



# An All-Electric Refuse Collection Vehicle as a Solution to Local Air and Noise Pollution? The eRCV Projects

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**An All-Electric Refuse Collection Vehicle as a  
Solution to Local Air and Noise Pollution?  
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# The eRCV Project (I+II)



# The Problem

- Waste is an essential municipal service
- Refuse Collection Vehicles are crucial part of delivery
- Predominately diesel-powered
- Average lifespan = 7 years
- Contributes to air and noise pollution
- Nature of vehicle = a lot of idling/driving around residential roads
- Increased legislation to reduce air emissions



# A Solution?

- Repower an end-of-life vehicle to be fully electric
- Extend the life of an otherwise redundant asset
- Reduce local air pollution and noise pollution
- Be exempt from associated charges/compliant with legislation



# eRCV I – Repowering Greenwich RCV

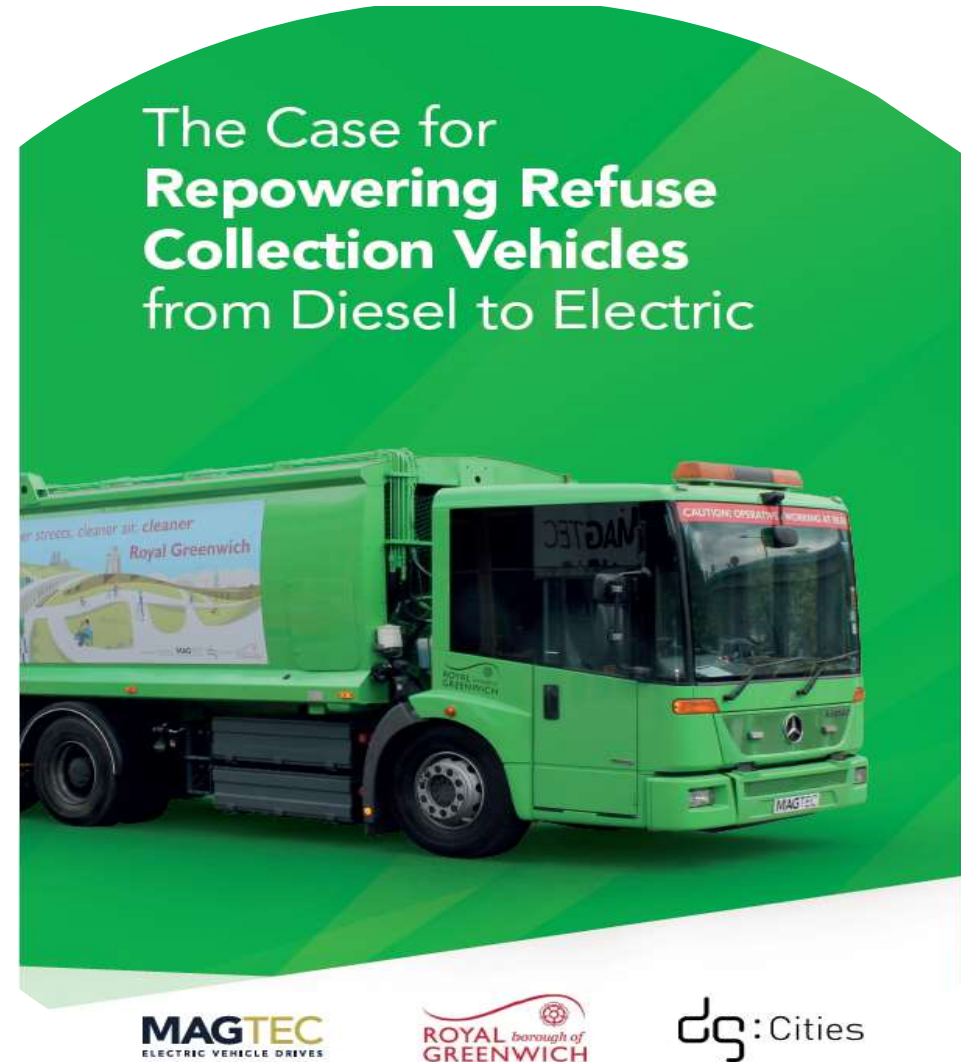
In collaboration with RBG and MagTec (funded by IUK)

Repowered Greenwich fleet vehicle to be fully electric

Launched for trials in June 2018

Project showed that:

- Repower is feasible/technically possible
- It is cheaper than alternative options on the market
- Project also suggested a number of environmental benefits, including reduced air and noise pollution - these would require validation



# eRCV I – Repowering Greenwich RCV



# eRCV II

- Further Innovate UK funding
- **Aim - can the eRCV perform at a commercial level? And can it perform in some of the most testing environments?**
- In collaboration with Veolia, MagTec, Sheffield and Westminster Councils and Microlise.
- Quantify additional benefits - environmental and social
- Understand opportunities and barriers to scaling technology



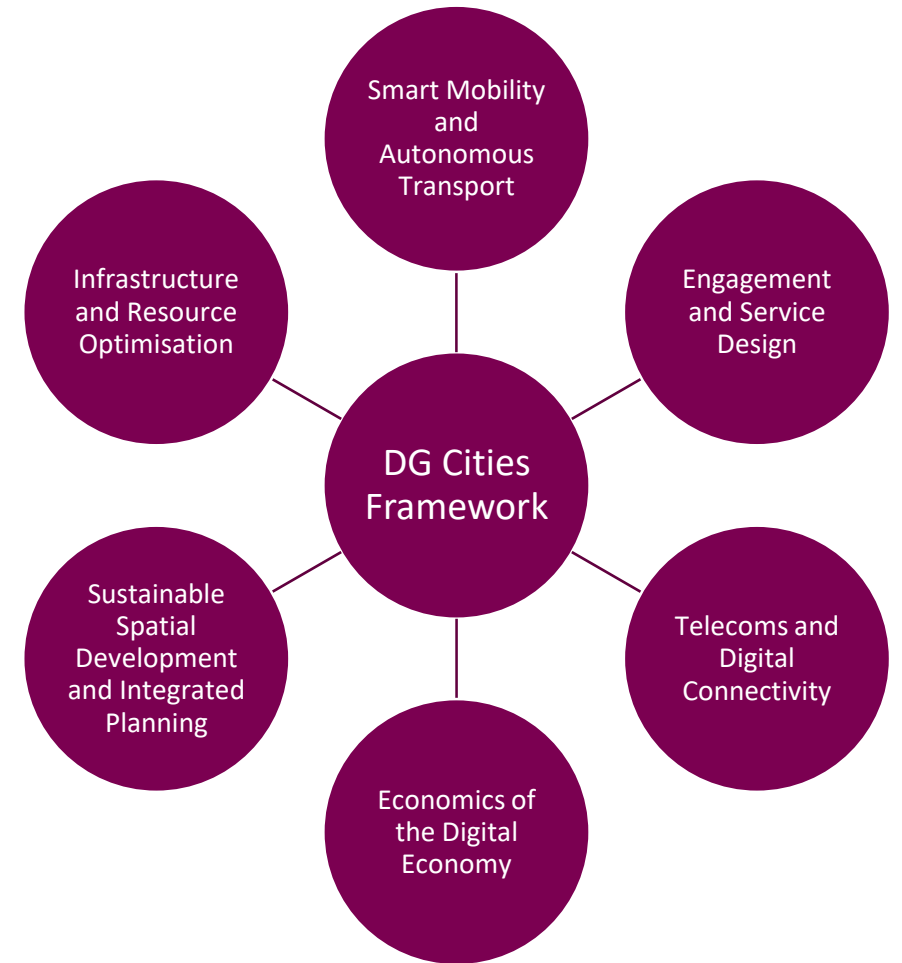


# Role of DG Cities

- An urban innovation company – delivering practical solutions to improve urban living.
- **The DG Cities approach** – an integrated approach that uses technology, data and spatial planning to deliver a blueprint for a sustainable city.
- Multidisciplinary team, 6 key service offerings

## Why eRCV II?

Has potential to **dramatically** improve urban living and sits within many of our service offerings



# Role of DG Cities

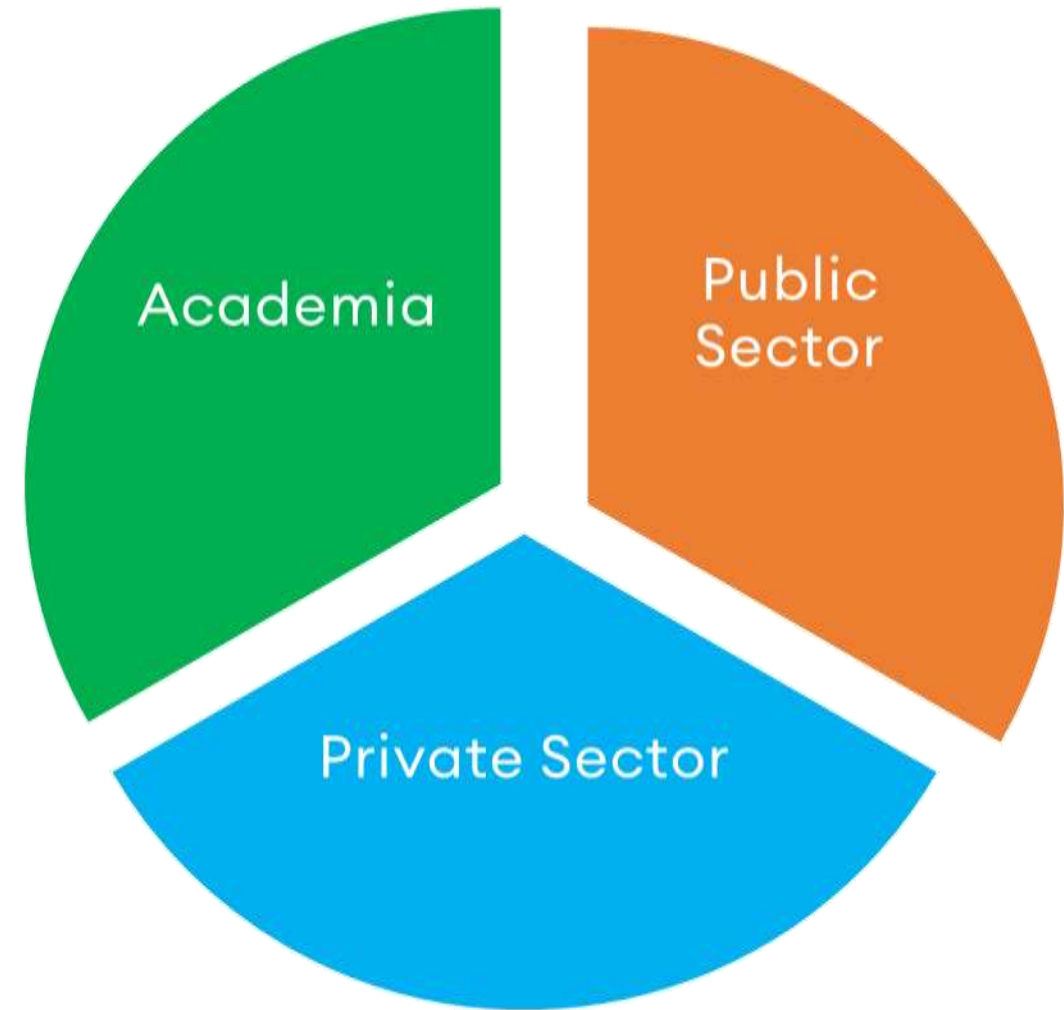
Number of different roles within project:

- Ensure technology benefits people and the environment
- Ensure benefits are fully articulated and internalised
- Understand the wider market and reasons/barriers to adoption

The logo for 'dg:cities' features the letters 'dg' in a stylized, rounded, black font. A colon follows, and the word 'cities' is written in a clean, sans-serif black font.

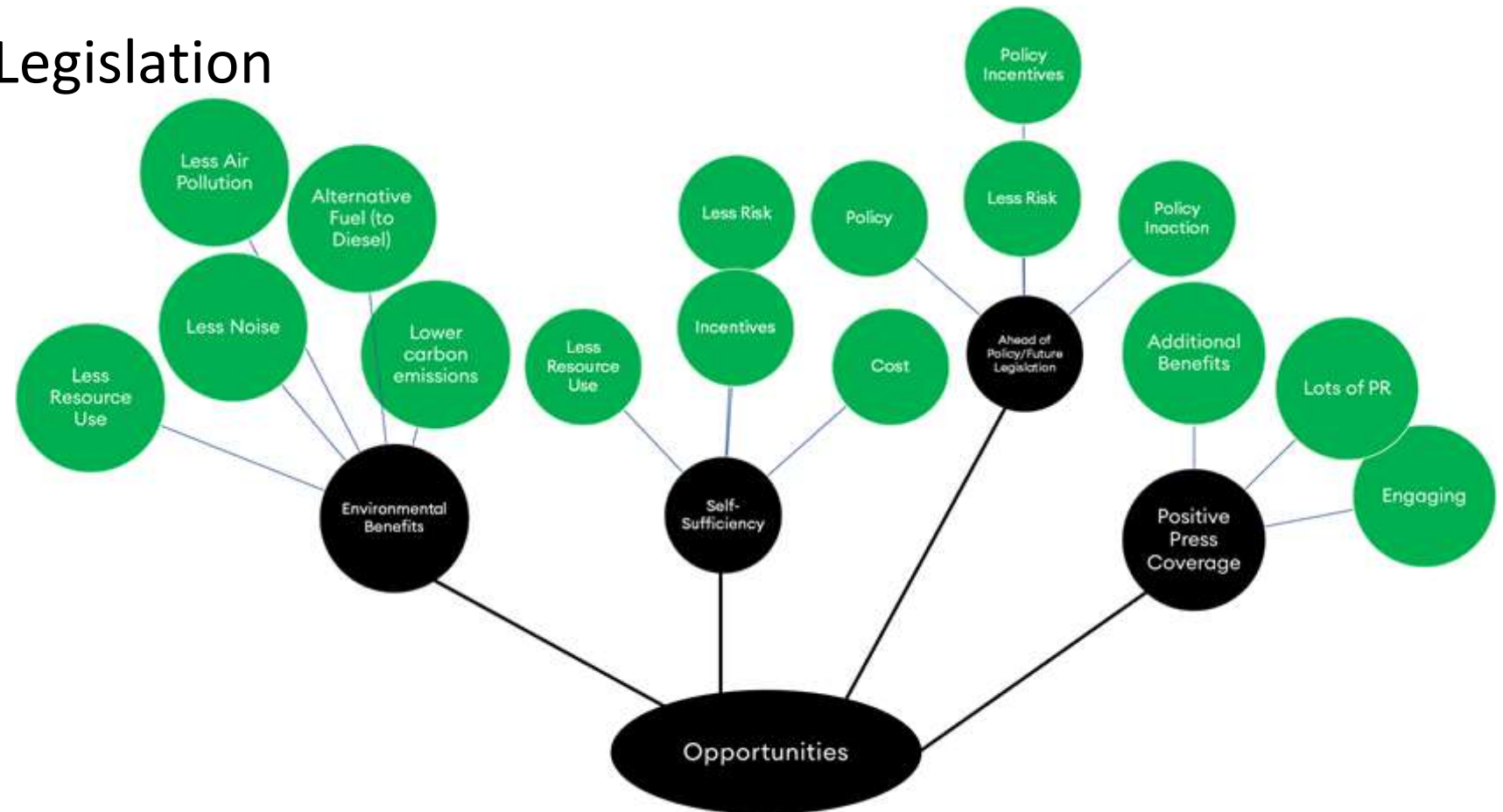
# Understanding the Opportunities and Barriers to scale

- DG Cities role within WP8 – understanding the market, the opportunities and barriers to uptake of an eRCV
- Conducted interviews with stakeholders within and outside of sector
- Thematic Analysis



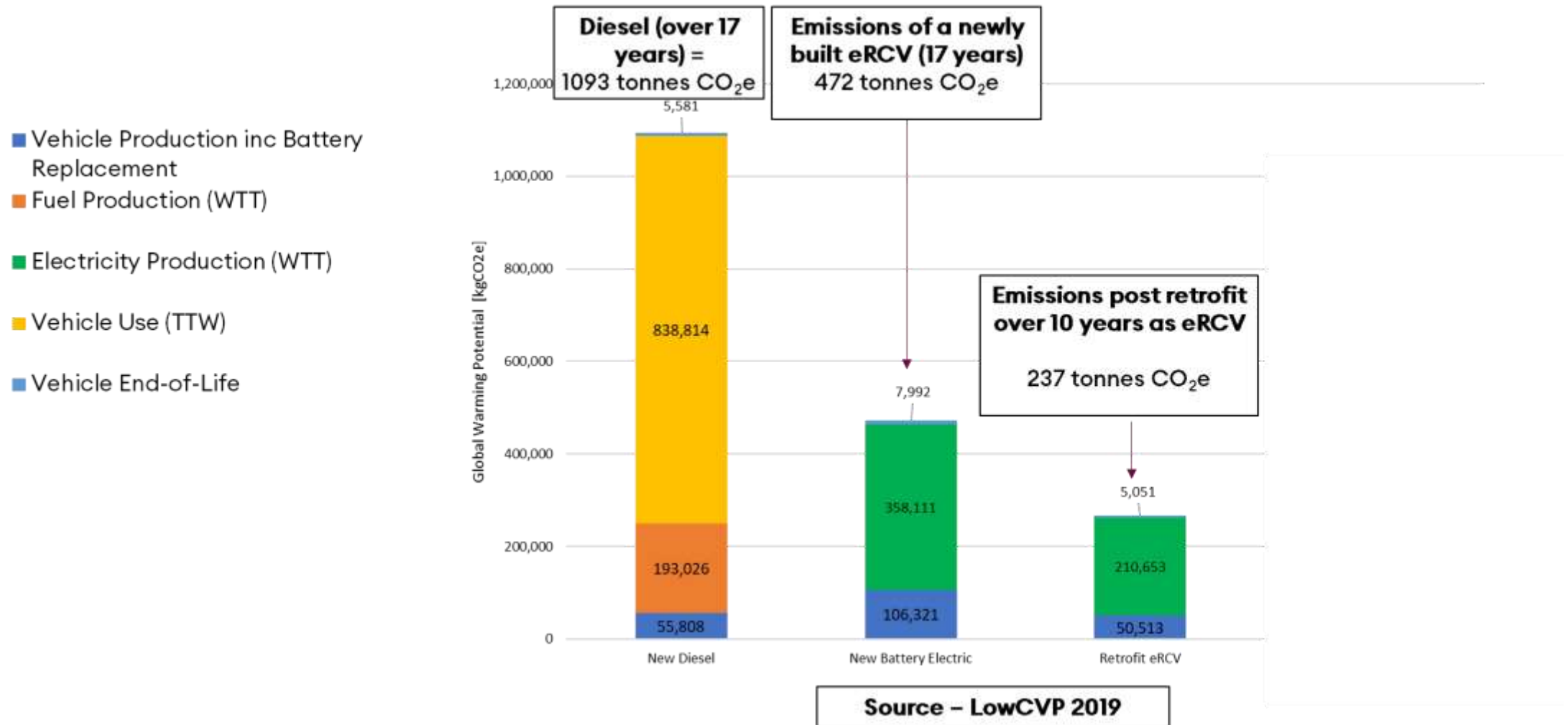
# Findings - Opportunities

- Environmental Benefits
- Self-sufficiency
- Ahead of Policy/Legislation
- Positive PR



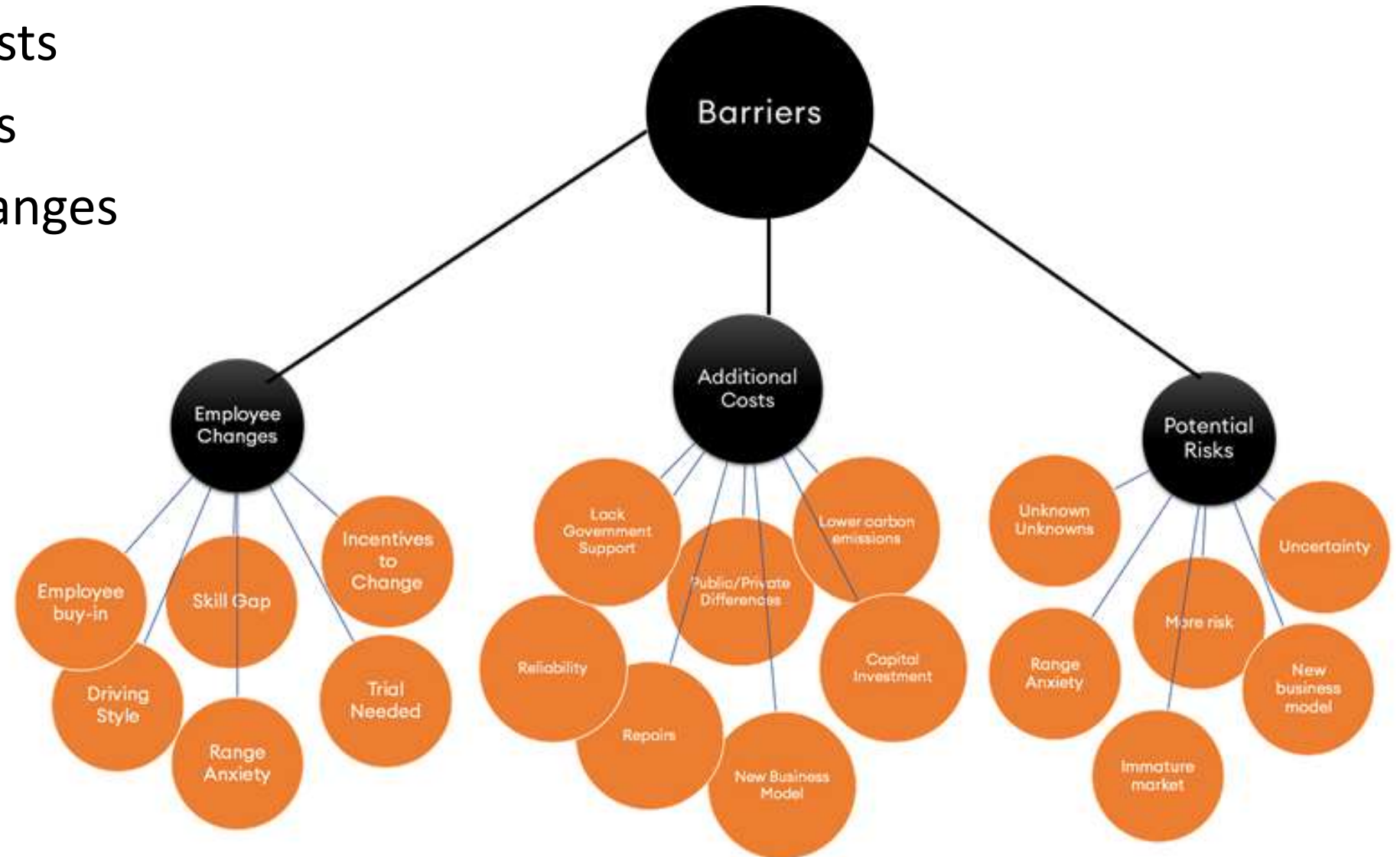
# Benefits – Carbon Emissions

- LowCVP conducted LCA of eRCV vs new diesel and new electric RCV.



# Findings - Barriers

- Additional Costs
- Potential Risks
- Employee Changes



# Key Learnings

- eRCV proposition is attractive to large fleet operators.
- Financially, environmentally and socially beneficial.

**Challenge for DG Cities:** How can we work with stakeholders to overcome barriers and optimise use of technology?



# Looking Forward

## Get Involved!

- Come talk to us at the Steering Pad @ Cenex
- Help us further understand the Opportunities and Barriers
- Workshops, Demonstrations, Meetings





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Thank you!

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**Urban Innovators**

# ၎င်း: cities

Appendix



# Benefits – Economic, Environmental Social

## Battery electric retrofit of diesel RCV

- 25,000kms annual mileage
- Retrofit Diesel to Battery Electric after 7 years
- Assume batteries last 10 years
- UK Pump Diesel & Grid Electricity
- Retrofit eRCV will produce 237 tn CO<sub>2</sub>e over 10 years based on 2019 UK electricity grid.
- Retrofit eRCV saves 370 tn CO<sub>2</sub>e over 10 years compared to diesel operations (60% GHG saving vs diesel)
- A new eRCV would save over 620 tn CO<sub>2</sub>e vs a new diesel over a 17 year lifetime (57% GHG saving vs diesel)

- Vehicle Production inc Battery Replacement
- Fuel Production (WTT)
- Electricity Production (WTT)
- Vehicle Use (TTW)
- Vehicle End-of-Life

