Low Carbon Vehicle Report

For

The Minister for Economy, Science and Transport

September 2015

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Report of the Low Carbon Expert Steering Group

This is the report of the Low Carbon Expert Steering Group (the Group) for the Minister for Economy, Science and Transport (the Minister).

1. Background to the Group

1. The Group was established following the Minister's statement on low carbon vehicles (LCVs) in July 2013[1].

2. The statement recognised that, as well as helping support sustainable transport solutions in Wales through offering environmental and social benefits for both urban and rural communities, increasing the uptake of LCVs can promote economic growth and job creation. The Group considers this to be an excellent example of green growth.

3. The UK is at the forefront of low carbon vehicle development, with British products and services experiencing international demand and significant investment having been committed by major manufacturers to produce and sell LCVs in the UK[2].

4. In Wales the existing automotive base is significant, with over 150 automotive companies based here employing around 15,000 people and bringing an estimated £3 billion to the Welsh economy annually. This places Wales in a good position to develop a centre of excellence for LCVs, stimulate new growth opportunities and capitalise on the economic benefits. The automotive sector in Wales accounts for 6% of the total UK employment in the automotive industry and 11% of the automotive components and parts sector. This mean that in terms of wealth creation, Wales has the second highest dependency on the auto industry in the UK; second only to the West Midlands[3].

Remit

5. The Group's remit is to provide the Minister with advice and recommendations on the development of the LCV sector in Wales to maximise the sector's opportunities for growth and jobs and to support social and environmental benefits. It will do this by

   - identifying evidence for LCV support in Wales, drawing on available evidence, best practice and evaluations

[1] http://wales.gov.uk/about/cabinet/cabinetstatements/2013/lowcarbonvehicles/?lang=en
[2] http://www.lowcvp.org.uk/assets/reports/Investing%20in%20the%20low%20carbon%20journey%20-%20FULL%20REPORT.pdf
[3] Cardiff Business School

- identifying barriers and opportunities to uptake through reviewing the current support for the sector, the needs and requirements of the sector and consumers
- identifying cost effective and sustainable intervention options for the Welsh Government to take in support of the sector
- promoting the uptake of LCVs to the public estate and business sectors

6. The Group recognises that, for the purpose of reducing overall emissions from vehicles, achievements can be made by changing the way they are driven or routed – for example, through 'eco-driving', and telematics for fleet vehicles. However for the purpose of the Group's work, the term 'low carbon vehicle' relates to the technology of the road vehicles, and specifically to electric and gaseous fuel technologies on road vehicles.

7. Although the Group's work has been focused on low carbon road vehicles, it understands that rail electrification is an important part of the UK's carbon strategy, with an electric train typically emitting between 20% and 35% less carbon per passenger mile than a diesel train, and that this benefit will only improve as the electricity generation industry reduces its carbon levels. The Group notes that the Welsh Government has worked with the UK Government and Network Rail to secure the electrification of the South Wales Mainline.

8. The Group, chaired by Professor Garel Rhys, Emeritus Professor at Cardiff University and President of Automotive Industry Research**,** comprises representatives from the automotive industry, manufacturers, supply chain businesses, utility companies and academia. Membership details are at Annex A.

2. Summary of Recommendations

9. The Group's recommendations for the Minister are summarised in the following table:

A: the Welsh Government considers installing LCV infrastructure at all its premises and encourages local authorities to do the same, making the information widely available in location, type and availability.
B: the Welsh Government installs LCV infrastructure at all premises when they are undergoing major refurbishment or where new premises are being built. Local Authorities to consider installation of LCV infrastructure in changes or new road infrastructure projects across Wales, in particular transport hubs such as park and ride or major interchanges (road to train).
C: depending on the nature of the project, the Welsh Government considers making the installation of LCV infrastructure and/or the provision of an LCV fleet, a condition of grant to the private, third or public sector.
D: any Welsh Government owned vehicle that needs to be changed is replaced with an appropriate LCV vehicle if there are no implications for health and safety; and the Welsh Government encourages local authorities to do the same.
E: the Welsh Government markets support for and benefits of LCVs and the necessary refuelling infrastructure and establishes a national contact point to which business, consumers and academia in Wales can direct LCV related queries in respect of Wales, and which can liaise on their behalf with OLEV on relevant issues if required.
F: expert solutions are provided to help organisations across the public and private sectors improve their fleet efficiency through the adoption of LCV technologies.
G: an up to date map of publicly accessible LCV infrastructure in Wales is produced, marketed and maintained by the national contact point recommended in Recommendation A, and is published on the Welsh Government and Traffic Wales website.
H: working with members of the Group, the Welsh Government provides a forecast of future refuelling infrastructure coverage on strategic routes without further government intervention and an analysis of whether there will be any strategic gaps, using the TEN-T network as basis for the strategic routes.
I: depending on the findings from Recommendation H, the Welsh Government considers plugging any strategic refuelling infrastructure gaps directly as they are likely to be on its own trunk road network, or establishing partnership arrangements with external bodies; and also explore further funding possibilities for plugging the gaps under the Connecting Europe Facility.
J: the Welsh Government considers establishing a grant scheme to which town

and community councils could bid for installing publicly accessible LCV infrastructure; integration with car clubs or tourism destinations to be reflected in bidding criteria.
K: the Welsh Government considers the use and usefulness of a 'Green Bus Fund' for the bus operators and establishing a fund to support the adoption and use of low carbon vehicle technologies for public transport.
L: Wales engages with vehicle manufacturers and the automotive industry regarding LCVs, Compressed Natural Gas and hydrogen research and development and low carbon growth opportunities, in particular targeting potential inward investors.
M: the Welsh Government continues to influence UK spend on LCV innovation and encourages Welsh organisations to apply for this funding.
N: the Welsh Government supports organisation's LCV research, development and innovation needs and innovation needs.

3. Background to LCVs

10. The Automotive Council's[4] roadmap sets out how low carbon technologies are likely to evolve for cars over the next 30 years and reflects the views across the UK's leading automotive developers and manufacturers (Annex B). The roadmap recognises that the internal combustion engine will continue to have an important role to play for years to come (this will secure the future of many automotive companies in Wales), but also makes clear that a wide portfolio of technologies and systems, including hybrid, electric and fuel cell vehicles, will play an ever greater role in the coming years. There are also efficiency savings that can be realised across each of these technologies from making vehicles lighter and more aerodynamic, however this was considered by the Group to be out of scope for this report.

11. In the main, the Welsh Government's view has been that the market is best placed to lead on the promotion and development of LCVs and their refuelling infrastructure. The Welsh Government now wants to explore the scope for intervention for socio-environmental reasons and supporting jobs and economic growth.

Key principles

12. Intervention options recommended for the Welsh Government must be based on sound evidence as to their expected outcomes, must add value, be cost-effective, complement Welsh Government policies and be sustainable.

Evidence

13. As well as taking into account Welsh Government policies, the Group considered a range of statistics, data and experience of support to the LCV sector from across the UK.

LCV Trends and Forecasts

14. OLEV have forecast that the plug-in car and van grant uptake will increase from a cumulative total of 40,000 to over 60,000 by the end of 2015 (Annex C).

15. There were 367 plug-in car and van grant vehicles newly licenced in Wales in 2014, 2.5% of the UK total (compared with less than 0.1% of the UK total in 2010). The number is increasing with a figure of 188 plug-in car and van grant vehicles registered in the January to March quarter 2015 (Annex D).

[4] http://www.automotivecouncil.co.uk/

4. Advice and Recommendations

16. In drawing up this report, the Group has had regard to the work of OLEV and the grants available in Wales under OLEV's new funding package arrangements. OLEV is a partnership of three UK Government Departments: Transport, Business, Innovation & Skills, and Energy & Climate Change. Its remit is to support the early market for ultra-low emission vehicles (ULEV) in order to position the UK at the global forefront of ULEV development, manufacture and use, contributing to economic growth and helping reduce greenhouse gas emissions and air pollution.

17. In April 2014, the UK Government published a report on ultra low emission vehicles in the UK: measures to support use and development, 2015 to 2020. The advice and recommendations below will complement support provided at a UK level.

18. The Group was mindful of the following general factors in reaching its recommendations:

- relevant legislation, focusing on emissions reduction, is technology neutral and the market has reacted by manufacturing as standard conventional fuel vehicles whose emissions are significantly lower than previous models, and this will continue

- the cost of oil, which will continue to influence consumer choices (although the accepted wisdom is the long term trend will be up)

- the re-sale or residual value of low carbon vehicles and the relationship between this and the cost of buying such vehicles new and running them

- range anxiety and the availability of LCV infrastructure, especially in more rural areas. The need to keep different types of fuel spatially separate could be a more significant barrier in less populated areas where smaller petrol stations, that do not have the space, are more common

- although the use of low carbon vehicles in urban areas should lead to social and environmental benefits by, for example, improving air and noise pollution, any interventions to encourage their use need to complement the Active Travel (Wales) Act 2013, as the Welsh Government's overarching aim is to reduce reliance on motor vehicles for commuting in urban areas

19. Based on the available evidence, the Group considers that the following are key interventions or actions that should be taken forward by the Welsh Government to support the uptake of low carbon vehicles in Wales

Government Leadership, Co-ordination and Marketing

20. The Group considers that government needs to act as an exemplar for encouraging the uptake of LCVs. The Group therefore considers that:

- **Recommendation A:** the Welsh Government considers installing LCV infrastructure at all its premises and encourages local authorities to do the same, making the information widely available in location, type and availability.

- **Recommendation B:** the Welsh Government installs LCV infrastructure at all premises when they are undergoing major refurbishment or where new premises are being built. Local Authorities to consider installation of LCV infrastructure in changes or new road infrastructure projects across Wales, in particular transport hubs such as park and ride or major interchanges (road to train)

- **Recommendation C**: depending on the nature of the project, the Welsh Government considers making the installation of LCV infrastructure and/or the provision of an LCV fleet, a condition of grant to the private, third or public sector

- **Recommendation D** : any Welsh Government owned vehicle that needs to be changed is replaced with an appropriate LCV vehicle if there are no implications for health and safety; and the Welsh Government encourages local authorities to do the same

21. The Group recognises that OLEV's remit is UK wide and that establishing a similar office for Wales might not add value. However the Group considers that Wales needs to badge and market itself nationally as supportive of LCV uptake, and that establishing a national contact point and web information could help.

22. The Group also suggested that Wales needs to raise awareness, promote incentives and communicate benefits of all LCV types.

23. The Group therefore recommends that:

- **Recommendation E:** the Welsh Government markets support for and benefits of LCVs and the necessary refuelling infrastructure and establishes a national contact point to which business, consumers and academia in Wales can direct LCV related queries in respect of Wales,

and which can liaise on their behalf with OLEV on relevant issues if required.

- **Recommendation F:** expert solutions are provided to help organisations across the public and private sectors improve their fleet efficiency through the adoption of LCV technologies.

LCV Infrastructure

24. There is currently no national map of LCV infrastructure provided and marketed solely for Wales. However, there are a number of mobile phone applications and web sites that show the location of electric vehicle charge points across Wales and the rest of the UK. The Group considers such a comprehensive map of LCV infrastructure is required and therefore recommends that:

    - **Recommendation G** – an up to date map of publicly accessible LCV infrastructure in Wales is produced, marketed and maintained by the national contact point recommended in Recommendation A, and is published on the Welsh Government and Traffic Wales website.

25. The Group notes that, the new OLEV funding package includes the continuation of 'Plug in' van grants for business and 'Plug-in' car grants to help with the costs of buying new LCVs. OLEV funding is also available to help installing domestic electric charging points.

26. The Group notes there is currently no national policy on the provision of publicly accessible LCV infrastructure in Wales and that provision has largely developed in line with market demand and with private investment; with the availability of electric LCV infrastructure being relatively well-developed and hydrogen LCV infrastructure less so, which reflects current supply and demand patterns. However a not insignificant influence on this pattern has been the availability of European funding for LCV infrastructure on Trans-European Transport Network (TEN-T) strategic road routes[5], which include the M4 and the A55.

27. The Group consider that one role for the Welsh Government is to implement economic policies that promote positive externalities by supporting the initial supply of infrastructure for all LCVs that will generate external benefits for society. The private sector can be relied upon to provide most of the infrastructure that is needed once a societal optimum has been reached and

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5 http://ec.europa.eu/transport/themes/infrastructure/doc/com%282011%29_650_final_2_annex_i_part07.pdf

early majority market adoption is reached. Therefore, some form of intervention is justified to support the early adoption of the vehicles necessary to promote the benefits of the wider use of the technologies.

28. It is possible that, through a combination of OLEV funding, TEN-T funding and private investment, a network of LCV infrastructure is likely to emerge on the South and North arterial routes and on other routes without further government intervention. However the provision of hydrogen LCV infrastructure is considerably less predictable.

29. The Group considers that government needs to explore whether there are likely to be any strategic geographical gaps which should be filled for electric charging points, and to look at the need for hydrogen LCV infrastructure on the strategic road network. The Group therefore recommends that:

- **Recommendation H** – working with members of the Group, the Welsh Government provides a forecast of future LCV infrastructure coverage on strategic routes without further government intervention and an analysis of whether there will be any strategic gaps, using the TEN-T network as basis for the strategic routes.

- **Recommendation I** – depending on the findings from Recommendation H, the Welsh Government considers plugging any gaps directly as they are likely to be on its own trunk road network, or establishing partnership arrangements with external bodies; and explore further funding possibilities for plugging the gaps under the TEN-T Connecting Europe Facility[6].

30. The Group recognises that pure battery electric vehicles might be easier to market for urban areas because of their range and the particular benefits they can bring to urban environments. However the Group appreciates the growing interest in LCVs for rural areas, away from the strategic routes, where alternatives to the car are more restricted, with walking or cycling less likely to be a commuting option and public transport more limited. So rural areas are more dependent on the car and this is reflected in higher per capita ownership level in rural areas.

31. The Group considers that there is considerable scope for integrating publicly accessible rural LCV infrastructure with community owned car clubs.

32. The Group also recognises that Wales is fast becoming an eco-tourism destination and that the availability of publicly accessible LCV infrastructure beyond the strategic routes could enhance that market.

33. The Group therefore recommends that:

[6] http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding/cef_en.htm

- **Recommendation J** – the Welsh Government considers establishing a grant scheme to which town and community councils could bid for installing publicly accessible LCV infrastructure; integration with car clubs or tourism destinations to be reflected in bidding criteria.

Incentives

34. The Group considers that the availability of a government 'Green Bus Fund' in England and Scotland has helped stimulate the uptake of LCVs, especially hydrogen, in the public transport sector and that the establishment of a similar fund for Wales could be useful, especially in helping to support new, hydrogen driven, economic growth opportunities. The Group welcomes the fact that the new bus fund under the new OLEV funding package arrangements[7] will extend to England and Wales, unlike the previous OLEV fund that was restricted to England. However given the competitive nature of the bidding process and that the criteria are yet to be finalised, the Group believes that the establishment of an additional fund exclusively for Wales should be considered. Early engagement should also be encouraged to develop credible and winning bids to the process. If such a fund were established, it is suggested that the Welsh Government may wish to consider monitoring the use and usefulness of such funding for the bus operators and prioritising funding on an 'invest to save' basis, where the technology would reduce overall running costs within the lifetime of the vehicle.

35. The Group therefore recommends that:

- **Recommendation K** – the Welsh Government considers the use and usefulness of a 'Green Bus Fund' for the bus operators and establishing a fund to support the adoption and use of low carbon vehicle technologies for public transport.

Industry Development

36. The Group recognise the emerging LCV market has been supported through research, development and innovation (RD&I) funding. This support needs to continue to maximise the value to the Welsh economy. Market stimulation at a UK level has also helped to drive demand and attract inward investment.

37. The Group therefore recommends that:

- **Recommendation L** – Wales engages with vehicle manufacturers and the automotive industry regarding LCVs, Compressed Natural Gas and hydrogen research and development and low carbon growth opportunities, in particular targeting potential inward investors

[7] https://www.gov.uk/government/publications/low-emission-bus-scheme-preliminary-guidance

- **Recommendation M** – the Welsh Government continues to influence UK spend on LCV innovation and encourages Welsh organisations to apply for this funding

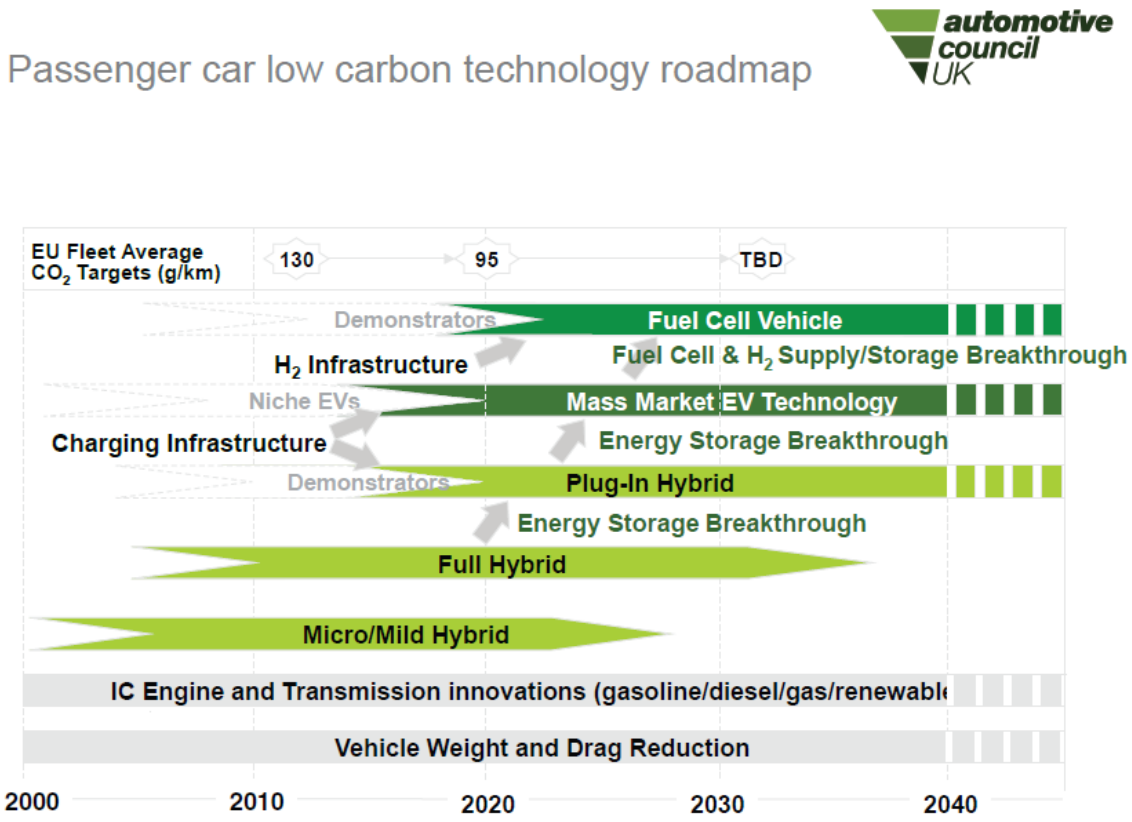
- **Recommendation N** – the Welsh Government supports organisation's LCV research, development and innovation needs.

ANNEX A

Low Carbon Vehicle Steering Group Members

Member	Organisation
Professor Garel Rhys	Welsh Automotive Forum & Cardiff Business School
Dr. Huw Davies	Electric Vehicle Centre of Excellence, Cardiff University
Dr. Liana M. Cipcigan	Electric Vehicle Centre of Excellence, Cardiff University
Dr. Paul Nieuwenhuis	Electric Vehicle Centre of Excellence, Cardiff University
Tim Williams	Welsh Automotive Forum - CEO
Dr Jon Maddy	University of South Wales
Duncan McCombie	Energy Saving Trust. Director Wales and Ireland
Bruce McGregor	British Gas Business Development Manager, Electric Vehicles
David Densley	SSE, Head of Sustainable Transport
Paul Jewell	Western Power Distribution
Phil Lowndes	Gas Bus Alliance
Dr John Newton	ITM Power PLC

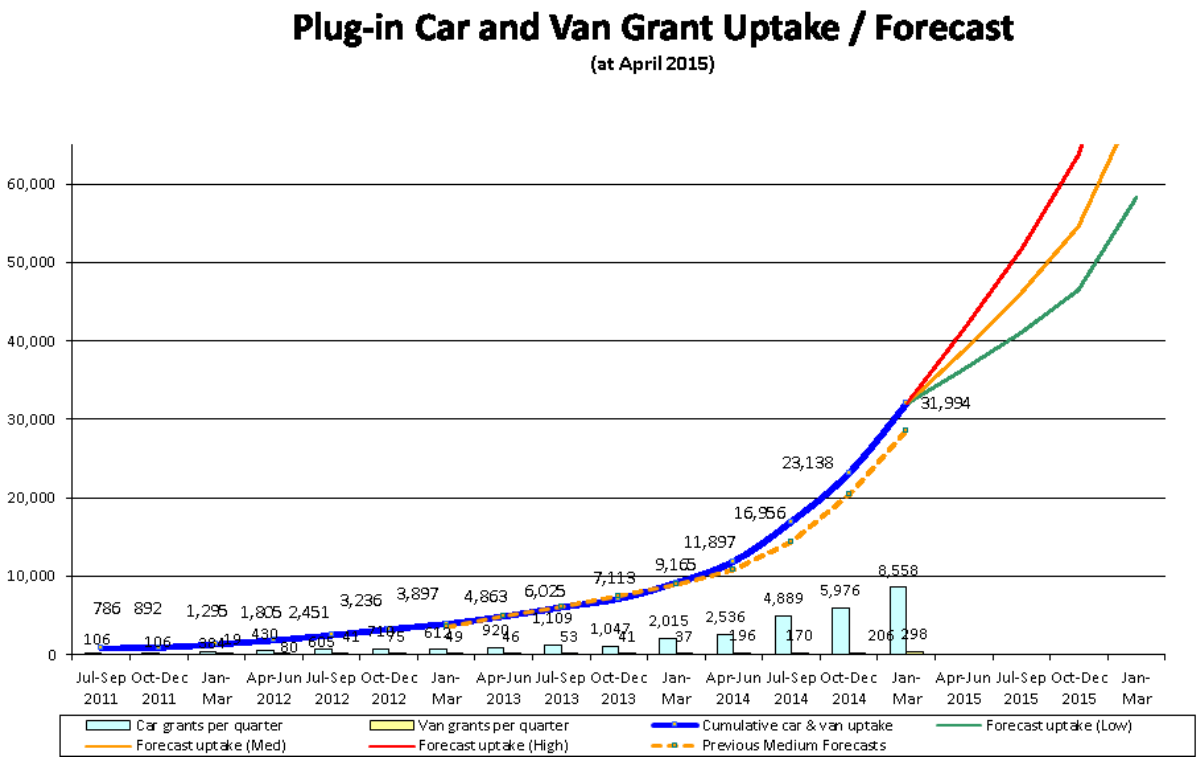
ANNEX B



Source: Automotive Council Technology Group 2013[8]

[8] http://www.automotivecouncil.co.uk/technology-group-2/automotive-technology-roadmaps/

ANNEX C



Source: OLEV, July 2015

ANNEX D

Department for Transport statistics
Vehicle Licensing Statistics (https://www.gov.uk/government/collections/vehicles-statistics)

Table VEH0170

Ultra-low emission vehicles (ULEV)[1] registered for the first time, Wales, quarterly: January 2010 to March 2015

Number

Year	Month	Plug-in-Grant Eligible Cars	Non Plug-in-Grant Eligible Cars [2]	Quadricycles	All Cars (inc. quadricycles)	Motor cycles & tricycles	Plug-in Grant Eligible Vans	Non Plug-in Grant Eligible Vans [2]	All Vans	Heavy goods	Buses and coaches	Other vehicles	Total
2010	01 Jan-Mar	0	1	0	1	4	0	0	0	0	0	1	6
2010	02 Apr-Jun	0	0	0	0	5	0	0	0	0	0	1	6
2010	03 Jul-Sep	0	0	0	0	3	0	0	0	0	0	1	4
2010	04 Oct-Dec	0	1	0	1	2	0	0	0	0	0	0	3
2011	01 Jan-Mar	4	0	0	4	3	0	0	0	0	0	0	7
2011	02 Apr-Jun	3	0	0	3	2	0	0	0	0	0	0	5
2011	03 Jul-Sep	6	0	0	6	1	0	2	2	0	0	1	10
2011	04 Oct-Dec	2	0	0	2	0	1	1	2	0	0	1	5
2012	01 Jan-Mar	11	0	0	11	2	1	0	1	0	0	1	15
2012	02 Apr-Jun	8	0	8	16	1	0	0	0	0	0	0	17
2012	03 Jul-Sep	13	0	5	18	1	1	0	1	0	0	0	20
2012	04 Oct-Dec	5	0	0	5	2	1	1	2	0	0	0	9
2013	01 Jan-Mar	12	0	2	14	2	0	1	1	0	0	0	17
2013	02 Apr-Jun	16	1	2	19	1	2	0	2	0	0	0	22
2013	03 Jul-Sep	20	0	3	23	0	0	0	0	0	0	1	24
2013	04 Oct-Dec	21	0	0	21	1	0	0	0	0	0	0	22
2014	01 Jan-Mar	34	0	0	34	0	0	0	0	0	0	0	34
2014	02 Apr-Jun	69	0	1	70	1	0	0	0	0	0	4	75
2014	03 Jul-Sep	139	0	1	140	3	1	0	1	0	0	0	144
2014	04 Oct-Dec	125	0	0	125	4	5	0	5	0	0	2	136
2015	01 Jan-Mar	188	1	2	191	1	1	0	1	0	0	2	195
2010	Whole year	0	2	0	2	14	0	0	0	0	0	3	19
2011	Whole year	15	0	0	15	6	1	3	4	0	0	2	27
2012	Whole year	37	0	13	50	6	3	1	4	0	0	1	61
2013	Whole year	69	1	7	77	4	2	1	3	0	0	1	85
2014	Whole year	367	0	2	369	8	6	0	6	0	0	6	389

And as percentage of UK total

2010	Whole year	0.0%	1.4%	0.0%	0.7%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	1.5%
2011	Whole year	1.4%	0.0%	0.0%	1.2%	1.3%	2.9%	1.4%	1.6%	0.0%	0.0%	1.1%	1.3%
2012	Whole year	1.7%	0.0%	4.5%	1.9%	2.4%	1.1%	0.6%	0.9%	0.0%	0.0%	0.6%	1.7%
2013	Whole year	1.9%	3.6%	5.4%	2.1%	2.7%	1.1%	0.9%	1.0%	0.0%	0.0%	0.7%	1.9%
2014	Whole year	2.5%	0.0%	3.6%	2.5%	3.4%	0.9%	0.0%	0.8%	0.0%	0.0%	3.8%	2.5%

Based on Table VEH170: https://www.gov.uk/government/statistical-data-sets/veh01-vehicles-registered-for-the-first-time#table-veh0170

1. The Department for Transport uses the term 'ultra-low emission vehicles' to refer to vehicles with significantly lower levels of tailpipe emissions than conventional vehicles. In practice, the term currently refers to electric, plug-in hybrid and hydrogen fuel-cell vehicles. For the purposes of this indicator, vehicles with fully electric powertrains, and cars with tail-pipe emissions below 75 g/km of CO_2 have been included at this stage.

2. Includes all vehicles of models that are eligible for the Plug-in Car and Van grants at the date of latest table update. Therefore earlier data in the series may be changed retrospectively as models are added to the eligible list.

Source: DVLA//DVADfT

Telephone: 020 7944 3077
Email : vehicles.stats@dft.gsi.gov.uk
Notes & definitions (https://www.gov.uk/government/publications/vehicles-statistics-guidance)