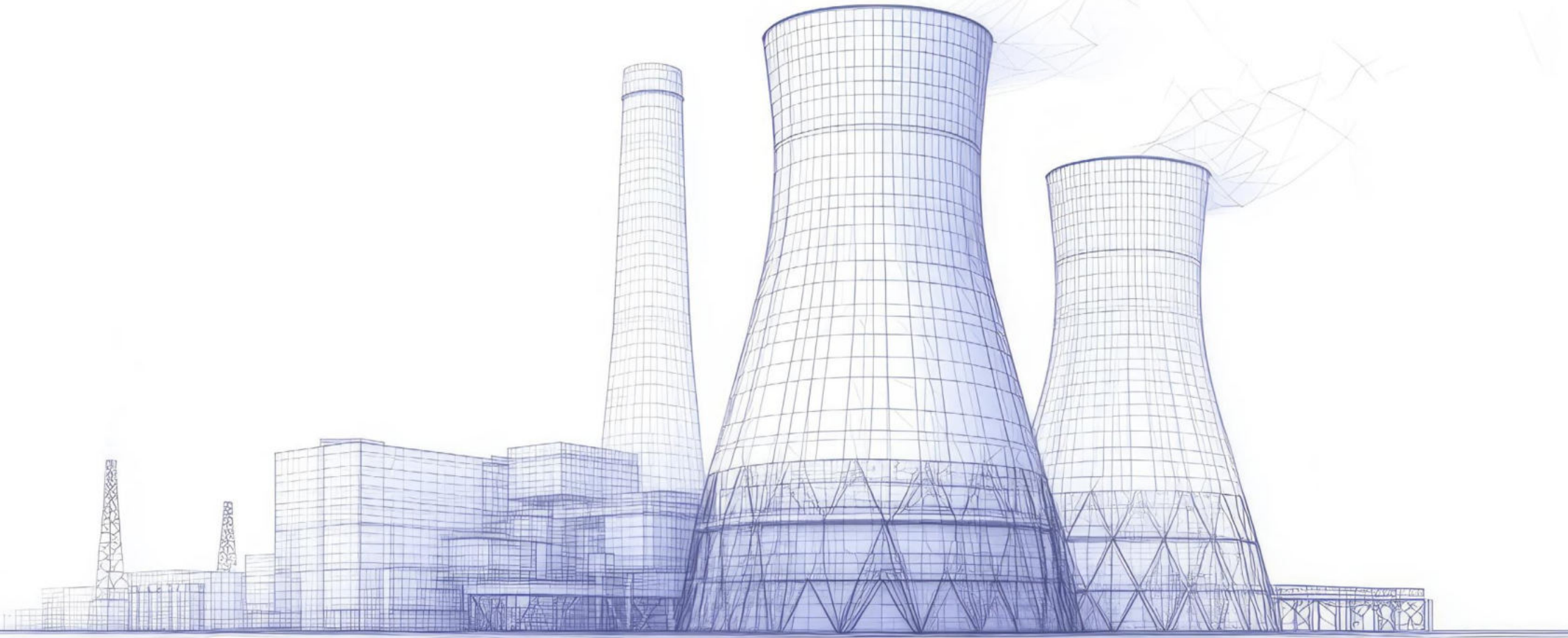
CJ ACTION
CENTER FOR JUSTICE GOVERNANCE AND ENVIRONMENTAL ACTION

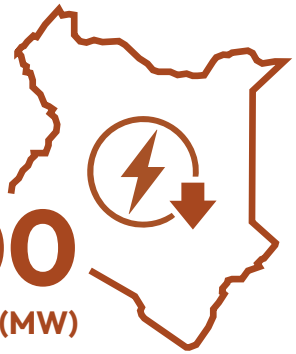


KENYA'S NUCLEAR POWER PROGRAMME FACT SHEET

CREDIT: KANA SCIENTIFIC WORKING GROUP

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Kenya will face an energy deficit of 17,000 MW by 2030 that can only be filled by nuclear power.



Energy Deficit of

17,000

Megawatts (MW)

Kenya's renewable Energy Potential (MW):

- Geothermal **7,000**
- Wind **5,000**
- Hydro **6,000**
- Solar **15,000**

Total:

~33,000

Megawatts (MW)

Facts

Studies under Kenya Vision 2030 project that national energy demand will rise to approximately 17,000 MW by 2030. However, Kenya's current renewable energy mix, including geothermal, wind, hydro, and solar, has a total potential of over 33,000 MW which is nearly double the projected demand. This indicates that renewable energy sources alone can fully meet the country's future energy needs.

Furthermore, various energy experts have noted that it is highly unlikely for Kenya to achieve the projected growth in electricity demand over the next five years. Over the past 20 years, since 2005, the country's peak demand has increased by approximately 1,000 MW, growth largely driven by government initiatives such as the Last Mile Connectivity Project and the economic expansion during the Kibaki's presidency era.

At present, there are no clear economic indicators to support a projection of demand rising to 17,000 MW. As such, this forecast appears to be significantly overstated

It is also important to note that despite substantial infrastructural developments in New York, such as the expansion of artificial intelligence data centers, electric vehicle charging stations and the adoption of electric heat pumps in homes among others; the growth in electricity demand over the past five years has remained below 10,000 MW.

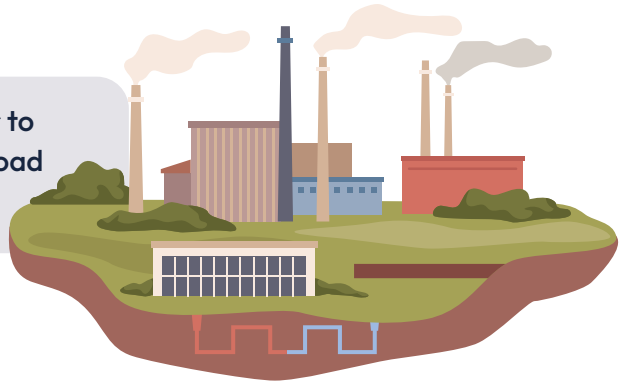
Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear energy is a cost-effective solution to Kenya's long-term power needs

KES 500–600 Billion

Estimated cost of constructing a nuclear power plant

Kenya needs nuclear to provide stable baseload power.



Kenya already has a stable base load from geothermal energy, which currently contributes around 30% of the national supply and has significant untapped potential.

Facts

Constructing a nuclear power plant is extremely expensive, estimated at KES 500–600 billion, and typically takes 10 or more years to complete. Additionally, Nuclear Power Plants are widely known for their cost and time overruns during construction.

In contrast, scaling up Kenya's vast renewable energy sources is faster, safer, and more affordable, with much of the required infrastructure already in place. Additionally, the various renewable sources like geothermal, wind, solar and storage will provide the much-needed diversity and enhance the reliability of Kenya's power grid as opposed to lumping 1000MW in a single source for a system that only has 2000MW peak demand.

While geothermal resources are not infinite, they are immense and sustainable for the foreseeable future especially when combined with diverse renewables and energy storage technologies.

Moreover, the Nuclear Power Plant will exacerbate the stability problems of the Kenyan power grid because of the weak transmission system. All that is required to stabilize Kenyan power is investment in the power transmission infrastructure so that the geothermal power (and other sources of power) can be transmitted reliably to all parts of the country.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear power will position Kenya as a global energy exporter

Ethiopia currently exports

200MW

to Kenya at a rate of **6.5 US cents per kilowatt-hour (kWh)**

Facts

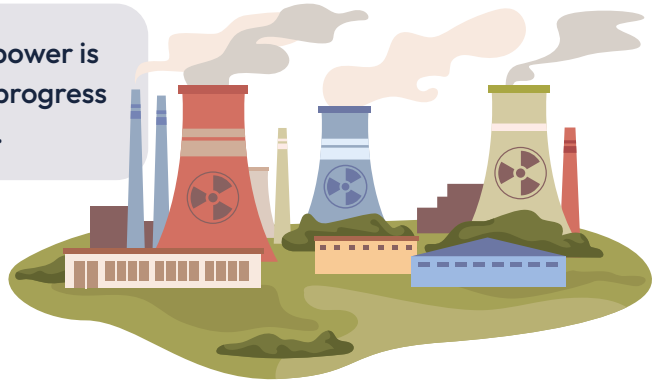
While NuPEA promotes nuclear power as a tool for regional power export, there is no clear demand or infrastructure in place to support large-scale energy exports from nuclear power. Kenya has greater opportunity to lead through clean, renewable exports and innovative energy solutions, setting a new global model for sustainable development just as it has done with mobile banking.

Additionally, Ethiopia has already established itself as a key power exporter, currently supplying electricity, primarily generated from hydroelectric sources to countries including Kenya.

Ethiopia currently exports 200 MW of electricity to Kenya at a rate of 6.5 US cents per kilowatt-hour (kWh), which is considered very competitive. In contrast, Kenya may face significant challenges entering the power export market, as nuclear energy is typically associated with high capital costs and frequent cost overruns, making it a more expensive option. It has also been pointed out that it is also counterintuitive to claim that you will be exporting the power while on the other hand claiming that you will have a deficit in generation in 2030.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Pursuing nuclear power is a sign of modern progress and development.



Nuclear power is a stable, efficient, and reliable source of electricity.

Facts

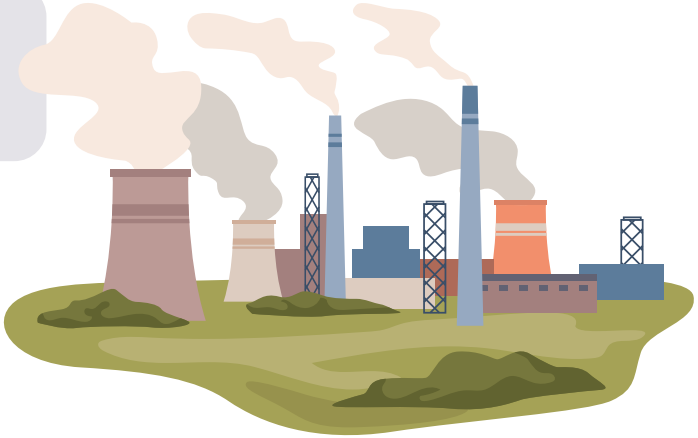
Many countries including the developed countries are decommissioning nuclear plants due to high costs, long construction times, waste management issues, and environmental risks. Africa and Kenya have the opportunity to leapfrog outdated models by investing in clean, smart, and scalable renewables, creating a new global standard.

While nuclear power is often described as reliable, it is also uniquely vulnerable to catastrophic failure. Historical disasters such as Chernobyl, Fukushima, and Three Mile Island have shown that accidents and natural disasters can cause irreversible harm to both communities and the environment.

Additionally, Nuclear power itself is not inherently reliable. The fuel by itself is fissile material. But the generator is the same as any other steam turbine run generator like in coal, oil or natural gas power plants. Because of the inherent risk of the nuclear power plant, the plant is usually made stable and reliable by having a strong backed up transmission system around it. Such a reliable transmission system does not exist on the Kenyan power grid. NuPEA has not provided any study that identifies the transmission system that will be required for the proposed Nuclear Power Plant.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear energy is cheaper than fossil fuels.



"Nuclear power plants are about four times as expensive as wind or solar, and take five times as long to build."

— Mycle Schneider,
Author, World Nuclear Industry Status Report

Facts

That may be true in some cases but the more relevant comparison is not between nuclear and fossil fuels, but between nuclear and Kenya's abundant renewables such as geothermal, wind, and solar.

Additionally, when calculating true energy costs, it is essential to factor in the entire lifecycle which includes:

- Construction and land acquisition
- Fuel extraction and transport
- Operation and maintenance
- Radioactive waste storage (most expensive and long-term)
- Decommissioning and site clean-up

It is also worth noting that most Nuclear power plants in the United States of America cannot make enough money in the competitive electricity markets and they are heavily subsidized by taxpayer dollars to remain in operation.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Fukushima led to stricter safety regulations, making nuclear accidents highly unlikely

Facts

Yes, Fukushima prompted more scrutiny. But acknowledging the need for more safety regulations is itself an admission that nuclear power carries inherent, serious risks - risks that cannot be fully eliminated. Moreover, one accident is too many and even a minimal risk of nuclear disaster is unacceptable given the scale of destruction. The fallout radius from a nuclear incident can contaminate hundreds to thousands of square kilometers, with lifelong impacts on human health, agriculture, water systems and ecosystems.

Additionally, new systems have been incorporated into nuclear power plant designs with the aim of enhancing safety. However, these systems are often untested in real-world operational settings, as they are introduced in newly constructed plants. A relevant example is the Boeing 737 MAX, which featured the Maneuvering Characteristics Augmentation System (MCAS) intended to improve safety, but ultimately contributed to two fatal crashes. Similarly, increasing design complexity in nuclear plants may shift certain risks from the operational phase to the design phase.

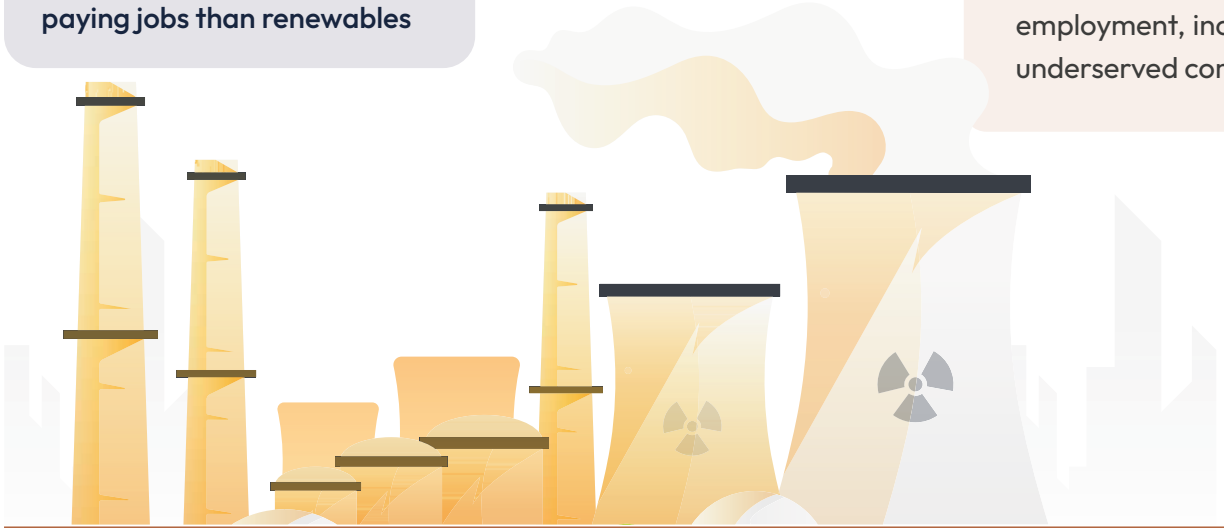
Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear power will create over 5,000 local jobs and provide long-term employment.

Facts

The figure of 5,000 jobs reflects temporary labor required during the construction phase, not long-term employment. Once operational, a nuclear plant typically employs only a few hundred highly skilled workers, most of whom are not from the local community.

Nuclear energy offers better-paying jobs than renewables



While it's true that some nuclear sector jobs offer higher salaries, renewables create more jobs per shilling invested, and they support a broader range of employment, including low- and mid-skill opportunities especially in rural and underserved communities.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

More power will trigger industrial growth and nuclear energy is necessary for this

Facts

Yes, reliable power supply supports industrial growth but this is true of all energy sources, not just nuclear. There is no evidence that nuclear energy is uniquely suited to trigger industrial development over other, cleaner, more cost-effective options.

Countries that invest in nuclear energy see faster GDP growth.

Some countries that invested in nuclear energy saw **GDP increases of 0.2% to 3%**, but these growth figures cannot be attributed to nuclear alone. GDP growth is typically influenced by multiple factors, including:

- Foreign investment
- Infrastructure development
- Policy reform
- Education and labor markets
- Access to diversified energy sources (not just nuclear)

Correlation does not equal causation and nuclear investment may coincide with economic growth, but that doesn't mean it caused it.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear power is environmentally friendly because it produces very low carbon emissions

Facts

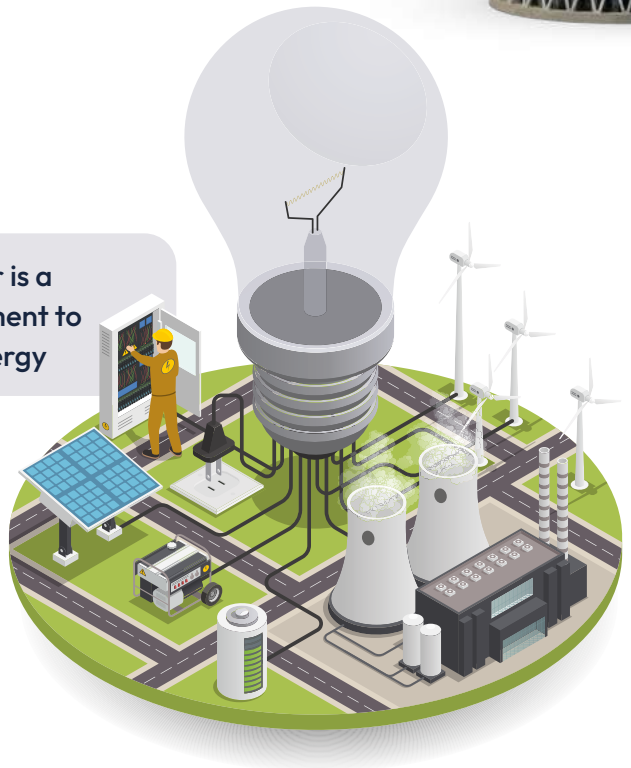
Yes, nuclear power has a relatively low carbon footprint comparable to wind and solar but this does not make it clean or environmentally harmless.

The Whole Lifecycle Must Be Considered:

While the operational emissions are low this excludes the significant emissions from:

- Uranium mining and refining
- Construction of reactors (which requires enormous quantities of steel and concrete)
- Radioactive waste management and decommissioning.

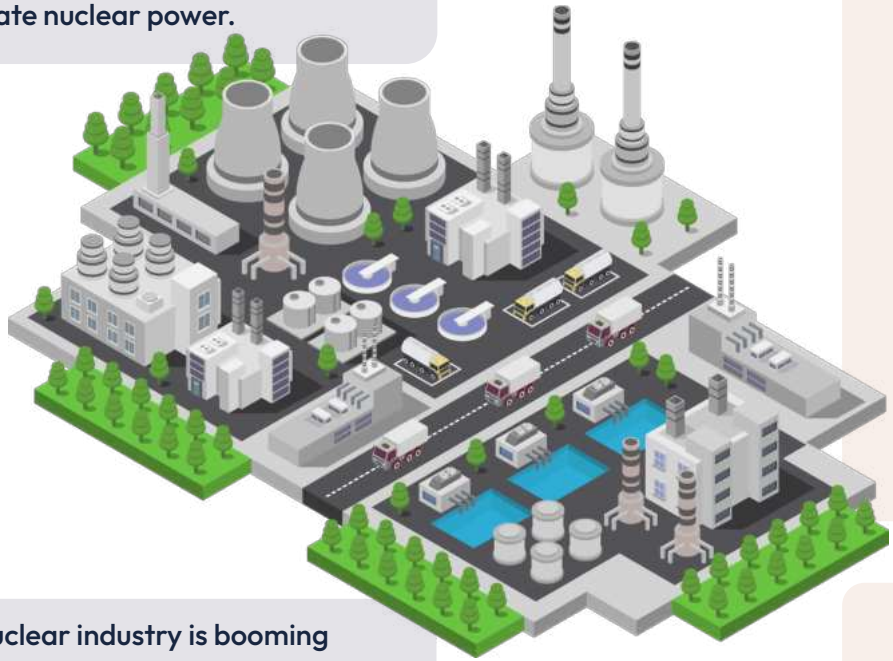
Nuclear power is a good complement to renewable energy



Nuclear power plants are not well-suited for load-following operations. Even if the technology allows for it, utilizing this capability is economically impractical. This is primarily because the majority of nuclear power costs are capital-related; operating the plant at only 50% capacity would effectively double the cost of electricity per kilowatt-hour (kWh), making it significantly less competitive.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Uranium is found on six continents, and only a small amount is needed to generate nuclear power.



The nuclear industry is booming as many countries invest in it.

Facts

While uranium exists in multiple regions and requires smaller volumes than fossil fuels, it is:

- Finite and non-renewable
- Politically controlled by a few exporting countries
- Environmentally costly to extract and refine.

Uranium mining and enrichment are energy-intensive, produce radioactive waste, and cause radiation exposure risks to local communities and miners.

Even though the volume is small, the toxic legacy of uranium fuel both during and after use is massive and long-lasting.

Yes, a few countries are initiating nuclear projects but majority of the countries are scaling down, delaying, or decommissioning nuclear programs due to the:

- High costs
- Waste disposal problems
- Public opposition
- Better alternatives in renewables

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear power is essential for climate goals and should be part of a sustainable energy mix.

Facts

According to OECD NEA and World Nuclear Association (both pro-nuclear sources):

Even doubling global nuclear capacity by 2050 would only reduce global greenhouse gas emissions by ~4%.

To achieve that the world would need to build 37 new large reactors every year until 2050 which is a logistically, financially, and politically unrealistic target.

Nuclear power plants use less land and are therefore better than solar or wind

While a 1,000 MW nuclear plant physically occupies about 2.5 square kilometers, the required safety exclusion zone around it is much larger, up to 80-kilometer radius in some proposals.

The land nuclear plants occupy is small, but the safety zones can displace tens or hundreds of thousands of people.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

The benefits of Kenya's nuclear power project outweigh the potential negative impacts

Kenya needs a nuclear reactor to advance nuclear medicine and treat diseases like cancer.

Facts

Evidence shows that the risks and long-term consequences, particularly in the event of a nuclear accident, could be devastating for the entire Coastal region and far outweigh the benefits, especially when renewable alternatives are available.

In case of an accident, like Fukushima or Chernobyl:

- Contamination and evacuation zones can extend 80+ km, encompassing:
- Kilifi County
- Mombasa
- Parts of Tana River County

This affects hundreds of thousands of people, and no community in this zone has been adequately informed or consulted.

Nuclear medicine does not require a nuclear power plant or uranium enrichment facilities.

Modern medical isotopes used for cancer diagnosis and treatment are mostly produced using particle accelerators or cyclotrons, not nuclear reactors.

Connecting nuclear medicine to the need for nuclear reactors is misleading.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Nuclear energy does not affect the ecology in nearby regions

Facts

Nuclear energy facilities significantly impacts local ecosystems and biodiversity:

- **Thermal discharge:** Nuclear power plants release large volumes of heated water into nearby rivers, lakes, or coastal areas. This alters local water temperatures, reducing oxygen levels and harming sensitive aquatic life, including coral reefs and fish populations.
- **Radiation risks:** In both normal operations and especially during accidents, radioactive materials can contaminate soil, water, and air leading to long-term ecological damage. Fukushima and Chernobyl provide clear evidence of widespread ecological disruption.
- **Land use and exclusion zones:** Even under normal operation, large areas around nuclear plants must remain sparsely populated or undeveloped for safety reasons affecting land use patterns and natural habitats.
- **Accidental contamination:** Leaks or improper waste handling can introduce radioactive isotopes into nearby ecosystems, impacting flora, fauna, and groundwater.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Small Modular Reactors (SMRs) are a cost-effective and a self-sufficient solution for nuclear power generation.

Facts

Over the past decades, the size of nuclear reactors has increased due to the benefits of economies of scale, as larger plants tend to generate electricity at a lower cost per kilowatt-hour (kWh). Small Modular Reactors (SMRs), however, forgo this advantage, potentially resulting in even higher electricity costs compared to conventional large-scale nuclear plants. Moreover, SMRs are typically designed to be serviced only at the manufacturing facility. This means they would need to be returned to the factory approximately every 10 years for refueling, which could make Kenya dependent on foreign companies for critical aspects of its energy infrastructure.

The 1000MW Nuclear Power Plant that is proposed by NuPEA is not an SMR. Worldwide there are only 2 power generation SMRs in operation (in China and in Russia). There is no SMR in commercial operation in the USA. Various efforts to develop SMRs for commercial power generation in the USA have been unviable because of cost overruns and potential higher nuclear waste as compared to conventional nuclear power plants.

Arguments used by Kenya's Nuclear Power and Energy Agency (NuPEA) and Nuclear Energy proponents

Kenya is ready to explore nuclear energy

Facts

Kenya is not yet ready to explore nuclear energy

There appears to be a lack of the necessary seriousness and strategic direction within NuPEA and the broader Ministry of Energy to support the successful development of a Nuclear Power Programme in Kenya. To date, NuPEA has not presented a compelling business case demonstrating the necessity of a nuclear power plant for the country.

The demand forecast provided by the Ministry of Energy appears to be significantly overstated, and there is currently no publicly available study from NuPEA that justifies the selection of a nuclear power plant over more cost-effective renewable energy sources, such as geothermal.

Furthermore, NuPEA has not produced a comprehensive study outlining the transmission infrastructure required to integrate a nuclear power plant into the national grid. This includes a lack of clear, actionable plans for financing and implementing what would likely be substantial and costly transmission system upgrades.

CENTER FOR JUSTICE GOVERNANCE AND ENVIRONMENTAL ACTION

P. O. Box 630 - 80108,
Kilifi, Kenya.
Email: info@centerforjgea.com
www.centerforjgea.com