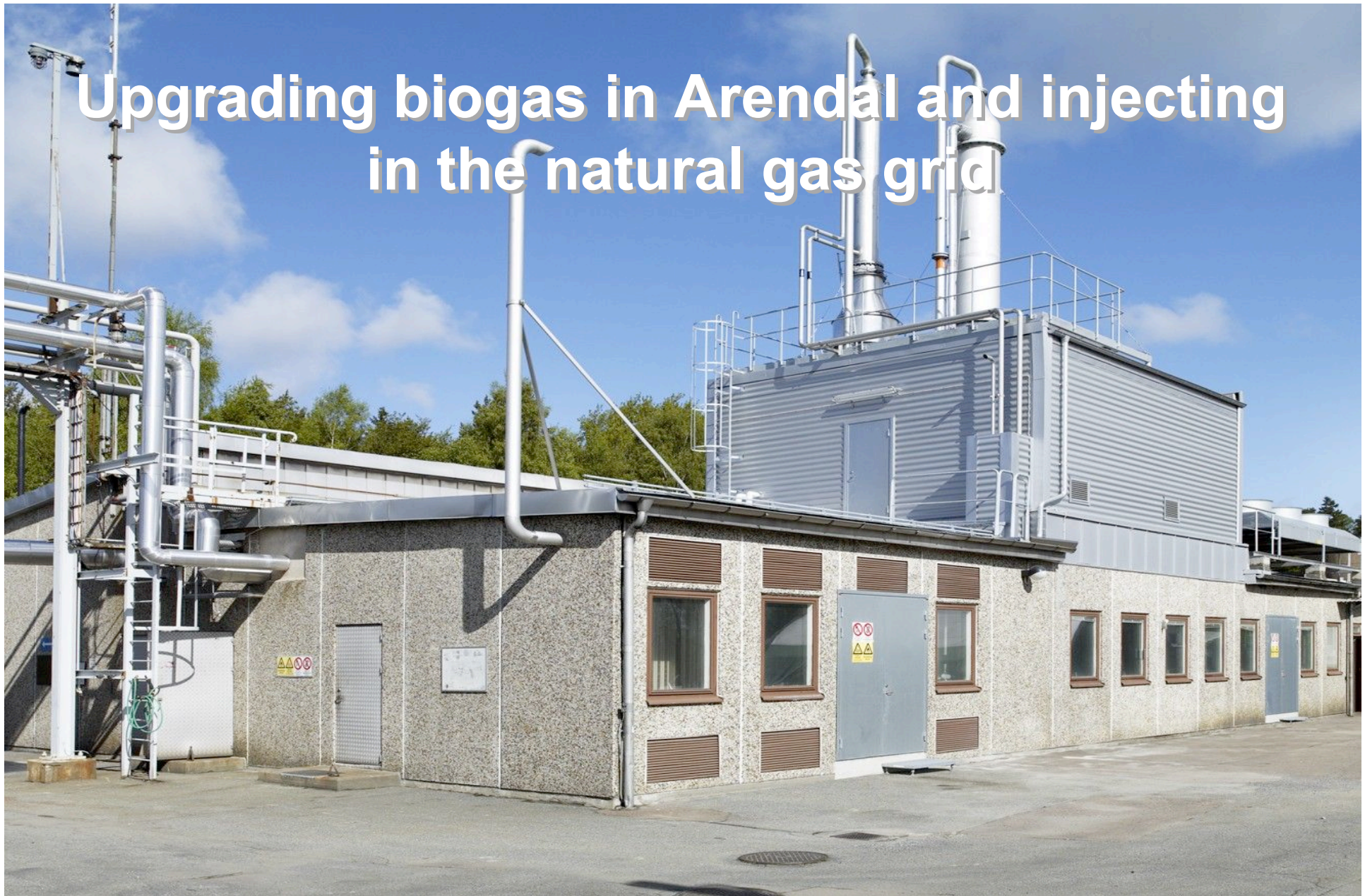


Upgrading biogas in Arendal and injecting in the natural gas grid



We've been “thinking big” from the start

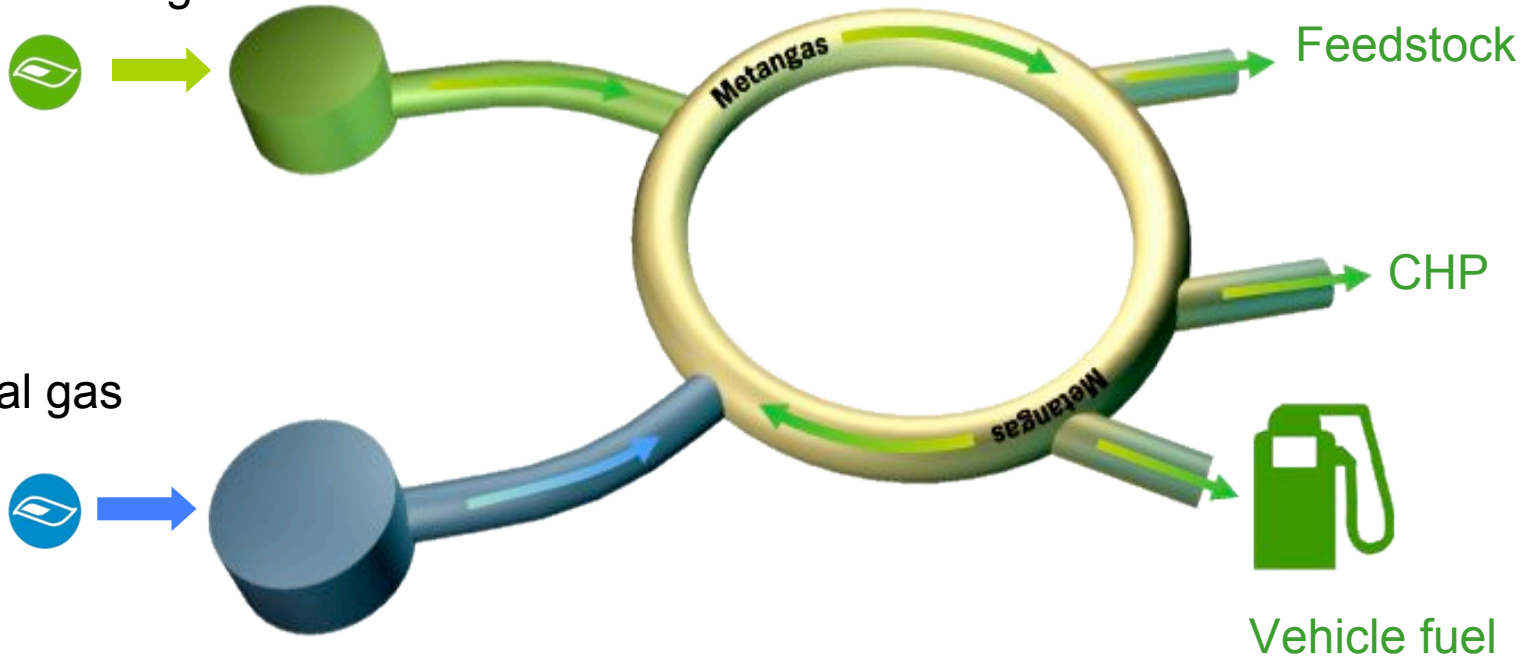


 **Göteborg Energi**

- Production of 60 GWh/a upgraded Biogas injected into the Natural Gas Grid
- Chemical adsorption technology with very low methane slip
- Investment: € 4 million
- Supported by Swedish KLIMP-programme and BiogasMax
- In cooperation with City of Göteborg and the WWTP
- In operation since April 2007

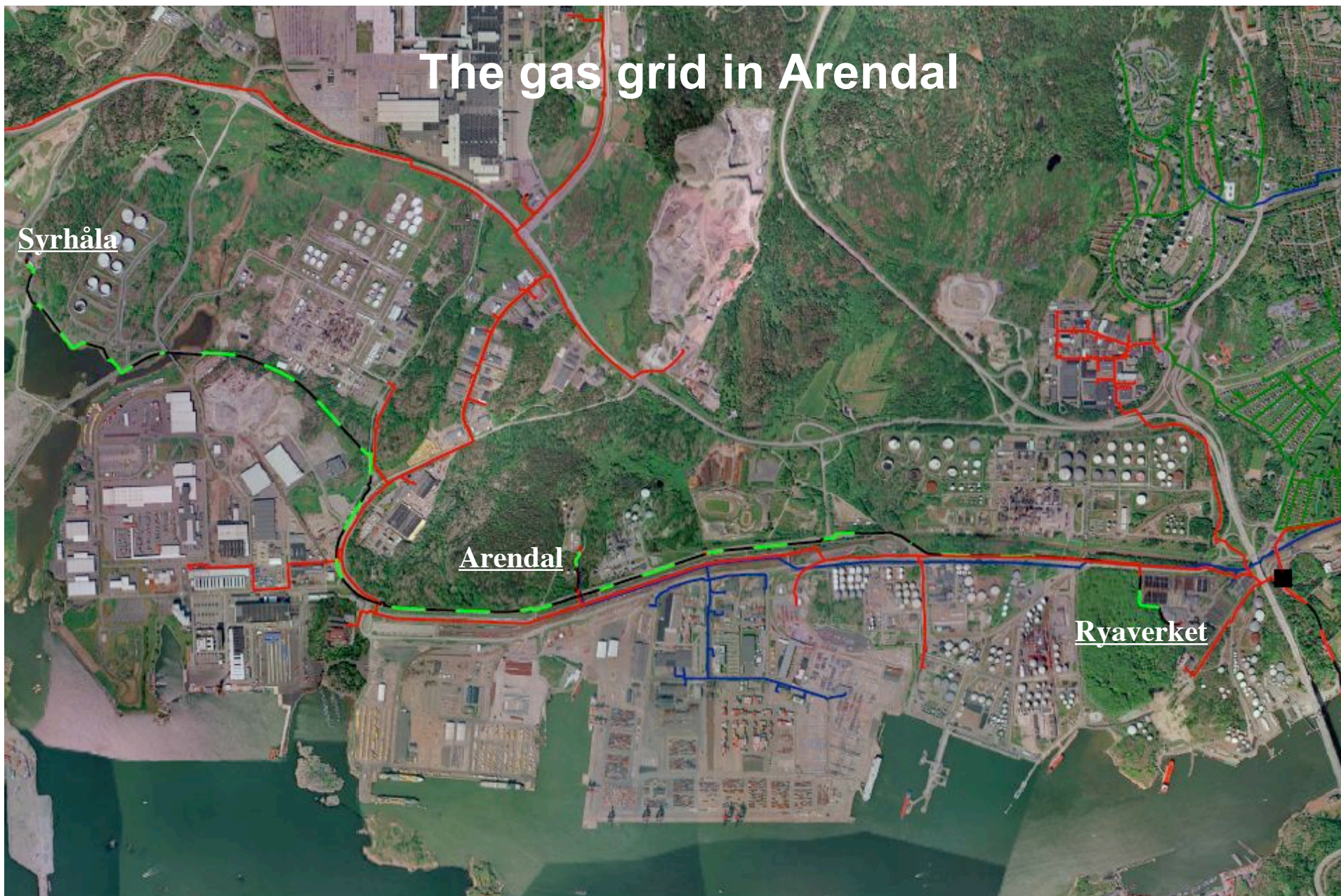
“Green gas concept”

Upgraded biogas



The green gas concept enables biogas to be offered at all connected filling stations for vehicles

The gas grid in Arendal

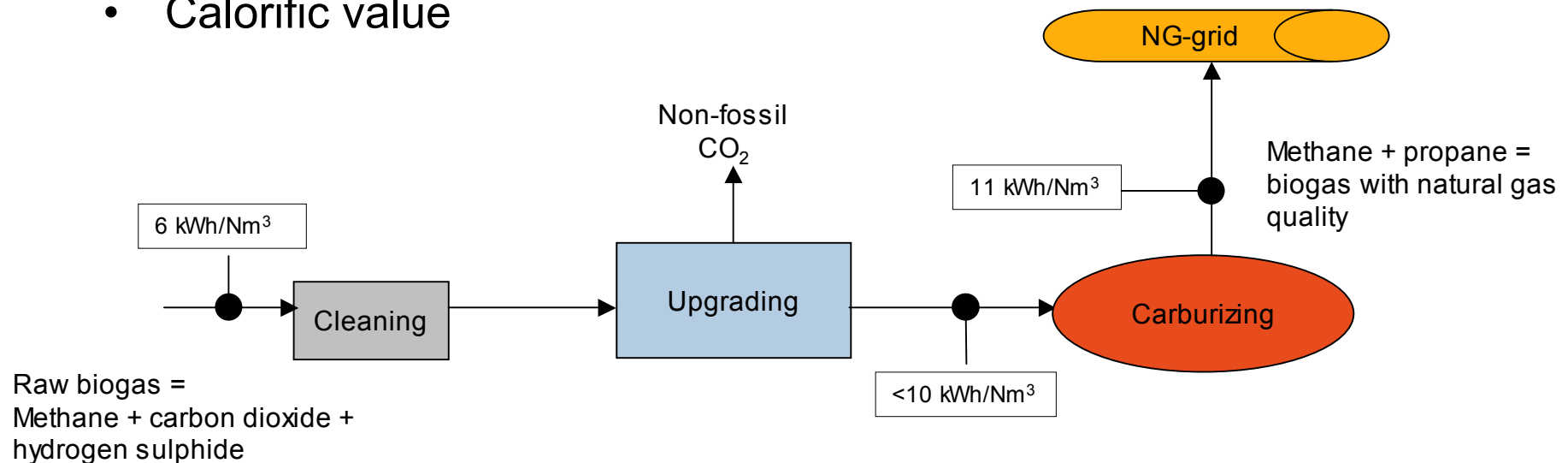


Continuous measuring

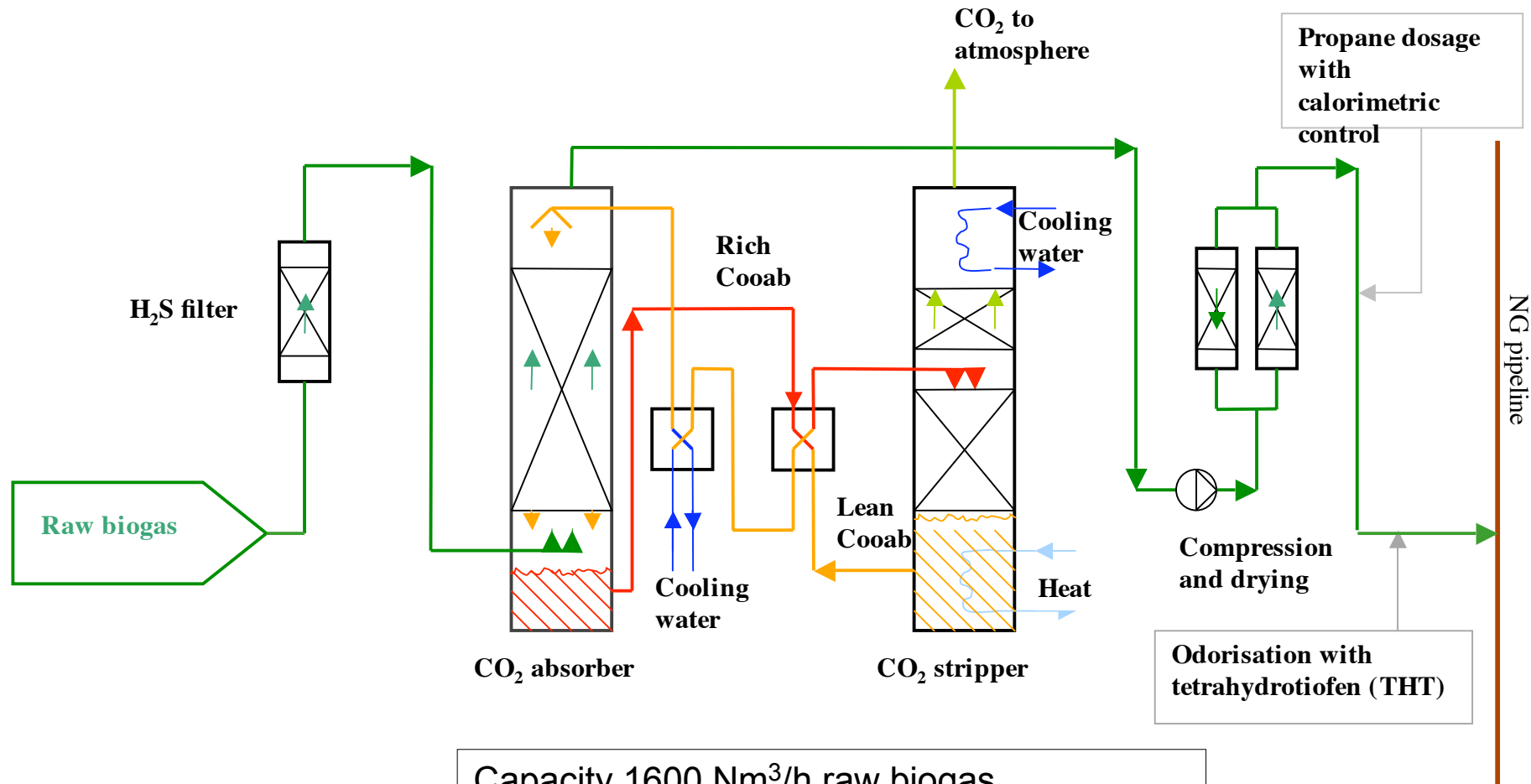
Continuous measuring of:

- Methane content
- H₂S-content
- Dew point
- Wobbe index
- Calorific value

No biogas is delivered out on the natural gas grid if the gas doesn't fulfill the quality demands, the biogas is then recirculated in the plant.



Low pressure CO₂ absorption (LP Cooab)



Capacity 1600 Nm³/h raw biogas
 → 1100 Nm³/h upgraded biogas
 Approximately 1100 ton/year propane
 Methane slip <0,1 %

Quality for upgraded gas

Before addition of Propane 95:

- CH₄ > 96 Vol%
- CO₂ < 0,5 Vol%
- O₂+N₂ < 4 Vol%
- Dew point -60°C at 4 bar g

After addition of Propane 95:

- Heating value lower 11 kWh/Nm³





We're paving the way for the energy of the future!

