DECARBONIZING LOCAL ENERGY

Landmann Way energy from waste electric depot

City of Westminster

VEOLIA

Agenda

1. Background
2. Project Delivery
3. Westminster's Electric Fleet
4. Vehicle 2 Grid

BACKGROUND

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Westminster

Key facts & figures

- Operating 24 hours a day, 365 days a year
- 192k tonnes of waste per annum
- 1,600 streets, over 750 km in length
- 2 million collections a week
- Over 50 special events a year
- Area - 8 sq miles
- ~250,000 résidents
- Population - 1 million a day & 30 million tourists a year
- >200 vehicles of various specifications are used to keep the city clean
- Poor air quality is a big concern
  - Clean Air and Fairer Environment Policy are key drivers

Background

Key drivers

- Climate Emergency
- Westminster City Council Clean Air Policy
- London Transport Strategy

- WCC Transport footprint 4,000 tonnes CO_2e p.a.

ULEZ

April 2019

October 2021

September 2023

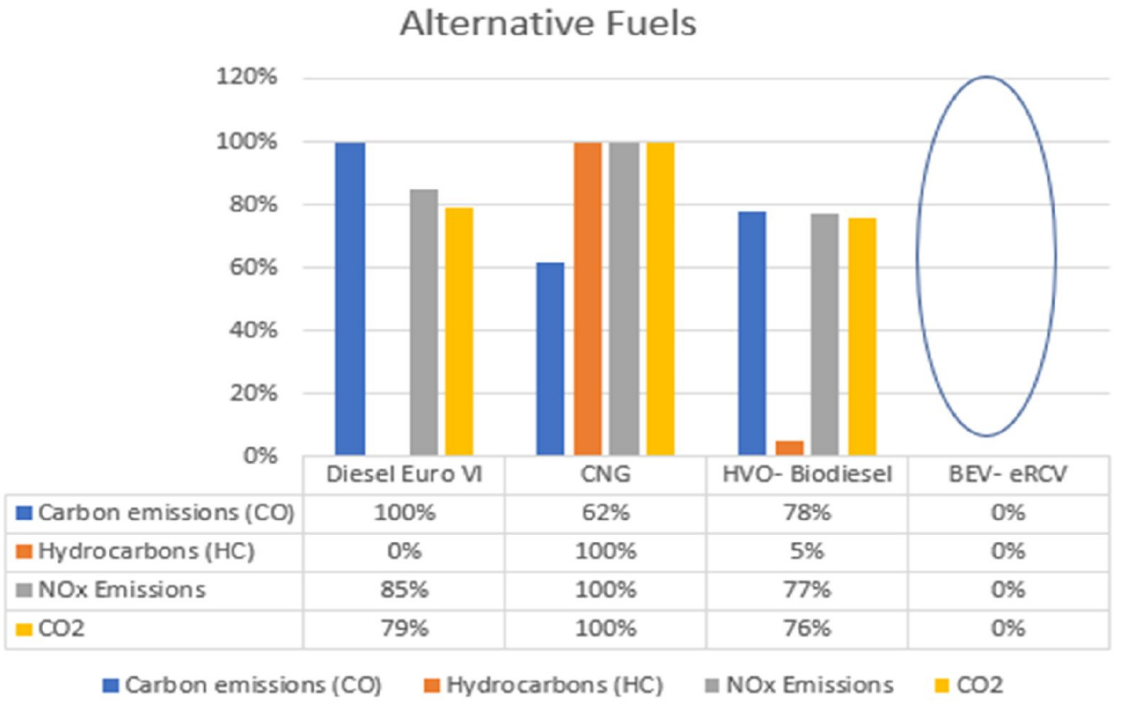
What is the best fuel technology for the Westminster City Council Large Waste Fleet ?

Alternative fuel technologies in the market

- Natural gas (CNG) - small reduction in emissions
- Biodiesel (HVO) - small reduction in emissions
- Hydrogen (H2) - reliability ~ 45%
- Electric powered - No OEM, tested upcycling model

Background

Tailpipe emissions



Background

Steps taken

- SWOT of WCC fleet (inc. technical details
- Developed partnership with key suppliers (Veolia, Dennis Eagle & Mercedes)
- Identified the electric fleet that meets our service demands
- **Tested them in real environment**
- Identified total power demand
- Reviewed local grid capacity
- Reviewed alternative power sources (EfW & Solar etc)
- Commissioned suitable smart charging infrastructure
- Ordered the EV fleet
- Trained staff and got them on board with changes
- Mobilised the fleet

WESTMINSTER ELECTRIC FLEET

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Electric Fleet

Dennis Eagle eCollect

Time to charge	Range (miles)	Carbon saving (tCO2e)
8.5hrs	80	52.8

Goupils

Time to charge	Range (miles)	Carbon saving (tCO2e)
3-9hrs	46-106	5.7-5.8

EAV bike

Time to charge	Range (miles)	Carbon saving (tCO2e)
6hrs	60	TBC

Overall average fleet savings

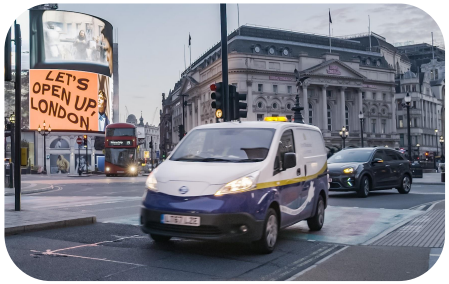
89% carbon saving

100% NOx reduction

significant noise reduction

Electric Fleet

Nissan eNV200 van



Time to charge	Range (miles)	Carbon saving (tCO2e)
7.5hrs	150	1.31

Bradshaw Pedestrian Operated Vehicle

Time to charge	Range (hours)	Carbon saving (tCO2e)
6hrs	17	0.76

Green Machine/Tenax Sweepers/Flushers

Time to charge	Range (hours)	Carbon saving (tCO2e)
3.5-8hrs	8-14	9.4-19.9

Overall average efleet savings (compared with diesel)

89% carbon saving

100% NOx reduction

significant noise reduction

LANDMANN WAY

City of Westminster

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Landmann Way

Project Overview

Depot procured by WCC next to SELCHP, at a **£22m investment**. Veolia's electrification services oversaw the design and implementation, including management of the electric feed and optimisation. Safety considerations were at the heart of the project.

54 vehicles

- Westminster procured
- 38 x 26t eRCVs
- 16 street cleansing vehicles (which includes 8 vans, 4 7.5t cages, 2 Large Mechanical Sweeper and 2 18t GEMs)

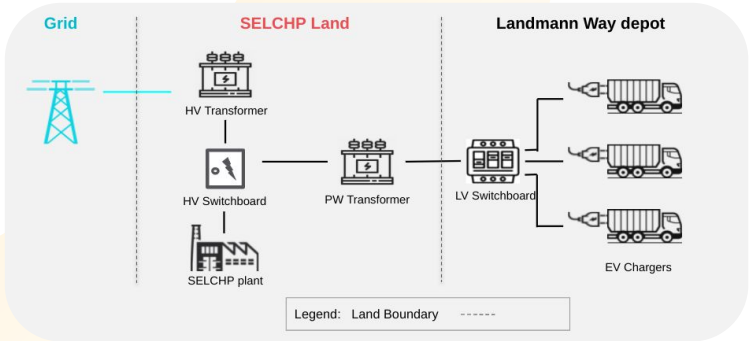
Power Purchase Agreement

- Signed with SELCHP eRF for the supply of electricity
- 3,300MWh of electricity per annum (~1.5% of SELCHP's overall generation),
- At an approximate annual cost of £350-500k (depending on wholesale prices)

Landmann Way

Design

1. A **new high voltage (HV) switchboard** was installed on SELCHP land, with a panel dedicated to the depot private wire (PW).
2. A **2.5MW transformer** steps the power down to low voltage (LV), then taken across the SELCHP boundary.
3. The **low voltage switchboard** installed **distributes the power** to the cabinets located across the depot.
4. Six large inverter cabinets convert the power from alternative current (AC) to direct current (DC), distributing it to a total of **40 DC outlets** where eRCVs connect. Another **18 AC fast chargers** power the smaller vehicles.
5. Each DC charger is capable of delivering 50kW per vehicle and each AC charger 22kW.



Landmann Way

Construction phase

LOCAL
DECARBONIZING
ENERGY

Building Landmann Way

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Safety Considerations

The Depot

Due to the unique nature of the site that incorporates railway lines and tunnels a robust fire mitigation risk review was undertaken. Veolia consulted with the fire brigade, fire risk experts, as well as an UCL Professor in the field, with support from the Chief Risk & Assurance Officer for Northern Europe. Measures included:

- Strategic location of vehicles to ensure no large eRCVs are parked under the semi enclosed arches
- Firewalls around parts of the perimeter of the site that were deemed as more vulnerable.
- Fire walls built in between vehicles to ensure that no more than six vehicles are enclosed within fire walls at any point on the site.
- Advanced detection system that uses flame, smoke and heat detection depending on the location (i.e. under arches or open air)
- 24/7 personnel at site - trained to identify risks
- Increased fence height to ensure site security

The detection system will alert the fire brigade who have confirmed a call out SLA of 3-5 minutes. All staff are instructed in the event of an alarm to evacuate the site.

Safety Considerations

The Vehicles

Fire mitigation

- Internal and external fusing arrangements within the batteries prevent any electrical failures propagating through the battery
- If a fault is detected, the battery management control system will isolate the battery so vehicle can not be utilised
- This ensures the safety of personnel and equipment in the event of an HV electrical isolation fault.
- The battery case assembly should protect the battery being penetrated in most cases apart from severe events
- The battery packs have completed rigorous Reg100 fire safety testing and are compliant with the standard.

Battery Location

Insurance & Responsibility

- Veolia is responsible for the motor insurance
- Landlord (ArchCo) is responsible for the structures at the site
- Westminster City Council is responsible for:
- The insurance of the vehicles whilst not in use and parked/stored at the Landmann Way depot.
- Any fixtures and fitting at the depot (i.e. offices, chargers and anything done post lease under the licence to alter etc).

Delivery

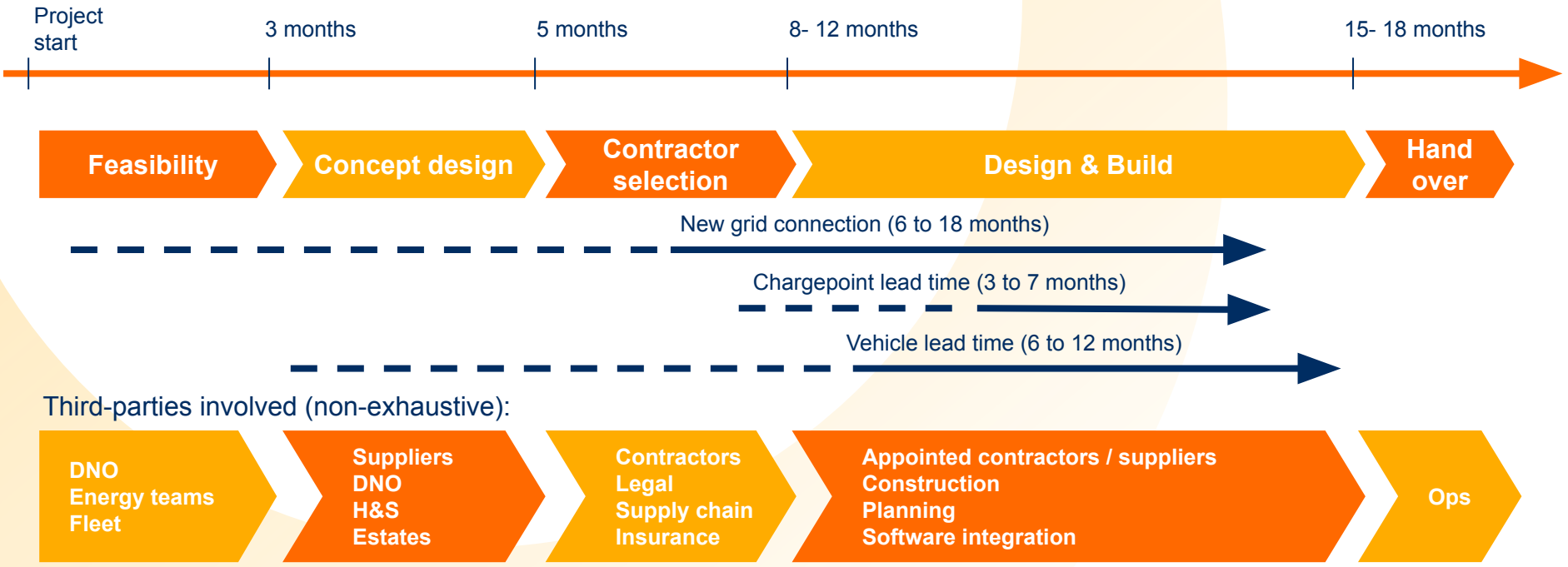
Partnership Working

Project Team:

- Shaun Bridges - Regional Fleet Manager
- Richard Johnson - Group Building Manager
- Mark Hedderley - Counsel Legal Department
- Briony Bendle - Strategy Manager
- Helder Branco - General Manager
- Alvaro Machuca - Electrification Project Manager
- Philippe Queruau - Electrification Services Manager
- Pascal Hauret - Municipal Director
- Rupert Grass - WCC Property Consultant
- Edward Yendluri - WCC Waste and Recycling Manager
- Debbie Biddiscombe - Senior Risk and Assurance Advisor
- Jon Griffiths - WCC Cleansing Manager

Journey to electrification

EXAMPLE



VEHICLE 2 GRID

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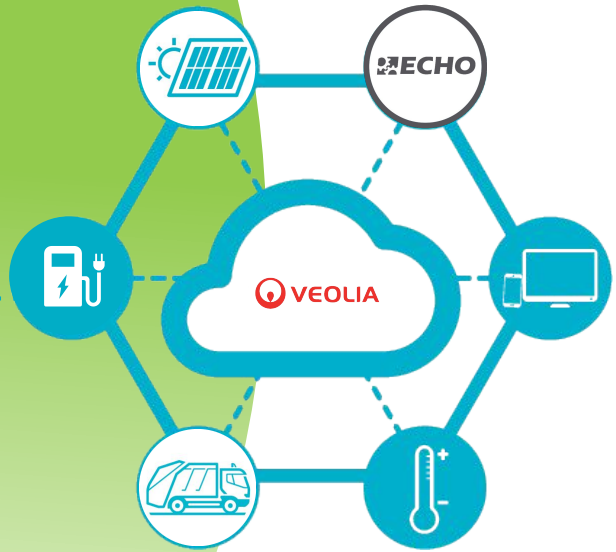
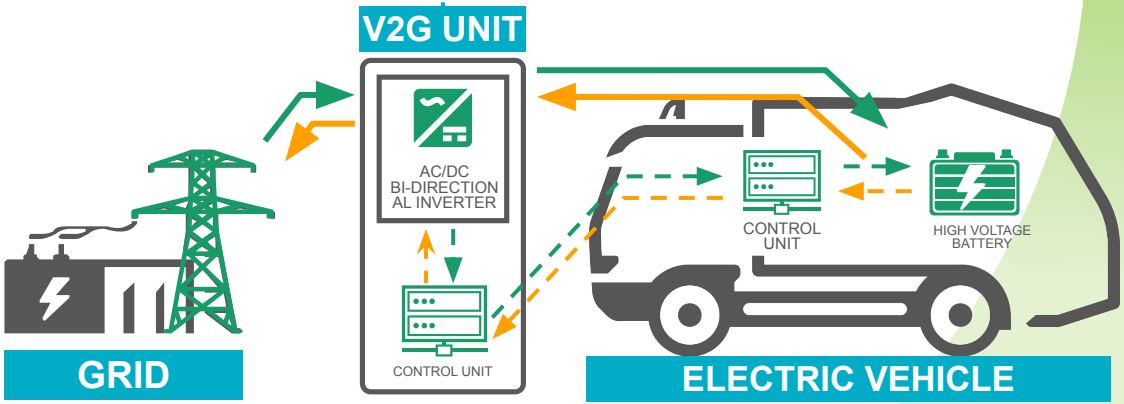
V2G 4 eRCVs

Over **10MWh** usable battery capacity

Over **50%** charge left at shift end

Scheduled 8-hour daily shifts

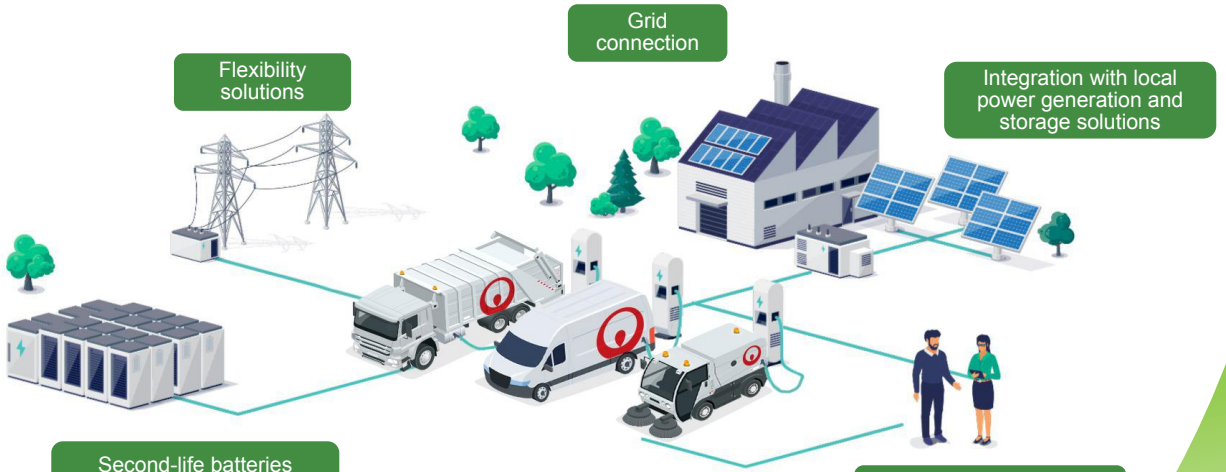




World first achievement

- Led a consortium to exploit latest technology advancements
- Trial within operations to start in May with two trucks
- Our aim is to roll this out across all our depots
- Unlocking 180MW of flexibility to support the grid

Integrated with local loops of energy



THANK YOU

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