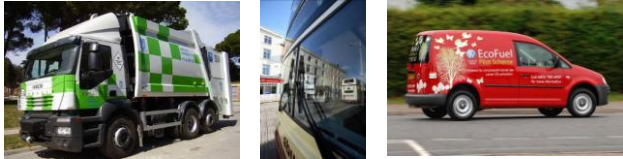


# The Low Emissions Toolkit



**Mark Jackson, CERC**

ADMS 4, ADMS-Urban and ADMS-Roads User Group Meeting  
21<sup>st</sup> October 2010  
Cambridge

**CERC**

Cambridge Environmental Research Consultants  
Environmental Software and Services

## Overview

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- CERC, TTR, and RPS are working for the Low Emissions Strategies Partnership to produce a Low Emissions Toolkit
- *Goal:* help local authorities reduce transport emissions
  - Climate change
  - Local air quality
- Products to be distributed to local authorities
  - Spreadsheet tool
  - Vehicle technology guide
- Inform local authorities on availability of low emission technologies
- Provide assessments of their costs and benefits

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## Low Emissions Strategies Partnership

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- **Who are the LESP?**
- Established in 2007 to disseminate good practice in reducing transport emissions of toxic air pollutants and greenhouse gases
- Phase I grant from CLG and Defra
  - 18 'peer group' projects across 15 local authorities, providing expert advice and sharing best practice
  - Guidance document produced '*Low Emission Strategies: Using the planning system to reduce transport emissions*'
- Phase II funded for November 2009 to March 2011
  - Low Emission Toolkit is a key element

[www.lowemissionstrategies.org](http://www.lowemissionstrategies.org)



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## Low Emissions Toolkit

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- *Goal: help local authorities reduce transport emissions*
- Local authority environment manager
  - want to have an informed discussion with the fleet manager regarding pros and cons of vehicle technologies
- Local authority fleet manager
  - what technologies are available, what are the costs and the benefits compared with business as usual?
- Local authority planning officer
  - what are the transport emissions impacts of a proposal? What transport emission reduction measures could I negotiate through a Section 106 agreement and what benefits would they bring?



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## Low Emissions Toolkit

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- Goal: *help local authorities reduce transport emissions*
- **How will the toolkit help?**
  - Provide robust quantified data to compare individual vehicle performance, emissions and costs, as well as qualitative information
  - A method of applying robust quantitative data on individual vehicle performance across whole fleets, to measure total impacts and costs
  - Help in assessing potential benefits and risks of mitigation or compensating / offsetting measures

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## Data

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- Data on standard vehicle technologies - costs, emissions
  - Emissions from the latest DfT data (2009)
- Data on new vehicle technologies: costs, emissions, qualitative advice
  - TTR have compiled data on technologies expected to be available in 2010 – 2015
  - Drive-train: Internal Combustion Engine, Fuel cell, Electric Vehicle, Hybrid
  - Fuel: Gasoline, Diesel, Natural Gas, Biomethane, Hydrogen, Electric, Biofuels (E85, ED90, B30, B100, Pure Plant Oil [PPO])
  - Vehicle types: HGV, Bus, LGV, Car
  - Retro-fit emission control devices for NO<sub>x</sub> and PM

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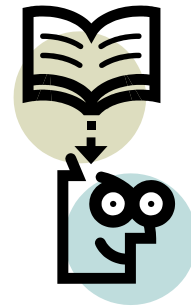
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## Toolkit outputs

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### Tool calculates:

- Costs
- Emissions
  - Well-to-wheel greenhouse gas emissions as CO<sub>2</sub> equivalent
  - NO<sub>x</sub> and PM<sub>10</sub> emissions from the vehicle
- Damage costs for GHG, NO<sub>x</sub> and PM<sub>10</sub>
  - using Defra / Treasury guidance

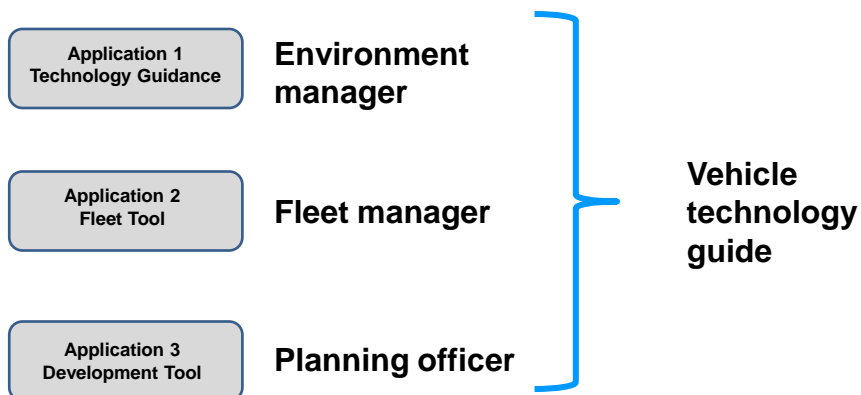


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## Parts of the toolkit

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# Vehicle Technology Guide

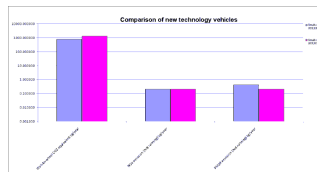
## Ethanol Light Duty Vehicles

- Overview:** Biofuel mix with suitably specified spark-ignition (gasoline) engines. High blend E85 (85% ethanol 15% gasoline) requires modified fuel line and engine over standard gasoline to create a FlexFuel Vehicle (FVV) able to run on any mix of the two fuels.
- Technological maturity:** mass scale exploitation. Where market for bioethanol use is well developed (US, Brazil) then also large scale adoption and use.
- Co-benefits:** energy security from home-grown feedstocks.
- Practicability:** easily available vehicles with multiple manufacturers; some specific safety precautions required for fuel handling; few UK forecourt refuelling stations.



| Performance and Costs        | Car             |
|------------------------------|-----------------|
| GHG (g per vkm) (WTW)        | 87.5            |
| NO <sub>x</sub> (g per vkm)  | 0.02            |
| PM <sub>10</sub> (g per vkm) | 0.04            |
| Capex (per veh)              | £17,000         |
| Maintenance (per vkm)        | £0.05 - 0.15    |
| Re-fuelling Infrastructure   | £0.0001 - £0.05 |

Chart 1: Comparison of E85 and base case (gasoline)

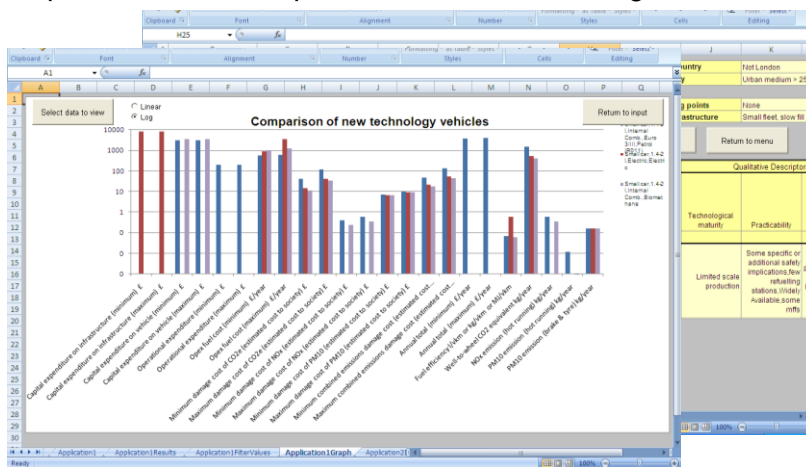


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## Application 1- Everyone

A quick overview comparison between technologies

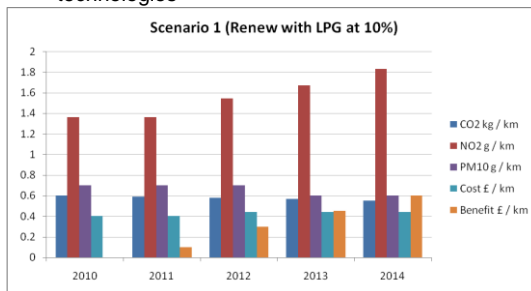


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## Application 2 – Fleet Managers

- A fleet manager is considering adopting low emissions technologies
- Application 1 has inspired them to explore some options in more detail
- Using Application 2:
  1. Enter the current fleet
  2. Select some low emission technologies
  3. Tool calculates the costs, benefits and emissions for the fleet, comparing “business as usual” (replacement with standard technologies) with low emission technologies

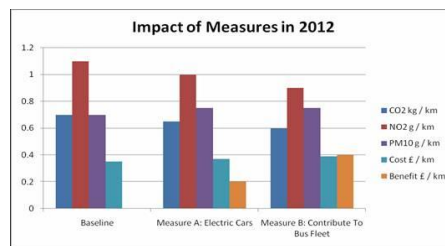


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## Application 3 – Planning Officers

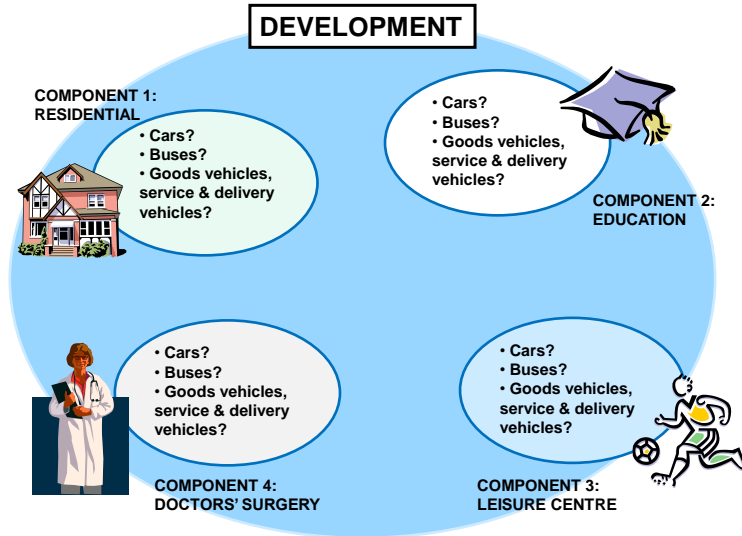
- What are the transport emissions impacts of a proposal?
- What transport emission reduction measures could I negotiate through a Section 106 agreement and what benefits would they bring? What emissions would still remain?



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## Application Three – Planning



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## Planning measures

| Measure Type                             | Sub-category                      |
|--|-----------------------------------|
| Vehicle Substitution / Deployment        | Fleet/Pool Cars                   |
|  | Service Fleet                     |
|  | Public transport fleet            |
| Fleet Transformation Measures            | Site-based Low Emission Zone      |
|  | Emission-based parking allocation |
| Provision of Low Emission Infrastructure | Electric Charging points          |
|  | Biomethane infrastructure         |
| Car Clubs                                | Standard Car Club                 |
|  | Low Emission Car Club             |
| Travel Plans                             | Multiple sub-categories           |
| User-based Charging                      | Congestion Charging               |
|  | Emission-based parking charges    |
|  | Emission-based user charging      |



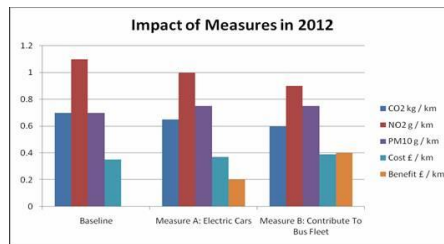
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## Application 3

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- User enters data characterising the development
- Tool calculates
  - baseline fleet for the development
  - emissions and damage costs
- User selects one or more planning measures
- Tool calculates
  - impact of measures on the fleet
  - emissions, damage costs
  - costs of planning measures



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## Summary

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- CERC, TTR, and RPS producing a Low Emissions Toolkit for the Low Emissions Strategies Partnership to
- Goal: *help local authorities reduce transport emissions*
  - Climate change
  - Local air quality
- Toolkit will be distributed to local authorities
  - Spreadsheet tool
  - Vehicle technology guide
- Final delivery to LESP is due later this year
- We assume LESP will distribute to local authorities shortly afterwards

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