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An Investigation into Designing a Derivative Vehicle Based on Liquid Natural Gas

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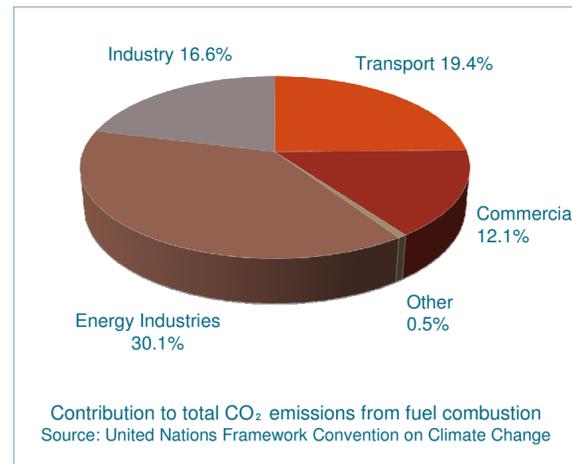
Supervisors: John Fieldhouse, Rakesh Mishra



Introduction

There are growing concerns about global warming and growing carbon dioxide levels in atmosphere. Transportation produces about 20% of the total CO₂ emission.

This study proposes to investigate is the fuelling system for a derivative car based on a natural gas fuelling system.



LNG vs. CNG

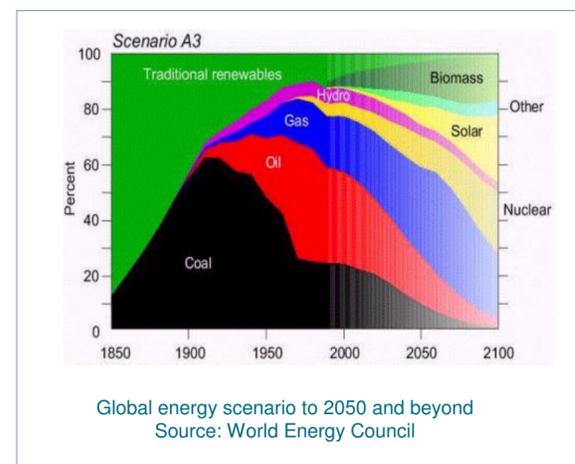
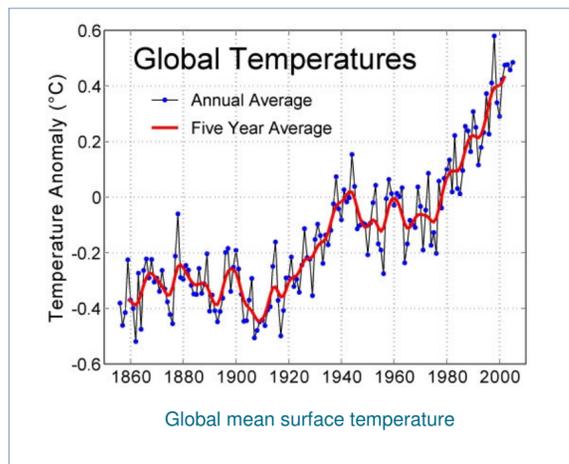
Liquid natural gas (LNG) has more than 2.4 times the energy density of compressed natural gas (CNG). This means that LNG vehicles can travel 2.4 times the distance of its CNG counterparts or that LNG powered vehicles need 2.4 times less fuel tank capacity than the CNG counterpart. LNG powered weigh less than CNG powered vehicles therefore can carry more payload.

Outcome

The study will combine the existent but mutually exclusive technologies of LNG and compressed natural gas CNG vehicles by designing a hybrid fuelling system to capitalise on the advantages of both types of fuel, namely the range for LNG vehicles and the easy availability of CNG conversion kits for petrol engines.

Why Natural Gas?

Natural gas is an indigenous fuel that could replace crude oil. Natural gas (methane) has the lowest carbon to hydrogen ratio, and the potential to produce less CO₂ per kilometre of travel than any other carbon-based fossil fuel.



Cryogenic LNG storage tank



LNG fuel station

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