

# Spark Ignited Engine Trends: A Historical Analysis with Future Projections

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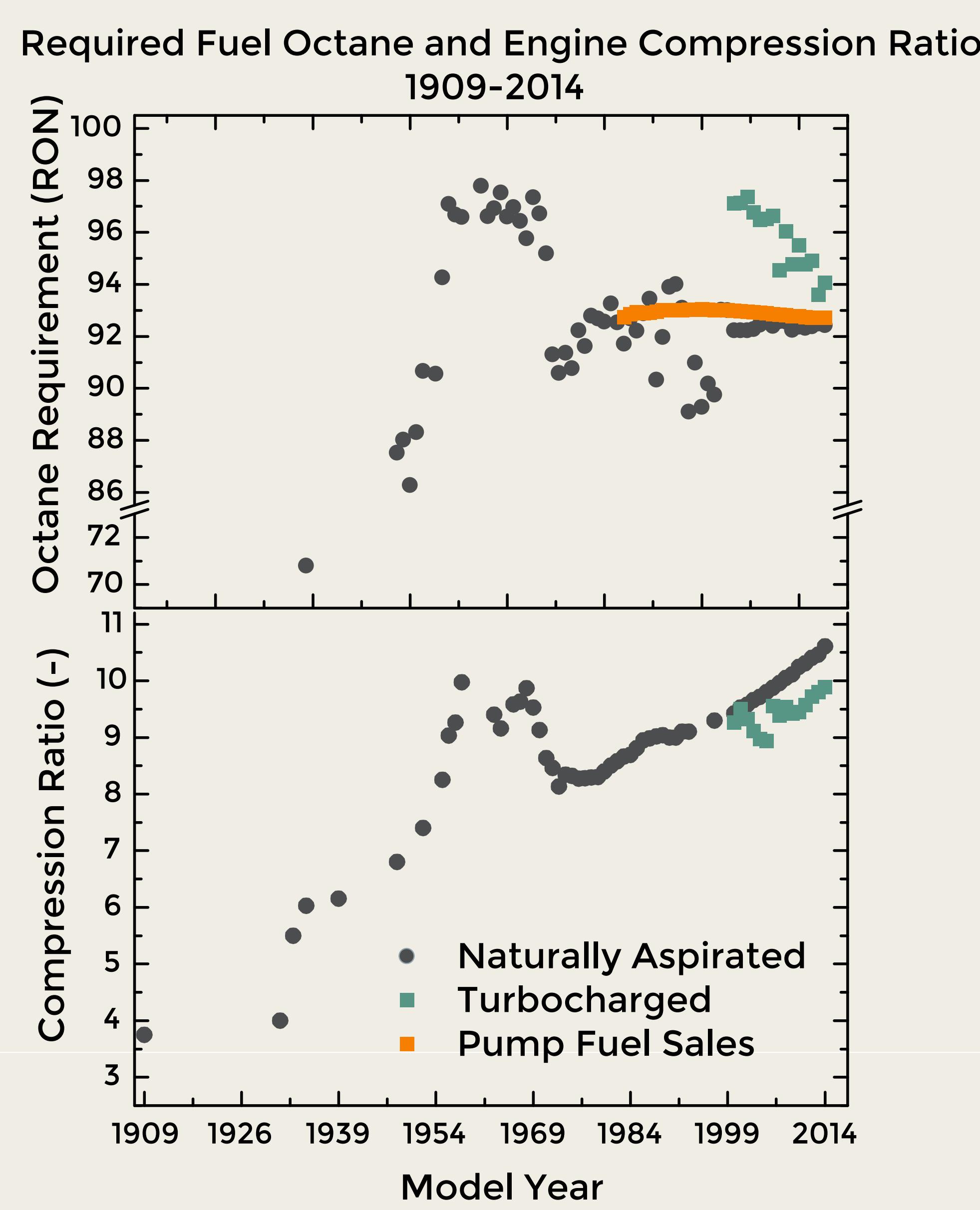
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## Introduction

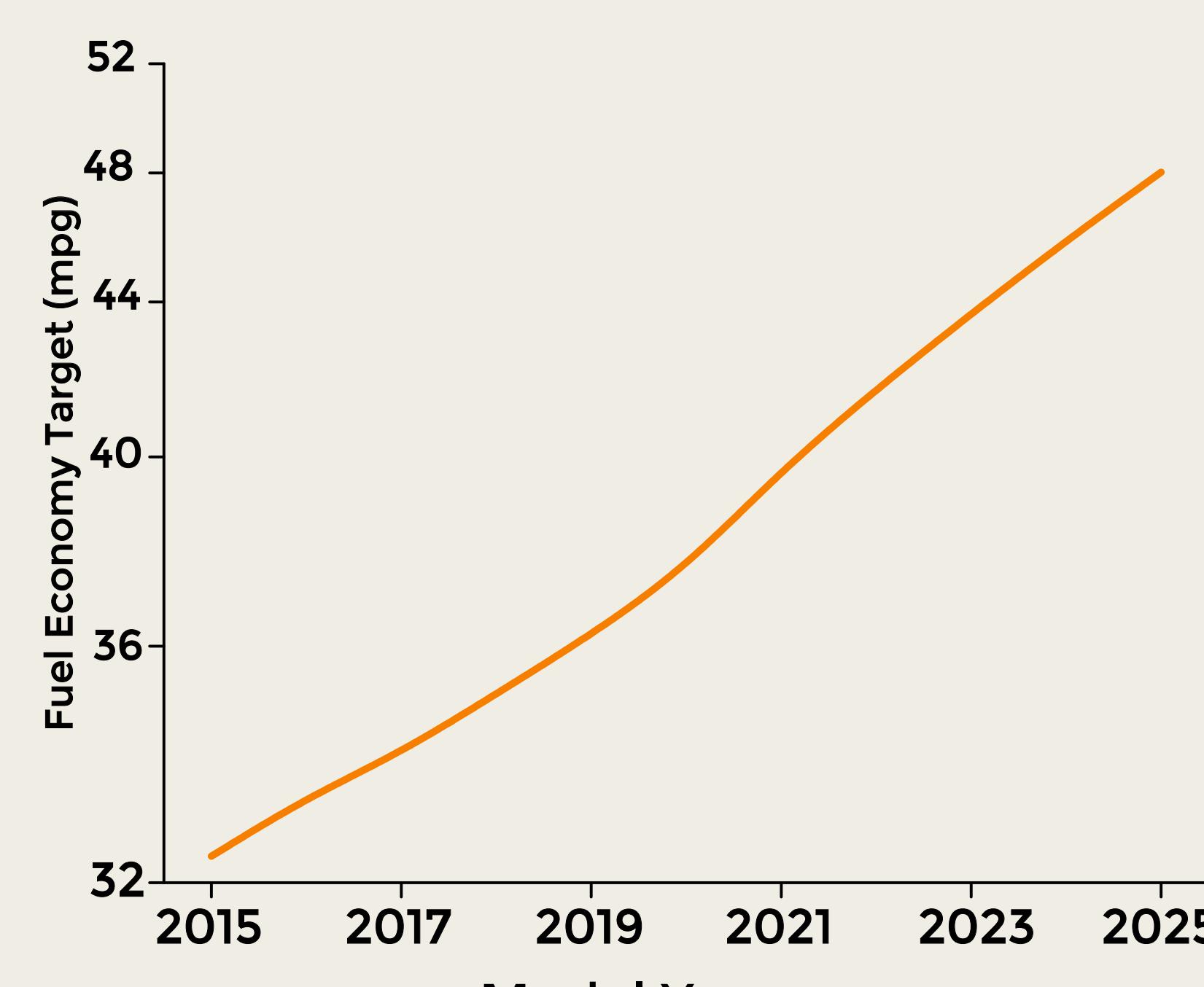
The performance and efficiency of spark ignited engines have been closely coupled to fuel octane number since the beginning

However, over the last 15 years the sales weighted averages of compression ratios, specific output, and fuel economy have increased, while the fuel octane number requirement has remained largely unchanged.

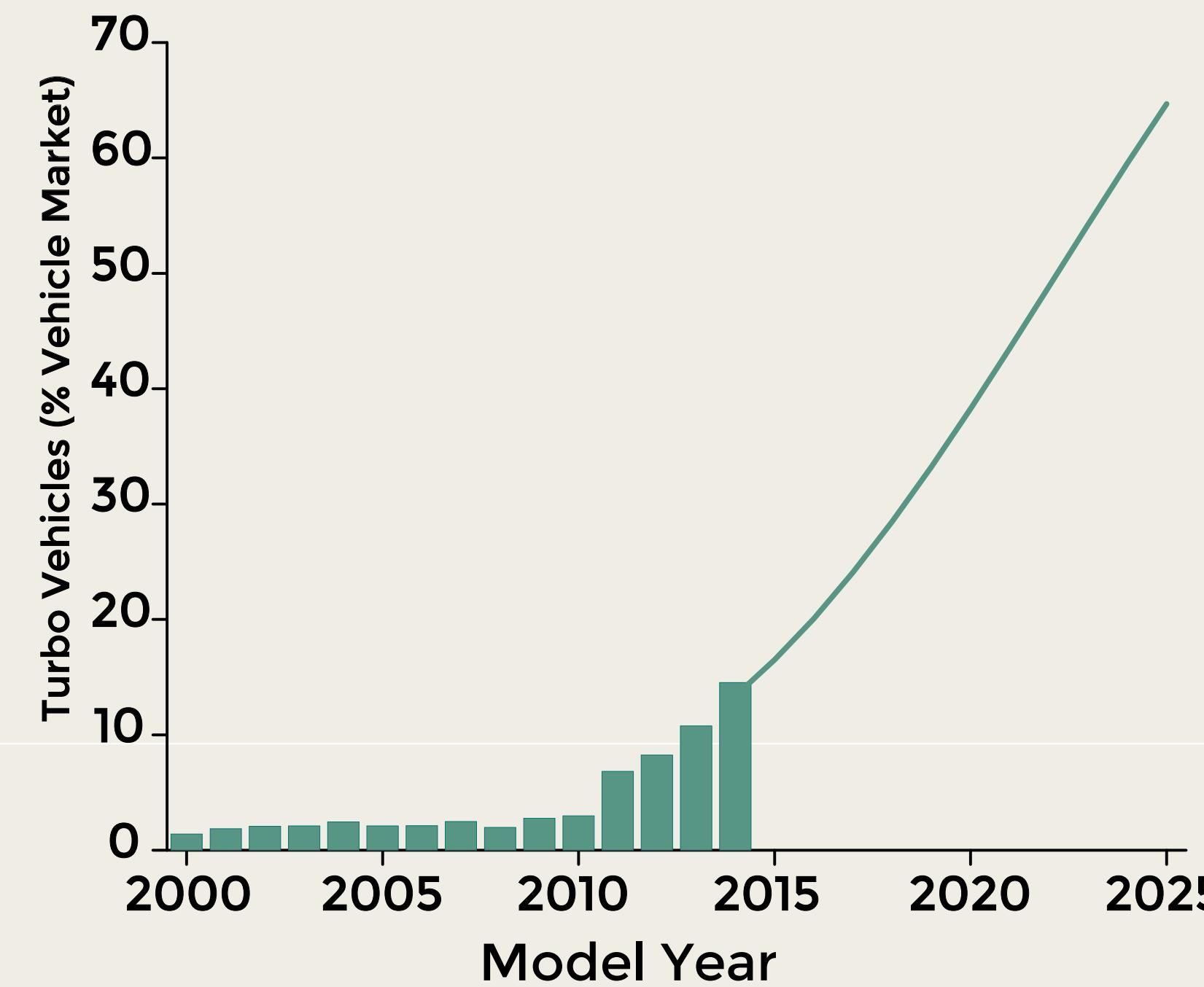


## Background

By 2025, the fleet average fuel economy will crest over 50 miles per gallon.



To reach the target, automakers are employing turbocharged gasoline direct injected engines to deliver similar power with small displacement engines, estimated in this study to crest 65% of the market by 2025



## Methods

## Results

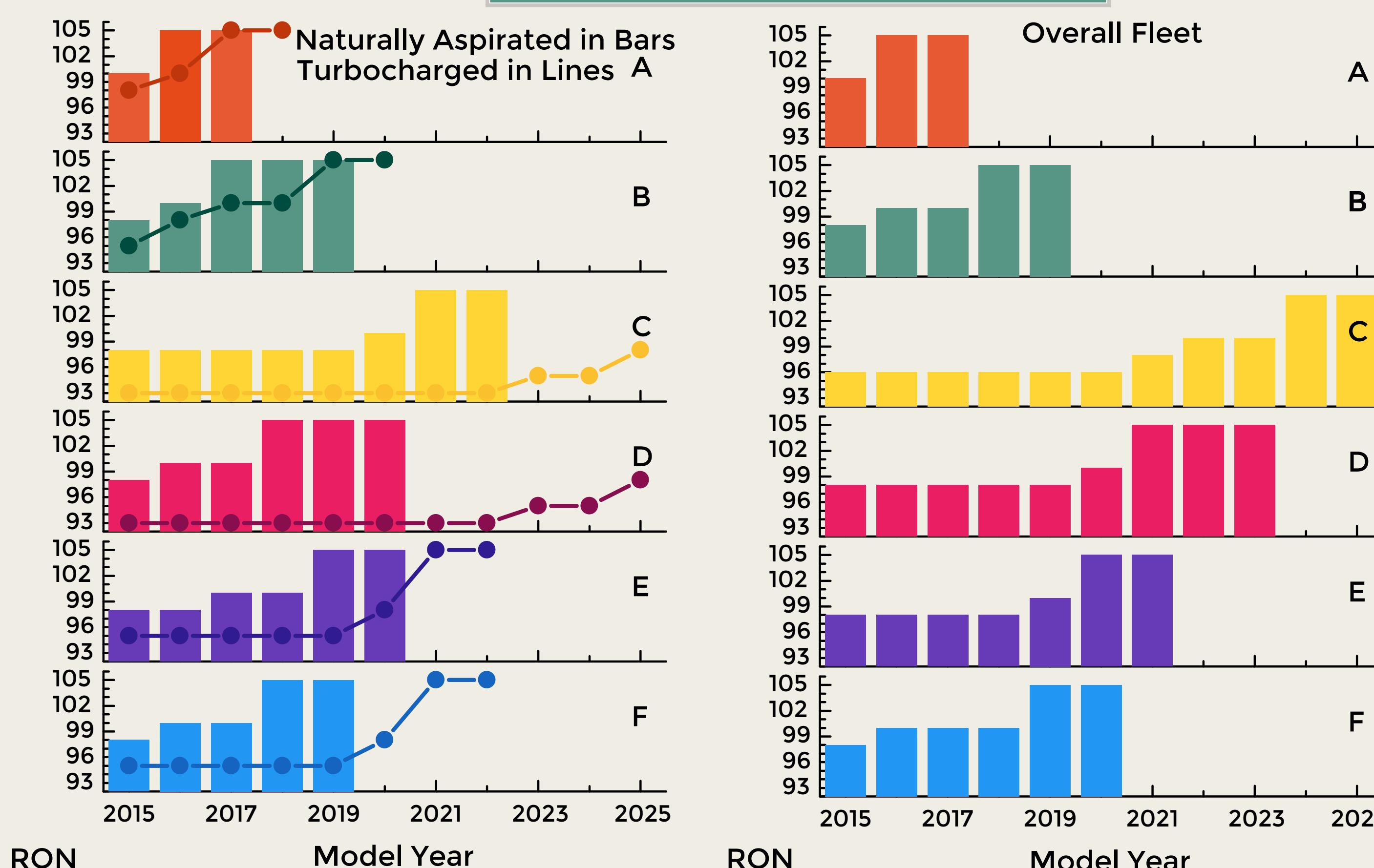
### Summary

By 2025, if the entire fleet remained naturally aspirated, no level of RON studied could help the fleet reach the target. An entirely turbocharged fleet, however, could reach the standard with Scenario C or D using 98 RON fuel.

For the overall mix, the only scenario to reach compliance is Scenario C, using 105 RON fuel.

If only 98 RON fuel can be used in the market, estimated weight savings per scenario is calculated assuming the overall mix. Both Scenario C and D can meet with only 10% reduction.

### Change in RON Only



### Weight Reduction

