

# Thermochemical Conversion Technologies

Combustion: Efficient utilization of different feedstocks for conversion of bioenergy to heat and power. Enabling nutrient recycling and production of new materials.

Gasification: Efficient utilization of different feedstocks for production of energy carriers. Enabling nutrient recycling and production of new materials.

Pyrolysis: Efficient production of bio-oil and char

# Thermochemical highlights

SFC-Bio4Gasification (with sub-projects)

Cyclon Pyrolysis (B4E strat)

Upscaling of fundamental research (B4E strat)

New process concepts (also strat)

...and many many more



# The goal (-2020):

To generate more fundamental understanding and contribute to the technical development of thermochemical conversion of forest-based biomass and make the corresponding technologies competitive to those for fossil fuels



[www.goteborgsenergi.se](http://www.goteborgsenergi.se)



<https://www.ltu.se/org/tvm/Avdelningar/LTU-Green-Fuels>

# The goal (2021-) :

To generate more fundamental understanding and contribute to the technical development of thermochemical conversion of forest-based biomass, **side streams, recycled fibers, underutilized fractions**, and to make the corresponding technologies competitive to those for fossil fuels



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# Challenges addressed

- New, difficult, fuels in thermochemical conversion processes
  1. Modelling of fuel conversion, reactors and processes
  2. Ash formation and transformation
  3. Improved reactor material
  4. Trace elements at high temperatures
  5. Supplying renewable energy for the remaining fossil-based industries
- Combustion
  - Ash for nutrient recovery
  - Enabling using renewable energy carriers in coal/oil fired processes
  - New materials (inorg) from combustion
- Gasification
  - New, difficult, fuels.
  - Syngas in new applications; fundamental studies + aiming for large scale CO<sub>2</sub> reduction within only a few years
  - Ash recirculation
  - Small-medium scale char+power production
- Pyrolysis
  - Improved efficiency and products