

## Power production from biomass Technological progress, perspective of development

*Research Centre ENEA Trisaia, Rotondella (MT), Italy  
10 October 2019, 8:30 – 13:15, Building R41, Room: Pitagora*

Residual biomass is undoubtedly a resource that can be used for energy purposes. Its proper use can meet sustainability and environmental impact criteria as well as contribute to the achievement of the energy targets proposed by the EU strategies by 2030 and 2050.

Suitable for both the production of heat and electricity with conventional combustion technologies, important R&D programs have been promoted in order to develop more efficient and economical production processes and supply chains, aimed at exploiting residual biomass for electricity production. Among the various technologies explored, gasification has certainly attracted remarkable attention for its potential to combine technical and scientific aspects with environmental and sustainability issues.

At EU level, the actions promoted, including those to support production costs with incentive policies, have enabled certain gasification technologies to reach the industrialization and commercialization stage. These are technologies suitable in particular to produce electricity in the small to medium range, i.e. in support of the decentralized energy production model, thus favoring the integration of a share of the production of electricity from biomass in the national grids of different European countries.

The experience gained through the operation of these technologies, the adjustment to specific efficiency targets, typically linked to the use of internal combustion engines for power production, together with technical-economic evaluations, lead to evaluate that, unlike what happened for technologies based on other renewable sources, gasification results in higher investment and management costs.

Thus the need to go further, to continue to innovate and improve in order to be able to reach an alignment of the costs of producing power from biomass with those achieved by technologies based on other renewable energy sources, such as hydro, photovoltaic and wind. Key elements to achieve this result in the case of gasification are the ability to develop technologies as flexible as possible with respect to the type of residual biomass feedstocks to be used and capable of leading to significant increases in plant productivity, both in terms of electrical and thermal efficiency, as well as of the annual producibility.

Funded within the EU Horizon 2020 programme, the BLAZE project aims to achieve these targets and, through the integration of gasification in fluidized beds with solid oxide fuel cells (SOFC), seeks to develop an advanced and zero emissions technology for cogeneration (CHP) by using low-cost biomass and from short chain. Reference range for power production, the sizes from small (25-100 kWe) to medium (0.1-5 MWe).

The project has also the ambition to achieve investment and operating costs of about 4k€/kWe and 0.05€/kWh respectively, high energy efficiencies (50% electricity over the current 20%), near zero gaseous and PM emissions. Electricity production costs of less than 0.10€/kWh.

Starting from the specific aims of the BLAZE project, this meeting takes the opportunity to bring to the same table the most recent European projects focused on the subject, as well as experts on related issues, to compare their experiences and points of view through which trigger profitable synergies not only on the technological side, but also in perspective and strategic vision.

## Programme

8:30-8:45 Welcome and Opening of the session.

8:45-9:00 The BLAZE project for the efficient power production from residual biomass feedstocks

9:00-11:15 Overview of related EU projects

9:00-9:15 FlexiFuel-SOFC - Development of a new and highly efficient micro-scale CHP system based on fuel-flexible gasification and a SOFC ([www2.flexifuelsofc.eu](http://www2.flexifuelsofc.eu), BIOS BIOENERGIESYSTEME GMBH, Thomas Brunner)

9:15-9:30 HiEff-BioPower - Development of a new highly efficient and fuel flexible medium-scale CHP technology based on fixed-bed updraft biomass gasification and a SOFC ([www.hieff-biopower.eu](http://www.hieff-biopower.eu), BIOS BIOENERGIESYSTEME GMBH, Thomas Brunner)

9:30-9:45 Bio-CCHP - Advanced biomass CCHP based on gasification, SOFC and cooling machines (<https://bio-cchp.net>, Bioenergy2020, Stefan Martini, Graz University of Technology, Gernot Pongratz)

9:45-10:00 DEMOSOFC (<http://www.demosofc.eu/>, PoliTO, Domenico Ferrero)

10:00-10:15 SOFCOM - SOFC CCHP with poly-fuel: operation and management (<https://cordis.europa.eu/project/rcn/101098/factsheet/en>, PoliTO, Domenico Ferrero)

10:30-10:45 Waste2Grids (<https://www.waste2grids-project.net/>, EPFL, Jan van Herle)

10:45-11:00 Waste2Watts (<https://waste2watts-project.net/>, EPFL, Jan van Herle)

11:00-11:15 Coffee break

11:15-11:30 Biomass target 2030/2050 for small and medium cogeneration (IWG8, F. Cotana)

11:30-11:45 The strategic role of forest and agro-forestry biomass in the production of heat and power (by ITABIA)

11:45- 12:00 Bioenergy as a sustainable solution for the exploitation of residual biomass (IEA BIO-ENERGY, V. Pignatelli)

12:00-12:15 Discussion

12:15-12:45 Session Summary and Closing remarks

13:30 Lunch at CR Trisaia Cafeteria