The reforms also introduced performance contracts and other energy efficiency initiatives to decentralise the value chain, which had been monopolistic. This was also a pre-condition by development financiers such as the World Bank.

Between 2000 and 2019, electricity generation capacity increased at a rate of 6.4% a year from 1,358 megawatts (MW) to 4,695 MW. Supply capacity has nearly doubled since the 2013 power crisis. At the same time, system peak demand grew at a 4.6% annual rate from 1,161 MW to 2,804 MW.

The increase in power generation supported Ghana s economy. The economy grew in real terms by 6.67% a year between 2011-2019. Electricity demand is estimated to have grown at 7%-10% a year since 2010.

Despite energy generation being in excess of demand, power remains expensive and unreliable, and has become a constraint on doing business in the country.

We recently conducted research in which we analysed how the country s changing power mix affects energy security, energy equity and environmental sustainability. The three are referred to as the energy trilemma .

We found that Ghana has shown significant improvement from 2000 to 2019 in energy security and energy equity. It has made marginal improvements on environmental sustainability. However, these improvements mask some inefficiencies that need addressing if the country is to have a more resilient electricity sector.

Rebalancing energy sources

The World Energy Council s Energy Trilemma Index ranks Ghana among the top 10 countries that have improved on energy security, equity and environmental sustainability. Only two other African countries Kenya and Ethiopia made the top 10.

The shift from hydro to thermal has helped Ghana to increase energy security. Whereas hydro accounted for 68% of electricity generated in 2000, it s now 36%. At the same time, the country has increased thermal generation capacity to 64% of the mix. Ghana also has a better balance of sources for fuel for electricity generation. In 2019 Ghana procured 63% of gas from its own offshore fields and another 37% via the West African Gas Pipeline. Gas supply reliability is expected to improve again when the Tema LNG project is completed.

Renewable energy makes up less than 1% of the electricity mix excluding hydro. There are a number of reasons for this. They include a lack of financing for renewable projects and a general lack of public awareness of renewable energy technologies. Ghana is also short of experienced personnel to install and manage renewable projects.

On equity, 85% of the population has access to elec-