INTRODUCTION

- Ammonia has attracted both the attention and imagination of researchers, technologist and industries currently developing energy systems across the globe. As a potential storage medium of renewable energy, ammonia can deliver enough energy to support the decarbonization of the global economy. From research programs looking at the replacement of fossil fuels in the event of a fuel crisis to the current progress achieved towards the recovery of stranded renewable energy, ammonia promises a suitable solution to many applications that need large power outputs, decentralized use of energy sources, or delivery of reactive blends to industrial locations, processes or transport activities off the grid. Therefore, ammonia has been catalogued as a fuel that will play a critical role in the coming years. This presentation approaches some of the current developments on the area, whilst raising the challenges that we still need to overcome for the onset of a "hydrogen through ammonia" economy.

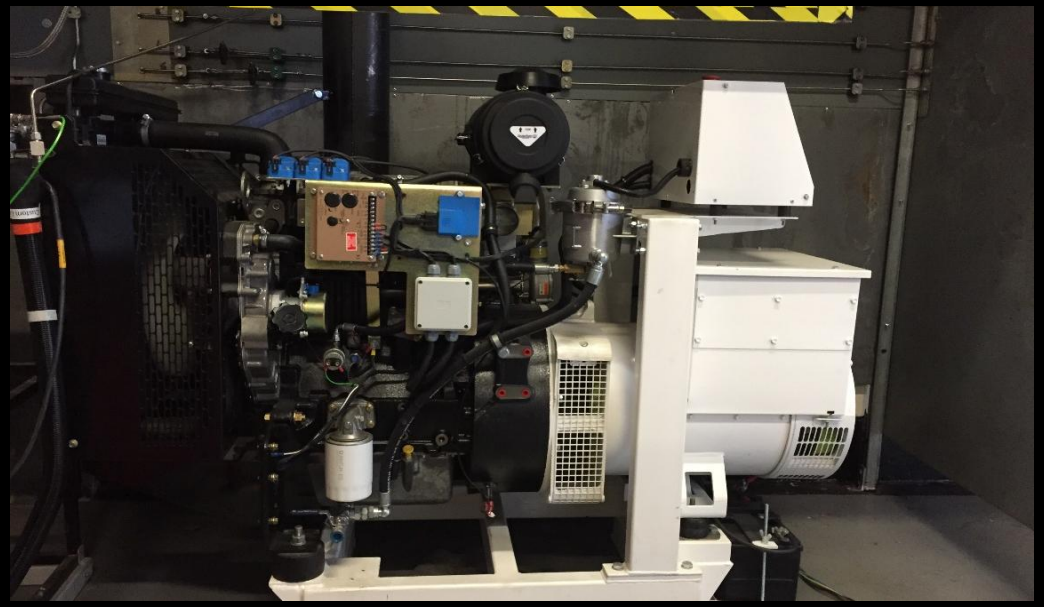
INTRODUCTION

- Renewables are one of the best technologies to provide the needed energy whilst reducing greenhouse gases.
- The problem is their intermittency (i.e. Australia - 2 weeks Blackout; UK – 1 Million People during ~48% Wind power).
- However, their intermittent nature requires the use of energy storage (batteries, chemicals, compressed gas, etc.)

DEVELOPMENTS - AMMONIA ICE - CARDIFF

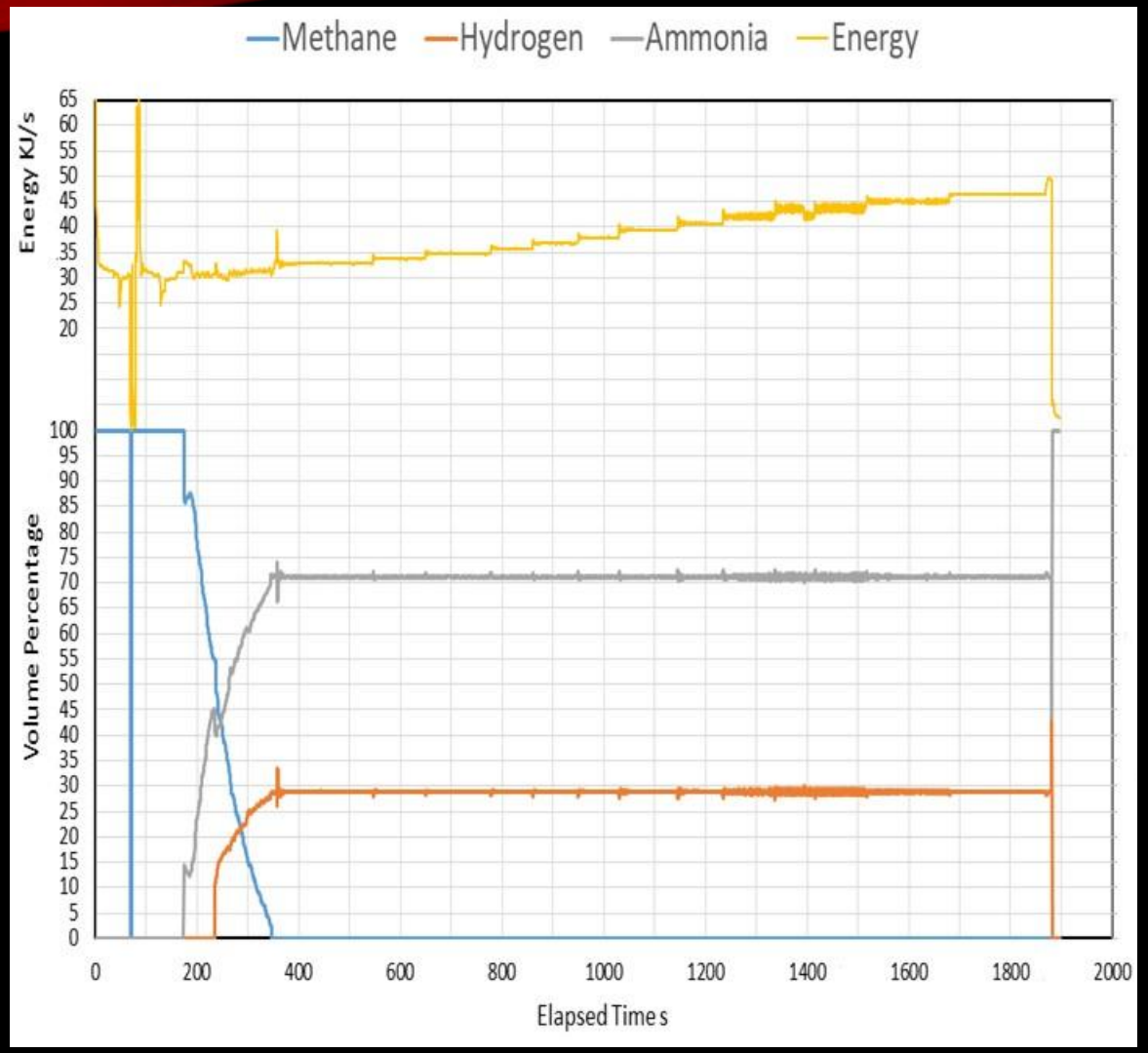
- Ammonia Demonstrator at RAL, Oxford. Cardiff developed the ammonia engine and container for the production of power and its transmission back to the grid.

Internal combustion engine running on H2/NH3

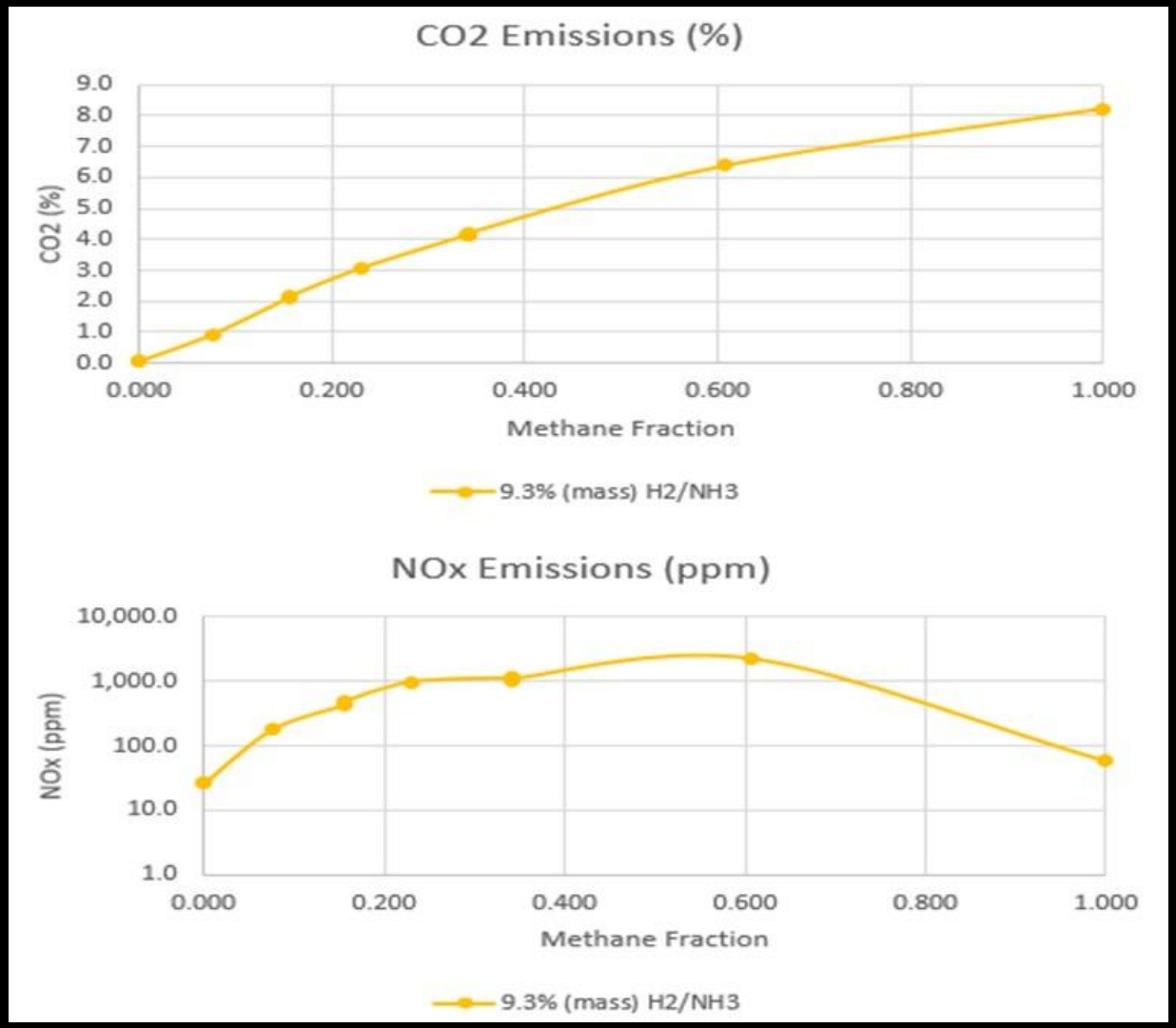


Emissions (CO2 and NOx) using ICE-H2/NH3

DEVELOPMENTS - AMMONIA ICE - CARDIFF



Injection strategy to power using NH3/H2



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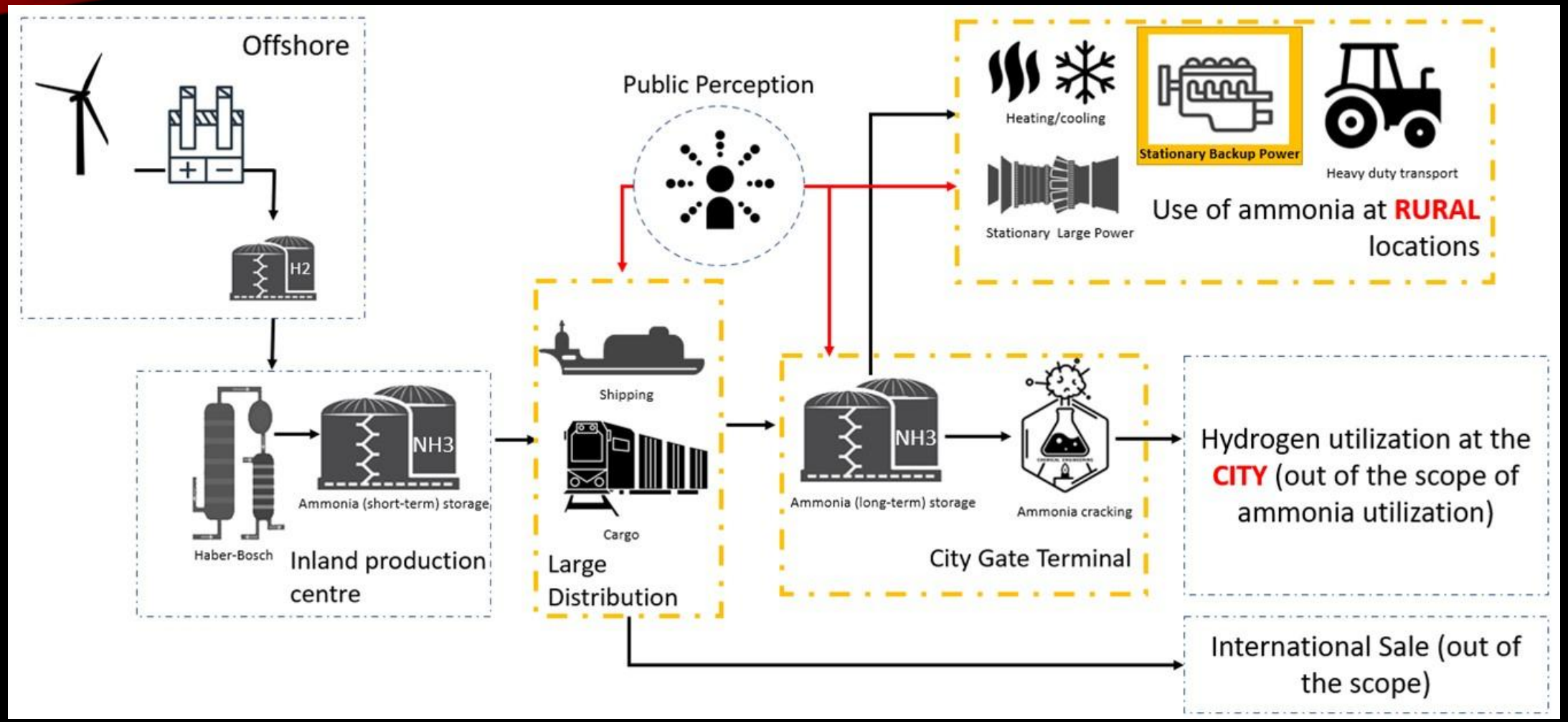

OceanREFuel Program to develop ammonia-based capabilities in the UK.