Cambodia renewable electricity

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Renewables are an increasingly important source of energy as countries seek to reduce their CO2 emissions and dependence on imported fossil fuels. Renewables are mainly used to generate electricity, though renewable technologies can also be used for heating in homes and buildings. Renewable biofuels are also an emerging technology solution to decarbonise parts of the transport sector.

Note thatmodern renewablesexcludes traditional uses of biomass, such as burning collected wood, agricultural byproducts or dung for cooking or heating. This has serious negative consequences on health and the environment, including contributing to millions of deaths annually from air pollution, and is targeted for phase-out in international development and climate goals and in the IEA"s Net Zero scenario.

Biofuels, mostly made from plants, and waste products, such as household trash and industrial wastes, can be burned to generate electricity or heat. This can have environmental and climate advantages compared to burning fossil fuels, though the impact varies widely depending on the fuel source and how it is used. Traditional uses of biomass for heating and cooking, which remain a major source of energy in many developing countries, are targeted for phase-out in international climate goals and IEA scenarios.

Biofuels are used in all parts of the energy system: as replacement for oil-based fuels in transportation, to generate electricity, for heating buildings, or to provide heat for industrial processes.

Renewables such as solar panels, wind turbines and hydroelectric dams generate electricity without burning fuels that emit greenhouse gases and other pollutants. As the costs of solar panels and wind turbines have fallen dramatically in recent years, renewables now represent the cheapest source of new electricity generation in many parts of the world.

Renewable heat sources have made fewer inroads in industry, as many important industrial processes such as steelmaking require higher heat than renewable fuels can achieve. New techniques and technologies will be needed to decarbonise these areas.

As Cambodia strides towards its net-zero 2050 goal, developing renewable energy in Cambodia is an important step. While the largest share of emissions in the country comes from land-use changes, primarily deforestation and forest degradation, the energy sector in Cambodia is second.

This is an interesting position for Cambodia because its electrification rate and per capita emissions are the second lowest in the region. While, on the one hand, it can appear challenging to scale up electrification primarily with renewable energy in Cambodia, it is also an opportunity. Off-grid solar, wind power and hydropower offer a route to electrify typically hard-to-reach parts of the country. This will not only support the nation’s decarbonisation goals but also boost the standard of living in the country.

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Cambodia’s energy mix is unlike most other Southeast Asian countries, which heavily rely on natural gas, coal and oil. Instead, biofuels and waste are the main source of power in Cambodia, accounting for 41.9% of the country’s total electricity supply. This is primarily due to the low electrification rates and the use of wood and agricultural byproducts for light and cooking. Oil holds the second-largest share at 39.9% and coal at 12%.

When looking at just power generation, this image shifts. Around 46% of the country’s electricity comes from hydropower and 42% from coal. The remaining 12% is a mix of solar, oil and biomass energy. This is a dramatic shift from just a decade ago when oil generated over 80% of the country’s electricity. The country’s location at the mouth of the Mekong River Basin, which is the largest river in Southeast Asia, provides a significant opportunity for ongoing hydropower growth.

In total, 52.93% of the country’s electricity and 59.2% of its total energy supply come from renewable energy sources. These are among the highest rates in the region. Cambodia’s renewable energy mix is heavily dominated by hydropower and biofuels.

However, the country has raised concerns about its large reliance on hydropower due to its variable output based on climate conditions. Less rainfall or too intense rain events can alter the energy output of its hydropower facilities. Both of these situations become more likely as climate change progresses. For example, 2022 had some of the lowest hydropower outputs on record and forced the government to import fossil fuels to meet the growing energy demand.

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