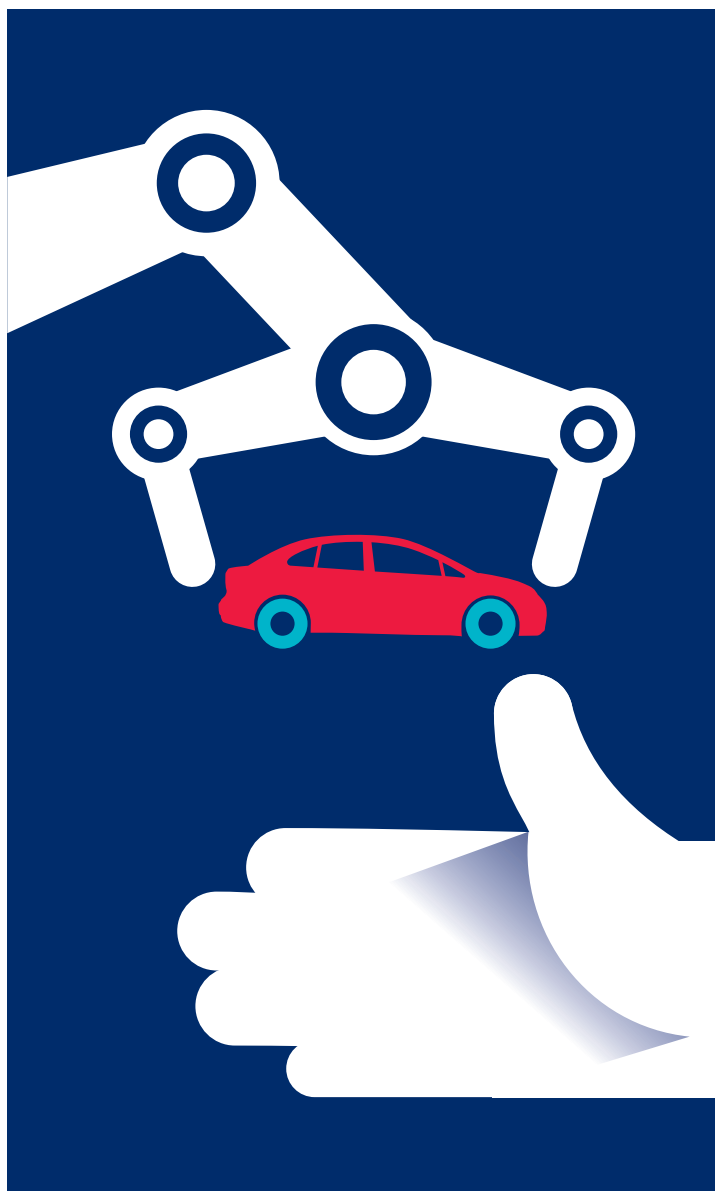
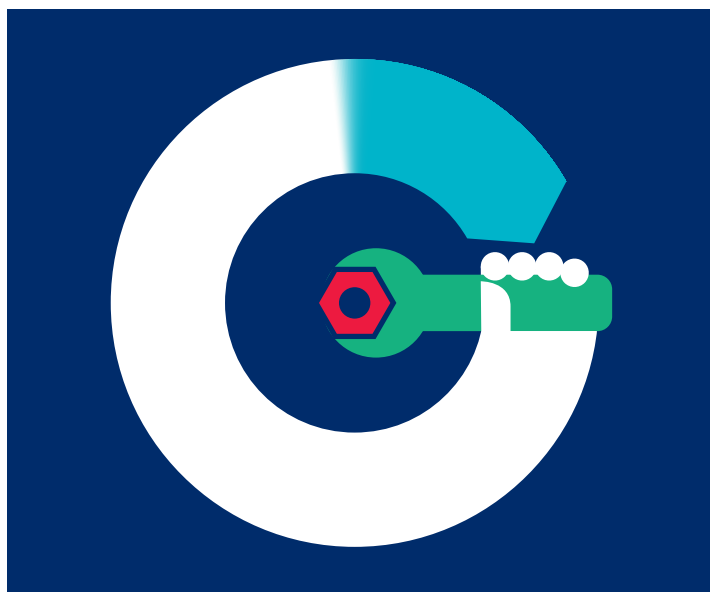


**2022 AUTOMOTIVE
SUSTAINABILITY REPORT**
23RD EDITION - 2021 DATA



“The automotive sector continues to improve its sustainability, reducing energy use, sourcing more responsibly and increasing recycling.”

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LETTER FROM THE CEO

The events of the past two years have been anything but business as usual, but the commitment of the automotive sector to be greener, cleaner and better remains undiminished, regardless of the outside factors that have buffeted the world.

Following the profound impact of the pandemic in 2020, 2021 was an opportunity to begin to rebuild – an opportunity seized by the industry, despite various factors holding us back from reaching our full potential. There were many positives: Covid restrictions began to roll back, markets reopened, the UK hosted the world at COP26, electric vehicle uptake skyrocketed. There were also new challenges: the knock-on effects of pandemic lockdowns stymied supply chains, inhibiting production, energy costs began to rise, and evidence suggests that charging infrastructure investment continued to fall behind EV demand.

Nevertheless, the automotive sector continues to improve its sustainability, reducing energy use, sourcing more responsibly and increasing recycling. Indeed, total energy use has declined, by -6.1% on last year, and water use per vehicle fell -6.3%. Waste to landfill also hit a record low, of 0.6%, with 17 report signatories reporting zero waste. However, energy used per vehicle has risen by 4.5% – a direct consequence of 2021's diminished output arising from semiconductor shortages, and herein lies the challenge and opportunity for UK Automotive to set the standard for others to follow.

The environmental performance of the products continues to break new records. Average new car emissions were again at the lowest level ever recorded, some -11.2% down on 2020 as manufacturers bring an ever-wider choice of lower and zero emission vehicles to market. Last year, around one in six new cars registered could be plugged in, while the battery electric (BEV) share of the van market almost doubled – although at 3.6%, it remained some way behind cars.

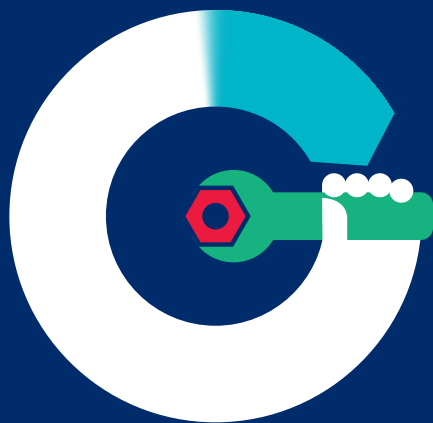
Supporting manufacturing in the UK supports jobs and economic growth. Greater output delivers greater efficiency and greater revenue which can be channelled back into efficiency improvements, R&D or essential environmental projects such as those highlighted in this report. Meanwhile, 12 OEMs have committed to science-based targets that will ensure they contribute to efforts to limit global warming to less than 2°C above pre-industrial levels.

Looking ahead, with government action to support UK competitiveness, we can help cut the UK's carbon emissions, creating new jobs and generating growth. With the world now reopening for business, we must ensure that every opportunity is seized to deliver an effective net zero transition of efficient production and zero emission mobility for all.

Mike Hawes Chief Executive

The Society of Motor Manufacturers and Traders (SMMT)

2021 SUSTAINABILITY SUMMARY



SOCIAL

-7%
Sectoral jobs
down

-30.8%
Employee accidents
down

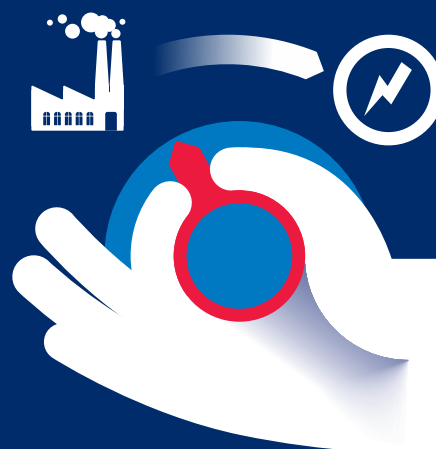
13.4%
Share of women
employed, up 0.6
percentage points

ENVIRONMENT

4.3%
Energy per vehicle
produced up

-1.3%
CO₂ per vehicle
produced down

-6.1%
Water used per
vehicle down

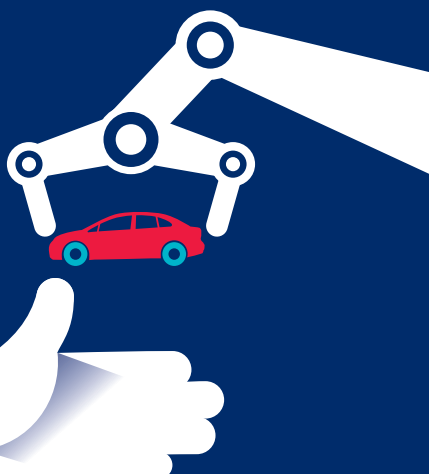


ECONOMIC

-3.2%
Vehicle production
down

4.1%
All vehicle
registrations up

£14bn
Auto manufacturing
GVA £14bn and
employment 182,000



		1999	% change 2021 on 1999	2020	2021	% change 2021 on 2020
AS	Number of signatories	11	81.8%	19	20	5.3%
Social performance						
WI	Number of jobs dependent on the sector**	907,000	-12.1%	795,642	781,800	-1.7%
AS	Combined number of employees	95,214	-17.3%	83,322	78,143	-6.2%
	Number of lost-time incidents per 1000 employees	13.4	-93.0%	1.4	0.9	-30.8%
	Number of training days per employee	3.8	-55.9%	1.6	1.7	5.6%
	Share of women employed by signatories (%)		N/A	12.8	13.4	0.7
Environmental performance						
Production inputs						
AS	Total combined energy use (GWh)	7,013	-53.9%	3,440	3,230	-6.1%
VMs	Energy used per vehicle produced (MWh/unit)	3.9	-18.3%	3.05	3.19	4.5%
AS	Total combined water use (000m3)	6,090	-50.6%	3,587	3,004	-16.2%
VMs	Water use per vehicle produced (m3/unit)	5.3	-43.9%	3.2	3.0	-6.1%
Material inputs						
AS	Total combined CO ₂ equivalents (tonnes)	2,182,926	-70.6%	721,597	640,502	-11.2%
	CO ₂ equivalents per vehicle produced (tonnes/unit)	1.1	-42.6%	0.64	0.63	-1.2%
VMs	Volatile Organic Compounds emissions (cars) (g/m2)	55.0	-57.6%	24.8	23.3	-6.1%
	Volatile Organic Compounds emissions (vans) (g/m2)	59.0	-38.9%	37.1	36.0	-2.9%
AS	Total combined waste to landfill (tonnes)	80,399	-98.4%	1,285	1,104	-14.1%
VMs	Waste to landfill per vehicle produced (kg/unit)	40.3	-96.2%	1.30	1.27	-2.6%
Vehicle use						
AC	Average new car CO ₂ emissions (g/km)			134.8	119.7	-11.2%
Economic performance						
WI	Automotive manufacturing sector turnover * (£ billion)	47.90	25.7%	63.9	67.1	5.0%
	Expenditure on business R&D* (£ billion)	0.86	235.6%	2.90	3.00	3.4%
	Total number of cars and CVs produced (million)	1.81	-48.6%	0.99	0.93	-5.5%
	Total new car and CV registrations (million)	2.52	-20.4%	1.92	2.00	4.1%
AS	Signatories' combined turnover (£ billion)	21.0	134%	64.1	58.5	-8.8%
VMs	Total number of vehicles produced (million)	1.57	23.0%	0.90	0.87	-3.2%

Key:

AS = signatories, WI = whole industry, VMs = vehicle manufacturers only (WI) Whole industry data; (AC) All car registrations in the UK; (AS) All signatories; (VMs) UK vehicle manufacturer signatories; (CV) Commercial vehicles; (CO₂) Carbon dioxide.

The report has 20 signatories which represented 93.2% of UK vehicle production in 2021, with Nissan and Autocraft returning as a signatory. LEVC was not able to provide data this year.

*The 2020 data has been adjusted to ensure consistency with the current number of signatories and enable comparable year-on-year comparisons.

**Sector turnover, R&D and jobs dependent on the sector are compiled from several official sources using expert SMMT analysis. The 2021 figures are based on projections.

***Estimate of manufacturing, distribution, refuelling and repair of vehicles where automotive is the main activity of the firms. All per vehicle figures also contain resources used during engine and battery production, some of which are destined for export.

UK Production- the completed vehicles as they leave the production line in a UK facility.

Registrations- vehicles registered for road use in the UK for the first time with the DVLA or the DVLA's equivalent organisation in Northern Ireland, Channel Islands or Isle of Man.

UK Turnover- the money/income that a business generates each year.

UK expenditure on Business R&D- the amount, in monetary terms, spent on research and investment, each year.

SMALL VOLUME MANUFACTURERS (SVM) KPIS		2020	2021	% change 2021 on 2020
Economic performance				
Production		6,246	9,276	48.5%
Environmental performance				
Production inputs				
Total combined energy use	(MWh)	117,311,482	126,821,965	8.1%
Energy used per vehicle produced	(MWh/unit)	18.8	13.7	-27.2%
Total combined water use	(000m3)	96	119	24.0%
Water use per vehicle produced	(m3/unit)	15.3	12.8	-16.5%
Material outputs				
Total combined CO ₂ equivalents	(tonnes)	24,284	24,981	2.9%
CO ₂ equivalents per vehicle produced	(tonnes/unit)	3.89	2.69	-30.7%
Total combined waste to landfill	(tonnes)	0	0	0%
Waste to landfill per vehicle produced	(kg/unit)	0.0	0.0	0%

SMALL VOLUME MANUFACTURERS (SVM) KPIS

Three small volume manufacturer (SVM) reported their performance, including Aston Martin, Lotus and McLaren Automotive. In 2021 SVM signatories recorded a 40% increase in production levels. As a result, the absolute energy, associated CO₂ and water use also increased, but to a much lesser extent. All relative performances have improved due to increased efficiency. All SVM signatories have reached zero landfill.



SUPPLY CHAIN KPIS		2020	2021	% change 2021 on 2020
Economic performance				
Output (weight of product produced)	(tonnes)	252,632	310,412	22.9%
Environmental performance				
Production inputs				
Total combined energy use (reporting weight)	(GWh)	120.8	116.8	-3.3%
Energy used/output (per tonne shipped)	(MWh/tonne)	0.48	0.38	-21.3%
Total combined water use (reporting weight)	(000m ³)	167	147	-12.0%
Water use/output (per tonne shipped)	(m ³ /tonne)	0.66	0.47	-28.4%
Material outputs				
Total combined CO ₂ equivalents (reporting weight)	(tonnes)	24,966	22,904	-8.3%
CO ₂ equivalents/output (per tonne shipped)	(tonnes/tonne)	0.10	0.07	-25.3%
Total combined waste to landfill (reporting weight)	(tonnes)	0	0	0%
Waste to landfill/output (per tonne shipped)	(kg/tonne)	0.00	0.00	0%

SUPPLY CHAIN KPIS

In 2021, five supply chain signatories were included in the table above; Autocraft, Bosch, Caterpillar, Michelin, and Unipart, representing a wide range of activities, from component production to remanufacturing.

The activity level, defined as the weight of products produced, increased by 22.9% year-on-year. All absolute and relative metrics improved to a varying degree. All supply chain signatories have reached zero landfill.

SMMT's Full Throttle To Full Charge: Driving Forward UK Automotive report includes a new study on the automotive-related supply chain. This looks beyond the traditional parts and component manufacturers, encompassing wider inputs such as steel, plastics, rubber and paint which feed into the sector. The sector had an estimated turnover of £21.2 billion in 2020, GVA of £5.7 billion and employs 123,500 (data based on ONS, various sources).



SOCIAL PERFORMANCE

→ The industry has always valued its employees by creating rewarding workplaces, even during the recent downturn. The pandemic shifted the focus to social challenges and demonstrated industry's clear commitment to the safety and wellbeing of its employees. Unfortunately the ongoing supply chain issues and challenging economic conditions, alongside the closure of a key vehicle manufacturer and engine producer, have had a negative impact on the direct and indirect jobs within the sector.

Performance

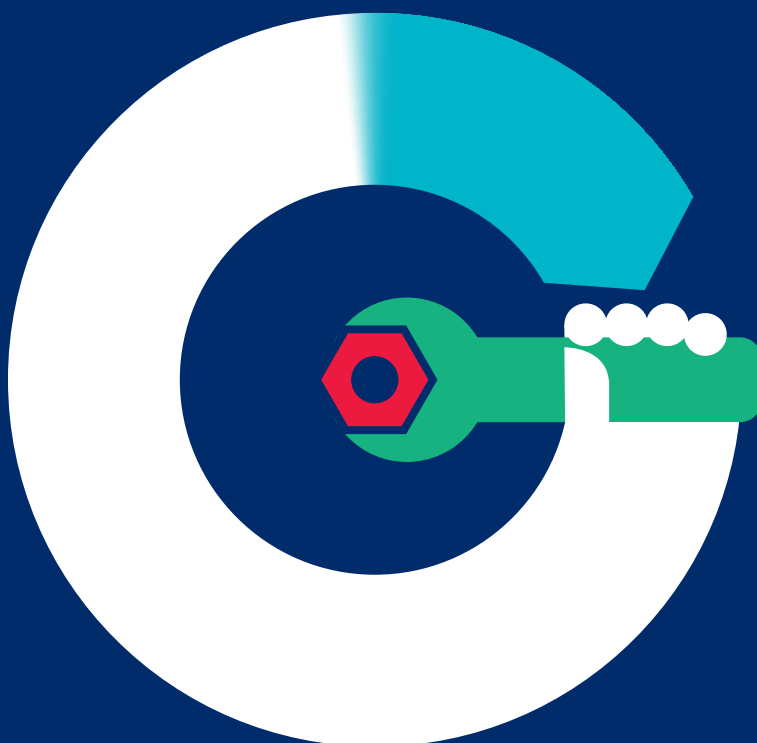
- Auto-related manufacturing jobs down -7.0%, signatories reported a -6.2% drop
- Employee accidents down -30.8%; training days per employee up 5.6%

Reasons

- Production growth constrained by supply chain issues and the on-going pandemic. In wider auto sector, one key manufacturer and an engine site permanently ceased their UK production in 2021

Future challenges/opportunities

- Labour shortages, attracting and retaining skilled staff and upskilling the existing workforce to be able to meet net zero, electrification and digitalisation ambitions
- Increasing diversity, equity and inclusion among staff



EMPLOYMENT

The pandemic and the supply chain issues continue to have impact on the global and UK economy. This is reflected in another drop in signatories' employment by -6.2% on 2020, with a -16.6% drop in agency workers and -4.8% for those in permanent employment.

Nevertheless, automotive remains one of the UK's major employers, with 182,000 workers directly occupying automotive-related manufacturing roles and a broader 600,000 jobs across the wider sector (e.g. retail and leasing), equating to some 782,000 jobs in total. The people involved in the sector and their respective skills sets are just as diverse as the products which the industry offers. The UK's automotive workforce is amongst the most skilled and productive in the world. Automotive employment also stretches into every region and nation of the UK, with concentrated hubs of activity located in the West Midlands, North East and North West of England, and Wales. Annual salaries in automotive manufacturing are typically 14% higher than the average across all UK employment and the combined national salary contribution of the sector amounts to over £7.5 billion.¹

STAFF TURNOVER

Over the years, employee satisfaction with remuneration and the working environment has kept staff turnover low, and only in the last few years has it exceeded 10%. This is most likely caused by employment volatility during the pandemic, with furlough and supply chain shortages, as well as tightening of the labour market in general, leading to increased movement amongst workers. In 2021, staff turnover dropped by 2.8 percentage points to 10.7%.

Chart 1 Automotive employment



Chart 2 % staff turnover

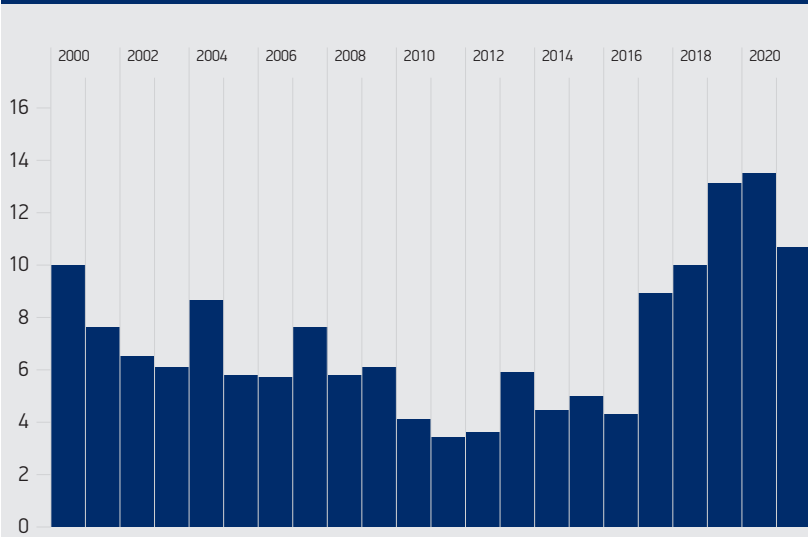
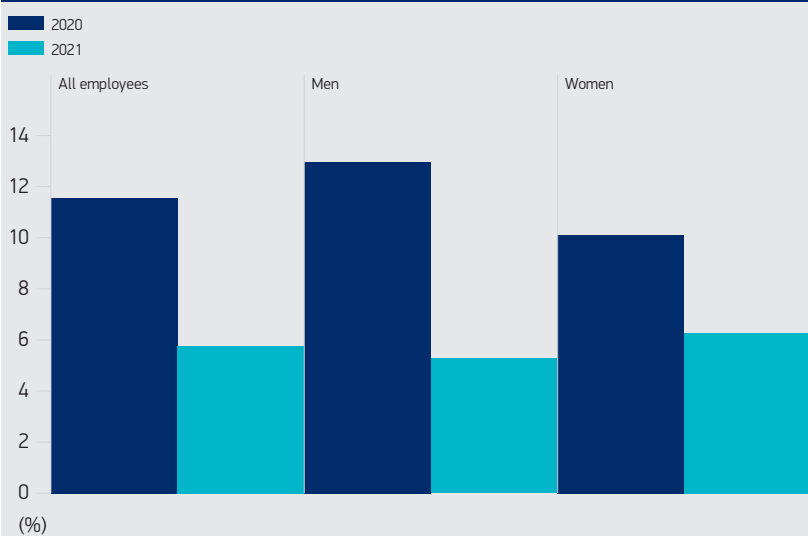


Chart 3 Percentage of employees furloughed with reduced pay (ONS)



¹ ONS (NOMIS) regional / national data set for 2020, ONS ASHE data for earnings and ONS ABS data for employment costs.

GENDER PAY GAP

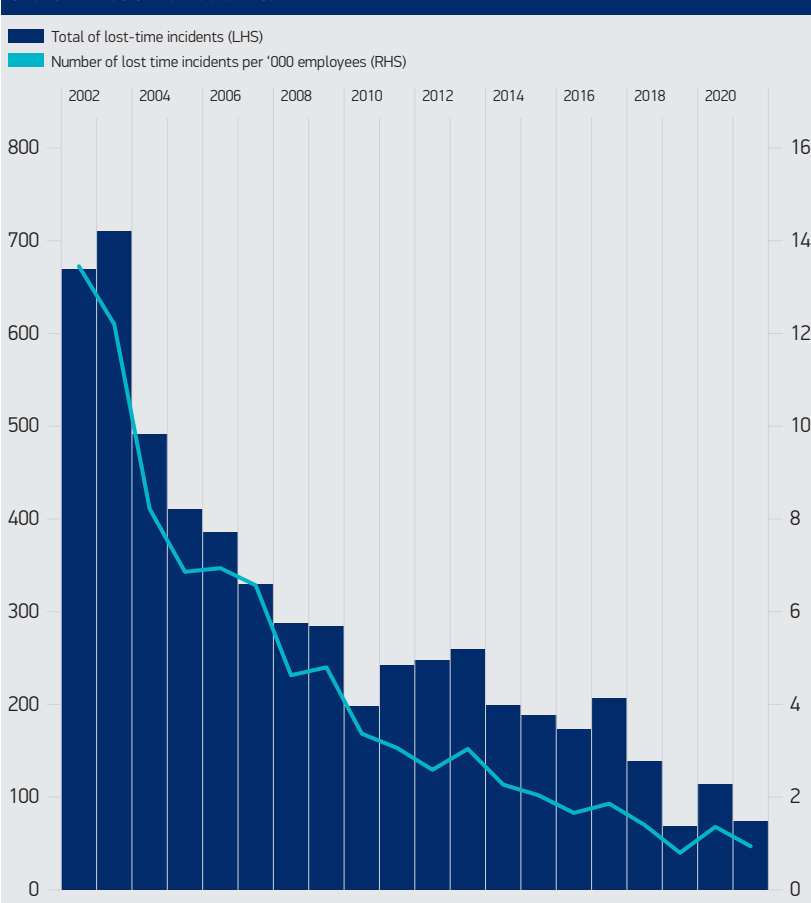
According to the Office of National Statistics, on average in 2021, men in the UK workforce were paid 15.4% more than women, based on median hourly earnings. By contrast, the gender pay gap for 20 signatories to this report covered by the obligation was a more modest 8.1% (median).

However, more still needs to be done and industry continues to work to address this issue.

HEALTH AND SAFETY

Health and safety improvements continue to be a priority for the industry. The number of lost-time accidents has fallen by -89% since 2002, which demonstrates the effectiveness of concerted efforts by signatories to improve the safety of their employees. In 2021, the total number of accidents as well as the number of accidents per employee figure decreased by -35% and -31% respectively year on year.

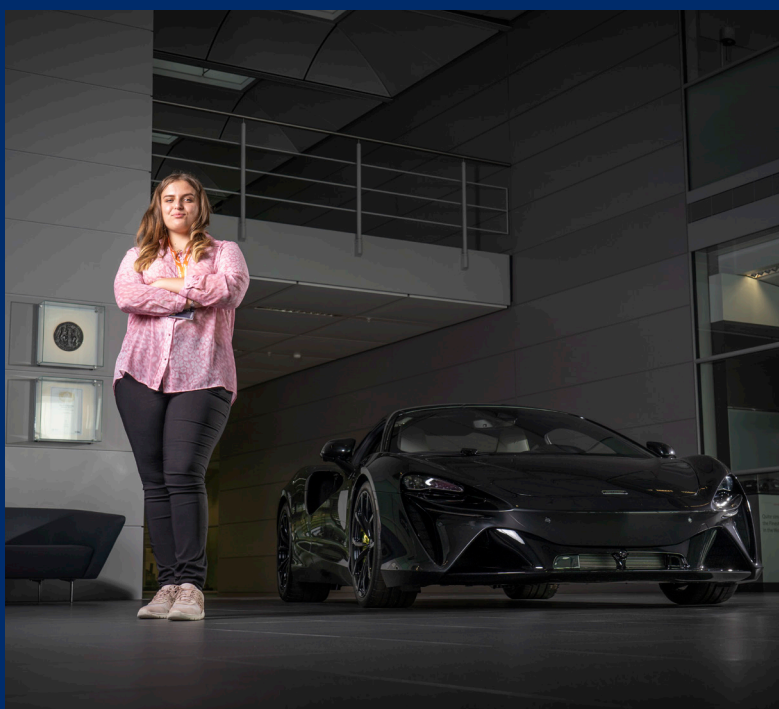
Chart 4 Lost time accidents



CASE STUDY: MCLAREN AUTOMOTIVE EMPOWERS AND INSPIRES CHILDREN TO FULFIL THEIR POTENTIAL

McLaren Automotive and children's charity Plan International partnered in 2021 to bring together McLaren Automotive's long-standing commitment to encourage young people to take up careers in science, technology, engineering, and maths (STEM), with the charity's track record of challenging gender stereotypes to support girls globally to stay in school and open opportunities to pursue fulfilling careers.

As part of McLaren Automotive's partnership with Plan International, in 2021 a 17-year-old youth activist became the Chief Executive Officer of McLaren Automotive for the day to celebrate International Day of the Girl and encourage young people, and particularly young women, into science and engineering careers. The day included leading her executive team in strategic decisions as well as collaborating with many of the company's female business leaders, engineers, scientists, and designers.



CASE STUDY: BENTLEY HELPS CREWE COME BACK STRONGER AFTER PANDEMIC

In 2021, Bentley Motors launched its COVID Impact Fund with Cheshire Community Foundation (CCF), to support charities and people in need across its local community in Crewe. The social impact of the pandemic saw Bentley recognise the need to enhance its support further, investing in vital local services.

Donations were granted to 11 local charities. The grants, ranging from £7,800 - £25,000, were awarded to projects tackling food poverty, mental health and wellbeing, debt relief and financial education. It is anticipated that more than 5,000 people will directly benefit from the funding.



TRAINING

Signatories remain committed to employee development, despite the overall economic challenges faced by businesses. In 2021 the number of training days per employee increased by 5.6% year on year, to 1.7 days per employee.

APPRENTICESHIPS

During the height of the COVID-19 pandemic in 2020, apprenticeship take-up across the industry declined sharply. The sector's apprenticeship starts have now picked back up. There was a 67% increase in apprenticeship starts in the full academic year 2020/21 compared to 2019/20 – and 16% higher than pre-pandemic levels.

FUTURE SKILLS

The 2030 end of sale date for pure petrol and diesel cars and vans, as well as the need to ramp up production of batteries and electrified vehicles, means automotive's workforce is facing increasingly short upskilling timeframes.

It is estimated that out of the 182,000 workers directly employed by the UK automotive sector, 65% or 120,000 employees are in engineering or production roles.² Many will need some form of upskilling or reskilling, whether through basic, awareness-level courses, or higher-level practitioner training courses.

The Emerging Skills Project (ESP) was a pilot programme forming part of the UK Government's transformation of further and

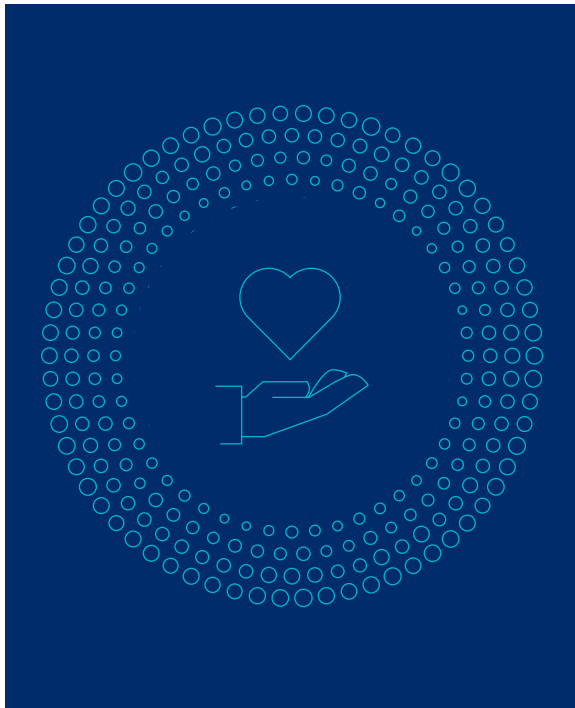
technical education in England. The initiative was designed to address future skills gap across manufacturing sectors and in the wider engineering workforce. The programme delivered more than 50 one to three day units of training covering electrification, digitisation, additive manufacture and advanced materials.

As of mid-March 2022, 65% of the manufacturing registrants have been attributed to the automotive sector, equating to approximately 747 training days. Of the registrants, 36% are from training or education providers, 28% from supply chain businesses and 25% from OEMs. The take-up from automotive employers highlights the importance and increasingly urgent need to access upskilling training content.

² Data collected by the Automotive Council Skills Working Group and Enginuity.

LOCAL COMMUNITY SUPPORT

In 2021, signatories reported cash donations to charities of more than £1.9 million and made other contributions worth around £70,000. Signatories also reported giving in excess of 23,000 hours of employees' time to local causes.



DIVERSITY, EQUITY AND INCLUSION

Since the inception of the SMMT Diversity, Equity and Inclusion (DEI) taskforce in July 2020, it has implemented a number of initiatives within SMMT Group to ensure inclusion across the workforce, recognising and supporting differences. In addition to the taskforce itself, a number of employee network groups have been created. The purpose of these groups is to provide support to members based on a shared identity or life experience. There are currently seven groups;

- Disability, Mental and Physical Health Conditions
- LGBTQ+
- Women's Network
- Man Chat
- Race and Ethnicity
- Working Families
- Families Abroad

As well as providing an invaluable forum for staff to discuss issues relevant to them, these groups are able to shape DEI policies to identify areas for improvement, and to create and develop actions that support inclusion across SMMT group and recognise diversity, allowing individuals to bring their true selves to work.

The Automotive Council is producing its first report into Diversity, Equity & Inclusion in the UK automotive industry, addressing underrepresentation of women working within the sector, while acknowledging the proactive steps many larger companies are taking. The report will be published later this year.

CASE STUDY: TOYOTA MANUFACTURING UK PARTNERS WITH DERBY COUNCIL TO DEVELOP AND DELIVER FUTURE MOBILITY SOLUTIONS

In 2021, Derby City Council entered a partnership with Toyota Motor Manufacturing (UK), named T-DREAM (Toyota-Derby Revolution in Energy and Access to Mobility) that will allow Derby to explore, develop and deliver mobility solutions for the future to tackle climate change. T-DREAM is focusing on a number of projects, including exploration into how future low-carbon society systems can operate in Derby, and how the partnership can innovate to achieve a positive recovery for Derby's economy. The ultimate aim is to reduce inequality by giving everyone the ability to travel between home and work and enhancing accessibility for those in the region with disabilities.

DERBY GO BY KINTO

Making journeys for students across the city of Derby easier, more efficient and more environmentally friendly.

Good afternoon
John Smith
20°C Clear
Derby, UK

Where to? Plan your journey here
Know where you're going? Book now

Bus
Parking
Taxi
Rail
Active travel

Derby City Council | DERBY | DERBY COLLEGE | sociability

Download on the App Store | GET IT ON Google Play

INTERNATIONAL WOMEN'S DAY

Earlier this year SMMT hosted its first in-person DEI event to celebrate International Women's Day. The theme was 'Breaking the Bias' and aimed to celebrate women's achievement, raise awareness against bias and take action for equality.

Hearing from three inspiring women from within the industry provided confidence that without gender bias, and with the support of allies, women can succeed in this sector.



Kenroi Consulting
'Bringing Diversity to Life'

SMMT has commissioned Kenroi Consulting to create a toolkit for members to develop their own DEI strategies. This will provide support and guidance to members so that they may also develop their own DEI initiatives. A series of webinars will also be launched.



ENVIRONMENTAL PERFORMANCE

→ Great progress has been made in all areas of the vehicle lifecycle, in terms of product and production decarbonisation, resource preservation and local air quality improvements. However the scale of the challenge ahead of the sector remains significant. To enable the industry to reach its full potential and fulfil its ambitions, a close cooperation with government and stakeholders is needed to create the right conditions and incentives for the sector to be able to provide sustainable mobility for all.

Performance

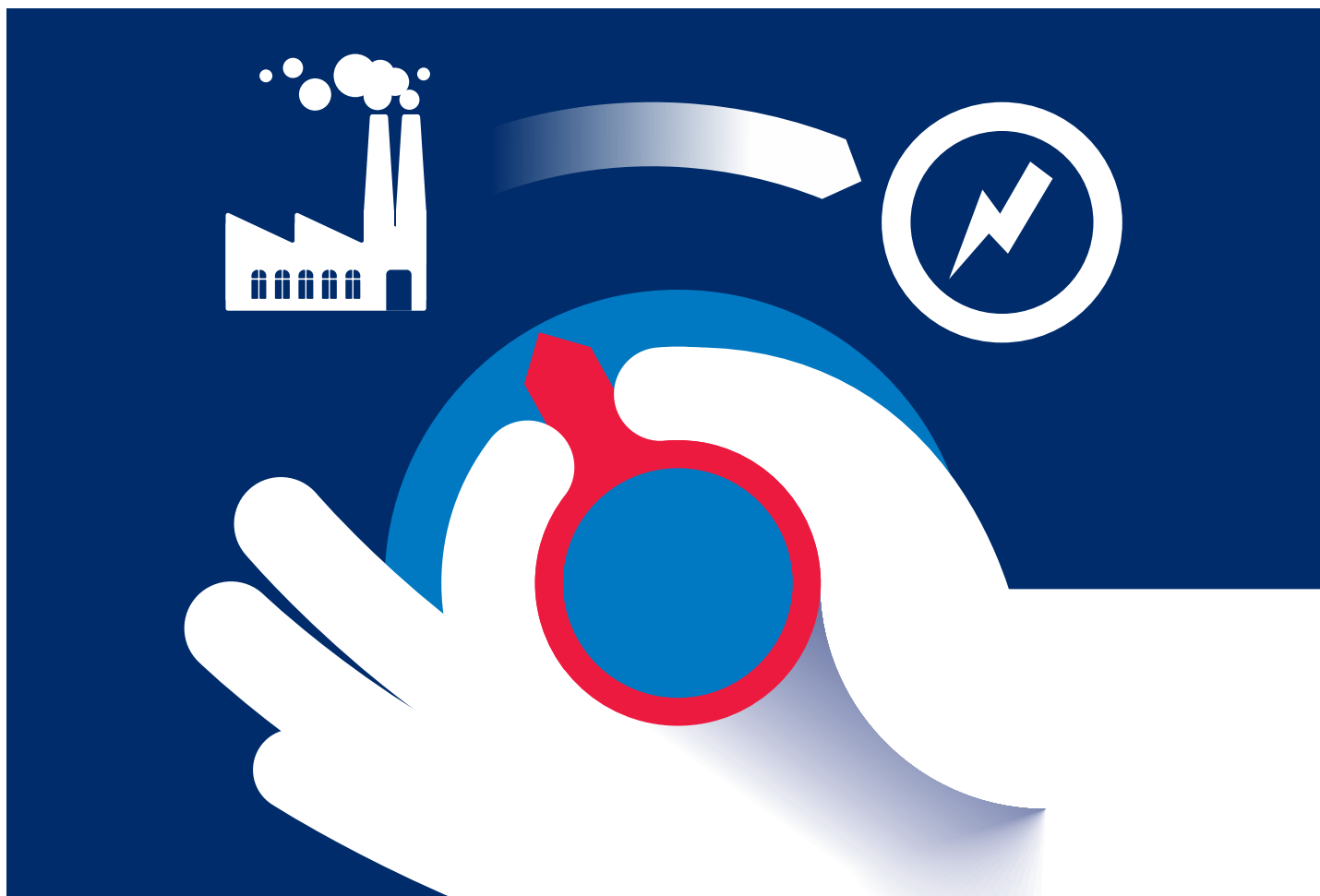
- Both absolute energy and CO₂ down -6.1% and -11.2% respectively
- New car average CO₂ emissions down -11.2% to 119.7g/km (WLTP measure)
- 2021 AFV registrations at 27.5% market share (BEVs took an 11.6% share)

Reasons

- COVID and supply chain issues caused a further decline in production, resulting in reduced efficiency
- Production and market increasingly shifting to electrified vehicles

Future challenges/opportunities

- ICE phase out and fulfilling ZEV mandates
- Decarbonisation of vehicle production and its supply chain
- Further increase sector's circularity



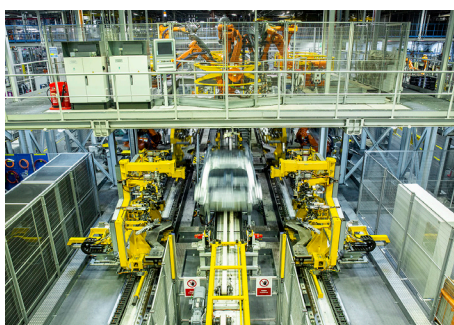
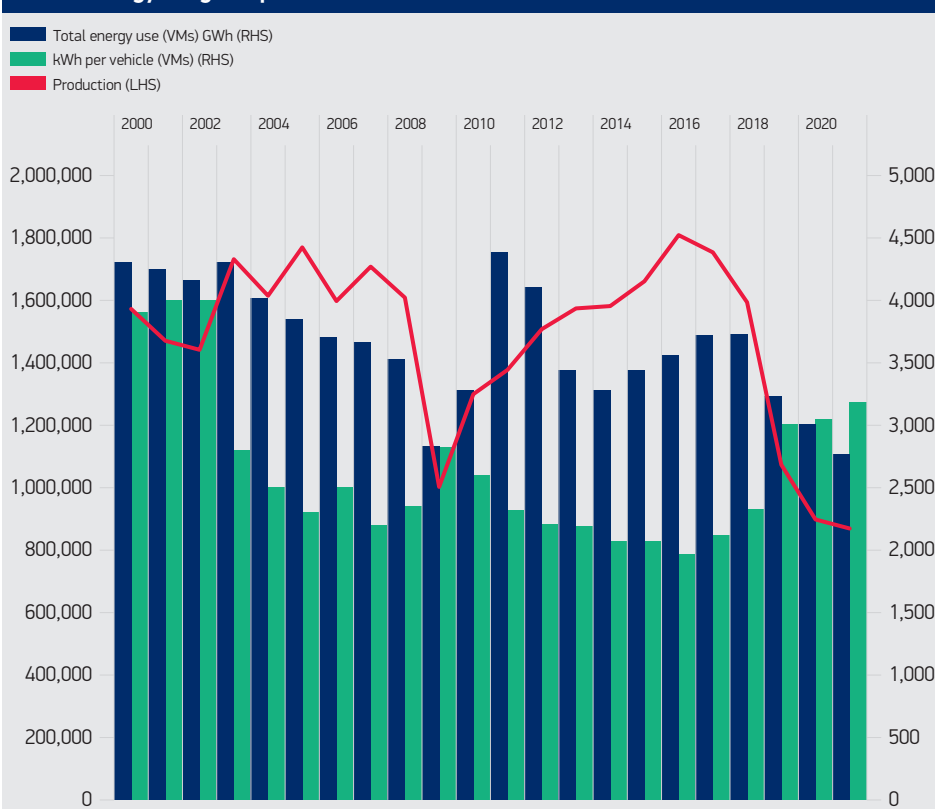
VEHICLE MANUFACTURING

ENERGY

Total energy (gas, electricity and oil) consumed by vehicle manufacturers was down 7.9% to 2.8 GWh in 2021, but the much-reduced volume of vehicles produced meant that energy per vehicle rose by 4.5% year-on-year to 3,185 kWh. This latter relative performance is contrary to the pre-2019 trend, which saw energy consumption per vehicle produced fall to below 2,000kWh, but is directly linked to record low production levels.

When demand and production volumes fall, vital energy sources need to remain operational, which means fewer vehicles over which to spread this baseload of energy consumption. At the same time, the amount of carbon per vehicle produced came down due to grid decarbonisation, decoupling the link with production volumes.

Chart 5 Energy usage vs production



The amount of carbon per vehicle produced came down due to grid decarbonisation

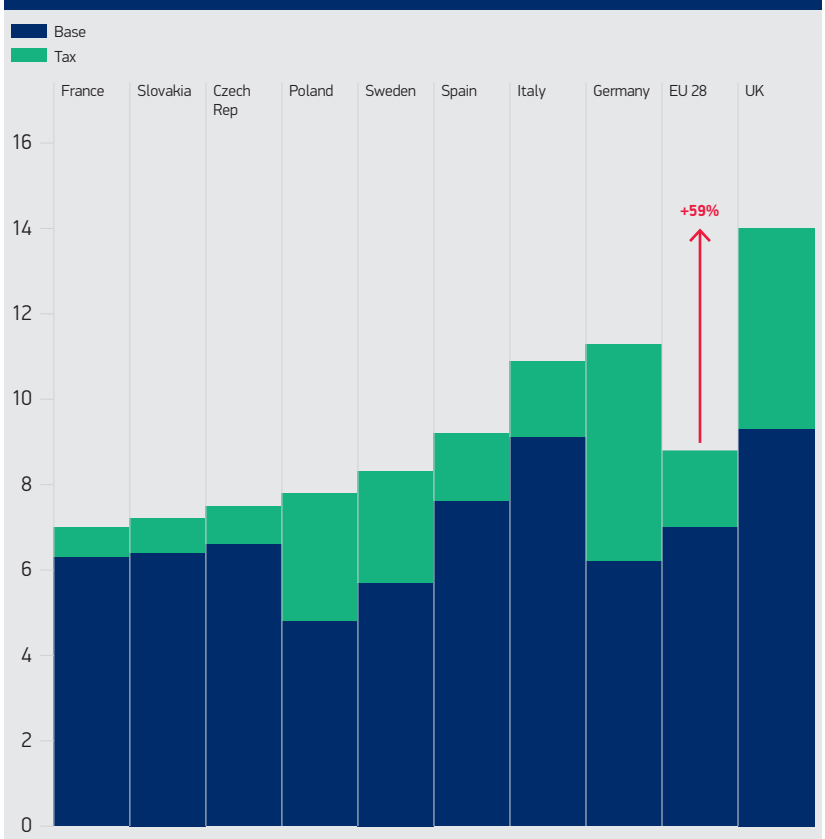
BUSINESS COST

The significant rise in energy costs, and industry and government's desire to move to net zero, have ensured that energy has become an increasingly significant issue for the automotive sector. Energy was already typically the second largest 'in-house' manufacturing cost, after labour, and so is critical to competitiveness.

Gas and electricity prices in the UK rose by 73.5% and 17.2% in 2021, with automotive manufacturers reporting even larger rises. The UK already has the highest prices of electricity in Europe (see chart), 59% above the EU average.

High electricity prices will undermine the transition to electric vehicles. They are more energy intensive to make, putting UK-based sites at a disadvantage for investment decisions. It also makes the economics of running an electric vehicle less attractive from a consumer perspective. The move to decarbonise the electricity supply sector will help make using electricity more attractive from an environmental perspective for businesses, but must be balanced with cost containment. On a positive note, a business case for on-site renewables with battery storage will look more positive.

Chart 6 Electricity prices, incl taxies – 2021 – large users (pence per kwh)



CASE STUDY: SOLAR PV GENERATION FOR ASTON MARTIN ST ATHAN SITE

In 2021 Aston Martin progressed a major project that will deliver 6.4MW of on-site Solar PV generation capacity at its St Athan plant. Subject to planning approval and agreement on connection to the national electricity distribution network, during 2022 more than 14,000 solar panels will be installed, capable of generating around 20% of the plant's total annual demand.



RENEWABLE ENERGY

In 2021, 10 signatories produced 40.4GWh of electricity, which would be sufficient to power 10,840 homes. This accounts for 2.7% of all electricity used by signatories. The value dropped 39% on the previous year's performance, as one site with renewable energy production was closed and another changed how it reports its performance. Other factors, such as less favourable weather conditions, could also have impact. Many companies also moved their electricity supply to green tariffs, with some guaranteed by REGO certificates. The amount of on-site renewable energy production is expected to grow, in the context of increasing energy prices.

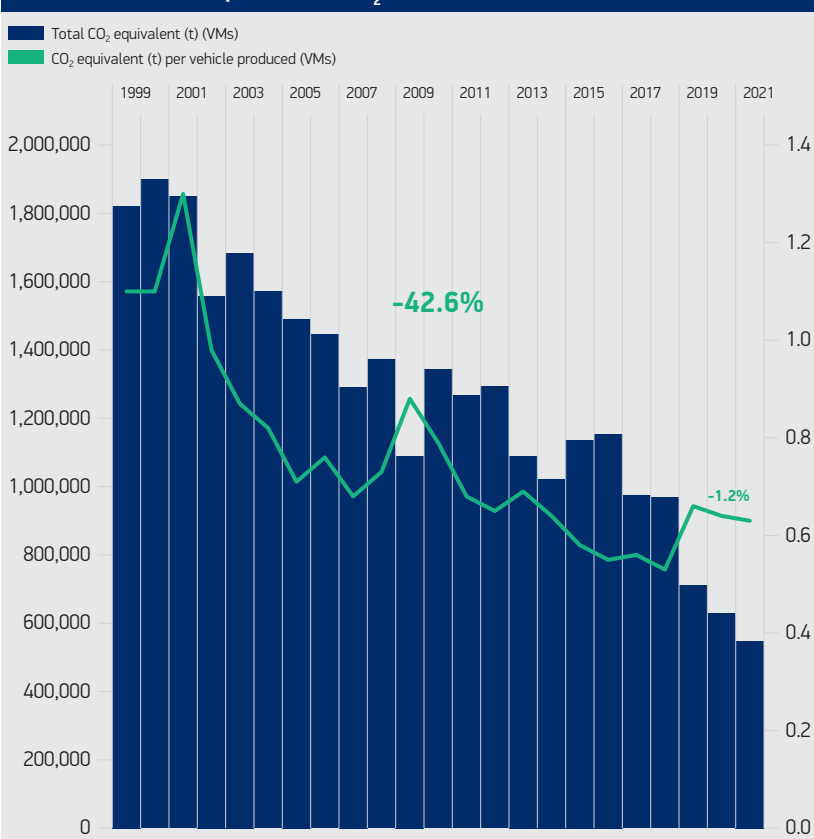
CO₂

CO₂ emissions are calculated based on the official conversion factors for each energy stream used by manufacturers. Total CO₂ produced (tonnes) from vehicle manufacturing and other operations was down -12.8%, while CO₂ per vehicle produced dropped -1.2% to 0.63 tonnes due to further grid decarbonisation. Overall, it is -42.6% lower than in 1999, even though lower production volumes in recent year have led to a diminished rate of reduction in CO₂ per vehicle produced.

Electricity accounted for 50.6% of the overall energy used by VMs. Green energy made up 44.6% of all the electricity used in 2021.

Some signatories such as Bentley Motors and Toyota have their carbon neutrality certified annually by the Carbon Trust.

Chart 7 Total VM and per vehicle CO₂



CASE STUDY: NISSAN SUNDERLAND EXPANDS RENEWABLE ENERGY GENERATION

In 2021 Nissan started installing an additional 20MW solar farm at its UK plant, as part of its EV36Zero project and the company's journey to carbon neutrality.

The new 20MW installation will double the amount of renewable electricity generated at Nissan's Sunderland plant to 20% of the plant's needs - enough to build every 100% electric Nissan LEAF sold in Europe.

This is the first of a potential ten additional solar farms planned under Nissan EV36Zero, with an initial £1bn investment from Nissan and its partners in future electric vehicle manufacturing, a new Envision AESC gigafactory and Sunderland City Council's renewable energy Microgrid. Nissan installed its first wind turbines on site in 2005. These 10 turbines contribute 6.6MW power, with the existing 4.75MW solar farm installed in 2016.



BIODIVERSITY

The industry is committed to the sustainable use of resources while building healthy ecosystems for future generations. Many companies invest time and resources in conserving the flora and fauna in their locality. Activities range from small-scale local projects, to more extensive collaborations that have a wider significance and are helping to preserve and even improve the local ecosystem.

SCIENCE BASED TARGET

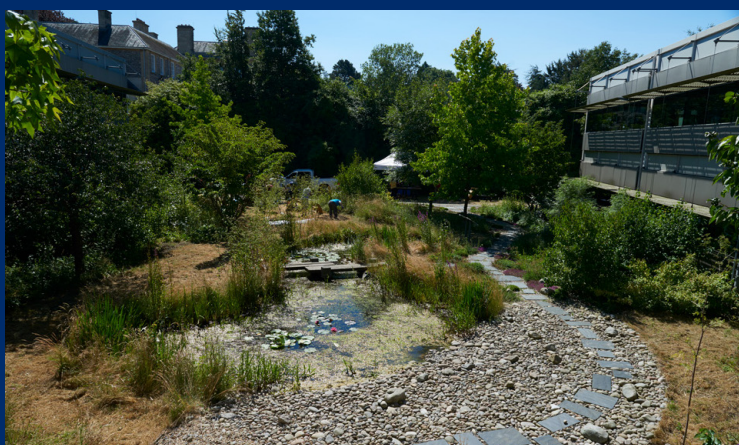
Science based targets (SBTs) are set in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement agreed at COP21– limiting global warming to less than 2°C above pre-industrial levels, and pursuing efforts to limit it to 1.5°C. The table outlines the automotive commitments to date.

Following the initial announcement in 2020, as of 6 April 2022, the largest UK-registered companies and financial institutions are required to disclose climate-related financial information, using guidelines from the Task Force on Climate-related Financial Disclosures (TCFD). Companies will be required to go through a formal process of identifying and then disclosing details of material risks and opportunities arising from climate change under differing future climate scenarios.

CASE STUDY: TOYOTA MAKES FURTHER BIODIVERSITY GAINS

Toyota UK has been working closely with UK Butterfly Conservation to record butterflies on the green grid hedgerows and meadows across the Burnaston site. The fifth year of this activity was celebrated in 2021, and in total nearly 14,500 butterflies were recorded over 493 weekly observation walks, which were undertaken by members of Butterfly Conservation.

Since 2004, the Environmental team have worked closely with the Wildlife Trust to develop a rich wildflower meadow from a previously closely mown grassland, with a range of hedgerows to create ideal habitats for insects, butterflies and other wildlife. There are almost 200 different species of plants in green corridors across the site. In 2007 a nature reserve on site became registered as a “site of biological importance” and in 2009 Toyota became a founding member of the Trent Valley initiative, creating a diversity of lined wetland habitats. Toyota also has a strategic partnership with Royal Botanic Gardens Kew.



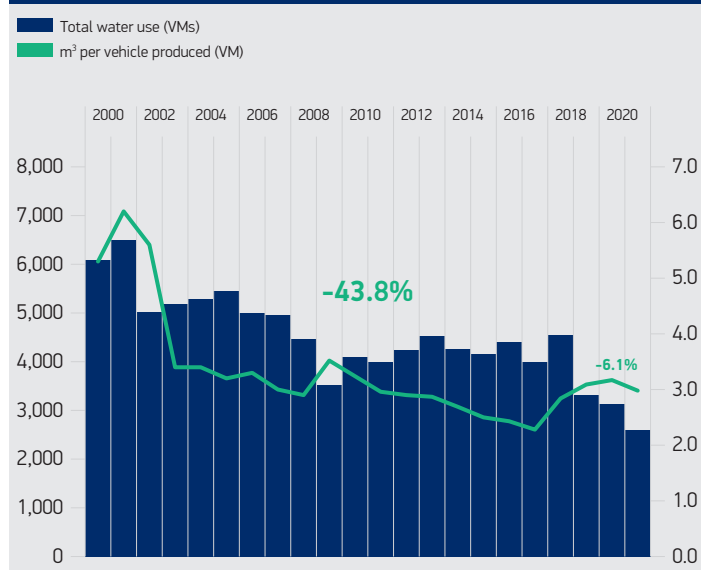
SCIENCE BASED TARGETS

Rank	Company name	Near term – target status	Near term – target classification	Near term – target year	Net-Zero committed	Business ambition for 1.5C member
1	Aston Martin Lagonda	Committed			Yes	01/01/2022
2	BMW Group	Targets Approved	1.5°C	2030	Yes	01/08/2021
3	Ford Motor Company	Targets Approved	1.5°C	2035	Yes	01/09/2020
4	General Motors	Targets Approved	1.5°C	2035	Yes	01/12/2020
5	Renault	Targets Approved	Well-below 2°C	2030		01/03/2021
6	Jaguar Land Rover	Targets Approved	1.5°C	2030	Yes	01/04/2021
7	Mercedes-Benz AG	Targets Approved	1.5°C	2030		
8	Nissan Motor Co., Ltd.	Targets Approved	Well-below 2°C	2030	Yes	01/04/2021
9	PSA Automobiles SA	Targets Approved	2°C	2034		
10	Robert Bosch GmbH	Targets Approved	1.5°C	2030		
11	Volkswagen AG	Targets Approved	1.5°C	2030, 2025		
12	Volvo Car Group	Targets Approved	1.5°C	2030		01/03/2021

WATER

Total water consumed by the signatories was down -17.3% in 2021 year-on-year, while water consumed per vehicle dropped by -6.3%, due to increased efficiency despite a much reduced volume of vehicles produced. The long-term relative performance remains positive, with water consumption per vehicle produced falling by -43.9% since 1999.

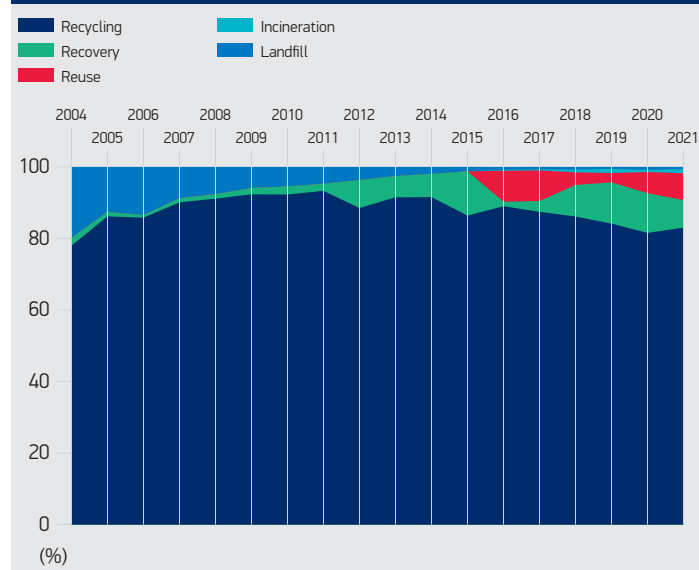
Chart 8 Total VM and per vehicle water use



WASTE

Landfill diversion techniques continue to deliver gains, resulting in waste to landfill falling to a new low of 0.6% of all waste produced. 83.1% of waste was recycled in 2021, while 15.2% was reused or recovered, and 1.2% was incinerated. Waste to landfill per vehicle dropped -2.6% year on year, to 1.3kg per unit. The landfilled waste mostly consists of paint sludge from paintshops. In 2021, 17 signatories reported zero waste to landfill.

Chart 9 VM waste



CASE STUDY: MICHELIN SETS OUT THE CHALLENGES OF 100% SUSTAINABLE TYRES

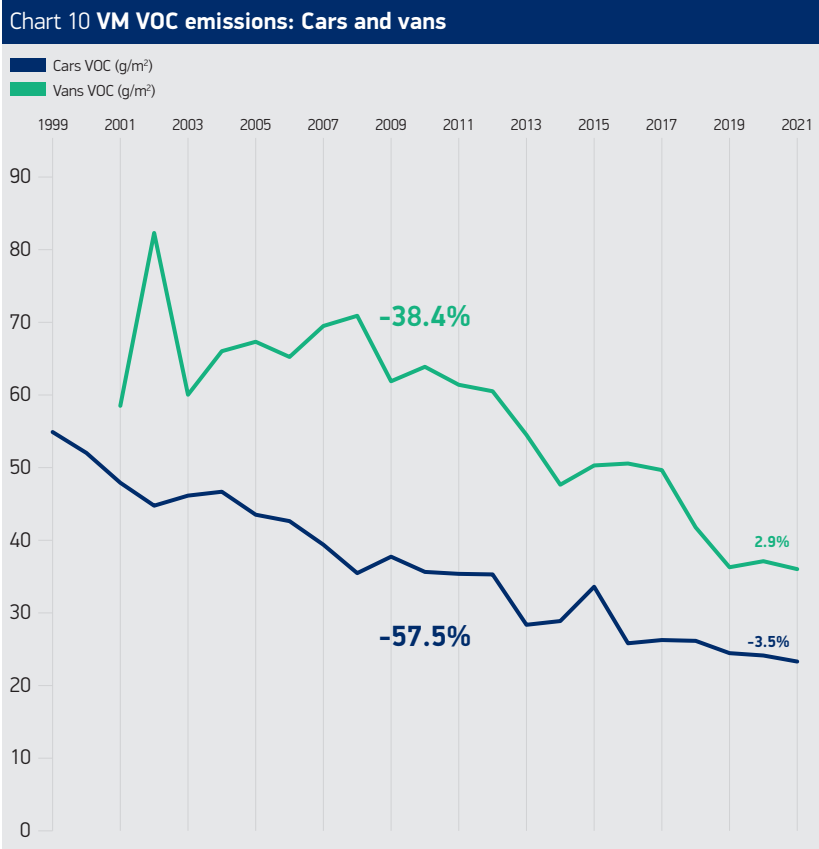
In 2021, Michelin recognised that it would have to develop 100% sustainable tyres to have a significant impact in the fight against climate change.

To achieve this, Michelin has created a new technology incubator, harnessing the expertise of the group's 6,000 scientists and building on its work with hi-tech materials.

To deliver a truly sustainable tyre, the Michelin Group knows that action has to be taken at every stage of the product lifecycle.

- **Design:** tyres composed of 100% bio-sourced or recycled materials by 2050 with 40% by 2030.
- **Manufacture:** net zero CO₂ emissions from production plants by 2050
- **Logistics:** transporting less, with greater efficiency, and developing alternative modes of transport
- **Use:** reducing rolling resistance, increasing lifespan, decreasing tyre wear particle emissions and capitalising on the potential of connected tyres, which can be tracked throughout their lifetime.
- **End-of-life and recycling:** turning today's waste into the resources for tomorrow's tyres and beyond.





VOLATILE ORGANIC COMPOUNDS (VOCs)

VMs have invested heavily in the most efficient paint shops, enabling them to comply and go beyond the strict legal requirement of limiting Volatile Organic Compounds (VOC) emissions.

In 2021, VOC from painting cars and vans declined by -3.5% and -2.9% respectively year on year.

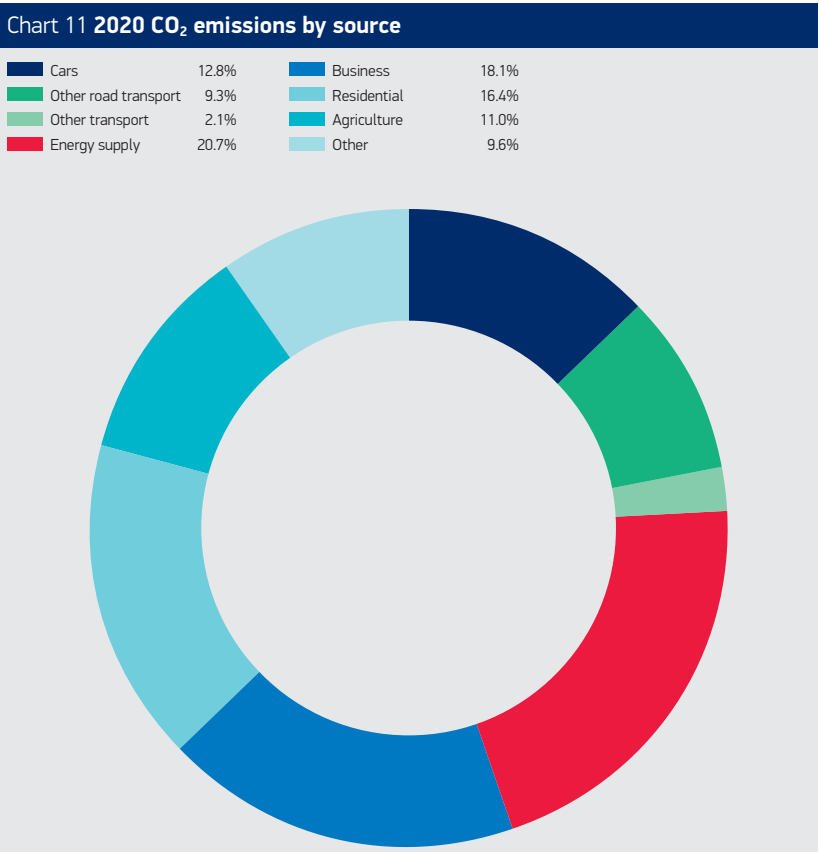
Both car and van values are well below the legal limit.

VEHICLES

CO₂ EMISSIONS

The automotive industry understands the critical role it plays in decarbonising the road transport sector and enabling the UK's transition to net zero, through its investments and innovations, and the delivery of affordable zero emission vehicles across all transport sectors. Extensive investment by manufacturers in advanced powertrains, lightweight materials and aerodynamics means that new cars now emit, on average, -29.3% less CO₂ than models produced in 2000.

The automotive industry continues to invest heavily in zero emission and low carbon technologies, continuously driving down CO₂ emissions across their fleets. The UK government has committed to removing all CO₂ tailpipe emissions from new cars and vans, through the end-of-sale of petrol and diesel engines from 2030, and all non-zero emission engines from 2035. From 2024, the primary lever for reducing CO₂ emissions from new cars and van fleets will be a ZEV mandate, requiring manufacturers to sell an increasing proportion of zero emission vehicles each year. In this scenario, the role of CO₂ regulation may change as it seeks to focus investment on ZEVs, rather than on further emissions improvements from a rapidly reducing number of new petrol and diesel engines on sale.



CASE STUDY: VOLVO CAR UK FURTHER SUSTAINABILITY AIMS WITH EDEN PROJECT COLLABORATION

In 2021, Volvo Car UK announced a three-year partnership with the Eden Project and the Eden Sessions music concerts. The collaboration aims to inspire and educate visitors about people's relationship with the environment and how we can protect the planet to create a secure future.

Volvo Car UK will provide the Eden Project with a fleet of Volvo XC40 Recharge pure electric vehicles to support its ongoing operations. By working together collaboratively, Volvo and the Eden Project hope to tackle some of the challenges and barriers consumers have around purchasing and driving electric cars, and accelerate the uptake of zero-emission vehicles.

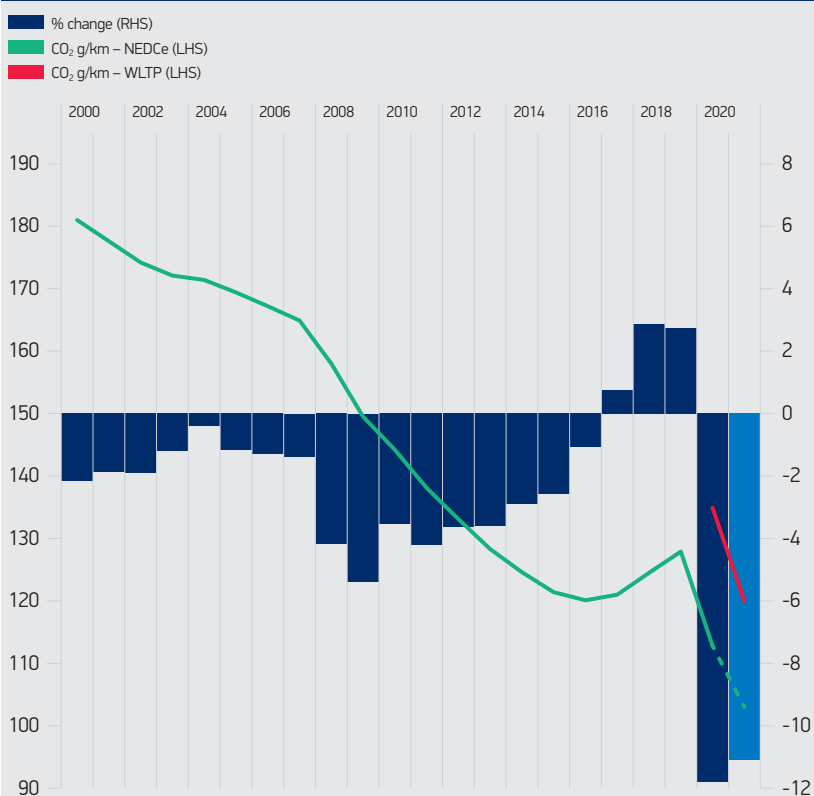
Volvo Car UK will also be the Presenting Partner of the Eden Sessions, the annual series of concerts in Cornwall.



Going forward, the UK automotive industry is committed to working with government on its pledge to end the sale of petrol and diesel engine vehicles, while ensuring that both household consumers and businesses are provided with affordable, desirable and practical zero emission alternatives. Vehicle manufacturers continue to invest heavily in zero carbon technology and, in 2021, registrations of Battery Electric and Plug-in Hybrid vehicles more than doubled. 2021 was the most successful year in history for electric vehicle uptake as more new battery electric vehicles (BEVs) were registered than over the previous five years combined.

190,727 new BEVs joined Britain's roads, along with 114,554 plug-in hybrids (PHEVs), meaning 18.5% of all new cars registered in 2021 can be plugged in. This is in addition to the 147,246 hybrid electric vehicles (HEVs) registered which took a further 8.9% market share in a bumper year for electrified car registrations, with 27.5% of the total market now electrified in some form. Following billions of pounds of investment into new technology by automotive manufacturers, more than 40% of models are now available as plug-ins. It is imperative that investment in charging infrastructure throughout the UK keeps pace with the commitment and progress already made by the automotive sector.

Chart 12 Average new car CO₂ g/km



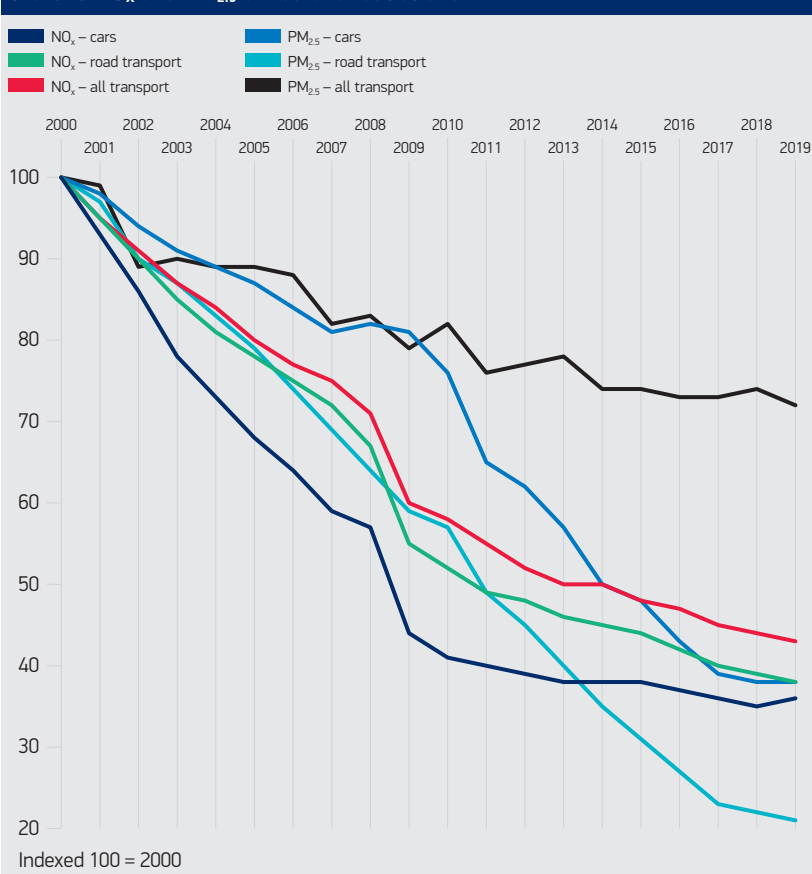
AIR QUALITY

While COVID restrictions, and constraints within the supply chain in 2021, continued to heavily impact the industry, the bumper uptake of plug-in vehicles should help improve air quality in many of our towns and cities.

The National Atmospheric Emissions Inventory³ provides data showing a significant decrease in emissions from road transport, with nitrogen dioxide (NO₂) reducing by 78% since 1990 and emissions of particulate matter (PM₁₀ and PM_{2.5}) having reduced by 81% since 1990. The full inventory of emissions is as yet only available up to and including 2019. Defra reports road transport should account for 28% of NO_x emissions, 7% of PM₁₀ and 10 % of PM_{2.5} emissions in 2020.⁴

In 2017 the government published its plan for tackling NO₂ at the roadside and it was expected that many cities would implement clean air zones. While there are some in place – namely, Bath, Birmingham and Portsmouth – others have cancelled their plans, because early interventions for fleet renewal have delivered the required air quality improvements with no need for further regulation.

Chart 13 NO_x and PM_{2.5} emissions reductions



³ <https://naei.beis.gov.uk/data/>

⁴ https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2203151456_GB_IIR_2022_Submission_v1.pdf

CASE STUDY: FORD WORKS WITH HERMES ON SMART USE OF VANS TO MAKE LAST MILE DELIVERY FASTER AND SUSTAINABLE

Ford teamed up with Hermes to trial a sustainable courier service aimed at reducing the footprint of parcel deliveries in cities. The partnership utilises Ford's smart 'MoDe:Link' multi-modal routing and logistics software to coordinate traditional delivery vans with pedestrian couriers, identifying safe locations for drivers to park within walking distance of multiple delivery addresses. From there, the final leg of the journey is completed on foot as couriers make deliveries to a mix of high-rise, business and residential buildings. The system ensures that deliveries are as efficient and as sustainable as they can be. During the trial, two Ford Transit vans delivered the same number of parcels as six vans making conventional doorstep deliveries and did so more quickly.



CASE STUDY: LEYLAND ENGINEERS JOIN FIGHT AGAINST CLIMATE CHANGE WITH NEW ZERO EMISSION ELECTRIC TRUCK

In 2021, Leyland Trucks began production of a new DAF LF zero emission electric truck, designed for urban and intra-urban operations.

The technology utilises latest generation LFP (Lithium Ferro Phosphate) batteries, providing up to 175 ultra-quiet, zero emission miles in one charge. The batteries can be charged from 20% to 80% within one hour using fast charging or within 6.5 hours using the regular electricity network.

Leyland Trucks was selected in 2021 to support the UK Government's efforts to encourage the use of battery electric vehicles in commercial transport. 20 DAF LF Electric 19-tonne rigid trucks were fitted with data logging equipment and feed into an interactive website, which will inform future fleet operator buying decisions and help stimulate uptake of battery electric trucks.

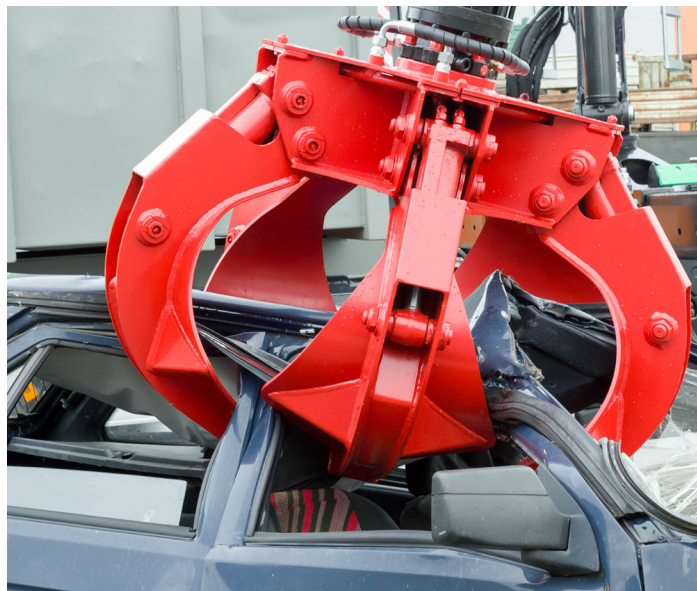


RE-USE, RECYCLING AND RECOVERY OF END-OF-LIFE VEHICLES (ELVS)

The UK automotive industry is committed to both sustainable manufacturing and responsibly managing a vehicle at the end of its life cycle. When a vehicle reaches the end of its life, it must be disposed of in an environmentally responsible way through an Authorised Treatment Facility (ATF). Through the End of Life Vehicles (ELVs) Regulation, vehicle manufacturers have an obligation to provide free take-back for cars and light commercial vehicles.

VMs have partnered with companies such as Autogreen and Cartakeback that will collect vehicles that have reached the end of their usable life and issue the necessary Certificate of Destruction (CoD), and in many cases will pay the last owner for the vehicle. The vehicle can then be disposed of and parts re-used, recycled or used for energy recovery.

From 2015 the industry has ensured that 95% (up from 85% previously) of the vehicles by weight going through its takeback network are re-used, recycled or recovered.



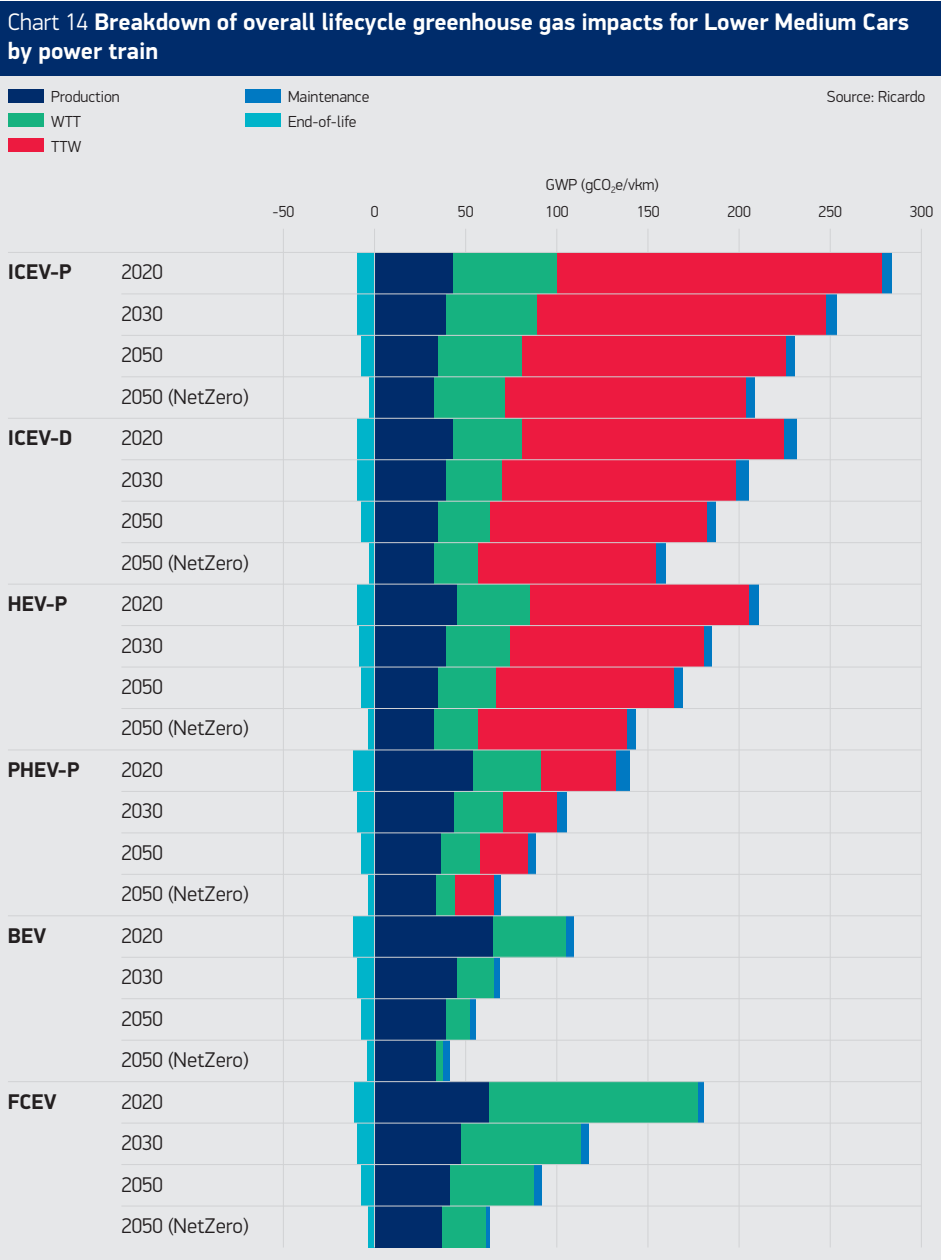
The UK automotive industry is committed to both sustainable manufacturing and responsibly managing a vehicle at the end of its life cycle

VEHICLE LIFE CYCLE ASSESSMENT

The 2021 Ricardo report, commissioned by the Department for Transport, shows that electric vehicles powertrains used in UK road vehicles are expected to have significantly lower greenhouse gas (GHG) lifecycle impacts across all vehicle types. According to the study, battery electric vehicles (BEVs) consistently perform better than all other powertrains. Due to the UK's very clean electricity mix, in 2020 a typical battery electric car was estimated to emit ~65% less in GHG compared to an equivalent conventional petrol car over its lifetime.

Improvements in battery technology, battery manufacturing and end-of-life treatment are projected to significantly reduce the LCA GHG emissions of BEVs in the future.

- By 2030, BEVs are estimated to deliver a ~76% GHG reduction over the lifecycle compared to an equivalent conventional petrol car, due to a combination of improved battery technology and a further decarbonised UK electricity grid. By 2050, these savings could increase to 81%.
- Production emissions for BEVs are around 50% higher than petrol cars in 2020 (mainly due to the batteries), and make up 67% of total estimated lifecycle GHG emissions. However by 2050, BEV production emissions could reach close to parity with those of conventional vehicles. This is mostly due to an increase in the scale of EV battery manufacturing, leading to efficiencies and reduced impacts. Battery recycling and second life utilisation will create additional benefits.
- Battery replacement is not expected to be needed for BEV cars and vans over their normal operational lifetimes with current technology. It is assumed that EV battery repurposing for second life will increase from 7% in 2020 to 40%-80% by 2040.



BATTERIES

In recent years, the battery technologies landscape has undergone significant change, particularly for EV batteries, and is expected to evolve further. In recognition of this, both the European Commission and the UK have started the process of reviewing the applicable legislation. In December 2020, the European Commission published the draft regulation concerning batteries and waste batteries, which, when finalised, will be directly applicable in all 27 Member States as well as Northern Ireland. The EU regulation is expected to be finalised by the end of 2022 and the UK is expected to follow a similar pathway, with draft regulations scheduled to be published in Q4 2022.

Almost 400,000 BEVs and more than one million hybrids have been registered in the UK since 2011. As a typical vehicle lifespan is 14 years in the UK, and because EV sales are relatively low, battery recycling is unlikely to contribute as a significant source of raw materials before 2030, when it is estimated to reach 28,164 tonnes. By 2040, the dominant feedstock for battery materials is expected to be from EoL vehicle retirement. A total of 235,000 tonnes are expected to be available for recycling and reuse by 2040, almost eight times that in 2030 (source: Advanced Propulsion Centre).

Reprocessing scrap from the scale up of UK gigafactories could generate up to 20,000 tonnes of cathode active materials by 2030 that can be reused, capable of making 7GWh of new batteries, equivalent to the supply for 100,000 cars.

By 2040, recycled battery waste from ELVs and manufacturing waste could supply enough cathode materials to product 60GWh of new batteries.

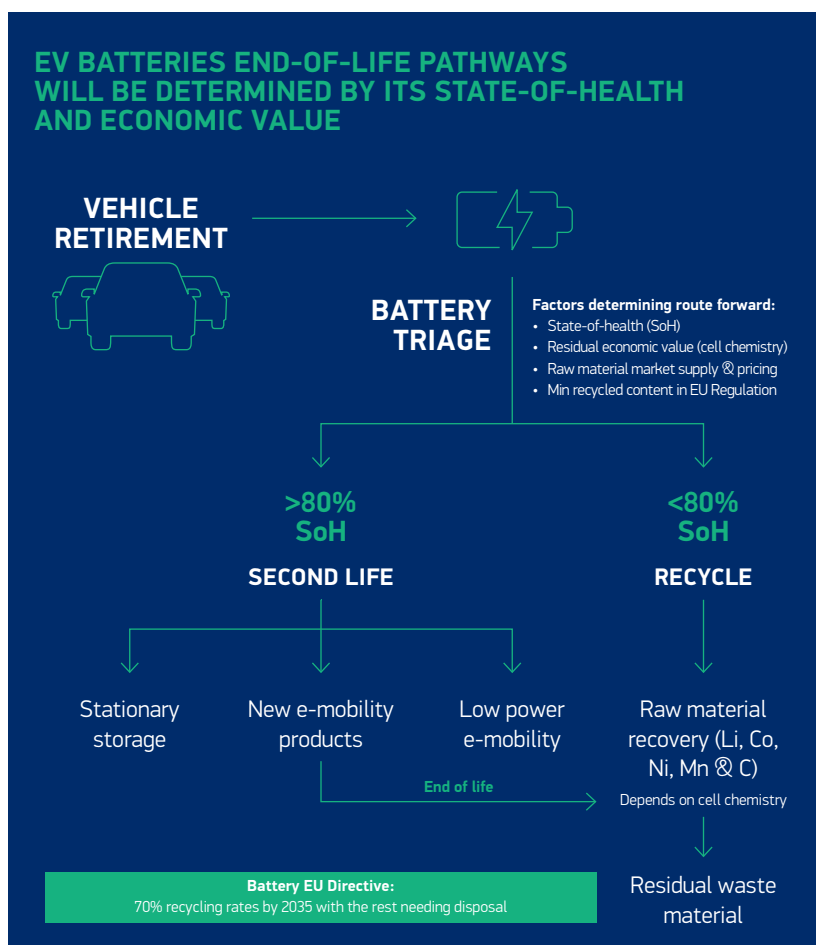
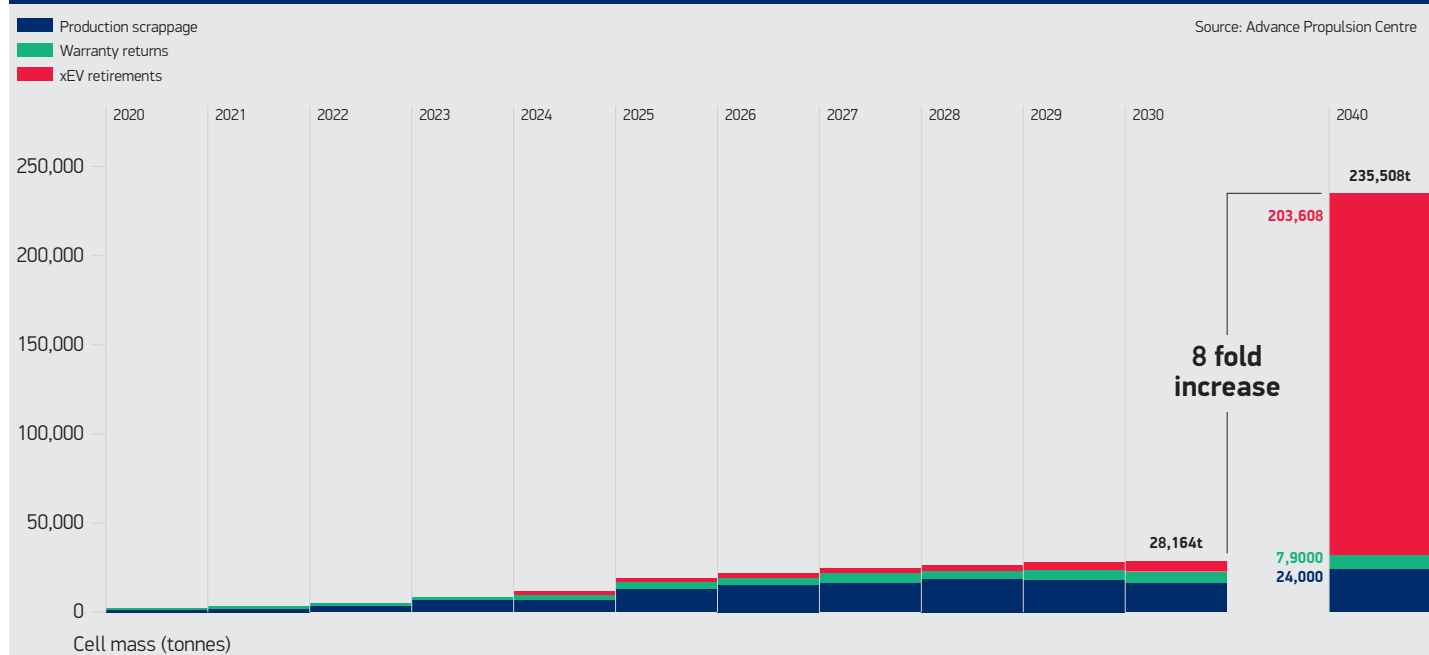


Chart 15 UK Battery capacity available for recycling and reuse



SUSTAINABLE SOURCING

In 2021, Drive Sustainability, the leading automotive partnership of 11 Original Equipment Manufacturers, launched [Raw Material Outlook](#), the new platform dedicated to managing and mitigating Human Rights violations and the Environmental Social and Governance (ESG) impacts of materials used in the automotive value chain. The platform covers the following materials: aluminium/bauxite, graphite, iron ore, magnesium, manganese, molybdenum, nickel, Rare Earth Elements (REE), tantalum and zinc. Findings on these materials are publicly available and updated regularly.



Almost 400,000 BEVs and more than one million hybrids have been registered in the UK since 2011.



CASE STUDY: JAGUAR LAND ROVER TRIALS SUPPLY CHAIN FOR LEATHER USING BLOCKCHAIN TECHNOLOGY

In 2021, Jaguar Land Rover partnered with supply chain traceability provider Circulor, leading UK leather manufacturer Bridge of Weir Leather Company, and the University of Nottingham, to trial the use of blockchain technology to ensure full transparency within a sustainable leather supply chain.

As part of the Innovate UK-funded research, a 'digital twin' of the raw material was created, allowing its progress to be tracked through the leather supply chain simultaneously in the real world and digitally. A combination of GPS data, biometrics

and QR codes was used to digitally verify the movement of leather at every step of the process using blockchain technology. The digital process also enabled Jaguar Land Rover to assess the carbon footprint of its leather supply network.

Jaguar Land Rover also offers customers more sustainable and responsible material choices for their vehicle interiors, such as the premium natural fibre eucalyptus for textile interiors and Kvadrat - a refined wool blend textile that's paired with a suede cloth made from 53 recycled plastic bottles per vehicle.

FROM ORIGIN TO VEHICLE



Jaguar Land Rover has teamed up with Circulor, Bridge of Weir Leather Company and the University of Nottingham to track the leather supply chain from origin to vehicle in a world-first trial.



ECONOMIC PERFORMANCE

→ After suffering one of the sharpest economic declines in history in 2020, the UK economy grew by 7.5% in 2021. However, COVID still left its mark, with ongoing workforce impacts, supply chain constraints (notably so in the automotive sector) and rising inflation. This meant that automotive was hindered in its recovery. The sector did nevertheless achieve significant success in driving further transformation in the market and production towards zero emission vehicles. Wholesale change, however, will require huge investment with multiple stakeholders needing to work together.

Performance

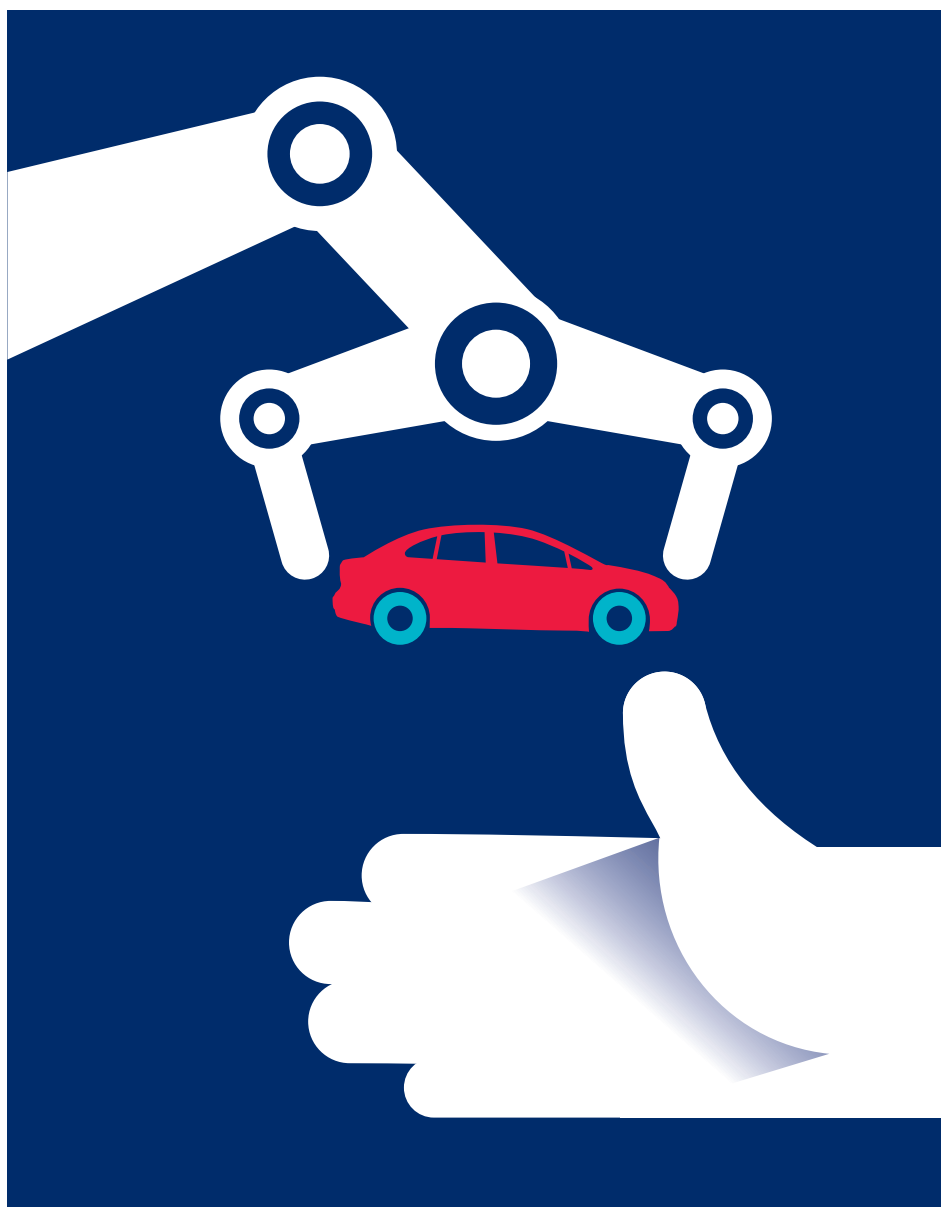
- Vehicle output down -5.5% in 2021 on weak 2020.
- New car registrations up modest 1.0% in 2021, with record volumes and share of electrified vehicles
- Auto manufacturing GVA £14 billion and employment 182,000

Reasons

- Ongoing COVID issues, including major supply chain shortages (notably of semiconductors)
- Sector working to meet net zero / accelerated decarbonisation ambitions
- Inflation, notably on energy, impacting profits and competitiveness

Future challenges/opportunities

- Reshoring supply chains
- Continued COVID disruption
- Mass transformation of markets and manufacturing process to meet net zero ambitions
- Russia/Ukraine conflict brings supply chain disruption, reducing sales



PRODUCTION

The global semiconductor supply issue resulted in a fall in UK vehicle output, as opposed to the expected bounceback in 2021, given the enormity of the COVID impact to 2020 production. Output was down -5.5% in 2021 at just over 930,000 units and almost a third (-32.4%) off 2019 levels. Car output fell by -6.7% in 2021 and was also impacted by the closure of Honda in July. CV output however rose by 11.3% (and was just -6% off 2019) as it was less impacted by the chip shortage.

Exports still account for 80% of UK vehicle production, with the majority going to Europe (55% for cars and 93% for CVs). In 2021 electrified vehicles accounted for 29.6% of car output, with 8.2% of the total being battery electric after a 72% rise in BEV output.

Output is expected to increase in 2022, from the lows of 2020 and 2021, if the semi-conductor issue recedes as hoped for. The Russian invasion of Ukraine has also shown the fragility within global automotive supply chains and increased uncertainty over the broader economic setting, as well as vehicle markets. To note, in 2021 1.1% of UK car exports went to Russia and 0.5% to Ukraine. Despite all of this, there has also been a raft of positive investment news in 2021 following the EU-UK TCA, notably around the move to electric vehicles, which should help to shore up UK volumes ahead.

Chart 16 Car and CV production (rolling year)

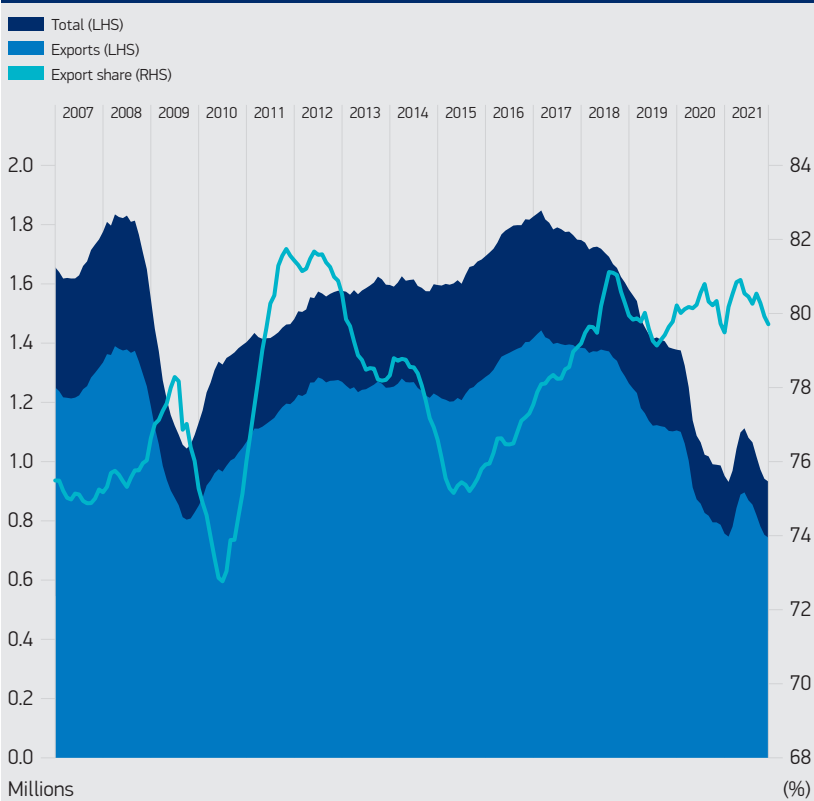
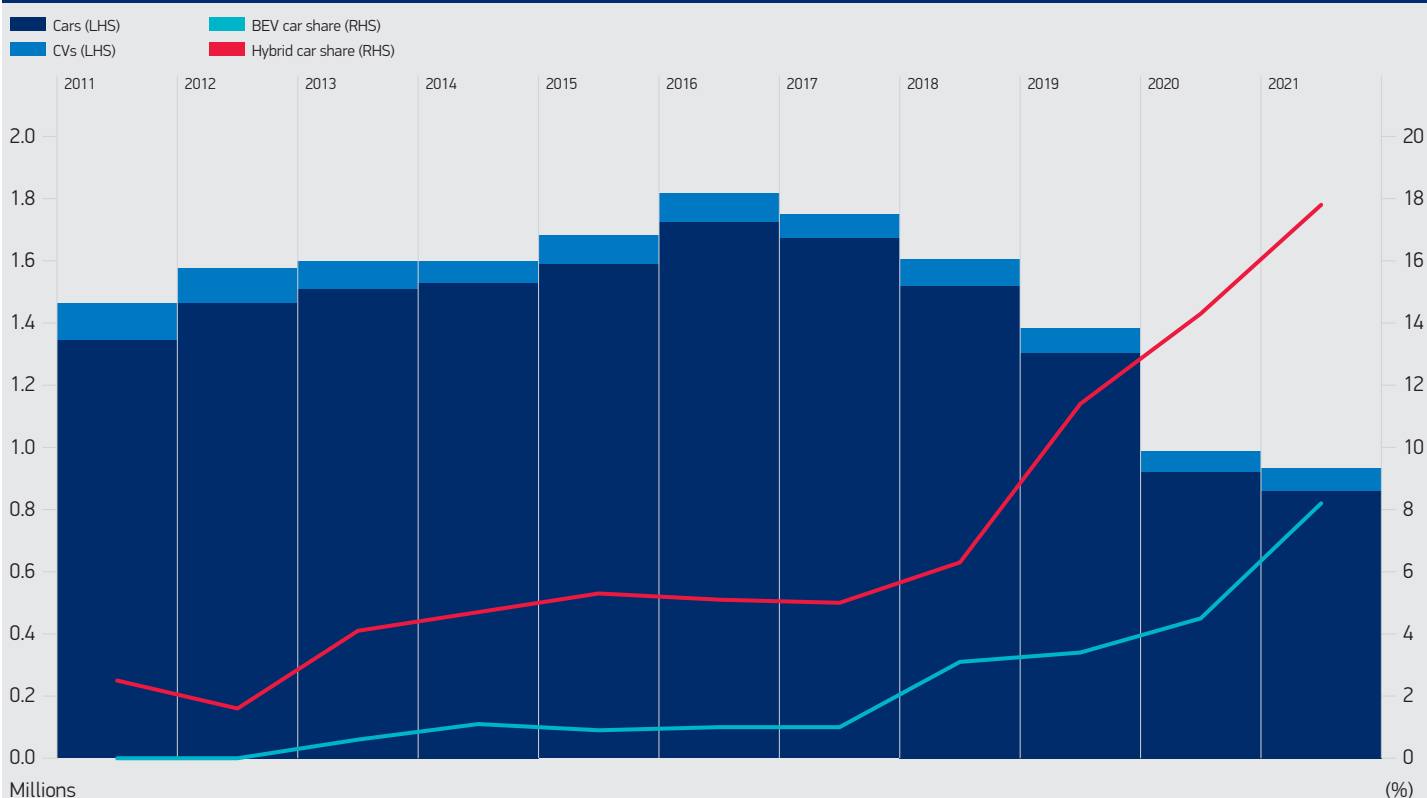


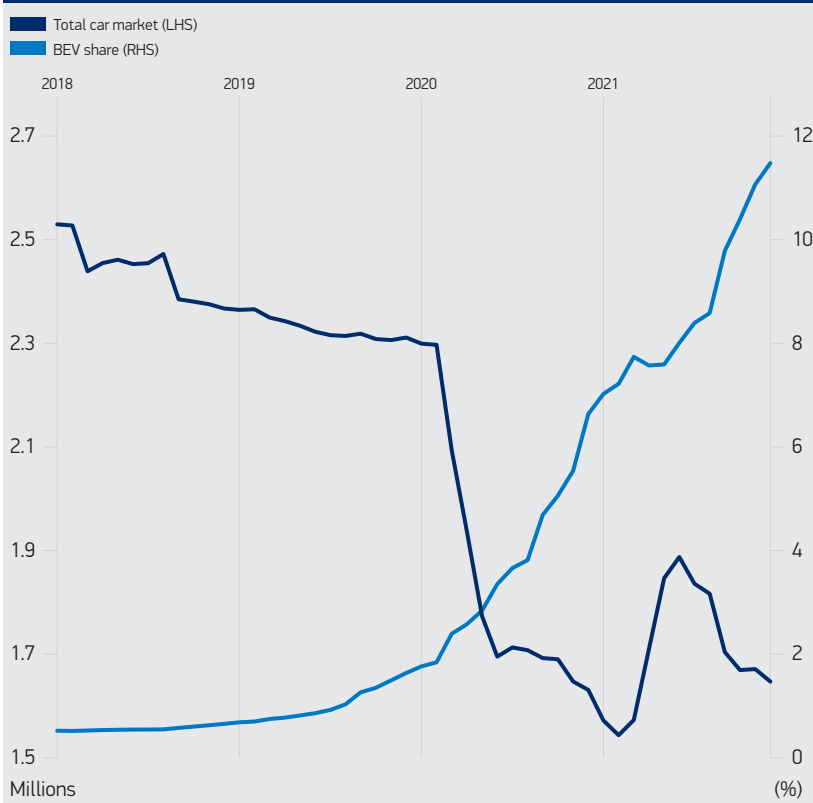
Chart 17 UK vehicle production and car BEV/hybrid share



REGISTRATIONS

The new car market rose by a very modest 1.0% in 2021 to 1.647 million units. A hoped-for swift recovery was constrained by continuing COVID issues and supply chain shortages. Economic headwinds did pick up too, but the supply chain disruption was key and left the market still down -28.7% on 2019's 2.311 million units. Compared with 2019 volumes, the market has lost more than 1.3 million units over the past two years, equivalent to some £43 billion (based on JATO average new car price).

Chart 18 New car market and BEV share (rolling year total)



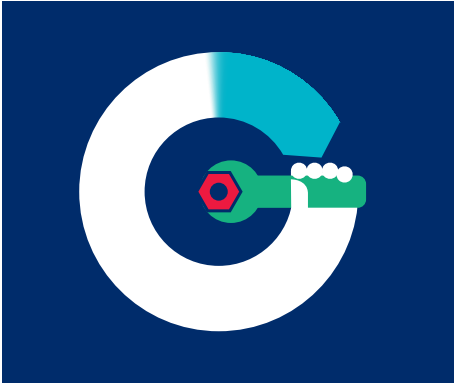
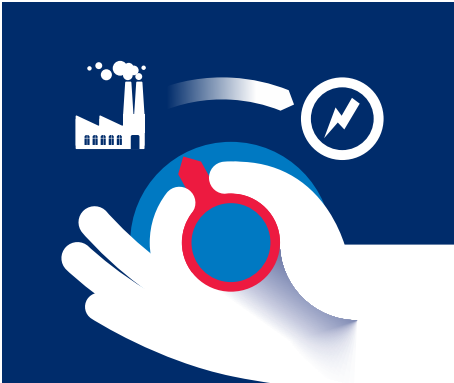
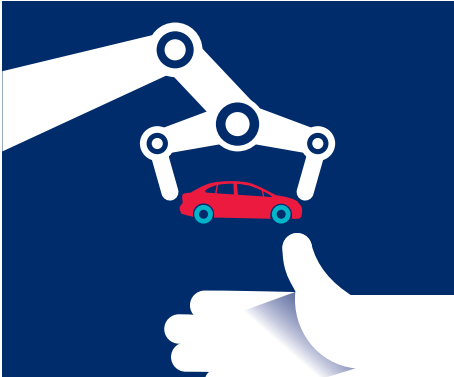
TURNOVER

UK automotive-related manufacturing turnover is estimated to have recovered by 5% in 2021 to £67.1 billion. In 2020, COVID impacts meant it fell by -20.6% to £63.9 billion, but 2021 was still some -16.6% or £13.4 billion lower than pre-COVID 2019 levels.

SMMT has undertaken an exercise to study in more depth the supply chain, notably the other sectors which feed into automotive. This is set out in our recent Full Throttle to Full Charge report. Automotive-related GVA is estimated to have recovered to £14.1 billion, although still -12.2% down on 2019 levels. However employment did fall, on the back of documented plant closures.



FUTURE SUSTAINABILITY AMBITIONS

	Ambitions	Challenges/opportunities
SOCIAL 	<ul style="list-style-type: none"> • Attracting and retaining skilled staff and upskilling the existing workforce to be able to meet future ambitions • Ensuring diversity, equity and inclusion among staff 	<ul style="list-style-type: none"> • Upskilling to support and develop new technologies • Create workforce which reflects our customer base
ENVIRONMENT 	<ul style="list-style-type: none"> • Deliver government ambition to decarbonise mobility • Decarbonisation of vehicle production and its supply chain • Further increase sector's circularity (including battery recycling) 	<ul style="list-style-type: none"> • Growing uptake of EVs • Supply chain issues caused record production drop, resulting in reduced efficiency • Zero emission energy supply would cut carbon from production and encourage investment in UK • Resource long-term security owing to closed loop approach • Reshoring production would reduce carbon footprint
ECONOMIC 	<ul style="list-style-type: none"> • Restoring supply chains to enable production volumes to recover and developing new ones to support EV transition • Securing UK investment in EV production 	<ul style="list-style-type: none"> • Ongoing supply chain shortages (e.g. semi-conductors) • Developing new supply chains for EVs • Ensuring the competitiveness of the sector – notably from high energy costs

SIGNATORIES

Signatories to this report	UK Brands
Aston Martin Lagonda Ltd	Aston Martin, Lagonda
Autocraft	Autocraft
Bentley Motors Ltd	Bentley
BMW Group UK including Rolls-Royce Motor Cars Ltd	BMW, MINI, Rolls-Royce
Bosch	Bosch
Caterpillar	Caterpillar, Perkins
Ford Motor Company Ltd	Ford
Jaguar Land Rover Ltd	Jaguar Cars, Land Rover
Leyland Trucks	DAF Trucks
Lotus	Lotus
McLaren	McLaren
Michelin Tyre plc	Michelin
Nissan	Nissan
Switch Mobility	Switch Mobility
PSA Group	Citroën, DS Automobiles, Peugeot, Vauxhall
Toyota (GB) plc Toyota Motor Manufacturing (UK) Ltd	Lexus, Toyota
Unipart	Unipart Logistics
Volkswagen Group (UK) Ltd	Audi, Cupra, SEAT, ŠKODA, Volkswagen Passenger Cars, Volkswagen Commercial Vehicles
Volvo Car UK Ltd	Volvo

REFERENCES AND ONLINE CONTENT

References and detailed data on the automotive industry performance can be found at:

www.smmmt.co.uk/sustainability

The webpage also contains links to signatories' sustainability websites.

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