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Heliyon Open Access
Volume 6, Issue 9, September 2020, Article number e05009

Techno-economic analysis of bio-briquette from cashew nut shell waste (Article) (Open Access)

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Abstract

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The implementation of this research consists of 2 (two) aspects: the making and testing of bio-briquettes called technological aspects and economic analysis called economic aspects. Bio-briquettes is made from cashew nutshell waste obtained from Southeast Sulawesi, Indonesia. It is followed by pyrolysis, which is carried out in a simple batch type reactor by heating using liquefied petroleum gas (LPG). The bio-briquettes product has a calorific value of 29.49 MJ/kg, moisture content of 5.3%, ash content of 4.96%, volatile substances content of 17.16%, and carbon content of 72.62%, which meets the universally accepted bio-briquettes standard (SNI 016235-2000), Japanese, English and ISO 17225. The bio-briquettes product is suitable as an energy source. The economic analysis of the cashew nutshell was analyzed to determine its economic feasibility. For the bio-briquettes production capacity in 2,000 tons/year, cashew nut shell-briquettes products can be sold at 1,052,878 USD/year. The total production cost is USD842,304/year. The net profit is of USD147,402/year. The cost of LPG for 2,000 tons/year production capacity is USD954,358/years. The replacement of LPG with cashew seed bio-briquettes tends to help the average household of Muna Regency community to reduce the annual cost by 37.00%. In conclusion, bio-briquettes production's economic feasibility as analyzed from the investment rate is 23.55%, payout time is 3.42 years, and break-even point is 50.09%. © 2020 The Author(s)

Chemical engineering; Energy; Energy economics; Bioenergy; Biomass; Cashew nut shells; Pyrolysis; Bio-briquettes; Economic analysis. © 2020 The Author(s)

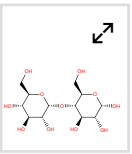
SciVal Topic Prominence

Topic: Briquettes | Sawdust | Calorific Value

Prominence percentile: 82.370

Chemistry database information

Substances



Author keywords

Bio-briquettes | Bioenergy | Biomass | Cashew nut shells | Chemical engineering | Economic analysis | Energy | Energy economics | Pyrolysis

Funding details

Funding sponsor	Funding number	Acronym
	5077/H.25/UMI/VIII/2016	

Funding text

This work was supported by the Ministry of Research, Technology and Higher Education of Indonesia through the PUPT research scheme (Project No. 5077/H.25/UMI/VIII/2016).

ISSN: 24058440
Source Type: Journal
Original language: English
DOI: 10.1016/j.heliyon.2020.e05009
Document Type: Article
Publisher: Elsevier Ltd

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