

1. TURBODEN ORC SOLUTIONS FOR BIOMASS CHP: TECHNOLOGY INSIGHT, CASE STUDIES AND REFERENCE PROJECTS

In a country with an important presence of forests and agricultural land such as Ukraine, biomass is potentially an important renewable energy resource.

In the speech, it will be presented the application of ORC technology in Combined Heat and Power (CHP) generation fueled by wood biomass or other biomass residues.

The main characteristics of the Turboden ORC technology will be described.

Characteristics such as simplicity, unmanned operations and reliability have made ORC systems Turboden particularly suitable for CHP distributed generation.

The aim of the speech is to show the benefits from technological, environmental and economic points of view offered by Turboden ORC technology and to present reference cases of interest in the biomass and wood industry sector.

2. STEAM & POWER: THE NEW TURBODEN SOLUTION FOR POWER AND STEAM PRODUCTION FROM BIOMASS

ORC systems are well known as the best available technology for electricity production from low temperature heat sources -such as geothermal ones - and continuous technical development is done to optimize performances by means of finding new working fluids and improved design criteria and thermodynamic cycles.

With regard to medium and high temperature heat sources exploitation for electric power production, ORC technology and Steam Rankine Cycle solutions are competing in terms of power production, capital expenditures and O&M costs to become the preferred choice on a case-by-case basis.

Commercially available ORC technology used to be limited to a maximum working fluid operating temperature of about 300°C. Turboden has identified and developed a solution that operates at temperatures close to 400 C, improving the ORC technology competitiveness in terms of efficiency, especially in Combined Heat and Power schemes with high temperature cogeneration to produce low and medium pressure steam. This High Temperature ORC technology allows ORC technology to enter market segments traditionally belonging to other technologies (e.g. Steam Rankine Cycles, Bryton Cycles, etc.) to satisfy industrial steam heat users like vegetable oil production facilities, panel board industry, paper production, organic chemical production, textile, etc.

This high temperature ORC solution results to be very economically attractive using biomass as fuel but also with more conventional fuels like natural gas.