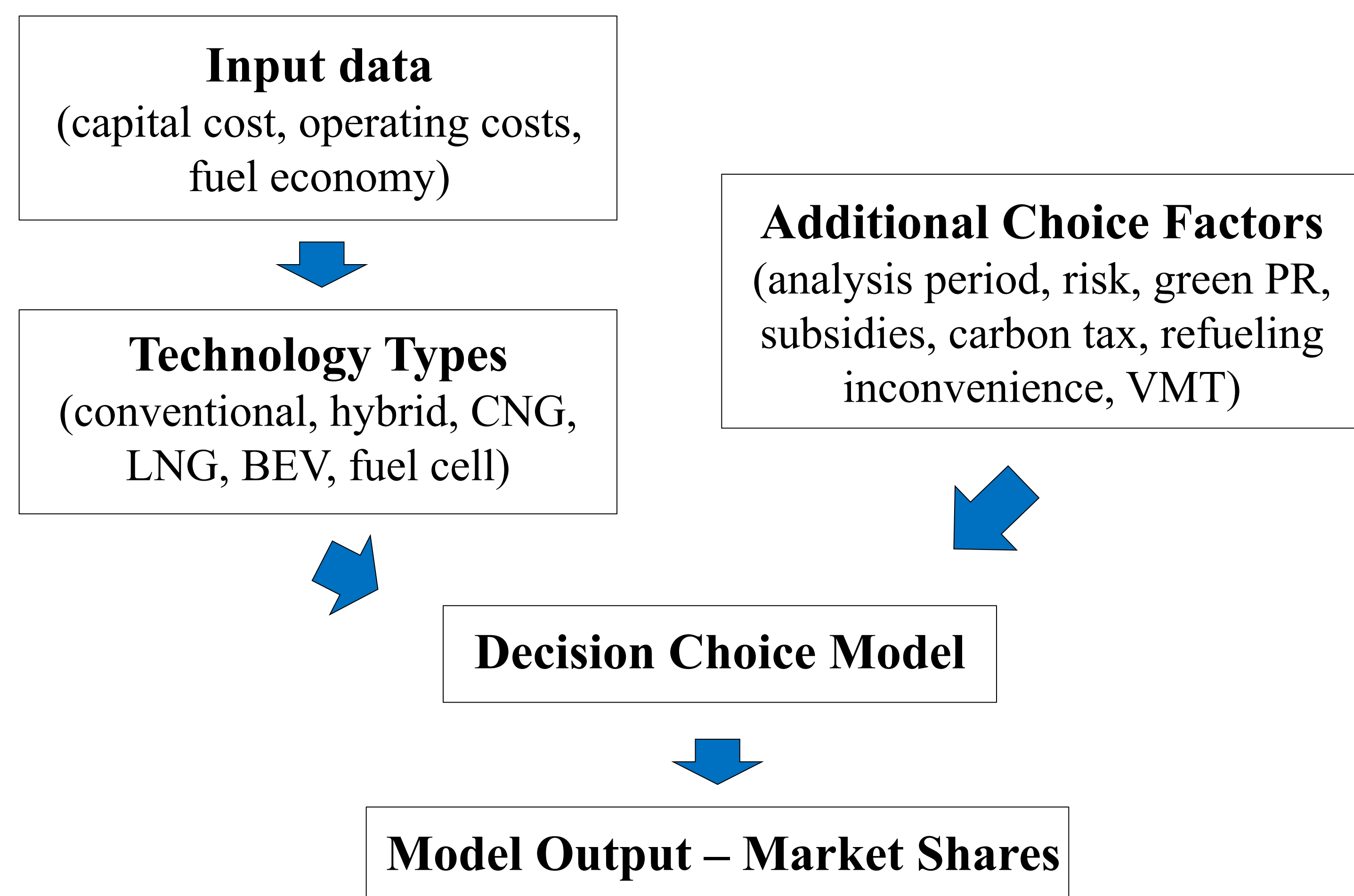


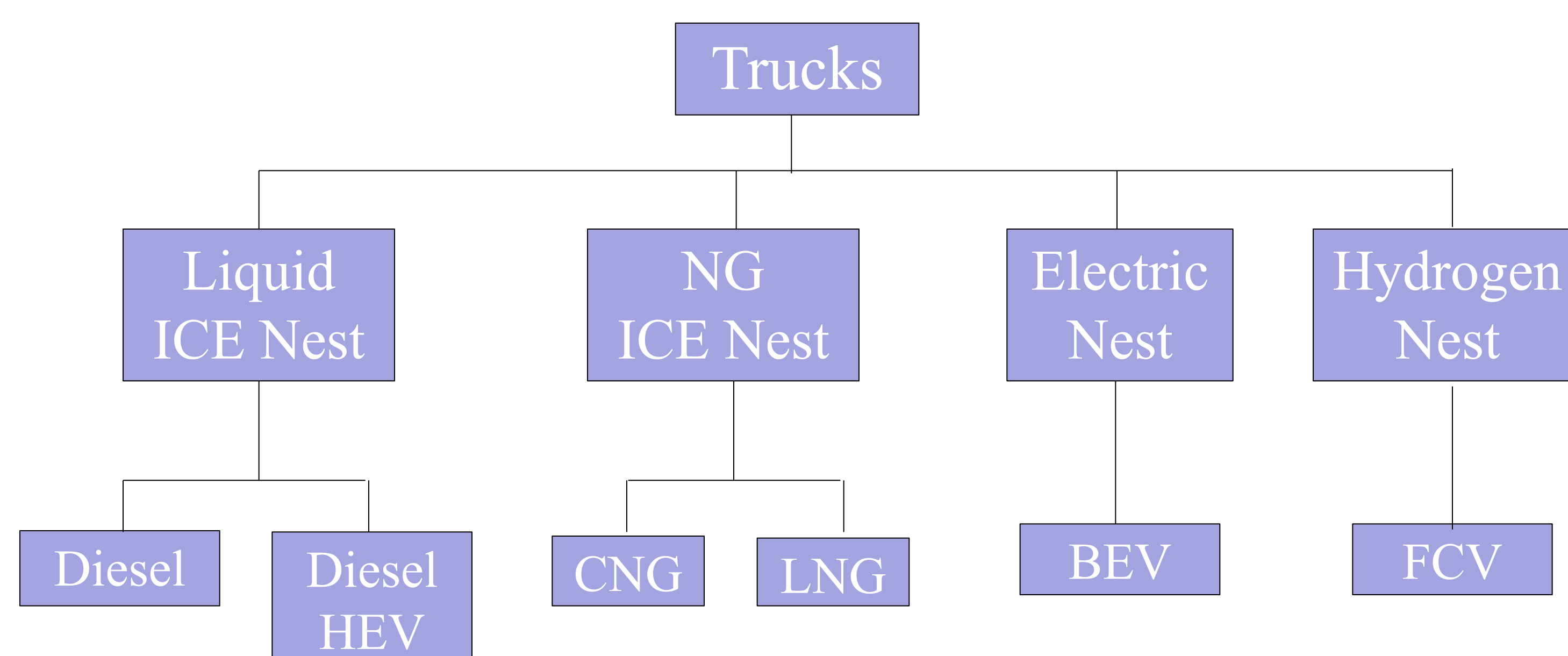
## Background

Despite the relatively small number of vehicles, the trucking sector accounts for a disproportionately large and fast increasing percentage of GHG emissions and local criteria pollutants. However, historically the trucking sector has been poorly represented in energy and emission modelling due to its complexity. The objective of this project is to understand the technical characteristics of alternative fuel truck technologies and the barriers of adoption. This work focuses on the development of a detailed choice model that incorporates economic and non-economic factors influencing truck purchases, which is used to analyze scenarios for the future deployment of trucks.

## Model Structure

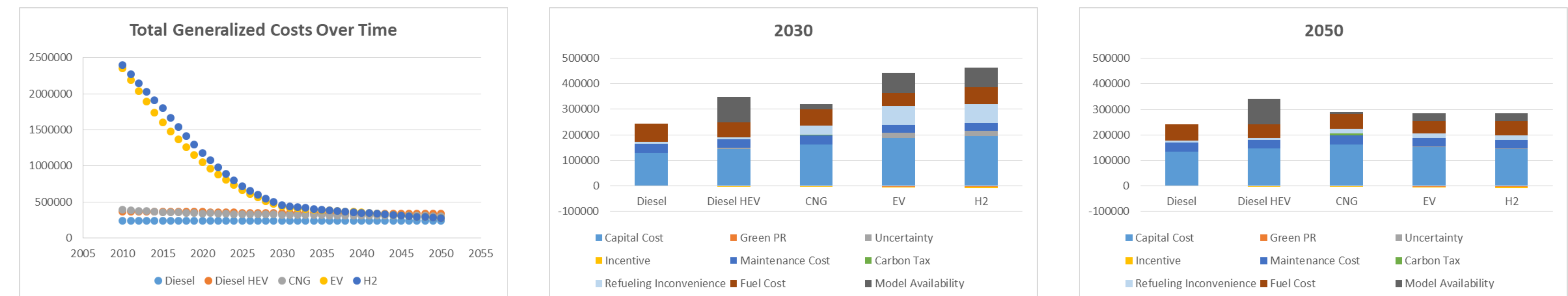


The nested multinomial logit framework of the truck choice model



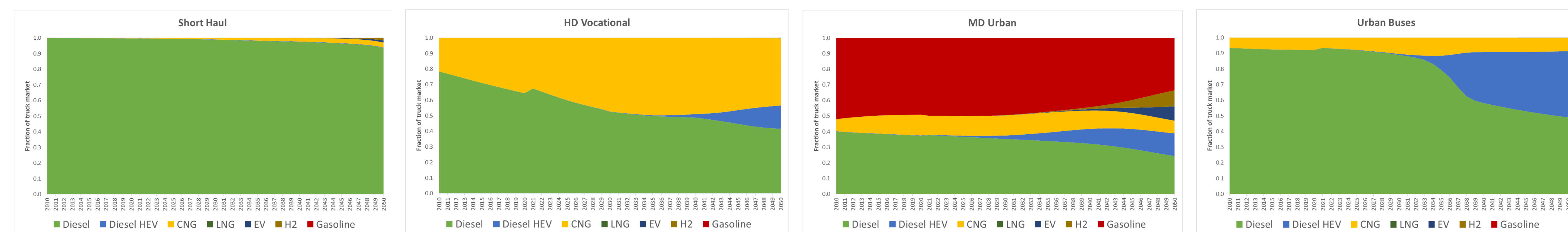
## Total Generalized Costs

The model calculates a total generalized cost which is the numerical summation of both monetary and non-monetary factors. Using these generalized costs, the model calculates the market shares. The following graphs show the changes of total generalized costs for short haul trucks and their constituents in 2030 and 2050.



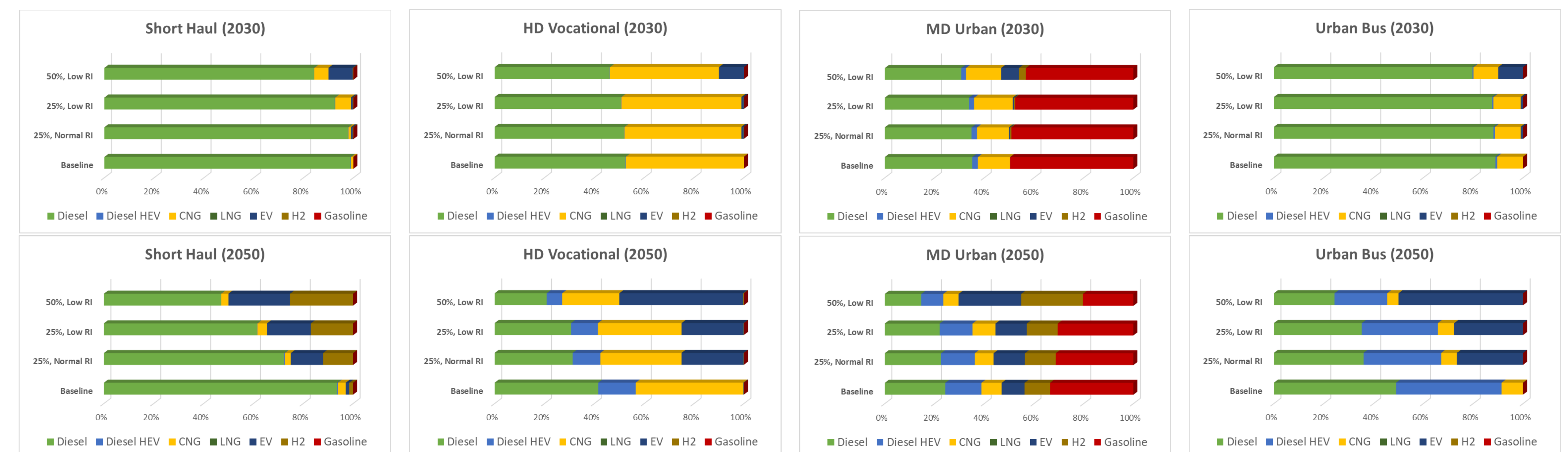
## Baseline Output

Market share by year for four different truck types. 4-year analysis, low oil price, high carbon intensity, expected carbon tax, expected green PR, low incentives.



## Scenarios

Two scenarios were generated to investigate the potential costs of ZEV mandates. In both scenarios, buyers of BEVs and fuel cell trucks receive the same amount of incentive per vehicle. The mandate requires a series of increasing market shares of ZEVs (BEVs and fuel cell trucks combined) throughout the period of 2025 to 2050. We also consider a variation of normal and low refueling inconvenience.



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