Environment, Climate Change and Land Reform Committee

Inquiry into air quality in Scotland

Written submission from Calor

Calor Scotland welcomes the Environment, Climate Change and Land Reform Committee inquiry into improving air quality in Scotland. We believe the solution lies in offering drivers of all vehicles a choice of alternative fuels and modes of transport, so that they can choose how they reduce the impact of emissions from diesel vehicles on the public’s health.

Calor offers LPG (Liquefied Petroleum Gas) and LNG (Liquefied Natural Gas) as alternative fuels for vehicles of all sizes. LPG, sold via our joint venture Autogas, has been proven to reduce NOx by 80% and PM by 99.9% in real world testing compared to diesel in Black Cabs. It can also deliver real world CO₂ savings – the same converted TX4 diesel taxi cab showed a reduction in CO₂ of 7%. LNG offers reductions in CO₂, particulates, NOx and SOx. In addition, bioLPG will be available in the UK, at scale, in the near future. This can be deployed via existing infrastructure and offers a carbon saving of 90% to petrol and diesel.

Does Scotland have the right polices (Clean Air for Scotland Strategy), support and incentives in place to adequately tackle air pollution?

Calor welcomed the commitment in the Clean Air for Scotland strategy that the Scottish Government will “continue to engage with partners on the role lower carbon intensive fuels such as liquid petroleum gas, compressed natural gas and biofuels can play in the transition towards a near zero emission road transport sector by 2050.”

However, to help ensure that the potential air quality benefits of LPG are maximised, Calor believes the following actions should be taken:

- Evidence on LPG should be incorporated into the National Modelling Framework, including outcomes from on-going and emerging research.
- LPG should be captured as an option in detailed modelling of the four cities, especially with regard to its use in taxis, Private Hire Vehicles, vans and HGVs.
- LPG should be identified as an option in guidance to Local Authorities.
- The development of an accessible modelling tool which will enable Scottish cities to understand the benefits of LPG should be supported.

The Scottish Government and local authorities should consider part-funding conversions of diesel TX1, TX2 and TX4 cabs to LPG as has been done in Birmingham City Council, prioritising older vehicles to ensure the most significant impact on reducing harmful emissions.

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Additionally, Calor would like to see funding made available for the development of gaseous fuel stations, for fuels such as LNG and CNG, to encourage fleet operators of heavy goods vehicles to consider switching in the knowledge there is an established refuelling network.

**Are the powers and resources of Local Authorities and SEPA to address air pollution adequate?**

Local authorities are able to grant an extension of life to taxis through licensing if they are converted to run on LPG. Transport for London (TfL) currently provides a 5 year extension for LPG converted taxis which is an affordable option for many taxi drivers as the pay back is less than two years due to difference in price of LPG to diesel. Reading Council has recently implemented a similar condition and it remains an option for Scottish local authorities as they develop their LEZ plans.

**Are the policies and delivery mechanisms (support and incentives) being effectively implemented and successful in addressing the issues?**

Transport Scotland are currently in the process of developing a National Low Emissions Framework. The Framework will enable local authorities to appraise, justify the business case for, and implement a range of air quality improvement options related to transport. Calor believes it is important that LPG is part of the Framework to ensure that local authorities are aware of all the options available to them in seeking to reduce transport related emissions. Transport Scotland figures for 2014 show that, only 0.04% of vehicles in Scotland were run on some form of gas bi-fuel. Thus opportunities exist for the introduction of LPG/bioLPG.

Calor commissioned a report by Aether to quantify emissions that could be saved through use of LPG and the wider sustainable development benefits that targeted LPG use in taxis and vans could bring to Scotland’s cities. The report showed targeted LPG use in taxis, PHVs, vans and potentially HGVs, could contribute to the National Low Emissions Framework helping emission reduction targets to be achieved in Scotland and bring wider sustainable development benefits.

These benefits were broken down by environmental, social and economic factors:

**Environmental:** LPG use in taxis, vans and potentially HGVs could offer Scotland air quality improvements with regard to NOx as well as CO2. A reduction in emissions in the vicinity of taxi ranks and fleet depots offers potential ‘easy wins’ in relation to Scotland’s existing city centre Air Quality Management Areas. Any carbon reduction will be greatly enhanced with the introduction of bioLPG onto the Scottish market in 2017. BioLPG offers carbon savings in the region of 43% to 89% compared with the fossil fuel it replaces.

**Social:** A targeted approach to air quality emission reduction could help social inequality related to air quality and reduce health impacts more broadly. For communities who live in Scotland’s existing AQMAs in the city centre or near industrial estates LPG use in taxis, LGVs and HGVs could make a major impact on local air quality.
**Economic:** LPG offers an immediate, subsidy free option for central and local government as the infrastructure is already in place and can be expanded at no cost to the taxpayer; vehicle retrofit will have local, direct employment benefits for the existing sector; and LPG offers financial benefit to drivers reflecting the fact that LPG is a lower cost fuel which means that the payback period for a LPG conversion can be within 2-3 years, providing an additional incentive for drivers.

The report also helps identify locations, in the cities of Edinburgh, Glasgow, Aberdeen and Dundee, where targeted use of LPG could have the greatest impact. The maps for Edinburgh and Glasgow have been included in this response.

Taking Glasgow as an example, there are over 1425 taxis and 2640 private hire vehicles registered to operate within Glasgow. Aether's analysis looked at two scenarios for reducing emissions from the taxi and PHV fleets where 5% and 10% were powered by LPG over the whole of the city.

The scenarios are seen as aspirational but plausible given the DfT's existing Clean Air Fund which has provided Birmingham City Council with a grant to repower 63 black cabs to LPG. The DfT has recently announced new funding of £150m which will provide additional support to retrofit existing engines in order to reduce NOx.

In terms of the variable, the following is considered:

- Taxi/PHV vehicle mileage – 45,000 miles (higher) and 30,000 (lower) scenarios were tested.
- Vehicles substituted – LPG substitution of diesel Euro 3/4/5 and Euro 6. A 50:50 split between black cabs/PHV was assumed.
- Average speed: 20mph corresponding with Transport Scotland analysis for Glasgow

For LGVs, two scenarios were modelled with 1.25% and 2.5% of vehicles powered by LPG, based on levels of uptake witnessed in the rest of the EU.

Emissions savings for NO\textsubscript{X} could be between 12 and 32 tonnes per year assuming LPG substituted for taxis, PHVs and LGVs. The UK National Emissions Inventory shows NO\textsubscript{X} total emissions from road transport in Glasgow as 2622 tonnes in 2014.
Thus under a higher mileage, higher uptake scenario a reduction of around 1.2% could be achieved from use in taxis, PHVs and LGVs.

The results from the Glasgow example suggest that LPG offers significant potential for reducing NOx from a vehicle segment that does not have many low emission alternatives.

The modelling for Glasgow also shows potential carbon savings which were greater if older vehicles are substituted and if real world usage is taken into consideration. Annual savings of CO$_2$, as set out below, are based on the assumption of savings in line with the latest data on real world testing for diesel TX4 cabs. Comparable data on real world testing for PHVs could increase these savings further.

![Annual CO$_2$ savings tonnes - Taxi only](image)

**How should the improvement of air quality be prioritised in areas where there have been persistent breaches of NO$_2$ limit values?**

Local Authorities need to undertake a detailed assessment of the local area to identify areas exceeding the base line levels of NOx. The make-up of current traffic flows, types of vehicles operating in that particular area and pollution hotspots will help to identify the scope and extent of the LEZ required. Calor will work with Local Authorities as required to help them determine the arrangements best suited for their area.

As well as giving consideration to the potential benefits of LPG for air quality at city level, the Aether analysis also looked at the potential impact on a more local level in Glasgow and Edinburgh, in relation to the location of the AQMAs. On the maps (below) areas where vehicles are likely to be driven are shown including:

- For taxis and PHVs, the location of taxi ranks$^2$ has been used, reflecting these as key locations for taxi pickups and for journeys which will involve pre-booked cabs, for example, main train stations.
- For LGVs, data on the location of industrial estates$^3$ are relevant to the use of LGV vehicles.

• For HGVs, data on the location of ports and industrial estates has been used. Whilst caution needs to be applied (correlation does not imply causation) setting the AQMAs in the context of locations related to vehicle use—especially for taxis in the city centres does suggest that the targeting of these vehicles could offer potential easy win opportunities.

3 https://m.trafficscotland.org/Mapping/ViewMap?layerIds=209
Are there conflicts in policies or barriers to successful delivery of the air quality objectives?

Local authorities are inevitably going to be concerned about the costs to themselves as well as business of any refuelling infrastructure required to support low emission vehicles. LPG refuelling infrastructure exists already with over 150 LPG refuelling stations across Scotland and as demand increases, it could be expanded at no cost to local authorities or customers.

As a readily available, low emission fuel, LPG offers diesel van drivers and fleet operators a "no regrets" solution which is cheaper to run, while functioning in a very similar way to diesel. However, UK diesel van drivers and fleet operators looking to reduce their emissions can only source LPG-powered vans through the conversion of petrol vans to run on LPG.

This is because there are currently no LPG, factory fitted, vehicles available to buy in the UK. It is not because these LPG vehicles are not available. They can be easily purchased across Europe, North America, the Far East and Australia. However, vehicle manufacturers believe that the Government here does not support LPG because there is a fuel duty escalator placed on the fuel by UK Treasury. Albeit that it has never been enacted. This has acted as an effective brake on the development of factory-fitted LPG vehicles in the UK.

As a result Calor is asking HM Treasury for the removal of the fuel duty escalator. This will send a positive signal to taxi, van and HGV drivers who may consider switching to LPG to extend the life of their existing diesel vehicles for use within
future CAZs and ULEZs. Such a move would also send a positive signal to vehicle manufacturers, fleet managers and individual owners, promoting the uptake of conversions and the availability of new LPG production vehicles.

With regards to LNG, which is most-suited to HGVs, further support in developing a network of gaseous fuel parks, demonstrating the fuels available is required. Currently there is a reluctance by fleet operators to choose LNG, knowing that there is not an already established refuelling network. Reluctance is also shown on behalf of HGV manufacturers for the same reason, who see no reason to develop a right-hand drive version of their LNG models. Funding to help the development of strategic sites would help to encourage the choice of this cleaner fuel and the increased demand would then lead to the market supplying further supply points.