Decarbonizing ammonia production for a climate-neutral food future

Reducing CO_2 emissions from ammonia production

YARA CCS

Blueprint for European hard-to-abate Industry

Carbon Capture and Storage (CCS) is a scalable, cost-efficient solution to decarbonize existing infrastructure. Yara's project kickstarts the commercial CCS market in Europe.

HOW CCS WORKS

CO_2 as byproduct of ammonia production

Yara's ammonia production relies on hydrogen generated via steam methane reforming (SMR), a process that emits high-purity CO_2.

CO_2 capture

CO_2 is captured at the ammonia plants using MDEA absorption technology.

Liquefaction

Captured CO_2 is compressed and liquefied for safe transport. Yara expanded its liquefaction capacity to handle 800kt/yr.

Temporary storage at the plant

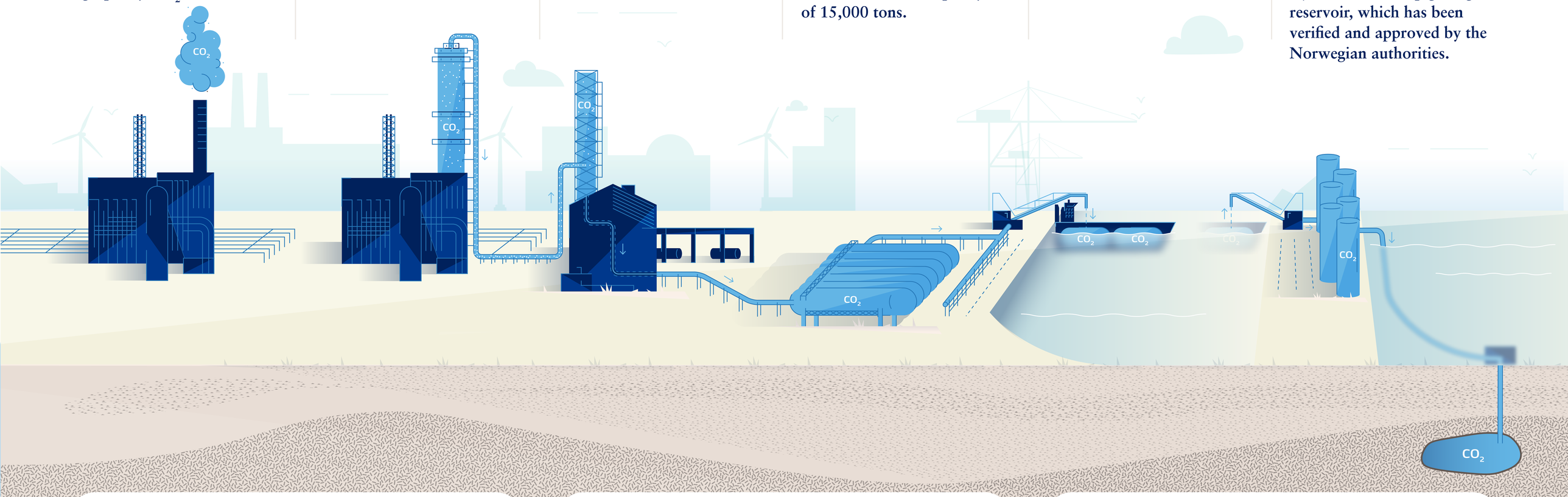
The liquid CO_2 will be temporary stored in the storage tanks on site in Sluiskil. There are 7 storage tanks with a total capacity of 15,000 tons.

Loading into ships

Twice per week, a ship of Northern Lights arrives in Sluiskil and liquid CO_2 is loaded from the storage tanks into the ship.

Transport & permanent storage

The ship delivers CO_2 to Øygarden, Norway, for intermediate storage. Subsequently the CO_2 is injected into a deep geological reservoir, which has been verified and approved by the Norwegian authorities.



HOW CCS WORKS 1

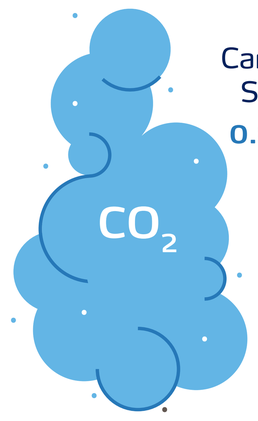
CO_2 as byproduct of ammonia production

Ammonia producing plant
Sluiskil is Europe's largest fertilizer plant, making it a strategic site for large-scale CO_2 capture and as future CCS hub for nearby factories.

Ammonia production
1.9 M ton/year

Used in different industries

- **Greenhouses**
- **Food**
- **Urea fertilizer**
- **AdBlue**

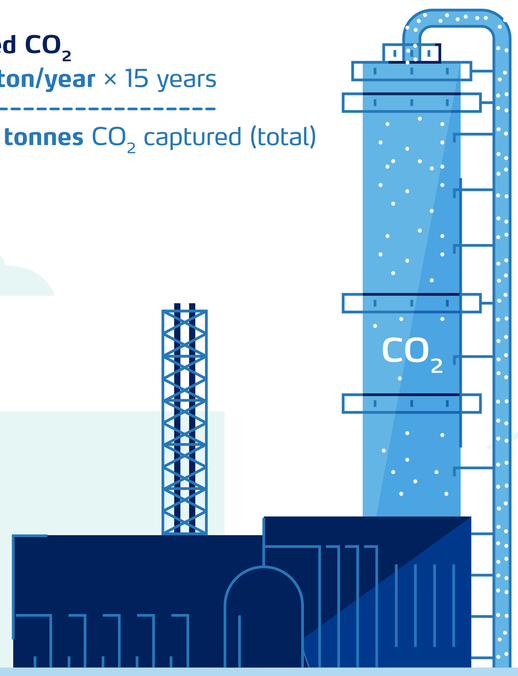


Carbon Capture Storage (CCS)
0.8 M ton /year

HOW CCS WORKS 2

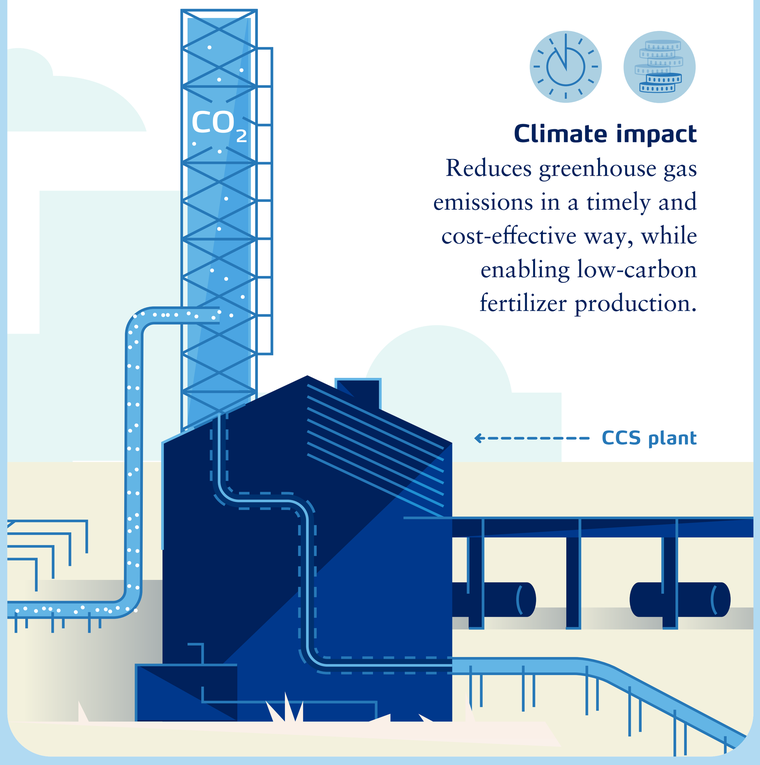
CO_2 Capture

Captured CO_2
0.8 M ton/year × 15 years
= **12 M tonnes** CO_2 captured (total)



HOW CCS WORKS 3

Liquefaction

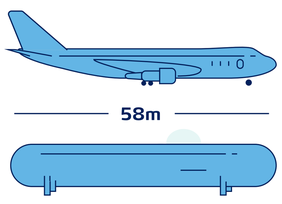


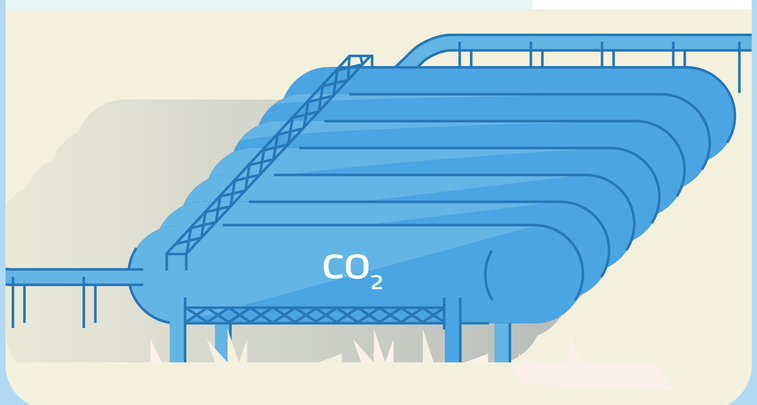
Climate impact
Reduces greenhouse gas emissions in a timely and cost-effective way, while enabling low-carbon fertilizer production.

HOW CCS WORKS 4

Temporary storage at the plant

Storage tanks
Each tank is 58 meters long with a diameter of 8 meters and weighs (empty) 400 tons. This is the same length as a Boeing 747 (without wings) and twice the weight.



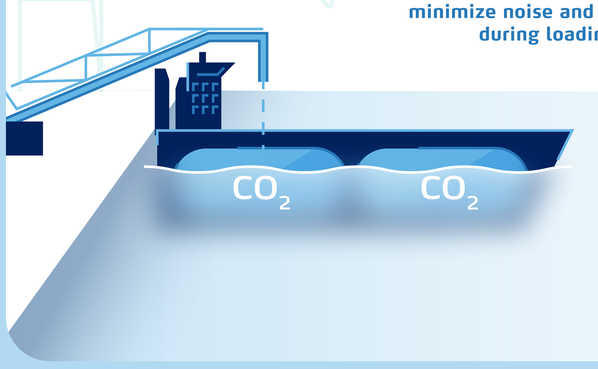


HOW CCS WORKS 5

Loading into ships

Transport vessel
This is the world's first cross-border CCS into operation, enabled by the Northern Lights JV (Equinor, Shell, Total Energies).

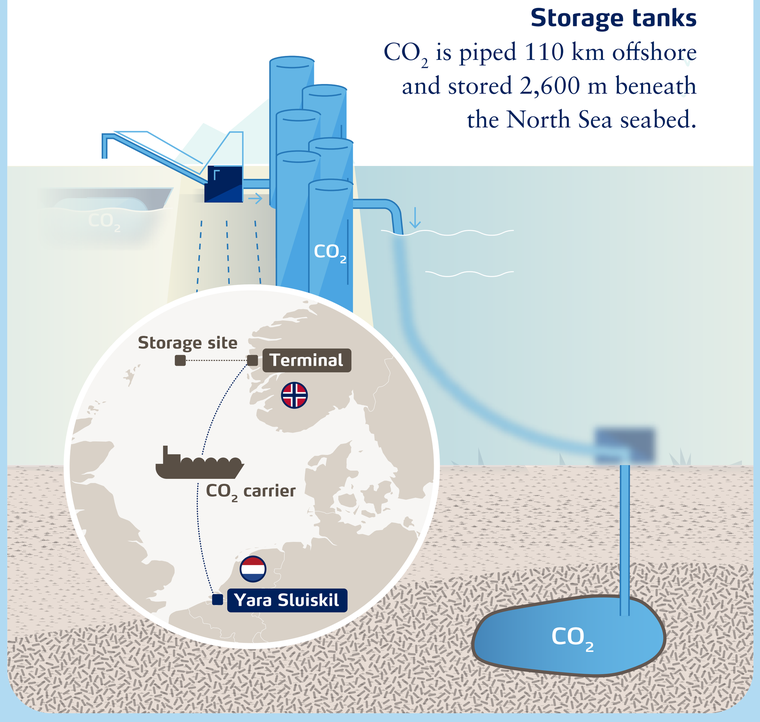
The ship uses shore power provided from site to minimize noise and emissions during loading.



HOW CCS WORKS 6

Transport & permanent storage

Storage tanks
CO_2 is piped 110 km offshore and stored 2,600 m beneath the North Sea seabed.



CCS is a **key technology** for sustainable agriculture and climate neutrality

Scan this QR code for more information about our CCS process.