



## Transportation' s Impact Assessment on Construction Sector

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### ABSTRACT

Pollution sources in Indonesia have been classified into those from movable and unmovable sources. Transportation of goods and people through water, air and land are the movable sources of pollution, these sources of pollution originate mainly from gasoline and diesel combustion. This paper will discuss the movable pollution, which will be referred to as the embedded emissions from the transportation sector in buildings. The embedded emissions refer to the emissions, which occur indirectly throughout a building' s lifetime (for instance, during manufacturing, transportation etc). This is in contrast to the emissions normally considered for buildings, which usually only include those originating from its usage during a certain life span. By using life cycle analysis tools the value of the impacts of the transportation sector on buildings can be quantified. GEMIS 4.4 was used to simulate the emissions during the process of transporting materials as well as any other goods related to the construction of the building. The research however did not include the transportation of materials after the demolition of the building to the landfill. The results show that the transportation emissions from glass, sand, gypsum and concrete roof production have the highest emissions per kilogram of product. Concrete roofs emit  $1.82 \times 10^{-4}$  kg CO<sub>2</sub>/kg, transporting raw material and glass products to customers emits  $1.05 \times 10^{-3}$  kg NO<sub>x</sub>/kg, and transporting wood material  $1.33 \times 10^{-5}$  kg of particulates/kg. Furthermore, the future emissions caused by this sector are also analysed in the present paper by comparing four potential scenarios regarding different types of future fuels that could be used by vehicles, including a (JCL) Jatropha Curcas L. based biodiesel scenario that uses a perennial harvesting system, a (PME) Palm Methyl Ester based biodiesel both scenarios, Natural Gas Vehicles (NGV) that could replace the current petroleum diesel engines and the business as usual (BaU) scenario.

### KEYWORDS

Transportation, Construction, Environmental Impacts, Materials

### Cite this paper

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