

TECHNO ECONOMICAL ANALYSIS OF ADVANCED WOOD PELLETS FOR INDUSTRIAL POWER PLANTS

Urmo Ariva

Master Thesis

CONCLUSION

Advanced pellets are not competitive against conventional white pellets among already converted power plants. The cost savings from logistics do not cover the higher production cost even at longest possible routes. Advanced wood pellet cost efficiency argument is considerably lower conversion cost for making existing coal-fired generation stations suitable for pellets. Exact CAPEX and OPEX from power generation side are too project specific to develop economic model for efficiency.

Although torrefied pellets lifecycle GHG emissions are lower compared to conventional pellets, the difference is too little to have any effect on the total cost even if there is subsidy reduction from carbon footprint in effect.

One way to improve steam explosion attractiveness is to find synergy in several outputs from the same raw material and technology. If the mass and especially energy loss from process could be turned into biomethane or liquid biofuels, the overall raw material valorisation would increase to competitive level.

It is well known fact that white pellets requires more energy than torrefied pellets for grinding in the power plant, decreasing the net efficiency. A comparative study for steam exploded pellets is needed in order to evaluate the operation expenditure on utility side. Further research into net efficiency and capacity of advanced pellets use in coal power plants should be done. There is no clear understanding how the biochemical change in wood composition might influence the boiler efficiency and capacity.

Major obstacle in market development is lack of producers and production capacity available. The few producers that are in operation could not provide capacities necessary for large scale consumers. On the other hand, as long as demand is low, there is little interest in large scale production investment.