

## **LIFE CYCLE ASSESSMENT (LCA) INDUSTRI GARAM DI KABUPATEN PATI, JAWA TENGAH**

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### **ABSTRAK**

Garam merupakan salah satu komoditas strategis di Indonesia. Garam menurut pemanfaatannya dibagi menjadi dua macam, yaitu garam konsumsi dan garam industri. Selama 6 tahun terakhir, total kebutuhan/konsumsi garam nasional terus mengalami peningkatan. Aktivitas dalam menghasilkan garam konsumsi membutuhkan garam bahan baku (krosok) yang berasal dari proses penguapan air laut. Pengolahan garam hingga menjadi produk yang siap dikonsumsi membutuhkan berbagai macam elemen energi yang dapat menimbulkan dampak pada lingkungan sekitar.

*Life Cycle Assessment* (LCA) adalah metode untuk menghitung potensi dampak lingkungan suatu produk, dimulai dari ekstraksi sumber daya, proses produksi bahan, produk jadi sampai dengan produk tersebut dibuang. Tahapan dalam LCA meliputi *goal and scope definition*, *inventory analysis*, *impact assessment*, dan *interpretation*. Penelitian LCA industri garam dilakukan sejak proses pengadaan air laut hingga menjadi garam krosok dan pembuatan garam konsumsi beryodium. Lingkup penelitian yang digunakan yaitu petani garam dan IKM garam konsumsi beryodium yang berada di Kecamatan Batangan, Juwana dan Wedarijaksa, Kabupaten Pati, Jawa Tengah.

Sumber energi yang digunakan dalam proses produksi garam bahan baku (krosok) yaitu berasal dari matahari, BBM (bensin) dan manusia. Total konsumsi energi berdasarkan media tanah (tradisional) dan geomembran tertinggi dimiliki oleh energi matahari. Pada garam konsumsi beryodium membutuhkan energi yang berasal dari listrik, BBM (solar), LPG, dan manusia. Konsumsi energi tertinggi dimiliki oleh energi BBM (solar). Emisi bahan bakar yang dihasilkan pada proses produksi industri garam yaitu CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CO, SO<sub>2</sub>, dan NO<sub>x</sub>. Nilai emisi tertinggi pada proses garam bahan baku (baku) dalam 1 kw garam pada masing-masing media adalah 1,079901 kg (Ds.Genengmulyo) dan 0,9256297 kg (Ds. Tluwuk). Nilai emisi tertinggi garam konsumsi beryodium dalam 1 ton garam yaitu UD Y dengan 787,2326 kg. Nilai tertinggi pada dampak yang dihasilkan yaitu *global warming potential*. Proses produksi garam bahan baku media tanah dan geomembran, nilai GWP tertinggi pada desa Tluwuk yaitu 2,3302 kg CO<sub>2</sub>-eq dan 1,4645 kg CO<sub>2</sub>-eq. Pada garam konsumsi beryodium dimiliki oleh UD Y sebesar 200.377,86 kg CO<sub>2</sub>-eq.

Kata kunci : garam bahan baku (krosok), garam bata (briket), energi, emisi, LCA

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## ***LIFE CYCLE ASSESSMENT (LCA) OF SALT INDUSTRY IN PATI REGENCY, CENTRAL JAVA***

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### **ABSTRACT**

Salt is one of the strategic commodities in Indonesia. According to its utilization is divided into two, consumption salt and industrial salt. Over the past 6 years, total national consumption of salt has continued to increase. However, the fulfilment of domestic salt is only able to meet the need for consumption salt. The activity in producing consumption salt requires raw material of salt which derived from the evaporation process of sea water. To process raw material to become consumption salt, products require variety energy that can cause impact in surrounding environment.

Life Cycle Assessment (LCA) is a method to calculate potential environmental impact of product, starting from resource extraction, material production process, finished product until the product is discarded. Stages in the LCA include goal and scope definition, inventory analysis, impact assessment, and interpretation. The salt industri LCA research has been conducted since the process of sea water procurement to become raw material of salt and making iodized consumption salt. Scope of research used is salt farmers and IKM iodized consumption salt located in District Batangan, Juwana and Wedarijaksa, Pati Regency, Central Java.

The energy source used in the production process of raw material of salt is derived from the sun, fuel (gasoline) and humans. The highest total energy consumption based on (traditional) soil media and geomembrane is owned by diesel fuel energy. The consumption of iodized salt requires energy from electricity, fuel (diesel), LPG, and humans. The highest energy consumption is owned by fuel (solar) energy. Fuel emissions generated in the salt industry production processes are CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CO, SO<sub>2</sub>, and NO<sub>x</sub>. The highest emission values in the salt process of raw materials in 1 kw of salt in each media were 1,079901 kg (Ds.Genengmulyo) and 0,9256297 kg (Ds. Tluwuk). The highest emission value of iodized consumption salt in 1 ton of salt is UD Y with 787,2326 kg. The highest value on the resulting impact is global warming potential. The salt production process is raw material for soil and geomembrane media, the highest GWP value in Tluwuk village is 2,3302 kg CO<sub>2</sub>-eq and 1,4645 kg CO<sub>2</sub>-eq. The iodized consumption salt is owned by UD Y with 200.377,86 kg CO<sub>2</sub>-eq.

Keywords : raw material of salt, brick salt (briquettes), energy, emission, LCA

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