

SUPPORTING NEW NUCLEAR POWER PROGRAMMES

The decision to introduce nuclear power is one of the most far-reaching policy choices a government can make. It is a complex decision. A nuclear power programme is a commitment of at least a century, from planning, through construction, to operation, waste management and eventually decommissioning. "It is a sophisticated technology that requires sophisticated planning, yet the countries that are now considering a nuclear power programme can rely upon the cumulative experience that over 30 operating countries have acquired in the past 50 years, and the systematic support provided by the IAEA", states Anne Starz, Head of the Integrated Nuclear Infrastructure Group at the IAEA.

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The step from 'newcomer' to operator requires up to two decades of planning, licensing and construction before the plant delivers electricity. Thirty years ago, a country building its first nuclear power plant did not have the network of international and bilateral support that newcomers can call upon today. Specialized knowledge is available via international and bilateral cooperation to help newcomers establish the necessary legal, regulatory and human infrastructure. In addition, newcomers profit from the know-how acquired through three decades of nuclear safety peer reviews, expertise in developing human resources and management systems, energy planning, feasibility studies, site selection, technology assessment, handling financial risks, and managing waste.

"There are no shortcuts", Starz explains. "Newcomers have more to learn than their predecessors had to master 30 years ago, yet we find that since they are starting from the very beginning, many lessons learned have been acquired and expensive mistakes can be

avoided. They are not alone in this enterprise, as they might have been years ago when countries were pioneering this technology."

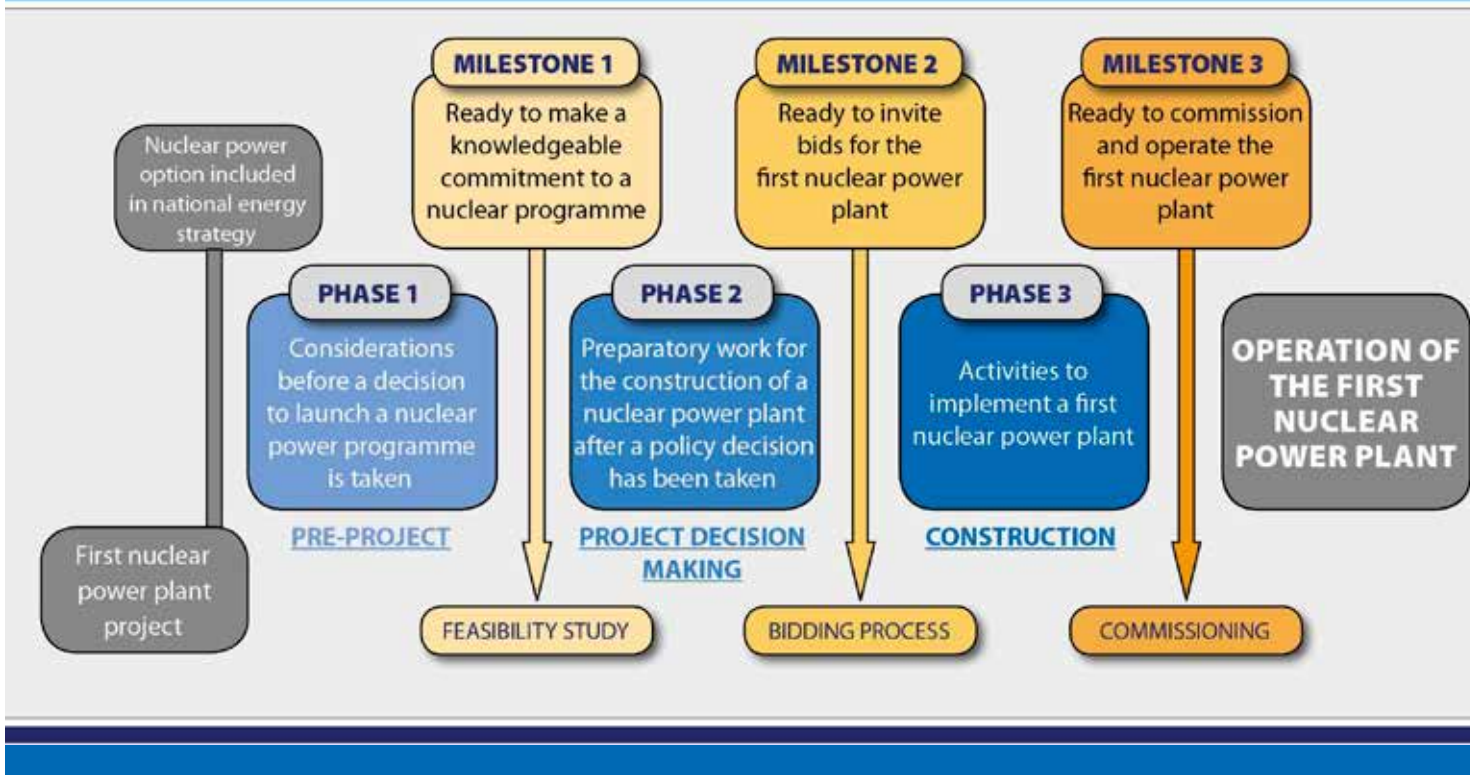
The IAEA Member States that are actively working towards introducing a nuclear power programme, and those that are considering that decision, share several main challenges. They need to find a method to cement support for a project that will begin to provide a return on investment several years after the decision is taken to pursue nuclear power. "It is much more likely that a country will be able to sustain the policy to introduce nuclear power, if all of the main governmental actors and stakeholders are aligned in their commitment to the enterprise. That is one of the main purposes of systematic stakeholder involvement", Starz says.

For many developing countries, the relatively large capital investment needed to fund the reactor's construction can become one of the major obstacles. The IAEA supports countries in identifying means to handle the financial risks.

Another issue that arises early in the planning is the need for an experienced nuclear workforce, which probably does not exist when the decision is taken to introduce nuclear power. Starz explains that human resource development is a classic 'chicken-and-egg' problem: "How can a country train people to safely operate the nuclear power plant, if no power plant exists? By the same token, countries need to know how to employ experienced people, if the nuclear power plant is not yet operational." The answer lies in workforce planning and human resource development, two areas in which the IAEA also provides support.

Another challenge, waste management, needs to be explained through stakeholder and public outreach. Starz explains, "Planning for waste management is like deciding how and when the airplane will land before it takes off". Nuclear safety is another extremely important area that is closely scrutinized by the public and the stakeholders. Following the Fukushima Daiichi nuclear accident, "Public confidence in nuclear power was shaken. Yet we see in those countries that are actively pursuing the introduction of a nuclear power programme, as well as in some countries with

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established nuclear power programmes, that public sentiment is elastic and has shifted to a supportive stance,” adds Starz.

Since the Fukushima Daiichi nuclear accident in March 2011, one IAEA Member State began constructing its first nuclear power plant. This was a notable development since it was the first time in 27 years that any newcomer had started construction of its first plant. Two more countries ordered their first nuclear power plants and another six have decided to introduce nuclear power and are actively preparing the related infrastructure.

All the countries that are introducing nuclear power will be making significant infrastructural decisions over the course of the coming decades. That decision-making process entails much more than technical considerations, such as choosing a reactor technology, site selection or capacity development. “The IAEA provides rational, structured guidance for nuclear power introduction through the ‘Milestones’ approach, which provides Member States with a methodology they can use to mark progress during the planning stages and to demonstrate their commitment to nuclear safety and control of nuclear materials. It emphasizes the need to build consensus on a decision that will affect many generations”, Starz notes.

IAEA guidance to newcomers was reviewed extensively after the Fukushima Daiichi nuclear accident. While the Milestones approach remains valid, greater emphasis will be placed on the role of the future owner-operator who has the primary responsibility for safety.

There is growing interest among IAEA Member States for IAEA support in reviewing nuclear power infrastructures in a systematic and integrated manner. Both established operators and newcomers have requested comprehensive, international peer reviews organized by the IAEA to assess progress in introducing nuclear power, or in an existing programme’s expansion. “With this guidance on the Milestones, the IAEA has set the bar higher for countries that wish to demonstrate progress, and, as a result, we see that this guidance is valued both by the newcomers and the established operators as it ensures a safer and more sustainable nuclear power programme”, Starz concludes.