

Renewable and nonrenewable energy in Myanmar's economic growth

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The Republic of the Union of Myanmar is located in the western part of the Indochinese Peninsula and has a number of peculiar economic features. Green energy accounts for a considerable share of the country's energy balance. However, Myanmar is the second biggest source of greenhouse emissions among ASEAN states. The state revoked fossil fuel subsidies in 2007 to prevent its wide use, and three years later a military government was overthrown by a democratic one which attracted investments to the country. Trade liberalization and increased economic growth accelerated the production of renewable energy. Recently the growth of GDP in Myanmar has been amounting to 6.9% p.a.

Energy is a category of natural capital and an integral component of [economic growth](#) (along with capital and workforce). CO₂ emissions are considered a negative side of such growth and a sign of low-efficient technologies. Ecologists recommend replacing carbon-bearing energy with clean and renewable. Green energy is generated from [renewable resources](#) that are replenished naturally within a human time span. Such sources

include sunlight, wind, rain, and geothermal heat.

Renewable energy sources help reduce ecological costs and increase economic growth. A number of studies have shown that renewable energy creates new workplaces and opens new prospects for entrepreneurs. It reduces the burden on the external accounts (financial flows between countries) and supports stable economic growth. According to the International Energy Agency, the share of green energy would increase by 40% by 2050. Many EU states, China, and the U.S. want to become world leaders in the field of renewable energy.

The purpose of the work was to understand the role of various energy sources in Myanmar's economic growth. No [similar studies](#) of developing states have even been carried out before.

Before the study began, the scientists developed three hypotheses: advanced energy use increases the level of economic growth; renewable energy causes economic growth; and the intensity of CO₂ emissions and low technological efficiency prevent economic growth.

To confirm them, the scientists analyzed the data for the period from 1990 to 2016 and developed a [mathematical model](#) on their basis. Stable per capita GDP in USD (at the rate of 2010) was taken as the dependent variable of the equation. Two independent variables were general use of renewable and nonrenewable energy in gigawatt-hours. The intensity of CO₂ emissions per energy unit was considered an indicator of technological efficiency. All variables were log-transformed to reduce the influence of anomalies on the calculations.

The model confirmed all three hypotheses. The study demonstrates that total energy use is positive but insignificant in promoting economic growth in the short and long run. In the second model, the

influence of decomposed energy use on economic growth shows that renewable energy and non-renewable energy uses are inconclusive in the long run, but renewable energy use is positive and significant in the short run. Model 3 shows the impact of renewable energy on growth while incorporating other control variables. Lastly, Model 4 is reestimated by considering the impact of the interaction term between NRE and technological inefficiency (CO2I) on growth. The direct impact of NRE is negative and significant. Likewise, the interaction of NRE and CO2I is also negative and significant, which implies that NRE, along with efficient technology use, in the production process is counterproductive to economic growth.

According to the IEA, the carbon intensity of electrical energy production all over the world amounts to 0.5 g per 1 kW in 2018. The optimal share of renewable energy in the total energy consumption should make 51.43%, however, currently it is less than 3%. The model showed that [renewable energy sources](#) accelerate economic growth while nonrenewable ones have almost no impact on it. In the long term the increase of [green energy](#) use by 1 unit would lead to economic growth by 0.3 units.

"The study provides several policy implications. Given the minor role of nonrenewable [energy](#) and the importance of renewable sources, political emphasis should be placed on the latter. Currently Myanmar remains an oil importer which has a negative impact on its external accounts and economic growth. New technologies would increase its technological efficiency and speed up its development," concludes says Sohag Kazi, Ph.D., Senior Researcher, Department of Econometrics and Statistics, Higher School of Economics and Management, UrFU.

More information: Shakoor Ahmed et al, Renewable and non-renewable energy use and its relationship with economic growth in Myanmar, *Environmental Science and Pollution Research* (2019). [DOI: 10.1007/s11356-019-05491-6](https://doi.org/10.1007/s11356-019-05491-6)

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