Global Electricity Demand for EVs to Skyrocket 630 percent by 2030

June 13, 2024. Andrea Stojanovic

Global EVs Electricity Demand (GWh; by year)

Details: EVs stand for Electric Vehicles. Finbold extracted the annual energy consumption figures in gigawatt hours (GWh) for each of the four examined regions and then calculated the percentage change for specified periods. The average annual increase was calculated using the geometric mean method.

Sources: International Energy Agency (IEA), Finbold
Attribution: IEA (2024), Global EV Data Explorer, IEA, Paris
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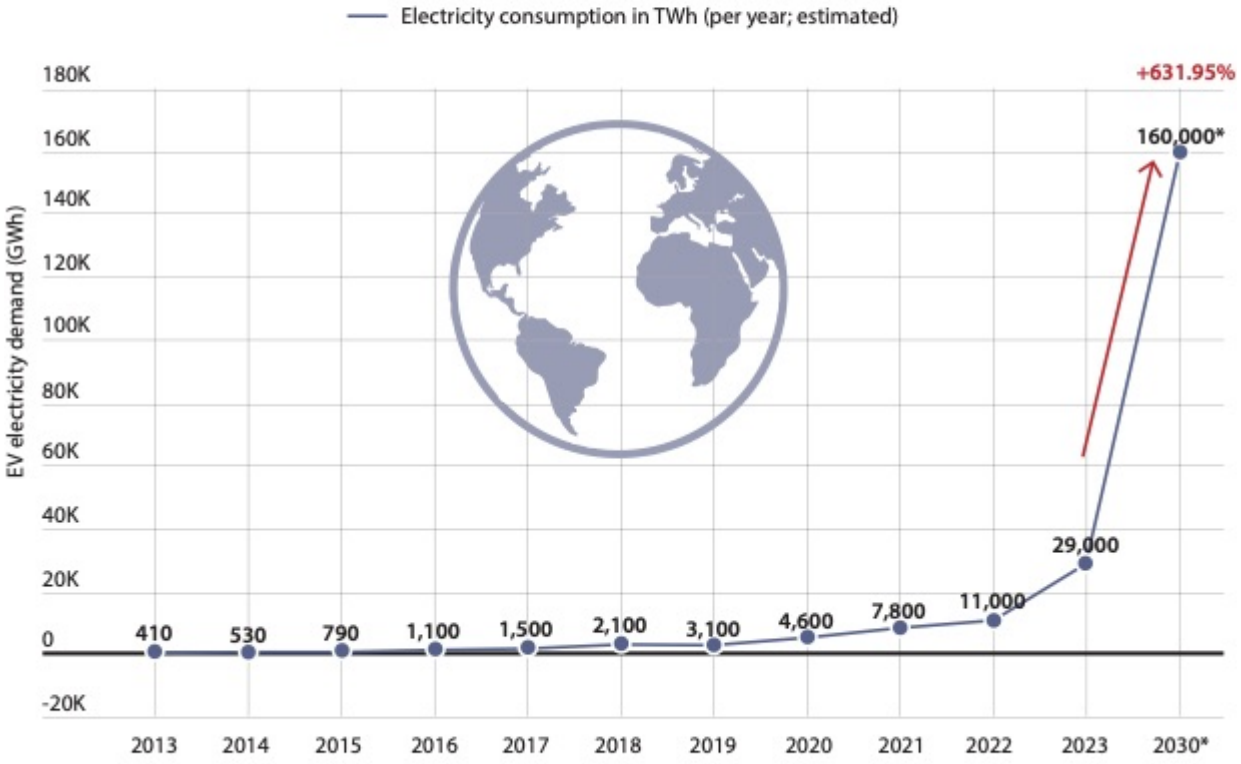


*Supplementary note: Figures for 2030 are a projection retrieved from the IEA reached using Stated Policies Scenario (STEPS) and are excluded from the final tallies covering annual average increase and 2013-2023 total increase.

Despite a noted slowdown in the electric vehicle (EV) industry in 2024, significant progress has been made in their adoption over the last decade. Research by Finbold, using data from the International Energy Agency (IEA), found that the global electricity demand stemming from the usage of electric cars skyrocketed by 3,630.77 percent from 2,600 gigawatt hours (GWh) annually in 2013 to 97,000 GWh in 2023.

Additionally, projections based on the Stated Policies Scenario (STEPS) which uses current trends and scheduled policies – indicate that global electricity demand stemming from EV adoption will rise another 631.96 percent by 2030, reaching 710,000 GWh.

China leading the charge in EV energy demand

As may have been inferred from the robust sales figures provided by the Chinese electric and hybrid vehicle maker BYD Company Limited, the People's Republic has been increasingly taking the lead in terms of EV-related energy demand. In fact, in 2013, the country needed 470 GWh to fuel its electric cars while, by 2023, the number increased to 38,000 GWh. Furthermore, by 2030, China is expected to account for 32.39 percent of the global EV electricity demand, with 230,000 GWh. While the country saw the biggest demand increase in absolute terms between 2022 and 2023 – from 23,000 GWh to USD 38,000 GWh – in relative terms, the most impactful year was 2014, as the demand rocketed 142.42 percent. However, China is a relative laggard when its vast population is considered, as the average per-capita EV-related electricity demand stood at 0.00002695 GWh – 26.95 kWh – in 2023.

U.S. expected to bounce back by 2030

The United States, which led in 2013 with an annual electricity demand of 560 GWh, has fallen behind in recent years and is the only one of the three major examined regions to have experienced negative growth in 2020.

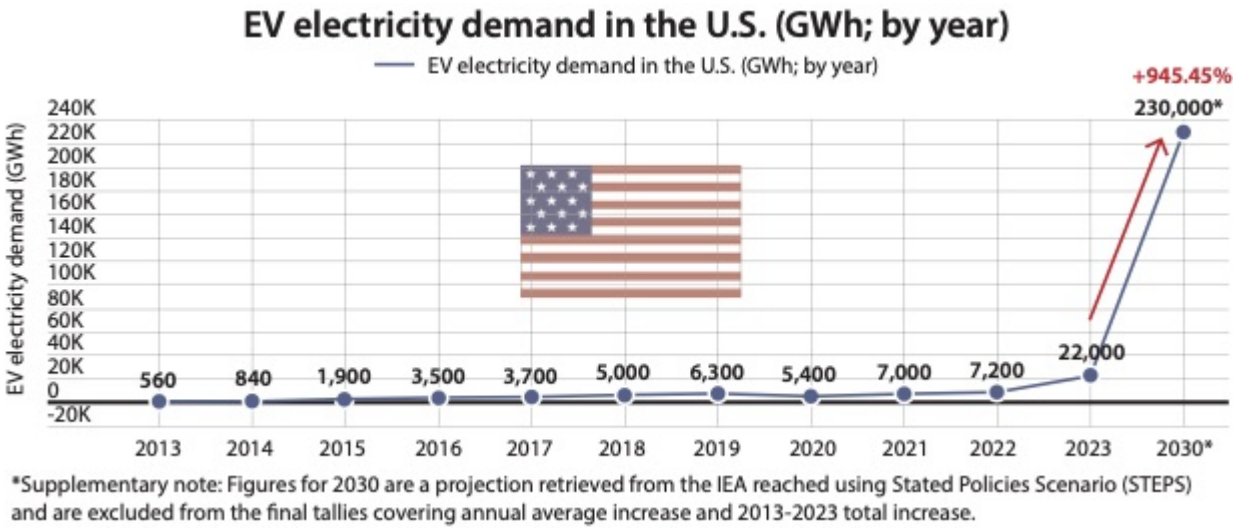
Indeed, by 2023, the United States' EV-related electricity demand grew to 22,000 GWh, which – while representing a massive increase from the 7,200 GWh in 2022 – places the country behind both China (38,000 GWh) and Europe (29,000 GWh), respectively. Nonetheless, in per capita terms, the U.S. remains in the lead. Their demand relative to the population amounted to 0.0647 GWh (64.7 kWh) in the previous year.

In comparison, the per capita demand in Europe – implicitly defined on the IEA website as all non-microstate countries whose mainland territories are wholly on the European continent, as well as Turkey – amounted to 0.04342 GWh (43.42 kWh) by 2023.

Furthermore, the U.S. is projected to achieve parity with China by 2030, given its EV-driven electricity demand is forecast to hit 230,000 GWh.

EV adoption alone is not enough

Another way to frame the significant levels of EV adoption is the reduction in the need for oil stemming from people driving electric cars.



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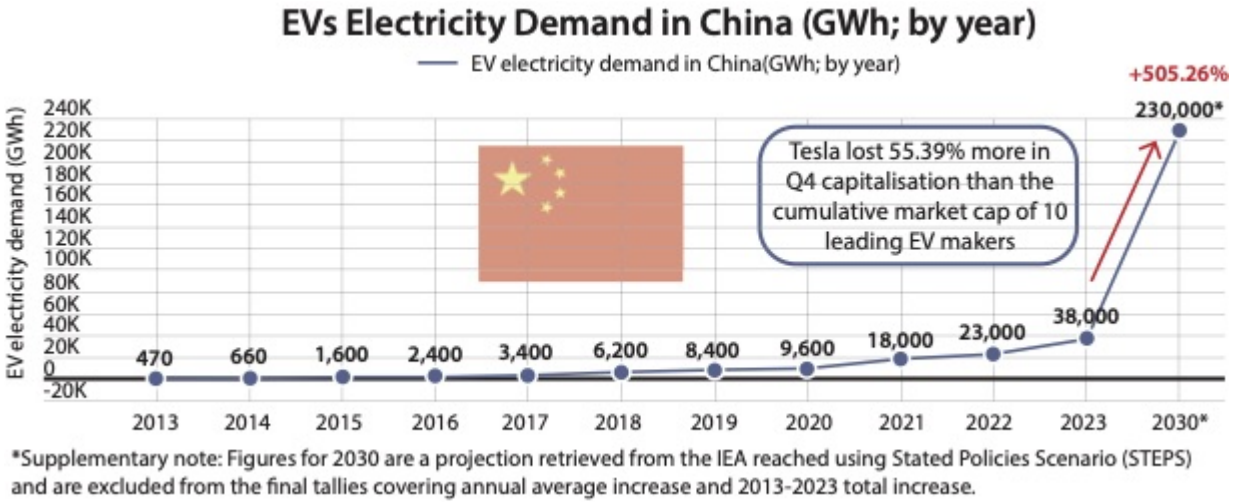

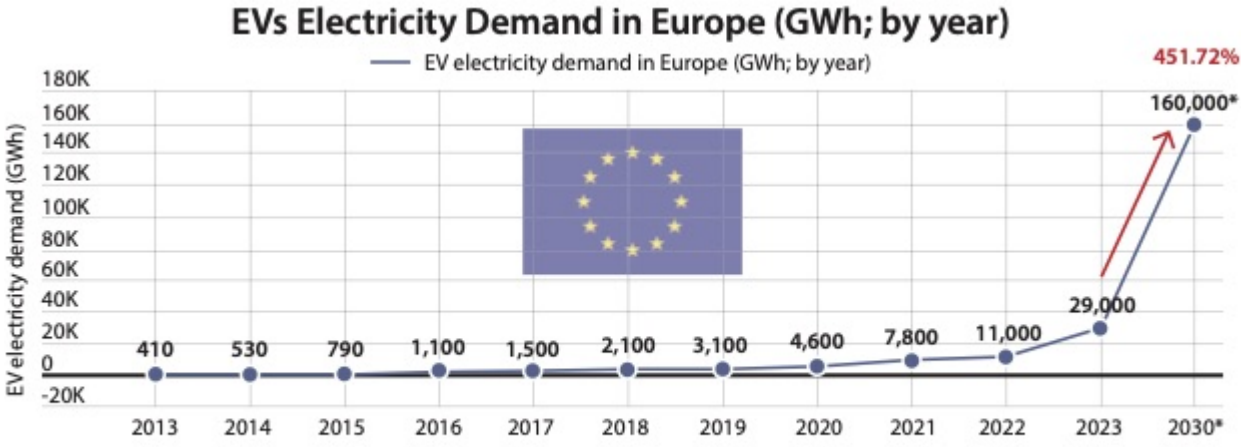

Using the raw conversion – one barrel of oil is enough to produce approximately 1,700 kWh of electricity – the current EV electricity demand equates to approximately 57 million barrels of black gold annually.

Given the projected increase in electric car needs, this figure will increase to nearly 420 million barrels by 2030. The International Energy Agency estimates an even greater impact, placing oil displacement due to the adoption of EVs at 255 million barrels in 2023 and projects it at 2.847 billion in 2030. Still, it is worth remembering that the world is estimated to have burned some 37 billion barrels of oil in 2023 and more than 11 billion for road transportation.

Additionally, electric vehicles themselves are far from the entire solution. Much of

the electricity produced to power EVs continues to be generated by burning fossil fuels, and the mining of lithium – a key material used in producing lithium-ion batteries – remains a highly controversial topic.

Nonetheless, the IEA's 2023 report indicates that investments in clean energy, such as solar, have decisively surpassed investments in fossil fuels.

When combined with other potential energy sources – such as nuclear fusion, exemplified by the International Thermonuclear Experimental Reactor (ITER) – EVs are likely to have an even greater impact.

Andreja is a skilled finance news reporter, copywriter, and screenwriter with a growing fascination for finance, especially in the wake of the retail investing boom. He has since committed himself to providing rigorous coverage of financial news and the exploration of intricate financial concepts.