

Gaopalelwe Santswere

## Africa's Need for Nuclear Power and Nuclear Medicine

*This is the edited transcript of the presentation of Gaopalelwe Santswere to Panel 2, "Physical Economy: Developing the Noosphere," of the Schiller Institute's Nov. 12, 2022 Conference, "The Physical Economy of the Noosphere: Reviving the Heritage of Vladimir Vernadsky." Mr. Santswere is a nuclear physicist and senior scientist at the South African Nuclear Energy Corporation. He is the President of the African Young Generation in Nuclear (AYGN).*

*The video of Mr. Santswere's presentation is available [here](#).*



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opportunity to industrialize to have a future in the continent which would create sustainable jobs, to improve the conditions of the Africans in order to ensure that they can move forward.

There has been quite a robust debate within the continent as to what sort of technology should the continent adopt in order to ensure that we can move forward, and also develop the continent for the sustainability of most of the continent's population, which are young people. So, when we look at the types of energy sources that we have, we know that

there is some potential hydro in the Democratic Republic of Congo, which can potentially give us 40,000 MW of electricity. But we know what is the problem there: The geopolitical instability, regional instability that has caused the delay of this project seeing its life.

So we have seen, recently also, in the topic of hydro, Ethiopia has just launched or commissioned a hydro-power plant that is supplying most of the East African countries there. But it also was not completed without political tension with Egypt and Sudan, because they're saying that as it continues to fill up, it could potentially dry up some of the [downstream areas in Sudan and Egypt] and also affect the income.

Now we have seen the potential contention between the use of coal or hydrocarbons within the world: The world is saying that we need to move away from hydrocarbons and move to more clean energy that will sustain the world moving forward. But that being said, we're seeing that world has not been achievable because of what we have seen in terms of the energy crisis in Europe and so forth.

So for Africa to develop, one of the energy sources that we foresee potentially could develop Africa is the use of nuclear power. We know that in Africa we've got two units at Koeberg Nuclear Power Plant in South Africa, that are continuously supporting South African electricity to almost 2,000 MW. But it's the only two power reactors that are currently existing in the continent.

**Gaopalelwe Santswere:** Thank you very much for the opportunity to be part of the speakers today on a very important topic of the growing youth movement for nuclear power and nuclear medicine in Africa. We've seen that Africa has adopted what is called the Agenda 2063. One of the ancestors of Agenda 2063 is the need for integration, as one of the key foundations for assuring Africa achieve its goals for inclusive and sustainable growth and development. There we have seen that within the African Agenda 2063, there are about seven aspirations. Just to give you one of the most fundamental ones, which is Aspiration 2 of this Agenda 2063, placing import on the need for Africa to develop world-class infrastructure that criss-crosses Africa and which would improve connectivity through newer and bolder initiatives to link the continent by rail, road, sea, air, and develop regional and continental power pools, as well as ICT [Information and Communication Technology].

So there's a need for us, if you look at the United Nations Sustainable Development Goals, to assure access to affordable, reliable, sustainable and modern energy for all.

Now, if you take a look at Africa, we've got about 620 million Africans who are sitting without power. So out of 1.2 billion, you can see that almost half of Africans don't have access to electricity. Therefore, Africa has not the

We have seen a number of countries expressing interest within the African continent, countries like Kenya, countries like Nigeria, countries like Ghana and so forth, who want to introduce nuclear power, due to the demand or energy poverty that their populations are subjected to. We have seen recently that Egypt has started construction on 4,800 MW of new nuclear power plants in the continent. This is very much welcome, because we have seen that now nuclear is starting to expand within the continent, and this will bring much relief in terms of the energy poverty that the continent has been experiencing for decades. We know that Africa is mostly referred to as “the darkest continent” because of lack of access to electricity.

So, one of the things that we need to do, in Africa in terms of energy, is to have a strategic plan that will ensure its society or citizens’ wellness within the continent; energy security which takes consideration of the environment; and competitiveness, including affordability and funding, in order to ensure that we have got economic growth and transformation, job creation, and equitable share in fulfillment of the African objective.

Now, when we look at a nuclear power plant, it is one of the most affordable [sources of] electricity. We can take cognizance that when you look at the power generation in South Africa in terms of the cost per kilowatt, nuclear is very, very low compared to other energy sources. Most of the developed countries in the world, they exist because the economy is based also on the development of nuclear power, so therefore, Africa must take some of the lessons from the world to ensure that they also can emphasize energy security, they also improve the lives of their citizens, by developing the nuclear power plan.

So, one fact is that we have over the years developed what we call the African Young Generation in Nuclear, which has enabled the young generations within the continent to emphasize why there is a need for us to go nuclear. We have emphasized that the bottom aspect of this is because Africa has to develop its own capacity and ensure that it addresses the socioeconomic issues of the continent through the promotion of nuclear power technology in Africa.

So, we need to do this. We have been doing it by degrees, to define, first, nuclear technology and educating the public about the benefits of nuclear for the public. We have facilitated the student government platforms and knowledge transfer platforms between the current generation of leading nuclear experts and

the young generation about the nuclear profession.

What we are doing is, we have offered the platform to share, exchange ideas, and network on issues related to nuclear science and technology. Because what we have seen is that once we have addressed the energy issues, we have addressed a lot of things. And we strongly believe that nuclear has the capacity to address what Africa is lacking currently. And just to mention a few: We’ve seen that when you develop nuclear, you develop an economy in terms of energy security and by socioeconomic development. We align with national goals in terms of national development plans for energy transfer, and diversifying the African continent’s energy mix, which opens up an array of opportunities within the energy sector. It gives you the benefit of industrialization, and beneficitation within the [African] economy, translating to a higher and inclusive growth path and job creation. Of course, this will increase the pace of inclusive growth, which will face the biggest challenges on the continent.

Also bearing in mind, for sustainable economic growth we need to develop a technology that can develop and advance the economic wellbeing of the African continent.

So what we need also to recognize is that nuclear technology is not only power related. We can also apply it in different sectors like agriculture, nuclear medicine, and so forth. We know, just from the International Atomic Energy Agency this year there was a scientific forum focusing on the Rays of Hope initiative to ensure there can be access to cancer care. So we strongly believe that the nuclear technology can address that kind of issue.

We know that the continent has been losing quite a lot of money, where the patients are taken out of the continent to get care in the East or in Europe. So therefore, we strongly believe in the development of cancer treatment within the continent through radiotherapy, through access to nuclear medicine. Of course, we understand that cancer is one of the most killing diseases of the continent. So diagnosis and treatment of cancer will ensure that the development of Africa moves forward.

Just to give you an example: For a treatment for cancer, for example prostate cancer, we’ve seen South Africa developing the [radioactive isotope] Lutetium-177 production facility, which we have seen can treat prostate cancer much better.

So with that, I would like to say thank you for the opportunity. Thank you very much, and we look forward to the discussion.