

# Welsh ZE Waste and Recycling Vehicle Programme – RRV Deployment and TCO Tool –

Session Chair, Vicente Jofré

06<sup>th</sup> March 2024

## Welsh ULEV – LA Engagement Workshop

# ZE Waste and Recycling Vehicle Project



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Aims to Accelerate and De-Risk

Access to Support

WG Net-Zero Target

Try Before you Buy

Vehicle Purchase Grant Support

Shared Learning and Dissemination



## Objectives for Day

- **Share** learnings from newly deployed eRRVs in NPT
- **Revelation** of the brand-new programme website
- **Discover** new financial tools to help you plan your transition
- **Discuss** exciting plans for FY24/25

# Agenda

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- 13:15 Welcome and Programme Status
  - 13:25 eRRV Deployment Experiences
    - Opportunity for NPT to share their experience with the Terberg/Electra RRV
  - 13:45 Programme Website Showcase
    - Initial release of new programme website
  - 13:55 Total Cost of Ownership Tool
    - Showcase of the capabilities of this new planning tool for LAs
  - 14:15 Looking Forward to 24/25
    - Highlighting the next support opportunities for 24/25
  - 14:30 Close
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# Programme Update

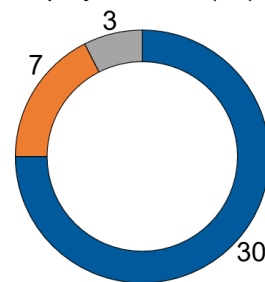


## Welsh ULEV – LA Engagement Workshop

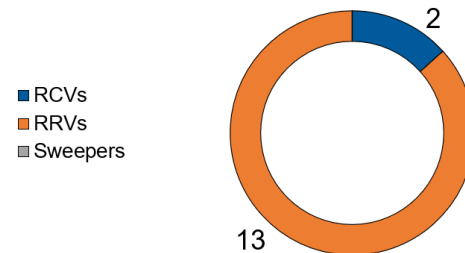
## Deployment Status

Local Authority	Deployed	Potential Procurement
Cardiff	12	
Carmarthenshire	3	
Conwy	4	3
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	

Deployed so far (38)



Potential Procurement (15)



■ RCVs  
 ■ RRVs  
 ■ Sweepers

53 Vehicles Delivered or Pending Procurement  
 13 Different Local Authorities

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## Deployment Status

*26t eRCV*

- Providers:
  - Dennis Eagle (26) (2)
  - Electra (3)
  - RVS/E Moss (1)

*12t eRRV*

- Providers:
  - Romaquip (4) (5)
  - Terberg (3) (8)

*eSweeper*

- Providers:
  - Bucher (3)

Blue: Deployed  
Orange: Potential



# Local Authority Updates





# Programme Website Showcase



## Welsh ULEV – LA Engagement Workshop

## New Programme Hub



**Waste And Recycling ULEV Programme Hub**

Welcome! The Waste and Recycling Ultra-Low Emission Vehicle Programme hub is an online resource created to provide information, guidance, support tools, and updates on the performance of vehicles for Welsh local authorities.

[KNOWLEDGE HUB](#) [ABOUT THE PROGRAMME](#)

**Waste and Recycling ULEV Programme**

As part of its 2050 path to net zero, the Welsh Government has the ambition to achieve a carbon neutral public sector by 2030.

The Waste and Recycling ULEV Programme provides grant support to Welsh local authorities to accelerate and de-risk the transition to ultra-low and zero emission technologies within Welsh public sector waste fleets.



# Total Cost of Ownership Tool



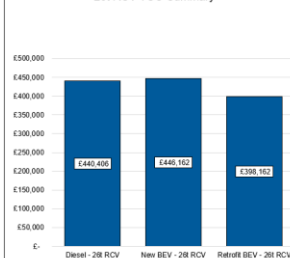
## Why is this Useful?

- Full transparency of financial benefits of ULEV transition
- Power to choose how to optimise your fleet operations
- Make the most out of your vehicles

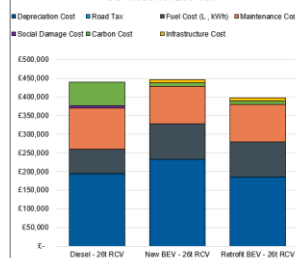
# Acquire the Knowledge to Transition!

Lifetime Financial Factors				
	Diesel - 26t RCV	New BEV - 26t RCV	Retrofit BEV - 26t RCV	
Depreciation Cost	£ 191,541	£ 233,200	£ 185,200	
Road Tax	£ -	£ 3,150	£ -	
Fuel Cost (L, kWh)	£ 66,206	£ 94,559	£ 94,559	
Maintenance Cost	£ 108,836	£ 100,347	£ 100,347	
Social Damage Cost	£ 6,703	£ -	£ -	
Carbon Cost	£ 83,971	£ 10,214	£ 10,214	
Infrastructure Cost	£ -	£ 7,842	£ 7,842	
<b>Total Cost of Ownership</b>	<b>£ 440,456</b>	<b>£ 446,162</b>	<b>£ 396,162</b>	
Capital Cost Infrastructure	£ -	£ 5,658	£ 5,658	
Operating Costs Infrastructure	£ -	£ 2,184	£ 2,184	
<b>Total Infrastructure Cost</b>	<b>£ -</b>	<b>£ 7,842</b>	<b>£ 7,842</b>	
Lifetime Economic Factors				
Return on Investment (ROI)	-	-1%	11%	
CAPEX	£ 203,000	£ 492,000	£ 396,000	
Avg. yearly OPEX	£ 25,456	£ 27,844	£ 27,844	
AQ Damage Cost Savings NOx	£ -	£ 6,497	£ 6,497	
AQ Damage Cost Savings PM	£ -	£ 206	£ 206	
Carbon Costs Savings	£ -	£ 53,757	£ 53,757	

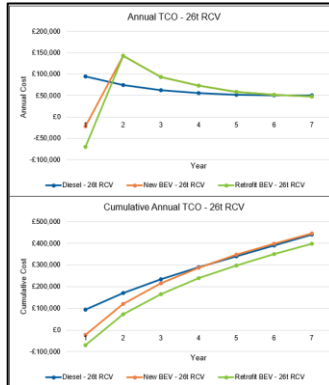
26t RCV TCO Summary



TCO Model for 26t RCV

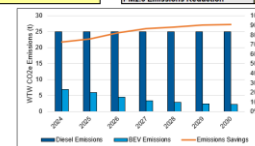


Battery Use and Vehicle Range					
		Vehicle Assessed: 26t RCV			
		Average Day		Max Usage Day	
		Used	Remaining	Used	Remaining
Battery use (%)	Average	57%	43%	73%	27%
	Winter	61%	39%	77%	23%
	Summer	53%	47%	69%	31%
Energy Used (kWh)	Average	155	115	198	72
	Winter	165	105	208	62
	Summer	144	126	187	83
Vehicle Range (miles) - Year 1 -	Average	30.3	22.5	30.3	11.0
	Winter	30.3	19.4	30.3	9.1
	Summer	30.3	26.6	30.3	13.5
Vehicle Range (miles) - Year 7 -	Average	30.3	15.2	30.3	0.7
	Winter	30.3	12.6	30.3	-0.8
	Summer	30.3	18.7	30.3	2.5



Annual TCO - 26t RCV										
	1	2	3	4	5	6	7			
Depreciation Cost	£18,364	£45,341	£30,072	£19,944	£13,228	£8,773	£5,819			
Road Tax	£450	£450	£450	£450	£450	£450	£450			
Fuel Cost (L, kWh)	£9,458	£9,458	£9,458	£9,458	£9,458	£9,458	£9,458			
Maintenance Cost	£17,059	£17,059	£17,059	£17,059	£17,059	£17,059	£17,059			
Social Damage Cost	£360	£360	£360	£360	£360	£360	£360			
Carbon Cost	£8,730	£8,863	£8,997	£9,135	£9,274	£9,415	£9,558			
Infrastructure Cost	£ -	£ -	£ -	£ -	£ -	£ -	£ -			
<b>Annual Cost of Ownership</b>	<b>£95,020</b>	<b>£74,960</b>	<b>£62,656</b>	<b>£55,496</b>	<b>£51,749</b>	<b>£50,356</b>	<b>£50,286</b>			
<b>Cumulative - Annual Cost of Ownership</b>	<b>£95,020</b>	<b>£169,980</b>	<b>£232,636</b>	<b>£288,132</b>	<b>£339,882</b>	<b>£390,148</b>	<b>£440,434</b>			
New BEV - 26t RCV										
	1	2	3	4	5	6	7			
Depreciation Cost	£18,364	£118,675	£70,464	£41,838	£24,842	£14,750	£8,758			
Road Tax	£450	£450	£450	£450	£450	£450	£450			
Energy Cost (kWh)	£13,508	£13,508	£13,508	£13,508	£13,508	£13,508	£13,508			
Maintenance Cost	£7,059	£7,059	£7,059	£7,059	£7,059	£7,059	£7,059			
Social Damage Cost	£360	£360	£360	£360	£360	£360	£360			
Carbon Cost	£8,730	£8,863	£8,997	£9,135	£9,274	£9,415	£9,558			
Infrastructure Cost	£ -	£ -	£ -	£ -	£ -	£ -	£ -			
<b>Annual Cost of Ownership</b>	<b>£22,027</b>	<b>£142,489</b>	<b>£93,765</b>	<b>£73,237</b>	<b>£58,925</b>	<b>£51,511</b>	<b>£48,291</b>			
<b>Cumulative - Annual Cost of Ownership</b>	<b>£22,027</b>	<b>£164,516</b>	<b>£258,281</b>	<b>£331,518</b>	<b>£390,443</b>	<b>£441,954</b>	<b>£490,245</b>			
Retrofit BEV - 26t RCV										
	1	2	3	4	5	6	7			
Depreciation Cost	£18,364	£118,675	£70,464	£41,838	£24,842	£14,750	£8,758			
Road Tax	£450	£450	£450	£450	£450	£450	£450			
Energy Cost (kWh)	£13,508	£13,508	£13,508	£13,508	£13,508	£13,508	£13,508			
Maintenance Cost	£7,059	£7,059	£7,059	£7,059	£7,059	£7,059	£7,059			
Social Damage Cost	£360	£360	£360	£360	£360	£360	£360			
Carbon Cost	£8,730	£8,863	£8,997	£9,135	£9,274	£9,415	£9,558			
Infrastructure Cost	£ -	£ -	£ -	£ -	£ -	£ -	£ -			
<b>Annual Cost of Ownership</b>	<b>£22,027</b>	<b>£142,489</b>	<b>£93,765</b>	<b>£73,237</b>	<b>£58,925</b>	<b>£51,511</b>	<b>£48,291</b>			
<b>Cumulative - Annual Cost of Ownership</b>	<b>£22,027</b>	<b>£164,516</b>	<b>£258,281</b>	<b>£331,518</b>	<b>£390,443</b>	<b>£441,954</b>	<b>£490,245</b>			

Vehicle Assessed: 26t RCV										
Vehicle Emissions										
	Diesel - 26t RCV	New BEV - 26t RCV	Retrofit BEV - 26t RCV							
WTW CO <sub>2</sub> e Emissions (t)	174.8	28.2	28.2							
Life-time NO <sub>x</sub> Emissions (g)	589.7	0.0	0.0							
Life-time PM <sub>2.5</sub> Emissions (g)	2,231.0	0.0	0.0							
Emission Savings										
Transition from Diesel to BEV with Grid Electricity										
WTW CO <sub>2</sub> e Emissions (t)	148.5									
NO <sub>x</sub> Emissions (g)	589.7									
PM <sub>2.5</sub> Emissions (g)	2,231.0									
WTW CO <sub>2</sub> e Emissions Reduction	84%									
NO <sub>x</sub> Emissions Reduction	100%									
PM <sub>2.5</sub> Emissions Reduction	100%									
Yearly Vehicle Emissions										
	2024	2025	2026	2027	2028	2029	2030			
WTW CO <sub>2</sub> e Emissions (t)	25.0	25.0	25.0	25.0	25.0	25.0	25.0			
NO <sub>x</sub> Emissions (g)	72.8	72.8	72.8	72.8	72.8	72.8	72.8			
PM <sub>2.5</sub> Emissions (g)	318.7	318.7	318.7	318.7	318.7	318.7	318.7			
WTW CO <sub>2</sub> e Emissions (t)	6.9	6.9	6.9	6.9	6.9	6.9	6.9			
NO <sub>x</sub> Emissions (g)	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
PM <sub>2.5</sub> Emissions (g)	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Yearly Emission Savings										
	2024	2025	2026	2027	2028	2029	2030			
WTW CO <sub>2</sub> e Emissions (t)	18.1	18.1	18.1	18.1	18.1	18.1	18.1			
NO <sub>x</sub> Emissions (g)	72.8	72.8	72.8	72.8	72.8	72.8	72.8			
PM <sub>2.5</sub> Emissions (g)	318.7	318.7	318.7	318.7	318.7	318.7	318.7			
WTW CO <sub>2</sub> e Emissions Reduction	72%	70%	67%	65%	63%	60%	57%			
NO <sub>x</sub> Emissions Reduction	100%	100%	100%	100%	100%	100%	100%			
PM <sub>2.5</sub> Emissions Reduction	100%	100%	100%	100%	100%	100%	100%			





# Looking Forward to 24/25



# 2021 to 2024 Project Activity

2021/22

Programme Start-up  
and Early Learning

- Est. data availability
- Data collection protocols
- Analysis routines
- Internal performance reporting

2022/23

Creating Knowledge  
Resources and Insights

- Quarterly reports
- Vehicle performance and planning models
- Cost analysis
- Vehicle catalogue

2023/24

Developing a Support  
Eco-system and  
Cohort

- Provide strategic support and advice
- Increase outreach and joint learning

# 2023/24 Delivery Items

Item	Notes
<b>Quarterly workshops and newsletters</b>	Increase engagement and outreach. Allow LAs to share implementation experience and best practice.
<b>Project knowledge hub</b>	Improved, dedicated one stop shop for all past, current and future project activity and information.
<b>Procurement and implementation support</b>	Procurement checklists, resources and 1:1 support.
<b>Business case support tools</b>	Spreadsheet and documents to aid better procurement and deployment decisions
<b>Vehicle performance monitoring and data collection</b>	Time allocated reduced by ~ 50% compared to 22/23. Focus on new vehicles and vehicle types. Publish public reports.



# 2024/25 Work programme feedback



**2024/25 Leading by Example**

Continue	New areas	Potential activity
Performance reporting (6-monthly)	RRV vehicle performance model	Reliability data collection and reporting
Quarterly workshops	Programme Teams channel	
Quarterly newsletters	Case study support – development of fleet and infrastructure strategies	
Procurement check list and 1-1 support	Case study support – procurement and implementation	
	Case study support – disseminate case study processes and analysis through workshops for joint learning	

# Thank you for your time!

## Contacts for Grant Applications

### **Catrin Roberts**

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### **Mark Brown**

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## Contacts for Planning and Implementation Advice

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# Thank you for listening

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