

# eCollect

100% electric Refuse Collection Vehicle



collecting refuse ... ... delivering zero emissions



**WELCOME...**

# DENNIS EAGLE

Company History & Brief Overview

**August - 2020**

**Dennis Brothers**  
Guildford

1895



Municipal Chassis

**Eagle Engineering**  
Warwick

1907



Municipal Bodies

Purchased by  
**Hestair PLC**

1973

**Dennis Eagle**  
New Factory  
At Warwick

1985

1992

**Elite**  
Low Entry Cab



Purchased by  
**Ros Roca**

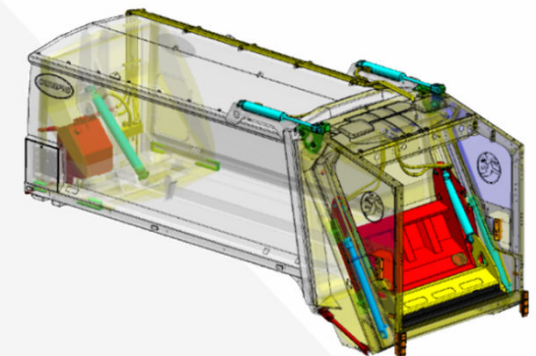
2006

Merger  
**Terberg / RosRoca Group**

2016

2009

**Olympus**  
Smooth Sided Body





**ENVIRONMENTAL  
EQUIPMENT**

Group Manufacturing Sites – Terberg RosRoca Group



**TERBERG ROSROCA  
GROUP LIMITED**  
(UNITED KINGDOM)

**TERBERG MACHINES B.V.**  
(THE NETHERLANDS)

**TERBERG MATEC  
NEDERLAND B.V.**  
(THE NETHERLANDS)

**TERBERG MATEC  
BELGIUM BVBA**  
(BELGIUM)

**TERBERG MATEC  
POLSKA Sp. z o.o.**  
(POLAND)

**DENNIS EAGLE LTD**  
(UNITED KINGDOM)

**ROS ROCA S.A.U.**  
(SPAIN)

**ENVIRO RENT XXI, S.L.U.**  
(SPAIN)

**ROS ROCA FARID, S.L.**  
(SPAIN) (JV 50/50)

**HS FAHRZEUGBAU GMBH**  
(GERMANY)

**EURO VOIRIE SAS**  
(FRANCE)

**RESITUL EQUIPAMENTOS SERVIÇOS E  
TECNOLOGIAS AMBIENTAIS LDA**  
(PORTUGAL)





Video of manufacturing processes – excluded from final print

# Contents

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The challenges



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Previous projects



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Our solution: eCollect



Climate change



# Air pollution

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- Traffic plays key part
- Particularly in cities

**83%** of Londoners think tackling air pollution should be a priority



## Clean Air Zones

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- London
- Now has on-going RCV air quality monitoring
- Leeds
- Manchester
- Oxford
- Cambridge,
- Birmingham, etc.  
plan to adopt soon



## Previous DE projects

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- CNG/LNG
- Dual Fuel
- Electric body
- HiUCV





# Innovative Group projects

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- Electric terminal tractors
- Electric bin lifts
- Autonomous vehicles



The logo for eCollect features the word "eCollect" in a bold, sans-serif font. The lowercase "e" is a vibrant green, while the uppercase "C" and the rest of the word are a dark grey. A white lightning bolt is integrated into the center of the "o", which is part of the "Collect" portion of the name.

**eCollect**

100% **electric** Refuse Collection Vehicle

## Our project remit

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Produce a vehicle to:

- Address environmental issues
- Be more efficient
- Cost-effective over its lifetime

“A genuine alternative to our diesel vehicles”





Only manufacturer in the WORLD to  
produce a complete eRCV

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# Principles of design

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Use existing chassis, body and bin lift:

- Tried and tested
- Hugely popular
- Familiar







☆☆☆☆☆


5-Star  
Direct Vision Standard  
rated cab



# Direct Vision Standard

TRANSPORT  
FOR LONDON

[Plan a journey](#) [Status updates](#) [Maps](#) [Fares](#) [Help & contacts](#) [More](#) 

Search 

[Home](#) [Deliveries in London](#) [Delivering safely](#) [Direct Vision Standard and HGV Safety Permit](#) [DVS star ratings and Safe System Improvements](#)

## DVS star ratings and Safe System improvements

The Direct Vision Standard gives HGVs a star rating, measured by how much a driver can see directly through their cab windows. Safe System measures help reduce the danger of HGVs that don't meet the minimum star rating for an HGV Safety Permit.

▼ [Meet the minimum DVS star rating](#)

▼ [Safe System measures: improving HGV safety](#)

▼ [Contact your manufacturer to find your vehicle's DVS star rating](#)

▼ [Vehicle exemptions](#)

▼ [An international standard](#)

▼ [Driver training](#)

▼ [Changes to LEZ emissions standards from 2021](#)

[Check star rating and apply](#)

### Meet the minimum DVS star rating

Deliveries in London

► [Efficient deliveries](#)

▼ [Delivering safely](#)

○ [Driving near vulnerable users](#)

○ [Safer Lorry Scheme](#)

○ [Work Related Road Risk](#)

▼ [Direct Vision Standard and HGV Safety Permit](#)

○ [DVS star ratings and Safe System improvements](#)

○ [Guidance for the HGV Safety Permit](#)

○ [Direct Vision for HGVs Research and Tools](#)

► [Delivering legally](#)

○ [Delivering goods by water](#)

## Integrated design & build

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- Optimised assembly
- One-stop shop
- Tested & WVTA approved





A genuine  
alternative to  
our best selling  
RCV

- 26 tonnes
- 6x2 RS Elite chassis
- Olympus 19m3 body
- Terberg automatic split bin lift







# Batteries and infrastructure

## Battery capability & cost

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- Battery chemistry improved
- Better power density
- Better stability



Increased  
range



Increased  
payloads

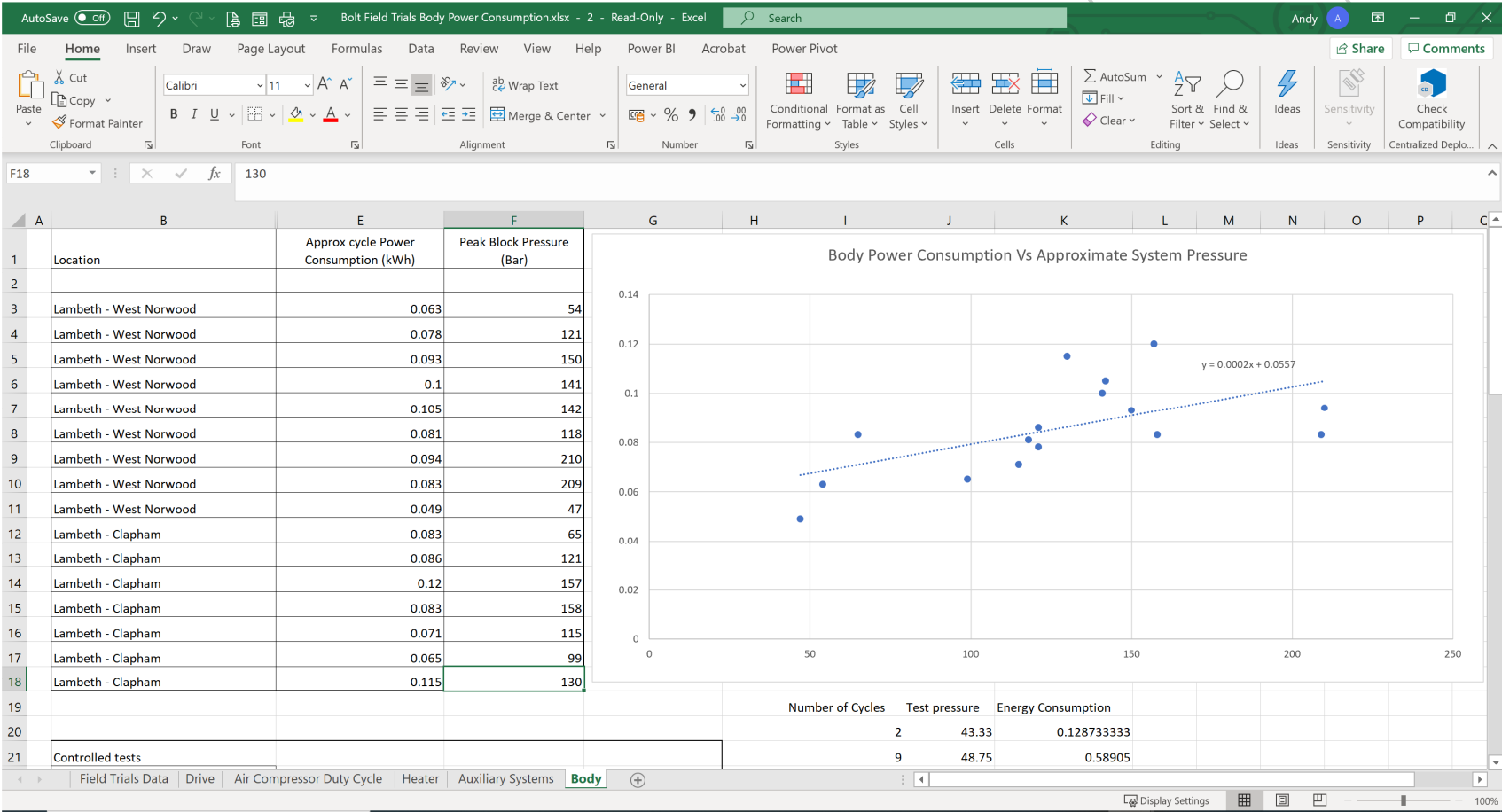


Different  
routes



# Duty cycle analysis

- Motive power
- Auxiliary equipment
- Compaction
- Discharge
- Operating Margins





## The benefits of electricity as the alternative fuel

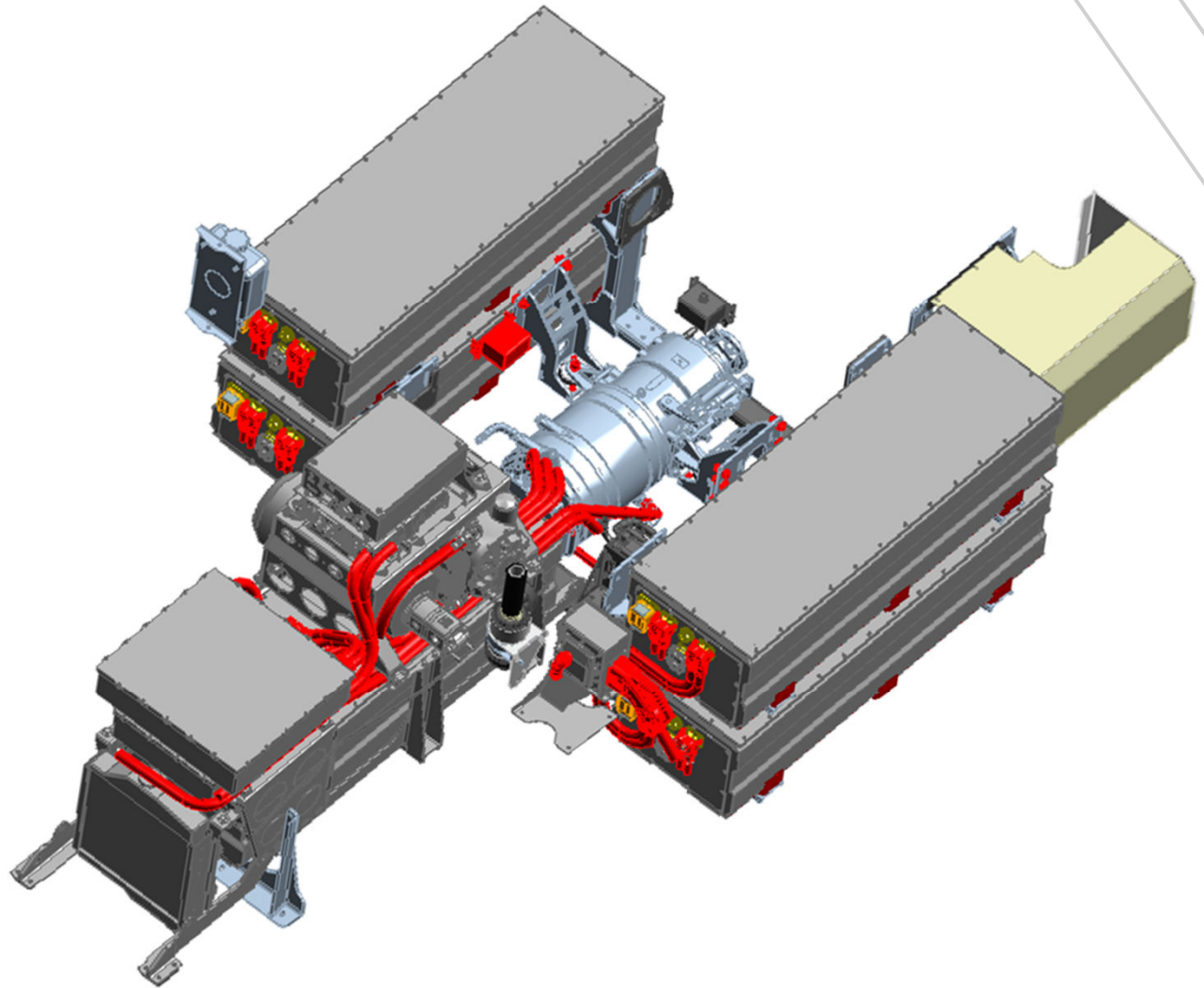
- Zero vehicle emissions
- Electricity is the cheapest energy produced in the UK vs oil based fuels
- Existing electricity infrastructure



## Battery & Motor

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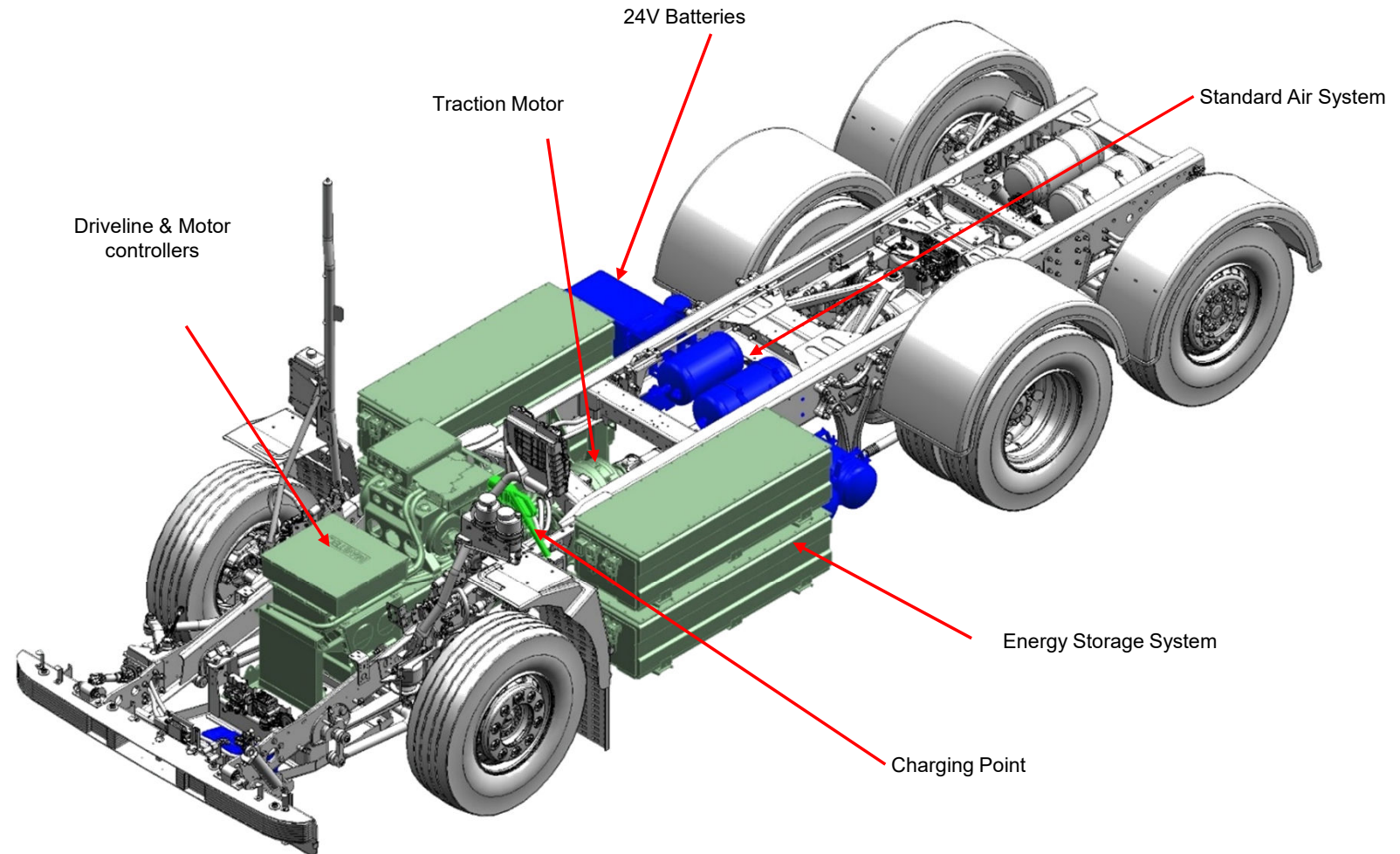
- Li-NCM batteries
- 5 packs in total = 300kWh
- 200kWh motor



# All-new powertrain

## Fully integrated solution

- Brakes
- Suspension
- Steering
- Body Systems





## Battery capacity

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- 300 kWh capacity
- 5 packs on the vehicle
- c. 385 kgs per pack



## Narrow track – for urban rounds

Aimed at urban rounds, so we chose the narrow body and chassis which are that much quicker and easier to manoeuvre.

- 2.25 metre body width\*
- Rear Steer wheel-plan

\* standard 2.55m width will be available in the near future

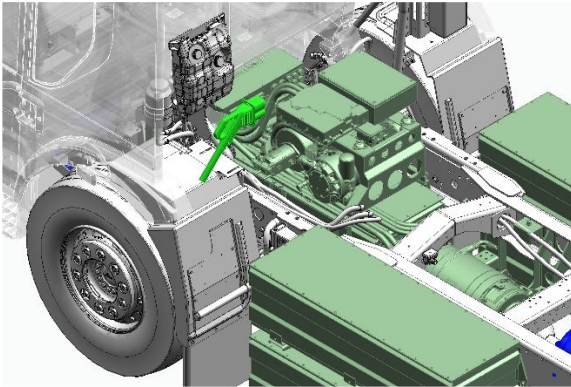




# Battery Management System

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- Heart of the eRCV
- Monitors and controls battery packs
- Limits vehicle to 40mph





# Operating the vehicle

- New instrument cluster
- New gear change pad
- New programmable switches




1. Digital display.
2. Reverse.
3. Neutral.
4. Drive.



Apply footbrake before selecting Drive or Reverse.

## State of charge (SoC)

- Fuel gauge replaced by state of charge display
- Shown on cluster as a simple bar graphic
- Tortoise warning - for 'return to base' 



# CCS2 Charging

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- Industry standard charging
- Nominal 50 kW / 63 Amp
- 415V 3-phase





# Maintenance & service

- Simpler servicing
- Fewer consumable parts
- Additional training for High Voltage systems
- Assured life-term support
- Fully illustrated EPC
- Full R&M contract support



## EV Safety Equipment Kit

- Download available from the eCollect website
- Supply via our service network

## Electric Vehicle Safety Equipment Kit

eCollect

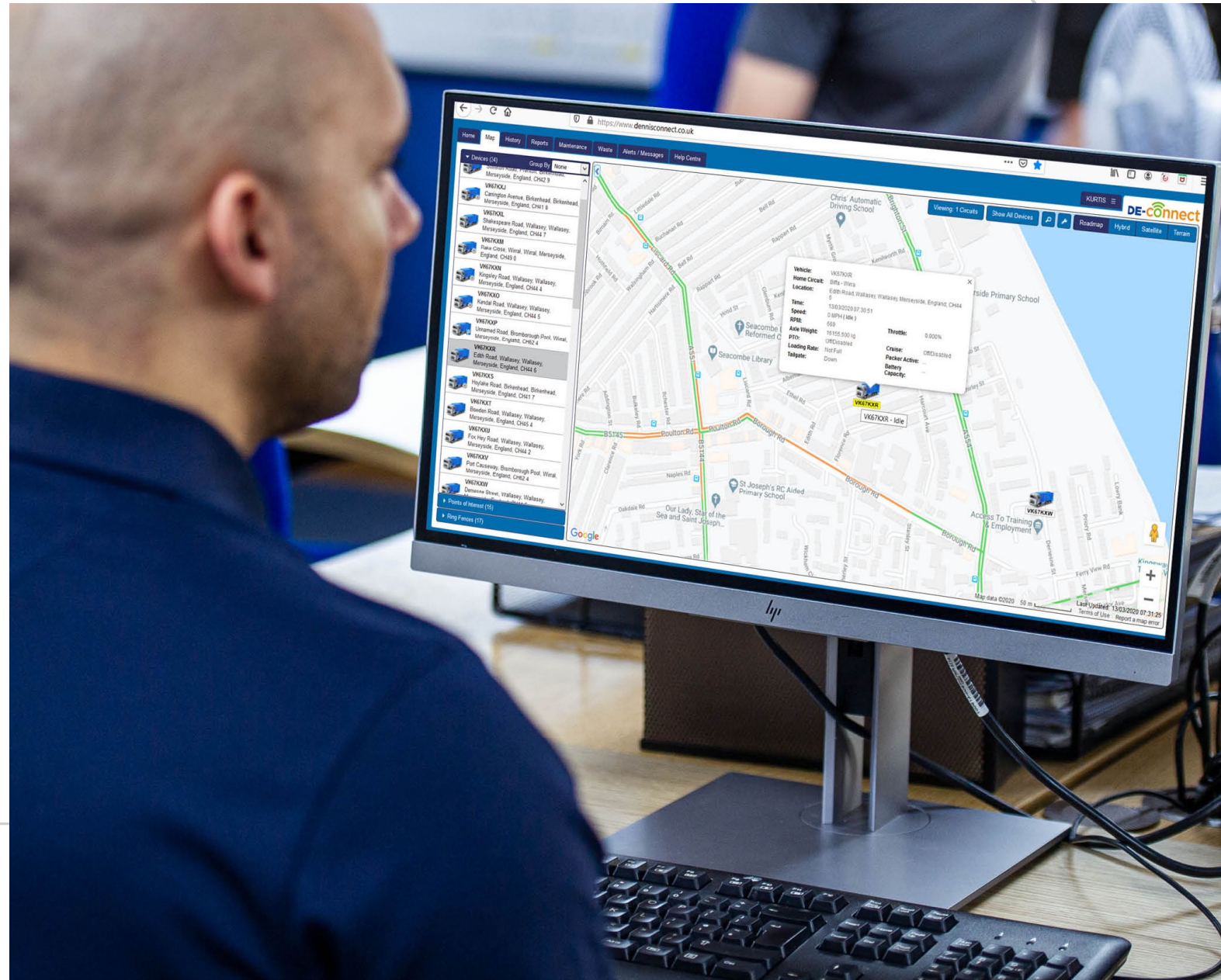


Our Electric Vehicle Safety Equipment Kit has been designed to help create a safer working environment when working on the Dennis Eagle eCollect RCV.



# DE-Connect telematics

- Standard on all vehicles
- Monitors vehicle health
- Adapted for eCollect





# Warranty

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- 3 years as standard
- Extended options available
- Same procedures





Safety from bumper to bumper



Chassis

Body

Bin Lift

Safety solutions

Telematics



## Cameras

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- Optional 5 camera DVR recording system
- Linked to DE-Connect telematics





The background features a large, solid dark blue rectangle. Overlaid on this are several thin, white geometric lines. A series of parallel diagonal lines runs from the top-left towards the bottom-right. Another set of parallel diagonal lines runs from the top-right towards the bottom-left. These lines intersect to form a series of parallelograms and other geometric shapes. A horizontal white line segment is positioned below the main text.

Why switch to an eRCV?

## Zero carbon emissions

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- Clean vehicles
- Better for the environment



## No air pollution

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- Zero tail pipe emissions
- No impact on environment





## Less noise

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- Half as loud when packing\*
- 16x quieter when idling
- Quieter when starting



\* Bin movements and discharge into the hopper remain unchanged

## Less maintenance

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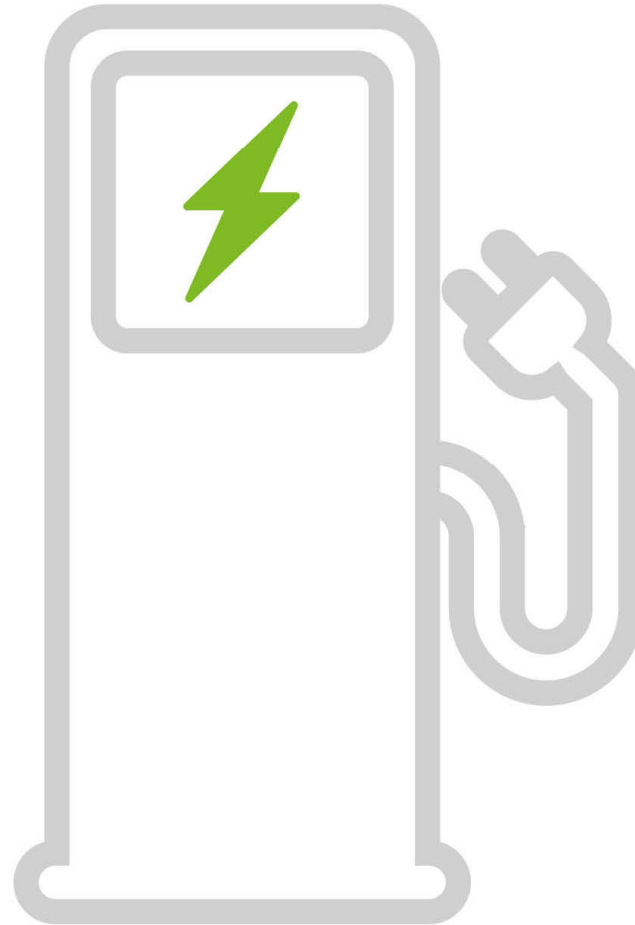
- **Fewer** moving parts
- **No** engine oil change
- **No** AdBlue (Urea)
- **No** Diesel Particulate Filter



## Quicker between stops

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- Better acceleration
- Instant throttle response
- Shorter route times
- Relaxed driving experience





# Field Trials

Sample data 13/01/20  
**Single Shift**

Total Time 09:43:25 Hrs  
Driving Time 07:40:14 Hrs

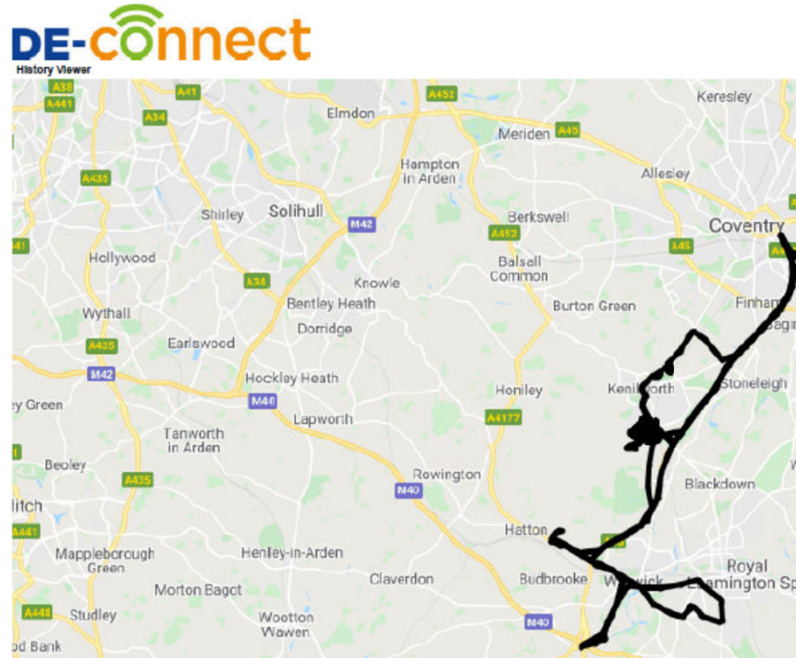
Odo Distance 66.22 miles

## Payload

Round 1 = 11,140 Kgs  
Round 2 = 9,260 Kgs

Total = 20,400 Kgs

Final State of Charge 29%  
(c. 213 kWh consumed)



# Field Trials

Sample data 02/03/20  
**Double Shift**

Total Time 17:41:43 Hrs

Driving Time 12:14:36 Hrs

Odo Distance 85.71 miles

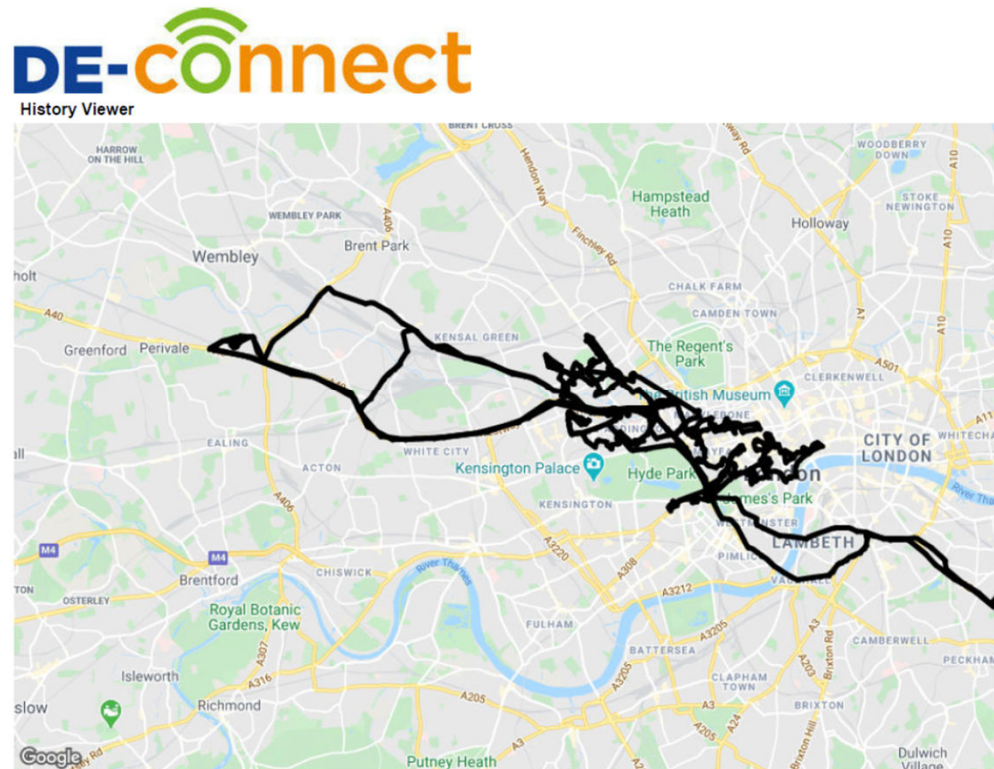
Payload

Round 1 = 6,720 Kgs

Round 2 = 6,000 Kgs

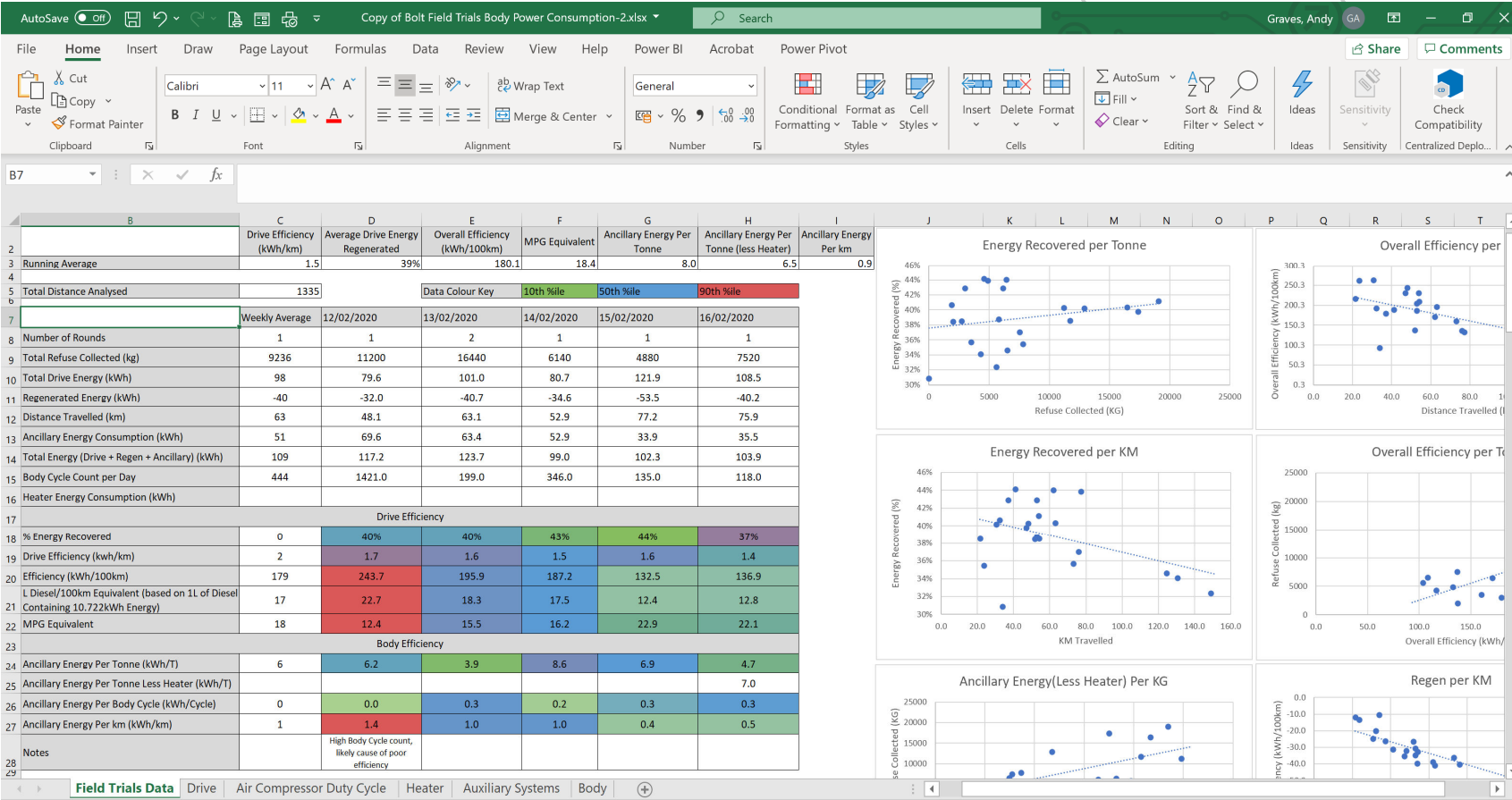
Total = 12,720 Kgs

Final State of Charge 17%  
(c. 249 kWh consumed)



# Continuing duty cycle analysis

- Real-world data
- Assumption validation
- Basis for updates
- Optimisation





# Questions

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**eCollect**  
100% electric Refuse Collection Vehicle



<https://www.ecollectrcv.co.uk/>