

Potential Issues of Rushing EV Mandates

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Amidst the global movement to reduce carbon emissions, electric vehicles (EVs) are drawing attention as an alternative to mitigate climate change. Many countries are even discussing and planning the mandatory adoption of EVs. However, there is currently criticism over whether mandatory electric vehicles can be realized and whether they will be effective in mitigating climate change. This essay explores whether mandating EVs is an essential solution to environmental issues or a premature move. Given the current circumstances, mandatory EVs are unrealistic due to challenges in the charging environment, economic burdens, and environmental problems related to battery production and disposal.

First, one of the biggest challenges in expanding electric vehicles (EVs) is the lack of adequate charging infrastructure. The scarcity of charging stations, sluggish charging speeds, and steep installation costs underscore the inadequacy of EV charging infrastructure. Currently, EV charging infrastructure is nowhere near as widespread as gas stations. (Azizbek, 2024) This leads to another significant drawback of EVs: the difficulty of long-distance travel. Especially when traveling long distances or in remote areas, finding a charging station can be a challenge. Moreover, the charging speed of EVs is significantly slower than refueling a conventional internal combustion engine vehicle. Filling up a gas tank takes just a few minutes, whereas charging an EV can take around 30 minutes with a fast charger and 4-5 hours with a standard charger. The reality is that fast chargers are scarce, and most homes or apartment complexes are equipped only with standard chargers, forcing many users to rely on the slower option. On top of that, installing new charging stations is expensive and not a simple task. High installation costs make private companies

reluctant to invest, and government support is limited. (Alanazi, 2023) Unless these issues are addressed, it will be challenging to make EVs a convenient and accessible choice for everyone.

Second, the high cost of electric vehicles (EVs) remains one of the key obstacles to their widespread adoption, preventing many potential buyers from making the switch to more sustainable transportation. The initial purchase price of EVs is significantly higher compared to traditional internal combustion engine (ICE) vehicles. (Woody, 2024) This price discrepancy is primarily driven by the expensive battery technology that powers EVs, which accounts for a substantial portion of the vehicle's total cost. While some individuals or businesses may be able to absorb these higher upfront costs, for many people—particularly those in low-income households—this price gap is an insurmountable financial barrier. As a result, the widespread adoption of EVs remains out of reach for a large segment of the population, exacerbating existing economic disparities. Moreover, beyond the initial purchase price, the cost of replacing an EV battery adds another layer of financial concern. EV batteries are designed to last for several years, but over time they degrade in performance, leading to the need for eventual replacement. This can be a considerable expense, often reaching thousands of dollars, and presents a significant challenge for consumers who have already made a substantial investment in the vehicle. With battery replacement costs often representing a large portion of the vehicle's value, this becomes a deterrent for many who might otherwise consider purchasing an EV. Finally, while government subsidies can help reduce the financial burden of EVs to some extent, they are not a permanent solution to the high costs associated with electric vehicles. Subsidies are often limited in scope and duration, meaning that their impact may not be sufficient to make EVs accessible to everyone, particularly as the number of potential EV buyers grows. These economic barriers make it clear that mandating EV adoption at this stage might be premature. Without addressing the affordability issues

surrounding EVs, particularly the high initial purchase price and the substantial costs of battery replacement, it is unlikely that EVs can be adopted on a large scale.

Finally, The environmental concerns surrounding EV battery production and disposal challenge the perception of EVs as a sustainable alternative. From resource extraction to manufacturing and eventual disposal, the process can lead to significant environmental damage. (Azizbek, 2024) The mining of critical raw materials like lithium, cobalt, and nickel—essential components of EV batteries—causes habitat destruction and water pollution. Furthermore, the battery manufacturing process consumes vast amounts of energy, resulting in substantial carbon emissions. (Kapustina, 2023) The facilities involved in battery production require large amounts of electricity, often sourced from fossil fuels, which results in a significant environmental footprint. This energy consumption can diminish the potential benefits of EVs, especially in regions where the electricity grid is primarily powered by coal or other non-renewable sources. Lastly, with inadequate battery recycling technology, improper disposal could lead to soil and water contamination due to toxic materials. The toxic materials found in these batteries, including heavy metals and chemicals, pose long-term risks to ecosystems and human health if not disposed of properly. This issue is compounded by the growing number of EVs on the road, which increases the demand for battery disposal and recycling solutions that are currently insufficient in scale and effectiveness. If these environmental challenges are not addressed through improved mining practices, cleaner manufacturing technologies, and better recycling infrastructure, EVs may not achieve their potential as a truly sustainable transportation solution.

Many argue that EV mandates must be rapidly implemented to solve climate change and reduce carbon emissions. (Haghani, 2024) While it's undeniable that EVs can play a crucial role

in reducing emissions, rushing the mandate may actually hinder the expected environmental benefits. For instance, the high carbon emissions from battery production and resource mining during the manufacturing process could reduce the net positive impact of EVs on climate change. Additionally, since over 63% of global electricity still comes from fossil fuels, the indirect carbon emissions generated during EV charging complicate the issue. Therefore, instead of focusing solely on speeding up the implementation of EV mandates, efforts should prioritize improving battery manufacturing technology, building recycling systems, and expanding renewable energy. This approach will ensure the long-term sustainability of policies and maximize the actual carbon reduction effects.

In conclusion, enforcing EV mandates is currently unfeasible due to insufficient infrastructure, the financial burden on consumers, and environmental issues related to battery production and disposal. While EVs hold great potential for reducing carbon emissions, premature mandates risk unintended consequences. Notably, the significant energy consumption and carbon emissions during battery production diminish EVs' overall environmental benefits. Additionally, the challenges posed by toxic materials from battery disposal and the lack of effective recycling technologies hinder long-term environmental sustainability. Moreover, with the global energy mix still heavily reliant on fossil fuels, indirect carbon emissions from charging EVs remain unresolved. Therefore, policymakers must focus on addressing these issues before enforcing EV mandates. For example, Governments, businesses, and private sector players must work together to develop a robust network of charging stations that are strategically located, easily accessible, and capable of supporting fast charging speeds. Also, expanding the use of renewable energy sources, such as solar and wind power, for EV charging stations should be a priority. Furthermore, battery recycling

plants should be expanded regionally, and infrastructure must be established to safely and efficiently process discarded batteries. Expanding charging infrastructure, advancing battery technology, establishing recycling systems, and increasing renewable energy adoption are crucial steps. By prioritizing these efforts, the transition to electric mobility can be carried out more sustainably and equitably. This approach ensures that policies reflect not only short-term goals but also long-term environmental and social responsibility.

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