Low Emission Zones
and the impact on fleets

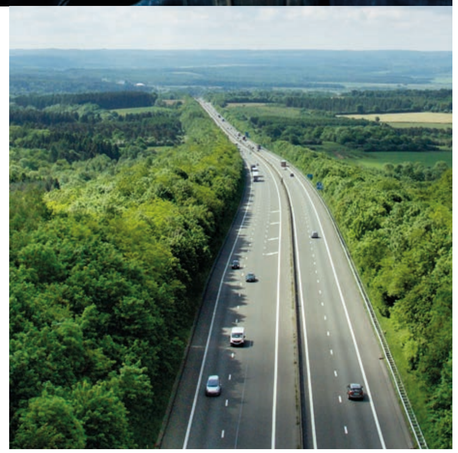
What's next?

Q3 2017

“Air pollutant emissions from transport make a significant contribution to the overall air quality in European cities”

As far back as in 1997, with the Kyoto Protocol, and more recently in 2016 with the Paris Agreement, members have made a commitment to reducing greenhouse gas emissions. Today, in view of greater global awareness of sustainability and the environment, cities around the world are also striving to reduce greenhouse gas emissions by, amongst other things, restricting access for certain vehicles.

There are several factors contributing to this increased focus on CO_2 emissions. Firstly, with the worst of the crisis behind us, economies are growing and the overall standard of living is improving for many people. Especially in countries like China, this is making car ownership possible for more and more consumers.



Secondly, hybrid or electric alternatives to purely fossil fuel-powered vehicles as well as other alternative modes of transport are available in the market, empowering city governments to actively stimulate the shift towards those alternatives.

Last but not least, recent scandals relating to emission levels have turned the spotlight on diesel vehicles. Historically, diesel-powered vehicles have been the preferred choice for many car owners in Europe. Good fuel mileage, reliability and overall cost effectiveness have given diesel a high market share.

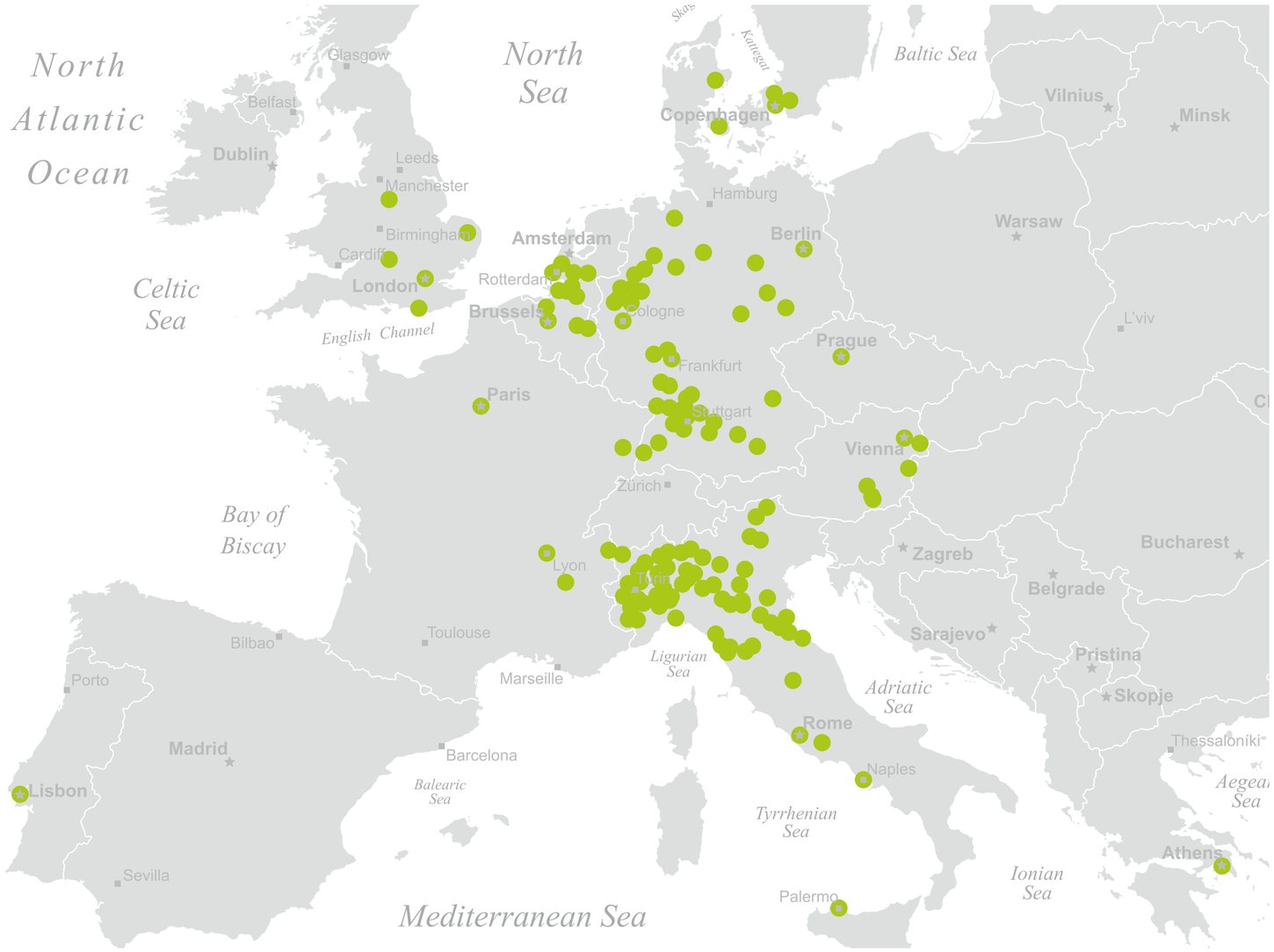
Even though CO_2 levels emitted by diesel-powered vehicles are lower than those of petrol-powered vehicles, air pollutant emissions from transport make a significant contribution to the overall air quality in Europe. Cities that suffer from heavy air pollution, such as Athens, Beijing and Mexico City, have permanent restrictions in place based on the last digit of a vehicle's licence plate[1]. Closer to home in Western Europe, Paris introduced similar restrictions for vehicles in December 2016[2]. And more drastic measures are on the way, with some cities considering banning all diesel vehicles from their centres in the long run[3]. This raises the question of whether it is necessary to move away from diesel in favour of either petrol or even electric-powered vehicles in order to ensure access to city centres.

Low Emission Zones

The effectiveness of restrictions based on licence plates is a topic of controversy, as it may lead motorists to purchase an extra vehicle with a different licence plate in order to circumvent restrictions. This not only increases the number of vehicles on the road, but often these vehicles are also relatively old, effectively increasing greenhouse gas emissions instead of reducing them[1].

Low Emission Zones (LEZs), which restrict certain vehicles or impose a surcharge on drivers every time they enter the zone, may be more effective instead. Examples of LEZs can be found all over Europe, where well over 200 cities already have some sort of restriction in place[4].

Most countries have a national scheme in place that is applied once a city decides to implement an LEZ. However, it is possible for local cities to deviate from the national scheme, making it less clear for drivers what the local legislation entails. Restrictions may be based on any combination of fuel type (diesel or petrol), vehicle type (heavy-duty LCV, light LCV, passenger car, motorbike, moped, motorhome/ camper van, etc), first year of registration and/ or the European emission standards ('Euro 1' to 'Euro 6') that define the acceptable limits for exhaust emissions of vehicles.



Low Emission Zones across Europe[5].

LEZs apply to both petrol and diesel vehicles. If the norm has been set at Euro 5, your vehicle or fleet is fine as long as the vehicles have been registered after January 2011. Euro 5 vehicles are allowed to enter almost 97% (petrol) and 95% (diesel) of LEZs currently in place. And even if the latest Euro 6 norm applies, which is the case in 3.3% (petrol) and 5.8% (diesel) of today's LEZs, the only thing that matters is whether the vehicle was registered after September 2015, irrespective of whether it runs on diesel or petrol.

European Emission Standards

The European emission standard was first introduced in 1991, but emissions from road transport have not been reduced as much as expected since then. Emissions in real-life driving conditions are often higher than those measured during approval testing (in particular for diesel vehicles). Urban hotspots of high NOx concentrations (see box below) are even more impacted by vehicle emissions, with transport share rising to more than 60%[6].

The air pollutant emissions from transport make a significant contribution to the overall state of air quality in Europe. Emissions of particulate matter (PM), nitrogen oxides (NO and NO_2 which, when measured in combination, are referred to as NOx), un-burnt hydrocarbons (HC) and carbon monoxide (CO) are pollutants regulated by Euro emissions standards.

Most commonly we find that governments restrict city access based on the vehicle's Euro standard, which can easily be derived from the date of first registration of the vehicle. The standards have been introduced and amended in six stages. Any vehicle registered in the European Union after September 2015 must adhere to the most recent and thus strictest standard, Euro 6[7].

Euro emissions standards for diesel cars

Euro Standard	Date	CO	NOx	PM
Euro 1	July 1992	2.72	-	0.14
Euro 2	January 1996	1.0	-	0.08
Euro 3	January 2000	0.64	0.50	0.05
Euro 4	January 2005	0.50	0.25	0.025
Euro 5a	September 2009	0.50	0.180	0.005
Euro 6	September 2014	0.50	0.080	0.005

Euro emissions standards for petrol cars

Euro Standard	Date	CO	NOx	PM
Euro 1	July 1992	2.72	-	-
Euro 2	January 1996	2.2	-	-
Euro 3	January 2000	2.3	0.15	-
Euro 4	January 2005	1.0	0.08	-
Euro 5	September 2009	1.0	0.060	0.005
Euro 6	September 2014	1.0	0.060	0.005

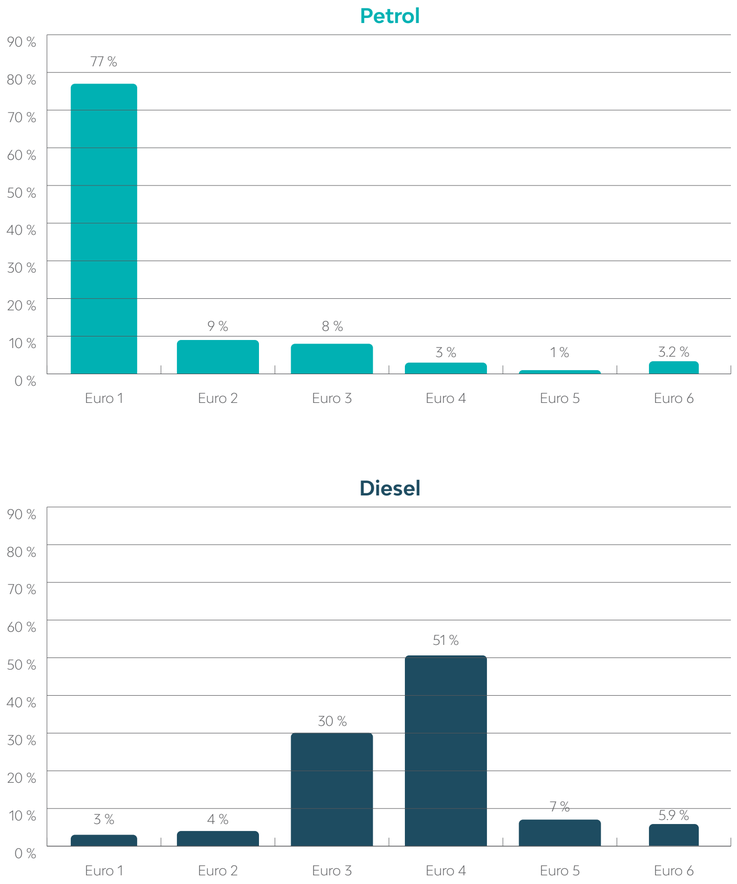
Euro emission standards for diesel and petrol cars[2].

All dates listed in the tables on the left refer to new type approvals (i.e. new models of vehicles that have not been produced before). All vehicles had one year after the date given below in which to comply with the standards, to allow manufacturers to sell the vehicles already produced. Conversely, some vehicle models were released before the dates below, so met the standards earlier than they were legally required to. A few models produced on a small scale were given extensions[8].

In the case that drivers are required to purchase a sticker that must be displayed visibly on the vehicle, enforcement generally takes place manually. In some cases, such as in The Netherlands, cameras automatically check all licence plates of vehicles entering the LEZ. The cameras are linked to the database of the department of motor vehicles, providing access to the first date of registration and thus the applicable Euro standard. This also means that fines are automatically issued to the owners of vehicles that are not permitted within the LEZ.

Impact on drivers

An increasing number of cities in Europe have emergency air quality schemes. These are in operation at times of very high pollution, or when very high pollution is predicted. In this context, Oslo already has a diesel ban (for pre-Euro 6 diesel vehicles) and an odd-even licence plate scheme during times of high pollution and is considering a total ban on cars from the city centre as of 2020. Brussels and Antwerp in Belgium will ban pre-Euro 6 diesel vehicles from 2025 onwards (and petrol vehicles will require Euro 3). On days when pollution is high, Milan only allows electric vehicles into the city centre and Stuttgart, home of Mercedes-Benz and Porsche, is set to ban diesel cars that do not meet the latest Euro 6 emission standards.



Minimum Euro standard required to enter the LEZ for petrol and diesel vehicles[8].

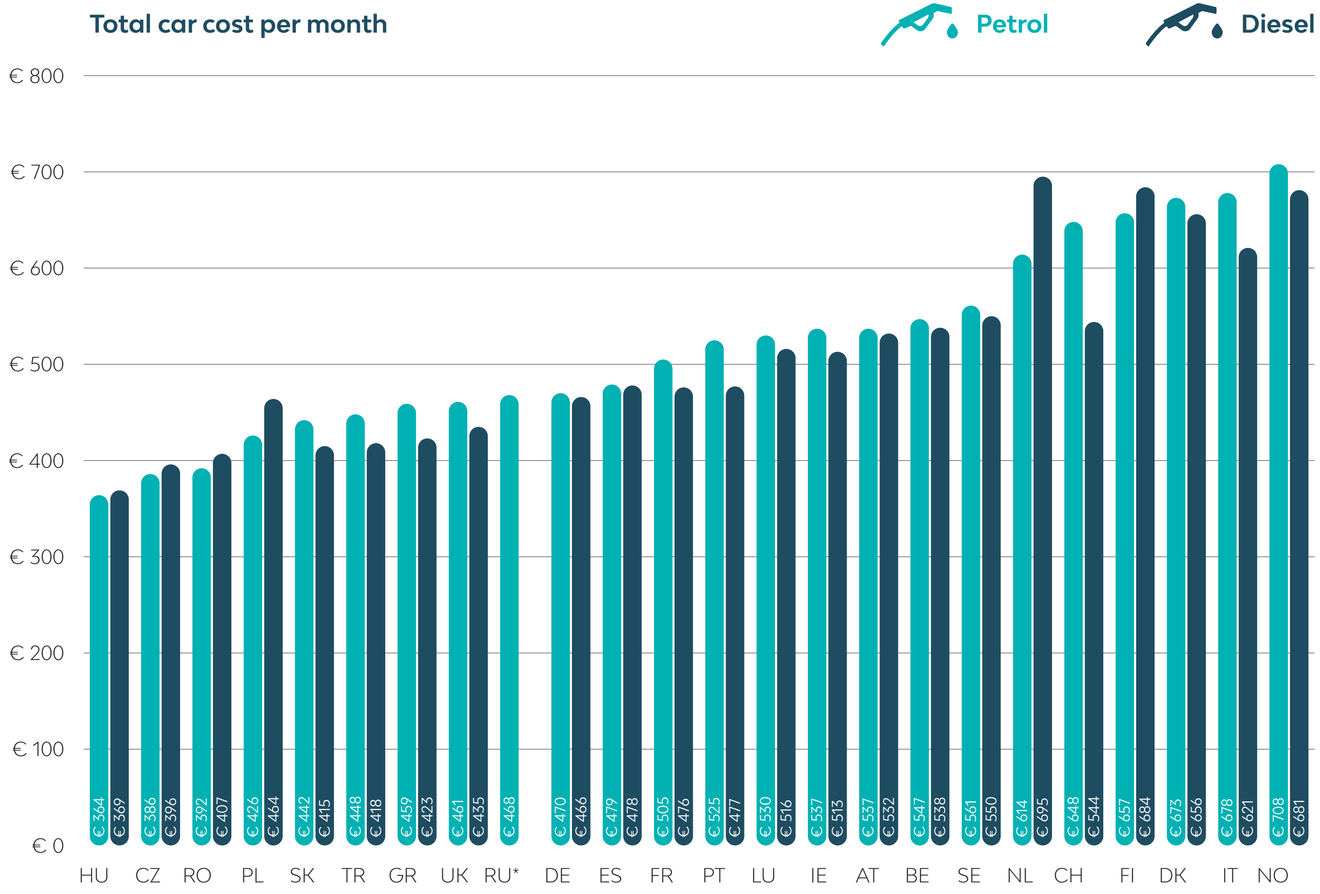
However, Stuttgart is not the only city set to restrict the use of diesels. Since 1 July 2016, there has been a ban on vehicles older than 19 years from driving in the French capital, Paris, on workdays. Motorcycles face even tighter restrictions, with a driving ban on all two-wheeled motor vehicles made before 2000. And from October 2017, drivers of older diesel cars entering the centre of London will have to pay a GBP 10 (EUR 11.80) 'toxicity charge' in addition to the current GBP 11.50 (EUR 13.60) congestion charge. Furthermore, London Mayor Sadiq Kahn has called for the city to become an Ultra Low Emission Zone (ULEZ) by 2019. An ULEZ is already in place for large commercial vehicles, but this could now be expanded to cover older diesel cars and vans that don't comply with Euro 6.

Although many European cities of various sizes already have LEZs in place, the majority of cities do not. When LEZs are in place, the restrictions usually apply to the inner city centre. The scope of LEZ restrictions vary; some cities have a relatively low threshold (Prague is *considering* implementing Euro 1 for petrol and Euro 3 for diesel), whereas other cities have already set the minimum norm at Euro 5 for large LCVs and buses (e.g. Stockholm). Our analysis shows that most LEZ restrictions apply to diesel vehicles, yet no cities permanently restrict all diesel vehicles so far. Furthermore, if restrictions are in place, they are stricter for diesel vehicles (most commonly Euro 3 or 4 being required to enter the LEZ) than for petrol vehicles (most commonly Euro 1 being required to enter the LEZ)[9].

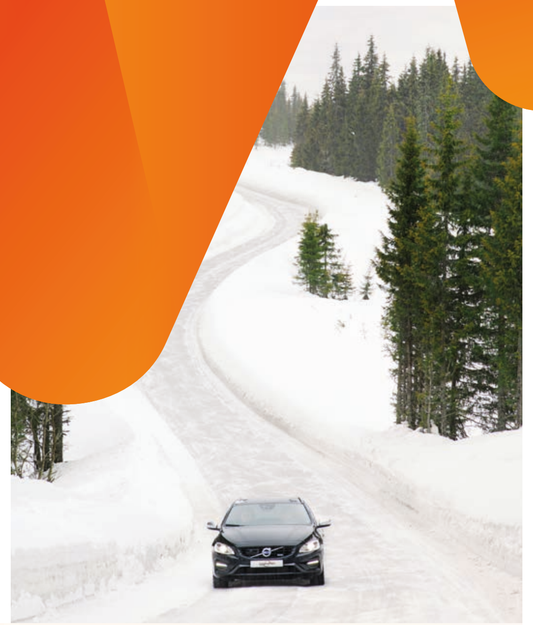
Diesel versus petrol

LeasePlan recently conducted its annual Car Cost Index, investigating the difference in the total cost of ownership in the B and C segments for diesel versus petrol vehicles. This study maps out all the cost elements of a car in great detail at an international level, drawing upon LeasePlan's knowledge and experience from its own multi-branded fleet using index methodology. The analysis of 24 European countries showed that diesel is the cheaper option in the majority of countries, albeit marginally in some cases.

Even though diesel vehicles are still the preferred choice within Europe because of lower cost, their share is decreasing. New diesel passenger cars registered in Western Europe peaked at 55.7% in 2011 but declined gradually to 53.1% in 2014. In the wake of the emissions scandal, the market share fell rapidly to 51.6% in 2015 and 49.5% in 2016, according to European Automobile Manufacturers Association data. Diesel now commands less than half of the European market for the first time since 2005, apart from an anomaly in 2009, when small petrol cars were incentivised by scrappage schemes, especially in Germany. Nevertheless, it remains the dominant fuel type in the region, especially for fleets, with petrol having accounted for 45.8% of new



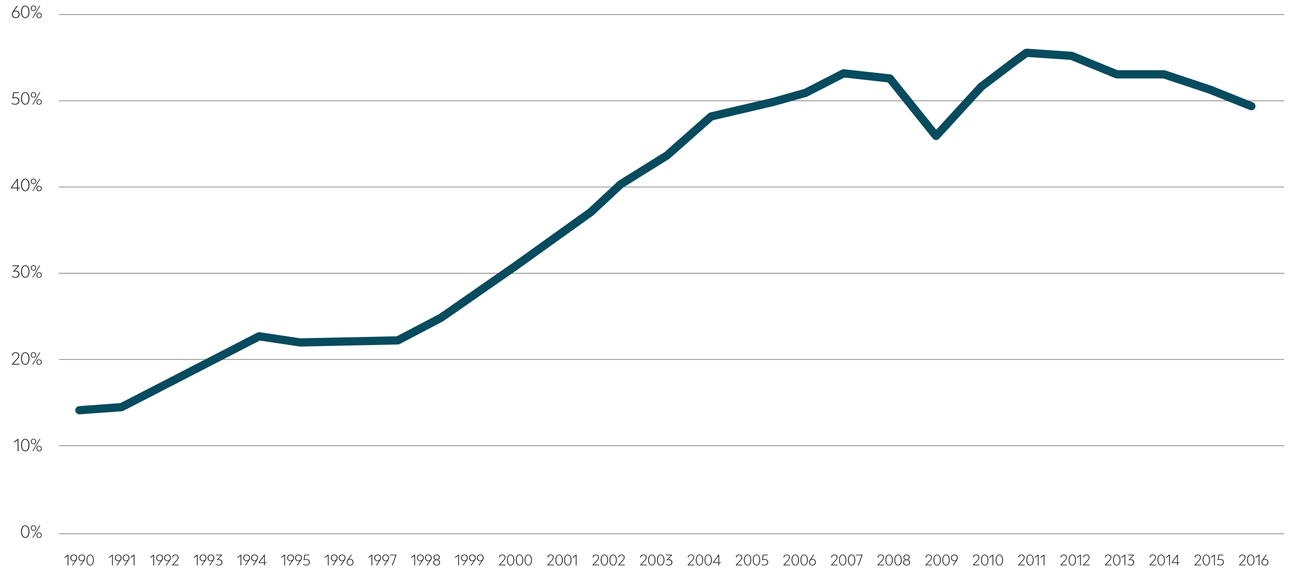
LeasePlan Car Cost Index 2017: diesel vs. petrol comparison of the total average cost per month for B & C segment vehicles shows that diesel often is the cheaper option.



registrations in 2016. But diesel is set to lose its dominant position and the diesel share is expected to fall to just 30% by 2020[11].

Overall in 2016, 49.5% of all new passenger cars registered in Western Europe ran on diesel and 45.8% on petrol, while hybrid electric vehicles (HEV) accounted for 2.1% of new cars, electrically chargeable vehicles (ECV) for 1.5% and other alternative fuels (such as LPG, natural gas and E85) for 1.2%.

Share of diesel in new passenger cars in Western Europe (%)

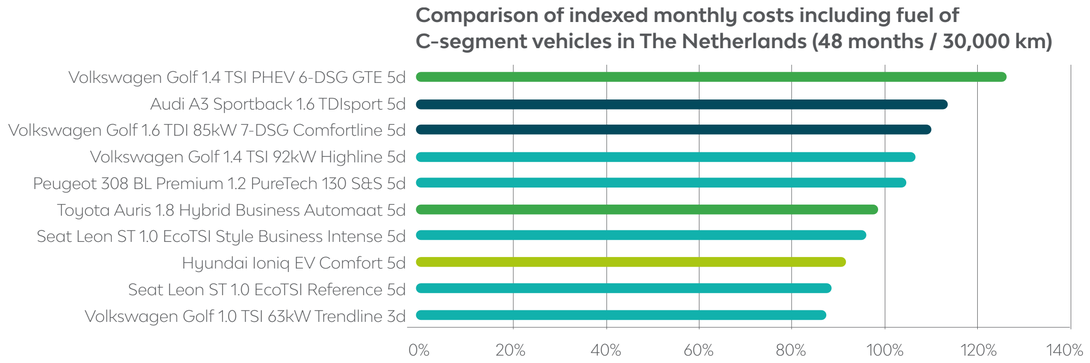


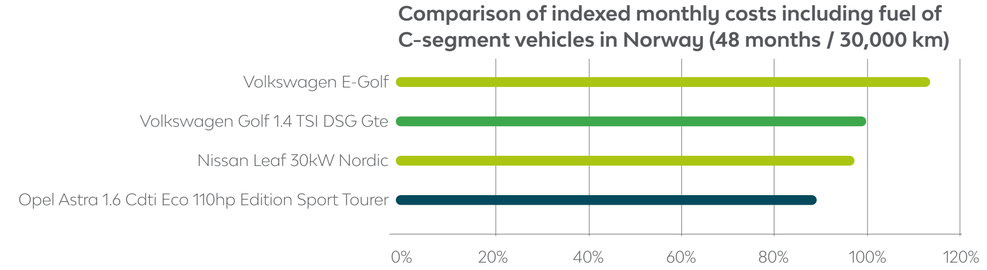
The popularity of diesel in Europe has been falling as a result of the emissions scandal and this is expected to continue[11].

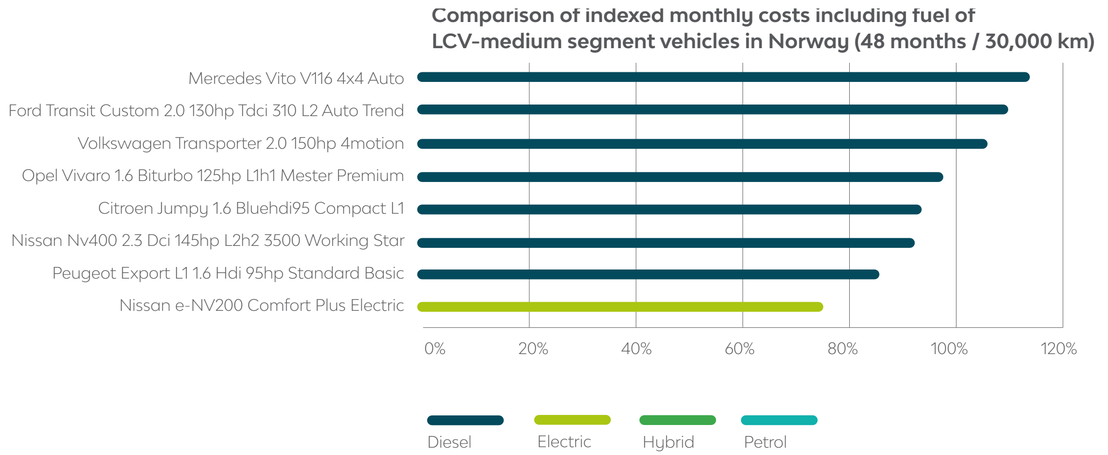
Electric vehicles

Even though the diesel engine still tops the list today, the usage of low-emission vehicles – especially electric cars but also potentially fuel-cell vehicles – is set to rise as technology costs fall and regulatory pressure to cut emissions increases. The adoption of electric vehicles is therefore expected to grow exponentially, increasing tenfold compared to today to 20 million vehicles globally by 2020[12].

For illustrative purposes, LeasePlan compared a number of electric vehicles with petrol and diesel models from Norway and The Netherlands in the C-segment and medium-LCV segment. The analysis shows that affordable electric alternatives are available today. For example, if you are looking for a medium-LCV in Norway, the Nissan e-NV200 is a serious alternative. For a C-segment vehicle in The Netherlands, the Hyundai Ioniq EV is one to consider. Due to lower costs for fuel (electricity) plus tax breaks, both models have very competitive monthly lease instalments.







1 www.theguardian.com/cities/2014/mar/20/licence-plate-driving-bans-paris-ineffective-air-pollution
2 www.theguardian.com/world/2016/dec/07/paris-bans-cars-for-second-day-running-as-pollution-strikes
3 www.theguardian.com/environment/2016/dec/02/four-of-worlds-biggest-cities-to-ban-diesel-cars-from-their-centres
4 urbanaccessregulations.eu/low-emission-zones-main/what-are-low-emission-zones
5 urbanaccessregulations.eu/low-emission-zones-main/what-are-low-emission-zones
6 ec.europa.eu/environment/air/transport/road.htm
7 eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0001:0015:EN:PDF
8 www.urbanaccessregulations.eu/low-emission-zones-main/what-emissions-standard-is-my-vehicle
9 LeasePlan analysis based on data from http://urbanaccessregulations.eu
10 www.leaseplan.com/news/2017/2/6/leaseplan-carcost-index-car-ownership-in-norway-most-expensive-almost-doubling-hungary/
11 www.autovistagroup.com/news-and-insights/diesel-set-lose-its-dominance-western-europe
12 Electric vehicles: amp it up www.ft.com/content/472020da-bae6-11e6-8b45-b8b81dd5d080

Conclusion

Based on the increased focus on the environment and the growing number of LEZs across Europe, it is clear that LEZs and the electrification of vehicles are trends that cannot be ignored. This raises the question of whether you need to consider a move from diesel vehicles in favour of petrol or even electric-powered ones. Also, regardless of LEZs, the environmental impact of purely diesel or petrol vehicles may prompt you to consider a possible switch to electric vehicles.

As things stand today, there is a small risk of being denied access to city centres across Europe with a diesel vehicle. That being said, it is expected that more and more cities will adopt LEZs in the years to come. Also, diesel vehicle prices are expected to rise as manufacturers need to invest more in order to meet increasingly stringent emission targets[11].

This article shows that diesel vehicles will often still be the preferred choice because of their lower cost, although this may vary depending on the country (based on local legislation, fuel prices, possible tax breaks for electric vehicles, etc.) and the specific vehicle model.

Affordable electric vehicles are already available today and the number of electric vehicles to choose from will only expand, bringing them increasingly into the mainstream. At this stage, it is essential to be at least aware of this development. This is an opportunity for your organization to take a stance on sustainability and the environment by updating its car policy to allow employees to order and drive electric vehicles.

For more information please contact LeasePlan International's Consultancy Services department or a local LeasePlan office. Email: info@leaseplan.com

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