Analisa Teknik dan Keekonomian Pengolahan Biomassa Sawdust sebagai Bahan Bakar Co-Firing pada PLTU Tipe Boiler Pulverized Coal = A Technical and Economic Analysis of Sawdust Biomass Processing as a Co-Firing Fuel in Coal-Fired Power Plant with Pulverized Coal Boiler Type

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Abstrak

Salah satu jenis bahan bakar alternatif yang berpotensi dapat dikembangkan dan mampu menyumbang angka bauran EBT secara signifikan adalah biomassa. Signifikansi bauran energi didapatkan dari penggunaan sistem co-firing pada Pusat Listrik Tenaga Uap (PLTU) dengan mencampur bahan bakar batubara dengan biomassa seperti sawdust. Biomassa sawdust sebagai bahan co-firing PLTU sangat efisien karena mempunyai kandungan energi dan ketersediaan yang mudah dikelola. Penelitian bertujuan untuk membuat analisis teknik dan keekonomian biomassa sawdust sebagai bahan bakar padat PLTU Co-firing tipe boiler pulverized coal. Tahapan penelitian yaitu memetakan potensi biomassa sawdust untuk mengetahui ketersediaan potensi biomassa di sekitar lokasi PLTU Co-firing, menganalisa sisi teknis dan spesifikasi yang terdapat di bahan baku biomassa sawdust untuk mengetahui kecocokan atau kelayakan dengan spesifikasi PLTU tipe boiler pulverized coal, dan menganalisa kelayakan keekonomian pengembangan teknologi pengolahan biomassa sawdust untuk mengetahui biaya pokok produksi biomassa sawdust sehingga nantinya tidak berdampak secara teknis dan finansial khususnya pada kenaikan biaya pokok penyediaan pembangkit serta emisi lingkungan. Hasil dari potensi pemetaan biomassa dapat mengimplentasikan co-firing hingga 9,91 % dari rencana co-firing 5%. Analisa keekonomian menunjukkan bahwa usaha produksi biomassa sawdust layak dijalankan dengan parameter NPV 0 > Rp. 3.268.834.655, IRR 11,19% dan payback periode 7,35 tahun dengan harga biomassa Rp780.501/Ton. Perhitungan BPP co-firing biomassa yang disimulasikan tidak menaikan biaya BBP Pembangkitan karena terdapat selisih lebih kecil dari BBP Batubara sebesar Rp 0,55/kWh.

.....One type of alternative fuel that has the potential to be developed and is able to contribute significantly to the NRE mix is biomass. The significance of the energy mix is obtained from the use of the co-firing system at the Steam Power Plant (PLTU) by mixing coal fuel with biomass such as sawdust. Sawdust biomass as co-firing material for PLTU is very efficient because it has energy content and availability that is easy to manage. The aim of this research is to analyze the technique and economics of sawdust biomass as solid fuel for Co-firing PLTU pulverized coal type boiler. The research stages are mapping the potential of sawdust biomass to determine the availability of potential biomass around the location of the Co-firing PLTU, analyzing the technical side and specifications contained in sawdust biomass raw materials to determine the suitability or feasibility of PLTU specifications for pulverized coal boiler type, and analyzing the economic feasibility of the development. sawdust biomass processing technology to determine the cost of production of sawdust biomass so that later it will not have a technical and financial impact, especially on the increase in the cost of providing power generation and environmental emissions. The results of the potential for mapping biomass can implement co-firing of up to 9.91% of the 5% co-firing plan. Economic analysis shows that the sawdust biomass production business is feasible with the NPV parameter >IDR.

3,268,834,655, IRR 11.19% and payback period of 7.35 years with a selling price of Rp780.501/MT. Calculation of simulated biomass co-firing BPP does not add to the cost of Generation BBP because the difference is smaller than Coal BBP of IDR 0.55/kWh.