

Small modular nuclear reactors for developing countries: Expectations and evidence

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Abstract

Many developing countries have shown interest in acquiring nuclear power plants, particularly small modular reactors (SMRs). By analyzing presentations made by national representatives at International Atomic Energy Agency conferences, we identified 3 key expectations of SMRs expressed by many officials: that they generate electricity at low cost, that the design be demonstrated through operating experience elsewhere, and that there be potential for local manufacturing associated with the nuclear power project. However, based on the available evidence regarding SMR designs, we demonstrated that these expectations are unlikely to be fulfilled. SMRs do not benefit from economies of scale, unlike large nuclear power plants. Because electricity from large nuclear plants is expensive, SMRs will produce more costly power. Second, it is unrealistic to expect that SMRs will qualify as proven technology in the near future because of the very limited number of SMRs currently in operation or under construction. The performance of currently operating SMRs has also been underwhelming. Finally, the idea of local manufacturing conflicts with the proposed economic model of mass production. At the same time, the skilled local workforce needed to operate these reactors is not readily available in many newcomer countries.

Introduction

Institutions promoting nuclear power in many countries, and a number of companies engaged in developing reactor designs, have advocated for small modular nuclear reactors (SMRs), often on the basis of utopian and futuristic visions (1). In parallel, there is also an ongoing effort to argue that SMRs will be valuable to developing countries (2–5). Supporters of nuclear power speaking at the annual SMR & Advanced Reactor 2022 event in Atlanta, Georgia, for example, reportedly “used the pressing electricity, heating, and drinking water needs of today’s fast-growing world population to justify the deployment of SMRs even in developing countries with no prior experience in the nuclear sector” (6). Previously, two academics argued that if “the cost of more advanced small modular reactor designs can be brought down, even to the range of conventional reactors, many nations may find SMRs an attractive way to meet their growing demands for electricity or process heat, and may find the smaller size more compatible with their smaller, less-developed electricity grids” (7).

Governments of countries with nuclear suppliers are adding their political clout to advocate for SMRs. In September 2024, for example, when the SMR developer NuScale signed an agreement with Ghana, US officials were effusive in their support, with Deputy Assistant Secretary for International Cooperation Aleshia Duncan saying that it was “imperative that the United States remain a strong and engaged partner, offering technical expertise and resources to ensure the successful deployment of

nuclear energy across the continent” (8). Such statements fit well with the long history of White Saviorism that has propelled various colonial and neocolonial ventures into Africa (9, 10). This is a feature underlying many aspects of energy planning, including in developing fossil fuels, hydropower, and renewables.

The International Atomic Energy Agency (IAEA), whose objectives include “to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world,” has long been interested in promoting SMRs for developing countries. In 2009, for example, it argued that SMRs “may provide an attractive and affordable nuclear-power option for many developing countries” because of their smaller electrical grids, limited infrastructure and restricted investment capability. (11) It has continued making this assertion [see, for example, Hidayatullah et al. (12)]. Its 2024 report on SMRs claimed that developing “countries are looking to SMRs as a more affordable option for smaller grids” (4).

Such claims have been repeated by members of institutions that shape investments in developing countries. More than a dozen years ago, an analyst from the World Bank argued, “Given their lower capital requirements and small size, which makes them suitable for small electric grids, SMRs can more effectively address the energy needs of small developing countries” (13). The World Bank has had an unsuccessful history of promoting nuclear energy, having invested in a failed nuclear project in Italy back in 1959 (14). That investment was based on many conditions,

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especially the absence of other cost-competitive alternatives. Even though that specific condition is no longer valid, because solar and wind power have become far cheaper than nuclear power, the World Bank recently decided to consider investing in nuclear energy. In 2021, a report published by the Economic Research Institute for Association of Southeast Asian Nations and East Asia endorsed SMRs as “more suitable than conventional large-scale reactors for developing countries” (15).

For their part, many developing countries have expressed an interest in SMRs. In 2021, the IAEA reported that through its “discussions with Member State representatives,” it had determined that “there is a great deal of interest” in SMRs, particularly “from developing countries with smaller grid capacities” (16). An example is Bangladesh. Following the 28th Conference of Parties to the Framework Convention on Climate Change, the Permanent Mission of Bangladesh to the United Nations touted SMRs saying that they “could offer developing countries new opportunities ... [and] be more economical and safer and offer a replacement for retired medium-sized coal or gas based plants... [and] could also open up the option for public–private partnerships” (17). A paper in *Energy Strategy Reviews* by a government official from Lesotho claimed that SMR designs could “solve Lesotho’s energy, agricultural and health challenges through their multi-functional abilities” (18).

Bangladesh’s Mission, however, added the important caveat: “the operational competitiveness of SMRs must be thoroughly evaluated before investing in FOAK [First Of A Kind] initiatives” (17). Bangladesh is not alone. Four members of Nigeria’s Nuclear Regulatory Authority offered this assessment: “The major drawback of this technology is that they still produce nuclear waste for which no known solution exists. The primary disadvantage of SMRs at the moment is their lack of development” (19). The authors explained their claim by pointing out that SMRs “do not yet exist as power reactors” and also highlighted some of their practical shortcomings: “nuclear reactors developed in size and output as manufacturers and operators realized commercial benefits from doing so. The economics of SMRs should logically be worse than those of big reactors. Furthermore, constructing a fleet of smaller, dispersed nuclear installations would undoubtedly cause more public opposition and increase security costs” (19).

These reservations are also reflected in the global map of SMR sites prepared by the Nuclear Energy Agency: the few sites in developing countries are marked as “non-binding agreements/MoUs/non-binding announcements” (20).

Such caveats and related questions about SMRs are the subject of this paper. In addition to categorizing these questions, we also evaluate whether SMRs can offer the kind of benefits that developing countries are looking for. To get a handle on these, we examine the expectations expressed by spokespeople for developing countries, and identify the ones that are widely shared. We then evaluate the evidence about various characteristics of SMRs and challenges these pose for SMRs meeting the expectations. Many proponents of SMRs offer arguments for why nuclear power may be appropriate for the country but do not carefully distinguish between whether the nuclear power should be generated by SMRs or standard-sized reactors. Though this lack of distinction can be confusing, it lays bare an important underlying point. To the extent that there are reasons for countries to consider the acquisition of nuclear power—diversification of fuel sources, for example—it does not really matter whether the nuclear power is generated in a small reactor or a large one. SMRs may be preferred, or not, only inasmuch as they meet the criteria laid out for the acquisition of nuclear power. Before we examine these

expectations, we offer a brief history of small reactors and outline the methodology that we have used to carry out our analysis.

A brief history

Interest in promoting smaller reactors to developing countries is not new and the nuclear industry has long offered a vision of powering developing countries with such plants, even before nuclear power was established at a commercial level. To be sure, these earlier rounds of advocacy focused on just small reactors, rather than on small modular reactors. Modular construction is intended to help ameliorate the loss of economies of scale associated with the lower power outputs of SMRs. At a historic conference held under the auspices of the United Nations in Geneva in 1955, the UN’s Department of Economic and Social Affairs argued, “The present volume of energy consumption in most underdeveloped countries, however, does not justify the employment of large thermal power stations and the same will be true, in many cases, of large-size reactors. In other words, nuclear power in under-developed countries would have to be generated in plants with a relatively small capacity. In many cases reactors would have to compete with scattered diesel units” (21). Advocates also made similar arguments for small reactors in richer countries like the United States, and many were constructed, but the effort ultimately failed (22).

Advocacy for small reactors picked up again in the 1980s, as orders for nuclear plants started declining. The IAEA projected that 20 to 25 countries might buy such reactors by 2000; “supplier readiness was judged high” (23). But that was not to be. One perceptive analyst had predicted even by 1988 that it was “unlikely that such reactors will find a market” and “unlikely that they [i.e. small reactors] will affect the direction or success of the world nuclear industry” (24).

Although this market for small reactors did not emerge, the IAEA was undeterred and continued making confident projections. In 2000, one IAEA official projected that by 2030, “over 60% of the world’s electricity generating capacity could be operating in a cogeneration mode. If the appropriate SMR technologies are pursued with reasonable haste, SMRs could provide up to 25% of this capacity; beyond 2030, SMRs could dominate the energy production market” (25).

A decade later, the U.S. Department of Commerce’s International Trade Administration ranked a number of countries on the basis of various characteristics in order to evaluate the prospect that they would be a market for SMRs (26). Among the top third of the potential customers for SMRs in their list were many developing countries like Turkey, Jordan, India, China, and Morocco. But such lists are very dependent on the criteria applied, and other analysts identify entirely different countries as being most suitable—another study published in 2015 did not rank any of the previously mentioned countries within the top one-third (27).

These examples offer just a sampling of the claims about SMRs being suitable for developing countries.

Methodology

The data for our analysis come from a detailed literature review that we carried out. Because of the nature of the topic being examined, we had to rely on gray literature; expectations about SMRs cannot usually be found in peer-reviewed journals. Therefore, we developed a dataset consisting of papers presented at IAEA meetings by spokespeople from developing countries. We identified these using a series of searches using appropriate keywords

within the IAEA website and the information portal it maintains called nucleus. While the bulk of the documents we examined come from the past 10 years (i.e. since 2015), we also used a few older documents when they laid out long-term visions. In all, we examined 66 documents (see [Supplementary Material](#)) referring to single countries (or in a few occasions, regions) in detail. Of these, 27 documents did not articulate any clear expectations of what SMRs would provide, whereas the other 39 documents included 1 or more expectations of SMRs. These documents were presented by spokespeople from 27 different countries. We also examined other government documents, especially reports from nuclear agencies or energy ministries, and media reports quoting government officials, at important international meetings to make sure that our database was representative of expectations expressed elsewhere. But we did not include such documents in the numbers we tabulate.

Many of these papers also discussed the state of readiness of the country, including its regulatory systems and the numbers of trained personnel available. We did not document these systematically because these were not expectations of the technology and were primarily focused on domestic preparedness.

Many authors also talked about the importance of nuclear power for mitigating climate change, but, again, this was not an expectation of SMR technologies specifically but of nuclear power, and the energy system more generally. In other words, the desire to mitigate climate change does not translate into specific demands of SMRs. Further, as many energy analysts have explained, for nuclear power, including from SMRs, to be relevant to mitigating climate change, the technology would have to be economically competitive with other low-carbon technologies and be deployable at rates compatible with the time scales in which emission reductions are sought (28–30). We discuss these criteria later.

We now turn to the expectations of SMRs that we identified.

Expectations

Representatives and nuclear officials from potential customer countries offer a long list of desired characteristics. Although differently worded in each case, the broad thrust of these expectations was usually clear. We therefore grouped these expectations under some key thematic goals. The three most common ones were low cost, proven technology, and local manufacture and supply localization.

In addition to these, some other concerns about nuclear power were mentioned but not posited as an expectation about SMRs. For example, many officials spoke about the risk of severe accidents, although the implicit or explicit assumption was that SMRs would lower or eliminate this risk. Likewise, many officials discussed radioactive waste and the linkage with nuclear weapon proliferation, but again the presumption was that these concerns can be adequately dealt with through the development of legislation or acceding to international agreements. A paper presented by a Tanzanian official mentioned that an “environmental impact assessment” would “evaluate the potential environmental consequences of SMR deployment, including water usage, waste generation, and ecosystem impacts” but added that the report will also identify “mitigation measures to minimize adverse environmental effects” (31). The environmental and public health risks associated with uranium mining were never mentioned but an official from Mongolia did admit that “people fear radiation-associated risks” from uranium mining but interpreted that to mean the need “to deliver scientific and factual information, and

government policies, establish an information center, and update secondary school curricula in Mongolia” (32).

Low cost

Because of their emphasis on economic growth for alleviating poverty, developing countries are naturally interested in electricity being cheap. This expectation about low costs has long been articulated. For example, back in 1998, a “specially assigned group of scientists and engineers of the National Atomic Energy Agency” in Indonesia came up with the formulation that “the levelled [sic] cost of electricity from nuclear plants should be lower than from coal plant with clean-up system based on prevailing national regulation” (33).

The economic goal is articulated in multiple ways. For example, Kenyan officials used the term “offering better economic affordability” (34), whereas a Brazilian official said Brazil’s decision will be “hard dependent [sic] on tariff” (35). A Bolivian official felt that one of the advantages of SMRs is “that these reactors can be built in factories and then shipped and consequently reduced costs if compared to conventional nuclear reactors” (36). While the last formulation appears to be talking about total cost, the rest of the paper shows that the critical variable in their analysis is the cost per unit of power capacity, measured in dollars per kilowatt or megawatt.

In addition to electricity, countries also express the expectation that SMRs can desalinate water at low cost, which is related to the larger argument that nuclear power is cheap. Using nuclear power plants for desalination has been considered since the 1960s, including active discussions between the United States and Israel (37, 38). At a recent IAEA conference, two officials from Kuwait mentioned that the country’s economy is “burdened” by the “annual expenditures on direct water supply and distribution,” and saw small PWRs as “the ideal option for Kuwait’s desalination industry” (39). A representative of the Egyptian Atomic Energy Authority stated that “nuclear desalination has gained recognition for its [...] cost-effectiveness” (40).

Proven technology

Several countries interested in SMRs do specify that the system they procure should be proven with a good operational record. The expectation that any nuclear reactor technology should have a proven track record is long-standing. More than a decade ago, Samer Kahook, commissioner for the nuclear fuel cycle at Jordan Atomic Energy Commission, said that it would be difficult for any of the Middle East and North Africa states to use a first-of-a-kind reactor “that has not been built in the home market” (41). [For more on Jordan and SMRs, see Ramana and Ahmad (42)]. And in 1998, Indonesian officials put it this way: “SMRs including the nuclear desalination plant shall be licensable in the country of origin” (33). More recently, in 2023, Bangladesh’s Integrated Energy and Power Master Plan expressed it as “it is desirable to select the introduction of SMR after fully confirming its safety and economic efficiency based on development trends and operating results of commercial SMRs around the world” (43).

At a conference convened by the IAEA, officials from Vietnam’s Atomic Energy Institute and Electric Power University posited that “light water SMRs and/or other SMR technologies should be proven and commercialized before being selected for deployment in Vietnam” (44), while officials from Kenya emphasized that the country “is targeting SMR technologies that will be commercially available in the next 3 to 5 years” (34). Other countries that articulated this requirement at various IAEA conferences were Indonesia, Mexico, and Nigeria.

Local manufacture/supply localization

While desiring completed and tested designs, many countries also would like to take part in the construction of reactors or manufacture of components. There are pressures in many developing countries to indigenously develop the many technologies and pieces of equipment needed in nuclear power generation. Policymakers also want to stimulate high technology development, generate employment, and gain prestige.

Even the IAEA has argued that “local participation in implementing” nuclear programs is necessary and recommended that developing countries “maximize the role of national manpower” when planning for their first nuclear power plant (45). And developing countries are keen to do the same. A spokesperson from Ghana expressed a preference for the BOOT (Build-Own-Operate-Transfer) model while importing reactors because of the hope that it “will facilitate the transfer of knowledge and skills to local workers and engineers, boosting the domestic capabilities in the nuclear industry and related sectors” (46). In the BOOT model, a nuclear developer from an exporting country raises the necessary finances and constructs nuclear reactors in the importing country, and owns and operates these reactors for a specified period of time, and then finally transfer the reactor and the necessary know-how to the importing country. The director of Uzbekistan’s nuclear energy agency said that plans to build SMRs involve “the obligatory localization of some components” (47). And Saudi Arabia lists “Human Capability Building on key Nuclear technology” and “High potential for localization to promote economic growth and job creation” as the first two in their list of objectives in considering SMRs (48).

Evaluating SMRs against expectations

In the following, we discuss what challenges will confront small modular reactors to meet the requirements listed previously (see Table 1).

Cost

One of the major selling points for SMRs is their lower capital cost, at least when compared with large gigawatt-scale nuclear reactors that have recently costed upwards of \$15 billion dollars per unit (49, 50). However, SMRs also provide less electrical power. When the power output of the reactor decreases, it generates less revenue for the owning utility, but the cost of constructing the reactor is not proportionately smaller. This “economy of scale” has been observed in costs of actual nuclear plants (51, 52), and is the reason for companies, over the decades, building nuclear reactors with more output power. Because they revert to smaller output levels, SMRs will, therefore, cost more than large reactors for each unit (megawatt) of generation capacity. This makes electricity from small reactors more expensive (53–56). Even for remote locations that are not connected to the grid, the cost of power from SMRs is considerably higher than electricity from diesel generators (57).

Some developing country officials are aware of the downside of the smaller size. For example, an Indonesian official argued “the smaller size of SMR may lead to a loss of economy of scale, which could impact the generation costs of electricity” (58).

In December 2024, Australia’s Commonwealth Scientific and Industrial Research Organisation (CSIRO) released a report that estimates the costs of electricity generated by different technologies (59). Australia is a good case to consider: even though it is categorized as a developed economy and it has a research reactor, it has no nuclear power plants and is thus similar to many

Table 1. Expectations about small modular reactors among 27 developing countries and challenges posed by economic and operational characteristics of these technologies.

Expectation	Number of references expressing expectation	Challenges
Cost	27	High capital cost, expensive electricity
Localization	5	Development of local know-how and supply-chain capacities
Proven technology	19	First-of-a-kind designs, lengthy construction times, low efficiency of operations in actually operating SMRs

Out of the 66 references in our database (see [Supplementary Material](#)), 27 documents had no explicit expectations listed.

developing countries. Yet, the capital costs for SMRs used by CSIRO closely matches the current estimates for the BWRX-300 reactors to be built at the Darlington site in Canada and are thus representative of costs that can be expected even in countries with significant experience with nuclear reactor construction (60). Thus, CSIRO estimates make more favorable assumptions about SMR costs than might be expected to hold in a developing country with limited or no experience with nuclear technology.

Estimates by CSIRO show that each unit of electrical energy from SMRs would be far more expensive than a corresponding unit from renewable sources of power. Specifically, it estimated the cost of electricity from SMRs in the year 2030 to be in the range of AU\$328 to AU\$619 (or roughly US\$215 to US\$405) per megawatt hour. In comparison, the cost of solar and wind power, when the cost of storage technologies and other means of accounting for the variability are included, is expected to range from AU\$90 to AU\$131 (US\$59 to US\$86) per megawatt hour by 2030. This is for grids with 90% variable renewable energy—and CSIRO has explained why that is a reasonable fraction. Should the grid have a lower proportion of variable renewable energy, the additional cost needed to maintain reliability will be lower.

Looking further ahead, CSIRO assumed that there could be significant declines in capital costs of SMRs, by about 40% between 2024 and 2050. Such declines are not in line with historical experiences in countries like the United States and France (61–63). Even with these significant declines, electricity from SMRs is estimated at AU\$276 to AU\$467 (US\$180 to US\$305), more than 2 to 5 times the cost of 90% renewable energy grids by the end of this decade.

This comparison offers a glimpse into the level of financial premium a developing country might pay for its electricity if it decides to build SMRs instead of renewables.

Desalination using SMRs is not economical either. Most studies arguing that it could be viable are based on unrealistically low assumptions about the cost of constructing an SMR. For example, a 2025 paper that calculated the cost of electricity and desalinated sea water using small modular reactors assumed that the “most likely” overnight construction cost of an SMR would be \$8,000/kW, which is less than half of the corresponding figure for proposed BWR-X 300 projects in Ontario, Canada, and Tennessee, United States. In its 2024 Integrated Resource Plan, the Tennessee Valley Authority estimated the overnight capital cost of an SMR to be \$17,949/kW; even for the hypothetical

nth-of-a-kind SMR, the overnight capital cost comes down only to \$12,471/kW (64).

There is a need for careful research that compares the costs of desalination using SMRs and solar energy using realistic figures, but that is beyond the scope of this paper. One study focused on Saudi Arabia from over a decade ago showed that using nuclear energy to power desalination plants was comparable in cost to solar power (65), but that assumed that capital costs of solar PV technology per unit of capacity was just 70% of the cost of a nuclear plant. Today, that ratio is more like 10%, and thus the results using today's capital costs will likely show that solar desalination is cheaper than nuclear desalination. Such a comparison should account for the fact that costs for solar photovoltaics have declined sharply and are expected to become cheaper; in contrast, construction costs of nuclear plants have increased in the last decade (66).

Localization

While most SMR proposals do not envision any need for extensive training, it is unlikely that reactors can be licensed, regulated, and operated without some local experts, including nuclear engineers and reactor operators. SMR vendors have been trying to get nuclear regulators to allow these reactors to be operated with fewer personnel, but even a very small power plant, such as Oklo's 1.5 MW Aurora design, would require 15 personnel to operate it (67). Larger SMRs will need more operators.

One country that has sought to localize SMR technologies is Saudi Arabia, but a detailed assessment of its capacity to do so found that "the kingdom presents low technical capabilities, with moderate political support" (68). Involving suppliers within country is seen by many SMR developers as an obstacle to building reactors in that country. An illustration is Brazil, which is viewed as "an attractive prospective customer, given its existing nuclear supply chain and its ability to finance projects," but SMR developers view "supply localization requirements" as an obstacle (69). One analyst explained that Brazil will "be looking at vendors that are willing to pair up with local players and allow for the establishment of a supply chain in Brazil for SMRs."

The development of local know-how and supply-chain capacities for SMR deployments also contradicts another necessity: the need for rapid decarbonization of the energy system in order to meet climate targets and the necessity of building adequate energy supplies meeting a rapidly growing energy demand.

Proven technology

The expectation from many developing countries is that the reactor designs have been proven to be buildable within reasonable cost and time parameters, and should operate efficiently and safely. This is clear from the Bangladesh's Integrated Energy and Power Master Plan's requirement, mentioned previously, about "fully confirming...safety and economic efficiency" and its discussion of "operating results of commercial SMRs." We also mentioned previously the explicit invocation of the design being commercially available in 3 to 5 years by Kenya. So far, SMRs have not met this expectation.

As documented in successive editions of the World Nuclear Industry Status Report [for the latest five, see (66, 70–73)], SMR projects continue to be delayed or canceled. A good representative is Argentina's CAREM (Central Argentina de Elementos Modulares) project, which has been under construction for over a decade, since February 2014. Originally expected to start generating power by 2017 or 2018, the project has not done so as of the

time of writing, and is reported to have stalled (74). The Micromodular reactor design that was to be Canada's first SMR project (75) appears to be canceled after the company developing it filed for bankruptcy protection (76). NuScale's UAMPS project offers another example of a project that was announced with much fanfare but was eventually canceled in 2024 (77, 78).

The only two SMRs under operation are in China and Russia, but these have not met expectations either. When construction of China's twin High Temperature Gas Cooled Reactor units started in December 2012, the builder and operator of the unit announced that the project would "take 50 months" to complete (79). In fact, these units were connected to the grid only in December 2021—108 months after construction started—and were declared as operating commercially, which represents stable operations, only in December 2023 (80). Since then, their output has been reduced from a combined capacity of 200 MW to 150 MW, and that is the current power level reported by the International Atomic Energy Agency's Power Reactor Information System (as of December 2025). There is no public announcement about why the power output has been reduced by 25% of the design power capacity; nevertheless, the lowered output suggests that the reactors are not in good health. The amount of energy they have produced since they started operating has been much smaller than what they are designed to produce as reflected by the low load factor (81).

Russia operates two KLT-40S SMRs loaded on a barge that is stationed in the far east of Russia. The reactors were commissioned in May 2020 after lengthy delays—13 years instead of the anticipated 3 years—and cost overruns, from 6 billion rubles to at least 37 billion rubles (70). These reactors, too, have been operating with low load factors, a standard measure of efficiency.

In short, the evidence so far does not suggest that SMRs will be built quickly or that they would operate without problems.

Conclusion

SMRs are often promoted as a serious energy solution, particularly for developing countries. Many of these nations have expressed interest in acquiring nuclear power, with a specific focus on SMRs. This interest is driven by a set of expectations regarding the potential benefits and characteristics of these technologies.

To better understand these expectations, we analyzed presentations by government officials at IAEA conferences and categorized the publicly expressed expectations for SMRs. The most commonly expressed expectations are cost-effectiveness, demonstrated reliability of these SMR designs, and the ability to leverage or develop local manufacturing expertise.

However, our analysis, based on historical evidence and the economic and operational realities of SMRs, reveals a significant gap between these expectations and what SMRs can realistically deliver. These expectations will be challenging, if not impossible, to meet. SMRs are unlikely to provide electricity at competitive prices, especially in countries that lack an established regulatory framework and would need to create one for just one or a few reactors. Furthermore, SMR projects have consistently taken longer to complete than anticipated, and the performance of operational SMRs has been underwhelming. Additionally, it is improbable that developing countries will play a significant role in manufacturing these reactors or substantially enhance their technical capabilities through SMR deployment. Although we focus on developing countries, these expectations are not unique to those countries, but rather are shared by nations worldwide.

The continued advocacy for SMRs, despite the availability of numerous commercially viable low-carbon energy sources and the declining costs of renewable energy—particularly photovoltaics—raises important questions about why countries are engaged in this effort. Further research is needed to explore the motivations behind this persistent support for SMRs.

Supplementary Material

Supplementary material is available at [PNAS Nexus](#) online.

Author Contributions

F.F. (Conceptualization, Funding acquisition, Investigation, Methodology, Writing—original draft, Writing—review & editing), M.S. (Data curation, Formal analysis, Investigation, Methodology, Writing—review & editing), and M.V.R. (Conceptualization, Formal analysis, Investigation, Methodology, Writing—original draft, Writing—review & editing)

Data Availability

All publicly available documents are linked in the supplementary information file. Additional papers were accessible only to registered attendees of the Vienna conference (IAEA SMR 2024) and are not publicly available.

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