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PUTTING OUR FOOT ON THE ELECTRIC PEDAL

BEUC position paper on the future of automotive markets, with a focus on the revision of CO_2 standards for cars and vans

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Why it matters to consumers

Mobility is the second-largest area of expenditure for European households[1]. For those that depend on a car for their daily journeys, the purchase of a vehicle is therefore an important financial decision. Electric cars offer an opportunity for consumers willing to make a more sustainable choice. BEUC research finds they are the most financially interesting solution for consumers, with the greatest savings for second and third owners. But electric cars still suffer from a high purchase price and a small offer in several car segments. An ambitious EU law on CO_2 emissions standards is crucial, as it nudges car makers to ramp up the supply of electric vehicles at a lower purchase price.

Summary

This paper summarises BEUC position ahead of the revision of EU Regulation 2019/631 setting CO2 emission performance standards for new passenger cars and for new light commercial vehicles (here 'the CO2 standards regulation').

The recommendations presented in this paper build upon the findings of a new Total Cost of Ownership (TCO) study commissioned by BEUC and conducted at EU level and in 9 Member States. The study shows the financial benefits of battery-electric vehicles (BEVs, or simply 'electric cars') compared to other powertrains and how an early BEV adoption can maximise savings for consumers, especially those on lower-incomes, while bringing significant environmental benefits.

The increase in electric cars sales show that consumers are willing to play a key role in the transition towards a more sustainable mobility system. Yet car makers need to ramp up the supply of electric vehicles with lower purchase price. An ambitious EU law on CO2 emissions standards for cars and supportive EU and national regulatory frameworks are key to tools to drive the market in the right direction.

The CO2 standards regulation must therefore favour the uptake of BEVs over combustion engines, set ambitious emission reduction targets, and remove all loopholes and mechanisms allowing car manufacturers to artificially reduce their emissions.

A supportive regulatory framework at EU and national levels should accompany this regulation and address consumers' concerns in terms of charging or sustainability of electric vehicles. It should also provide better information to consumers when buying a car.

[1] According to the European Sustainable and Smart Mobility Strategy, based on data from Eurostat. Source: Eurostat – Statistics Explained, 'Household consumption by purpose' [website], https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=371156, (accessed 4 May 2021).

BEUC recommends:

- To **legislate for more stringent CO2 emission reduction targets** for cars and vans and set the following targets:
    - At least – 25% by 2025
    - At least – 40% by 2027
    - At least – 60% by 2030
    - An objective of 0g C02 / km by 2035

- To **promote Zero-Emission Vehicles** (ZEV – 0g CO2/km) instead of Zero-and-Low Emission Vehicles (ZLEV – emitting between 0 and 50g CO2/km) in all provisions of the new regulation on CO2 standards for cars. The current regulation and laboratory testing conditions encourage the sales of plug-in hybrids that do not represent a financially (nor environmental) advantageous solution for consumers;

- To **remove regulatory flexibilities** if they present a risk to the accelerated uptake of electric cars and zero-emission vehicles. These flexibilities include the ZLEV benchmark, the mass adjustment parameter and eco-innovations;

- To **exclude e-fuels crediting** from the revised CO2 standards regulation;

- To **keep real-life emissions from petrol and diesel cars under control** and ensure that the gap with laboratory values does not increase over time. To reduce emissions on the road, the EU needs to make use of the data available via on-board fuel consumption meters (OBFCM) and use it as a compliance tool towards car manufacturers;

- To **develop a common methodology to assess the lifecycle emissions of a car** along with the **promotion of efficient batteries** in electric cars. Particular attention should be brought to the efficiency, durability, re-use, and recycling of batteries, in line with the objective of sustainable production and consumption;

- To **assess national COVID-19 recovery plans** so that mobility-related funds and incentives are targeted towards zero-emission mobility only. The EU should continue to support national and local authorities in the deployment of clean vehicles via guidelines on urban planning or dedicated funding;

- To **promote an early transition to electric driving** for high mileage consumers, company cars and fleets (taxis, shared cars). The EU should encourage Member States to adopt specific legislation for these user groups;

- To **revise the Alternative Fuels Infrastructure Directive** and the **Energy Performance of Buildings Directive** to ensure an easy access to convenient charging where consumers live, work, or carry out their daily activities;

- To **propose a new Car Labelling Directive** to properly inform consumers about the technical characteristics of electric vehicles in an understandable and easily comparable manner. The revised Directive should also contain information on lifecycle emissions of electric cars;

- To **swiftly adopt the next generation of EURO emissions standards**. Emissions limits should be tightened, and more pollutants covered;

- **Not to include road transport in the Emission Trading System** as it would harm lower-income consumers the hardest.

Introduction

The EU Sustainable and Smart Mobility Strategy[2] (published in December 2020) calls for a 90% reduction target in the transport sector's emissions by 2050. Yet, decarbonisation of transport is a long-term battle for the European Union. Unlike other sectors, combined emissions from aviation, rail, maritime and road transport have increased since 1990. Road transport alone accounts for 70% of these emissions, with private cars being the main contributor of this share[3].

Mobility is the second-largest area of expenditure for European households. Many consumers want to move around more sustainably and when buying a car, the choice of a clean vehicle is often considered. From an environmental, health and efficiency point of view, battery-electric cars (BEVs)[4] are proven to provide the greatest benefits compared to other powertrains[5]. However, consumers are dependent on the limited supply of these vehicles, their higher purchase price, the available information on range and the existing charging infrastructure (or the possibility to have a private charging point installed).

A new Total Cost of Ownership (TCO) study commissioned by BEUC brings forward the economic rationale of buying an electric car *(in this paper, 'electric car' and 'BEV' are used interchangeably)*, showing the financial benefits to consumers, especially lower-income user groups. Different scenarios and complementary analyses of other powertrains or market trends reinforce the unambiguous position of BEVs as the cheapest solution for consumers throughout the vehicle's lifetime, and the need for their rapid uptake. The TCO study also acknowledges that the greatest potential to cut down CO2 emissions from the car fleet lies with an increased share and a rapid uptake of BEVs on the road.

Driven by the general 95g CO2/km target set by the CO2 standards regulation for 2020/2021, the supply of BEVs has surged, and the boom in sales confirms consumer interest. In 2020, electric cars represented 5,44% of all new registrations in Europe, a 117% increase[6] compared to 2019. This first-ever ambitious goal has produced an unprecedent market effect, breaking the upward curve of CO2 emissions from new cars observed in recent years[7]. Almost all car makers met or exceeded their fleet targets, avoiding the fines for non-compliance foreseen by the regulation.

Keeping the momentum going and scaling up the electric car market share is essential to empower consumers in the transition. Based on the findings of the TCO study, this paper provides recommendations ahead of the upcoming revision of the CO2 standards for cars and vans to be presented in July 2021 as part of the 'Fit-for-55' package.

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2 European Commission (December 2020), *Sustainable and Smart Mobility Strategy – putting European transport on track for the future* (accessed 4 May 2021).

3 Passenger cars and light commercial vehicles covered by the CO2 standards regulation account for 15% of all Europe's CO2 emissions. Source: European Environment Agency, 'Greenhouse gas emissions from transport in Europe' [web article], 18 December 2020 (accessed 4 May 2021).

4 Battery-electric vehicles are fully electric cars, as opposed to hybrids (HEV) combining a conventional combustion engine recharging an auxiliary electric engine and plug-in hybrids (PHEVs) where the auxiliary electric engine can be recharged from a socket.

5 Transport & Environment, 'How clean are electric cars?' [web article] (accessed 4 May 2021); Matteo Barisione, 'Electric vehicles and air pollution: the claims and the facts' [web blog], *European Public Health Alliance*, 5 March 2021 (accessed 4 May 2021).[6] ACEA (February 2021), *New passenger car registrations by fuel type in the European Union. Quarter 4 2020* (accessed 4 May 2021).

6 ACEA (February 2021), *New passenger car registrations by fuel type in the European Union. Quarter 4 2020* (accessed 4 May 2021).

7 European Environment Agency, 'Average CO2 emissions from new cars and new vans increased again in 2019' [web article], 3 December 2020 (accessed 4 May 2021).

Section 1 summarises the main findings of our electric car ownership study, providing evidence of the social, economic, and environmental benefits of an early BEV adoption scenario. We briefly discuss national realities, targeted user groups and market trends for electric cars and other powertrains to shed light on the concrete gains and risks for EU consumers. An in-depth analysis of the results can be found in our dedicated TCO summary report.

Section 2 builds upon these findings and looks at the structure of the CO2 standards regulation. It presents a proposal on the overall targets for the period between 2025 and 2035 while addressing the regulatory mechanisms that could prevent or promote the uptake of electric cars.

In section 3, we recall the need for a comprehensive policy framework to complement the CO2 standards regulation. Supportive schemes and other EU regulations should address the financial constraints for consumers, the convenience of BEVs and the information available to consumers when buying a car.

1. Electric cars are the best financial choice for consumers

A recent analysis for BEUC shows that medium-sized electric cars are already the cheapest powertrain over their lifetime (see Figure 1).

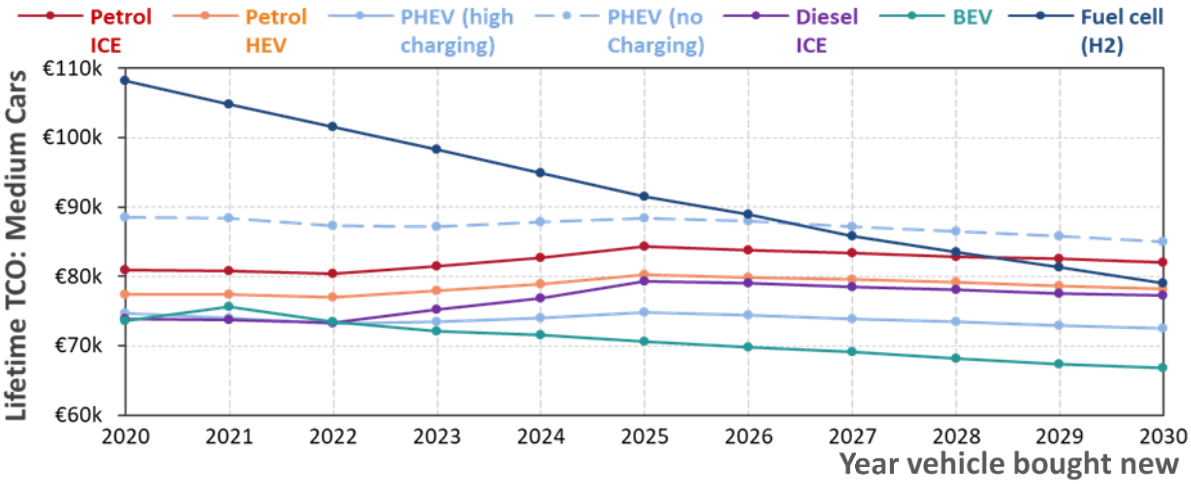

Figure 1: **Lifetime owner TCO comparison between different powertrains for a medium car. Note that the year indicates when the car is first bought new.**

This competitive advantage increases over time and puts **electric cars as the most suitable, future-proof solution for consumers over all other powertrains**[8]. While first owners will on average be better off by switching to electric in 2025 due to the higher average purchase costs of BEVs, second and third owners will make substantial savings for each BEV bought new today. The second and third owners – who bear less of the car's depreciation and benefit from low maintenance costs – will save almost €9,000 over the lifetime of the car.

[8] CNG and LPG have not been considered in the TCO study as they represent a low and decreasing market share in the EU average fleet (despite some growing markets in Europe because of extremely low sales in gross figures). Moreover, car makers do not plan to reshape their business models around these powertrains.

National case studies express the need for some purchase subsidies or tax breaks during a transitional period to support the purchase of electric cars by first owners – who dictate the market for second- and third-hand cars. Moreover, some consumers would not benefit fully from BEVs during the three to four years to come due to the lack of supportive measures (subsidies, tax cuts), the scarcity of charging infrastructure, few affordable BEVs available or high electricity price (see section 3).

From a macroeconomic perspective, **electric cars are the most socially equitable powertrain**[9] as the first owner, who is most able to afford it, pays a higher proportion of the lifetime TCO. Even if first owners benefit from a purchase subsidy – say one of a €7,000 – they would still bear a greater share of the costs of the vehicle against second and third owners than if they had bought a new petrol car.

The study also identifies that the greatest potential for the early adoption of electric cars by first owners rests with high mileage users due to lower running costs (€6,000 savings over a petrol car) and via an accelerated supply of cheaper BEVs (with lower battery capacity) that would fit many consumers' needs. Both scenarios make the TCO of medium BEVs already competitive today:

- As the running costs of electric cars are particularly competitive in comparison with petrol and diesel cars, consumers driving over 20,000 km per year can expect a better TCO already today. These savings can represent over 20% compared to a petrol car.

- Based on previous research, our TCO study shows that the vast majority of European drivers could use a small electric vehicle with a 200 or 300 km battery range for their daily commutes (compared to the current average range of 479km) without the need to use 'en-route charging'. This could perfectly fit the needs of a pensioner, a suburban driver, or replace the second car of a household living in a rural area. Alternatives to car use must certainly be promoted but some consumers will still rely on a car and should not be left out. Cars with low-battery range are significantly cheaper due to falling battery costs and are already competitive versus petrol cars today. One example of such an affordable electric car is the Dacia Spring, recently announced with a purchase price of €17,000 to €18,000.

Similarly, the TCO varies greatly depending on whether users have access to a home charging point or depend on public charging stations. Solely relying on public charging (11kW) delays TCO parity up to three years compared to the off-peak tariffication available in some Member States[10]. There is also evidence that the lack of access to home charging and expensive public charging is already limiting BEV growth.

Finally, the results show that **plug-in hybrids (PHEVs) – even when charged regularly – are a more expensive powertrain for consumers compared to BEVs**. They also demonstrate that even considering the best-case scenario, e-fuels are currently 80% more expensive than petrol and will never compete with the savings offered by BEVs.

Based on these findings, it is therefore crucial to speed up the adoption of electric cars. An early adoption scenario for electric cars will help bring the demonstrated benefits to lower-income consumers as early as possible.

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[9] For this study, the equity index has been defined as the percentage of a vehicles' lifetime cost that is paid by the first owner. BEVs have an equity index of 47%, compared to 41% for petrol cars.

[10] Not all Member States have electricity companies providing off-peak tariffs to consumers. For example, in Germany, prices for charging at home are constant throughout the day.

Results from the national TCO studies[11] confirm the financial benefits of BEVs by analysing specific user groups as close as possible to real-life examples European consumers can relate to (highway commuters, city dwellers, suburban drivers, pensioners, part-time workers, …). For example, in comparison with a petrol car:

- A Spanish commuter driving over 30,000km per year can expect to save more than €14,000 over the first 6 years by buying a new BEV (even when partly charging on the highway where prices are usually higher due to higher power delivered).
- A German pensioner with a low mileage (7,500 km per year) would save €300 per year by buying a medium-sized, second-hand BEV (bought new in 2020).
- A resident of Vilnius using a home charging point would save almost €5,000 over 5 years by buying a second-hand BEV (12,000km a year, bought new in 2020).

1.1. Promoting electric cars today is a socially and environmentally responsible policy

Electric cars are not only the most financially advantageous solution for consumers. They can also bring the greatest benefits in terms of emission reduction for CO2 and other pollutants harmful for citizens' health. Our TCO study shows that the timing of BEV uptake is just as important as the final percentage of market share reached by 2030. For a 60% BEV market share of new sales by 2030, an early adoption scenario (akin to the uptake seen in markets such as Norway) would achieve a total passenger car fleet (old and new sales) CO2 reduction of 52% by 2030 compared to 2020 levels. Whereas a late adoption strategy only leads to a 34% reduction. This shows the importance of such early adoption scenario to harness both the social and environmental benefits of electric cars.

In a 60% BEV market share scenario by 2030, BEV growth will also provide a 74g CO2/km reduction in new cars' emissions, by far the most substantial decrease, with PHEV and fuel cell uptake reducing emissions by an additional 18g CO2/km. Fuel efficiency improvements across conventional powertrains contribute only to around a 7g CO2/km reduction.

Moreover, high mileage consumers (commuters, company car owners, taxi drivers), who would financially benefit from switching to electric cars already today, will also induce the greatest benefits in terms of CO2 emissions reduction if they switch to electric. Indeed, the top 25% of consumers with the highest annual mileages (over 15,000km per year) produce almost 50% of total CO2 emissions. Targeting these user groups would be sound policy, also because they tend to have shorter ownership periods, meaning their vehicles would enter the second-hand market at a faster pace.

[11] Nine countries took part in the study: Belgium, Cyprus, France, Germany, Italy, Lithuania, Portugal, Slovenia, Spain. National studies consider government subsidies, fuel/electricity price, annual mileage, ownership periods, etc.

2. An ambitious regulation on CO2 standards for cars is a consumer-friendly policy

With the results of the TCO study in mind, this section provides BEUC recommendations to decision-makers for the revised CO2 standards regulation to maximise the environmental and the financial benefits of BEVs. Emission reduction targets must reflect the fact that the earliness of BEV uptake is essential to maximise the financial benefits for consumers. In other words, **the sooner electric cars are on the road, the better it is for consumers.**

2.1. Strengthen the ambition of emissions targets to bring more electric cars to market

As mentioned in the introduction, CO2 emission targets are the main mechanism to lower emissions from the European passenger car fleet. While progress has been very limited for the last decade, the current targets in the CO2 standards regulation set a more ambitious objective of 95g CO2/km[12] by 2020/2021. 2025 and 2030 targets impose a reduction of 15% and 37,5% respectively (compared to 2021).

According to the International Council on Clean Transportation (ICCT), *"Average new car CO2 emission levels went from 122 g/km (NEDC) in 2019 to an estimated level of 107 g/km in 2020"* [13] (not considering the regulatory mechanisms allowing manufacturers to meet their objective – see below in section 2.2). This represents a ≈ 13% decrease in one single year compared to previous increases in average emissions observed between 2016 and 2019[14]. Ambitious targets can therefore deliver. Electrification of the fleet has contributed greatly to this trend, with consumers showing interest once they are offered convenient options and the right incentives to buy electric cars.

Recent announcements by several car manufacturers also show that BEVs will be the core powertrain in the future. For instance, Volkswagen announced that 70% of their sales will be composed of electric cars by 2030. Volvo and Ford are more ambitious and plan to sell only electric cars by this date. Yet we cannot wait until 2030 as our TCO study shows that consumers will be better off with new BEVs entering the market as early as possible.

These announcements suggest that the current targets are not strict enough. Our TCO study confirms this: Figure 2 illustrates forecast emissions between 2020-2030 under different BEV uptake scenarios (to make the graph easier to read, current EU emission targets have been converted and expressed in *g CO2/km*[15]). **The current 2030 target would be achievable with way less than a 40% BEV uptake by 2030.** And this does not even consider the regulatory mechanisms in place today that allow manufacturers to reach their targets via crediting systems, adjustments or benchmarks. Should these mechanisms stay in place, even fewer electric cars will be 'needed' to meet the current targets.

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[12] The 95 g CO2/km target partially entered into force in 2020 following a "95% phase-in" condition. This objective is calculated according to the New European Driving Cycle (NEDC), a laboratory test to measure CO2 emissions. It is currently being replaced by the Worldwide harmonized Light vehicles Test Procedures (WLTP) which better evaluates (although not perfectly) these emissions compared to real-life.

[13] The International Council on Clean Transportation (January 2021), *Market monitor: European passenger car registrations, January–December 2020* (accessed 5 May 2021).

[14] European Environment Agency, Ibid., 3 December 2020.

[15] Using a x1.15 conversion factor from NEDC based on The International Council on Clean Transportation (November 2016), *2020-2030 CO2 standards for new cars and light-commercial vehicles in the European Union*, p. 2, (accessed 5 May 2021).

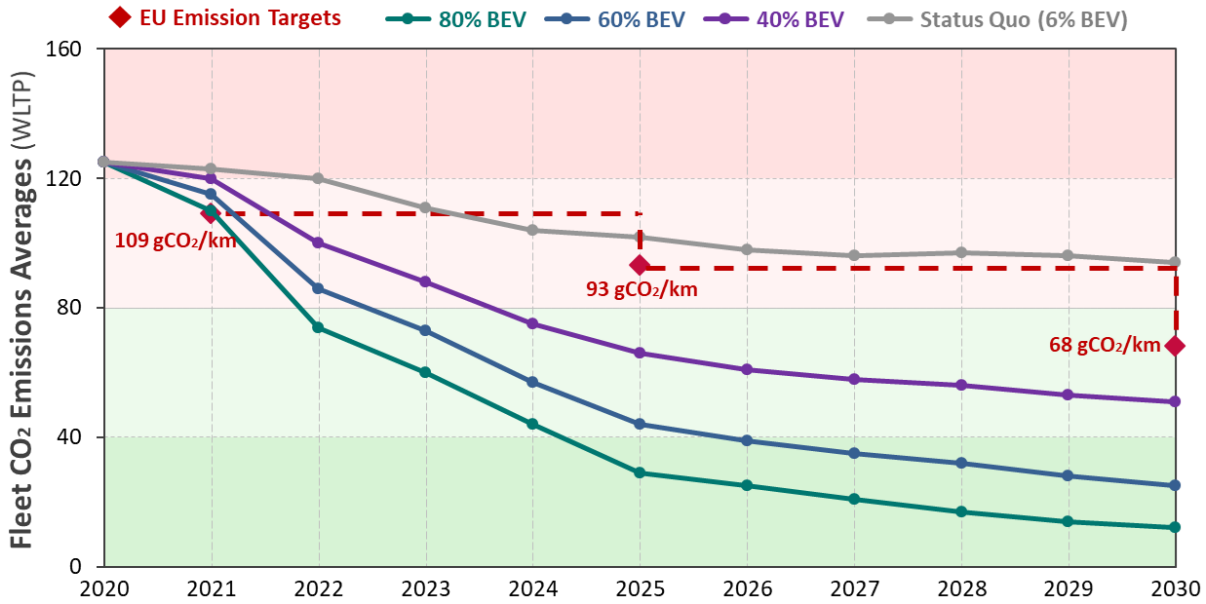

Figure 2: new fleet WLTP CO2 emissions for BEV uptake scenarios compared to current EU targets

There is indeed a clear risk that the current unambitious 2025 target leads to the stagnation of BEV sales in the years to come[16]. This is because several car makers would already achieve the 'necessary' share of electric cars in their fleet in 2021 and maximise profits from existing models. Using regulatory flexibilities, they would therefore have few incentives to sell more BEVs in the coming years, leaving consumers with a limited supply and higher prices.

As detailed in our TCO study, **such stagnation would especially be to the detriment of lower-income consumers** relying on the second-hand market and who would see significant savings for every new BEV bought today. A more ambitious 2025 target would boost BEV sales which then feed into the second- and third-hand market. Sales could then accelerate as their financial benefits become even clearer with purchase price parity. An intermediate target between 2025 and 2030 can also 'keep the momentum going', avoid stagnation or increase in emissions and help consumers in Member States currently facing less favourable conditions for the deployment of BEVs.

To favour an early BEV adoption scenario maximising their environmental and financial benefits, the targets within the CO2 standards regulation should be revised as follows:

- At least – 25% by 2025 (compared to 2021)
- At least – 40% by 2027 (compared to 2021)
- At least – 60% by 2030 (compared to 2021)
- An objective of 0g CO2/km for all new cars put on the market by 2035

[16] Transport & Environment (January 2021), *Cars CO2 review: Europe's chance to win the emobility race* (accessed 5 May 2021) ; Peter Mock, 'Europe's lost decade: About the importance of interim targets' [web blog], *ICCT*, 9 May 2021 (accessed 17 May 2021).

The targets up to 2030 should accompany the electrification trend and pave the way for the sale of only zero-emission cars by 2035 at the latest. This objective is necessary for the EU to stay in line with its own Green Deal objective of a 90% emission reduction in road transport by 2050. It is also feasible and is a truly consumer-friendly policy, as shown in our TCO study.

2.2. Simplify the regulation to deliver emission reduction on the road

On top of currently unambitious targets, the current CO2 standards regulation contains several provisions and mechanisms that allow car manufacturers to (artificially) reach their average fleet emission targets. These mechanisms simply delay the benefits consumers can gain from buying electric because they lead to fewer BEV models on the market or pose a risk in terms of real-world emission reduction.

As mentioned in the previous section, emissions have dropped from 122g to approximatively 107g CO2/km in 2020. However, with a target of 95g CO2/km partially entering into force in 2020, the gap still seems enormous. A recent report from Transport & Environment in line with the ICCT estimated that *"half, or over 13g/km, of the gap to reach the 2020 target EU-wide will be closed by regulatory flexibilities. (…) Only around 30% of the gap [in 2020] is expected to come from plug-in car sales, rising to almost half in 2021 as some flexibilities are exhausted."*[17]

Many consumers will still buy petrol, diesel, or gas cars (combustion engines) in the years to come. Yet, regulatory mechanisms currently in place to artificially lower the ambition of the CO2 targets are their worst enemies as they pose a risk to increase both emissions and costs for consumers.

The CO2 standards should ensure that classic combustion engines do no emit more over time due to a lack of investments from car manufacturers in these powertrains. Straightforward, unambiguous targets are the best tool to promote both electrification and lower fuel consumption. Removing flexibility mechanisms could also promote the supply of cheaper BEVs to target lower-income consumers.

Several regulatory flexibilities (such as the 95% phase-in[18] or the super-credits[19]) will be phased out or have been fully used by car manufacturers. Other mechanisms are addressed in the following sections.

> Regulatory flexibilities should be carefully reviewed, adapted, or removed if they present a risk to reducing emissions on the road. A steady increase in BEV sales is the best way to achieve this reduction, both for the environment and consumers.

[17] Transport & Environment (October 2020), *Mission (almost) accomplished*, (accessed 5 May 2021).

[18] In 2020, only 95% of sold cars counted towards the 2020 target allowing car manufacturers to exclude the 5% highest-emitting cars from their reporting obligations.

[19] In order to reach their 2020/2021 targets, manufacturers are given additional incentives to put on the market zero- and low-emission cars emitting less than 50 g/km through a "super-credits" system. Simply put, manufacturers could "double count" low-emission vehicles as part of their 2020/2021 targets. The system could last until 2022 (with a fewer interesting incentive in 2021 and 2022), but the vast majority of car manufacturers have reached the 7.5g CO2/km cap for such super-credits in 2020.

2.3. The ZLEV benchmark leads to trade-offs between powertrains and prevents significant emission reduction

The current CO2 standards regulation foresees a crediting system for "zero- and low-emission vehicles" (ZLEV), i.e., cars with CO2 emissions between 0 and 50 g/km. As of 2025, should a car maker have more than 15% of its fleet composed of ZLEVs[20] (including plug-in hybrids – see following section), they can ease their own target by up to 5%. In 2020, already 11% of the EU's car fleet were ZLEVs[21].

This ZLEV benchmark would not only be easily reached but it could also have a severe impact on real-life emission reduction. As calculated by Transport & Environment[22], *"if a car maker sells around 25% EVs (BEVs + PHEVs) in 2025, they could even increase the CO2 emissions of their conventional engine fleet by 1% annually and still be compliant."* On the other hand, should a manufacturer decide not to sell 15% of ZLEV, it could still reach its target with limited efficiency improvements of its petrol/diesel cars.

> The regulation must prevent any trade-off with emissions from combustion engines by removing the ZLEV benchmark allowing manufacturers to ease up their CO2 emission reduction target.

2.4. Do not incentivise the sales of plug-in hybrids

The ZLEV benchmark also has a significant impact in the sales of plug-in hybrids (PHEVs). Between 2019 and 2020, PHEVs sales have surged by 262% in the EU[23]. In raw numbers, almost as many PHEVs as BEVs were registered in 2020 and the trend is likely to continue. For example, in 2020, German car makers had 43 PHEV models on offer, but only 6 BEV models. PHEVs have been used as compliance tools by manufacturers to meet their CO2 targets, as they were given a very low laboratory CO2 emission value by type-approval authorities and have been counted as clean cars (ZLEV) when registered on the EU market. This also led to fiscal advantages for PHEVs at national level, as many Member States used the laboratory value to determine tax credits for companies for example.

Simply put, a car manufacturer could rely mostly on its PHEV sales to achieve its target without reducing emissions from the rest of its fleet (or even emit more with conventional engines). This would be a double whammy for consumers and the environment.

2.4.1. Laboratory testing of PHEVs does not reflect the reality of daily use

There is a growing set of evidence[24] that **the current laboratory testing method gives way too much weight to the portion of kilometres driven on electric motor for PHEVs, when in fact their real-world usage relies much more on fossil fuels.** BEUC members Altroconsumo (IT), Test Achats/Test Aankoop (BE), OCU (ES) and DECO (PT) confirm such discrepancy in the MILE21 project, which collects real-world fuel consumption

[20] For calculating the ZLEV share in a manufacturer's fleet, an accounting rule applies. A 0.7 multiplier gives PHEVs registered with just less than 50g CO2/km a third of a credit.
[21] Peter Mock, Ibid., 9 May 2021.
[22] Transport & Environment (January 2021), Ibid., p. 15.
[23] ACEA (February 2021), Ibid.
[24] The International Council on Clean Transportation (September 2020), *Real-world usage of plug-in hybrid electric vehicles. Fuel consumption, electric driving, and CO2 emissions* (accessed 6 May 2021); Green NCAP, 'Plug-in Hybrid cars: are they all the same?' [press release], 25 February 2021 (accessed 6 May 2021).

data for all powertrains. According to the values reported by consumers across Europe, their PHEV fuel consumption – and therefore CO2 emissions – is on average 2 to 3 times the one of the official laboratory tests advertised when they buy a car. Similarly, BEUC member *Which?* recently tested 22 PHEVs models and found that "average fuel economy was 61% less than official manufacturer claims"[25].

This shows that theoretical, laboratory conditions are not realistic in terms of daily usage. More importantly, PHEVs are sometimes advertised to consumers in a misleading way. Car makers usually promote these vehicles as 'the best of both worlds', without mentioning the discrepancy between laboratory and real-life electric range, the relatively small importance of the electric engine, and the necessary requirements in terms of charging.

2.4.2. PHEVs are not a financially interesting solution for consumers

An extensive analysis in our TCO study confirms that PHEVs are a more expensive powertrain for consumers compared to BEVs. Even under a high charging scenario, which reflects the most the theoretical values of the laboratory test, **PHEVs are more expensive than BEVs in 2020 and beyond**. These additional costs escalate significantly with lower charging, with PHEVs being 17% and 27% more expensive than BEVs in 2030 for low and no charging respectively (see Figure 3).

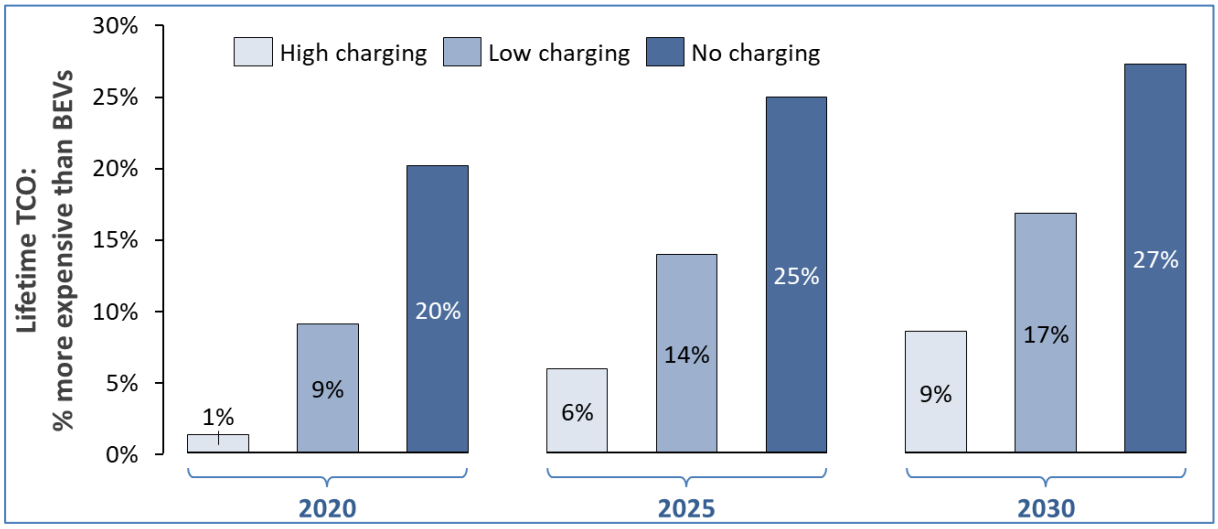

Figure 3: percentage higher lifetime TCOs vs. BEVs for a new PHEV bought in 2020, 2025 & 2030

An increase in PHEV sales also has an impact on **second and third owners**, who are less likely to have access to off-street charging and will rely more on the combustion engine for their daily journeys. They **will thus be more impacted by significantly higher running (and potentially maintenance) costs, providing an additional risk to consumer equity.**

Finally, two market trends should refrain decision-makers to encourage PHEVs:

- Many of them are company cars[26] and are provided to employees without access to home charging or with the usual 'petrol card' diverting them from using the electric

[25] Nagra Daljinder, 'Plug-in hybrid cars use more fuel than official figures claim' [web article], *WHICH?*, 2 March 2021 (accessed 6 May 2021).

[26] Belgium, which has an advantageous taxation scheme for PHEVs as company cars, is the 4th biggest EU market in terms of PHEVs sales for 2020.

engine. Knowing these company cars usually drive more kilometres, the environmental impact is even greater.

- PHEVs usually have the highest purchase price. Only the most affluent consumers can afford them. Due to the higher costs borne by second and third owners, financially supporting the purchase of PHEVs would therefore not be a fair policy. Moreover, due to their small batteries, which are cheaper than a full electric car, the purchase incentive can be considered as a subsidy to the petrol engine.

It is impossible to ensure that PHEVs will only ever be used by consumers who have adequate charging access. And even in the most optimistic charging scenario, PHEVs offer increasingly worse value to BEVs. **It is therefore critical to consider PHEVs as closer to a conventional petrol or diesel car rather than a "steppingstone" to fully electric vehicles.**

The legislation needs a semantic change and should only promote Zero-Emission Vehicles (ZEV – 0g CO2/km) instead of Zero- and Low-Emission Vehicles (ZLEV – emitting between 0 and 50g CO2/km) in all its provisions. The ZLEV benchmark – and the undue/artificial advantage given to PHEVs via testing procedures – should be removed as soon as possible as PHEVs do not represent a financially advantageous solution for consumers, no matter their usage.

2.5. With the mass adjustment parameter, cars get heavier, to the detriment of consumers

The emission targets for manufacturers are set according to the average mass of their vehicles (the so-called 'mass adjustment parameter'). This simply means that car makers who sell heavier cars are allowed to have a fleet emitting more CO2.

The effect of this mass adjustment parameter has also facilitated a surge in the sales of heavier cars (about 38% of new car registrations in 2019 can be considered SUVs – which are often accompanied by misleading green claims when advertised to consumers). **The average mass of new cars increased by 30 kg from 2018 to 2019, and the trend continues**[27]. Under this mass parameter, car manufacturers also promote PHEVs, which are heavier due to the combination of the battery and the combustion engine, and the electrification of the heaviest cars of their fleet.

While BEVs also tend to be heavier, **this mass parameter could lead to a vicious circle of growing fuel consumption and CO2 emissions from conventional engines** 'compensating' the CO2 savings from BEVs. The EU car fleet would also move away from the necessary light-weighting which represents an efficient way towards a more sustainable mobility.

The mass adjustment parameter should be removed as it increases fuel consumption, favours PHEVs and goes against the principle of a more sustainable mobility.

[27] European Environment Agency, Ibid., 3 December 2020.

2.6. Eco-innovations present a risk for the future

Eco-innovations are credits given to manufacturers for fitting technological developments in their cars that can contribute to lower emissions but are not tested during the official type-approval procedures. So far, car makers have been using this opportunity to bring relatively low emission reductions, except for some more premium cars. The current regulation foresees CO2 savings up to 7g C02/km for the use of eco-innovations, and the list of technologies approved by the European Commission grows every year[28].

As it is not officially tested, there is no real control over the potential for emission reduction. Monitoring of real-life emission data (see below) could help but will give extra time for manufacturers to bend the targets.

The Eco-innovation flexibility should be removed as it poses a risk (up to 7g Co2/km) to actual emission reduction.

2.7. Refuse fuel credits in the CO2 standards regulation to favour e-fuels

Several car manufacturers and fuel suppliers are promoting e-fuels, which are liquid fuels produced with the help of electricity, water and CO2 from the air or industrial emissions. Manufacturers and fuel suppliers call for the addition of fuel credits into the CO2 standards regulation, meaning that the production of these fuels would be counted as part of their effort to reach the fleet emission reduction target established by the regulation.

Presented as carbon-neutral solution, e-fuels should however not be used in passenger cars and should be reserved for the transport modes most difficult to decarbonise, such as aviation and shipping. From a consumer point of view, e-fuels would be a costly solution.

Our TCO study shows that even based on the most optimistic projection, which relies on the production of electricity via solar panels in the Middle East, with no additional fuel duty, **e-fuels are currently 80% more expensive than petrol** and do not reach price parity until 2037. Moreover, they are not competitive with the savings offered by BEVs. **Even by the time the TCO for E-fuels is similar to that for petrol, for a vehicle lifetime between 2030-46, they remain 23% more expensive for consumers than buying a BEV**. It is therefore essential that investments and regulatory focus is not diverted away from securing BEV uptake across Europe.

The future CO2 standards regulation should not include fuel credits to favour e-fuels.

[28] European Commission, 'CO2 emission performance standards for cars and vans' [website], (accessed 7 May 2021).

2.8. Monitor the deployment of BEVs across Europe

In 2020, we observed a double- or triple-digit growth in BEV sales in many countries. The largest growth figures were registered in still nascent markets such as Slovenia (+785%), Slovakia (+456%) or Czech Republic (+331%), showing that there is a real potential despite relatively low gross numbers.

The current CO2 standards regulation contains a provision for the period 2025 to 2030, where *"a greater weight (for a manufacturer to reach its target) is given to ZLEV registered in Member States with a low ZLEV uptake in 2017, and this as long as the ZLEV share in the Member State's fleet of newly registered cars does not exceed 5%"*[29].

While this might seem like a good idea, should only ZEV be promoted and not ZLEV, there is a need to monitor the use of such flexibility by car makers to avoid misuse and gaming of the system.

> The CO2 standards regulation should avoid misuse in this provision and ensure the homogeneous deployment of BEVs across Europe.

2.9. Real-life emission data should serve as a compliance tool

Since January 2021, all new cars must be equipped with a device gathering data on the real-life fuel consumption of the car (On-board Fuel Consumption Meter – OBFCM). Via this device, car makers and Member States must report the fuel consumption data to the Commission on a regular basis as of 2022. The Commission shall then use the reported data to monitor the gap between the laboratory values and the real-life emissions of the EU car fleet. As previously mentioned, **consumer organisations have been calling for years for a stronger monitoring of real-life fuel consumption**. Consumers currently cannot rely on the right information and have lost trust in the laboratory testing. Tools such as MILE21 are a step in the right direction and should inspire decision-makers.

> The EU needs to use the OBCFM data as a compliance tool to ensure that real-world emissions from petrol and diesel cars effectively reduce over time. Car makers must be sanctioned if these emissions increase. Third parties, such as consumer organisations, should also have access to this data.

[29] European Commission, 'CO2 emission performance standards for cars and vans' [website], Ibid.

2.10. Lower emissions from the production to the end-of-life of electric cars

Measuring tailpipe exhaust is currently the most accurate tool to drive down the global fleet CO2 emissions. Electric cars have proven to be cleaner over their lifetime[30]. Yet **consumers deserve to know the 'breakdown' in emissions and car makers must ensure a steady reduction in the whole value chain of their vehicles**: the sourcing of raw materials, the production, the use, and the disposal of old vehicles should be considered in vehicle life-cycle assessment (LCA). This would be in line with other initiatives from the European Commission to promote sustainable products.

Some car makers already propose such LCA for some of their vehicles. This is a good step forward, yet the comparison between brands and vehicle types is not easy and consumers have little means to verify the information provided (see section 3.3).

2.11. Improve efficiency, recycling and re-use of batteries

When it comes to electric cars, the efficiency of batteries is a key issue. As our member Test Achats/Test Aankoop explains[31], the driving range of cars with the same battery capacity can vary greatly. This is obviously linked to the weight of the car and its aerodynamism, but the components of the battery also play a role.

Secondly, **the durability of car batteries and their recycling is a matter of concern for many consumers.** Along with developing a business line for the re-use of batteries, durability and recycling standards should be developed at EU-level. Consumers can play a great role should they have the right price signal when discarding, re-using, or recycling their batteries. For example, they could be financially rewarded for repurposing their batteries at the end of the vehicle's lifetime.

As part of the revision of the CO2 standards regulation, the EU must develop a common methodology to assess the lifecycle emissions of a car along with the promotion of efficient batteries in electric cars. Such information should be displayed to consumers when buying a car and made available for easy comparison (see section 3.3).

Particular attention should be given to battery efficiency and durability, in line with the objective of sustainable production and consumption. Business models for re-use and recycling should help consumers make the most sustainable choice via the right price signals.

[30] Transport & Environment, 'How clean are electric cars?' [web article], Ibid.
[31] Test Achats, 'Voitures électriques : plus la batterie est grosse, mieux ça vaut ?' [web article], 25 January 2021 (accessed 6 May 2021).

3. Beyond CO2 emissions: supporting consumers in their journey to decarbonisation

The CO2 standards regulation should serve as the backbone of a sound emission reduction policy framework for the automotive sector. However, other EU and national tools could support this core legislation and help promote BEVs.

3.1. Promote electric cars as part of Member States' recovery plans and apply EU recommendations

National and local authorities can play a key role to steer the automotive market in the right direction. Our TCO analysis shows that countries such as France and Germany, which have the most generous subsidies, have the biggest BEV share in their fleet.

Many **post-COVID-19 recovery plans** submitted to the European Commission by Member States contain provisions on mobility. They should be carefully assessed by the Commission to **make sure the money is spent towards zero-emission mobility only**, notably via purchase incentives for zero-emission vehicles.

Purchase incentives and tax cuts have strong market effect and bring benefits to second/third owners in the medium term. No matter the policy mix, **BEVs also drive greater market equity** over their lifetime than a petrol car because they offer second and third owners low running costs with limited additional upfront costs. Subsidies and tax cuts should be considered as transitional measures to help electric cars reach TCO-parity for first owners before their 'natural' date. Incentives are spread throughout the lifetime of the vehicle and ultimately benefit second and third owners.

EU legislation or recommendations are also sources of examples of how the EU can nudge Member States in the electrification of their fleet:

- The Clean Vehicles Directive sets targets to Member States to deploy cleaner vehicles in public procurements (public fleet, buses, public postal services fleet). A similar framework could be envisaged for other vehicle fleets (notably company cars).
- The Urban Mobility Package[32] helps decision-makers at local level design so-called "Sustainable Urban Mobility Plans"[33]. The Sustainable and Smart Mobility Strategy foresees the revision of the Urban Mobility Package to promote sustainable modes of transport. The EU also provides funding to reshape cities via several instruments[34].

The EU should continue to support Member States and identify the needs for a homogeneous deployment of BEVs. Figure 4 summarises the situation for the nine countries that took part in the TCO study and provides an interpretation grid to assess the need for supportive policies. Note that the current BEV share in Spain is much lower than expected despite a strong purchase bonus for these cars. This shows the potential risk of subsidising BEVs without providing consumers with the necessary charging infrastructure.

[32] European Commission, 'Urban Mobility Package: Evaluation confirms importance to adapt urban mobility planning to today's technological, social, political, environmental, and health-related reality' [web article], 2 March 2021 (accessed 12 May 2021).

[33] European Platform on Sustainable Urban Mobility Plans (2019), *Guidelines for developing and implementing a sustainable urban mobility plan*, (accessed 6 May 2021).

[34] European Commission, 'Clean transport, urban transport - Commission's support' [website], (accessed 12 May 2021).

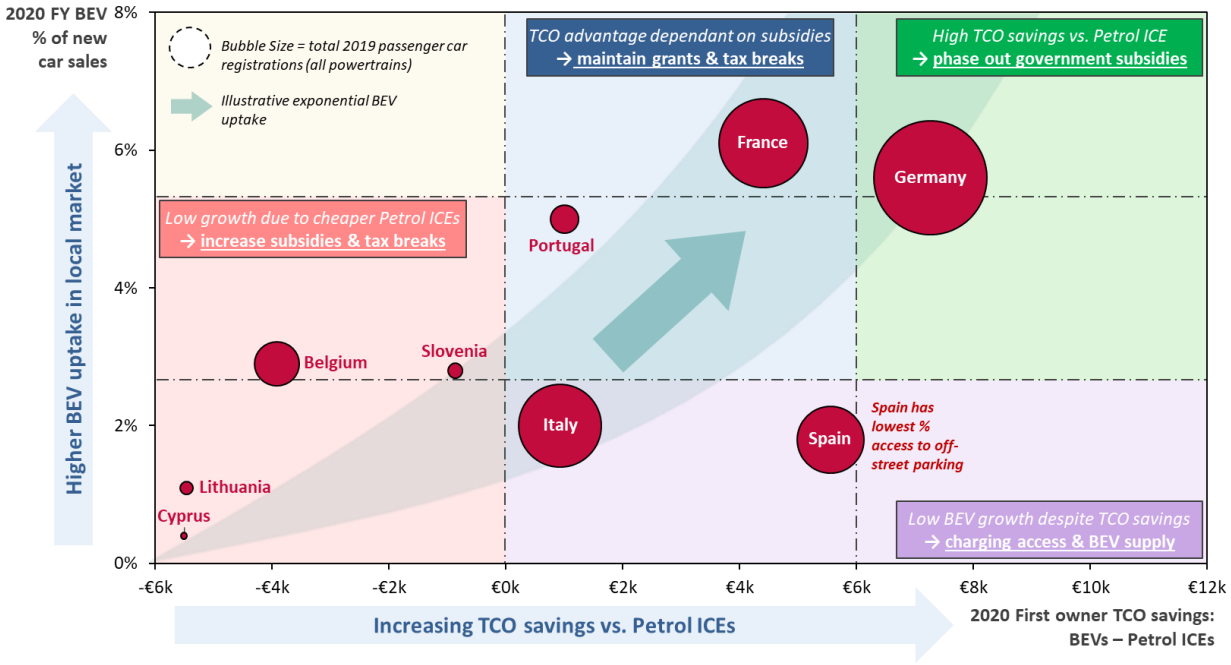

Figure 4: weighted average for small & medium cars showing BEV 2020 share of market sales vs BEV first owner Δ TCO to Petrol ICEs

The EU should carefully assess the COVID-19 recovery plans to make sure the funds and incentives are only targeted to zero-emission vehicles. The European Commission should regularly evaluate the implementation of the Urban Mobility Package and continue to support Member States in shifting towards zero-emission mobility.

Overall, the EU should identify new areas of action for a common policy framework to promote clean vehicles and support national and local authorities in their deployment. In its vision paper on mobility, BEUC already outlined some tools available to national authorities:

- Promote the early transition for high mileage consumers, company cars and fleets (taxis, shared cars);

- For countries with longer ownership periods, promote the renewal of the fleet with conversion premiums (scrapping an old vehicle and replacing it with an electric one);

- Propose zero-interest rate loans for the purchase of electric cars to address the barrier of higher purchase price;

- Introduce a 'bonus-malus' scheme to better spread the costs among consumers and apply the polluter-pays principle: for example, in France, the 'bonus' granted to electric cars is entirely funded by a 'malus' (that is, more taxes) applied to high-emitting cars;

- Develop alternatives to car ownership for consumers who do not need or want one.

3.2. Improve the consumer convenience of charging a BEV

Access to convenient charging is paramount for any BEV driver. Most of the charging will take place at home or at work, where consumers will benefit from the most interesting tariffs, therefore bringing even greater savings from a TCO perspective. Electricity providers should include BEVs in their offers and propose off-peak tariffs or smart charging[35] opportunities to consumers. For a medium BEV, **first owners with access to off-peak tariffs will already have a cheaper TCO compared to a petrol car** (EU average). In a near future, consumers should be able to make the most of the flexibility offered by their electric car by connecting it to the electricity grid and generate savings thanks to a smart charging scheme that protects their interest and their data.

However, the lack of public charging infrastructure is a strong barrier to BEV uptake for many consumers who will rely on it due to longer commutes or not having the possibility to install a private charging point, as shown by the Spanish example. When available, these **public charging stations must be convenient, with seamless payment methods and transparent tariffs.** BEUC and its members have been calling for a consumer-friendly Directive in a previous position paper. E-mobility service providers should also offer attractive tariffs, notably via preferential pricing for frequent users.

> The European Commission should submit a proposal for the revision of the Alternative Fuels Infrastructure Directive and the Energy Performance of Buildings Directive without delay to ensure an easy access to convenient charging where consumers live, work, or carry out their daily activities.

National and local authorities also have a role to play in facilitating access to charging, notably via on-demand rollout of charging stations or well-designed public tenders focusing on user convenience. The Sustainable Transport Forum, the expert group (of which BEUC is a member) assisting the Commission in developing a charging network across the EU, recently published a report[36] providing recommendations to public authorities to deploy charging stations on their territory.

3.3. Better inform consumers when they buy a car

As part of the last negotiations on the CO2 standards Regulation, the European Commission was required by the Council and the European Parliament to present, by 2021, a revised version of the 20-year-old Car Labelling Directive[37]. Unfortunately, it has not been integrated in the Commission's working programme for this year.

Yet there is an urgent need for a revision. In a previous position paper, BEUC demonstrated that **current legislation fails to guide consumers towards more sustainable cars.** A new, harmonised label (similar to the EU energy label) should contain easily comparable information about real fuel consumption, real CO2 emissions, running costs, emissions of

[35] Smart charging allows consumers to optimise the recharging of electric vehicles, by initiating charging when solar panels produce electricity or when the demand on the grid is low.

[36] Sustainable Transport Forum (December 2020), *Recommendations for public authorities on: procuring, awarding concessions, licences and/or granting support for electric recharging infrastructure for passenger cars and vans*, (accessed 6 May 2021).

[37] European Commission, 'Car labelling' [website], (accessed 7 May 2021).

regulated pollutants, the car's EURO standard, and the test-cycle under which it has been type-approved.

With the arrival of electric cars on the market, **information on the real electric range, the charging speed and the average charging time** should also be mentioned in a clear manner. As a future-proof label, it should also reflect the lifecycle carbon and environmental footprint of a vehicle discussed in sections 2.10 and 2.11.

The European Commission should propose a new Car Labelling Directive to properly inform consumers about the characteristics of electric vehicles in an understandable manner.

3.4. Ensure the swift adoption of ambitious EURO 7 emissions standards

On top of limiting their CO2 emissions, **consumers need to have urgent access to less polluting cars to protect their health.** The timely adoption of post-Euro 6 emissions standards (EURO 7) fixing the emission limit for nitrogen oxides (NOx), particulate matter (PM) and other pollutants is of utmost importance.

The Commission is expected to propose a new regulatory framework by the end of 2021. Yet, the car industry is redoubling its efforts to diminish the ambition of this much needed legislation. History taught us that this has previously led to inefficiencies in air pollution policies that have been very costly for consumers, both for their health and for their wallet, with consumer organisations leading the charge to obtain fair compensation.

From a TCO perspective, any delay in the introduction of EURO 7 poses a risk for the just transition between governments (supporting the BEV market in the early years) and car manufacturers (having to improve their motors to lower emissions). While the price impact of EURO 7 on petrol and diesel cars would be limited for consumers, it could be considered as a positive price signal if combined with a sufficient supply of BEVs and a regulatory framework improving their convenience for consumers.

An ambitious legislation on pollutants emitted from cars is also a complementary measure to monitor and prevent emissions from conventional combustion engines to grow, as explained in point 2.9.

Ambitious EURO emission standards must help protect consumers' health. The Commission should submit a proposal for EURO7 emissions standards that takes the most ambitious approach.

3.5. Oppose the inclusion of road transport in the EU carbon market

In a previous position paper, we have taken position against extending the EU carbon market (Emission Trading System – ETS) to road transport . Such extension would harm consumers financially, especially those on lower-incomes, without providing sufficient access to more energy-efficient mobility and heating/cooling alternatives. Our research rather shows that an ambitious sectoral regulation such as the CO2 standards will benefit lower-income consumers.

> Road transport should not be included in the Emission Trading System as it would harm lower-income consumers without access to affordable alternatives.

Conclusion

Affordable BEVs are just around the corner. This shift is not the result of a sudden change of car manufacturers' strategy but a clear consequence of the EU ambition to finally tackle the growing problem of emissions from the transport sector. The recent surge in BEV sales showcases the adaptability of the car industry and the willingness of consumers to make more sustainable choices should they have the opportunity to do so.

BEUC research proves that it is possible to fight environmental and social battles hand in hand. With the upcoming revision of the CO2 standards, it is now up to EU and national decision-makers to steer the market in the right direction through electrification of its car fleet. Setting strong CO2 targets in a regulation that is free of the loopholes would do just that. BEUC and its members will closely follow the upcoming negotiations to make sure consumers are better off and are fully on board the decarbonisation.

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