Electric vehicles:

The truth

September 2018

Summary

This paper presents evidence to dispel many of the myths about electric vehicles are explains why they are key to decarbonising personal mobility.

The briefing demonstrates that electric vehicles:

1. Will create jobs economy wide – 200 thousand are estimated by 2030 as a result of the lower total costs of ownership
2. That there are sufficient recharging points in western and northern Europe TODAY for the early market & that just 5% of charging happens at public recharging points
3. Are lower CO2 TODAY even when compared on a full life-cycle basis and even in countries with the least green electricity
4. Battery cells will be manufactured in the EU and there are sufficient raw materials available
5. Are affordable. With very modest tax breaks they are already cheaper on a total costs of ownership for the first owner. For second and third owners there are substantial savings in running costs and maintenance.

The paper shows policy makers can confidently drive a shift to electromobility.

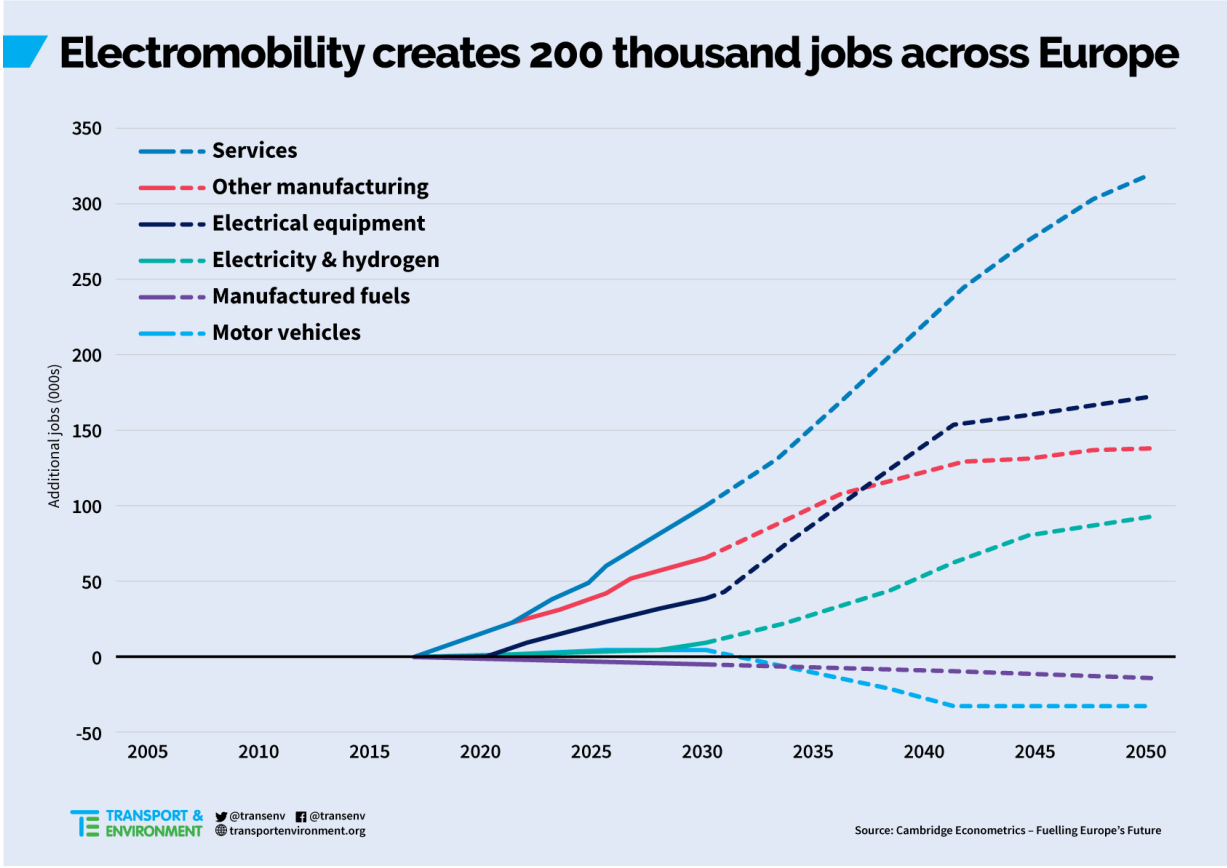
1. Electrification creates jobs

A host of studies show electrification of cars creates jobs across the EU economy, contrary to recent remarks by the Commission officials, carmakers and some trade unions on "factory closures." The Commission's impact assessment shows 30% and 40% reduction targets **increase** the number of jobs in Europe and the greater the reduction the higher the number of net jobs created, 86-88,000 by 2030.

Other studies also show a net positive impact, such as the study by Cambridge Econometrics (endorsed by BMW, VW, Daimler, Renault-Nissan and Toyota) - that finds a shift to plug-in vehicles will create 206,000 net additional jobs in Europe by 2030, including in construction, electricity, hydrogen, services and most manufacturing sectors. This shows jobs in automotive manufacturing only declining after 2030.

The widely discussed recent ELAB2 study by IGMetall has been misrepresented. Its results show that rather than the shift to plug-in cars being the main cause of job losses in the automotive industry, it is increased automation, digitalisation and productivity gains that are responsible. An extreme scenario of 40% sales of battery electric vehicles (BEV) and 20% sales of plug-in hybrids (PHEV) by 2030 results in 37,000 automotive jobs lost through the shift to e-mobility, but 45,000 jobs lost through increased productivity. No analysis was made in the study on the additional jobs created through the shift to e-mobility, e.g. manufacturing of batteries or installing charging infrastructure. **IGMetall after producing a misleading interim report have not published the final version.**

The real risk to jobs is that in the future electric vehicles would be supplied from China and not built in the EU. In the last 12 months alone, EU carmakers invested 7 times more into electric vehicle production in China than in Europe, owing largely to the Chinese EV quota policy. Setting a 2025 CO2 standard is urgently needed to accelerate investment and transition to emobility in Europe, which will secure industry's long-term competitiveness and manufacturing jobs here.



2. There is sufficient infrastructure to charge electric cars (in major markets)

To 2020, there is enough EV chargers to the expected number of plug-in cars on EU roads according to the reports from member states (National Policy Frameworks provided as part of reporting on the Alternative Fuels Infrastructure Directive.

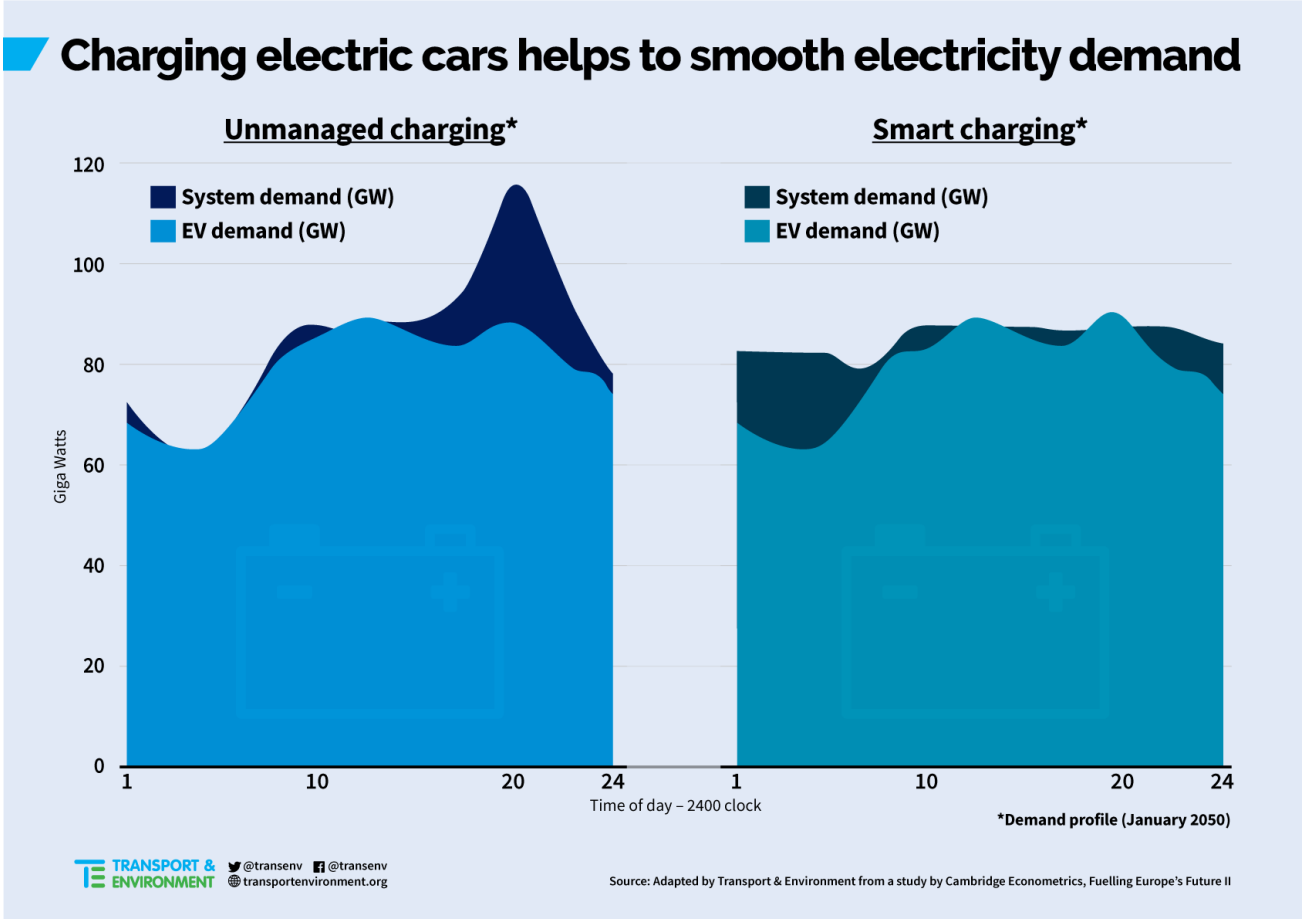
Around 1,000 ultra-fast (150-350 kW) charging sites are already planned for 2020, or one site every 34 km on the strategic EU road network allowing drivers to replenish up to 400 km driving in 15 minutes. By 2020 there will be nearly 5000 medium-fast chargers and 220,000 regular chargers across Europe. This is in line with the Commission guidelines of having 1 charger per 10 vehicles. Just 1 recharge in 20 is actually done at a public recharging point. In reality only 5% of recharging happens at public sites so the current volumes are sufficient to kick start the market.

More than 90% of new EV sales are in Northern and Western European countries where 80% of planned public charging points will be concentrated. Sales of EVs are likely to increase in the Southern and Eastern European countries with a 5 to ten years delay, with charging infrastructure ramping there in a similar timeframe supported by substantial funding earmarked in the Commission's proposed new MFF Framework.

3. Impacts on the electricity grid are manageable

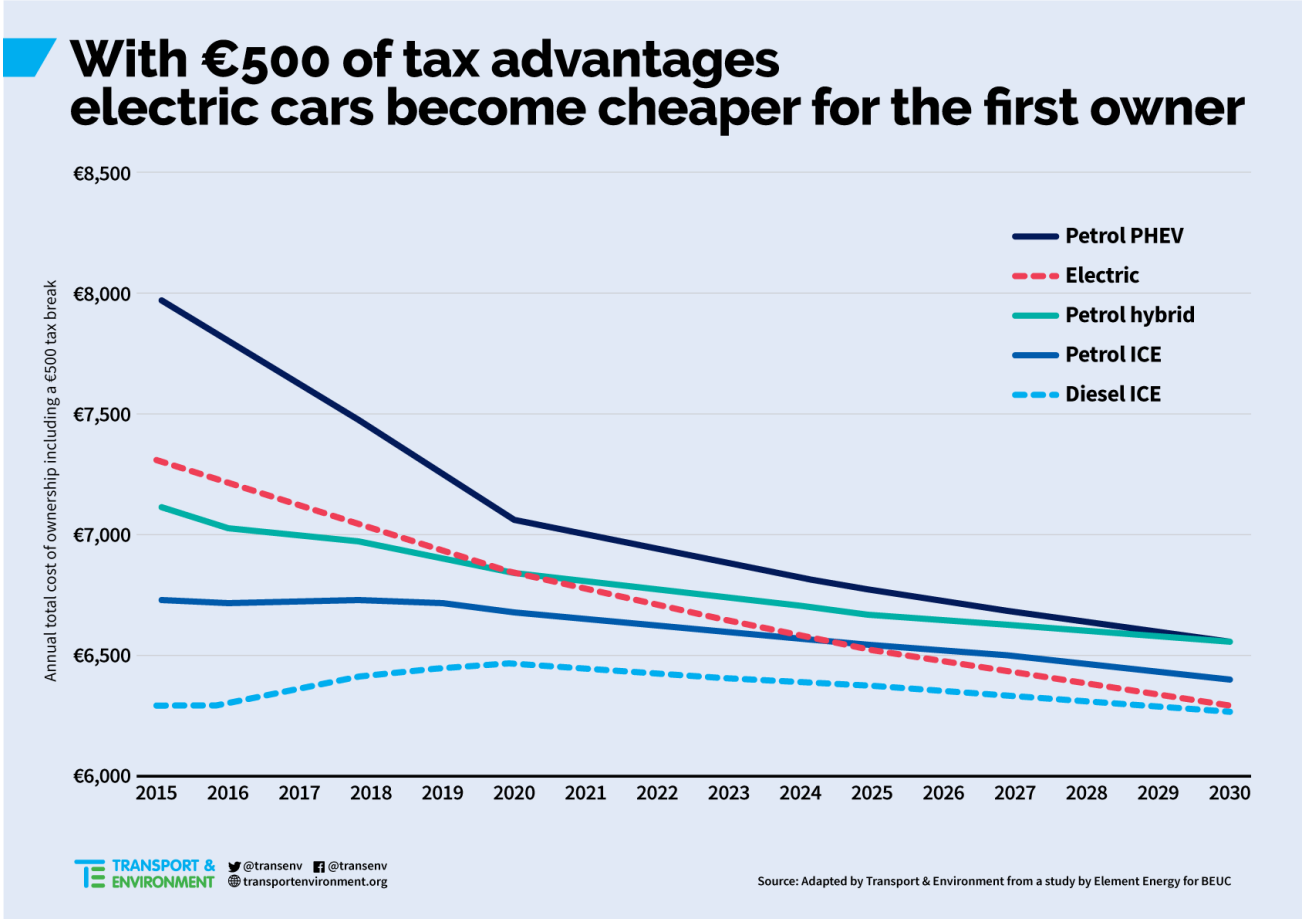
Fears that charging of EVs will cause widespread blackouts are scaremongering. A recent study by McKinsey shows that the expected ramp up of electric vehicles by 2030 will not cause significant increases in power demand. For example in Germany it would add only 1% to the current total, which could grow to 4% by 2050.

While EVs will not cause problems on a system level, there will be changes on a local scale, notably an increase in evening peak loads as people plug their EVs all at the same time after work. The solution is smart charging - optimising charging times and speeds via flexible tariffs and pricing. Instead of plugging in all cars at 6pm, this allows to spread the charging loads between 6pm and the following morning thus smoothing the peaks.



4. Electric cars have lower total costs of ownership

While purchase prices for most EV models remain higher than comparable diesel and petrol cars, the total costs of ownership (TCO) are lower taking into account how much it costs to fuel, maintain and insure the car. A study by the EU Consumer Organisation (BEUC) shows that by 2024 the average 4-year cost of running an electric vehicle will match that of a petrol car, and a diesel one by 2030 with tax breaks of just €500 per year.



More recent studies are even more positive, with EVs already cheaper to own and run in the UK, Japan and US markets with current incentives. For the second and third owners EV's are substantially cheaper with much lower operating and maintenance costs.

The rapid decline in battery prices and technology is continuing with cell prices expected to drop further. The price of lithium-ion batteries is dropping rapidly and is expected to drop by another third by 2025, making EVs competitive on purchase price by 2025.

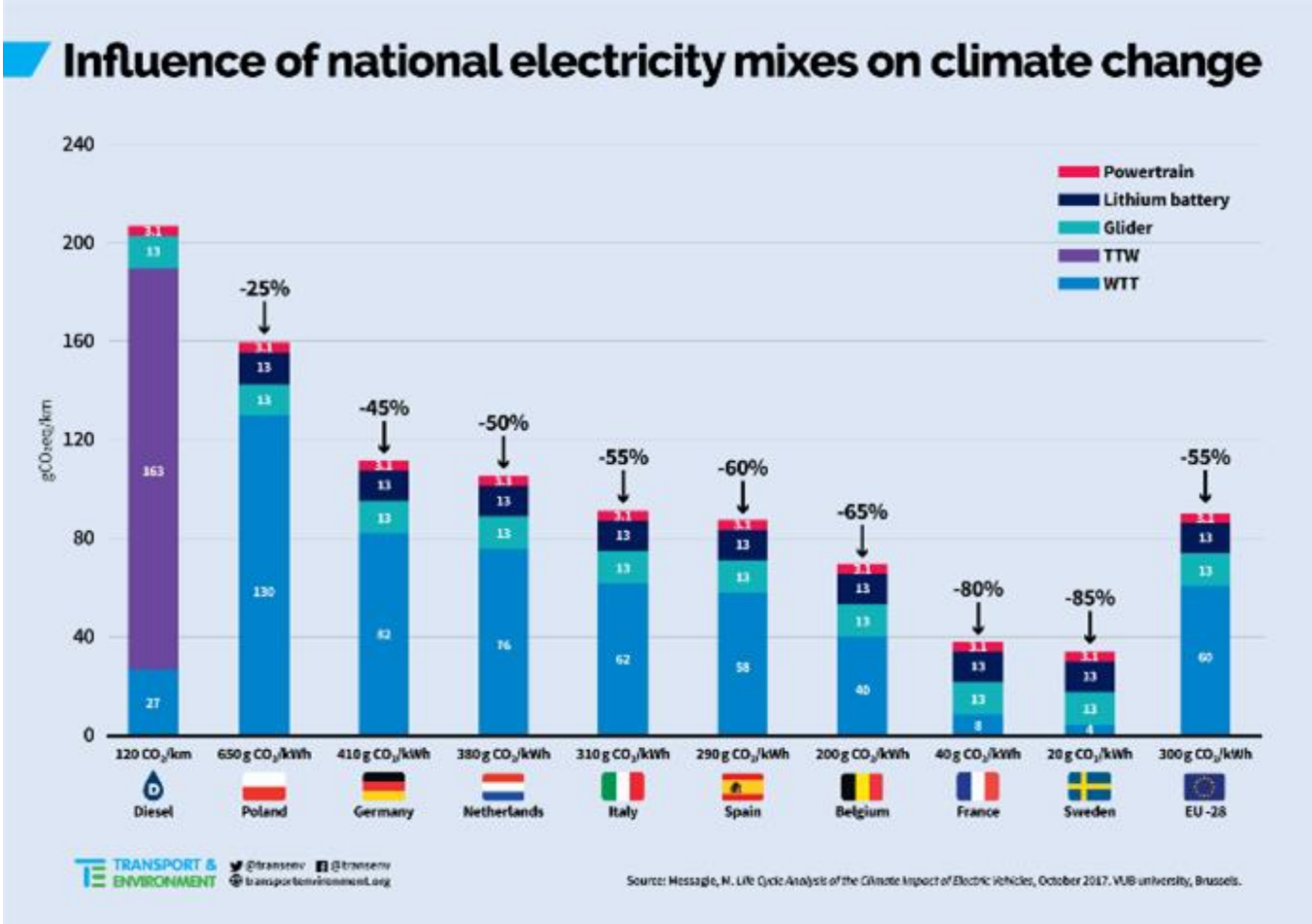
A lack of investment in manufacturing of EVs in Europe is a key reason for higher prices. In Europe expensive small volume manufacturing and minimal competition has meant carmakers have kept prices high. Just 10 battery electric models represent around 90% of sales and most models are not available for sale in showrooms or have long waiting times. Just 1.5% of advertisement spend was on zero emission models and 1.4% on plug-in hybrid models in the EU's largest car markets: Germany, France, UK, Italy and Spain. Carmakers are choosing to sell small numbers of models at high prices in Europe rather than investing in new manufacturing to create a mass market in the EU - just as they are in China.

5. Electric cars are far better for the environment

While electric cars have zero tailpipe (or tank-to-wheel) emissions, there are upstream emissions from manufacturing the battery and from electricity generation But analyses of full life cycle CO2 consistently show on average battery electric vehicles emit less CO2 over their lifetime than diesel cars. A meta-analysis of 11 independent LCA studies done in recent years concludes that a battery electric car over its lifetime produces 50% less CO2 emissions than an average EU car today.

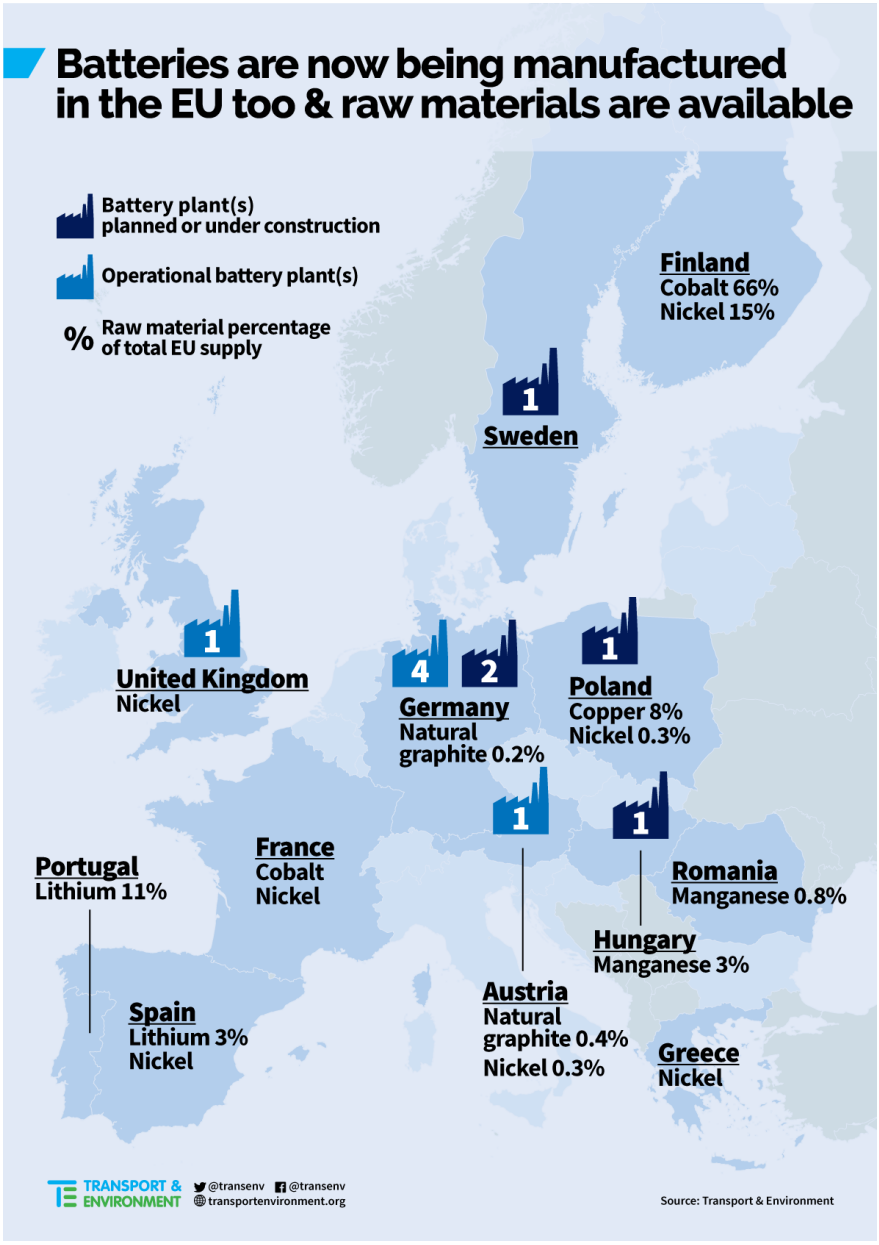
In Europe, when the latest grid intensity figures are taken, even a EV charged on Polish electricity produces 25% less CO2 than a diesel car. As the EU power sector decarbonises the benefit over oil becomes ever greater.

Battery cell manufacturing today is largely in China and South Korea but as the market expands so does production into Europe, where the electricity is less carbon intensive reducing emissions by 65%. At least 5 gigafactories are already planned by early 2020s addressing the environmental concerns of cell manufacturing and creating jobs.



6. There are adequate raw material supplies

Fears about raw materials availability for batteries are not backed up by the evidence, and instead are rumours spread by the oil industry. The latest report on battery materials from the Commission shows that critical materials such as cobalt, nickel and lithium are available across Europe. Globally there are enough natural resources even if all vehicles were electrified, but short-term shortages are possible as the mining, refining and smelting capacity ramps up.



5 battery gigafactories are already planned in Europe for early 2020s:

1. NorthVolt gigafactory, Sweden
2. CATL battery factory, Germany
3. TerraE factory, Germany
4. LG Chem, Poland
5. Samsung SKI, Hungary.

A solution with potential short-term supply bottlenecks is to boost recycling and repurposing of batteries in use. A study on the supply of raw materials for electric vehicles by Agora concluded that secondary cobalt from recycling can meet up to 10% of EU demand in 2030; secondary lithium - 10% of 2030 demand; and secondary nickel can further meet 7% of the 2030 demand.

Further information

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