
ALTERNATIVE HEATING OIL FROM WOOD RESIDUES – VTT'S EXPERIENCES

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Abstract

The focus on fast pyrolysis research in Finland has been on high-quality renewable heating bio-oil production from biomass. Experience has been gained by producing bio-oil from various feedstocks in bench and PDU scale units at VTT and lately in the operation of an integrated 7 tpd pilot scale unit at Metso's R&D facility in Tampere, Finland.

In the VTT's patented integrated bio-oil production concept the heat for pyrolysis is transferred from the hot sand of a fluidized-bed boiler. The integration of bio-oil production into the power plant process enables both high overall efficiency and high bio-oil yield. Pyrolysis by-products such as char and non-condensable gases are used in the boiler with high efficiency to partially replace boiler's main fuel in the generation of electricity and district heating. Produced bio-oil will be used in separate district heat boilers to replace mineral fuel oils. The integrated technology has been developed into commercial scale in cooperation between Fortum, Metso, UPM and VTT as part of TEKES Biorefine research program. World's first integrated 30 MW bio-oil production plant will be constructed aside Fortum's CHP plant in Joensuu, Finland.

The paper presents VTT's experiences from laboratory-scale research into industrial demonstration.

Keywords: fast pyrolysis, renewable, heating, bio-oil