

# Energy, Environment and the Hydrogen Economy: Electricity Generation and Transportation

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**Abstract.** In the Paris Agreement, many nations set ambitious global goals to stabilize and reduce carbon emissions to mitigate climate change. A large share of these emissions is caused by electricity generation. According to the International Energy Agency (IEA), in 2019 fossil fuels represented over 80% of the total energy supply globally, with oil comprising 31%, followed by natural gas (27%), and coal 23%. In 2019, the burning of coal accounts for 42 % of the world's GHG (greenhouse gases) emissions from fuel combustion, ahead of oil (34 %) and natural gas (22 %). Hydrogen will play a major role in the energy transition and meeting net zero carbon. This paper will explore the potential of hydrogen in particular blue and green hydrogen. The paper will focus on hydrogen production and uses, as well as hydrogen associate fuels (i.e. Ammonia, Methanol and DME).

## Introduction

### The World Energy Mix

### The World CO<sub>2</sub> emission

### The Hydrogen Economy

### Hydrogen Production

- Steam Methane Reforming
- Electrolysis
- Photocatalysis
- Biomass Gasification

### Hydrogen Uses

- Power Generation
- Fuel Cells

### Hydrogen Associate Fuels

- Ammonia
- Methanol
- DME