

The LeasePlan logo is a large, stylized 'M' shape composed of three overlapping, rounded rectangular segments in shades of orange and yellow. It is positioned in the upper left quadrant of the image, partially overlapping the sky and the top of the highway.

LeasePlan

Spotlight on emissions
Exploring greener
alternatives for diesel

What's next?



Introduction

Diesel-powered vehicles have long been the preferred choice for many car owners and drivers in Europe. In fact, they've been traditionally regarded as the 'cleaner alternative' to petrol engines due to their lower carbon emissions. However, recent revelations about other toxic emissions, and especially nitrogen oxide, have shone an unfavourable spotlight on diesel engines. As a result, people are looking for more environmentally friendly alternatives. At LeasePlan, we are committed to sustainability and support any steps that will help the automotive sector to achieve net zero exhaust emissions by 2030. So with fleet managers starting to ask themselves not whether they should introduce different powertrains to their fleet, but rather when, we aim to guide them through what's next for diesel and the possible alternatives.



What is the optimum fuel type?

Yet the choice for the right powertrain or fuel type remains a difficult issue for many fleet managers, who must ensure cost effectiveness in addition to keeping drivers happy. When is a petrol-powered vehicle more profitable than a diesel-powered vehicle, and vice versa? In other words, where is the tipping point? And how do alternatives such as hybrids, plug-in hybrids or full electric vehicles compare cost-wise?

The fuel tipping point determines the mileage at which the choice for one fuel type results in a lower cost of use, taking into account all cost elements, than for the other fuel type.

In an increasing number of countries, the tipping point between diesel and petrol has indeed shifted in favour of petrol-powered vehicles (Figure 1).

Petrol vs Diesel TCO - B/C segment 20.000 km/annum

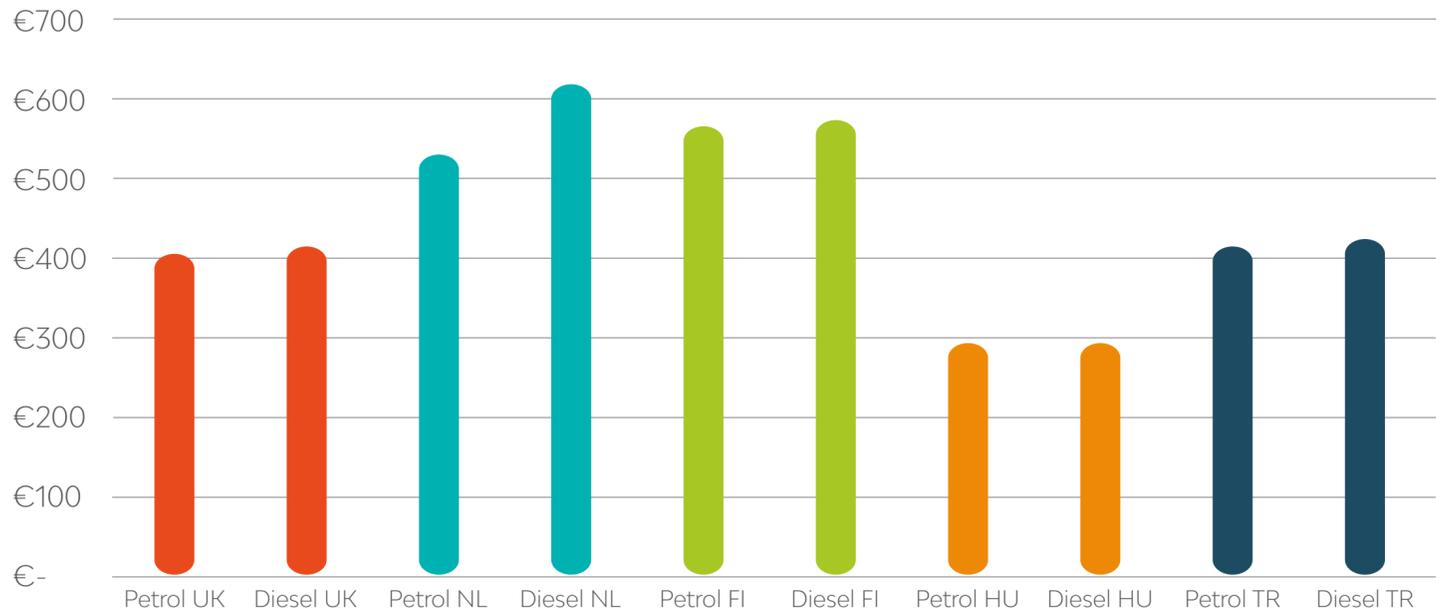


Figure 1: petrol vs diesel TCO (Source: LeasePlan Consultancy Services)



The tipping point varies by vehicle segment. Typically in the smaller vehicle segments, this break point is at a higher annual mileage than in the larger vehicle segments. In this small vehicle segment, increasingly economical petrol-powered vehicles are available on the market. For employees who don't drive a lot, a petrol vehicle is probably preferable to a diesel model.

However, petrol-powered vehicles produce higher CO₂ emissions compared to diesel-powered vehicles, so petrol isn't the most logical choice if your fleet's impact on the environment is assessed based on CO₂ targets. In addition, in most countries, car-related taxation is based on CO₂ emissions. This means that opting for petrol will negatively impact costs without necessarily alleviating the environmental challenges.





Serious alternatives are on the horizon, also for fleets

When we talk about the most environmental and cost-effective solutions, we must not overlook alternatives such as plug-in hybrids, CNG-powered vehicles and electric vehicles, especially when the total cost of ownership is taken into account.

1. Plug-in hybrids (PHEV)

A PHEV is a hybrid vehicle that can be connected to the grid. Charging can be done at home, at the office or at public charging points. PHEVs offer more electric autonomy, provided that the battery of the vehicle is charged regularly.

Nearly every car manufacturer currently has included a plug-in hybrid in their range, so there is definitely no shortage of choice.

Through the low reported consumption of plug-in hybrid, the tax treatment of these cars is often very favourable and the higher investment is partially compensated.

Yet there are also a couple of reservations:

- A hybrid propulsion system performs best in stop & go traffic, but is less suitable for lots of motorway driving.
- The (adapted) driving behaviour of the driver is also crucial. Unsuitable driving behaviour will lead to much higher fuel consumption and higher costing for the employer.
- It is important that with the calculation of the total cost of use, one should also take into account the costs for the charging infrastructure and electricity.



2. CNG-powered vehicles

Some car manufacturers also offer vehicles powered by compressed natural gas. By compressing natural gas under high pressure, a clean, safe and above-all inexpensive fuel is created: Compressed Natural Gas or CNG.

Vehicles that drive on natural gas have more advantages than disadvantages. In a 'well-to-wheel' approach, in which the entire production cycle is examined, there is respectively 20% to 30%¹ less CO₂ emission than with diesel and petrol. The engine lasts longer than an engine on fossil fuels, it is 75% quieter and doesn't cause any odour nuisance.

As such, a CNG car is not much more expensive than a vehicle running on petrol or diesel, and although the purchase price is a bit higher, this difference is soon recovered through the low cost of natural gas at the pump.

Yet, naturally, the reality is more nuanced. A major stumbling block is the still rather limited network of CNG filling stations. In addition, the range of a full natural gas tank is also limited; it's around 300 to 500 kilometres, significantly less than for a conventional engine vehicle. A CNG-powered vehicle does come with an extra petrol tank as standard equipment, but while the latter increases the driving range, it is less cost efficient and environmentally friendly.

Country	EV capitals
China	Beijing Hangzhou Qingdao Tianjin Shanghai Shenzhen
France	Paris
Japan	Tokyo
Netherlands	Amsterdam Rotterdam The Hague Utrecht
Norway	Oslo Bergen
Sweden	Stockholm
United States	Los Angeles New York San Francisco San Jose
United Kingdom	London

Figure 2: EV capitals by country^{IV}

3. Electric vehicles

An electric vehicle is driven by an electric motor that uses electricity originating, for example, from chemical energy that has been stored in batteries or from a fuel cell.

The key benefit of an electric vehicle is that it has no exhaust emissions. The ‘well-to-wheel’ comparison between the EV and an internal combustion engine (ICE) shows 26% to 43%^{II} less CO₂ in favour of the electric vehicle.

By means of government subsidies, tax benefits and lower maintenance costs, EVs are becoming an increasingly feasible alternative for certain mobility purposes. Sales figures are expected to increase to 20 million vehicles globally by 2020^{III}, which suggests the trend towards e-mobility will continue.

Figure 2 shows a number of markets with a so-called EV capital. These are markets and cities that are EV market ready: high sales, innovative and supportive EV policies (fiscal and non-fiscal) and a good charging infrastructure. Despite the higher initial costs, we shouldn’t lose sight of the environmental advantages that an EV brings to an organisation’s ambition to implement a zero-emission fleet policy.

Figure 3 provides an overview of the main characteristics of a range of powertrains available today.

	Diesel	Petrol	CNG	PHEV	EV
Characteristics	<ul style="list-style-type: none"> • High mileage • Motorway driving • Long trips 	<ul style="list-style-type: none"> • Medium mileage • Smaller segments (city cars) • Short trips 	<ul style="list-style-type: none"> • Medium to high mileage • Short and long trips 	<ul style="list-style-type: none"> • Low mileage • Lots of stop & go (braking & accelerating) 	<ul style="list-style-type: none"> • Low mileage • Short trips • Tax advantages • Home charging • Rapidly improving range
Comfort (noise, acceleration, ease of driving)	● ● ●	● ● ●	● ● ● ●	● ● ● ●	● ● ● ● ●
Total Cost of Ownership	● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ● ●
Purchase price	● ● ● ●	● ● ●	● ● ● ●	● ● ● ●	● ● ● ● ●
Fuel consumption	● ● ●	● ● ● ●	● ● ● ●	● ● ●	●
CO₂	● ● ●	● ● ●	● ● ●	● ●	
Other emissions	● ● ● ●	● ● ● ●	● ●	● ●	

Figure 3: Powertrain factsheet (Source: LeasePlan Consultancy Services)

● = low
● = high



Smart and tailored approaches to a clean fleet

With the end of the diesel era invariably approaching because of upcoming regulations, and assuming all OEMs will continue to invest in electric vehicle technology, now is a good time for organisations to start introducing more flexibility in their fleet policies.

In general, there are three types of companies when it comes to embracing alternative powertrains in the fleet:

- The smart leader is ready to adapt to electric mobility where relevant, by an EV-focused car policy. They introduce flexible fleet solutions such as hybrids, PHEV and shorter operational lease terms to be ready when suited EVs arrive. They actively engage drivers on EV mobility and have already introduced charging facilities at work locations.
- The smart transformer makes electric mobility and alternative powertrains happen by including EV mobility in their car policy and introduces flexible fleet solutions when suitable EVs arrive. They engage drivers on EV mobility and their alternatives and have charging facilities at work locations.
- The smart starter introduces electric mobility and other alternative powertrains by including EV sharing in their car policy. They start introducing charging facilities at work locations and engage drivers on EV sharing.

If as a fleet manager you are considering the switch to a lower-emission fleet, you should start with a policy check to understand which changes need to be made. Part of the policy check should be aimed at getting clear insight on your driver profile by collecting the vehicle choice, job purpose, annual mileage, standard daily mileage and the frequency of deviation. This should be followed by a market-readiness study providing insight in the supporting and restricting regulations

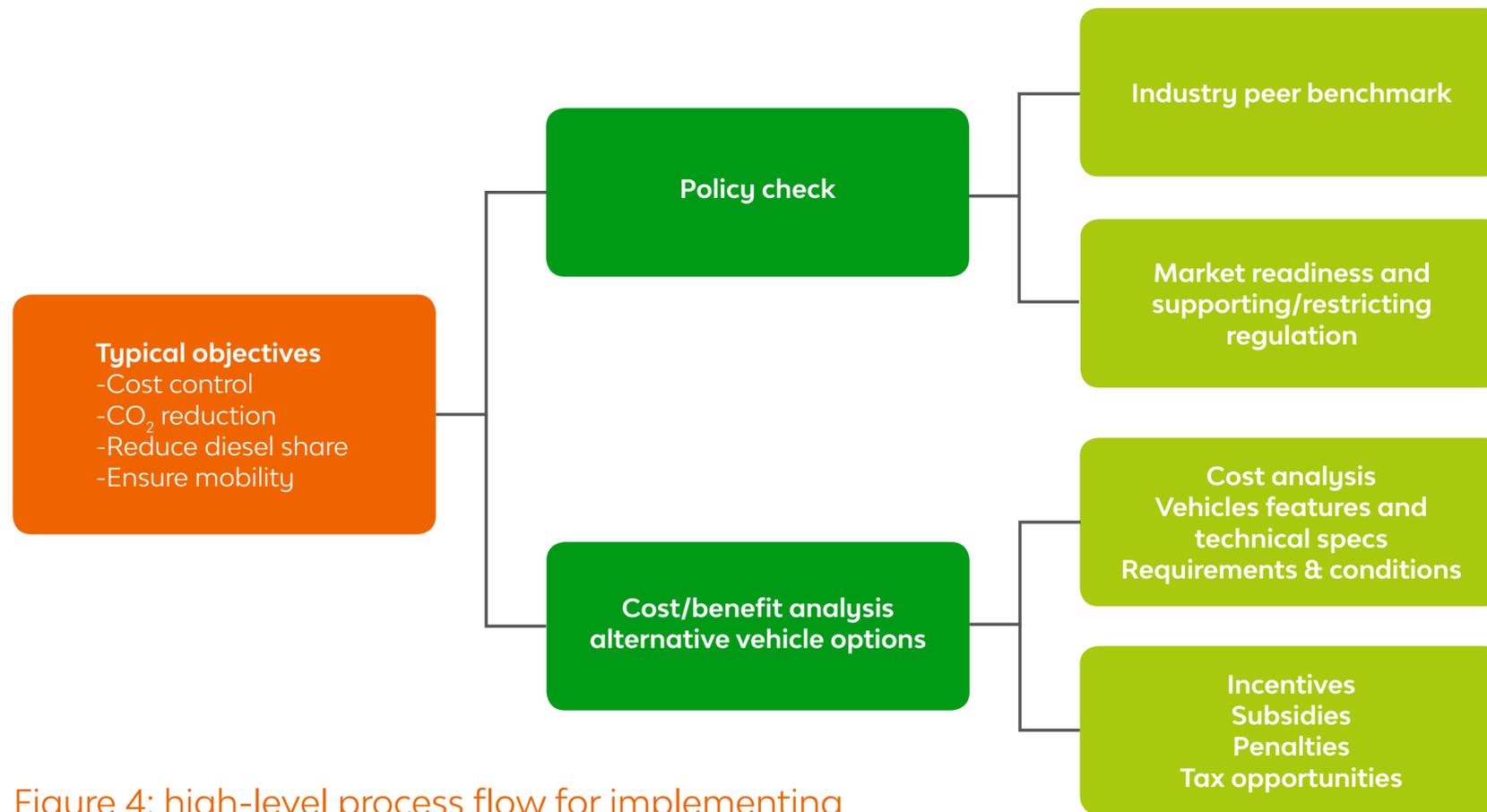


Figure 4: high-level process flow for implementing alternative powertrains

In addition to the policy review, a cost-benefit analysis should be undertaken to make the business case for change complete. If you are considering including alternative powertrains such as hybrids, PHEVs, CNG-powered vehicles and electric vehicles in your car policy, then you should also make sure to have clear agreements on the expected maximum fuel consumption, reimbursement of electricity costs, installation and use of charging points. See Figure 4 for a high-level process flow.



There is much to be gained from making a green choice

Today, in view of a greater global awareness of sustainability and the environment, cities and central governments are in the process restricting diesel-powered vehicles. Air pollutant emissions from all transport activities have an impact on air quality, but diesel-powered vehicles produce more toxic emissions (e.g. NO_x, fine particulate matter (PM)) that can cause serious illness than petrol-powered vehicles. A switch to petrol-powered vehicles is often not the best solution, as there is no environmental benefit to gain and many fiscal policies will penalise higher CO₂ emissions.

Within the automotive sector, hybrid and electric alternatives to purely fossil fuel-powered vehicles are becoming increasingly feasible. Although today only a handful of countries have a supportive policy and infrastructure, at LeasePlan we expect the trend to continue expanding rapidly to more markets in Europe and beyond.

An increasing number of companies and drivers are making a green choice, and you could join them. For fleet managers, it is important to be aware of the opportunities a move away from diesel can offer in terms of the environment, employee satisfaction, corporate image and, in a growing number of cases, costs. For advice or support, feel free to contact us.

References

- ⁱ www.CNG-one.com
- ⁱⁱⁱ Global EV Outlook 2017
- ⁱⁱ TNO 2015 R10380
- ^{iv} ICCT

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