

## Energy Integration of Combined Heat and Power(CHP) Plant with Torrefaction Process

윤동열, Quang vu bach, 이철진<sup>†</sup>  
중앙대학교  
(cjlee@cau.ac.kr<sup>†</sup>)

Among lots of renewable energy sources, torrefied biomass has arisen as an alternative energy to coal. Because of its similarity to coal such as high energy content, low moisture content, and hydrophobicity, torrefied biomass can be co-combusted with coal in combined heat and power (CHP) plants. In this study, torrefaction and CHP plant was simulated in ASPEN PLUS software. First, to interpret the effect of co-combustion, the solid fuel was replaced 25%, 50%, 75% or 100% by torrefied biomass instead of coal. Also, In order to perform energy integration, a case study was performed into two categories depending on how heat was supplied to torrefaction process. These categories were flue gas extraction and high pressure steam extraction as heat sources, respectively. The simulation results show that when the fuel is replaced by torrefied biomass, electric efficiency is not significantly reduced, within 3%. Total efficiency had also similar trend with electric efficiency. Through the heat integration, we expect that total efficiency, including the CHP plant and torrefaction process, will increase due to replace heat source for torrefaction.