

## ABSTRAK

Bank Sampah Banjarnegara mengolah sampah plastik menjadi bahan bakar alternatif petasol melalui proses pirolisis yang sejalan dengan *Sustainable Development Goals*, khususnya SDG 7 tentang energi bersih dan terjangkau serta SDG 8 tentang pekerjaan layak dan pertumbuhan ekonomi. Penelitian ini bertujuan menganalisis keberlanjutan pengolahan sampah plastik menjadi petasol, menentukan aspek prioritas perbaikan, mengidentifikasi penyebab risiko kerja, dan menetapkan strategi perbaikan yang paling optimal. Metode yang digunakan adalah *Life Cycle Sustainability Assessment* yang mengintegrasikan *Life Cycle Assessment*, *Life Cycle Costing*, dan *Social Life Cycle Assessment*. Analisis dilanjutkan dengan pendekatan *Bow-Tie*, *Rank Order Centroid*, dan *Multi Attribute Utility Theory*. Hasil penelitian menunjukkan nilai integrasi LCSA sebesar 0,912 sehingga proses pengolahan petasol memiliki tingkat keberlanjutan cukup tinggi. Aspek yang memiliki nilai terendah yaitu sosial dengan nilai sebesar 0,74 dengan kontribusi 27%, lebih rendah daripada aspek lingkungan 36% dan ekonomi 37%. Analisis *Bow-Tie* menunjukkan penyebab utama risiko berasal dari rendahnya kepatuhan penggunaan APD pada operator ketika proses produksi. Strategi terbaik berdasarkan ROC-MAUT adalah sosialisasi dan pelatihan K3 dengan nilai utilitas 0,81. Strategi ini perlu didukung oleh Bank Sampah Banjarnegara pada masa mendatang agar prosesnya lebih berkelanjutan.

**Kata Kunci:** Sampah plastik, SDGs, Pirolisis, Petasol, *Life Cycle Sustainability Assessment*, *Bow-Tie*, ROC-MAUT.

## ABSTRACT

*Banjarnegara Waste Bank processes plastic waste into alternative fuel petasol through a pyrolysis process that is in line with the Sustainable Development Goals, specifically SDG 7 on clean and affordable energy and SDG 8 on decent work and economic growth. This study aims to analyze the sustainability of processing plastic waste into petasol, determine priority aspects of improvement, identify the causes of work risks, and determine the most optimal improvement strategy. The method used is Life Cycle Sustainability Assessment which integrates Life Cycle Assessment, Life Cycle Costing, and Social Life Cycle Assessment. The analysis was continued with the Bow-Tie approach, Rank Order Centroid, and Multi Attribute Utility Theory. The results showed an LCSA integration value of 0.912 so that the petasol processing process has a fairly high level of sustainability. The aspect with the lowest value is social with a value of 0.74 with a contribution of 27%, lower than the environmental aspect of 36% and the economic aspect of 37%. The Bow-Tie analysis shows the main cause of risk comes from low compliance with the use of PPE by operators during the production process. The best strategy based on ROC-MAUT was K3 socialization and training, with a utility value of 0.81. This strategy needs to be supported by the Banjarnegara Waste Bank in the future to make the process more sustainable.*

**Keywords:** *Plastic waste, SDGs, petasol, pyrolysis, Life Cycle Sustainability Assessment, Bow-Tie, ROC-MAUT.*