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Welsh ZE Waste and Recycling Vehicle Programme
– Procurement Guidance Workshop –

Session Chair, Vicente Jofré

07th November 2023

ZE Waste and Recycling Vehicle Project

Llywodraeth Cymru Welsh Government

Catrin Roberts, WG Programme Lead

LOCAL PARTNERSHIPS

Mark Brown, Programme Manger

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Steve Carroll, Support Lead

Peter Speers, Project Manager

Vicente Jofré Matamala, LA Liaison Officer and Technical Support

Sophie Naylor, Data Analyst

- Aims to Accelerate and De-Risk
- Access to Support
- WG Net-Zero 2030 Target
- Try Before you Buy
- Vehicle Purchase Grant Support
- Shared Learning and Dissemination

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Objectives for Day

- **Share** learnings from procurement of ULEVs and their infrastructure
- **Discuss** opportunities for future assistance and programme support
- **Discover** specialist knowledge on vehicle and infrastructure procurement

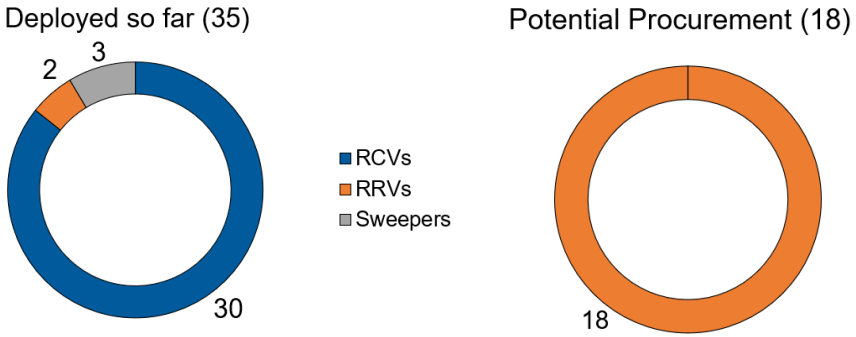
Agenda

- 10:00 Welcome and Programme Status
- 10:10 Let's Talk Procurement!
  - Discussion Rooms on Procurement Learnings
- 10:35 Feedback and Discussion on Procurement
  - Key Points as Discussed by Each Group
- 10:55 Break!
- 11:00 Specialist ULEV Procurement
  - Expert Guidance and Q&A
- 11:30 Choosing and Procuring the Right Infrastructure for my Vehicle
  - Expert Guidance and Q&A
- 12:00 Close

Programme Update

Deployment Status

Local Authority	Deployed	Potential Procurement
Cardiff	12	
Carmarthenshire	3	
Conwy	1	6
Denbighshire	2	3
Flintshire		2
Merthyr Tydfil		3
Neath Port Talbot	2	
Newport	7	2
Powys	1	
Swansea	3	
Torfaen	2	
Vale of Glamorgan		2
Wrexham	2	



51 Vehicles Delivered or Pending Procurement

13 Different Local Authorities

Deployment Status

26t eRCV

- Providers:
  - Dennis Eagle (26)
  - Electra (3)
  - RVS/Emoss (1)

12t eRRV

- Providers:
  - Romaquip (1) (8)
  - Terberg (1) (10)

eSweeper

- Providers:
  - Bucher (3)

Blue: Deployed
Orange: Potential

Let’s Talk Procurement!

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You will now join one of the breakout rooms to discuss your learnings on procurement

Feedback will be discussed in the following section

Feedback and Discussion on Procurement

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From your contribution, we have gathered these key topics for discussion

Room presenter will share key discussion topics

– Break –

What's Coming Next?

- ULEV Procurement Guidance:
  - Vehicle Procurement
  - Choosing the Right Infrastructure

ULEV Vehicle Procurement

by Carl Christie, Senior Fleet Specialist

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Why are we providing vehicle procurement support?

- **In response to your feedback and to ensure that new vehicles and charging infrastructure are:**
  1. Safe and reliable.
  2. Fit for purpose.
  3. Well supported by the supplier.
  4. Capable of providing good data.

Procuring an electric RCV or RRV isn't easy (yet)

Vehicles and powertrains are mostly from low volume suppliers.

Electric trucks are becoming available from OEMs

But they need to be trialled and demonstrated as waste & recycling vehicles.

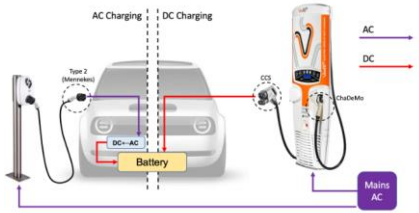
Vehicle procurement is only part of the challenge!

You also need to procure the right charging infrastructure and any additional electric vehicle fleet management systems.

- Chargepoints
- Telematics
- Grid Connection
- Back-office System
- Battery Electric Vehicle
- Electricity Tariff
- Load Management
- Training
- Renewables / Energy Storage

This can lead to some issues…

- Vehicle doesn't have AC / DC charging capability.
- Charging socket only on one side / cable too short.
- Vehicle can't get up steep hills / reach high speeds.
- Compressor needs resizing / better cooling.
- Onboard charger derates due to supply instability.
- 24V battery drains due to issues during charging.
- Vehicle and / or chargepoint don't provide the right data.



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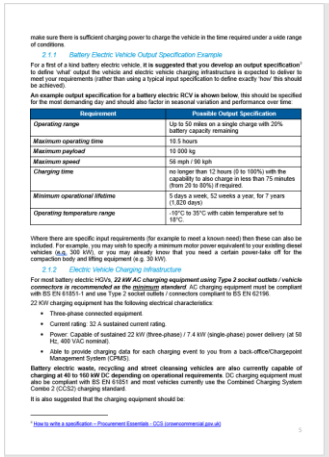
Vehicle Procurement Guidance

Technical Standards Document



make sure there is sufficient charging power to charge the vehicle in the time required under a wide range of conditions.

2.1.1 Battery Electric Vehicle Output Specification Example

For a fleet of a kind battery electric vehicle, it is suggested that you develop an output specification[1] to define 'what' output the vehicle and electric vehicle charging infrastructure is expected to deliver to meet your requirements (rather than using a typical input specification to define exactly 'how' this should be achieved).

An example output specification for a battery electric RCV is shown below, this should be specified for the most demanding day and should also factor in seasonal variation and performance over time:

Requirement	Possible Output Specification
Operating range	Up to 50 miles on a single charge with 20% battery capacity remaining
Maximum operating time	10.5 hours
Maximum payload	10 000 kg
Maximum speed	56 mph / 90 kph
Charging time	no longer than 12 hours (0 to 100%) with the capability to also charge in less than 75 minutes (from 20 to 80%) if required.
Minimum operational lifetime	5 days a week, 52 weeks a year, for 7 years (1,820 days).
Operating temperature range	-10°C to 35°C with cabin temperature set to 18°C.

Where there are specific input requirements (for example to meet a known need) then these can also be included. For example, you may wish to specify a minimum motor power equivalent to your existing diesel vehicles (e.g. 300 kW), or you may already know that you need a certain power-take off for the compaction body and lifting equipment (e.g. 30 kW).

2.1.2 Electric Vehicle Charging Infrastructure

For most battery electric HGVs, ***22 kW AC charging equipment using Type 2 socket outlets / vehicle connectors is recommended as the minimum standard.*** AC charging equipment must be compliant with BS EN 61851-1 and use Type 2 socket outlets / connectors compliant to BS EN 62196.

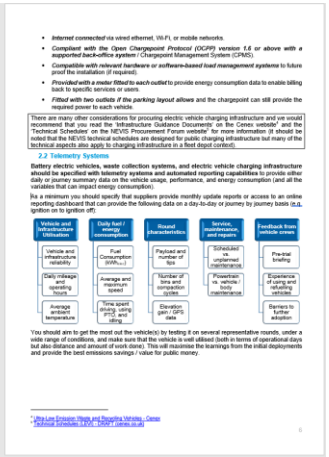
22 KW charging equipment has the following electrical characteristics:

- Three-phase connected equipment.
- Current rating: 32 A sustained current rating.
- Power: Capable of sustained 22 kW (three-phase) / 7.4 kW (single-phase) power delivery (at 50 Hz, 400 VAC nominal).
- Able to provide charging data for each charging event to you from a back-office/Chargepoint Management System (CPMS).

Battery electric waste, recycling and street cleansing vehicles are also currently capable of charging at 40 to 160 kW DC depending on operational requirements. DC charging equipment must also be compliant with BS EN 61851 and most vehicles currently use the Combined Charging System Combo 2 (CCS2) charging standard.

It is also suggested that the charging equipment should be:

[1] How to write a specification – Procurement Essentials - CCS (crowncommercial.gov.uk)



- ***Internet connected*** via wired ethernet, Wi-Fi, or mobile networks.
- ***Compliant with the Open Chargepoint Protocol (OCPP) version 1.6 or above with a supported back-office system*** / Chargepoint Management System (CPMS).
- ***Compatible with relevant hardware or software-based load management systems*** to future proof the installation (if required).
- ***Provided with a meter fitted to each outlet*** to provide energy consumption data to enable billing back to specific services or users.
- ***Fitted with two outlets if the parking layout allows*** and the chargepoint can still provide the required power to each vehicle.

There are many other considerations for procuring electric vehicle charging infrastructure and we would recommend that you read the 'Infrastructure Guidance Documents' on the Cenex website[2] and the 'Technical Schedules' on the NEVIS Procurement Forum website[3] for more information (it should be noted that the NEVIS technical schedules are designed for public charging infrastructure but many of the technical aspects also apply to charging infrastructure in a fleet depot context).

2.2 Telemetry Systems

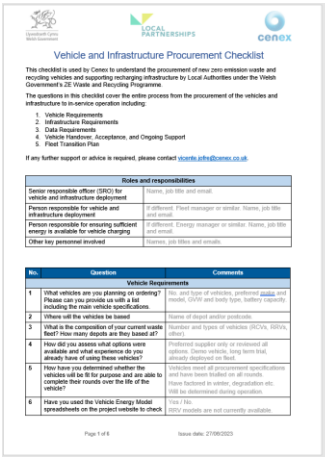
Battery electric vehicles, waste collection systems, and electric vehicle charging infrastructure should be specified with telemetry systems and automated reporting capabilities to provide either daily or journey summary data on the vehicle usage, performance, and energy consumption (and all the variables that can impact energy consumption).

As a minimum you should specify that suppliers provide monthly update reports or access to an online reporting dashboard that can provide the following data on a day-to-day or journey basis (e.g. ignition on to ignition off):

You should aim to get the most out the vehicle(s) by testing it on several representative rounds, under a wide range of conditions, and make sure that the vehicle is well utilised (both in terms of operational days but also distance and amount of work done). This will maximise the learnings from the initial deployments and provide the best emissions savings / value for public money.

[2] Ultra-Low Emission Waste and Recycling Vehicles - Cenex
[3] Technical Schedules | NEVIS - Cenex (cenex.co.uk)

Procurement Checklist



Vehicle and Infrastructure Procurement Checklist

This checklist is used by Cenex to understand the procurement of new zero emission waste and recycling vehicles and supporting recharging infrastructure by Local Authorities under the Welsh Government's ZE Waste and Recycling Programme.

The questions in this checklist cover the entire process from the procurement of the vehicles and infrastructure to in-service operation including:

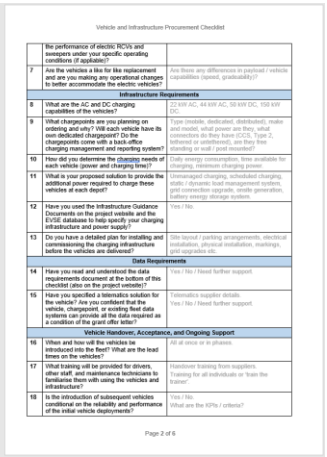
1. Vehicle Requirements
2. Infrastructure Requirements
3. Data Requirements
4. Vehicle Handover, Acceptance, and Ongoing Support
5. Fleet Transition Plan

If any further support or advice is required, please contact vicente.jofre@cenex.co.uk.

Roles and responsibilities	
Senior responsible officer (SRO) for vehicle and infrastructure deployment	Name, job title and email.
Person responsible for vehicle and infrastructure deployment	If different: Fleet manager or similar. Name, job title and email.
Person responsible for ensuring sufficient energy is available for vehicle charging	If different: Energy manager or similar. Name, job title and email.
Other key personnel involved	Names, job titles and emails.

No.	Question	Comments
	Vehicle Requirements	
1	What vehicles are you planning on ordering? Please can you provide us with a list including the main vehicle specifications.	No. and type of vehicles, preferred make and model, GVW and body type, battery capacity.
2	Where will the vehicles be based	Name of depot and/or postcode.
3	What is the composition of your current waste fleet? How many depots are they based at?	Number and types of vehicles (RCVs, RRVs, other).
4	How did you assess what options were available and what experience do you already have of using these vehicles?	Preferred supplier only or reviewed all options. Demo vehicle, long term trial, already deployed on fleet.
5	How have you determined whether the vehicles will be fit for purpose and are able to complete their rounds over the life of the vehicle?	Vehicles meet all procurement specifications and have been trialled on all rounds. Have factored in winter, degradation etc. Will be determined during operation.
6	Have you used the Vehicle Energy Model spreadsheets on the project website to check	Yes / No RRV models are not currently available.

Page 1 of 6 — Issue date: 27/09/2023



Vehicle and Infrastructure Procurement Checklist

	the performance of electric RCVs and sweepers under your specific operating conditions (if applicable)?	
7	Are the vehicles a like for like replacement and are you making any operational changes to better accommodate the electric vehicles?	Are there any differences in payload / vehicle capabilities (speed, gradeability)?
	Infrastructure Requirements	
8	What are the AC and DC charging capabilities of the vehicles?	22 kW AC, 44 kW AC, 50 kW DC, 150 kW DC.
9	What chargepoints are you planning on ordering and why? Will each vehicle have its own dedicated chargepoint? Do the chargepoints come with a back-office charging management and reporting system?	Type (mobile, dedicated, distributed), make and model, what power are they, what connectors do they have (CCS, Type 2, tethered or untethered), are they free standing or wall / post mounted?
10	How did you determine the charging needs of each vehicle (power and charging time)?	Daily energy consumption, time available for charging, minimum charging power.
11	What is your proposed solution to provide the additional power required to charge these vehicles at each depot?	Unmanaged charging, scheduled charging, static / dynamic load management system, grid connection upgrade, onsite generation, battery energy storage system.
12	Have you used the Infrastructure Guidance Documents on the project website and the EVSE database to help specify your charging infrastructure and power supply?	Yes / No.
13	Do you have a detailed plan for installing and commissioning the charging infrastructure before the vehicles are delivered?	Site layout / parking arrangements, electrical installation, physical installation, markings, grid upgrades etc.
	Data Requirements	
14	Have you read and understood the data requirements document at the bottom of this checklist (also on the project website)?	Yes / No / Need further support.
15	Have you specified a telematics solution for the vehicle? Are you confident that the vehicle, chargepoint, or existing fleet data systems can provide all the data required as a condition of the grant offer letter?	Telematics supplier details. Yes / No / Need further support.
	Vehicle Handover, Acceptance, and Ongoing Support	
16	When and how will the vehicles be introduced into the fleet? What are the lead times on the vehicles?	All at once or in phases.
17	What training will be provided for drivers, other staff, and maintenance technicians to familiarise them with using the vehicles and infrastructure?	Handover training from suppliers. Training for all individuals or 'train the trainer'.
18	Is the introduction of subsequent vehicles conditional on the reliability and performance of the initial vehicle deployments?	Yes / No. What are the KPIs / criteria?

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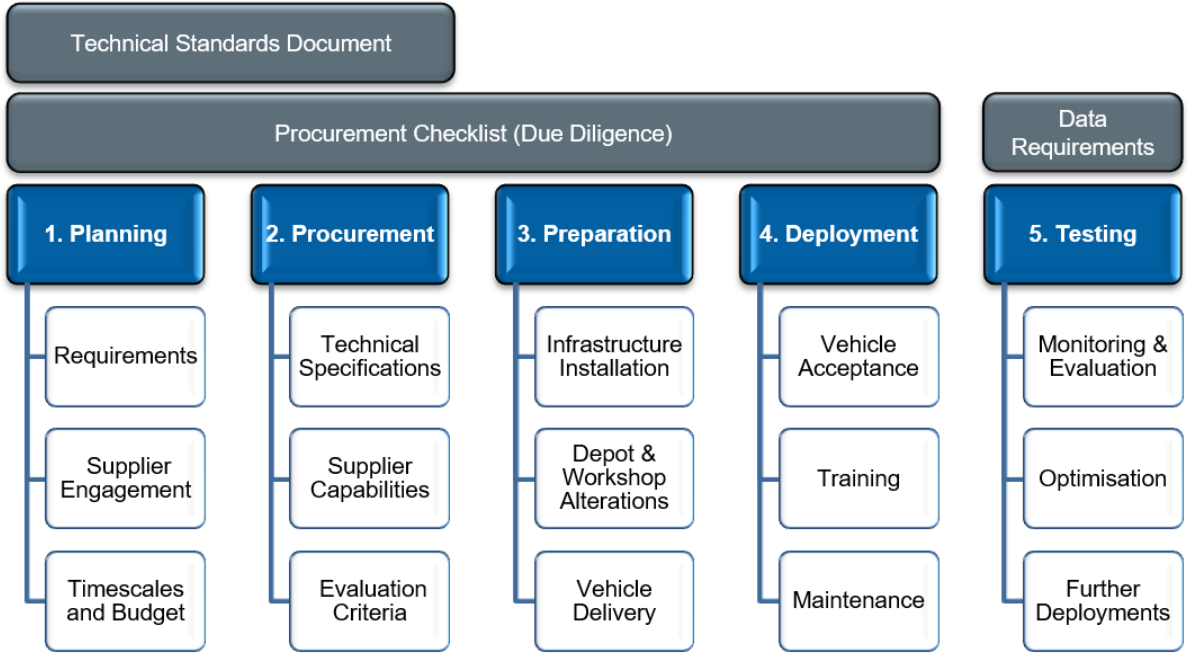
Electric vehicle procurement is an ongoing process



Define *what* you require, rather than *how* to do it

Output Specification (based on requirements)

Requirement	Example Output Specification
Operating range	Up to 50 miles on a single charge with 20% battery capacity remaining.
Maximum operating time	10.5 hours.
Maximum payload	10,000 kg.
Maximum speed	56 mph / 90 kph.
Charging time	No longer than 12 hours (0 to 100%) with the capability to also charge in less than 75 minutes (from 20 to 80%) if required.
Minimum operational lifetime	5 days a week, 52 weeks a year, for 7 years (1,820 days).
Operating temperature range	-10°C to 35°C with cabin temperature set to 18°C.

Input Specification (based on vehicle technical specifications)

Using output specifications can:

- ✓ Encourage **competition** between different suppliers.
- ✓ Encourage **innovation** and allows suppliers to develop the best solutions to meet your requirements.
- ✓ Allows suppliers to **specify the electric powertrain and battery capacity required for the vehicle** (electric motors, transmission, power take-off (PTO), batteries, and charging equipment).
- ✓ **Ensure that suppliers share some of the risk** to make sure that the vehicle is fit for purpose.

Engage with potential suppliers before procurement

- ✓ **Are suitable vehicles available?**
- ✓ **Increase awareness** of any resulting procurement (more choice of suppliers and vehicles).
- ✓ **Refine your procurement specifications.**
- ✓ **Set realistic timescales and expectations.**



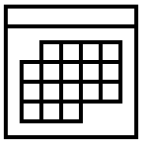




Tips for supplier engagement – be open and transparent, maintain commercial confidentiality, keep a record of discussions, ensure that the process is fair and equal to all suppliers so that no one gets a competitive advantage.

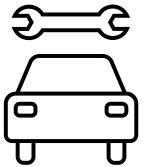
Evaluate supplier capabilities and experience

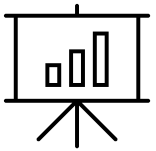
- **Delivery Timescales**
  - Request a detailed delivery plan.
  - Interdependencies (vehicles, chargepoints, site preparation).
- **Training**
  - Vehicle and infrastructure familiarisation.
  - Data collection systems.
  - Routine inspections and maintenance.
- **Experience**
  - Ask suppliers to provide evidence of their experience of delivering similar products and services including examples.



Specify the level of reliability and support required

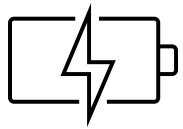
- **Aftersales Support and Account Management**
  - Service, maintenance, and repairs (including spare parts).
  - How quickly will the supplier respond to issues, how quickly will issues be resolved?
  - Will the vehicles have on-board diagnostic systems?
  - What will happen in the event of a roadside breakdown, how and where will the vehicle be recovered to? Will replacement vehicles be made available?
  - How will issues be escalated and disputes dealt with?

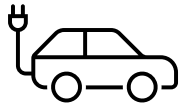




Specify the warranty duration and conditions

- **Warranty**
  - Need to cover the vehicle, battery, and electric drivetrain.
- **Minimum Recommended from OZEV Plug-In Truck Grant**
  - The vehicle must have a warranty of at least 3 years or 60,000 miles.
  - The battery and electric drivetrain must have a warranty of at least 3 years or 60,000 miles (with the option to extend the warranty by a minimum of 2 years).
  - The battery must have at least 80% of its initial or rated charge capacity for the initial 3 years or 60,000 miles and at least 70% for the initial 5 years of 100,000 miles.

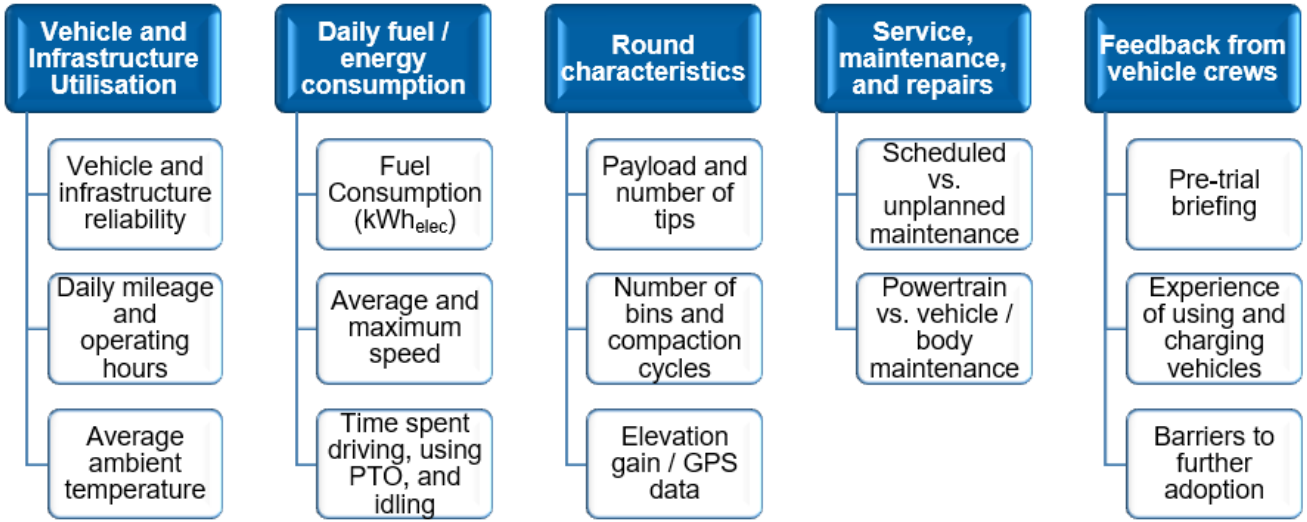




https://www.gov.uk/government/publications/plug-in-van-grant/plug-in-van-and-truck-grant-how-to-complete-the-application-form#degradation

Don’t forget about telematics and other data systems

- Use vehicle telematics and other systems to provide daily summary reports on the vehicle usage, performance, and electricity consumption.



Vehicle Procurement Recommendations

- **Planning**
  - Document your vehicle and infrastructure requirements.
  - Engage with potential suppliers.
  - Trial and demonstrate vehicles before procurement.
  - Set realistic timescales and expectations.
- **Procurement**
  - Focus on **what** you need the vehicle to do, not **how** (output specifications).
  - Evaluate supplier capabilities (delivery, training, aftersales, warranty).
  - Don’t forget about vehicle telematics and chargepoint back-office systems.

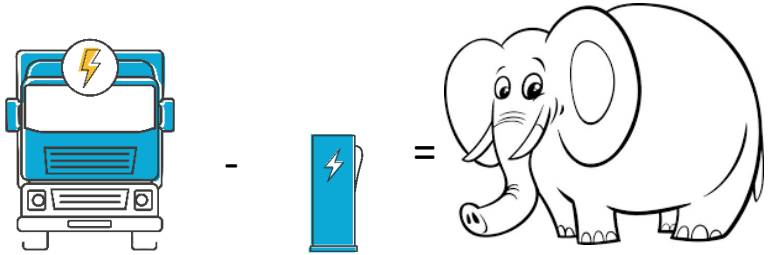
Vehicle Procurement Recommendations

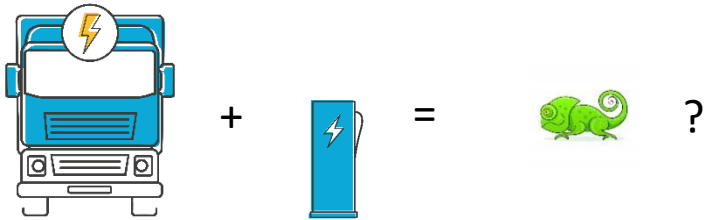
- **Preparation, Deployment, and Testing**
  - Make sure that the charging infrastructure is installed and commissioned before the vehicles arrive.
  - Build in time for testing and resolving issues with vehicles and infrastructure before signing them off or ordering more.
  - Monitor the performance and energy consumption of the vehicles across a selection of representative rounds and conditions.
  - Optimise technical specifications, rounds, and operations to improve the vehicle performance or better accommodate electric vehicles into the fleet.

Choosing and Procuring the Right Infrastructure for my Vehicle

by Matthew Knight, Principal Infrastructure Specialist

Why do we need charging infrastructure?



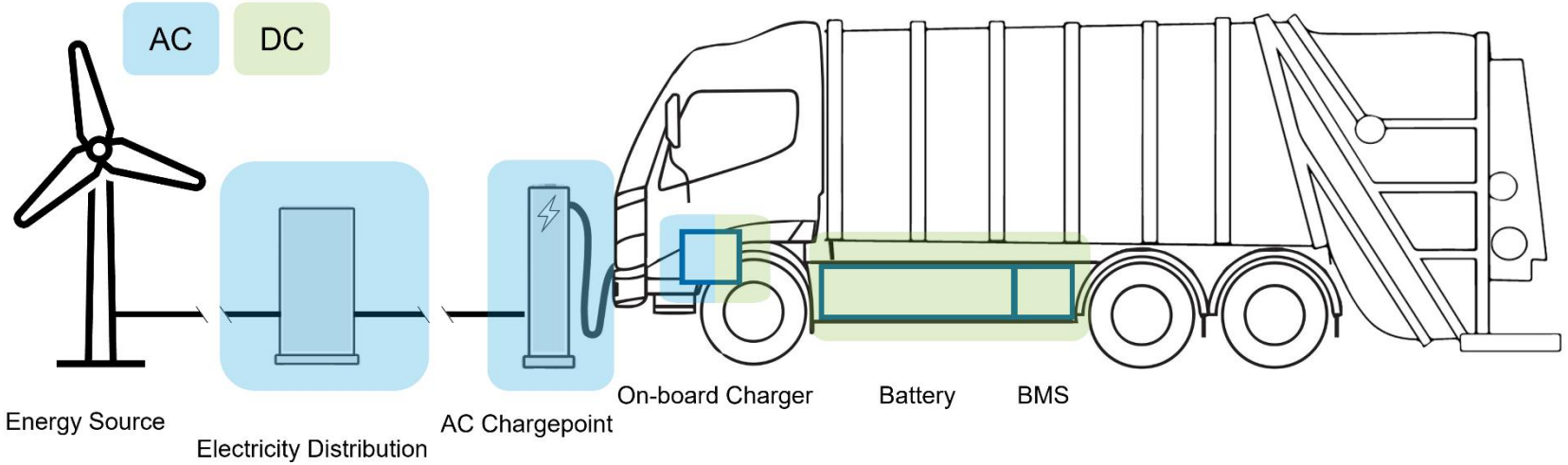


	Dennis Eagle eCollect	Electra	EMOSS e-One	Romaquip	Terberg
Image					
Chassis Config	6x2	6x2	6x2	4x2	4x2
GVW (tonnes)	27	27	26	12-14	12
Motor size (kW)	200	380	No data	No data	240
Battery size (kWh)	300	285 – 350	130 – 285	180	140 – 315
DC Charging Power / kW	40	None	150	100	None
DC Connector	CCS	N/A	CCS	CCS	N/A
AC Charging Power / kW	None	22 (44[1])	22 (44[1])	22	22 (44[1])
AC Connector	N/A	Type 2	Type 2	Type 2	Type 2

[1]The eMoss e-One and Electra specify 44 kW AC charging, but unclear whether this is via Type 2 charging or Commando connectors (IEC 60309)
Use of Commando connectors is not recommended for a permanent EV charging solution.

AC vs DC Charging

AC Charging



- Rectification from AC to DC happens on the vehicle using the “on-board charger”.
- Used for lower power charging (≤ 22 kW) where dwell times are longer.

Electra	EMOSS e-One	Romaquip	Terberg
			

AC vs DC Charging

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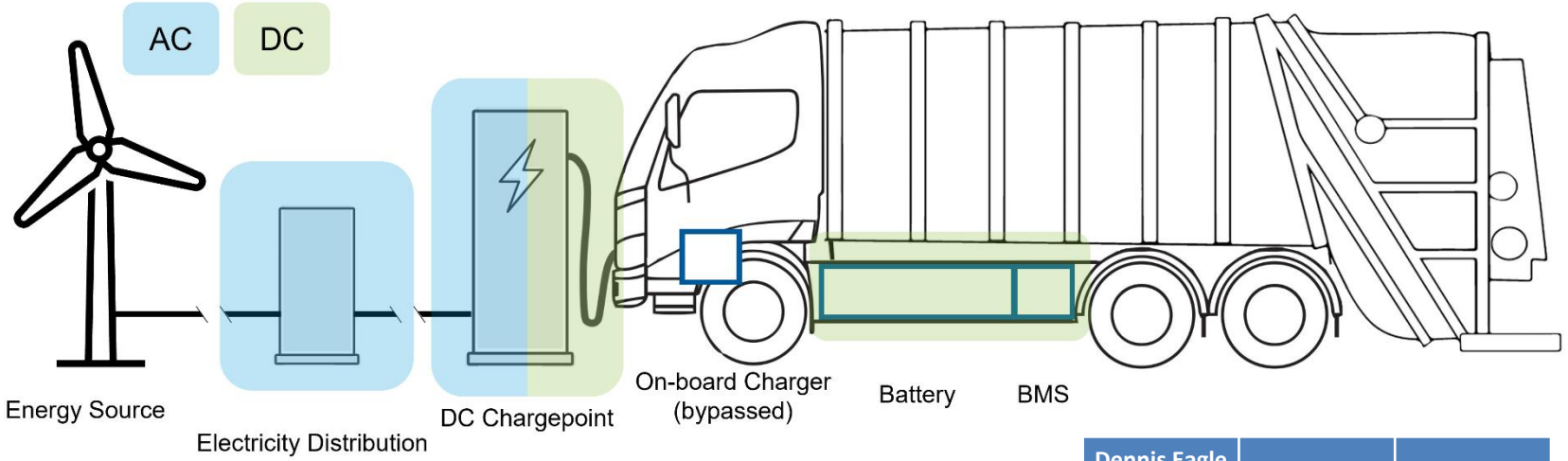
DC Charging

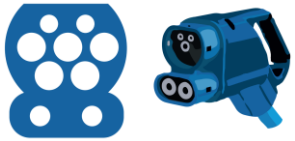


- Rectification from AC to DC is done by the chargepoint.
- For cars and vans, used for higher power charging where time is limited. However for eRCVs/eRRVs with very large batteries (200+ kWhs), DC may even be needed for long dwell time charging.

Dennis Eagle eCollect	EMOSS e-One	Romaquip
		

Chargepoint Connector Standards

The two connector standards being used by electric waste fleet vehicles:

AC, Mode 3	**Type 2**	 IEC 62196-2		  Socket outlet or tethered
DC, Mode 4	**CCS**	 IEC 62196-3		 Tethered only

What about commando, CHAdeMO and Type 1?

- Some of the current eRCV/eRRV models do include AC charging via commando. However, this is not recommended for a permanent EV charging infrastructure system.
- Luckily none make use of CHAdeMO or Type 1

Key takeaway 1: Ensure your infrastructure is AC/DC and Type 2 or CCS to suit vehicles you are deploying.

The Electric Vehicles (Smart Charge Points) Regulations 2021[1]

- Secondary legislation under powers granted by the Automated and Electric Vehicles Act 2018[2] and came into effect over 2022.
- Apply to all EV charge points sold in Great Britain for private usage. Includes:
  - Domestic
  - Workplace
- Exclusions:
  - non-smart cables (basic Mode 3 cables and Mode 2 charging cables)
  - public charge points,
  - rapid charge points (≥ 50 kW).
- Accompanied by guidance on compliance produced by the Office for Product Safety & Standards (OPSS)
- Key parts to regulations:
  - 5 Smart functionality
  - 6 Electricity supplier interoperability
  - 7 Loss of communications network access
  - 8 Safety
  - 9 Measuring system
  - 10 Off-peak charging
  - 11 Randomised delay
  - 12 Security
  - 13 Assurance
  - 14 Register of Sales

The Electric Vehicles (Smart Charge Points) Regulations 2021

Made - - - - *13th December 2021*
Coming into force - - *30th June 2022*

The Secretary of State, in exercise of the powers conferred by sections 15, 16, 17 and 18 of the Automated and Electric Vehicles Act 2018 (1) ("the 2018 Act"), makes the following Regulations.
In accordance with section 18(4) of the 2018 Act, a draft of this instrument has been laid before Parliament and approved by a resolution of each House of Parliament.
The Secretary of State has consulted such persons as the Secretary of State considered appropriate in accordance with section 18(3) of the 2018 Act before making these Regulations.

PART 1
Introduction

Citation, commencement and extent

1.—(1) These Regulations may be cited as the Electric Vehicles (Smart Charge Points) Regulations 2021 and come into force on 30th June 2022.
(2) These Regulations extend to England and Wales and Scotland.

Interpretation

2. In these Regulations—

Putting the user at the centre

- Specified a minimum user centric feature set.
- Aim to improve the user experience.
- Ensuring suitable information, user interface, and levels of control.

Security of supply

- Avoiding sudden and significant load swings
- More efficient use of the grid.

Cyber security

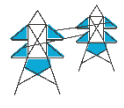
- Ensure data is secure, Encrypted communications
- Secure device update
- Tamper detection
- And more…

1. https://www.legislation.gov.uk/uksi/2021/1467, The Electric Vehicles (Smart Charge Points) Regulations 2021
2. https://www.legislation.gov.uk/ukpga/2018/18, Automated and Electric Vehicles Act 2018

Devising a Fleet Charging Strategy

Inputs

Vehicles:
- Number of vehicles
- Vehicle speeds
- Number of bin lifts
- Compaction cycles
- Payload
- Ambient temperatures
- Driving style
- Topography
- Shift start and end times
- Number of shifts

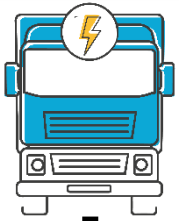


Depot:
- Maximum Import Capacity
- Existing electrical demand
- Existing electrical infrastructure
- Parking locations

Analysis

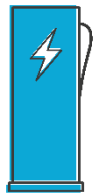
To churn the numbers, there are various methods to use, in order of the amount of resource required:
- Copy
- Convert
- Trial
- Calculate

Outputs



Vehicle Specification

Charging Infrastructure Strategy and Specification



For a fleet that only charges at the depot the exam questions for the charging strategy are essentially:

1. How many kWhs do I need to recharge each day?
2. How many hours are available in which to do it?

Understanding Charging Power Limitations

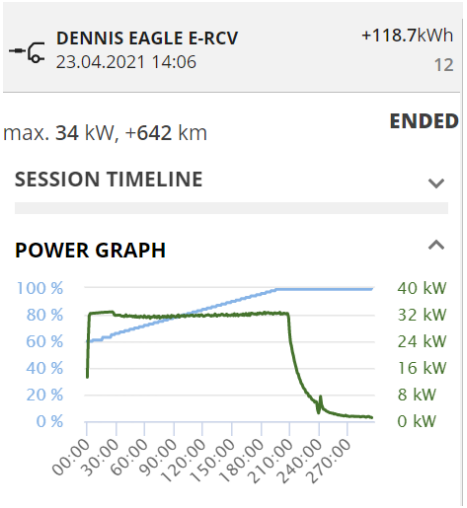
1. The charging power is limited by one of the vehicle or the chargepoint:

	Standard 7 kW AC (32 A single-phase)	Fast 22 kW AC (32 A three-phase)	Rapid 50 kW DC	Ultra-Rapid 350 kW DC
TERBERG KERBLOADER / ELECTRA  AC CHARGING: 22 kW[5] DC CHARGING: N/A	7 kW	22 kW	N/A	N/A
DENNIS EAGLE ECOLLECT  AC CHARGING: N/A DC CHARGING: 40 kW	N/A	N/A	40 kW	40 kW
ROMAQUIP  AC CHARGING: 22 kW DC CHARGING: 100 kW	7 kW	22 kW	50 kW	100 kW
RVS EMOSS E-ONE  AC CHARGING: 22 kW[5] DC CHARGING: 150 kW	7 kW	22 kW	50 kW	150 kW

2. This is the maximum rated charging power, not the power you will get throughout the charge. As shown in the example charge curve below:

- Achieved maximum power can be lower depending on vehicle, chargepoint, and environmental conditions.
- Charging power may reduce as the battery reaches a high state of charge (SOC)

Example charging curve from Newport with Kempower chargepoint



Analysis (Trial) – Refuse Collection Vehicles

- For cars and vans, as driving efficiency is fairly consistent, to calculate number of kWhs you need for a journey is simple: (kWh/mile) * miles!
- For RCVs, although more efficient than diesel equivalent, depending on usage factors shown before.
- Evidence from trials is that efficiency can vary from 4-8 kWh/mile. Longer routes more efficient.
- This equates to 14 – 24 kWh per operational hour.

Thinking in terms of kWh/hour operational:

Output Value: Operational time (hours)
Charging time: Maximum, 16 hours
25% safety factor applied

Charging Power (kW) \ Driving efficiency (kWh/hour)	24	22	20	18	16	14
7	4	4	4	5	6	6
11	6	6	7	8	9	10
22	12	13	14	16	18	20
50	27	29	32	36	40	46
150	80	87	96	107	120	137
350	187	204	224	249	280	320

Key takeaway 2: For “base” charging, 22 kW AC is min charging specification; but 25-50 kW DC may give greater operational resilience.

Site Assessment and Charging Strategy

Depot:
- Maximum Import Capacity
- Existing electrical demand
- Existing electrical infrastructure
- Parking locations

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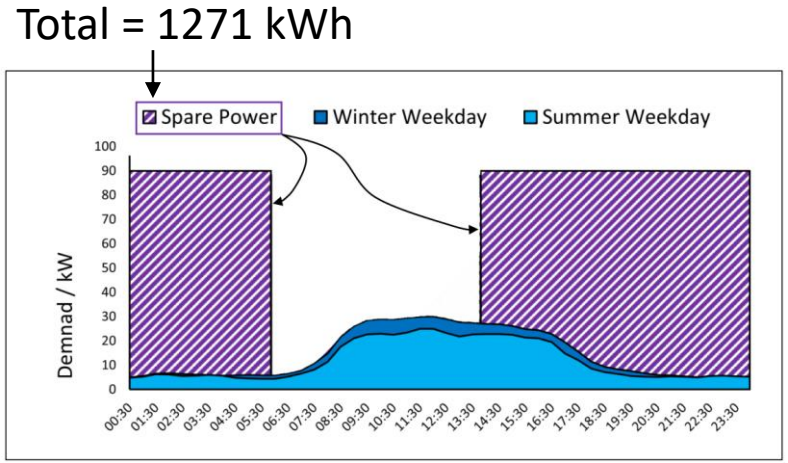
Step 1: Is it feasible to meet recharging requirements with current network connection?

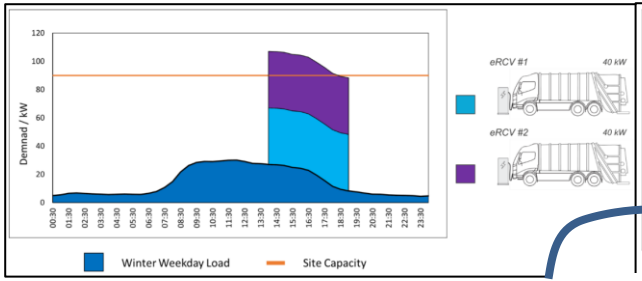
- Think about spare energy capacity rather than spare power
- Example: 90 kW site supply
- Check 1, is there enough spare energy capacity from 14:00 – 06:00 to deliver the required charging?
- If each eRCV has a 200 kWh daily recharging requirement, then it is feasible to deliver the required recharging of 6(?) vehicles with the current grid connection.



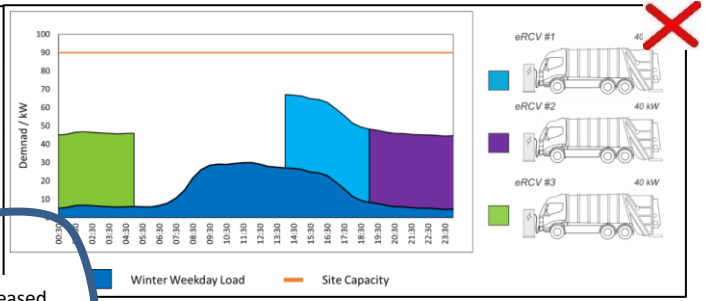
Site Assessment and Charging Strategy

Step 2: What charging strategy should I use?

1. Unmanaged – the vehicles charge at maximum power when they are plugged in.

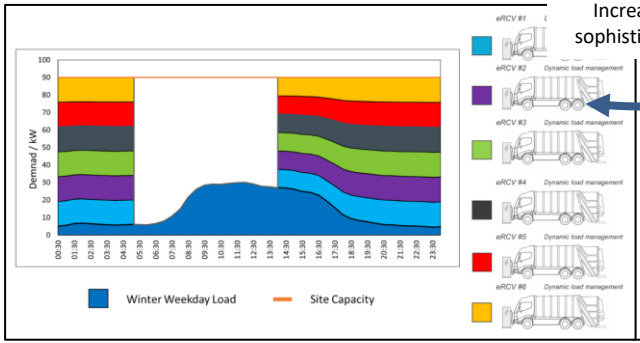


2. Timed charging – the vehicles use any inbuilt functionality within the vehicle to control the charging time.

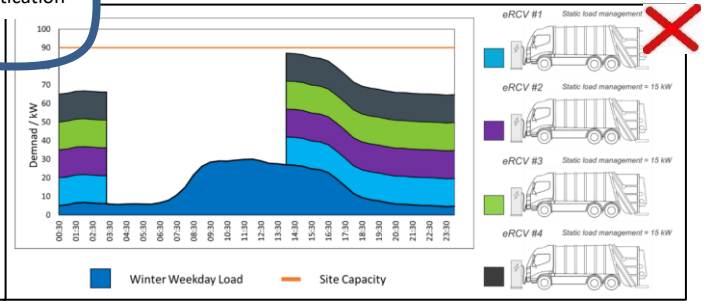


Increased sophistication

4. Dynamic Load Management - the real-time spare power is shared between connected chargepoints.



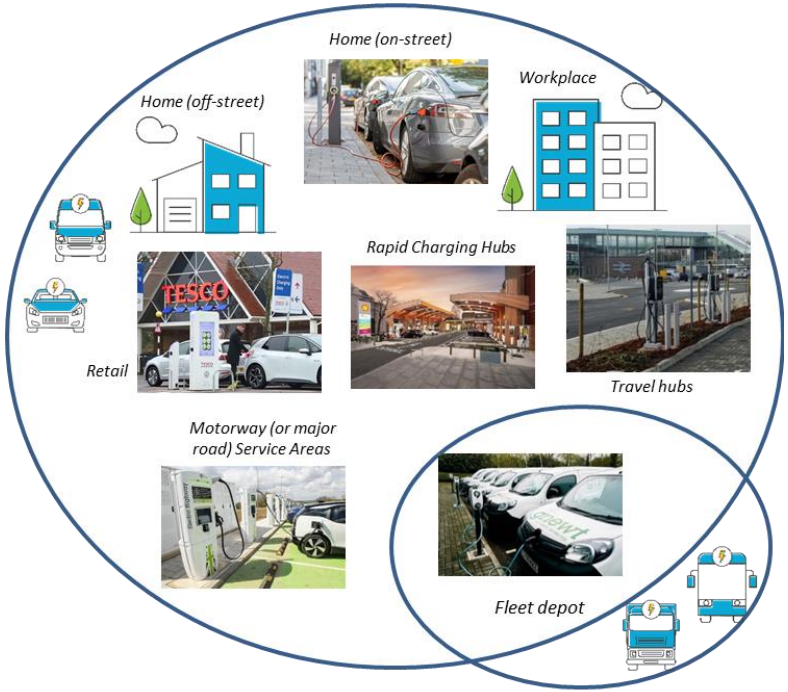
3. Static Load Management – a pre-set amount of "spare" power is shared between chargepoints.



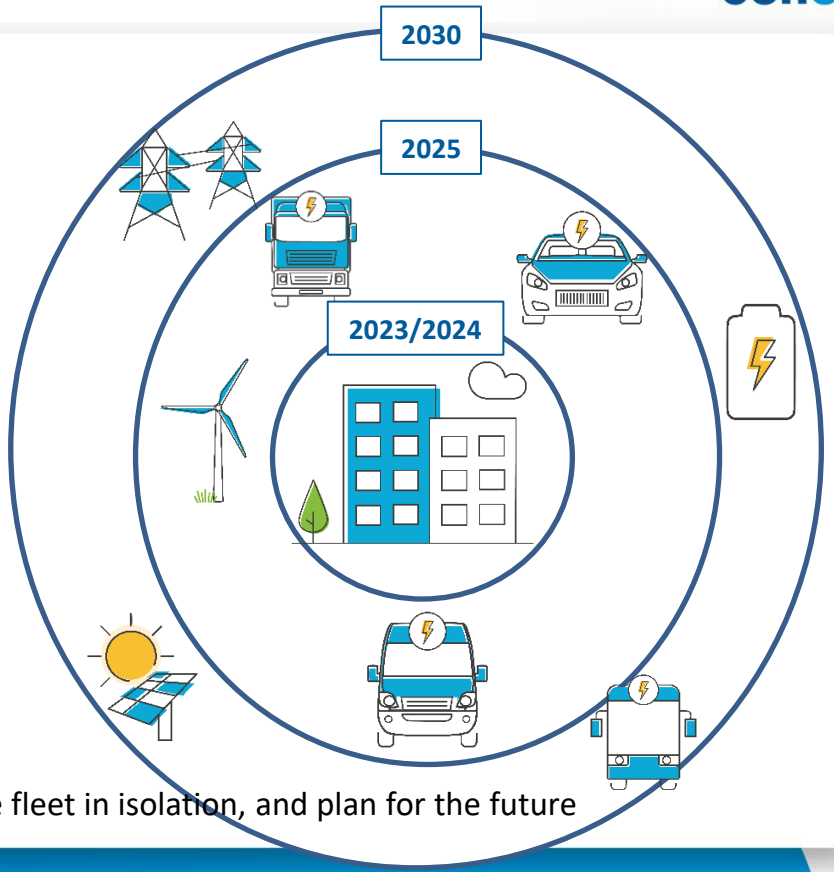
Key takeaway 3: For any site where power is likely to be a constraint, deploy a system with dynamic load management.

Key takeaway 4: Think about operational resilience. Do you need 100 kW charging as back-up?

What about other vehicle use cases?



and future plans?



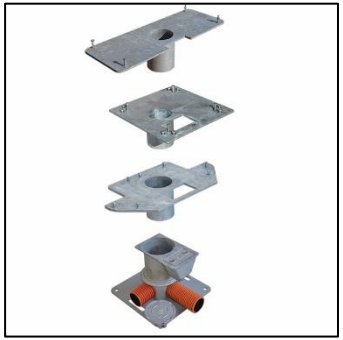
Key takeaway 5: Don't think about electric waste fleet in isolation, and plan for the future

Roles and Responsibilities

Key takeaway 6: Ensure all stakeholders - including those who may not have needed to be before - are engaged.

Physical Installation Considerations

- Parking layouts (where is the vehicle charging socket?!)
- Impact protection.
- Distance from electrical distribution and any civil works required.
- Passive provision (future proofing).
- Accessibility for all infrastructure users. Consideration of provisions in PAS 1899.
- Safety risk assessment of EV charging locations and where necessary mitigation of risks, particularly in respect of fire, limiting the spread of fire, and retention of fire water. Does the charging location impact upon emergency action plans?



Key takeaway 7: Ensure suppliers don't overlook what seem like simple installation design considerations

Summary of Key Takeaways

1. Select the appropriate chargepoint type (AC/DC and standard).
2. Select the appropriate chargepoint rated power – min. 22 kW AC or DC 25-50 kW+.
3. Use dynamic load management.
4. Think about operational resilience.
5. Plan for all vehicles and for the future and how to get there.
6. Engage the necessary stakeholders.
7. Don’t underestimate the importance of simple installation design considerations.
8. Think about how the electric vehicle infrastructure will be supported.

Welsh NEVIS access

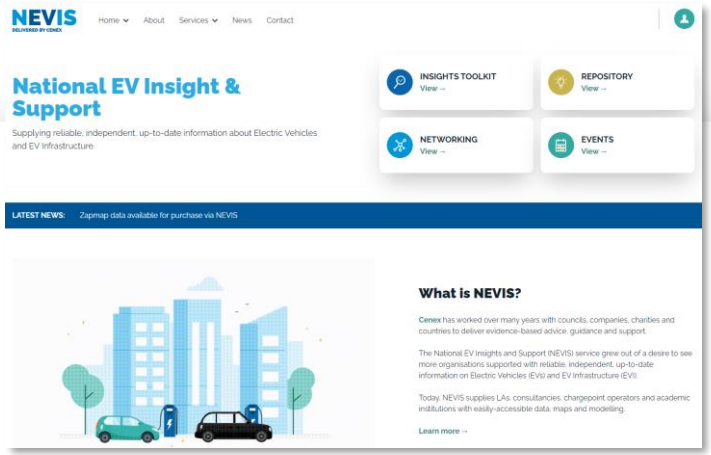
Every Welsh Local Authority and Welsh Health Board have access to the NEVIS service funded by Welsh Government and in collaboration with Transport for Wales https://nevis.Cenex.co.uk.

Access to:

- Insights Toolkit
- Mapping
- Knowledge Repository (inc. framework technical schedules)
- Networking Events

Welsh Roadshow on 23rd November, Port Talbot aimed at all LA officers in this space.

- Free to attend (includes lunch).
- Topics: What EV users want, on-street charging, fleet decarbonisation, and procurement.
- Register by 16th November
- https://nevis.cenex.co.uk/events/welsh-ev-infrastructure-roadshow



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Thank you for listening

Matt Knight

Principal Technical Specialist, Technical Innovation
Matthew.Knight@cenex.co.uk

Next Workshop – Your Views are Needed

- We are considering holding the next workshop *face-to-face* at a Local Authority venue (*volunteers are welcome*) which has deployed zero emission vehicles and recharging infrastructure.
- Time: **10am-2pm** with lunch and networking time provided
- Proposed **agenda** will include:
  - **Cenex** – programme update and show and tell of new website
  - **Invited vehicle manufacturers** – presentation (and possibly demonstration) of available and forthcoming vehicles
  - **Local authority** – vehicle and infrastructure operating experience and depot tour
- **Dates** under consideration are:
  - Week of 18th March 2024 (pre-Easter, might be rubbish weather, also year-end but better timing for discussion of current issues)
  - May-June 2024 (better weather … probably)

Slido Poll – Next Workshop

To join the poll, please open link in chat or scan the QR code.

Thank you for your time!

Contacts for Grant Applications

Catrin Roberts
Head of Infrastructure Investment and Performance Improvement/Pennaeth Buddsoddi mewn Tanadeiledd a Gwella Perfformiad
catrin.roberts@gov.wales

Mark Brown
Director - Climate
mark.brown@localpartnerships.gov.uk

Contacts for Planning and Implementation Advice

Vicente Jofré Matamala
Assistant Technical Specialist – Zero and Low Emission Vehicles
vicente.jofre@cenex.co.uk

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Thank you for listening

Vicente Jofre Matamala

Assistant Technical Specialist, Cenex, vicente.jofre@cenex.co.uk