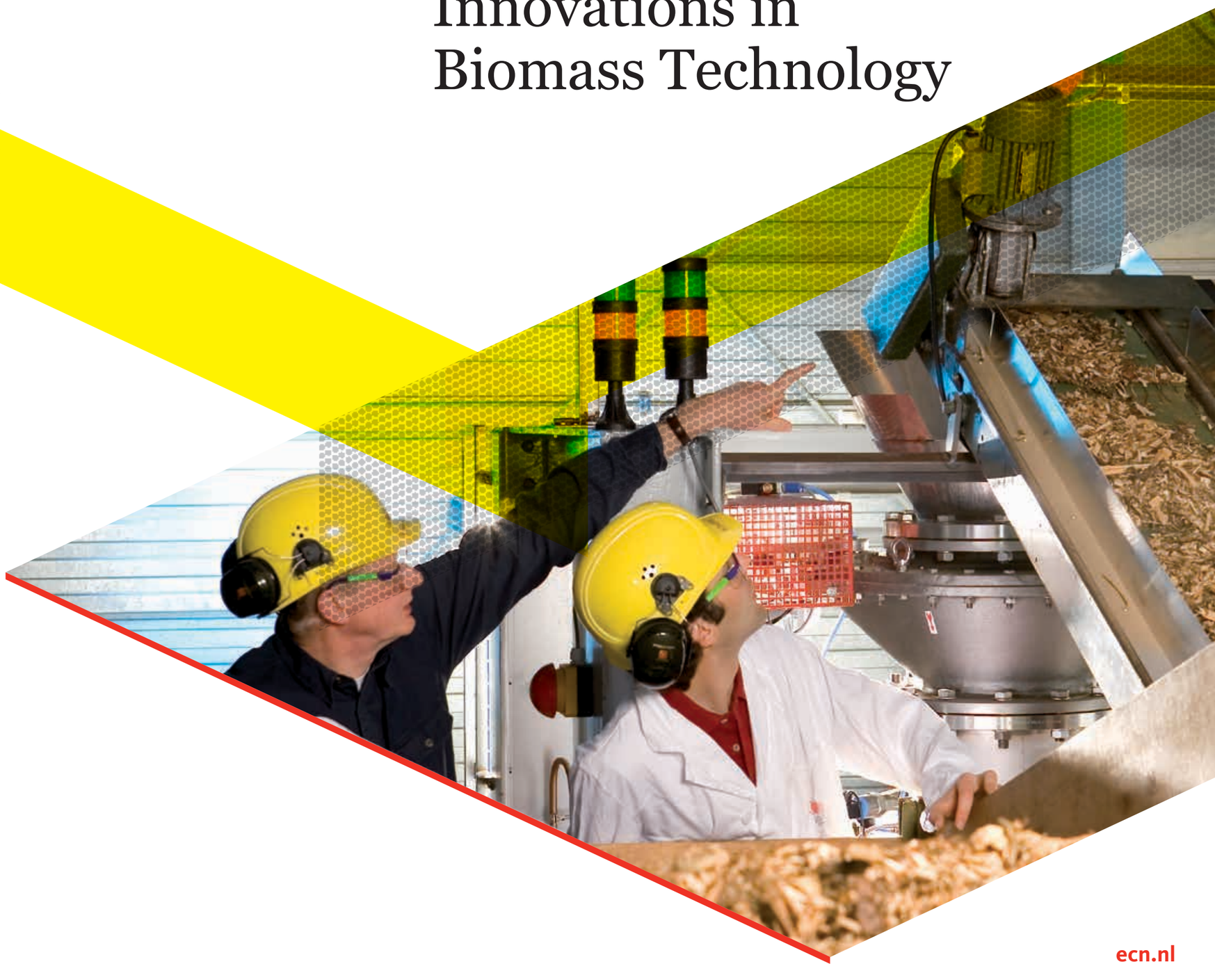
Innovations in Biomass Technology



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Sustainability in all its three dimensions (people, planet, profit) should be a rigid boundary condition for all biomass use. If you are looking to make this transition you will find our research at ECN of great value.

Join the bio-based economy: team up with ECN

In a bio-based economy, sustainable biomass plays a major role in the production of materials, chemicals, transportation fuels, power and heat. ECN is at the forefront of developing breakthrough technologies based on thermochemical conversion of biomass and waste. Technologies which enable you to produce bio-based products such as green gas, torrefaction pellets, heat & power, and a range of biofuels and biochemicals.

Our state-of-the-art knowledge and market oriented approach as well as the close collaboration with our clients have earned us a leading position in five areas: upgrading biomass to bioenergy carriers, heat and power generation, gasification-based production of SNG (Substitute Natural Gas or green gas) and other gaseous energy carriers, thermochemical biorefinery concepts and BECSS (Bio-based Energy or products with Carbon Capture and Storage).

Don’t miss the ‘transition train’

Sustainability in all its three dimensions - people, planet, profit- should be boundary conditions for all biomass use. ECN works on innovation for the transition to a bio-based economy built on low consumption of resources and low environmental pollution. This will also create new forms of employment and new value chains with huge opportunities. If you are looking to make this transition you will find our research at ECN of great value.

Taking transition technologies further

ECN has patented and licensed a robust technology (OLGA) to remove tars. After cleaning, the product gas can be used directly in boilers, engines, turbines or fuel cells. ECN pays particular attention to the conversion into SNG, which can be fed into the gas grid or used as transport fuel or chemical feedstock.

Pioneering a new standard: torrefaction

ECN has been pioneering solid bioenergy carrier production through torrefaction technology. This promising application has aroused a great deal of interest worldwide. We are currently working with a number of partners to launch this technology globally. Torrefaction in combination with pelletisation involves processing fuel pellets with a high-energy density and favourable properties for transport, handling and storage. The pellets can be used for co-firing in coal-fired power stations, in large-scale gasifiers to produce SNG, transport fuels and chemicals, or in small-scale boilers for heat and power production. Torrefied biomass pellets have the potential to become the international standard for solid biomass fuels, opening up large-scale business opportunities.

The biorefinery concept

Biorefinery concepts will play an important role in a bio-based economy. Our primary focus has been the development of pretreatment or fractionation technology as a basic step in biorefinery. This involves separating lignocellulosic or aquatic biomass into high-quality fractions using, e.g., organosolv or aquathermolysis processes which have been adapted and improved by ECN. We are also developing the thermochemical steps to process these fractions into transport fuels and chemicals. Although these technologies are in the early stages of development, they have an enormous potential which has already been recognised in the field.

Services for industries: the secret of success

We cost-effectively enhance co-firing percentages of biomass, enhance the operational time of biomass plants and extend their applications by using our knowledge, experience and R&D toolbox. ECN offers clients an extensive set of R&D tools based on our years of experience in coal, biomass and waste conversion. Our cutting-edge toolbox includes fuel databases, lab- and bench-scale facilities to mimic full-scale conversion conditions, probes and methods for sampling and online monitoring/analysis, and various physical-chemical modeling tools. We also offer a comprehensive range of analytical facilities.

Combining technology and policy: innovation in action

All of our technologies have been assessed on their potential added value. Our policy experts fully examine the broad perspective of the bio-based economy. Our core business is developing technologies for economic, high-efficiency energy and chemical production from biomass. These technologies will contribute to a sustainable energy infrastructure and a profitable bio-based sector. The indirect gasification process (MILENA) exemplifies ECN’s unique solutions in this field. MILENA converts solid biomass into medium-calorific gas with a high energy efficiency. Our experts in environmental research are able to provide advice on different sustainability options.

Contact us to find out how you can reap the benefits of innovation in action.

What can ECN do for you?

- Characterise biomass by a variety of certified, standard and advanced physico-chemical analyses methods and relate the results to the widely recognised Phyllis/BIODAT biomass properties database.
- Be your R&D partner in biomass technology development and implementation applying extensive knowledge on thermo-chemical biomass conversion and cutting-edge experimental facilities.
- Support you in assessing new biomass technologies and identifying business opportunities, e.g., by conducting techno-economic feasibility studies and screening experiments and producing test samples (for example, torrefied biomass, lignin, cellulose and hemicellulose fractions and seaweed extracts).
- Conduct biomass-related system and scenario studies, and full sustainability analysis.