# Research Report

## Introduction  
Simulation of combustion engine vehicles with electric vehicles is a crucial aspect of the transportation sector's transition to sustainable energy. The integration of electric vehicles (EVs) into the market can significantly reduce greenhouse gas emissions and dependence on fossil fuels. This simulation is essential for understanding the impact of electric vehicles on the environment and the economy, and for making informed decisions about the transition to sustainable energy sources.  
  
## Background  
To simulate the impact of combustion engine vehicles versus electric vehicles, several factors must be considered, including energy sources, emissions, and efficiency. Electric vehicles are powered by electricity from various sources, including wind and solar energy, which are becoming increasingly prominent in the energy mix. The growth of wind and solar energy can support the widespread adoption of electric vehicles. As the EU's solar generation increases by 21% and wind generation rises by 9%, the energy transition gains momentum. This shift can enable the transportation sector to reduce its reliance on fossil fuels and decrease emissions.  
  
## Methodology  
Simulating combustion engine vehicles alongside electric vehicles involves comparing their performance, efficiency, and environmental impact. A key aspect of this simulation is evaluating the costs associated with each type of vehicle. To determine which option is more suitable for a household, several factors must be considered, including:   
- Operational costs: fuel or electricity expenses  
- Maintenance costs: repairs, replacements, and upkeep  
- Environmental costs: emissions and resource consumption  
- Initial purchase or lease costs  
By simulating and analyzing these factors, households can make informed decisions about whether combustion engine vehicles or electric vehicles better meet their needs and budget.  
  
## Results  
Simulation of combustion engine vehicles with electric vehicles involves comparing the performance, efficiency, and environmental impact of both types of vehicles. Combustion engine vehicles rely on fossil fuels, whereas electric vehicles are powered by electric motors and batteries. In simulations, electric vehicles have shown to have lower operating costs and reduced greenhouse gas emissions. The comparison between wind and solar energy is also relevant in the context of electric vehicles. Wind power plants can supply a large area of households or industries, while solar energy is a better alternative for smaller households. The efficiency and cost-effectiveness of wind and solar energy will continue to improve as technology advances, making them more viable options for powering electric vehicles.  
  
## Discussion  
The simulation models can be used to analyze the effects of replacing combustion engine vehicles with electric vehicles on a large scale, taking into account factors such as energy consumption, battery life, and charging infrastructure. This can help policymakers and industry stakeholders make informed decisions about the transition to electric vehicles. Ultimately, the simulation of combustion engine vehicles with electric vehicles highlights the need for a sustained shift away from fossil fuels and towards renewable energy sources. As first-world countries implement policies like the European Green Deal to reduce greenhouse gas emissions, the transportation sector must adapt to these changes and prioritize sustainability.  
  
## Conclusion  
In conclusion, the simulation of combustion engine vehicles with electric vehicles is a crucial tool for understanding the impact of electric vehicles on the environment and the economy. By considering factors such as energy sources, emissions, efficiency, and costs, households and policymakers can make informed decisions about the transition to sustainable energy sources. The results of these simulations can help to support the widespread adoption of electric vehicles, reduce greenhouse gas emissions, and promote a more sustainable transportation sector. As technology continues to advance and the energy mix shifts towards renewable energy sources, the simulation of combustion engine vehicles with electric vehicles will remain an essential aspect of the transition to sustainable energy.

# References

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