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Transforming industry

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Role of hydrogen in a chemical site

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Proud partners

Sitech Services

TNO

Maastricht University

Brightlands Chemelot campus

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Fighting Climate Change.

Climate Conference Paris 2015

European Union 2050 long-term strategy

The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. This objective is at the heart of the European Green Deal and in line with the EU's commitment to global climate action under the Paris Agreement.

https://ec.europa.eu/clima/policies/strategies/2050_en#tab-0-0

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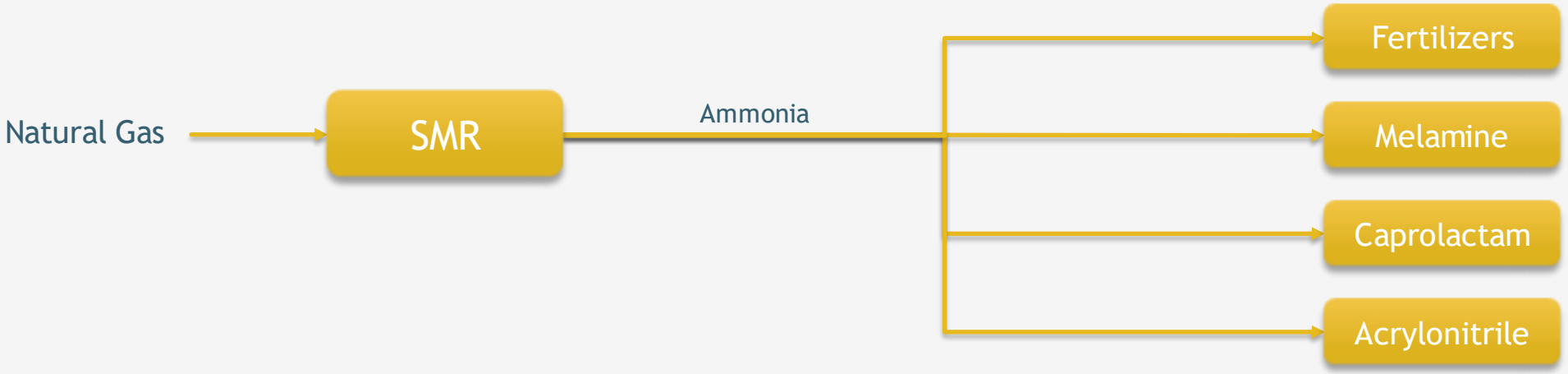
Integrated Chemical Site Like Chemelot.



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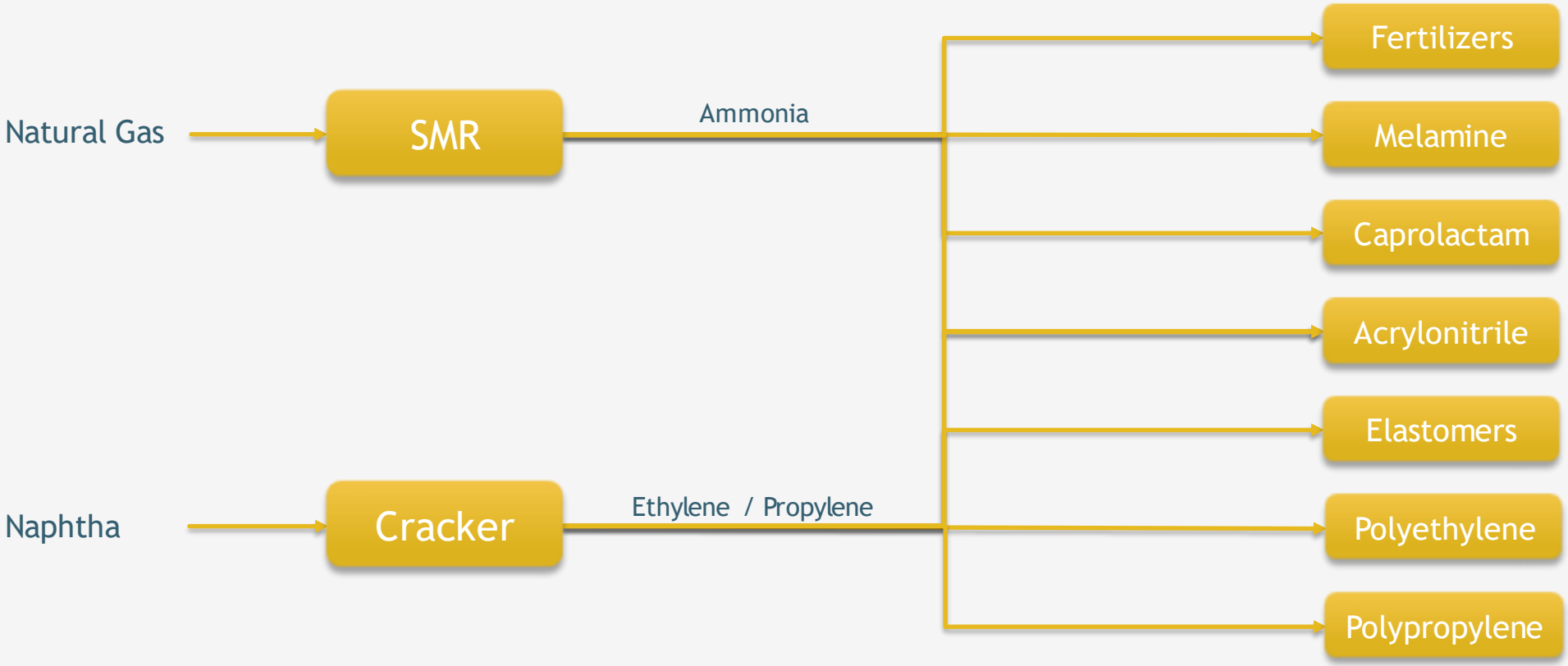

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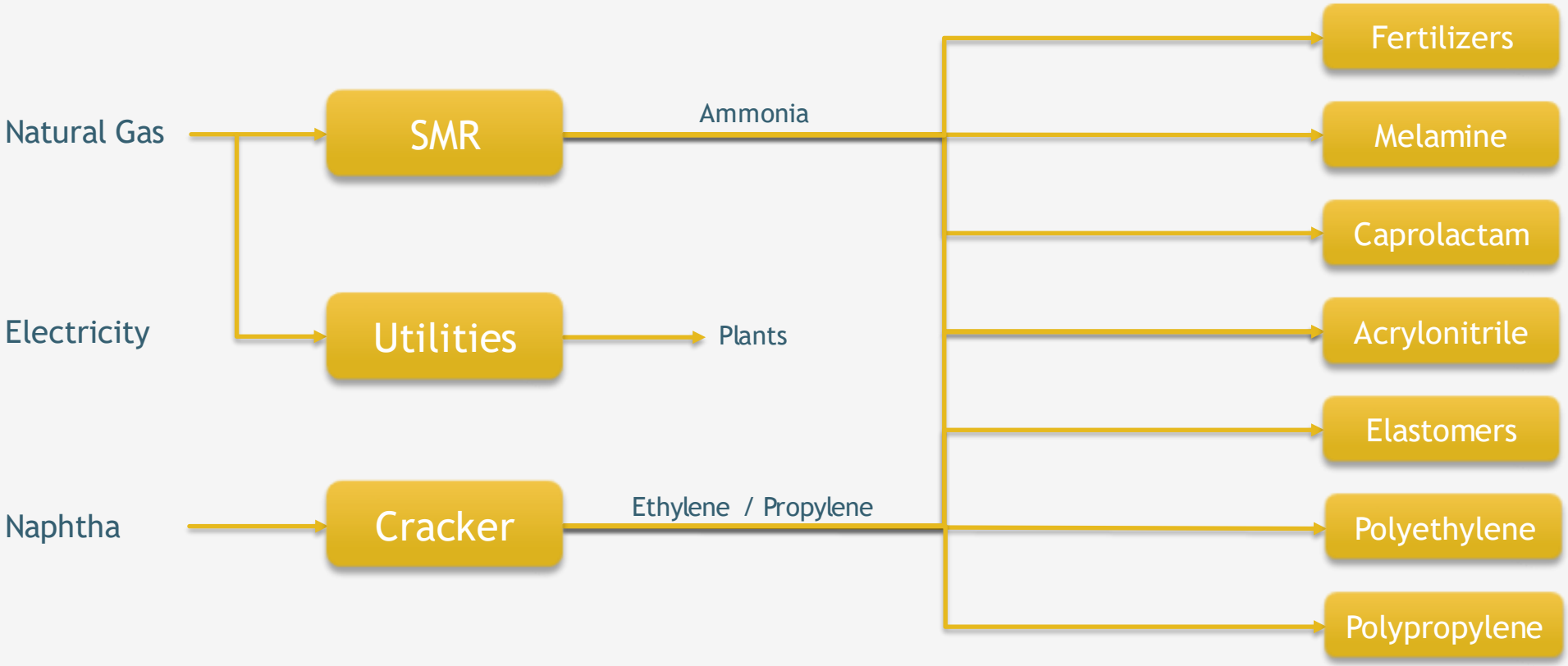

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How can an integrated site become climate neutral?

1. Eliminate CO_2 emissions originating from fossil resources coming from the production of:
   - Ammonia
   - Ethylene and Propylene
   - Steam
   - Electricity
2. Eliminate other greenhouse gas emissions

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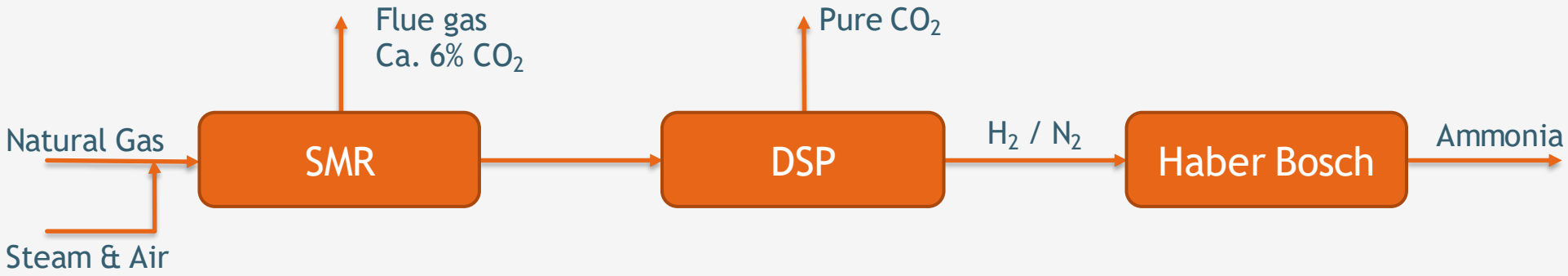
Ammonia Production.



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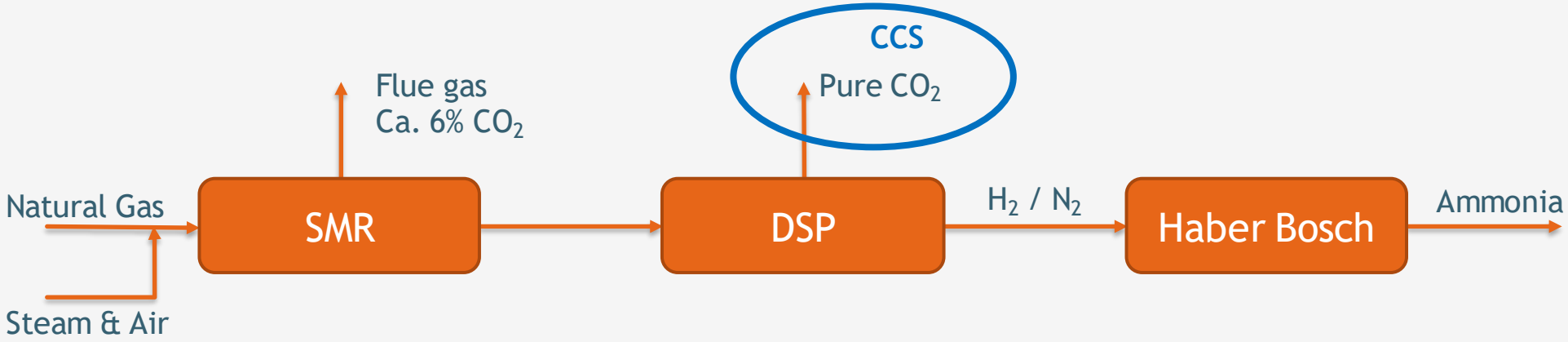
Carbon Capture and Sequestration



Carbon Capture and Sequestration of the pure CO_2 can reduce ca. 2/3 of the CO_2 emission.

CCS of the flue gas is a costly option for flue gasses.

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Switch to Hydrogen Sourcing.

Switching to sourcing fossil-CO_2-free hydrogen sourcing for ammonia production eliminates the use of Natural Gas and eliminates the CO_2 emissions.

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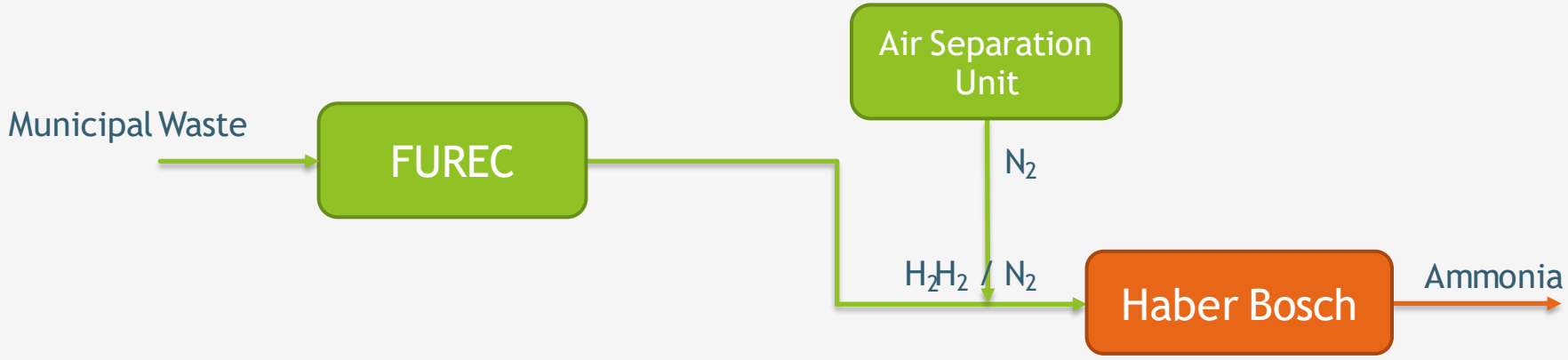
Options for Hydrogen Sourcing.



- FUREC project of RWE, producing hydrogen from municipal waste

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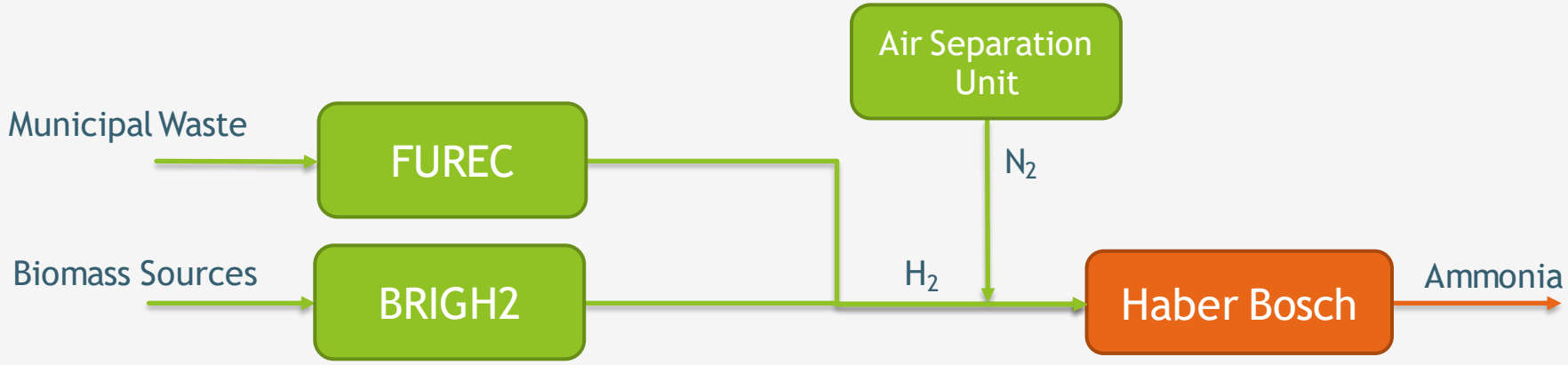
Options for Hydrogen Sourcing.



- FUREC project of RWE, producing hydrogen from municipal waste
- BRIGH2, producing hydrogen from biomass sources

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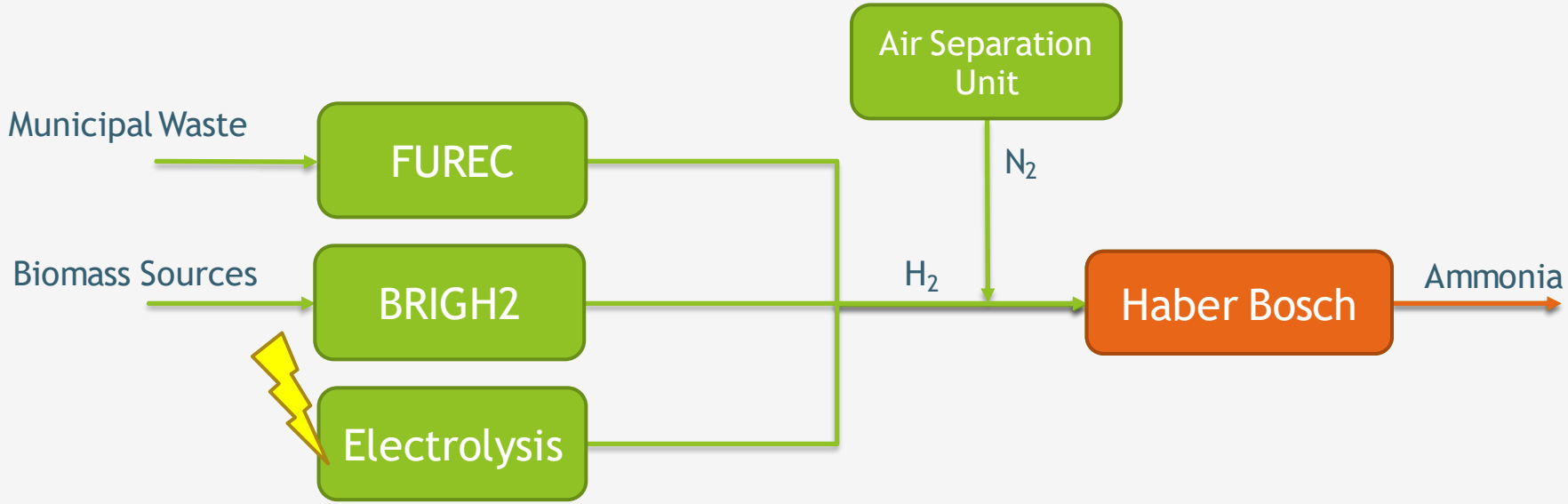
Options for Hydrogen Sourcing.



- FUREC project of RWE, producing hydrogen from municipal waste
- BRIGH2, producing hydrogen from biomass sources
- Electrolysis from CO_2 free electricity

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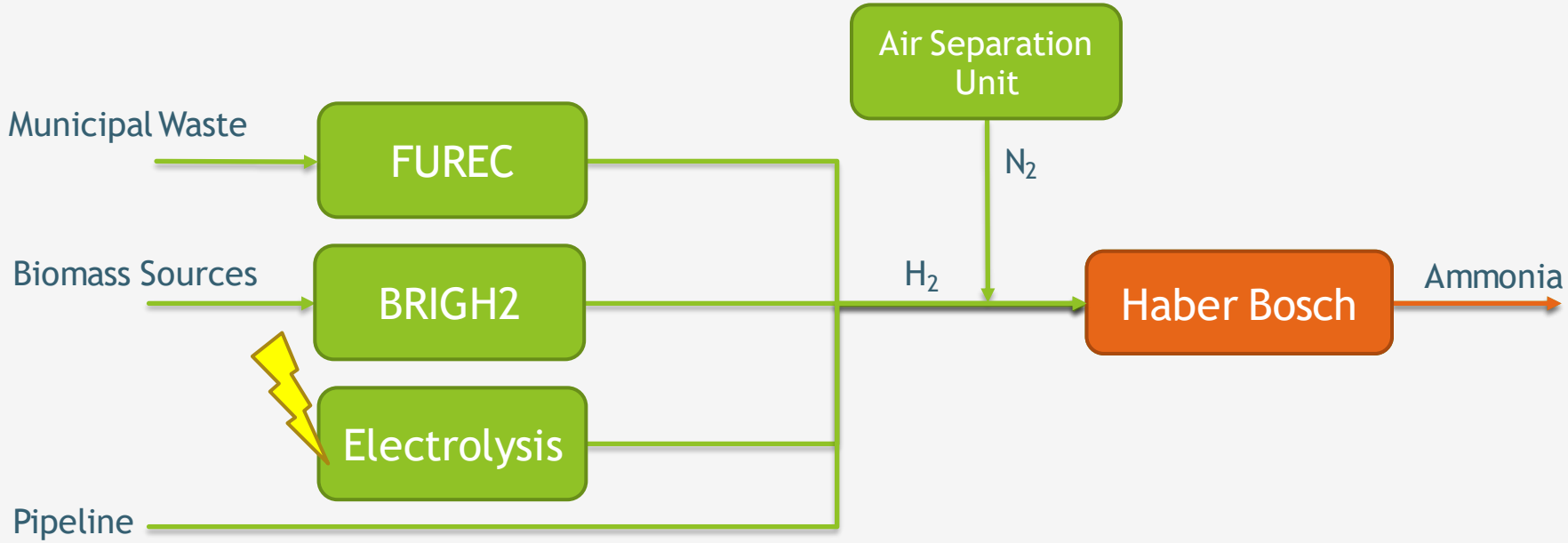
Options for Hydrogen Sourcing.



- FUREC project of RWE, producing hydrogen from municipal waste
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- Import of green hydrogen

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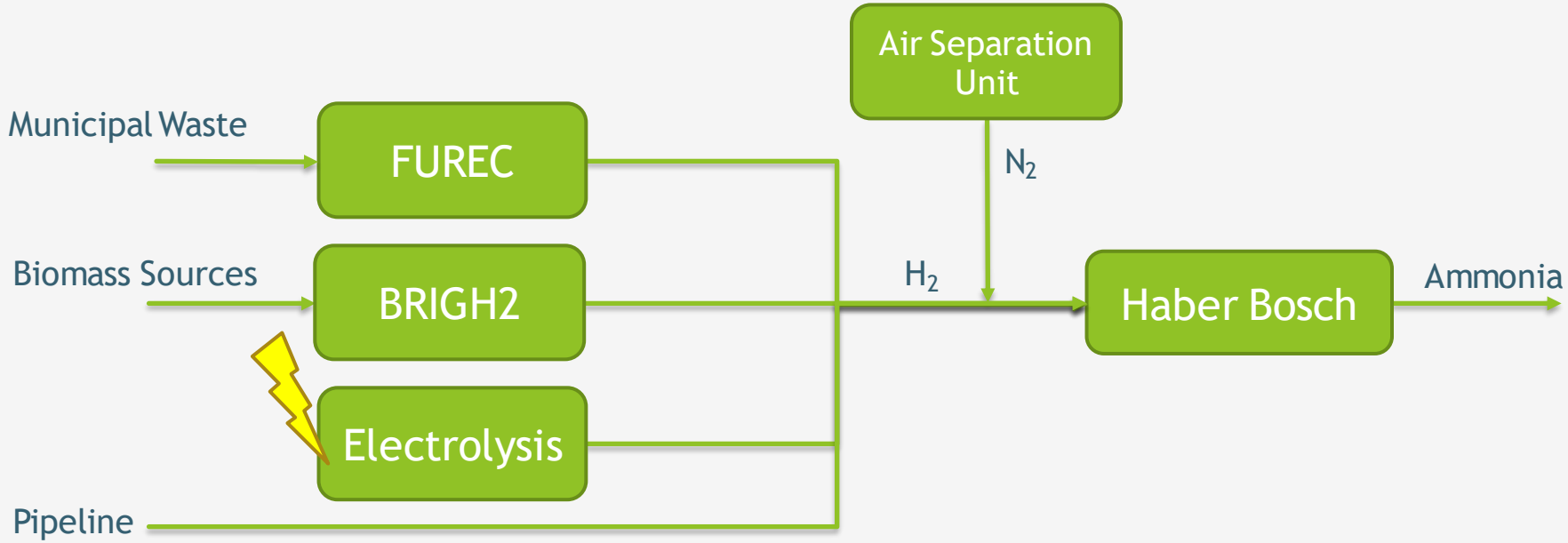

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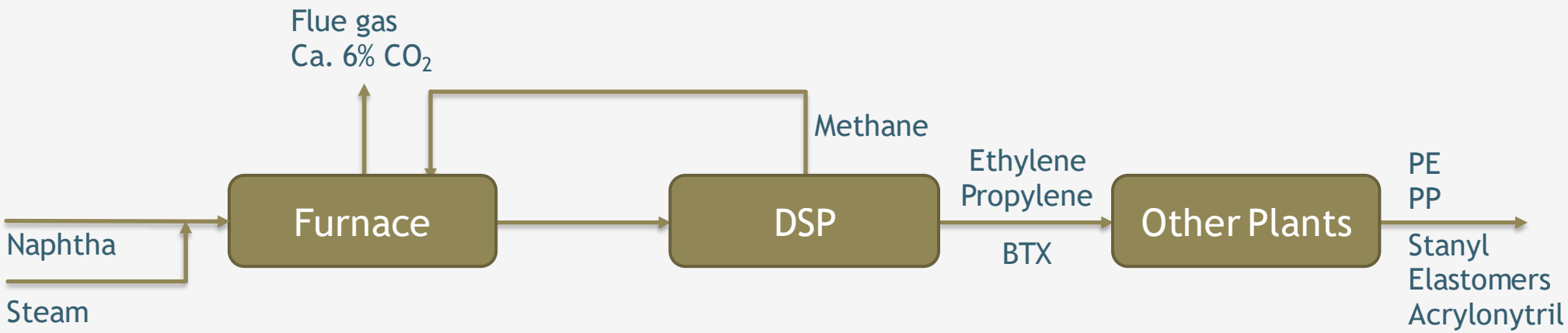
Ethylene and Propylene Production.



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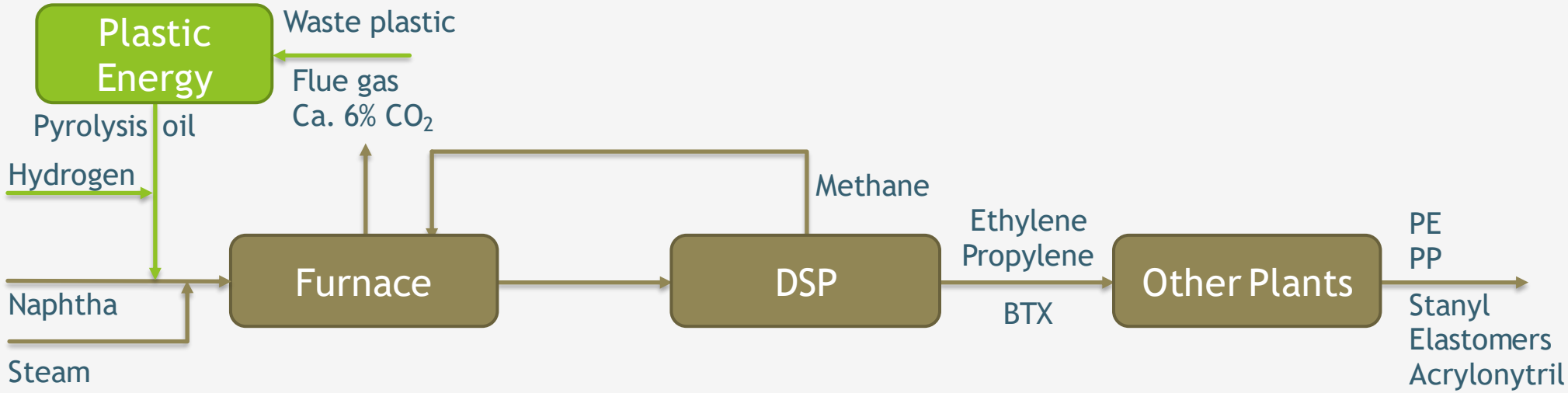
Options for becoming climate neutral.



- Switch to sustainable naphtha feedstock:
  - Pyrolysis oil from waste plastic

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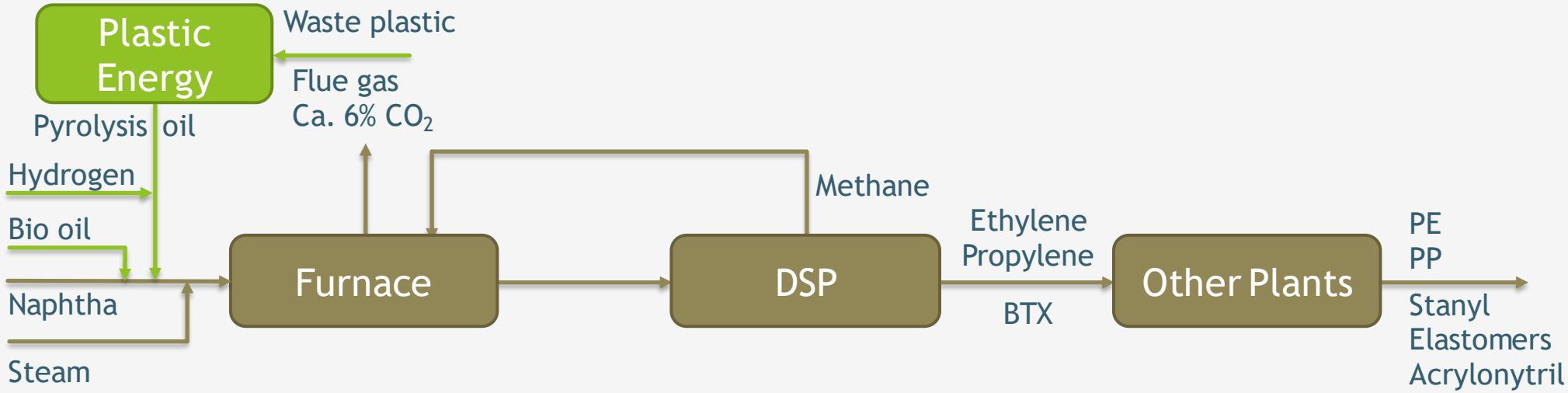
Options for becoming climate neutral.



- Switch to sustainable naphtha feedstock:
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  - Bio oil

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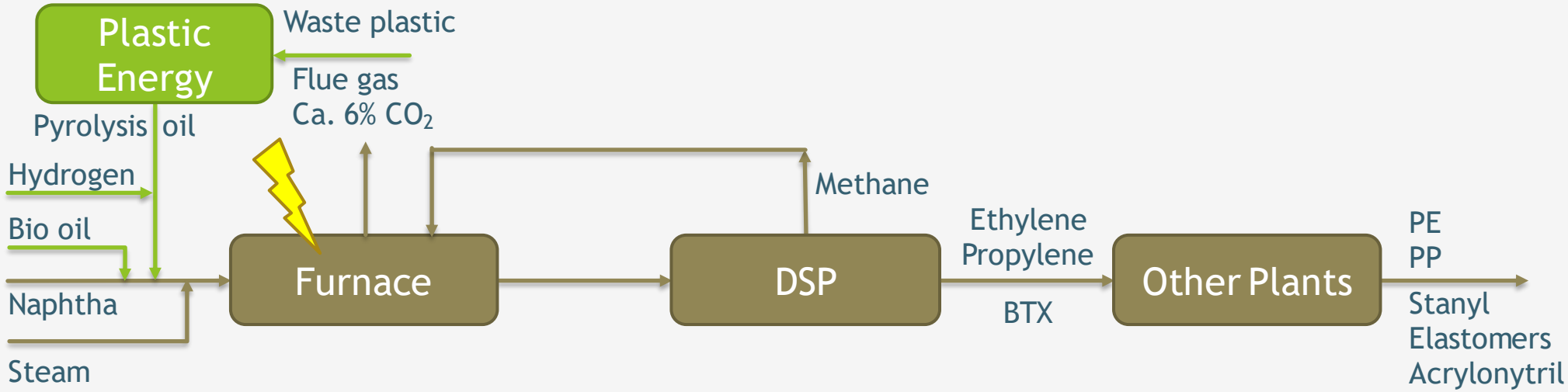

- Switch to sustainable naphtha feedstock:
  - Pyrolysis oil from waste plastic
  - Bio oil
- Electric cracking with CO_2 free electricity

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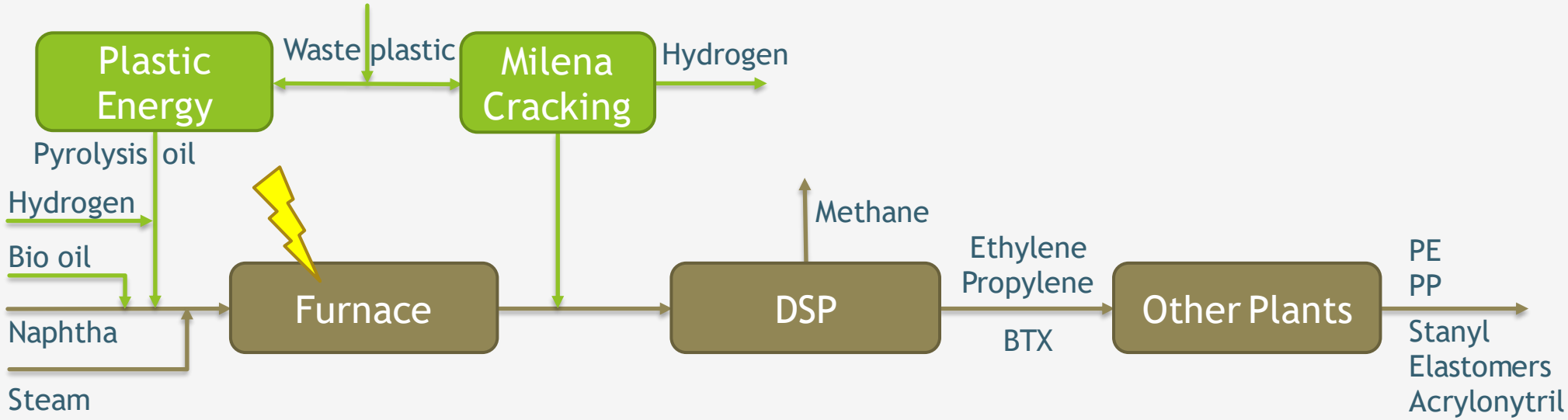

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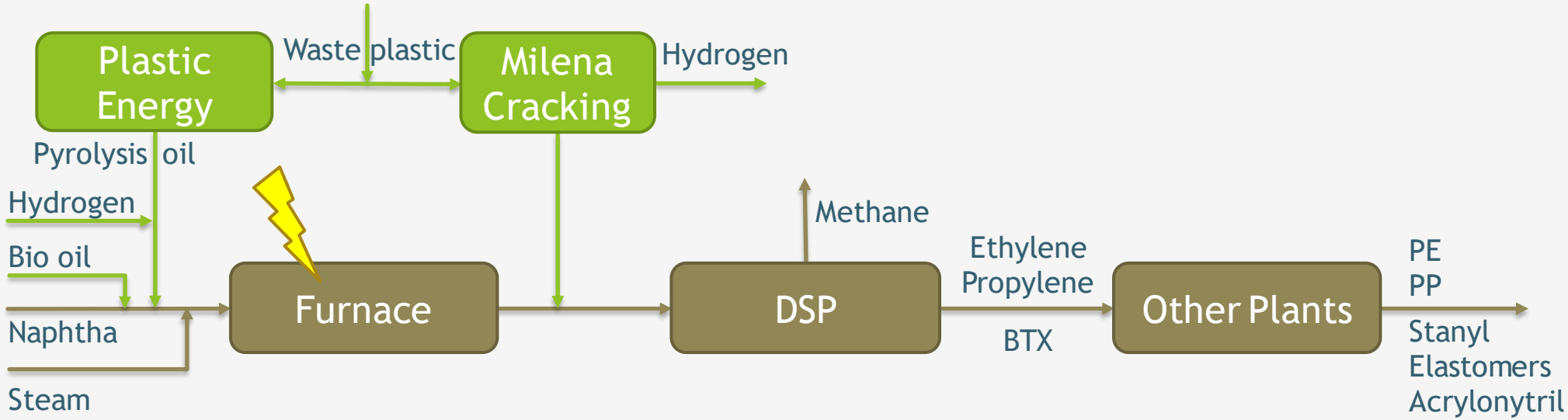

Options for methane:

- Feedstock for ammonia production, SMR and CCS
- Hydrogen production via ATR and CCS

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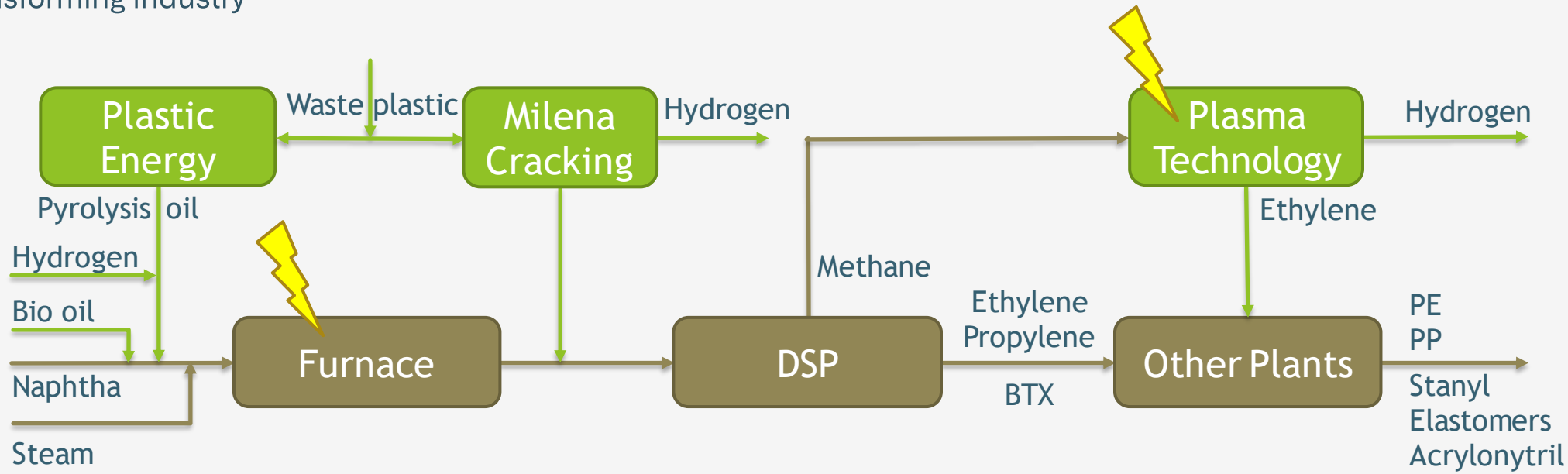

Options for methane:

- Feedstock for ammonia production, SMR and CCS
- Hydrogen production via ATR and CCS
- Hydrogen and ethylene production via plasma technology

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Role of Hydrogen at a Chemical Site

- Switching to sustainable feedstock for ammonia, ethylene and propylene makes it possible to turn the product portfolio sustainable.
- Hydrogen as feedstock and vehicle for the production of sustainable ammonia, ehtylene and propylene.
- Strength of an integrated site lies in the multiple synergy and integration options.

Requirements:

- Technology development
- CO_2 free electricity
- Circular economy

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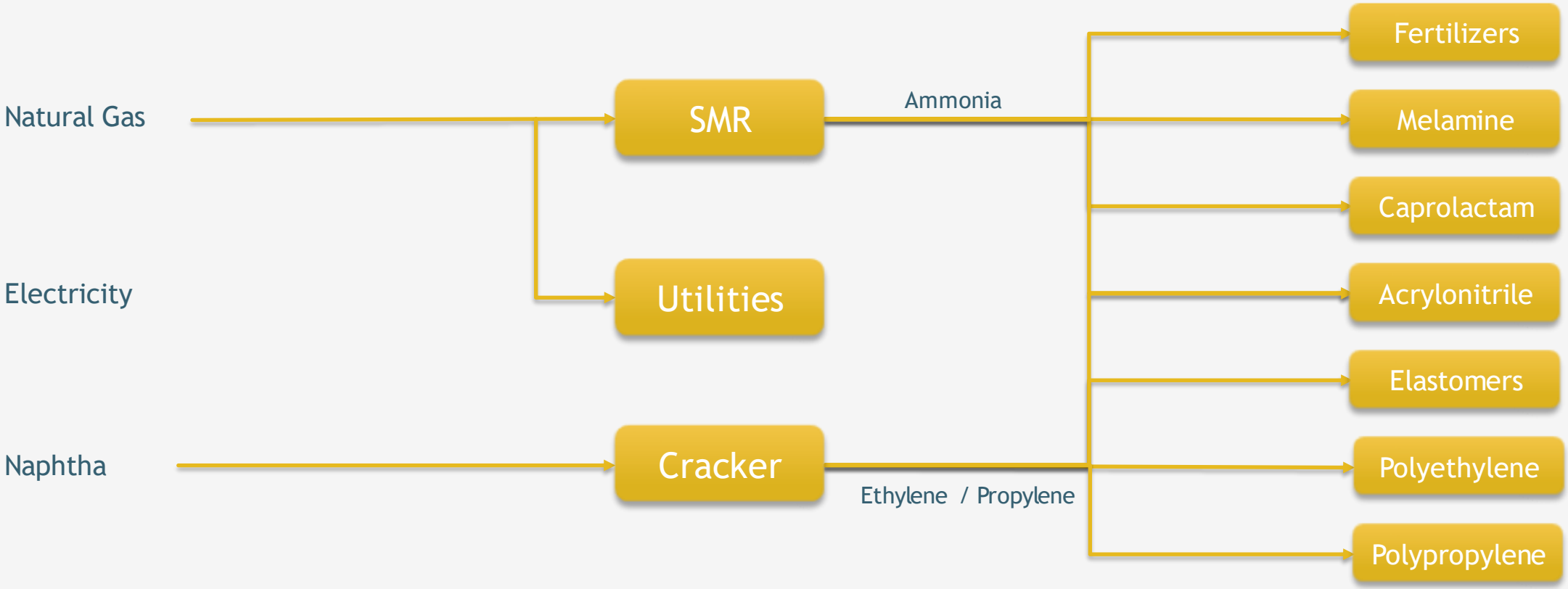

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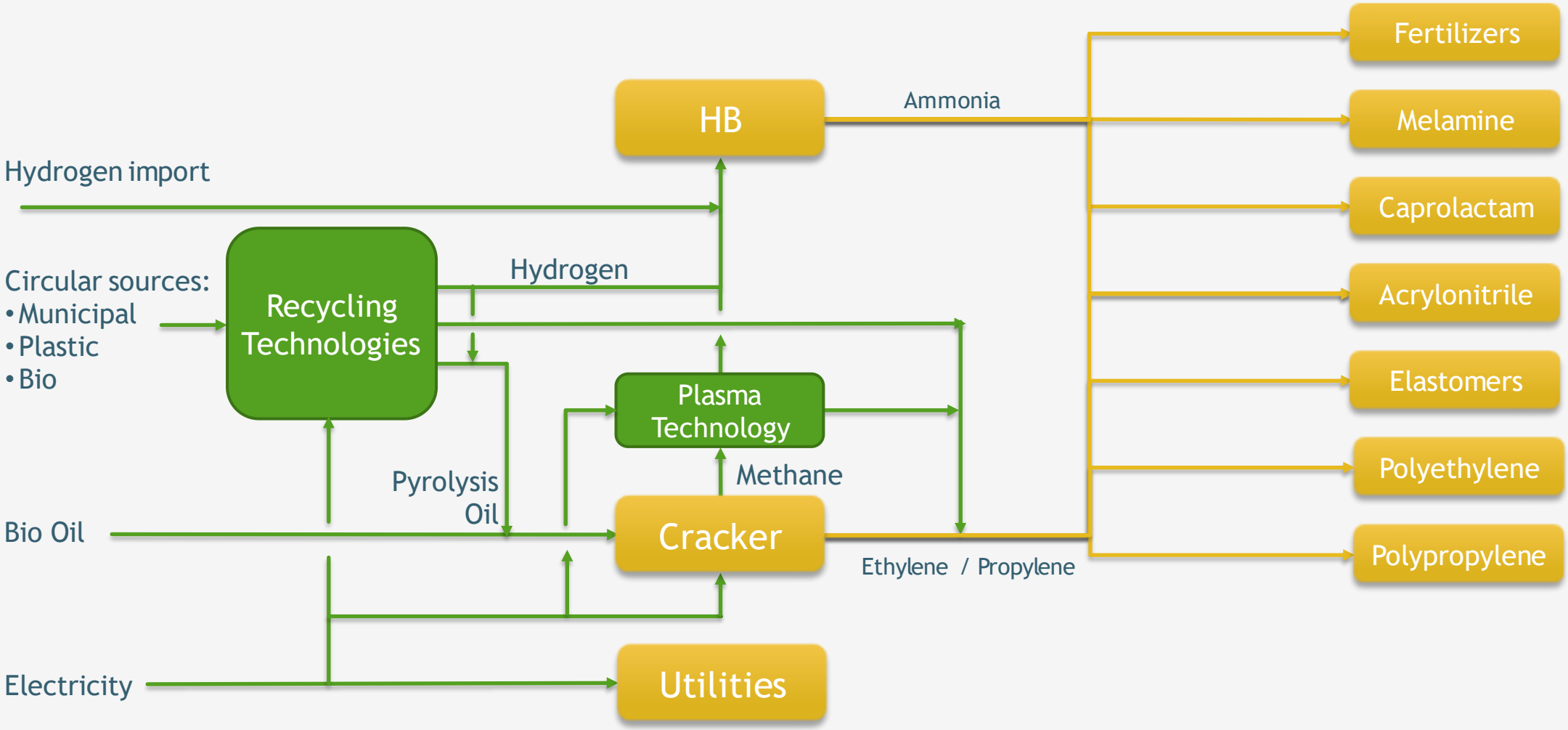

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