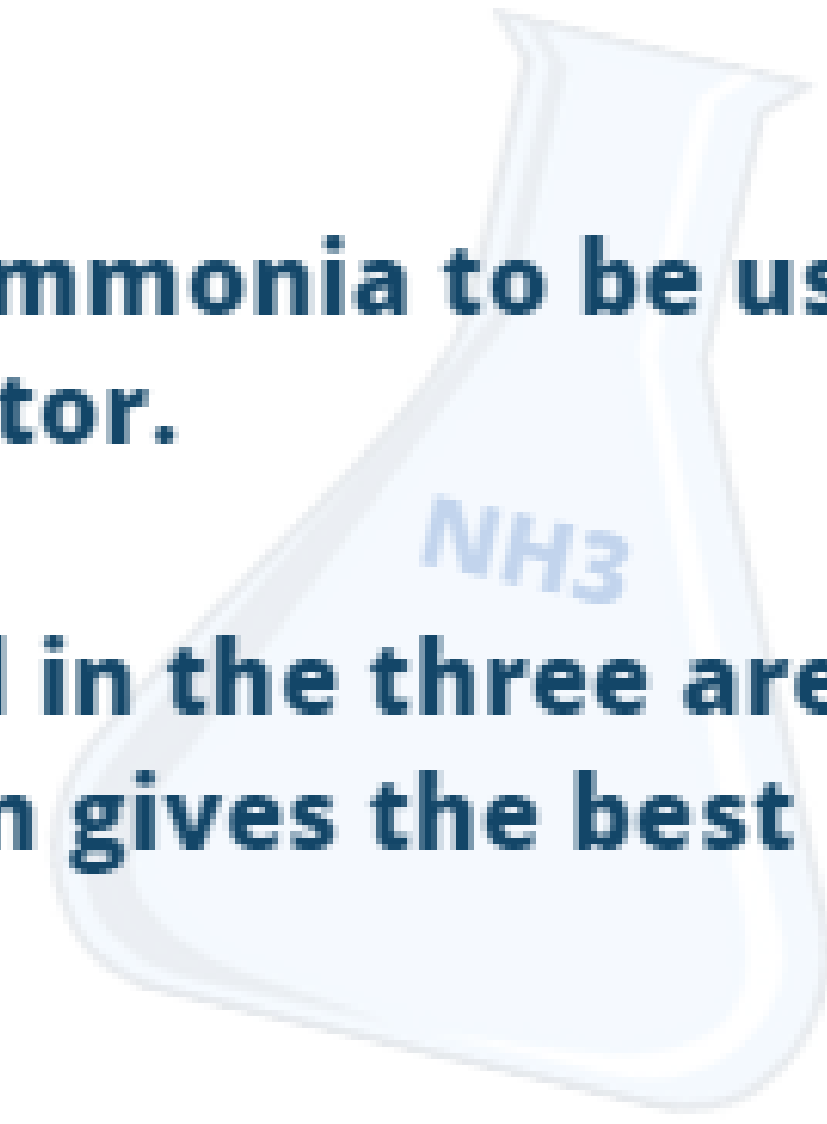


Project description

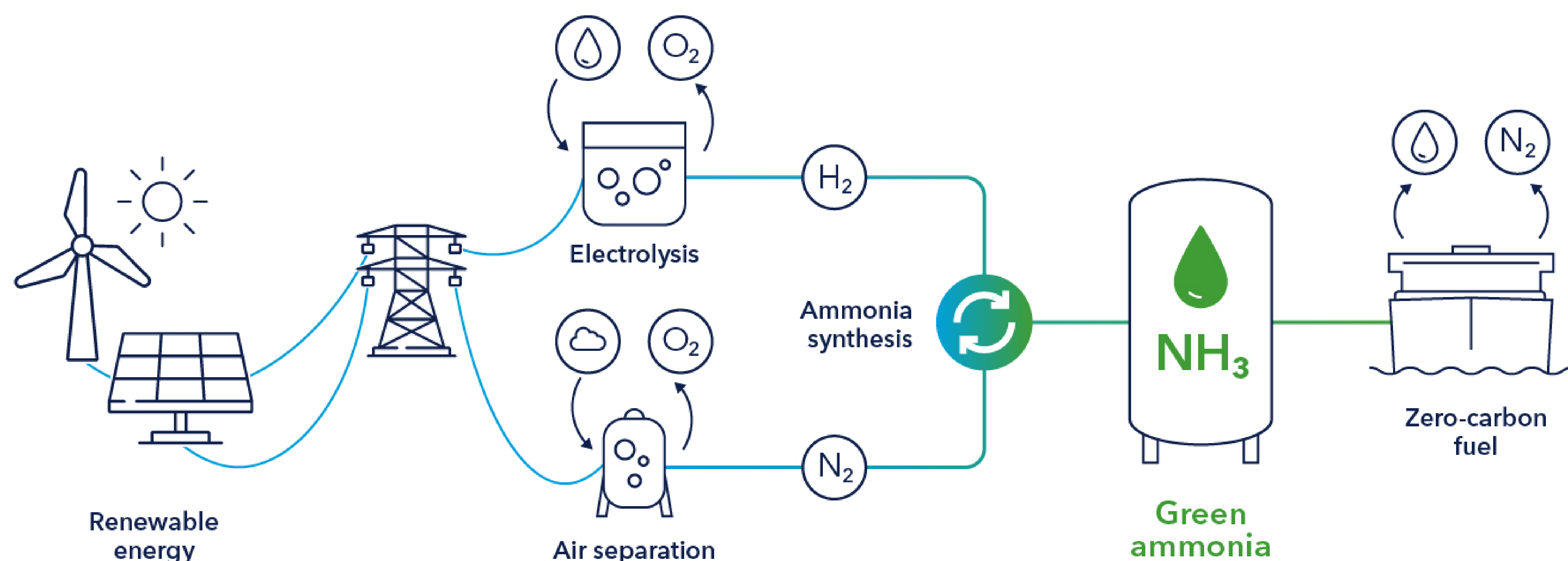
This thesis will investigate the best alternative for production of green ammonia to be used in the maritime sector, and will be compared with the current fuel distributor.

The goal will be to figure out if it is more efficient to use ammonia as fuel in the three areas cost, efficiency and emissions. It is important to figure out which solution gives the best results, looking into a 10 year time frame.



Production and utilization

Green ammonia - production and use



Source: DNV

Figure 1. Green ammonia production and use [1]

Goals



- Gain an overall understanding of how and why ammonia is used as fuel within maritime transport
- Find the best alternative for production of ammonia to be used in maritime transport
- Figure out if it is more efficient to use ammonia as fuel in the three areas cost, efficiency and emissions
- Look into safety concerns regarding usage of ammonia as fuel

R&D project

- Ammonia (NH₃) is one of the world's most produced chemical compound [3].
- Liquid ammonia is increasingly used as energy carrier. In recent years it has gotten more attention as a carbon-free fuel for maritime transport.
- It can efficiently be liquefied because of a higher energy density than for example liquid hydrogen[2].
- Limited access to carbon-free fuel in the shipping industry, where supply ships travel over longer distances- thereby looking more actively into ammonia



Green ammonia
CO₂ emission-free
Renewable electricity



Blue ammonia
Carbon capture and
storage (CCS)
Fossil sources



Grey ammonia
Natural gas or
other Fossil sources

References

- [1] Harnessing ammonia as ship fuel - DNV. en. URL: <https://www.dnv.com/expert-story/DigitalMagazineDefault> (visited on 03/01/2023).
- [2] Knut Hoftad. ammoniakk - energibærer. no. URL: https://snl.no/ammoniakk_-_energib%C3%A6rer (visited on 01/18/2023).
- [3] Bjørn Pedersen. ammoniakk. no. Jan. 2023. URL: <http://snl.no/ammoniakk> (visited on 01/18/2023).