

# COMBUSTION TESTING



**TNO** innovation  
for life

Biomass combustion is widely recognized as one of the important options to contribute to the necessary CO<sub>2</sub> emissions reductions in the EU and World-wide on short term. Both large-scale (co-)firing of biomass in coal-designed plants, as well as dedicated stand-alone CHP units can deliver the necessary contributions to the reduction targets. This sustainable heat and power is even more important for fully “greening” of biofuels and biomaterials production.

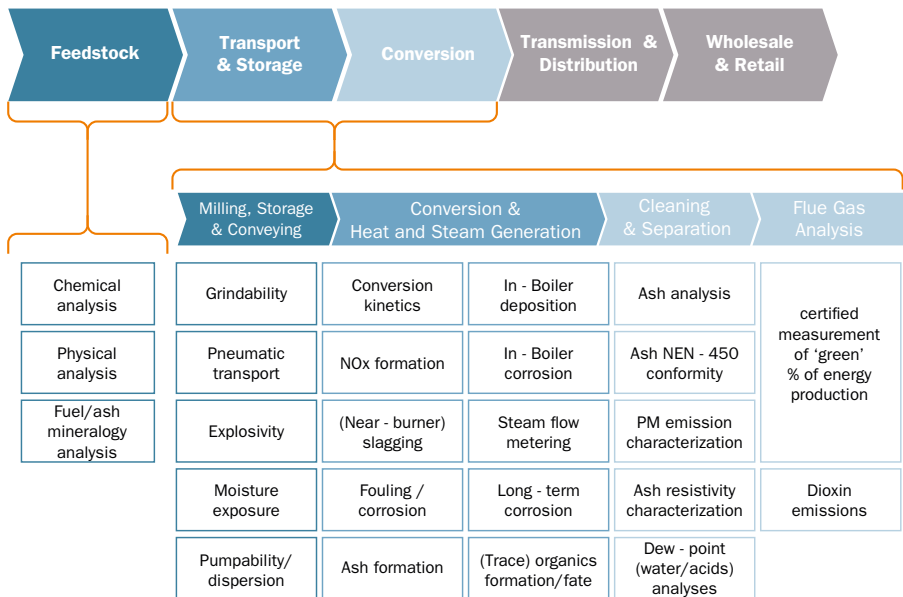
In such processes, utilizing the production residues is paramount to achieving acceptable sustainability levels. Thereby, swift adaptation of the existing designs to accommodate the fast-changing emission regulations and ever-broader portfolio of biomass and waste feed-stocks available on the market remains a critical skill.

#### COMBUSTION INSTALLATIONS

TNO owns and operates a variety of combustion test facilities, suitable for the simulation of nearly all state-of-the-art biomass combustion processes. This includes pulverized fuel, fluidized bed as well as grate-fired systems. Together with the advanced portfolio of sampling and analytical facilities, this enables widely-scoped and in-depth analyses of combustion-related problems.



Lab-scale Combustion and gasification Simulator (LCS) for Pulverised Fuel testing.

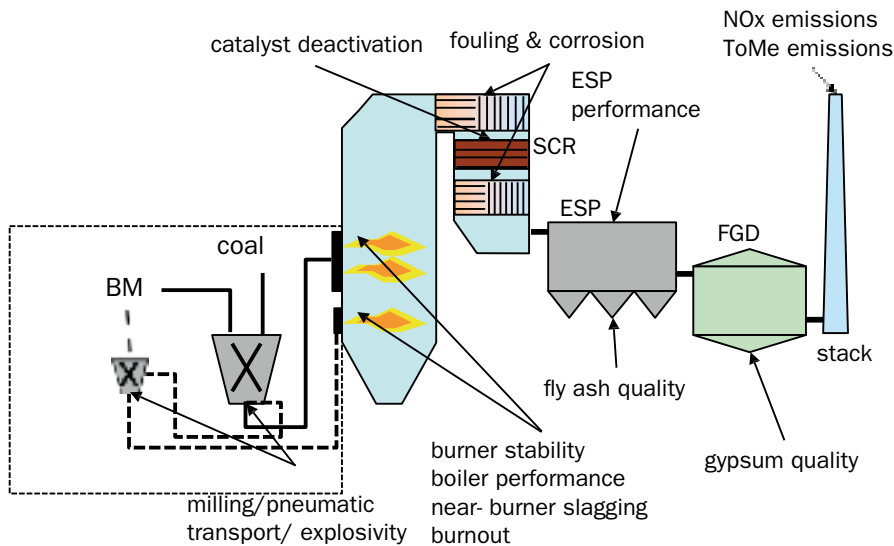


Overview of TNO biomass (and coal) conversion services.

**THERMAL PROCESSES OPTIMIZATION CLIENT SUPPORT**

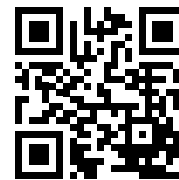
TNO can help optimizing (co-) firing biomass in thermal processes. We have over 25 years of hands-on experience throughout the biomass-to-energy value chain. Our portfolio ranges from feedstock characterization, through grinding and feeding advisory services, to

complex analyses and simulations of combustion behavior of fuel blends, measurement and removal of regulated emissions from flue gases, measurement of the biogenic fraction in fuel blends in energy production. Also corrosion, erosion and mechanical stress-related material degradation monitoring and optimization is our strong point.



Technical bottlenecks in coal/biomass (co-)firing.

**TNO.NL**



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