

DG Cars

Sustainability reporting and marketing opportunities assessment



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Structure

1. Background
2. DG sustainability reports for clients
3. DG Green Marketing proposals

Summary

Increasingly public and private clients are looking to reduce environmental impacts and drive carbon out of their supply chain. In Nottinghamshire there are Health trusts, Universities and Local Authorities, that are UK and in some cases world leading in their approach to reducing their impacts. After a significant focus over the last few years on investment in energy efficiency, renewable energy staff travel and waste, increasingly there is focus on the supply chain. Particularly with regards to the supply chain for transport and logistics, with the associated urban air quality impact of fossil fuelled vehicles, health trusts and Local Authorities are particularly aware of the need to push these suppliers to report on and reduce their urban emissions.

A independent report from the Committee on the Medical Effects of Air Pollutants (COMAP) ¹ in 2010 suggested that there are up to 29,000 annual deaths annually from long term exposure to mainly vehicle related air quality. A revision due this year is expected to increase this to 60,000 to include the impact of NOx². These deaths are concentrated in urban areas. DG is responsible for up to 3% of Nottingham City's CO₂ emissions; though this may be mitigated by the fact that the company has invested in better than average efficiency vehicles.

Public clients need to evidence the impact of their procurement choices in driving more sustainable social and environmental outcomes. To do this, public and private clients need good data on environmental impacts and data that allows them to work with suppliers to reduce these impacts. This may be through adjusting the types of services procured or seeking collaborative funding to support lower emissions options. This data also then allows them to celebrate and report the impacts of collaboration and the positive direction of travel they have achieved through partnership.

It is clear that several large local public clients will soon commission services that require better reporting. If DG wish to have a competitive advantage in this valuable market they will invest in establishing a **client data portal**.

The low carbon sector is one of the fastest growing sectors in the UK economy (1/3 of all UK economic growth 2011-12). Many businesses, in looking to improve their low carbon credentials, value the visible commitment in using a **clearly branded sustainable** taxi service.

There are significant marketing opportunities available through engaging with local low carbon networks, such as the Low Carbon Hub and **Investors In the Environment to ensure credibility of claims**. Also in generating client **case studies** that evidence quantitative reductions in impacts achieved, and the use clients have made of this data to reduce their own impacts.

¹https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304641/COMEAP_mortality_effects_of_long_term_exposure.pdf

²<http://www.independent.co.uk/news/uk/home-news/air-pollution-to-blame-for-60000-early-deaths-per-year-government-to-be-warned-9893810.html>



While vehicles cannot all be zero emissions, providing an emissions **offset option at maybe 1p per mile/km**, that funds local community sustainable energy projects, would provide DG with several low carbon and social impact marketing and publicity opportunities throughout the year and if **independently audited** and supported by environmental experts, allow clients to claim carbon neutral taxi travel.

Section 1: Background

As Nottingham's largest private hire taxi service DG has around 700 vehicles and owns several brands as well as the DG brand, including Trent Cars. DG has already invested in improving the efficiency and emissions performance of its fleet with 70 hybrid vehicles and several electric vehicles. Many of the petrol vehicles are highly efficient models, achieving better MPG than hybrid vehicles.

DG has also installed a public charging point and private charging points at its depot. As another 'public transport' provider, alongside the tram and the bus network, DG is actively involved in the city councils plans for lowering the emissions of public transport in the city, through its Ultra Low Emission Vehicles programme; which is currently subject to a multimillion pound bid for central government funding.

The DG fleet has been improving steadily in line with Euro Emissions standards ³ and as UK government VED band taxation rates encourage more efficient vehicles.

³ http://en.wikipedia.org/wiki/European_emission_standards#Emission_standards_for_passenger_cars



European emission standards for passenger cars (Category M*), g/km

Tier	Date	CO	THC	NMHC	NO _x	HC+NO _x	PM	P [#/#km]
Diesel								
Euro 1†	July 1992	2.72 (3.16)	-	-	-	0.97 (1.13)	0.14 (0.18)	-
Euro 2	January 1996	1.0	-	-	-	0.7	0.08	-
Euro 3	January 2000	0.64	-	-	0.50	0.56	0.05	-
Euro 4	January 2005	0.50	-	-	0.25	0.30	0.025	-
Euro 5a	September 2009	0.50	-	-	0.180	0.230	0.005	-
Euro 5b	September 2011	0.50	-	-	0.180	0.230	0.005	6 × 10 ¹¹
Euro 6	September 2014	0.50	-	-	0.080	0.170	0.005	6 × 10 ¹¹
Petrol (Gasoline)								
Euro 1†	July 1992	2.72 (3.16)	-	-	-	0.97 (1.13)	-	-
Euro 2	January 1996	2.2	-	-	-	0.5	-	-
Euro 3	January 2000	2.3	0.20	-	0.15	-	-	-
Euro 4	January 2005	1.0	0.10	-	0.08	-	-	-
Euro 5	September 2009	1.0	0.10	0.068	0.060	-	0.005**	-
Euro 6	September 2014	1.0	0.10	0.068	0.060	-	0.005**	6 × 10 ^{11***}
* Before Euro 5, passenger vehicles > 2500 kg were type approved as light commercial vehicles N₁-I								
** Applies only to vehicles with direct injection engines								
*** 6 × 10 ¹² /km within first three years from Euro 6 effective dates								
† Values in brackets are conformity of production (COP) limits								

With 700 cars driving an average of 30,000 miles per annum, generally around Greater Nottingham, (Note this excludes emissions from idling time) DG cars travel up to 700x30,000= 21,000,000 miles or 33,796,224km per year.

Carbon Dioxide and Green House Gas Emissions

Assuming an average CO₂ equivalent (CO₂e) Green House Gas (GHG) emissions per km using DEFRA factors for UK average vehicle, the DG fleet are potentially responsible for more than:

33,796,224km X (0.24857 + 0.053911kgCO₂e per km) = **10,223tonnes CO₂e** emissions per year.

10,223tonnes of CO₂ equivalent is roughly **3% of city's total road transport emissions**. It is unlikely that any other single fleet except Nottingham City Transport and Trent Barton will have an impact that approaches this.

A more accurate calculation based on actual vehicle efficiencies should show that the DG fleet is responsible for less than this, however as a scalar analysis, this gives context to the impact of this single fleet on the city's overall transport emissions and the critical role DG has in supporting the city to address climate change and air quality issues.



NOx

Using Euro 5b standards for NOx as show above and a UK average of 40% diesel, 60% petrol gives a NOx emissions factor of $((0.18 \times 0.6) + (0.06 \times 0.4)) = 0.132\text{g NOx per km}$

With this as a rough estimate, the DG fleet are responsible for $0.132\text{g} \times 33,796,224\text{km}$ or 4.5 tonnes of NOx per year

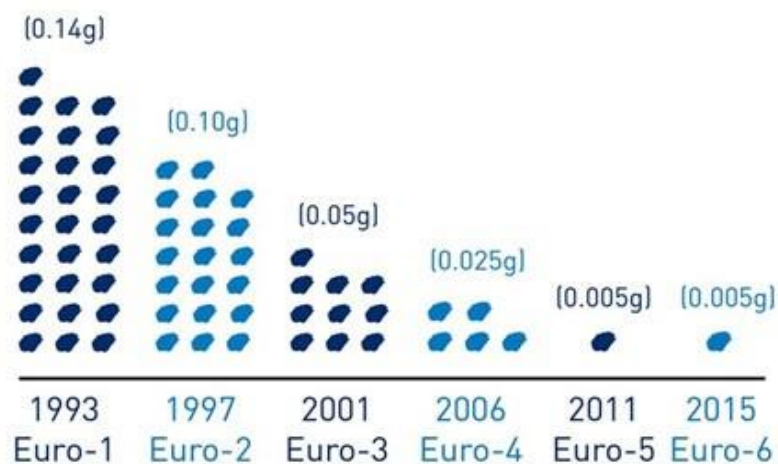
There are however suggestions, from actual road tests, according to research by Imperial College London and Emissions Analytics⁴ that Diesel cars may emit around three times more NOx pollution, in congested traffic, than is permitted in current European emissions tests and indicated by euro 5b standards.

The study analysed the exhaust emissions of 12 diesel cars, all of which met today's euro 5 emissions standard when tested in laboratory conditions. "We found that low-average-speed, stop-start driving dramatically increases levels of NOx emissions," says Nick Molden, CEO of Emissions Analytics.

PM10

A 2009 AEA report for TfL quantified the typical speed-emission coefficients for PM10s from London taxis at 25 km/h as 0.05750 g/km in 2010⁵. However under Euro5 standards vehicles since 2011 should be emitting roughly 0.005g/km PM10s ⁶

Particulate matter (PM10) emissions fell 96% from Euro-1 to Euro-6, and are today equivalent to one grain of sand per km driven



$33,796,224\text{km} \times 0.005 = 168,982\text{g}$ or 169kg PM10s

⁴ <http://www.telegraph.co.uk/motoring/news/10862975/Emission-tests-substantially-underestimate-pollution-pumped-out-by-diesels.html>

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/4556/aeat-updated-vehicle-emission-curves.pdf

⁶ <http://www.telegraph.co.uk/news/science/science-news/11573905/Diesel-vehicles-are-cleanest-ever-says-motor-industry-after-pollution-ruling.html>



It is likely that these PM10, NOx and CO2e emissions are focussed on Nottingham City Centre and around key public facilities, such as the train station, hospitals, schools council buildings and university buildings, with a gradually reducing impact out to the suburbs or greater Nottingham.

Indeed in late evening the majority of passenger vehicles in the city centre are taxis. Clearly there is a social and environmental responsibility that comes with such a significant contribution to urban air quality.

Health Impacts

Statistically pro rata per capita on national figures, there are around 150 deaths per year in Nottingham that are a result of the impacts of exposure to long term poor air quality from NOx and PM10s, this is largely from vehicle emissions. The true figure is almost certainly higher than this, as air quality health impacts are several times more acute in cities.

The official death toll for air pollution in the UK is currently 29,000, but this does not take into account levels of the gas nitrogen dioxide, which is mainly emitted by diesel engines.

According to a report due this year from the Committee on the Medical Effects of Air Pollutants, an official advisory body, the figure is actually as high as 60,000 per year in the UK.⁷ The risk is particularly high for those living in urban areas. This means that air pollution contributes 10-18% to total death rate across the UK particularly from lung and heart diseases and asthma. Public Health England has confirmed that NO2 is killing far more people than previously realised.

This issue is known to health trusts and public bodies. Consideration of reducing NOx and PM10 through their transport and logistics services, alongside carbon emissions, should be of some importance.

National and EU Legislation

Energy and carbon

There has been an increasing amount of legislative pressure around carbon reduction over the last few years. The **2008 Climate Change Act**⁸ set the UK 2050 carbon targets as an 80% reduction on a 1990 baseline. This has led a host of additional changes in the way carbon is dealt with in the UK including the **Companies Act 2012**⁹ requiring carbon reporting from LSE listed companies, UK carbon budgets and the **Carbon reduction Energy Efficiency Scheme (CREEES)**.

The targets in the CCA 2008 are translated in to **carbon budgets** for the UK by the **Independent Committee on Climate Change (The CCC)**¹⁰. The last Government's **Low Carbon Transition Plan**¹¹ and the current government's **Carbon Plan**¹² was put together under the last government and is supported by the current government.

⁷ <http://www.independent.co.uk/news/uk/home-news/air-pollution-to-blame-for-60000-early-deaths-per-year-government-to-be-warned-9893810.html>

⁸ <http://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change>

⁹ <https://www.gov.uk/measuring-and-reporting-environmental-impacts-guidance-for-businesses>

¹⁰ <http://www.theccc.org.uk/>

¹¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228752/9780108508394.pdf

¹² <https://www.gov.uk/government/publications/the-carbon-plan-reducing-greenhouse-gas-emissions--2>



EU legislation - CO₂ emissions

Within the European Union, road transport is responsible for about 20% of all CO₂ emissions, with passenger cars contributing about 12%. The target fixed at Kyoto Protocol was an 8% reduction of emissions in all sectors of the economy compared to 1990 levels by 2008-2012. Relative CO₂ emissions from transport rose rapidly in recent years, from 21% of the total in 1990 to 28% in 2004.

EU transport emissions of CO₂ currently account for about 3.5% of total global CO₂ emissions.

Obligatory vehicle CO₂ emission limits

EU Regulations sets an average CO₂ emissions target for new passenger cars of 130 grams per km. The target is gradually being phased in between 2012 and 2015. A target of 95 grams per km will apply from 2021.

In the area of fuels, the 2001 Biofuels Directive requires that 5.75% of all transport fossil fuels (petrol and diesel) should be replaced by biofuels by 31 December 2010, with an intermediate target of 2% by the end of 2005. However, MEPs have since voted to lower this target in the wake of new scientific evidence about the sustainability of biofuels and the impact on food prices. In a vote in Strasbourg, the European parliament's environment committee supported a plan to curb the EU target for renewable sources in transport to 4% by 2015. They also said that a thorough review would be required in 2015 before the EU could progress to an 8-10% mark by 2020.

In 2008 we saw the impact that sudden constriction in energy supply can have on fuel prices; **global risks remain present in fossil fuel supply** that could create a similar event.

There are also currently risks associated with gas supply and price, due to **conflict with Russia** and for electric vehicles the problem of **decreasing capacity margins** in the UK national electricity grid. According to OFGEM, 2015-16 could see a **significantly increased risk of large scale power outage** (1/12, up from 1/3300), as older coal and nuclear plant is shut down and new plant is still being built.

With the contentious issues of food vs fuel in biofuels, electric vehicles, and in the future hydrogen, is the current trajectory of the UK vehicle market. Looking at ways of linking EVs with local electricity generation to provide energy storage is becoming of increasing interest in the development of smart energy cities. Many cities are looking at ways to encourage electric vehicles and low emissions vehicles. To encourage low carbon technology local electricity generation and energy saving numerous measures have been put in place to incentivise and reward investment in energy saving and generating equipment. **Feed in tariffs¹³ and the renewable heat incentive¹⁴** have improved the business case for renewable energy.

If services are provided that minimise fuel use, have a flexible, and increasingly self-sufficient approach to low carbon fuel supply and cut emissions to air they can expect to perform financially and environmentally better than their competition.

¹³ <https://www.gov.uk/feed-in-tariffs>

¹⁴ <https://www.gov.uk/renewableheatincentive>



Increasingly cost aware clients are also choosing lower carbon options for energy, fuel and resource intensive products and services as a way of decoupling from cost risk.

Public Sector clients

NetPositive Chair the Public Sector Sustainable Procurement Working Group and are Low Carbon Sector Chairs for the Local Enterprise Partnership, we lead the Low Carbon Hub Consortium to develop support for the growth in low carbon sector businesses across the region.

Nottingham public bodies are some of the leading low carbon organisations in the UK and in some areas globally. The University of Nottingham and NTU are respectively the 1st and 3rd greenest universities in the world. The 4 Greater Nottingham Clinical Commissioning Groups, with a combined spending power of over £1bn, are recognised nationally in leading the health sector in low carbon practice. Notts Healthcare, Europe's largest mental health trust had the fastest falling CO2 emissions of any NHS organisation in the UK and topped the Carbon Reduction Commitment league table. Nottingham City Council has been recognised several times for its success in sustainable transport and carbon reduction, particularly for adopting a UK leading Energy Strategy in 2010, written by the NetPositive team.

All public bodies, though particularly Health and Universities, are required to report their carbon emissions and measures taken to reduce them. Since Dec 2012 under the influence of the **2012 Public Service Social Value Act**, they have also been required to demonstrate how they are proactively using their procurement processes to drive improvements in social, economic and environmental sustainability before opening up tenders.

NetPositive established the Public Sector Sustainable Procurement Group to enable public bodies to collaborate in evidencing their approach in using public procurement to drive improvements in social, economic and environmental sustainability.

The Group were asked if any would like to look in more detail at the impacts of their taxi services. 3 group members specifically asked to be involved in the discussion.

- NCC- Current DG Clients
- UoN- Current DG Clients,
- Notts HC- future procurement planned.

NTU have also expressed a strong interest in tendering for a company that reports on sustainability metrics.

Section 2 - Suggested data for reporting:

The 3 public bodies were asked what sort of data would they find useful to help them evidence manage and reduce the social and environmental impacts of their taxi services. The organisations asked NetPositive to propose a list that they could evaluate and respond to.

NetPositive proposed the following list of reporting metrics and issues that could potentially be integrated into a contract.

Points 1 and 2 are more to do with format and usability, point 3 would be the minimum data required for the clients to make their own estimates of CO₂, PM10 and NO_x impacts of the service,



from UK averages. Reporting on point 3 alone would not allow any comparison between different providers, so providing no differentiation to allow clients to favour a lower carbon provider.

Point 4 and 5 would allow demonstration of differentiation and a USP for a lower carbon provider with a high % of VED band A and B vehicles.

Points 6-8 start to provide the client with evidence for choice in booking taxis, showing the net impact of choosing VED band B, C or lower over VED band A vehicles. This provides the client with and incentive and means to engage staff in behaviour change in vehicle selection and the means to monitor impact of these initiatives.

Points 9-12 would support clients in looking at better ways of working with DG. Evidence of repeated journeys on 1 route could provide incentive for a designated minibus service, to increase vehicle occupancy, or help to site electric vehicle charging, to encourage DG electric vehicles to operate from those locations.

Data

Reporting area	Response from clients
1. Reporting period. Real time cumulative/ Weekly/ monthly/ quarterly/ annual. What period would be sufficient?	Ideally same as billing period
2. Reporting media. Email report PDF/ online portal/ online portal with CSV downloadable data file. What media would be most useful?	Online portal with downloadable CSV data
3. Total taxi mileage	Yes
4. Total mileage split by fuel type	Yes but better by VED band
5. Ave. CO2/PM10/NOx pmile for contract in reporting period.	Yes
6. Total CO2 emissions by fuel type	Yes but better by VED band
7. Total PM10 emissions by fuel type	Yes but better by VED band
8. Total NOx emissions by fuel type	Yes but better by VED band
9. Top 10 most frequent inbound pick up locations. By no./ journey length	Yes
10. Top 10 most frequent inbound drop off locations. By no./ journey length	Yes
11. Top 10 most frequent outbound pick up locations. By no./ journey length	Yes
12. Top 10 most frequent outbound drop off locations. By no./ journey length	Yes
13. Emissions Offset or not	

Proposal

It is suggested that DG commission a web developer to support in live exporting client data from the DG database to a client password protected user area.

The data should be of the type above and downloadable in CSV format, 2 simple data displays that shows

1. km or miles travelled by vehicles of each VED band
2. emissions arising from all journeys by vehicles of each VED band

These should be displayed as bar charts with numerical table underneath and be displayable ether by month, quarter or year ensuring that one of the display options matches the billing period.



A separate page should show the top 10 inbound and outbound drop off and pick up locations again shown by 4 bar charts with numerical tables beneath and also viewable by month, quarter and year.

A similar simple reporting system has been developed locally by Nottingham company, Internova, <http://www.internova.co.uk/about-us.html> for Wastecycle. They have already been approached for an outline quote for this type of work to ascertain in outline the level of investment required .

