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# Sustainable value stream mapping design to improve sustainability performance of animal feed production process

Putri A.A.A.; [Hartini S.](#) ; [Purwaningsih R.](#)[Save all to author list](#)<sup>a</sup> Industrial Engineering Departement, Diponegoro University, Semarang, 50275, Indonesia4 64th percentile  
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**Abstract**

This study aims to design a sustainable value stream mapping (Sus-VSM) as a basis for improving the sustainability performance of an animal feed production process. The scientific contribution of this study is to generate relevant sustainability performance indicators for an animal feed company, it was performed by conducting a literature study. Efficiency measurement approach was used to assess the performance. To exhibit the applicability of the method, a case study was conducted in one of the largest animal feed companies in Indonesia. Finally, the recommended Sus-VSM was proposed to improve the performance of the company as well as to estimate its future performance. © 2021, Novel Carbon Resource Sciences. All rights reserved.

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Animal feed production process; Engineering; Sustainability performance indicators; Sustainable-value stream mapping

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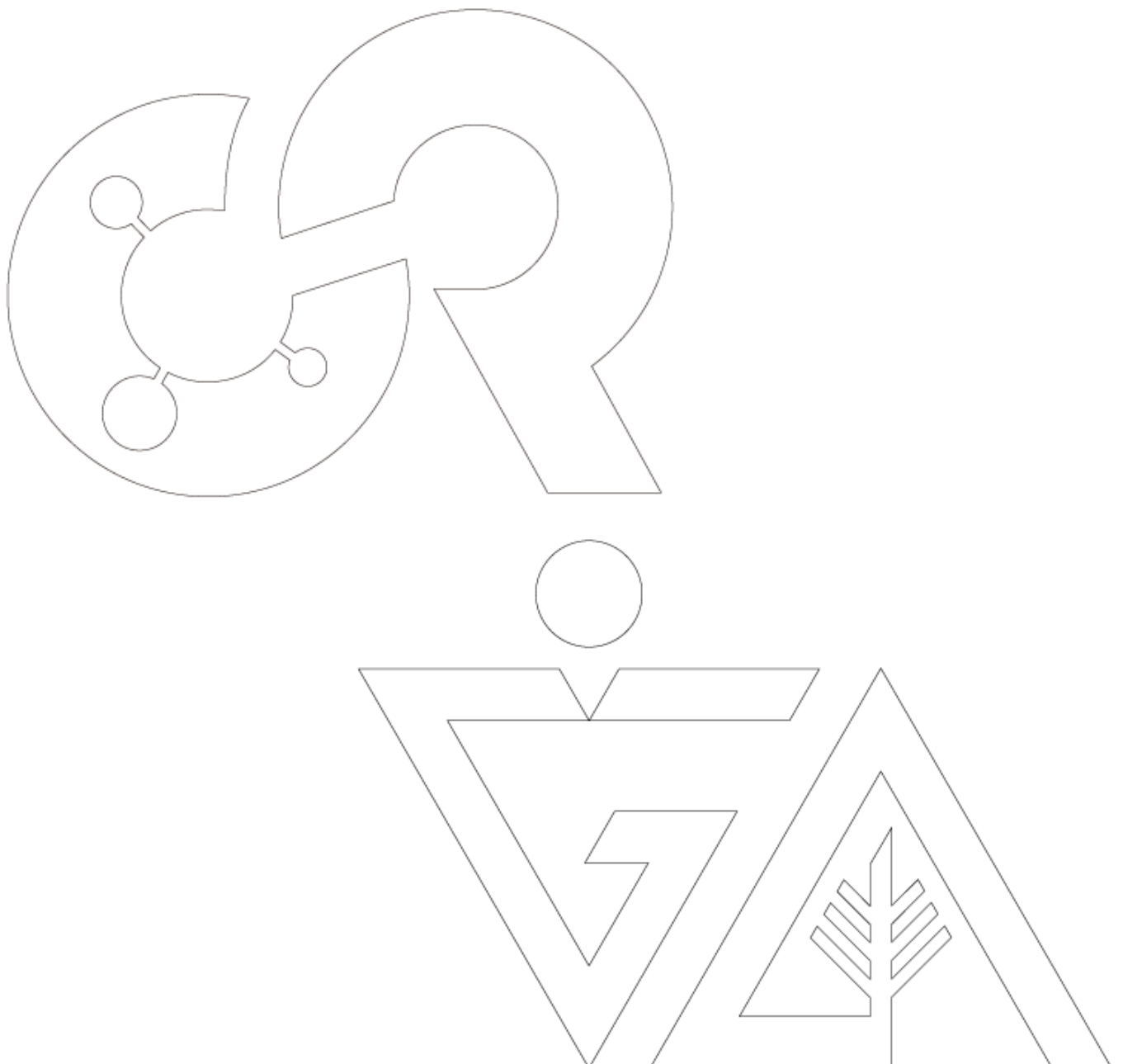
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## Sustainable Value Stream Mapping Design to Improve Sustainability Performance of Animal Feed Production Process

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<b>Abstract</b>	This study aims to design a sustainable value stream mapping (Sus-VSM) as a basis for improving the sustainability performance of an animal feed production process. The scientific contribution of this... <a href="#">show more</a>

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# Modelling Photovoltaic System Adoption for Households: A Systematic Literature Review

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(Received October 13, 2020; Revised March 22, 2021; accepted March 25, 2021).

**Abstract:** Despite the decrease in the cost of photovoltaic (PV) systems, its transition processes have encountered various challenges due to the low adoption rate. Therefore, as policymakers worldwide attempt to speed up the PV system's uptake, it is necessary to understand the decision-making process in the household sector. This study aims to review the modeling approach and factors influencing the PV adoption decision-making. A Systematic Literature Review (SLR) was conducted using the Preferred Reporting Items used for Systematic Reviews and Meta-Analyses (PRISMA) framework. The results showed that Equation-Based Modeling (EBM) is the most widely used approach. However, the Agent-Based Modelling (ABM) recently received more attention because it captures household heterogeneity, detail adoption decision-making processes, and the interactions among the decision makers, which overcome the limitations of the EBM. Furthermore, the financial aspects and social interactions have been much discussed in the PV adoption modeling. However, environmental awareness and support from local solar companies need to be incorporated in the PV adoption modeling for better understanding, thereby obtaining effective interventions to support the PV system's uptake.

**Keywords:** Agent-Based Modelling; Equation-Based Modelling; photovoltaic system; influential factors, household heterogeneity

## **Anomaly Detection Using LSTM-Autoencoder to Predict Coal Pulverizer Condition on Coal-Fired Power Plant**

Henry Pariaman<sup>1,2</sup>, G M Luciana<sup>1,\*</sup>, M K Wisyaldin<sup>1</sup>, Muhammad Hisjam<sup>3</sup>

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(Received October 12, 2020; Revised March 19, 2021; accepted March 25, 2021).

**Abstract:** Coal pulverizing systems reliability can be ensured effectively by using prognostics and health management approach. A mathematical model of coal pulverizing system used for anomaly detection is hard to be constructed due to its dynamic and nonlinear high-dimensional system typically. This paper proposed the use of the Long-Short Term Memory Autoencoder model for anomaly detection of the coal pulverizing system on a coal-fired power plant. The LSTM will solve the gradient reduction problem, and Autoencoder will improve the generalizability of the model. As a result, the proposed model can detect the anomaly successfully before the Sequent of Events occurs.

**Keywords:** Long-Short Term Memory; Autoencoder; Pulverizer; Anomaly Detection

## Predictive Numerical Analysis on the Mixing Characteristics in a Rotating Detonation Engine (RDE)

Mohammad Nurizat Rahman<sup>1</sup>, Mazlan Abdul Wahid<sup>1,\*</sup>, Mohd Fairus Mohd Yasin<sup>1</sup>, Ummikalsom Abidin<sup>1</sup>, Muhammad Amri Mazlan<sup>1</sup>

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**Abstract:** Detonation potential in rotating detonation engine (RDE) depends on well-mixed fuel and oxidizer in the annulus. A numerical study was carried out to analyze hydrogen (H<sub>2</sub>) – oxygen (O<sub>2</sub>) mixing in RDE prior to the detonation. A validation was effectively achieved by comparing the expected detonation criteria with the reported experimental results where less than 10 % error was observed. Non-reacting flow inside the annulus was examined with a new parameter describing the fuel uniformity, the amplitude of the maximum deviation from the H<sub>2</sub> average mass fraction,  $|S_{max}|$ . The numerical results are generated at variable distance between the fuel injector and the oxidizer plenum,  $D$  to provide insights on the fuel uniformity and the mixing efficiency. Case A3 with  $D = 6$  mm results in the worst mixing indicated by the highest  $|S_{max}|$  of 0.0156. This happened due to the impingement of fuel stream that separates the stream into two distinctive flows and formed two major vortices that separates the fuel streams. Case A1 with  $D = 2$  mm results in the best mixing indicated by the lowest  $|S_{max}|$  of 0.0012 due to the cross flow collisions of fuel and oxidizer and large turbulent region created. The location of fuel inlet situated face to face with the 90° elbow wall has been predicted to generate the most significant fuel distribution imbalance within the annulus. In conclusion, prediction towards excessive fuel inhomogeneity in the annulus as one of the major factors affecting stability of detonation wave for RDE is achieved in this study.

**Keywords:** Rotating detonation engine; fuel injection; non-premixed reactant; computational fluid dynamics (CFD); fuel uniformity.