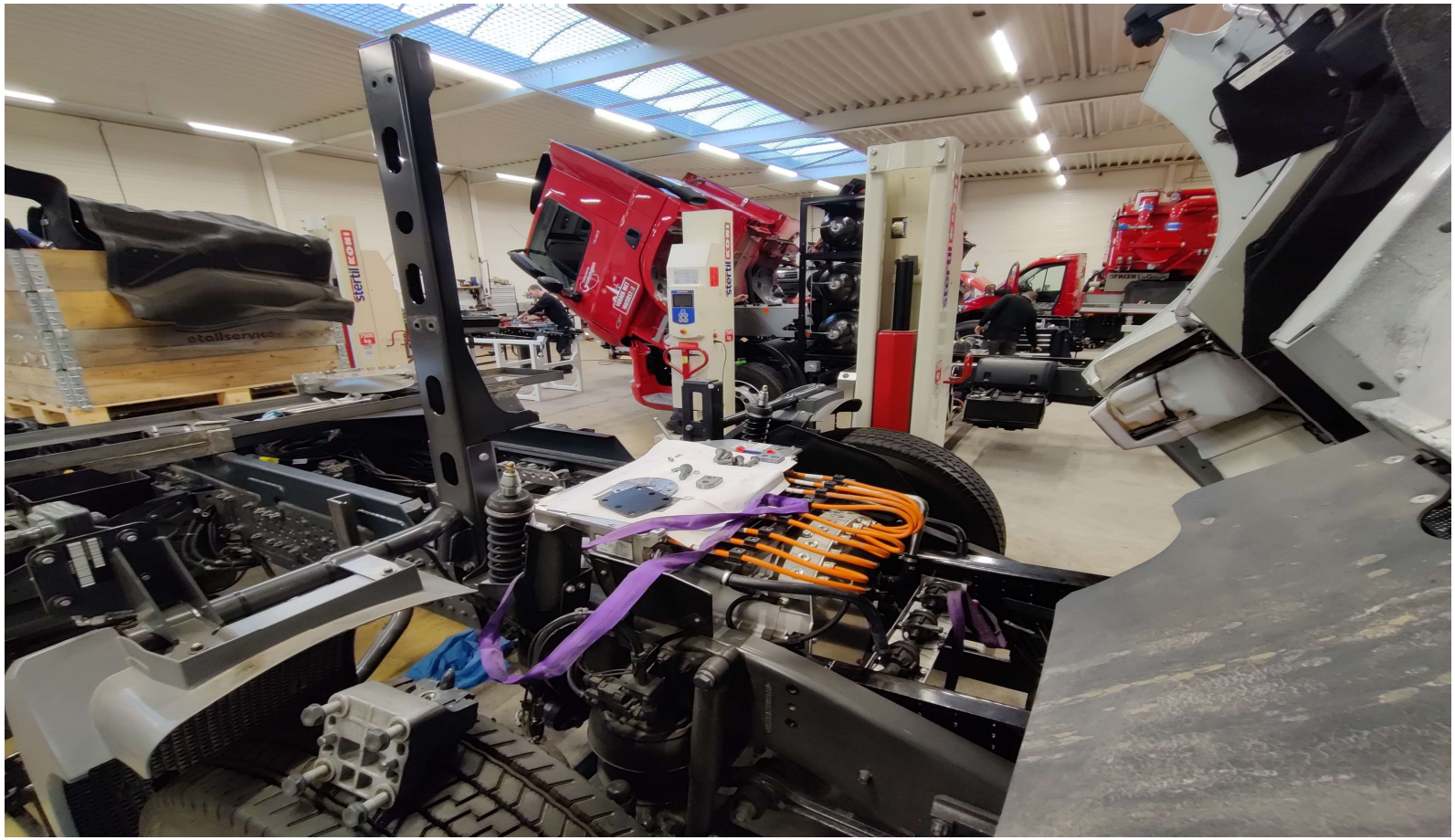


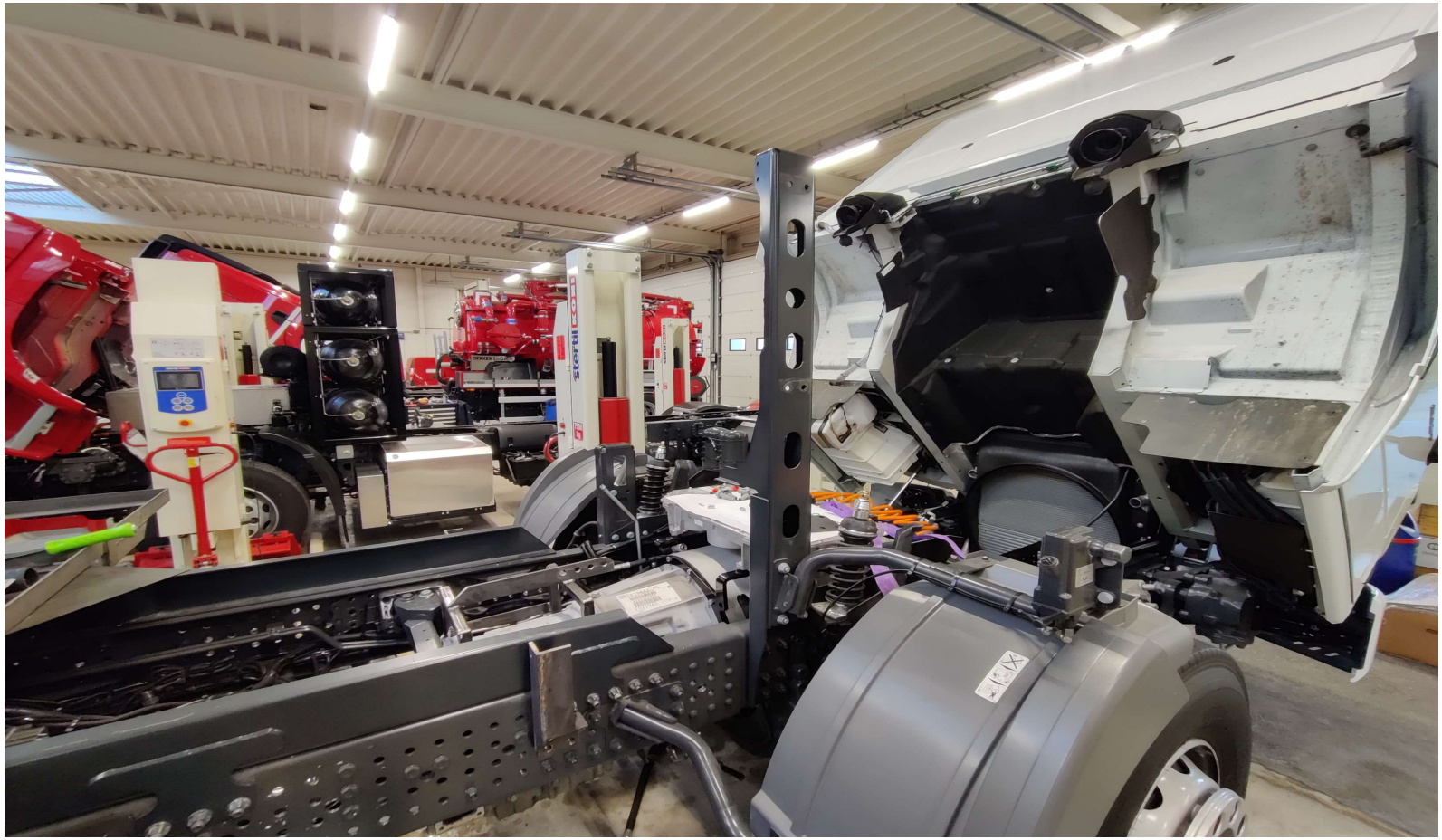
Hydrogen Fuel Cell Refuse Collection Vehicle
The First One in Britain




Stertil KONI
7500 kg


stertil
7500 kg





Aberdeen City Council Charging Sites

Publicly-available electric vehicle charge points in Aberdeen

Aberdeen City Council and partners offer electric vehicle charge points at 24 locations in the city.

- Rapid Triple Chargers (50kW DC CHAdeMO/50kW DC CCS/ 43 KW AC) at Gallowgate (2), Kingswells Park and Ride (2), Craibstone Park and Ride (2), Garthdee, Broomhill Road, Langdykes Road (ACHES), Exploration Drive and Sclattie Park. These units are capable of recharging a vehicle to 80% in 30 mins.
- Fast Chargers (22kW AC Mennekes) at Frederick St, Chapel St, Golden Square, Dunmail Ave, Danestone Community Centre, Bridge of Don Library, ARI Rotunda, ARI Rosehill Annexe, Cornhill Shopping Centre, Hazlehead Park, Mastrick Access Point, Satrosphere, Kincorth Library, Langdykes Road (ACHES) Exploration Drive, Kingswells Park and Ride and Tanfield Walk. These units are capable of fully recharging a vehicle in 2-4 hours.
- 7kW Chargers (7kW AC Mennekes) at Gallowgate, West North St, Polmuir Rd, Kingswells P&R and Craibstone Park and Ride. These units are capable of fully recharging a vehicle in 4-6 hours.

The charging unit itself is free to use at present but users are still required to pay the parking charges whilst charging in locations where these apply (except Gallowgate and Broomhill rapids where you are not required to pay if you stay with car whilst charging)

The charge points were funded by Transport Scotland, OLEV and the Energy Saving Trust and are operated by Chargeplace Scotland. They can be activated with a Chargeplace Scotland, by phone or using the Chargeplace Scotland mobile phone app. Go to http://chargeplacescotland.org for more details (Except for 7kW chargers at Craibstone which were funded by Aberdeen City Council, are free to use but don't link to Chargeplace)

Aberdeen City Council Charging Sites

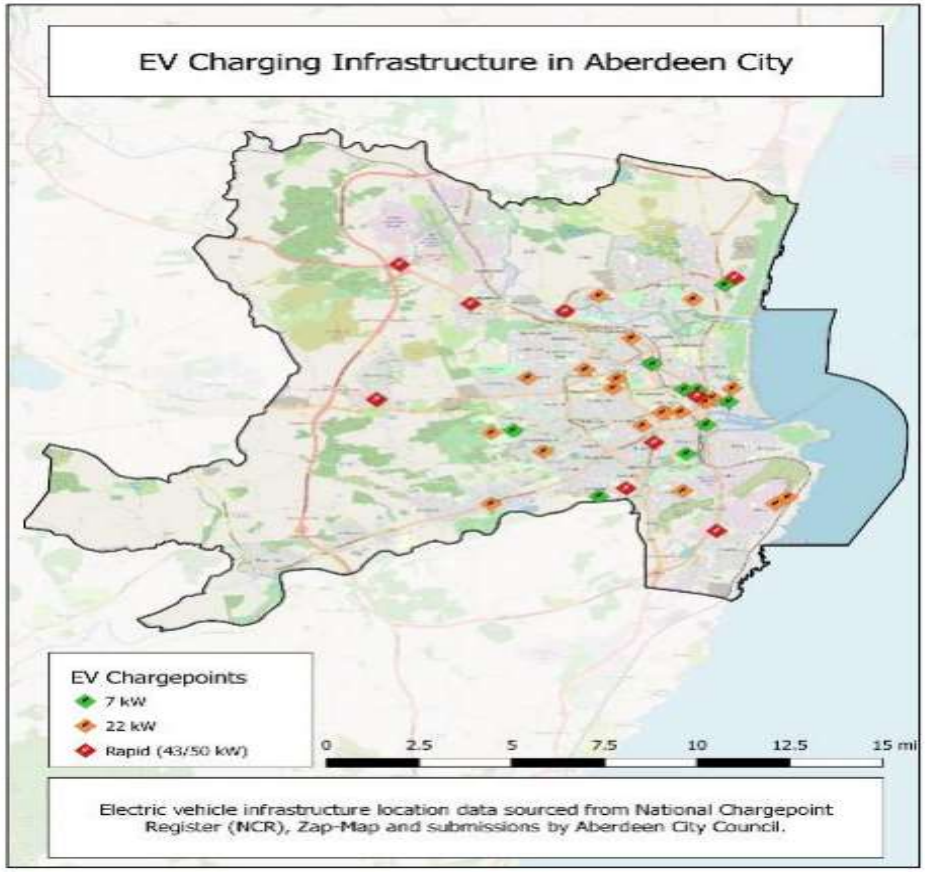


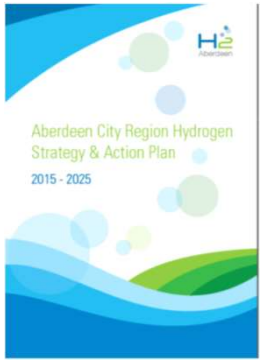
Figure 0-18: EV charging infrastructure in Aberdeen City - Charge type

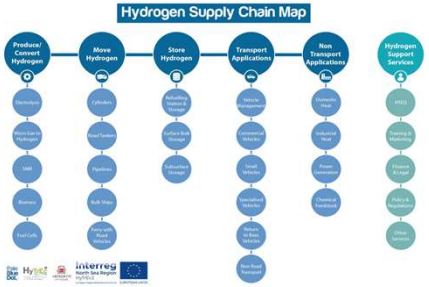
Fleet Services Electric Vehicles

Fleet No.	Reg No	Class	Class	Veh. Type	Veh. Type	Type Of Plant	Life (Yrs)	Operator	Operator	Ann L	K Or M	Chassis No	Apse Code	Fuel Type
														ELECTRIC
6474	MW68OPA	PEV	ELECTRIC VAN	R015	RENAULT KANGOO Z.E		4	GD1	GROUNDS MAINTENANCE		MILES	VF1FW0ZHC57058635		ELECTRIC
6475	MW68OPJ	PEV	ELECTRIC VAN	R015	RENAULT KANGOO Z.E		4	FS1	FLEET SERVICES		MILES	VF1FW0ZHC57058639		ELECTRIC
6476	MW68OPX	PEV	ELECTRIC VAN	R015	RENAULT KANGOO Z.E		4	FS1	FLEET SERVICES		MILES	VF1FW0ZHC57058638		ELECTRIC
6477	MW68ORC	PEV	ELECTRIC VAN	R015	RENAULT KANGOO Z.E		4	FS1	FLEET SERVICES		MILES	VF1FW0ZHC57058633		ELECTRIC
6581	SW19HLE	22	Panel Van	R026	Renault Kangoo I Ml20 ZE		5	CP1	CAR PARKS		MILES	VF1FWEZBC62601250		ELECTRIC
6590	SW19HLF	22	Panel Van	R026	Renault Kangoo I Ml20 ZE		5	CP1	CAR PARKS		MILES	VF1FWEZBC62601249		ELECTRIC
6595	SW19HLD	22	Panel Van	R026	Renault Kangoo I Ml20 ZE		5	CP1	CAR PARKS		MILES	VF1FWEZBC62601251		ELECTRIC
6673	SV69MXY	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	BS6	BUILDING SERVICES		MILES	VSKYAAME0U0613096		ELECTRIC
6674	SV69MXZ	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	BS6	BUILDING SERVICES		MILES	VSKYAAME0U0613086		ELECTRIC
6675	SV69MYA	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	BS6	BUILDING SERVICES		MILES	VSKYAAME0U0613043		ELECTRIC
6676	SV69MYB	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	BS6	BUILDING SERVICES		MILES	VSKYAAME0U0613049		ELECTRIC
6677	SV69MYC	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	RD1	ROADS MAINTERANCE		MILES	VSKYAAME0U0613005		ELECTRIC
6678	SV69MYD	PEV	ELECTRIC VAN	N012	Nissan eNV200		5	LR1	COUNTRYSIDE RANGERS		MILES	VSKYAAME0U0612970		ELECTRIC
6739	SF20UTC	ASC	1.0 - 1.4 CAR	B035	BMW i3			CW4	COMMON WHEELS		MILES			ELECTRIC
6740	SF20UTE	ASC	1.0 - 1.4 CAR	B035	BMW i3			CW4	COMMON WHEELS		MILES			ELECTRIC
6741	SF20UTG	ASC	1.0 - 1.4 CAR	B035	BMW i3			CW4	COMMON WHEELS		MILES			ELECTRIC
6742	SF20UTH	ASC	1.0 - 1.4 CAR	B035	BMW i3			CW4	COMMON WHEELS		MILES			ELECTRIC
6786	SV20BKK	22	Panel Van	R030	Renault Master Sl31 I Ze		5	GD1	GROUNDS MAINTENANCE		MILES	VF1VAE00965033427		ELECTRIC
6787	SV20BKJ	22	Panel Van	R030	Renault Master Sl31 I Ze		5	FR1	FLEET RESERVE		MILES	VF1VAE00765033426		ELECTRIC

Hydrogen Strategy for Aberdeen

Hydrogen Refuelling Infrastructure





Development of Supply Chain and Training

Innovative non-transport applications

Offshore hydrogen generation

Education and Communication

Vehicle Deployments

Interreg North-West Europe Fuel Cell Cargo Pedelecs

Interreg North-West Europe HECTOR

H2 Aberdeen Vehicles

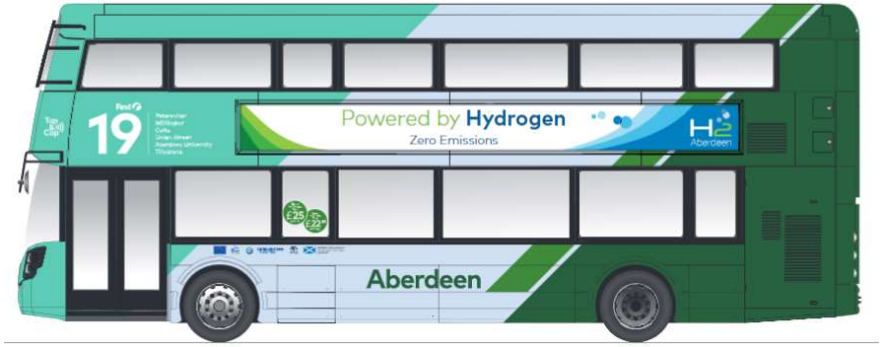
One of the most varied fleets in Europe

Interreg North Sea Region HyTrEc2 European Regional Development Fund — EUROPEAN UNION

Fleet of 65 vehicles (and counting)

FCH JU JIVE (Joint Initiative for hydrogen Vehicles across Europe)

- €32m to deploy 145 buses in 9 cities
- Focus on joint procurement from partners making the capital costs more commercially acceptable
- 15 buses in Aberdeen from Autumn 2020 and another 10 buses have just been approved in August 2020 for arrival in 2021
- Aberdeen H2 Bus Project +€1m per bus, JIVE buses are half this = technology and costs improving



Refuelling Infrastructure

- 2 stations delivering 130 and 360kg/ day
- 350 & 700 bar capable
- Refuel cars, vans, buses, large vehicles
- Both ‘green tariff’ stations

Until this year Aberdeen had the only two publicly accessible refuelling stations in Scotland!

Innovative Hydrogen

- Hydrogen a by-product at our new Exhibition Centre Aberdeen (TECA) and we are looking to see how we can use this to fuel vehicles
- New Energy Transition Zone being created at Aberdeen Harbour South to support development of renewable projects
- Seeking a commercial supply of renewable hydrogen for North East Scotland
- Recently awarded funding from the Scottish Government to develop Aberdeen as a “Hydrogen Hub”

Scottish Government
Riaghaltas na h-Alba
gov.scot

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NEWS

£62 million fund for energy sector

Published: 12 Jun 2020 11:46

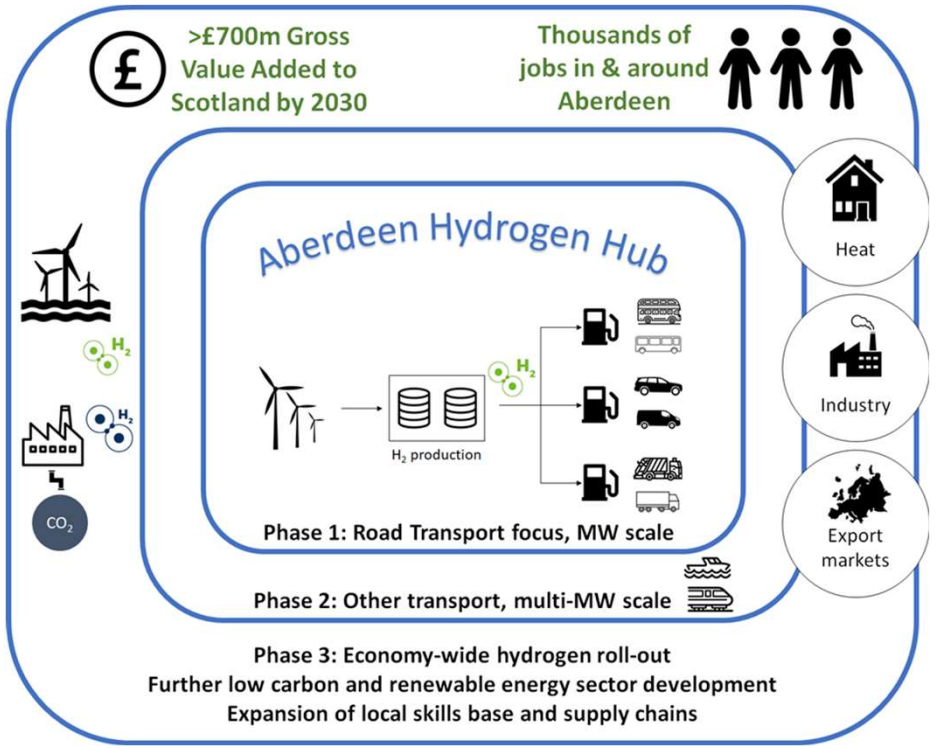
Part of: Coronavirus in Scotland, Energy, Economy, Environment and climate change

Support package to help deliver net zero future.

A multi-million pound fund has been set up to help the energy sector recover from the dual economic impacts of coronavirus (COVID-19) and the oil and gas price crash.

Aberdeen Hydrogen Hub

- **Phase 1** – provision of a resilient, cost effective supply of green hydrogen on a commercial basis to the market to support the existing and proposed transport projects.
- **Phase 2** – Expansion in the short to medium term to connect to larger volume utilisation of hydrogen – trains, trucks and marine.
- **Phase 3** – Whole system approach to supply and demand. Innovation, skills and transition hub to support expansion of the local supply chain. Pursue the ambition for Aberdeen to be the centre of a brand new Energy production business, exporting H2 to the world.

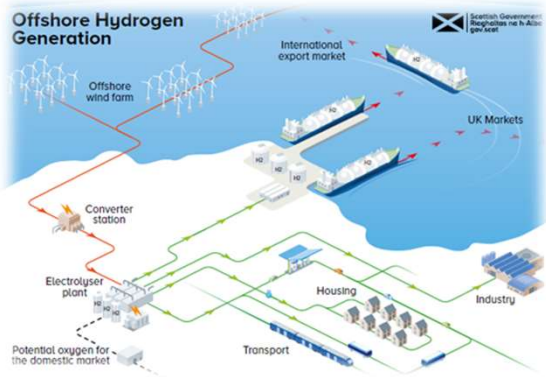


Partnership Working

- Partnership working critical
- We are no longer able to participate in Interreg projects but hope to take part in future Horizon 2020 opportunities
- Aberdeen's strategy for hydrogen has been to work with organisations across Europe to deliver and we hope to continue working across Europe in the future.

Context – Scotland and the EU

- Carbon Emissions: 80% reduction by 2050
- Low Emission Zones in Scotland's main cities by 2020
- Petrol and Diesel cars and vans phase out in all public sector fleets by 2025 and privately by 2032 in Scotland and UK
- Scotland target 2030 50% all energy transport/heating from renewables
- Scottish Government Energy Strategy: 2050 vision for electric and hydrogen futures
- Rapid growth and global interest in renewable hydrogen: Scotland has significant renewable resources, particularly offshore (25% of Europe's offshore wind resource)
- Hydrogen Roadmap Europe: A Sustainable Pathway for the European Energy Transition



The EU Hydrogen Strategy will give a boost to **clean hydrogen production in Europe**. Hydrogen can be used as **a feedstock**, **a fuel** or **an energy carrier and storage**, and has many possible applications which would reduce greenhouse gas emissions across industry, transport, power and buildings sectors. The Commission's economic recovery plan 'Next Generation EU' highlights **hydrogen as an investment priority** to boost economic growth and resilience, create local jobs and consolidate the EU's global leadership.