



# African Climate Reality Project

## Nuclear energy: Are Africans being taken for a ride?

### Summary

#### **Nuclear roll out throughout Africa**

17 African countries – Algeria, Egypt, Ghana, Kenya, Libya, Morocco, Namibia, Niger, Nigeria, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda and Zambia – are either seriously considering, conducting pre-feasibility studies or rolling out national nuclear programmes.

#### **What are the African Climate Reality Project's main issues and concerns with nuclear in Africa? Why are we opposing it?**

The African Climate Reality Project is opposed to nuclear for electricity generation in Africa because:

- Nuclear is not a clean source of energy
- Nuclear is not safe
- Nuclear creates health hazards for African citizens
- Nuclear is very expensive
- Nuclear is the inappropriate technology to meet energy needs in Africa
- Nuclear uses lots of water
- Nuclear does not create more jobs than other forms of electricity generation

Finally, the African Climate Reality Project is hugely concerned about the lack of transparency in the extractive and the nuclear industries. We believe that African citizens are being taken for a ride by their governments.

#### **What is the African Climate Reality Project recommending as a better, safer, cheaper way to meet Africa's growing energy needs?**

As the rest of the world shuts down their nuclear facilities and stops building more, the African Climate Reality Project urges African governments to invest in renewable energies such as sun, water and wind that are both cheaper and better for the environment.

## Nuclear roll out throughout Africa

South Africa, the only country in Africa that has an operational nuclear power generator, announced that it will ramp up its nuclear programme to include a fleet to generate 9,600 MW of power at a cost of \$100 billion.

The governments who are considering or planning nuclear energy programmes present them as a way to increase the proportion of 'clean' energy while ensuring access to reliable and sustainable power, an important stepping stone towards development. They also argue that investing in nuclear energy will boost their economies.

There is extensive evidence that nuclear energy is unsafe, that it doesn't solve accessibility issues, that it is bad for people, the environment and extremely expensive.

Are African citizens being cheated by the nuclear industry? Or, are African governments taking their citizens for a ride?

## Why is the African Climate Reality Project concerned about nuclear energy?

Nuclear energy has been found to be unsafe, bad for people and the environment. It is by no means a 'clean' energy, including in terms of CO<sub>2</sub> emissions released throughout the whole fuel cycle. Furthermore, nuclear energy, when compared with renewable energy, is extremely expensive.

Renewable energy is energy generated from natural resources—such as sunlight, wind, rain, tides and geothermal heat—which are renewable (naturally replenished). Renewable energy technologies include from solar power, wind power, hydroelectricity/micro hydro, biomass and biofuels for transportation.

### 1. Nuclear energy is NOT a clean source of energy

#### 1.1. The unspoken carbon footprint of nuclear energy

While people who support nuclear energy say that nuclear is a form of 'clean' energy with no greenhouse gas emission, nuclear energy does have a carbon footprint from its generation cycle that is often not calculated (OLINGO, 2016). The mining, milling, processing, conversion, enrichment and transportation of uranium fuel for reactors are all carbon-intensive processes, as are the construction and decommissioning of the plant. According to Earthlife Africa, nuclear power releases 3-4 times more CO<sub>2</sub> per unit of energy produced than renewable energy does.

### 1.2. Pollution and high-risk, long-lasting radioactive waste

Waste is generated at all stages of the nuclear fuel cycle, from uranium mining and enrichment to reactor operation, the reprocessing of spent nuclear fuel and the decommissioning of nuclear facilities.

Nuclear waste will remain dangerous for tens of thousands of years – up to a million years. This also means someone has to pay to store that waste, and keep it safe, for that length of time (Kings, 2016; GreenPeace, 2016). Most concerning is that despite lots of money being invested in researching various disposal options, the nuclear industry and governments have failed to come up with a feasible and sustainable solution.

Uranium mining results in tailings which contain uranium, thorium, radium, polonium, and emit radon-222. Conversion plants, where uranium oxide is turned into uranium hexafluoride, generate another both solid and liquid waste (Thorpe, 2008). Contamination of local water supplies around uranium mines and processing plants has been documented in Brazil, Colorado, Texas, Australia, Namibia and many other sites. The long-term management cost of these dumps are generally left out of the current market prices for nuclear fuel and is estimated to be almost as high as the uranium cost itself.

More waste is generated at the nuclear facility in the form of high-level and low-level waste. High-level nuclear waste mostly in the form of spent fuel rods from reactors, in USA or Russia is wrapped in glass cement and lead and buried underground. However, most countries have not found a solution to storing their high-level nuclear waste and so they leave it next to the nuclear reactors – hoping to find a solution to clean or safely store the dangerous residue. In South Africa, low-level nuclear waste, such as contaminated clothing, is stored in metal and concrete drums at the Vaalputs waste site in the Northern Cape.

### 2. Nuclear energy is NOT safe

Safe nuclear reactors do not exist. Accidents can happen at any nuclear reactor. Two examples are the accident at Fukushima in Japan (2011) where the nuclear plant was struck by an earthquake and tsunami; and the accident at Chernobyl in Russia (1986) where there was a steam explosion, followed by a fire at a nuclear reactor. The release of radiation has resulted in deaths, public health problems such as increased cancer epidemics from people that mine uranium or live close to uranium mines or nuclear facilities, the loss of livelihoods and homes for people living close to these dangerous places. In addition to accidents, nuclear plants are highly vulnerable to deliberate acts of sabotage and terrorist attack, making security a key concern.

### 3. Health hazards

'The effects of uranium mining are disastrous.' (Thorpe, 2008).

Uranium mining has a legacy of terrible health, water contamination and other pollution problems. Uranium mining and milling poisons watercourses and affects

miners and surrounding communities, as seen at Tudor Shaft in South Africa. Radioactive exposure continues in the enrichment phase and also in the normal operation of a plant, due to both routine and accidental gaseous and liquid emissions of radioactive isotopes.

#### **4. A very costly source of energy**

Nuclear energy is prohibitively expensive – especially when compared to renewable energy facilities. In South Africa, a 2016 study by the Centre for Scientific and Industrial Research (CSIR) found that nuclear energy will cost at best R1,17 per kilowatt hour (kWh) whereas renewable energy *already* costs R0,62 per kWh. These cost calculations do not include the costs of rehabilitation or disastrous accidents. In scenarios about the future energy mix for South Africa, the CSIR further indicates that an energy mix including 11,4% of nuclear energy capacity (as planned) would cost R90 billion more *per year* by 2040 than a scenario with only 2% of electricity generated from nuclear. Nuclear energy developments are difficult to finance as most development agencies and banks tend to not want to fund them – and from an economic and development perspective, the money spent on nuclear developments could be used to fund improved public transport, health and education in addition to renewable energy. Finally, experience shows that nuclear energy development projects always run behind schedule and are always costlier than the initial calculations.

#### **5. Nuclear energy is the inappropriate technology to meet the growing electricity demand**

Besides the concerns that the African Climate Reality Project has raised above, nuclear proponents claim that only with nuclear energy can African countries meet baseload electricity demand and their growing need for electricity. These arguments are both untrue.

Baseload supply is the constant level of power needed. It can be met from a variety of renewable energy sources such as wind, solar and hydro provided that the grid is improved and expanded accordingly. This means that neither coal nor nuclear energy is indispensable to meet electricity needs. Renewable energies installations are quick to set up, thus providing a real solution to meeting the growing demand and ensuring access to electricity to all rapidly. They offer the opportunity to leapfrog 'conventional' energy sources which have proven harmful to the environment, to people's health and are costlier than renewable energy.

#### **6. Nuclear energy uses lots of water**

Nuclear energy uses more water than any other form of electricity generation – nuclear uses over 190 000L of water per Megawatt Hour (MWh) compared to wind which uses less than 1L of water per MWh. In a water scarce continent, this is a hugely important factor that needs to be taken into consideration.

## Water used to generate 1 megawatt hour of electricity (MWh)\*



\* 1 MWh is the electricity needed to power 650 average-size homes for 1 hour.

### 7. Nuclear energy does not create more jobs

Data gathered by Earthlife Africa shows that nuclear energy creates the least jobs per megawatt when compared to all other forms of electricity generation. In Africa, where we have high unemployment statistics and a young population that will need jobs, our governments should take job creation and employment into consideration when making decisions regarding electricity generation.

Jobs directly created from generating electricity	
Energy technology	Total jobs per megawatt (MW)
Nuclear	0.5
Biomass	1.0
Gas	1.2
Coal	1.7
Wind	4.8
Landfills	6.0
Solar panels	35.4

### 8. The lack of transparency

The African Climate Reality Project is hugely concerned about the lack of transparency in the extractive and the nuclear industries. Uranium mines are dangerous and yet the dangers are not fully explained to people and communities who work and live in close proximity to these mines. Nuclear facilities too are dangerous and yet many African countries are still told that nuclear will solve Africa's energy crisis.

Finally, the current nuclear fad on the continent raises serious governance concerns. In South Africa, some members of the government secretly signed a deal with Russia's state nuclear agency, Rosatom – without public participation, which leads us to believe that some members of the government have gained financially from this deal. We suspect that the surge in nuclear energy programmes on the continent can in part be explained by similar deals and corruption taking place all over Africa. The Chinese- and Russian-led nuclear scramble in Africa are motivated by these two countries' need to secure access to uranium reserves. At the same time, they are solidifying their overall political and trade hold on African countries and their leaders – which is not to

the benefit of African citizens, the continent's economy and its ability to define its own sustainable development pathway.

## Conclusion

The African Climate Reality Project believes that African citizens are being taken for a ride by their governments. Nuclear energy is unsafe, bad for the environment and for people and is very costly. It is an inappropriate solution to electricity poverty on the continent. African citizens are either not being told the truth about nuclear or their government officials are not being transparent and are gaining financially from these deals.

As the rest of the world shuts down their nuclear facilities and stops building more, the African Climate Reality Project urges African governments to invest in renewable energies such as sun, water and wind that are both cheaper and better for the environment.

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