

## **Decomposition of Co2 Emissions from Fuel Combustion in LAO PDR**

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### **Abstract:**

This study analyzes the key drivers of carbon dioxide (CO<sub>2</sub>) emissions in Lao PDR from 2000 to 2022, examining the interplay between economic growth, energy consumption, and environmental sustainability. Using the Kaya identity and a two-factor decomposition method, the research quantifies the contributions of carbon intensity, energy efficiency, economic activity, and population growth to CO<sub>2</sub> emissions. Findings indicate that increased reliance on fossil fuels, particularly due to the introduction of the Hongsa Lignite power plant, has significantly contributed to emissions growth. While hydropower dominates electricity generation, the country remains dependent on imported petroleum and coal for transportation and industry. Additionally, deforestation from agricultural expansion and infrastructure development has further exacerbated emissions by reducing carbon sinks. Despite a rise in per capita emissions, Lao PDR's levels remain below the global average. However, the rapid increase underscores the need for urgent policy measures, including enhancing energy efficiency, investing in renewable energy, and promoting reforestation. Balancing economic expansion with environmental stewardship is crucial for sustainable development. This study highlights the necessity of coordinated efforts among policymakers, industries, and communities to reduce emissions while ensuring continued economic progress.

### **Keywords:**

Decomposition, Efficiency, Energy, Lao Prr, Sustainability.