EPISODE 387

Nucleus Wealth

RIPPLE EFFECT OF CHINESE EV OVERINVESTMENT

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Agenda:

- “China’s EV machine isn’t just a car story—it’s industrial strategy colliding with capitalism.”

Analogy: Over-Investment in Solar Panels

- China has a track record of pouring resources into industries (solar panels, steel, rare earths) far beyond immediate profit motives.
- Result in solar: Chinese dominance, bankruptcies for Western competitors, and prices falling dramatically.
- Suggest that the auto industry could face a similar dynamic — Chinese overcapacity pushing global EV prices down.

Incentives in China: Not About Profit

- Many Chinese carmakers are supported by state subsidies, cheap loans, and local government backing.
- The incentives are strategic — about industrial leadership, jobs, and national prestige — not necessarily shareholder returns.
- This creates a competitive environment where Western firms (who must deliver profits) are at a disadvantage.

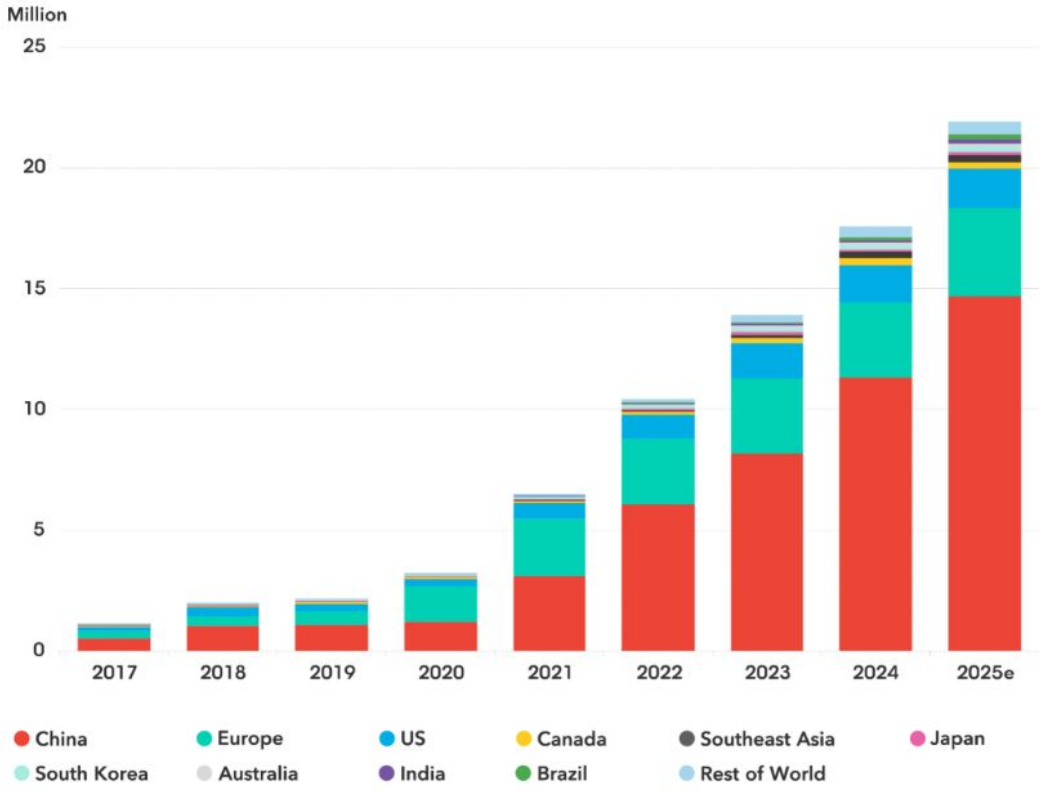
Why EVs Are Easier to Make than ICE Cars

- ICE (internal combustion engine) cars require decades of engineering expertise, supply chain precision, and emissions compliance.
- EVs simplify much of this: fewer moving parts, no exhaust/emission systems, no complex transmissions.
- This lowers the barrier to entry — making it easier for newer firms, especially in China, to catch up quickly

Car Industry Protections in the West

- The car industry is a strategic employer in the US, Europe, Japan, and Korea.
- Millions of jobs are tied to car production and supply chains.
- Governments often view cars through a national security lens — think of WWII production, or today's push for domestic EV supply chains.
- Protectionism (tariffs, subsidies, "Buy American/European" policies) is likely to grow as Chinese cars become more competitive.

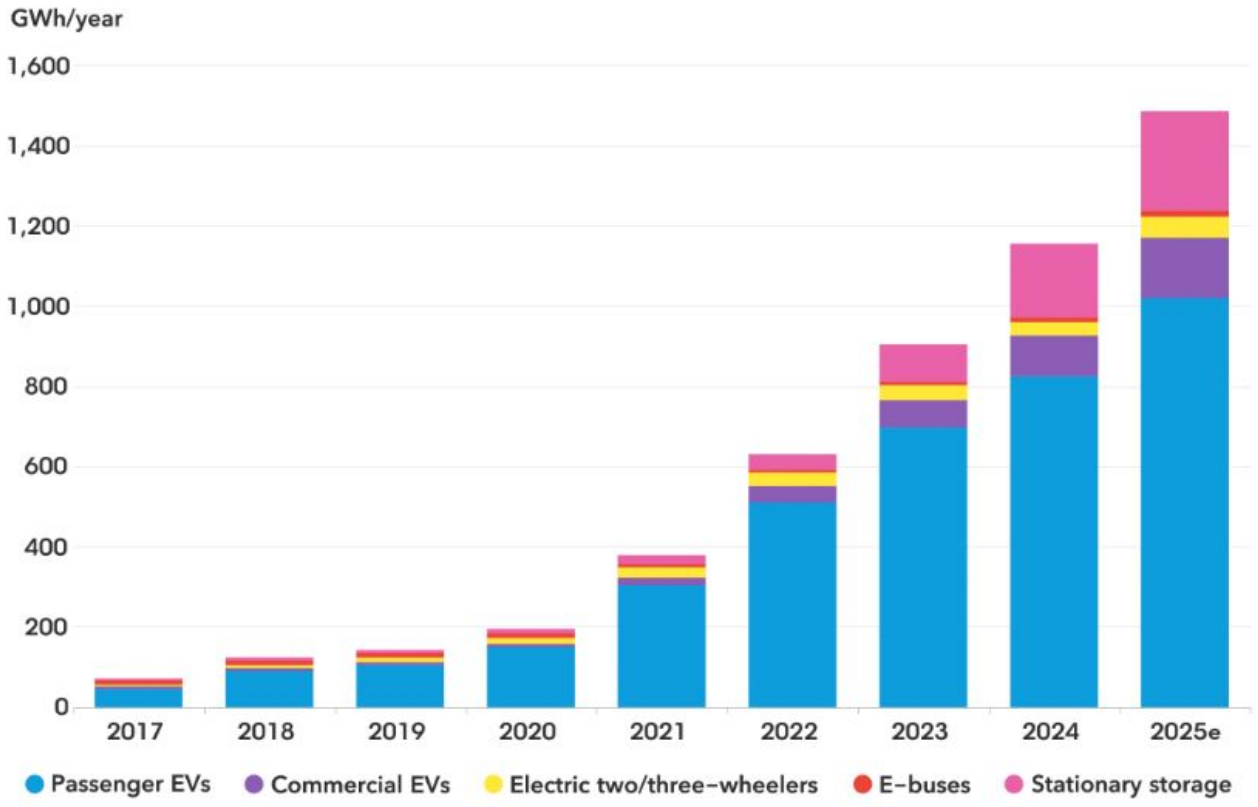
EV car sales (total = ~100m cars)



Source: BloombergNEF, MarkLines, Jato Dynamics

Note: Includes battery electric and plug-in hybrid passenger vehicles. 2025 is BNEF's forecast for the year.

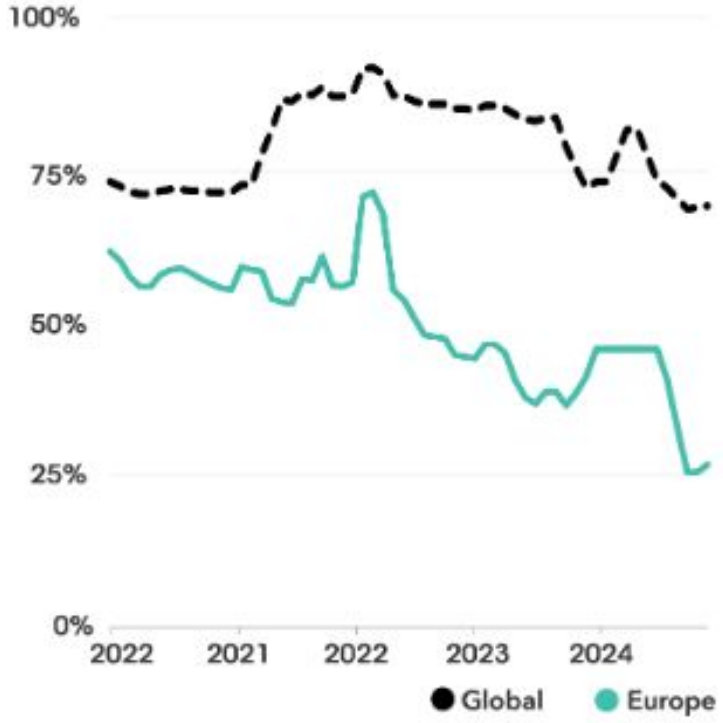
Lithium demand



Source: BloombergNEF

Note: Excludes consumer electronics

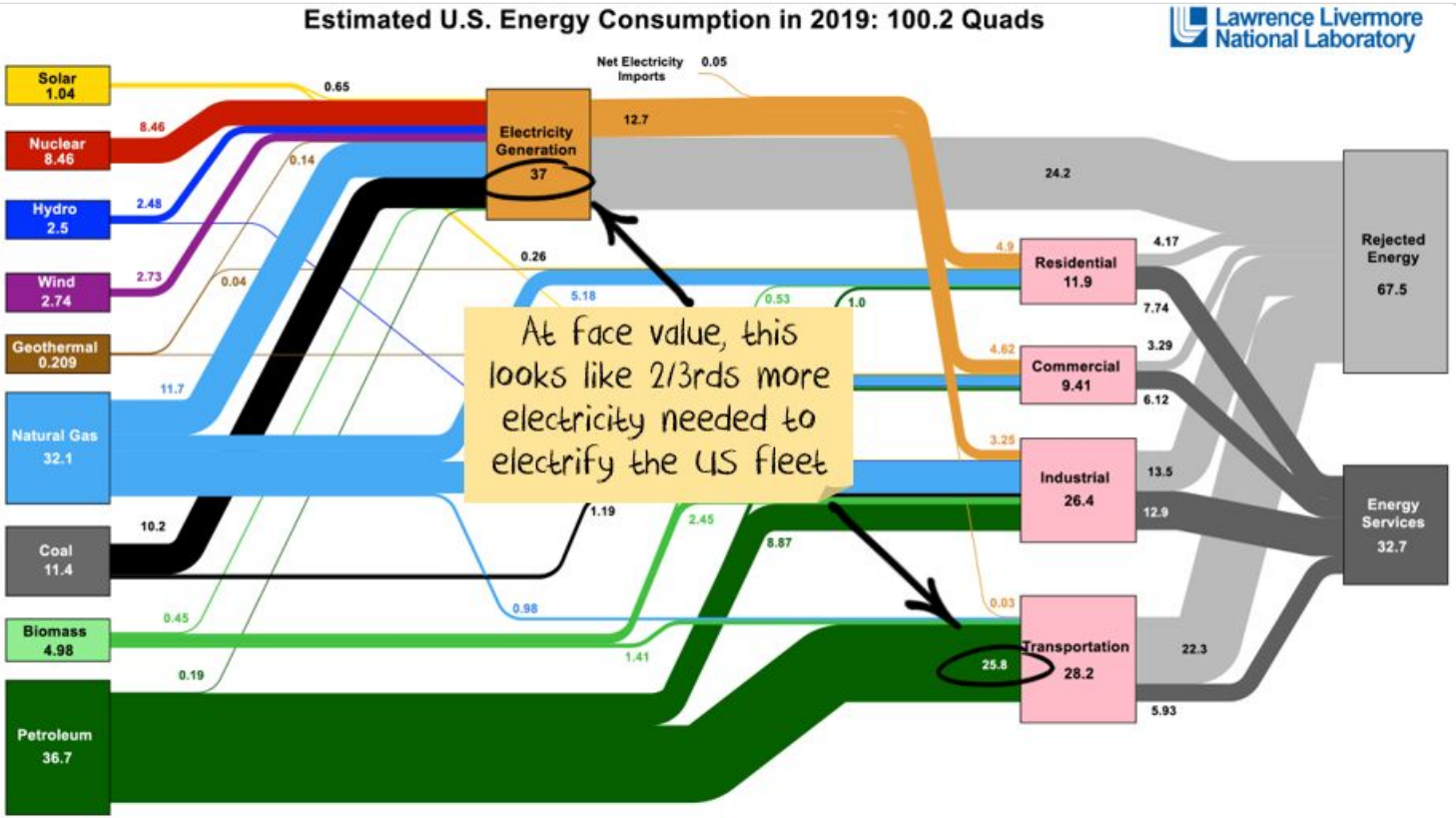
Share of EVs where residential electricity<50% of gasoline



Source: BloombergNEF

Note: See full report for assumptions.

Fighting physics

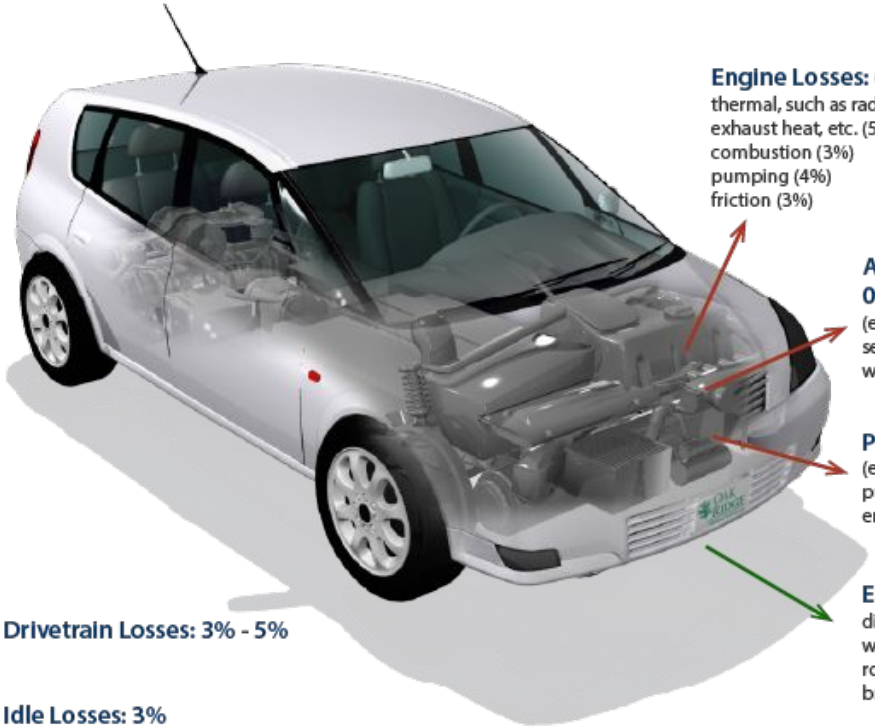


Source: LLNL March, 2020. Data is based on DOE/EIA MER (2019). If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports consumption of renewable resources (i.e., hydro, wind, geothermal and solar) for electricity in BTU-equivalent values by assuming a typical fossil fuel plant heat rate. The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 65% for the residential sector, 65% for the commercial sector, 21% for the transportation sector and 49% for the industrial sector, which was updated in 2017 to reflect DOE's analysis of manufacturing. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527

Fighting physics

Energy Requirements for Combined City/Highway Driving - Gasoline Vehicles

Click on blue text for more information.



Engine Losses: 68% - 72%
thermal, such as radiator, exhaust heat, etc. (58% - 62%)
combustion (3%)
pumping (4%)
friction (3%)

Auxiliary Electrical Losses: 0% - 2%
(e.g., climate control fans, seat and steering wheel warmers, headlights, etc.)

Parasitic Losses: 4% - 6%
(e.g., water, fuel and oil pumps, ignition systems, engine control systems, etc.)

Energy to Wheels: 16% - 25%
dissipated as
wind resistance (8% - 12%)
rolling resistance (4% - 7%)
braking (4% - 7%)

Drivetrain Losses: 3% - 5%

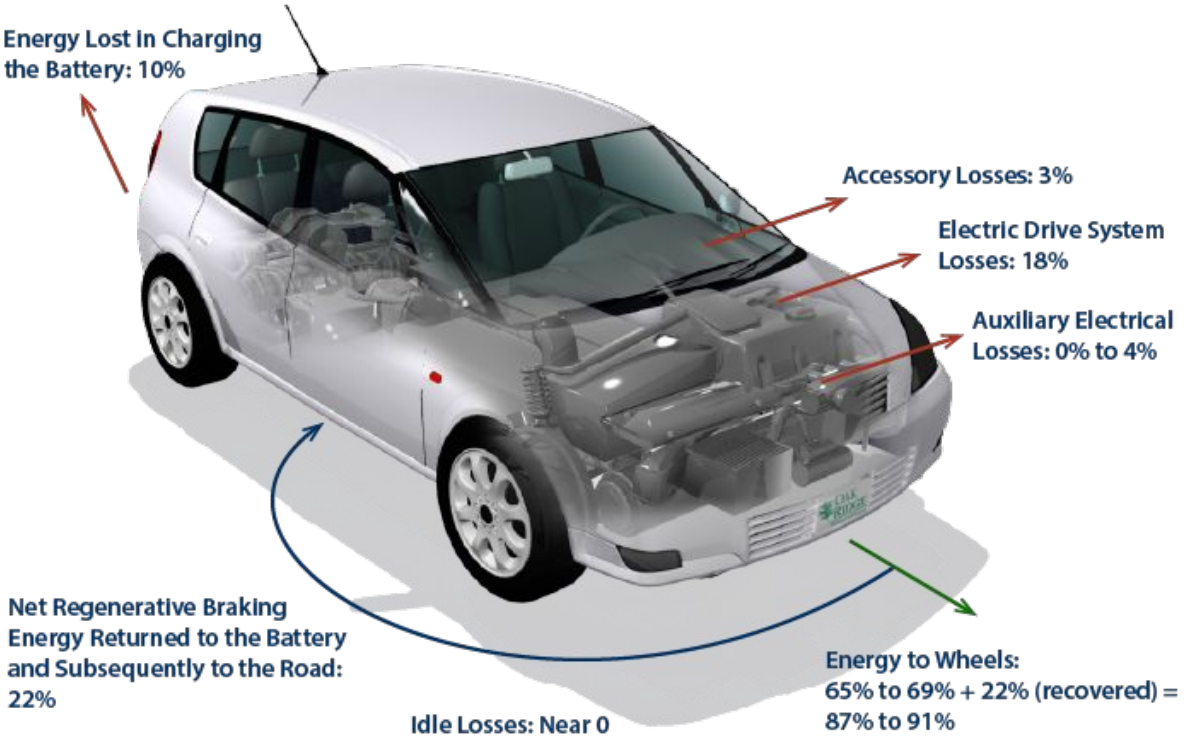
Idle Losses: 3%
In this figure, they are accounted for as part of the engine and parasitic losses.

Some percentages may not add to 100% because of rounding.

Fighting physics

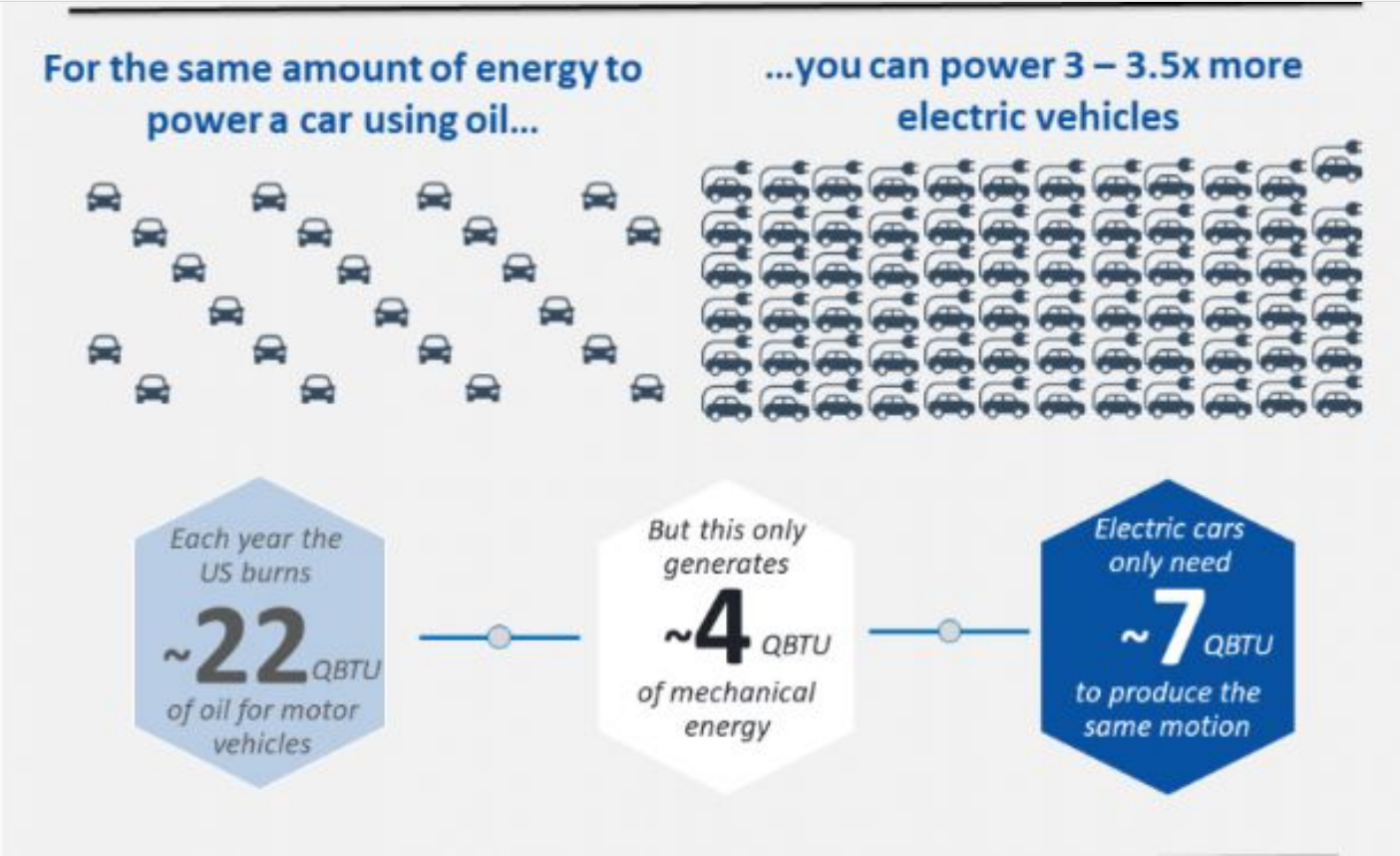
Energy Requirements for Combined City/Highway Driving - Electric Vehicles

Click on blue text for more information.



Some percentages may not add to 100% because of rounding. Percentage total may exceed 100% because regenerative braking recaptures energy and reuses it.

Fighting physics



At 100% EV sales, the electricity demands aren't heroic

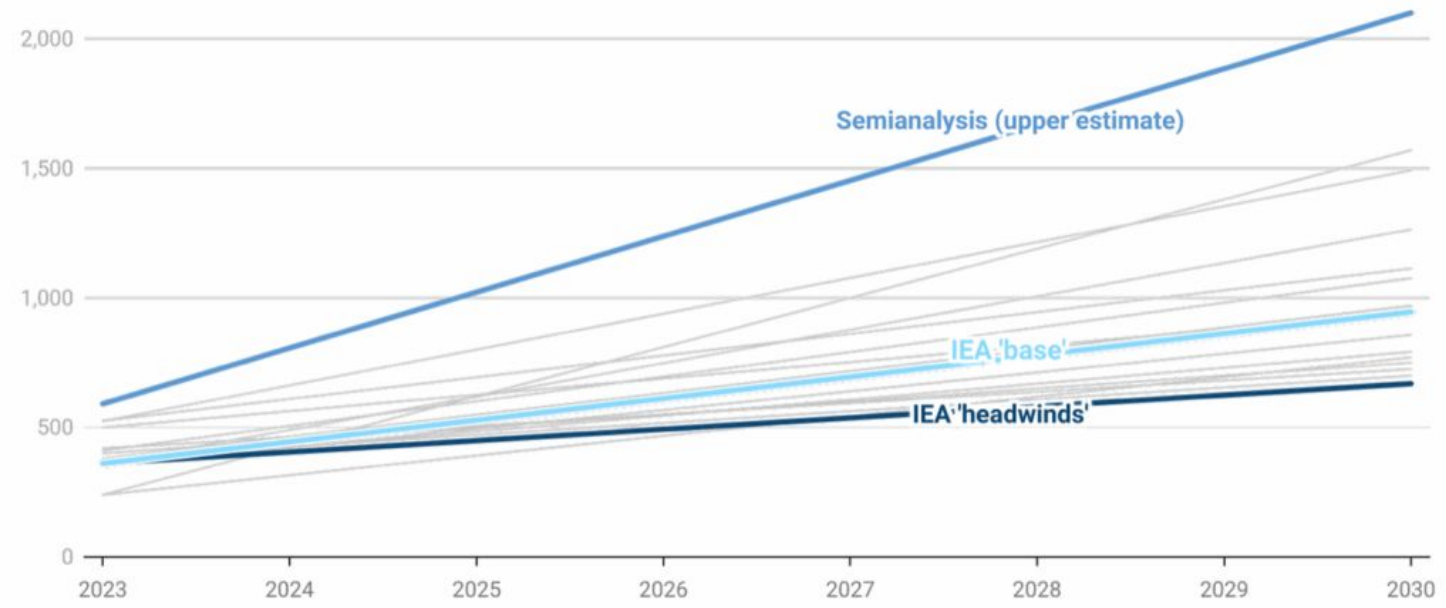
What if every new car sold will be an EV until the entire fleet is replaced.

- The US sells about 17m vehicles per year. There are approximately 290m cars registered in the US. So 17years to convert.
- An electric vehicle uses about 15 kWh per 100km
- The average US driver drives 14,000mi or 25,000km per year
- To be very conservative, assume 80% of charging is done at home
- There are about 1.9 cars and drivers per household.
- So, each household is going to need 5,685 kWh more power per year
- The average household use at the moment is 10,715 kWh/year, which means it will consume 53% more electricity, or ~3% annual increase over 17 years.

Data centre clash

Some experts forecast a doubling of data-centre electricity demand by 2030 – while others predict a fourfold increase or more

Estimated date-centre electricity demand in 2023 and 2030, TWh, according to a range of analysts



Source: IEA, Goldman Sachs, Deloitte, Boston Consulting Group, Gas Exporting Countries Forum, Liebreich Associates, Semianalysis, Schneider Electric, International Data Corporation, Jeffries (2024).

CarbonBrief
CLEAR ON CLIMATE

Data centre clash

Data centres are responsible for just 1% of global electricity consumption and 0.5% of CO2 emissions

Electricity consumption, TWh, and CO2 emissions, Mt, in 2024

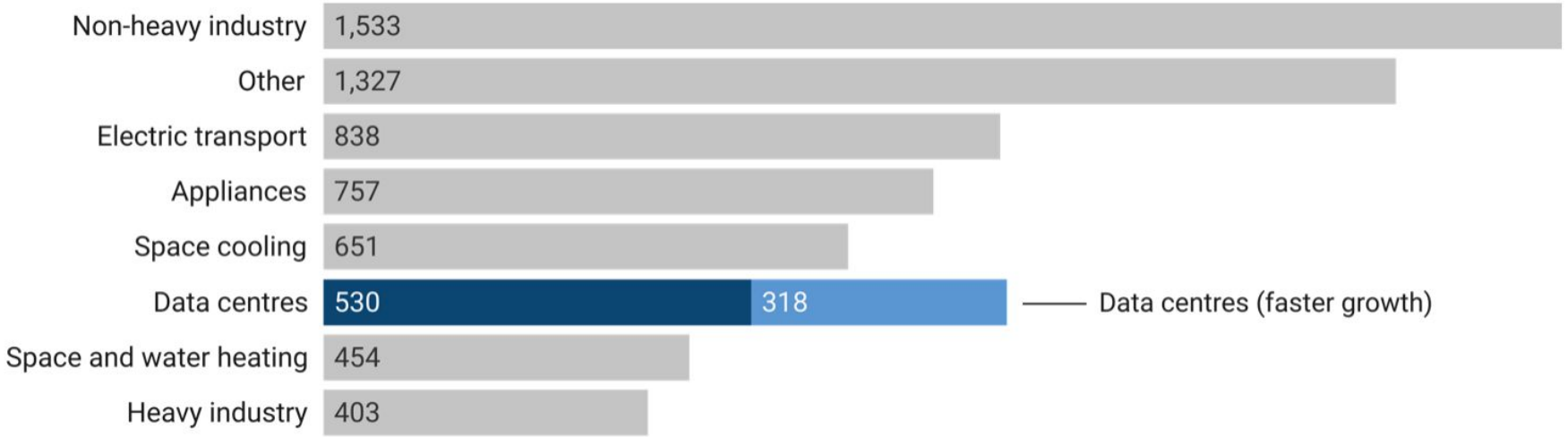
Source: IEA global energy review 2025, CO2 figures and report on energy and AI

CarbonBrief
CLEAR ON CLIMATE

Data centre clash

Around a tenth of the growth in global electricity demand is expected to come from data centres over the next five years

IEA projections of electricity demand growth between 2024 and 2030, TWh



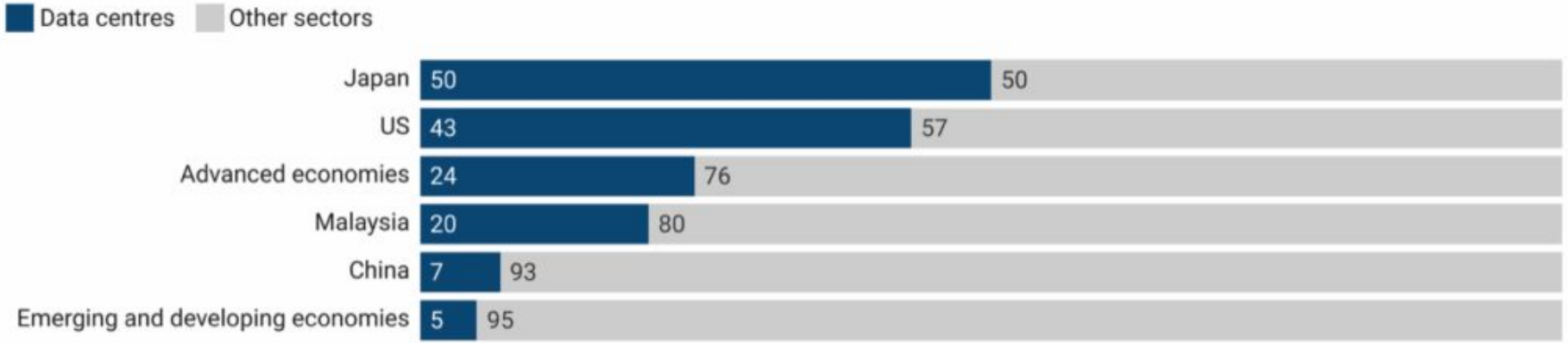
Source: IEA energy and AI report.

CarbonBrief
CLEAR ON CLIMATE

Data centre clash

Data centres are expected to be major sources of electricity demand growth in some countries

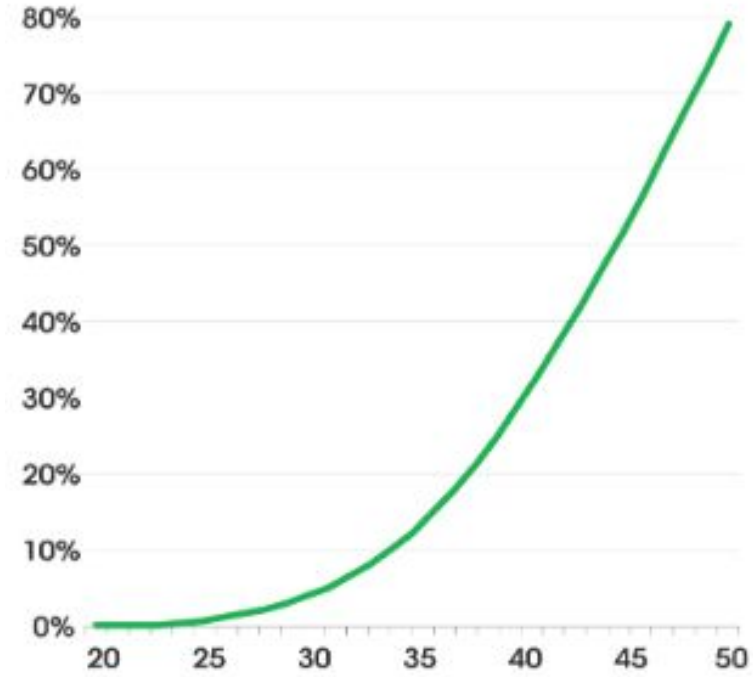
Data-centre share of electricity demand growth 2024-2030, %



Source: IEA

CarbonBrief
CLEAR ON CLIMATE

Brazilian Ethanol displaced by EVs



Source: BloombergNEF

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The Battery Cost Story

- Batteries are the single largest cost in EV production.
- Battery prices have been falling consistently, with breakthroughs in materials and scale expected to push costs even lower.
- At some point, EVs will be structurally cheaper than ICE cars.
- If China dominates batteries (as it already does in refining, cathodes, and anodes), they may set the pace of global car pricing.

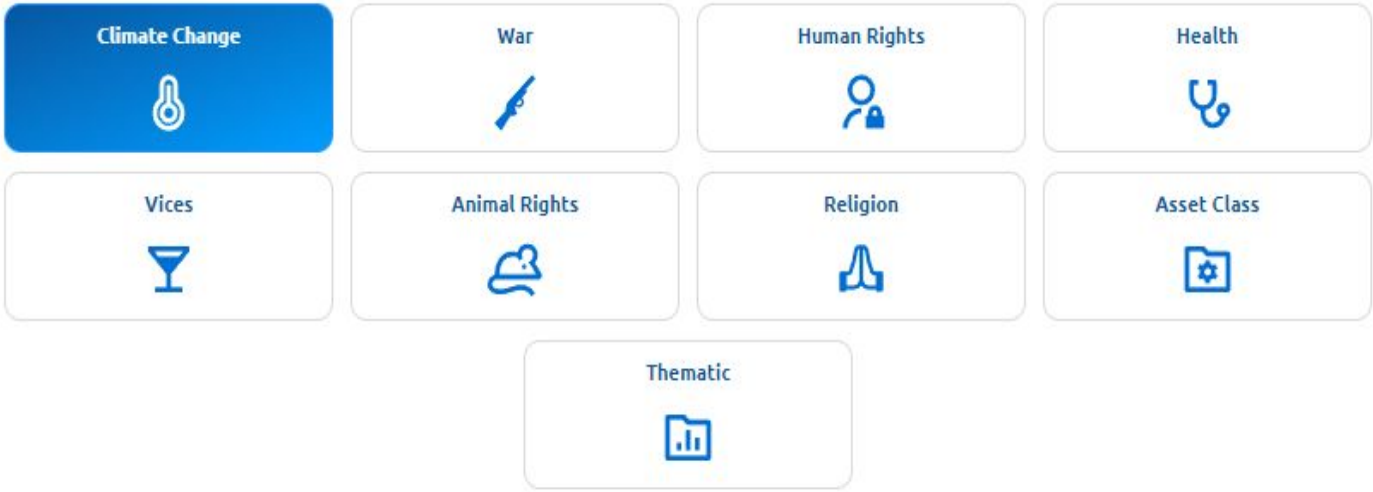
Investment Outlook

- Western automakers are caught between legacy ICE businesses and the EV transition.
- Chinese firms are entering with cost advantages, speed, and scale.
- Expect political battles: tariffs, subsidies, and attempts to build local EV supply chains outside China.
- Consumers may benefit from cheaper cars, but governments and incumbents will resist Chinese dominance.
- Chinese EV push is not just about cars, it’s about industrial strategy, geopolitics, and the future of one of the world’s largest industries.
- Will the world embrace cheap Chinese EVs like it did with solar panels, or will it fight to preserve local car industries?

Investment Outlook

- Car sector 4 times smaller than 20- years ago. 8 times if you exclude Tesla.
-

Choose themes to screen from your portfolio away from (i.e. remove stocks)



Climate Change

- [ ] No Fossil Fuels (Worst Offenders)
- [ ] No Fossil Fuels (Any)
- [ ] No Coal Seam Gas or Fracking
- [ ] No Nuclear Power
- [ ] No Old Growth Forest Logging

Personalise Your Portfolio

Screens

You can exclude the below to customise your portfolio

Climate Change | War | Human Rights | Health | Vices

Animal Rights | Religion | Asset Class | Thematic

- No Fossil Fuels (Worst Offenders)
- No Fossil Fuels (Any)
- No Coal Seam Gas or Fracking
- No Nuclear Power
- No Old Growth Forest Logging

Tilts

You can add the below to customise your portfolio

Investment Style Factors | Climate Change | Technology

Consumption | Commodities | Military | GICS Sectors

- Quality Stocks
- Value Stocks
- Growth Stocks
- Defensives

Personalise your portfolio now ›

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Portfolio Tilts

Quality Stocks	Value Stocks	Growth Stocks
Oil & Gas Stocks	Gold Stocks	Agribusiness
Large Technology Stocks	Cloud Computing Stocks	Robotics/AI
Video Gaming	Cybersecurity	Clean Energy
Defensives	Battery Supply Chain	Nuclear Power
Defense Contractors	Travel	Luxury Goods
Logistics	Global Communication Services	Global Consumer Discretionary
Global Consumer Staples	Global Energy	Global Financials
Global Health Care	Global Industrials	Global Information Technology

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