



Knowledge grows

Clean Ammonia

Blue hydrogen as first step to green

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Facts and figures

- **Hydrogen** is made from natural gas (CH_4) and water (H_2O) by SMR technology
- **Annual gas consumption: 2 BCM:** 80% feedstock; 20% energy
- **3.3Mta GHG emission (NeA):** 1.1Mta CO_2 , N_2O and CH_4 + **2.2Mta pure CO_2** from ammonia production
- **Climate Roadmap 2030:** 3 tracks to **reduce 85-90% emissions** in Sluiskil by 2030 compared to 1990
 1. New installations and modification of existing plants (0.4-0.6Mta)
 2. **Carbon Capture & Storage (0.8Mta)**
 3. Green Hydrogen (0.1Mta: Haddock + X Mta: connection to green hydrogen backbone/import)



0.8Mta CC(U)S = 2.2Mta pure CO_2 emissions - 1.4Mt CO_2 already used as feedstock

Added value of clean ammonia

- **Market perspective:** Opportunities for clean ammonia as green fertilizer, shipping fuel and energy carrier
- **Ammonia market perspective:** **180Mta** ammonia production worldwide (>75% locally used for fertilizer production); **16-17Mta** for international trading and shipping



Yara Sluiskil:

About **700kta blue ammonia** from 2025

About **70kta green ammonia** from 2025

Blue ammonia is phased out when **large scale green ammonia** comes in from 2030-2035 onwards

What do we need to realize this plans

- CCS as **system concept** on European level
- **Free trade and transport of CO₂ for CCS in Europe** – agreements between EU-members
- **Im-/export of ammonia** as energy carrier and shipping fuel

- **Infrastructure** for CO₂ transport (by ship)
- **Level playing field** for clean ammonia on international level



Thank you

