

**IAEA General Conference Side Event**  
**Expanding Access to Peaceful Uses of Nuclear Power:**  
**Ghana's Successful Implementation of Phase 1 of the IAEA Milestones**  
**Approach**

Today, 32 countries are operating commercial nuclear power plants, with two countries, the United Arab Emirates and Belarus having started up their first nuclear power plants in 2020. But many other countries are interested and have initiated studies or taken steps to develop the national infrastructure required for nuclear power. Some of these countries have progressed steadily and are now in Phase 3 of the IAEA Milestones Approach<sup>1</sup>, constructing their first nuclear power plants. But there are also a number of countries for whom the progress has been slow, as well as countries who started their investigations more recently and are still in the early phases of the Milestones Approach.

It is often the case that a country considering nuclear power already has some infrastructure for radiation safety, nuclear security, emergency preparedness and safeguards. Building on the existing experience can greatly assist a country in establishing the infrastructure necessary for a nuclear power programme. Ghana is one of these countries. Ghana has been interested in nuclear power for a long time, and in 2008, the Government established a presidential committee to report on the feasibility of adding nuclear to Ghana's energy mix. Based on the committee's report, and in line with the IAEA Milestones Approach, the Ghana Nuclear Power Programme Organisation (GNPPO) was formed in 2012 to oversee a systematic and methodical investigation of the national infrastructure required to implement a nuclear power programme. Ghana does not have the resources of a high-income country but nevertheless has been able to progress through the "studying and planning" Phase 1 of the Milestone Approach, requesting and hosting an IAEA Phase 1 Integrated Nuclear Infrastructure Review (INIR) mission in 2017 and an INIR Phase 1 Follow-Up mission in 2019, and transitioning successfully into Phase 2.

On 22 September 2021, during the 65th IAEA General Conference, the VCDNP and the Permanent Mission of Ghana to the UN in Vienna organised a hybrid (in-person and virtual) side event on Ghana's successful implementation of phase 1 of the IAEA Milestones Approach. Ghanaian Ministers and Directors-General of key organisations provided insights into the importance of government and stakeholder support, the coordination role of the GNPPO, establishing a 3S (safety, security and safeguards) nuclear regulatory authority, and the early designation and activities of an owner/operator for the future nuclear power plant.

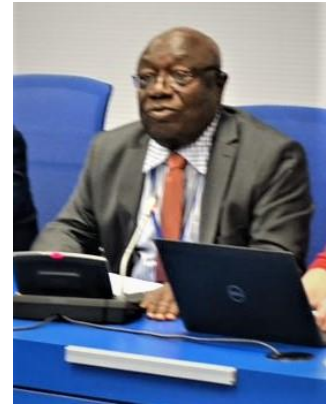
Speakers during the side event were:

- Ms Elena Sokova, VCDNP Executive Director (Opening Remarks)
- Hon. Dr Kwaku Afriyie, Minister for Environment, Science, Technology and Innovation
- Hon. William Owuraku Aidoo, Deputy Minister of Energy
- Prof. Ben Nyarko, Director General of the Ghana Atomic Energy Commission
- Dr Nii Allotey, Director General of the Ghana Nuclear Regulatory Authority
- Dr Stephen Yamoah, Executive Director of Nuclear Power Ghana
- Ms Ingrid Kirsten, VCDNP Senior Research Associate (Moderator)

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<sup>1</sup> IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1) Milestones in the Development of National Infrastructure for Nuclear Power (2015)

In his statement, **Minister Kwaku Afriyie** noted that Ghana celebrated the African Scientific Renaissance on 30 June 2021 with a focus on the country's readiness for nuclear power. He emphasised that Ghana is committed to the peaceful uses of nuclear power and has established the structures and systems that allow Ghana to properly address all 19 infrastructure issues of the IAEA Milestones Approach, including that of the management of radioactive waste.



*Hon. Dr Kwaku Afriyie, Minister for Environment, Science, Technology and Innovation*

Minister Afriyie spoke about climate change, noting that it is a significant threat for Ghana, as the country is susceptible to both the Atlantic Ocean and Sahelian climate effects. The Ghana nuclear power programme is a national programme that has the potential to contribute immensely to the country's commitment to reducing its carbon footprint in the energy sector and to reducing the negative environmental impact of the energy sector. The Comprehensive Report of the results of the Phase 1 studies

that was developed as a decision basis document for the Ghana Government, identifies nuclear power as a climate mitigating technology that will support Ghana in contributing to the global effort.

The Minister concluded that Ghana is willing to take up the challenge of introducing nuclear energy into its energy mix while efforts are put in place to contribute to the climate action and also the global effort of finding a final repository for its long-term radioactive waste.

The full text of the Minister's statement is available [here](#).<sup>2</sup>

**Deputy Minister William Owuraku Aidoo** echoed the Minister's statement, noting that the Ghana nuclear power programme was a very strategic developmental agenda to drive all sectors of the economy through the provision of affordable energy. He expressed the view that fossil fuels for electricity generation are going to be the thing of the past and as a country, Ghana needs to strategically plan for future electricity generation through clean fuels, and hence Ghana is strongly pursuing the nuclear power agenda to achieve this purpose. The Deputy Minister noted the government's commitment to the nuclear power programme, evidenced by the setting up of the Ghana Nuclear Power Programme Organisation (GNPPO) in line with the recommendations of the IAEA Milestones Approach. Further, the Ghana Nuclear Regulatory Authority and Nuclear Power Ghana, the owner/operator of the future nuclear power plant, have already been established.



*Hon. William Owuraku Aidoo, Deputy Minister of Energy*

Deputy Minister Aidoo stated that nuclear energy is expected to be centre stage as a key game changer at the Climate Change Conference of the Parties (COP26) in Glasgow later this year, and Ghana has already set the pace by including nuclear power in its climate change action policy and its Nationally Determined Contributions.

The full text of the Deputy Minister's statement is available [here](#).<sup>3</sup>

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<sup>2</sup> Also available at: [https://vcdnp.org/wp-content/uploads/2021/10/Minister-Opening-Remarks\\_R1-1.pdf](https://vcdnp.org/wp-content/uploads/2021/10/Minister-Opening-Remarks_R1-1.pdf).

<sup>3</sup> Also available at: <https://vcdnp.org/wp-content/uploads/2021/10/Deputy-Ministers-opening-remarks.pdf>.

**Prof. Ben Nyarko's** presentation focused on the role of the Ghana Nuclear Power Programme Organisation (GNPPO). He noted that the GNPPO is a coordinating mechanism that provides policy direction to the key institutions and the nuclear power programme. Prof. Nyarko explained that since nuclear power is intended for the generation of electricity, the GNPPO mandate with respect to the nuclear power plant project is drawn from the Ministry of Energy. The Deputy Minister of Energy is the Chair of the GNPPO. However, the government advisor on all nuclear related matters is the Ghana Atomic Energy Commission (GAEC) which reports to the Ministry of Environment, Science, Technology and Innovation. This latter Ministry provides the mandate with respect to the overall nuclear power programme and the development of the required infrastructure. The Director General of the GAEC is the Deputy Chair of the GNPPO.



*Prof Ben Nyarko, Director General of the Ghana Atomic Energy Commission*

Prof. Nyarko emphasized the importance of providing technical support to the GNPPO, addressing all 19 infrastructure issues of the IAEA Milestones Approach. The Nuclear Power Institute under GAEC has admirably performed this role, providing the technical support itself or coordinating the support of other competent organisations within Ghana, coordinating the IAEA INIR Phase 1 mission to Ghana, establishing a management system for Phase 1 activities and coordinating the development of the Comprehensive Report at the end of Phase 1.

Prof. Nyarko concluded his presentation with the following advice:

- Establish a Nuclear Energy Programme Implementing Organisation (NEPIO) early in the programme with well-defined objectives and mandate.
- Assemble a young, talented, dedicated and competent team as the technical support to the NEPIO in order to address the 19 infrastructure issues.
- Establish national project(s) with the IAEA and identify the right people with the right attitude to work with the IAEA to achieve the objectives of the project(s).

Prof. Nyarko's presentation is available [here](#).<sup>4</sup>

The Ghana Nuclear Regulatory Authority (GNRA) was established in 2016 by the NRA Act 2015 (Act 895). **Dr Nii Allotey** explained that the scope of GNRA covers the regulation and management of activities and practices for the peaceful use of nuclear energy and radiation, the management of radioactive waste and spent fuel resulting from civilian applications in Ghana, and liability for nuclear damage. The initial staff of GNRA were transferred from GAEC in 2016.



*Dr Nii Allotey, Director General of the Ghana Nuclear Regulatory Authority*

Dr Allotey described the benefits of having safety, security and safeguards within the mandate of the GNRA, noting that having the three areas together facilitates good synergy and understanding between the three areas, limits coordination problems between the relevant personnel,

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<sup>4</sup> Also available at: [https://vcdnp.org/wp-content/uploads/2021/10/Nyarko\\_The-Role-of-Ghana-Nuclear-Power-Programme-Organization.pdf](https://vcdnp.org/wp-content/uploads/2021/10/Nyarko_The-Role-of-Ghana-Nuclear-Power-Programme-Organization.pdf).

supports the development of robust and well-integrated regulations and helps to identify any interface loopholes during implementation.

Dr Allotey emphasised the importance of cooperation with other organizations and agencies in Ghana, such as the Environmental Protection Agency. Detailed MOUs are being developed, while platforms such as the Nuclear Security Committee are being used to strengthen cooperation with other organisations. Bilateral agreements with international bodies including nuclear regulators, such as the US Nuclear Regulatory Commission, the Canadian Nuclear Safety Commission, and the European Union Instrument for Nuclear Safety Cooperation are being implemented, providing support for the development of regulations, regulatory systems and training of GNRA staff. Dr Allotey commented that through appropriate cooperation with bilateral partners and other national and international agencies, GNRA is building its capacity to be an effective independent regulator for Ghana's nuclear power programme.

Dr Allotey's presentation is available [here](#).<sup>5</sup>

**Dr Stephen Yamoah** provided an overview of Nuclear Power Ghana (NPG), the State institution responsible for the project development, operations and maintenance of the envisaged nuclear power plant. He noted that all 19 infrastructure issues of the Milestones Approach are important and must be addressed. To take into account their inter-relationship, NPG has identified four thematic areas that cover all 19 infrastructure issues in Phase 2:



*Dr Stephen Yamoah, Executive Director of Nuclear Power Ghana*

- studies and selection for a preferred site;
- financial aspects that lead to the selection of a vendor or a strategic partner;
- stakeholder engagement with communities, organisations, and institutions, including the development of a virtual information centre (and later a physical information centre) and activities related to education and awareness building for secondary and tertiary students and the public; and
- planning, preparation and development of related nuclear project infrastructure.

This latter thematic area includes the development of a safety, security and safeguards programme, policies and strategies for the fuel cycle and radioactive waste management, integrated management systems and human resource development. Dr Yamoah stated that a comprehensive and integrated 5-year workplan has been developed that identifies the key activities that must be implemented, monitored, and completed by NPG in Phase 2. A risk management framework has been developed to support the implementation of the nuclear power plant project.

Dr Yamoah's presentation is available [here](#).<sup>6</sup>

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<sup>5</sup> Also available at: [https://vcdnp.org/wp-content/uploads/2021/10/Allotey\\_2021\\_VDCNP\\_Meeting\\_R2.pdf](https://vcdnp.org/wp-content/uploads/2021/10/Allotey_2021_VDCNP_Meeting_R2.pdf).

<sup>6</sup> Also available at: [https://vcdnp.org/wp-content/uploads/2021/10/Yamoah\\_NPG\\_IAEA-GC\\_VCDNP\\_Workshop.pdf](https://vcdnp.org/wp-content/uploads/2021/10/Yamoah_NPG_IAEA-GC_VCDNP_Workshop.pdf).

The presentations were followed by a robust discussion session during which the speakers emphasised that the Ghana nuclear power programme has wide political support aimed at energy security for Ghana but also for the West African region, while ensuring that climate change goals can be met. The speakers confirmed that large nuclear power plant technologies that are currently commercially available will meet Ghana's needs and are consistent with the electrical grid studies that have been performed. Ghana will continue to monitor the progress with the deployment of SMRs but will not consider "first of a kind" technology for its nuclear power programme. Ghana intends to use the energy produced by the nuclear power plant to help meet the current electricity needs of the country and stimulate economic development including through the development of the mining sector. The human resource development strategy for GNRA and NPG envisages the recruitment of Ghanaians, with further development and training as required. The progress in the development of the Ghana nuclear power programme has been facilitated by the country's long involvement with the IAEA, through the Ghana Atomic Energy Commission, in the peaceful uses of nuclear technology for non-power applications. In turn, it is anticipated that the implementation of the nuclear power programme will contribute to the expansion of the peaceful use of nuclear technology in all applications, power and non-power.

