

Brexit & Cars

The impact of the UK departure on the European automotive sector
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Executive Summary

The automotive industry plays a vital role in the economy of the EU and the UK, representing a significant part of exports and employing millions of people. Since the inception of the European Single Market, car manufacturers have greatly benefited from the absence of physical and trading barriers with components and vehicles freely moving from one end of Europe to the other.

While the shadow of the German car industry has dominated the EU market, UK car manufacturers have certainly stood out. Vehicle brands as Jaguar, Land Rover, Rolls-Royce and Bentley enjoy from an excellent reputation, while remaining relatively niche, and several foreign manufacturers have chosen the UK to establish their main EU factories and assembly lines over decades. The UK has also become a significant market for zero- and low-emission vehicles.

However, the UK departure from the EU Single Market on 29 March 2019 could inflict profound harm to its automotive industry and, consequently, to its economy. As the UK keeps affirming its departure from the Single Market, the following consequences seem likely without being part of a bespoke agreement:

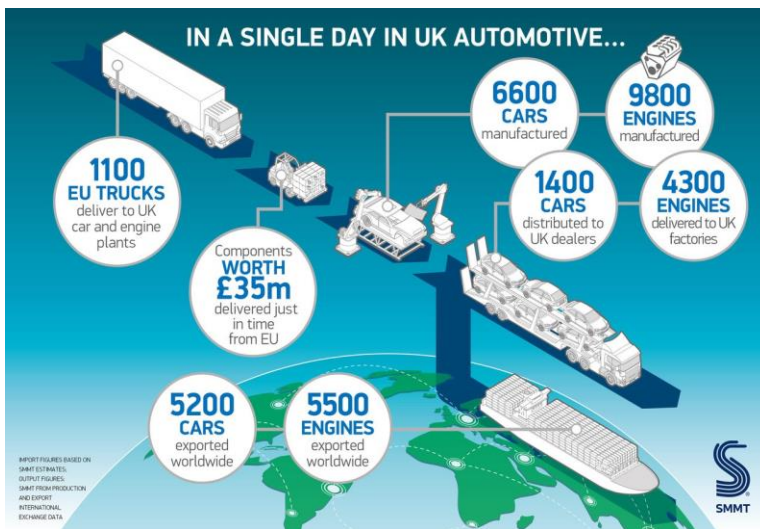
1. EU Regulations on vehicle CO₂ emissions will no longer apply to the UK. As such, incentives to increase electric vehicles sales will disappear potentially leading to reduced supply of EVs to the UK market.
2. The UK's attractiveness as a global centre for manufacture of EVs will be greatly diminished, and putting at risk meeting its ambitious 80% reduction target by 2050.
3. UK vehicles will become more expensive by around 10% abroad as they will have to be traded under World Trade Organisation (WTO) tariffs.
4. UK type-approvals issued by the UK Vehicle Certification Agency (VCA) will no longer be valid as to register, sell and enter into service vehicles in the EU. The VCA is likely to be limited to approving cars for sale in the UK.
5. Several thousands of jobs will be put at risk as the increase of costs, administrative burden and delays can be circumvented by relocating in an EU Member State.
6. According to T&E's estimations, around 7,310 direct employees could be partially put at risk with Brexit, from a total of 65,950 employees,ⁱ meaning a cut of up to 11% of the current UK employment by OEMs

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1. Introduction

According to the Society of Motor Manufacturers and Traders (SMMT),² every day more than 1,100 trucks cross from the European continent into the UK, to deliver some €40 million worth of components³ to UK vehicle and engine plants. These components build around 6,600 cars and 9,800 engines,⁴ the bulk of which are then shipped back to EU customers and assembly plants. All of these transactions and movements happen without being checked at a single customs or border, one of the many benefits of the European Single Market and the customs union.



The European automotive sector is central to the EU economy, employing directly around 2.3 million people in 2016 (8% of the EU's employment in manufacturing force).⁵ In the UK, direct employment in the sector amounted to about 110,000 people (0.4% of UK's active population).⁶ In addition, the sector is extremely export intensive: the EU exported in 2016 motor vehicles worth a total of €192 billion.⁷ In the UK, the sector generated €28 billion in exports in 2016, of which €15 billion were exports to other EU Member States. This dependency on the EU market also impacts imports, with an 81% of import volume to the UK coming from the EU.⁸

The Single Market, notably within the area of vehicles has been the most high profile example of the European liberalisation and integration in recent decades. The UK has been influential in shaping this development enabling its manufacturing sector to benefit from full market access. The UK vehicle sector is not homegrown, many European, Asian and US vehicle manufactures have established themselves within the UK ensuring their goods have access to the Single Market. Due to the UK departure from the EU, access will cease legally on 29 March 2019. Given the state of the negotiations, a hard Brexit will be hugely disruptive for manufacturers in both the UK and the EU. Due to high levels of integration, delays linked to increased customs checks or testing of vehicles will have significant impacts in terms of delivering new cars to the market. In turn this will lead to cars becoming more expensive. A high number of jobs could be under threat due to manufacturers simply relocating to continental Europe.

The following report highlights some of the most environmental and trade related issues that EU and UK negotiators will face in the coming weeks: European legislation related to vehicle carbon dioxide emissions (CO₂) within the Single Market; Rules of Origin; Type Approval.

2. EU Legislation and Targets

There are currently two Regulations⁹ that define the European vehicle market, specifically new passenger cars, with regards to carbon dioxide emissions (CO₂). These key pieces of law are fundamental pillars to Europe's ambition to decarbonise our economy and meet international climate targets such as Kyoto and Paris Climate Agreements.

2.1. 2021 targets

Regulation (EU) N° 333/2014 amending Regulation (EC) N° 443/2009, defines the modalities for reaching the 2020 target to reduce CO₂ emissions from new passenger cars. The law provides a one year phase-in period to comply with the 95g/km target. Ninety-five percent of each manufacturer's new cars will have to comply with the limit value curve in 2020, increasing to 100% in 2021. The legislation includes some key aspects that will have an impact on both the UK and the EU manufacturers, notably the sale of electrified vehicles.

The UK departure must have no consequences on either the implementation and enforcement (notably financial penalties) of the 2021 and the post 2020 targets.

a) Derogations

Special concession granted to manufacturers selling small runs of vehicles, less than a maximum of 300,000 cars per year, meaning that their overall target is less ambitious than the regulation. This concession was negotiated by the UK government and specifically benefits Jaguar-Land Rover (JLR).¹⁰ The current system will remain in place until 2024, meaning that the derogation will continue to be in place after the UK departure in 2019. Of JLR's total global sales, around 620,000, the UK market is 19%, while the EU-27 represents 16%.¹¹ The derogation linked not to a country, nationality of a manufacturer, or production location but linked to overall EU sales, as such the derogation will remain in place.

b) Penalties

Missing the established targets in the regulation is costly for manufacturers, penalties are broken down into two phases. Phase 1 from 2012 to 2019, sets out that should the average CO₂ emissions of a manufacturer's fleet exceed its limit value in any year from 2012, the manufacturer has to pay an excess emissions premium for each car registered. This premium amounts to:

- €5 for the first g/km of exceedance
- €15 for the second g/km
- €25 for the third g/km
- €95 for each subsequent g/km

Phase 2 from 2019, the cost will be €95 from the first gram of exceedance onwards.

Case Study: European Economic Agreement (EEA)

Both the 2009 and 2014 vehicle CO₂ emissions regulations have been incorporated into the EEA agreement,¹² applicable to Norway, Iceland and Liechtenstein. As such, vehicles sold on those markets must comply with both regulations. The agreement allows the EEA members a certain amount of access to European regulators, as such they may express their views on things like CO₂ reduction targets but they have no formal powers to amend the legislation or vote on the final text. This is what is commonly called as 'rule taking' over 'rule making'. Should the UK join, something they have continued to reject, the EEA after leaving the EU, the application of these regulations would be guaranteed

c) General CO₂ projections towards 2021

Compliance with the regulation is based upon the average emissions of all cars sold in the EU and EEA area. When the UK leaves the EU (and does not join the EEA) cars sold in the UK will not count towards companies targets (unless this is specifically included in the leaving agreement). At the EU level, Brexit should not have a significant impact on compliance with the 2020/1 targets. The T&E analysis based on the European fleet

average emissions, excluding the UK, shows that there will be little to no impact compared to the overall EU-28 fleet average emissions.¹³ The minor impact will be felt by individual manufacturers,¹⁴ specifically:

- Jaguar-Land Rover would be even earlier to meet its CO₂ target, as its EU-27 fleet emissions are lowered by 2.2gCO₂/km (because they on average sell higher emitting vehicles in the UK than in the rest of the EU);
- Ford, Honda, Hyundai, Mazda and Suzuki would delay their CO₂ compliance by one year, as their EU-27 fleet average emissions rise by +1.1 to +2.8gCO₂/km in 2021. As such with or without Brexit these manufacturers are most likely to not meet their targets on time and incur fines.

d) Impact of sales of electrified vehicles (EV)

An important impact of Brexit will be on the electrified vehicles market, especially the zero emission (ZEV) and plug-in hybrid models (PHEV). The current CO₂ regulation includes super-credits,¹⁵ a flexibility that gives a multiplying factor for low emitting vehicles. It means that these vehicles are artificially counted more than once reducing the CO₂ emission fleet averages. According to European Automobile Manufacturers' Association (ACEA), the UK was in 2017 the 3rd largest market in the EU for ZEVs (14%, behind Germany and France) and the biggest EU market for PHEVs (27%).¹⁶

The UK departure will mean that European manufacturers' sales of low emissions vehicles in the UK are no longer counted in the final 2020/1 Commission calculations. This would have a significant impact especially on those carmakers who need to earn a significant number of super-credits in order to achieve their targets and have appreciable UK sales.¹⁷

The effect could significantly reduce sales of EVs in the UK therefore impacting on the UK transport CO₂ emissions overall. This is because if the cars sold in the UK do not earn super-credits or count towards the regulation carmakers may choose not to sell these vehicles in the UK market at all. There are presently significant supply constraints in providing EVs in the EU market.¹⁸ Carmakers will therefore prioritise selling EVs in countries in which they earn super-credits and the sales help to meet their regulatory targets. If the CO₂ emissions of cars sold in the UK no longer matter it is possible carmakers will simply dump cheaper and less efficient models on the UK market.

2.2. Post-2020 target draft proposal

Published by the Commission in November 2017, the draft proposal calls for a 30% reduction target by 2030; along with an intermediate target of 15% by 2025. The proposal includes a zero- and low- emissions vehicle bonus, to reward manufacturers that sell more than the benchmark of electric vehicles. This inclusion will have an impact on both UK and EU manufacturers, due to the relative high volume of zero- and low-emission vehicles sold on the UK market. In the post 2020 period there will be no regulatory driver for carmakers to sell low and zero emission vehicles in the UK as these cars will not count towards compliance with the regulation. Some manufacturers may choose to rethink their sales and regulatory delivery strategy if margins are low on EVs and there is no regulatory driver for UK sales.

The draft proposal removes the derogation that carmakers, such as JLR benefit from today (carmakers selling between 10,000 and 300,000 cars) from 2025. However, the derogation for small volume manufacturers (selling between 1,000 and 10,000 cars) remains. This small-volume derogation is currently by several UK OEMs such as Aston Martin, Bentley, McLaren or Lotus. Regarding penalties, the excess emission premium from the existing Regulations is maintained, i.e. 95 euro/gCO₂/km.

The final outcome of the legislation is still not clear as the draft proposal is reviewed and needs to be adopted by the European Parliament and Council. The UK is likely to have a vote on the final deal (assuming

this is held before it leaves the EU) but its influence during the negotiation is currently limited. As a result it is unlikely JLR will be able to secure a further derogation.

Case Study: UK Climate Change Act and EVs

The Climate Change Act 2008¹⁹ is the basis for the UK's approach to addressing climate change. It sets out a strategy and legal framework to reduce carbon dioxide and other greenhouse gases emissions by at least 80% of 1990 levels by 2050. A key indicator to track progress is the emissions from new cars, and the market shares/penetration of electric vehicles over the years. However, since the UK market will no longer be an attractive selling point for European manufacturers, one could predict a slow down or stalling of zero-and low- emissions vehicles sales, thereby impacting the overall UK decarbonisation target. The UK 2017 progress report,²⁰ already noted an increase in transport emissions and a need to increase EV sales - without account for the impact of Brexit.

3. Rules of Origin

In today's global value chains, many industrial goods are produced with inputs and raw materials deriving from more than one country. Rules of origin (RoO) within trade agreements determine the national provenance of a product. Meaning that only goods that meet a certain level of local content can benefit from the preferential tariff rates envisaged within a Free Trade Agreement (FTA). The RoO vary based on product and on agreement, as these are not harmonised under World Trade Organisation (WTO) law.

When the UK leaves the EU (unless a comprehensive trade deal is negotiated), components coming from different EU Member States will no longer be considered as "local content". Currently, around 56% of vehicle components enter into the UK from abroad, many from EU Member States, meaning that only 44% are made domestically. This is far below the average of local content required in EU Free Trade Agreements (FTAs) for passenger vehicles,²¹ typically 50 to 60%.²² UK vehicles will not benefit from the preferential tariffs set in many FTAs, as they will be traded under WTO tariffs: 10% for passenger vehicles / 4.5% for vehicle components. This likely means that car parts and vehicles will become more costly due to tariffs.

This situation will not only have an impact in the future trading relationship between the UK and the EU, but also with third countries. The UK has announced²³ plans to "roll-over" EU FTAs which contain strict RoO. Meaning that these FTAs would simply be adopted by the UK in agreement with the other trading party. If these agreements will be unchanged, UK vehicles will also be traded under WTO tariffs with third countries such as Canada, Japan or South Korea, since the RoO provisions will not be met by UK manufacturers.

To prevent a major disruption for UK manufacturers: there could be a relaxation of the RoO requirements in a future EU-UK FTA as it was done for CETA,²⁴ allowing for EU parts to count as UK parts and vice-versa;²⁵ or including the UK in the Regional Convention on pan-Euro-Mediterranean preferential rules of origin (PEM Convention).²⁶

Trading under WTO tariffs will have a significant impact on manufacturers making cars in the UK destined for European and international showrooms. If you are looking to spend around 10,000 EUR on a new vehicle and it is suddenly 10% more expensive, you may decide to purchase another car manufactured elsewhere.²⁷



Case study: Manufacturing relocation

The map of England and Wales, includes the main manufacturers that currently own at least one assembly line, engine factory or engineering centre in the UK. The inability of the UK to meet strict RoO requirements, together with the significant increase of costs and administrative burden derived from the lack of mutual recognition of type approvals could have severe consequences in terms of direct employment by carmakers. Predicting firm numbers on job losses linked to manufacturing relocation remains a challenge at this stage of the ongoing negotiations. According to T&E's estimations, around **6,700 direct employees** could be partially put at risk with Brexit, from a total of **65,950 employees**,²⁸ meaning a cut of up to **10% of the current UK employment by OEMs**. Source for case study can be found in Annex I.

4. Type Approval

The EU type-approval system, by which carmakers are granted approval that vehicles meet the EU safety and environmental standards and can be sold across the EU, has been harmonised since the 2007 Directive.²⁹ While the system was recently improved, the existing regime is at the heart of the current diesel emissions scandal as it lacks robust and independent tests, or sufficient market surveillance. This has resulted in current diesel cars exceeding the air pollution limits by 4-5 times on average and as high as 10 times for some carmakers. The new provisions coming into effect in 2020³⁰, will ensure cars on the road are properly checked, with a bigger role to carry out controls given to the European Commission and independent third parties. This should result in much better compliance in the future.

This system is based on the principle of mutual recognition, meaning that a carmaker only needs to get an approval from one of the 28 national approval authorities to access the whole of EU market. This saves OEMs much time, effort and money as it is no longer necessary to go around 28 countries filing papers and performing separate tests.³¹

The European Commission has clearly stated that when the UK leaves the European Single Market, the type approvals issued by its approval authority, the Vehicle Certification Agency (VCA), will no longer be recognised as to obtain the European Whole Vehicle Type Approval (WVCA).³²

Currently, given their special relationship with the EU, only EEA countries and Switzerland³³ benefit from mutual recognition of type approvals with the EU. Trade agreements concluded with Japan³⁴ and South Korea,³⁵ both with substantive vehicle sectors, do not envisage mutual recognition of type approvals. Therefore, should the UK fail to achieve a similar relationship with the EU as per Switzerland, it will not be granted mutual recognition for the type approvals issued by the VCA unless this is specifically part of a comprehensive FTA.

As such, cars built in the UK will have to file double approval: once for the UK market and once for the European market there by adding cost, administrative burden, and increasing delays. As this could be simply circumvented by obtaining the Type Approval through another Type Approval Authority in an EU country. The work the VCA is threatened. Without an EU type-approval granted by a Member State authority, UK approved cars will not be able to be registered, sold or enter into service in the EU.

5. Conclusion

While it is clear that the UK departure from the EU will have a deep horizontal effect across different sectors and industries, the degree of this impact remains uncertain. This is in part due to a lack of clarity around the transitional agreement, and the future trading relationship.

In an effort to shed some light, this report has identified the consequences that Brexit could entail for the UK automotive industry and for the environment. If all current and future EU vehicle CO₂ emissions regulations are not implemented by the UK into national law after Brexit, vehicles manufactured in the UK will not be granted access to the Single Market and closing a massive market to those building cars in the UK. For European manufacturers incentives around zero- and low- emission vehicles will disappear. This will have a significant impact on manufacturers intending to sell such vehicles in the UK. Manufacturers will need to rethink their distribution at short notice. The Climate Act decarbonisation targets could be missed due to a slow-down in transport decarbonisation.

It has become increasingly evident for the sector that the conclusion of an EU-UK FTA does not actually prevent manufacturers from suffering severe disruption. As reflected in the case of RoO, having a FTA in place does not guarantee that UK cars will benefit from preferential tariff rates. Thus, these will become more expensive when traded under WTO tariffs. Similarly, a FTA does not ensure that UK manufacturers will be able to register and sell cars in the EU as the VCA will no longer be recognised as a certified authority after Brexit.

Unless a creative solution is found by both the UK and the EU that respects the European rule of law, upholds environmental standards and certification methods, and ensures smooth trade flows, the outcome of Brexit will be incredibly painful for the vehicle sector.

Annex I – Case study: Manufacturing relocation

The following annex was developed in order to assess the impact of potential OEM relocation. The focus was on all car makers located in the UK, regardless of location of headquarters. These manufacturers needed to have at least one facility, meaning an assembly line, an engine factory or a technical center. Comprehensive data on suppliers was not readily available as such not included. Those OEMs located in the UK with continental Europe plants where matched, to assess if the plant could easily absorb relocated manufacturing. Should a facility on continental Europe produce similar products the risk of partial or total relocation is high. Predicting firm numbers on job losses linked to manufacturing relocation remains a challenge at this stage of the ongoing negotiations.

- **Vauxhall (PSA Group)¹:** PSA owns both Vauxhall and Opel, the group is already concentrating production facilities. The UK departure could increase this concentration. PSA CEO has stated several times that the UK factories are not competitive compared to the French ones. Vauxhall's Ellesmere Port manufactures the Astra model that is also made in Poland, and has already suffered some employment cuts from 1,830 to 1,180.² The Astra could be manufactured in Poland or in France, as future models will share platforms and powertrains with other PSA models. Putting at risk the current **1,180 employees**, especially after 2021 when the PSA production engagement ends. The Astra could be manufactured in Poland or in France, as future models will share platforms and powertrains with other PSA models – putting at risk the current 1,180 employees, especially after 2021 when production of the new Astra model is set to begin.
- **Ford** owns a petrol engine factory in Bridgend, Wales. It currently produces petrol engines (called Sigma) that will be replaced by the newest generation (called Dragon) from this year but with a quarter of the current production level,³ knowing that similar petrol engines are already manufactured in Germany or Romania.⁴ Besides, the contract with Jaguar-Land Rover ends in the end of 2020, without any replacement for it.⁵ This could lead to a cut of about **1,500 employees** by 2020 from the current 2,130 employees working in the Welsh factory.
- **Mini (BMW Group):** Minis are mainly produced in the Oxford plant. However, BMW signed a contract with VDL NedCar, based in the Netherlands, to produce Minis on BMW's behalf in a dedicated BMW Group factory. More models have been added to the initial contract⁶ so the Dutch factory could absorb a partial amount of Oxford's production, putting partially at risk the current **4,000 employees**.
- **Jaguar-Land Rover (Tata Motors)** has a new factory in Slovakia that will be operational from 2018, so Jaguar-Land Rover could partially move its production on the continent; but this shift would be limited as Jaguar-Land Rover has 3 other assembly lines in the UK so it looks difficult to relocate everything, especially without further data about production capacities.

¹ The Guardian, [Vauxhall's Luton and Ellesmere Port factories will face battle after 2021](#), 06/03/2017 & The Guardian, [Vauxhall's Luton plant to increase production despite Brexit fears](#), 04/04/2018

² Reuters, [Peugeot to cut UK's Vauxhall car plant workforce by a third](#), 08/01/2018

³ Financial Times, [Future of Ford Bridgend engine plant further clouded by Jaguar decision](#), 28/09/2017

⁴ Ford, Corporate website, Company, Global operations, [Engine plants](#)

⁵ Financial Times, [Future of Ford Bridgend engine plant further clouded by Jaguar decision](#), 28/09/2017

⁶ VDL Groep, [VDL Nedcar starts production BMW X1](#), 22/08/2017

Endnotes

¹ This number corresponds to the total number of employees in the facilities owned by car manufacturers shown in the map in the case study of chapter 3. Data come from carmakers' corporate websites, JAMA (Japanese car industry association), Automotive News Europe and other articles from the press. The detailed list of sources used for this purpose is below:

- Automotive News Europe, [Assembly plant](#) and [powertrain](#) maps
- Automotive News Europe, [MG will end UK production](#), 23/09/2016
- Bloomberg, [Company Overview of Group Lotus plc](#), 02/03/2018
- BMW Group, [Annual report 2016](#)
- BMW Group, Corporate website, [List and details about worldwide production locations](#)
- BMW, Hams Hall Plant website, Facts & Figures, Plant Overview, [Factory data](#)
- Coventry Telegraph, [Aston Martin set to create 250 new jobs at Gaydon](#), 25/03/2016
- Financial Times, [Aston Martin won't pressure UK staff on EU vote](#), 03/03/2016
- Ford, Corporate website, Company, [Global operations](#)
- Jaguar-Land Rover, Corporate website, [Annual report 2016/17](#) for the list of facilities and 2014 company information for detailed employment per facility (not available on Jaguar-Land Rover's website anymore)
- JAMA, [Common challenges, Common future: Japanese Auto Manufacturers Contribute to the Competitiveness of Europe's Motor Industry](#), 2017 (data used for Honda's, Nissan's and Toyota's facilities)
- LEVC, Corporate website, Company overview, News, [London Taxi Company inaugurates £300 million new vehicle plant](#), 22/03/2017
- Opel, German media website, [Facts & figures – year in review 2016](#), 02/2017
- Reuters, [Ford warns of Brexit risks to its business](#), 09/06/2016
- Reuters, [Peugeot to cut UK's Vauxhall car plant workforce by a third](#), 08/01/2018
- Tata Motors, European Technical Centre's website, About us, [The company](#), 2017
- The Telegraph, [McLaren to double production work of its 200mph sports cars](#), 07/01/2016
- Volkswagen Group, Corporate website, Group, [Portrait & Production Plants](#)

² <https://twitter.com/SMMT/status/966943711270785025>

³ £34,810,384 – based on HMRC trade statistics and five day working week

⁴ 6,626 and 9,791 respectively – in 2016, 1,722,698 cars and 2,545,608 engines were produced in the UK; calculation based on five day working week

⁵ Eurostat, [Annual detailed enterprise statistics for industry \(NACE Rev. 2, B-E\)](#), Latest update: 02/02/2018 – Note: Regarding direct employment data for the automotive industry, all figures are 2016, except for France (2015, figure not yet available for 2016) and the UK (2011, confidential data since 2012). Regarding employment data for the overall manufacturing industry, all figures are 2016, except France and Malta (2015, figure not yet available for 2016).

⁶ Derived from Eurostat, [Annual detailed enterprise statistics for industry \(NACE Rev. 2, B-E\)](#), Latest update: 02/02/2018 and [Employment and activity by sex and age - annual data](#), Latest update: 22/01/2018 – Note: The latest available direct employment data for the UK automotive industry is from 2011, as data has been confidential since. The ratio has then been made with the 2011 data of the UK active population.

⁷ <http://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170621-1?inheritRedirect=true&redirect=%2Feurostat%2F>

⁸ <http://www.acea.be/statistics/article/motor-vehicle-trade-between-the-uk-and-main-eu-partners>

⁹ Regulation (EU) No 333/2014 amending Regulation (EC) No 443/2009

¹⁰ Between 10,000 and 300,000 cars per year can apply for a fixed target of a 25% reduction from their 2007 average emissions for 2012-2019, and a 45% reduction from the 2007 level as of 2020. Between 1,000 and 10,000 cars per year can propose their own emissions reduction target (subject to approval by the Commission based on agreed criteria) if they cannot or do not wish to join a pool. Fewer than 1,000 cars per year, as well as special purpose vehicles – such as vehicles built to accommodate wheelchair access – are excluded from the scope of the legislation.

¹¹ Derived from Reuters, [Jaguar Land Rover warns on UK outlook after record 2017 global sales](#), 08/01/2018 & ACEA, [2017 registration figures for passenger cars](#), 17/01/2018

¹² Decision of the EEA Joint Committee incorporating to the EEA agreement the Regulation (EU) No 333/2014, among others:

<http://www.efta.int/media/documents/legal-texts/eea/other-legal-documents/adopted-joint-committee-decisions/2017%20-%20English/109-2017.pdf>

¹³ The methodology regarding the CO₂ projections towards 2021 remains the same for both T&E's report, [CO₂ emissions from cars: The facts](#) (10/04/2018) and this report. Only the data changes to exclude UK figures, focusing on the new EU-27, based on EEA's databases ([Monitoring CO₂ emissions from passenger cars](#)). T&E cannot predict what vehicles the car manufacturers are developing, when they will be launched on the market and especially what will be their powertrain technology mix and their respective in lab CO₂ emissions. The projections give only an indication of the global trajectories car manufacturers are following, i.e. a "business as usual" scenario.

¹⁴ The following results do not count flexibilities allowed in the regulation, such as super-credits or eco-innovations.

¹⁵ Regulation (EU) No 333/2014 gives manufacturers additional incentives to produce vehicles with extremely low emissions (below 50g/km). Each low-emitting car is counted as: 3.5 (2012 and 2013); 2.5 (2014); 1.5 (2015); 1 (2016 to 2019); 2 (2020); 1.67 (2021); 1.33 (2022); 1 (2023).

¹⁶ ACEA, [2017 alternative fuel vehicle registrations figures](#), 01/02/2018

¹⁷ The methodology regarding the estimation of the number of sub-50g/km vehicles needed for manufacturers to meet their 2021 CO₂ target right on time is explained in further details in T&E's report: [CO₂ emissions from cars: The facts](#), 10/04/2018.

¹⁸ T&E, [Carmakers failing to hit their own goals for sales of electric cars](#), 05/09/2017

¹⁹ Climate Change Act 2008: <http://www.legislation.gov.uk/ukpga/2008/27/contents>

²⁰ 2017 Report to Parliament – Meeting Carbon Budgets: Closing the policy gap

<https://www.theccc.org.uk/publication/2017-report-to-parliament-meeting-carbon-budgets-closing-the-policy-gap/>

²¹ HS code: 8703

²² CETA: 50% to 55%; Japan 45% to 60%; ROK 55%.

²³ Her Majesty's Government technical note: International agreements during the implementation period, published 8 February 2018:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/680366/Technical_Note_-_International_Agreements_in_the_Implementation_Period_-_CLEAN.pdf

²⁴ In CETA, the local content requirement for the first 100,000 vehicles was reduced to 30% measured by value, or 20% measured by net cost, (Annex 5- A: Section D – Vehicles, p. 690 CETA).

²⁵ This is known as bilateral cumulation.

²⁶ This would allow for diagonal cumulation with third countries party to the PEM Convention that have a FTA with the UK and the EU <https://medium.com/@SamuelMarcLowe/why-the-uk-should-probably-join-the-pan-euro-mediterranean-convention-f25905bb17d9>

²⁷ During the parliamentary hearings between the UK government and the vehicle industry, it was estimated that the tariff impact could be as high as £1,500 for vehicles tariffs and £300 for components tariffs. Averaging around £1800 per vehicle in addition to the current cost. See declarations (Q24-Q47) made by Mike Hawes in the UK Business, Energy and Industrial Strategy Committee on 14 November 2017: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/business-energy-and-industrial-strategy-committee/leaving-the-eu-implications-for-the-automotive-industry/oral/73855.html>

²⁸ This number corresponds to the total number of employees in the facilities owned by car manufacturers shown in the map in the case study of chapter 3. Data come from carmakers' corporate websites, JAMA (Japanese car industry association), Automotive News Europe and other articles from the press. The detailed list of sources used for this purpose is below:

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- Tata Motors, European Technical Centre's website, About us, [The company](#), 2017
- The Telegraph, [McLaren to double production work of its 200mph sports cars](#), 07/01/2016
- Volkswagen Group, Corporate website, Group, [Portrait & Production Plants](#)

²⁹ Directive 2007/46/EC

³⁰ Council of the European Union; Approval and market surveillance for cars <http://www.consilium.europa.eu/en/policies/type-approval-for-cars/>

³¹ The European Commission has proposed a draft Regulation to reform the current framework Directive 2007/46/EC. This reform includes new elements such as market surveillance authorities and it allows any Member State to order recalls or market withdrawals. For more information, see T&E's report "Will final talks produce a robust vehicle approval system?" published 29 November 2017: <https://www.transportenvironment.org/publications/will-final-talks-produce-robust-vehicle-approval-system>

³² European Commission's notice to stakeholders on the withdrawal of the United Kingdom and EU rules in the field of type-approval of motor vehicles: https://ec.europa.eu/info/publications/withdrawal-united-kingdom-and-eu-rules-field-type-approval-motor-vehicles_en

³³ Chapter 12, Section V, 2 of the Agreement between the European Community and the Swiss Confederation on mutual recognition in relation to conformity assessment.

³⁴ See declarations (Q4) made by Patrick Keating in the UK Business, Energy and Industrial Strategy Committee on 14 November 2017: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/business-energy-and-industrial-strategy-committee/leaving-the-eu-implications-for-the-automotive-industry/oral/73855.html>

³⁵ Annex 2-C, Article 3(a)(i) of the Free Trade Agreement between the EU and the Republic of South Korea