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ENERGY IN CONTEXT SERIES

FINANCING A JUST, ORDERLY AND EQUITABLE TRANSITION



CASE STUDY

Geothermal energy
potential in Kenya:
A path to sustainable power

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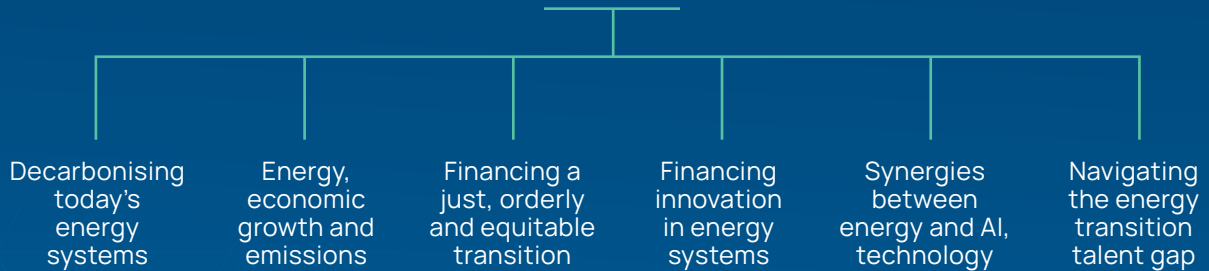
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KEY PILLARS OF ADIPEC



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Geothermal energy potential in Kenya: A path to sustainable power

CONTEXT

Kenya has made great strides in harnessing the power of geothermal energy. In fact, it is the only country in Africa to source half of its current electricity needs from this renewable resource. According to the country's energy regulator, Kenya has sufficient geothermal reserves to increase its current installed capacity by at least eight times. This could provide an opportunity to significantly expand renewable-powered industries, from green manufacturing to green hydrogen.

Private sector investments could help realise the promise and potential of this renewable energy source. Recent investment decisions by Globeleq, an independent power company in Africa, and the Geothermal Development Company (GDC), in the Menengai project will further bolster the country's energy sources. As the world seeks to transition to greener energy, Kenya's progress in geothermal energy offers a promising model for other nations.

HOW EARTH'S HEAT CAN BE TURNED INTO A CLEAN ENERGY SOURCE

In June 2023, Globeleq commenced construction of a new 35-megawatt (MW) geothermal power project in partnership with GDC. This US\$117 million greenfield venture marks Globeleq's inaugural foray into geothermal energy. Upon its expected completion in 2025, Globeleq will operate and maintain the plant. It will add to Kenya's ambition to almost double its geothermal capacity to 1.6 gigawatts (GW) – enough to power a city of one million.

US\$12.1bn

Estimated size of global geothermal power market by 2032⁵

28%

Contribution of geothermal energy to the total installed capacity of energy sources in Kenya⁶

0.5%

Share of geothermal energy in the world's total renewable energy capacity⁸

16.36GW

Global geothermal power generation capacity in 2023⁷

Organisations involved

- Globeleq
- Geothermal Development Company

Industry

Energy

Location

Nakuru, Kenya

Cost

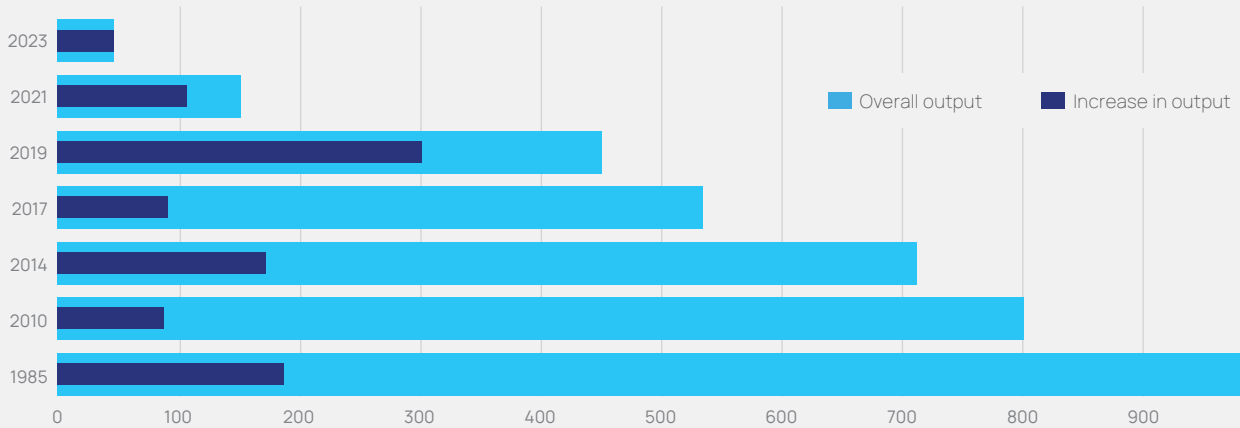
US\$117_{mn}

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Unleashing the Earth’s energy to transform Kenya’s energy landscape

Kenya’s geothermal reserves have the potential to boost the country’s current energy output by up to eight times, offering a transformative opportunity for its energy sector



Note: Installed capacity in megawatts (MW)

Source: KenGen

The Menengai complex is Kenya’s second large-scale geothermal field under development, following Olkaria. Located in the East African Rift region, Kenya is uniquely positioned to revolutionise its energy landscape and significantly contribute to sustainable energy goals, courtesy of its abundant geothermal resources.

Geothermal energy has the potential to deliver vast amounts of power. Despite this, its contribution to renewable energy deployment has been limited, largely constrained by geographic factors. By harnessing heat from the Earth’s crust, geothermal energy provides a constant and renewable power source capable of generating electricity around the clock, unlike solar and wind energy.

Paul Ngugi, Managing Director and CEO of GDC, said: “This project affords the country another opportunity to develop 35 MW more of clean, affordable, and reliable power. The Menengai geothermal project is of strategic national value especially at this critical moment when Kenya is determined to decarbonise its economy.”

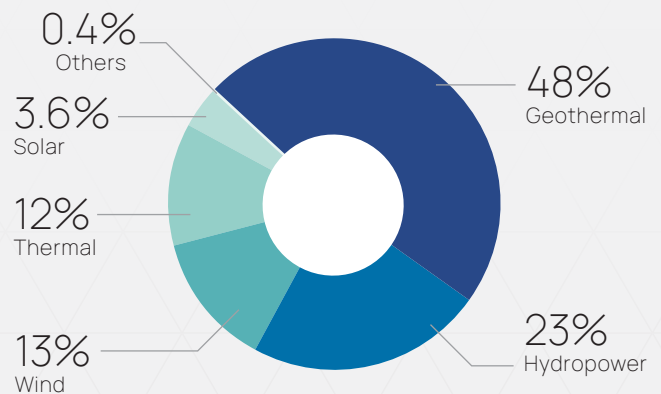
Kenya’s journey with geothermal energy has been both historic and transformative. The Great Rift Valley, which traverses Kenya, is a hotspot for geothermal activity. Since the 1980s, Kenya has rapidly expanded its geothermal capacity, establishing itself as a leader in the field. Today, the country generates approximately 900 MW of electricity from geothermal sources,

accounting for 48% of its total electricity production¹.

Kenya’s accomplishments in geothermal energy are not just a national success but also a regional and global beacon. Recent initiatives, such as the Menengai complex and ongoing expansions at Olkaria, reflect Kenya’s dedication to advancing its geothermal potential. This potential is recognised internationally, with projections indicating that Africa could emerge as a major geothermal power player

Kenya’s current energy mix

Installed capacity as of September 2023



Source: Statista

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by 2050, led by Kenya and Ethiopia². As a result, Kenya is attracting substantial investments in this sector.

In 2023, Kenya secured a US\$1 billion agreement with the Indonesian government and PT Pertamina Geothermal Energy for the Suswa geothermal project, which will contribute 300 MW to the national grid³. Additionally, AMEA Power and the Geothermal Development Company are investing US\$800 million in the Paka Geothermal Project, further enhancing Kenya's geothermal capacity⁴. These investments not only strengthen Kenya's energy infrastructure but also stimulate economic development and job creation.

The potential of geothermal energy extends beyond electricity generation. Geothermal steam has various applications, including heating, industrial processes, and agriculture. For instance, the Oserian Development Company in Kenya utilises geothermal steam to heat greenhouses, highlighting the diverse uses of geothermal energy. This versatility underscores the transformative impact geothermal energy can have across different sectors of the economy.

Despite the promising outlook, the geothermal sector faces challenges, particularly concerning costs and investment. Nevertheless, as technology advances and costs decline, geothermal energy is likely to become more attractive.

As global energy demands rise and the need for low-carbon solutions intensifies, Kenya's leadership in geothermal energy could play a pivotal role in shaping the future of global energy production.



“
The Menengai geothermal project is of strategic national value especially at this critical moment when Kenya is determined to decarbonise its economy.
”

Paul Ngugi
Managing Director and CEO of GDC

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