# governmental incentives for smr deployment

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**Abstract**

The nuclear industry has been described as being in a “stalemate”, because constituents facing first-mover concerns are trying to simultaneously generate orders for reactors, create a record of successfully deployed projects and build out a supply chain to sustain the industry’s scaling. Most participants agree that this triple-headed problem can only be resolved with various kinds and levels of governmental and other support. This paper will identify and explain several financial and other incentives which are necessary or desirable to enable SMR project deployment, with a focus on the United States market. Covering existing and potential programs, the discussion will touch upon legal regimes and developments in the United States, and their interaction with contracting and financing approaches taken by project participants. Some of the specific materials to be considered will include tax incentives, loan guarantees, cost overrun insurance, utility asset-backed securitization, financial assistance, fuel banks and capacity markets and other price support.

## INTRODUCTION

There is widespread discussion around the nuclear industry’s current chicken-and-egg stalemate problem: not enough new plants are being built to justify the scaling up of relevant physical and human capital, including the industrial supply chains that go into these projects, while at the same time investors are hesitant to move off the sidelines and finance nuclear plants due to perceived cost and schedule risk. The first problem would be ameliorated by having a sufficient pipeline of nuclear project orders; and the second, by having a more robust supply chain that would achieve deployment predictability and the benefits of scale.

Many industry participants think today that only public policy can solve these problems, and that it is too much to ask investors to put at risk the significant capital required to re-establish this industry’s foothold. This is mindful of investors’ fiduciary duties, which are not, at the moment of this writing, necessarily matched to take into consideration some of the societal costs that adhere to other forms of generation.

The paper considers several of the methods by which governments have attempted, and may attempt, to resolve these difficulties in order to attack the stalemate problem from both sides.

## TAX CREDITS

Tax credits have been utilized in the United States for many years to significantly improve the financing prospects of eligible infrastructure projects. Most notably, wind and solar facilities have benefited to varying degrees from production tax credits and investment tax credits. Production tax credits have generally remunerated project owners based upon their operating characteristics, usually at a unit rate of energy generated. Investment tax credits are premised upon qualifying cost basis invested in eligible projects. Different investors and projects have varyingly preferred production tax credits or investment tax credits depending upon targeted levels of risk and reward. [1]

In recent decades in the United States, structures have grown up around the use of tax credit financings. Generally, energy tax credits have required an investor with sufficient tax burden to defray by using such credits. These investors have not often overlapped with project sponsors, many of whose projects do not become revenue-positive. In addition, there are concerns around the use of other tax attributes in the United States tax code, including depreciation. The most frequently used structure is referred to as a tax equity partnership, wherein the investor purchases governance-limited equity interests in a taxable partnership that owns the project entity. Over time the investor realizes its targeted rate of return through a combination of allocation of tax credits and other attributes as well as (in some cases) cash flows. The time to maturity and risk allocation for these investments bears similarities to project finance indebtedness, although the structure and paperwork may seem dramatically different upon first encounter.

Recently, changes to the tax laws in the Inflation Reduction Act of 2022 (“**IRA**”) have enabled certain tax credits to be sold, though not necessarily with the depreciation and other attributes that can be monetized by tax equity investors. Historically, and in limited present contexts, the U.S. Government has been able to pay project owners directly rather than offset tax burden. [2]

A number of tax credits have been recently applicable to nuclear projects. A production tax credit was made available in IRA for existing nuclear reactors on a $15 per-megawatt hour basis, provided certain compliance criteria are satisfied. In addition, for advanced reactors, including SMRs, significantly larger production and investment tax credits, respectively in the amount of $25 per megawatt hour and 30% of cost basis, were made available in IRA. Each of these amounts are subject to increase depending upon the satisfaction of certain available bonus criteria. Nuclear power may also be used to unlock hydrogen production tax credits. In addition, there are advanced energy manufacturing tax credits that may be utilized by investors in the nuclear energy supply chain. [3]

## LOAN GUARANTEES

In the United States, IRA and the Infrastructure Investment and Jobs Act of 2021 together reinvigorated a mostly dormant financing mechanism under the auspices of the U.S. Department of Energy’s (“**DOE**”) Loan Programs Office: the Title 17 Clean Energy Financing Program. [4] Prior to these legislative efforts, the Title 17 Program had been used to finance the Vogtle project in Georgia [5] and nearly used in support of several other nuclear power plant and supply chain projects which ultimately were not finalized during the 2000s and 2010s. [6]

Since the Title 17 Program’s reinvigoration, a conditional commitment has been announced to restart the decommissioned Palisades nuclear power plant in Michigan (which is likely to catalyze expansion of the facility to include additional advanced reactors, subject to alternate financings). [7] Current monthly reporting information available from the Loan Programs Office suggests that a significant amount of financing applications in process involve advanced nuclear technology, and it is reasonable to expect other announcements in the near future. [8]

At a high level, the Title 17 Program enables borrowers with qualifying projects to obtain loan guarantees for up to 80% of qualifying costs. If borrowing entirely through the U.S. Government, a favorable interest rate and potentially lengthy loan tenor are also available. Most nuclear power plants would be able to meet one or more of the available eligibility buckets. The program is designed to demonstrate to private debt and equity markets that its chosen transactions are financeable in the marketplace and across a “bridge to bankability” – whether those transactions are currently facing challenges due to early technology risk or (in the case of some nuclear technologies) general absence of a record of predictable deployments of already-proven technologies. [9]

The Title 17 Program does have some significant compliance requirements and procedural hurdles that must be satisfied for access. For example, DOE is not able to be subordinated in lien or payment priority. [10] Foreign entities are subject to additional vetting. Certain U.S. requirements tend to protract deployment timeframes, subject to potential changes in law. However, there are nuances that also increase the utility of this program to nuclear developers. First, one of its subcomponents is specifically tailored to use by the vast pool of regulated utilities in the United States, which are likely among the best-positioned entities to bear nuclear power plant development risk and accustomed to use of financial products akin to those used by the Title 17 Program. Second, Title 17 borrowers are not precluded from access to certain other federal incentives, including most notably tax credits. Third, DOE has accumulated significant in-house nuclear expertise and has made available to the marketplace valuable analyses and manuals regarding, among other things, the state of the advanced nuclear industry and potential catalyzers for its further development, and conversions of existing fossil sites to nuclear use.

The Export-Import Bank of the United States (“**Ex-Im Bank**”) is the country’s official government export credit agency. In addition to loan guarantees, Ex-Im Bank provides direct loans, insurance and working capital guarantees in furtherance of its mission of supporting U.S. jobs by financing and facilitating U.S. exports. [11] Ex-Im Bank has made available an online toolkit with resources for SMR financing. [12]

## GRANTS

Governments in the United States have also made available grant funding to owners of nuclear power plants and other industry participants, in some circumstances, including to facilitate the construction and commissioning of demonstration projects for technologies that have been developed but not yet deployed. One of the most significant is the Advanced Reactor Demonstration Project, [13] which has included billions of dollars in funding conditionally awarded to TerraPower and X-energy to build their demonstration projects.

## ZERO EMISSIONS CREDITS AND SIMILAR CREDIT MECHANISMS

Credit mechanisms have also been made available through the federal and state governments in recognition of the carbon-free attributes of nuclear power and to help this technology compete in deregulated electricity markets where other assets benefit from certain advantages. States have enacted programs requiring local utilities to purchase these credits from nuclear plant owners. [14] A similar program was enacted at the U.S. federal level, enabling nuclear power plant owners to access credit payments to address detrimental economics characteristic of their ongoing operations, subject to the satisfaction of specified criteria. [15]

## government purchasing

The U.S. Government and other entities in its federal system have various programs in place in order to purchase electric power and other outputs from nuclear power plants and industry suppliers. For example, the HALEU Availability Program was created as part of IRA in order to “ensure access to HALEU for civilian domestic research, development, demonstration and commercial use” [16] and will function through application and approval processes to provide HALEU for commercial use or demonstration process.

Government entities are also able to enter into power purchase agreements with project owners and otherwise arrange for project deployments. For example, the federally owned Tennessee Valley Authority has issued Requests For Proposals (“**RFPs**”) seeking carbon-free power, with nuclear being included among eligible sources. [17] TVA has also taken steps toward the licensure and deployment of an SMR at one of its sites. [18]

The United States Army has also recently announced a forthcoming deployment program for advanced reactors to power Army sites in the United States. [19]

## UTILITY ASSET-BACKED SECURITIZATION

Some programs have been enacted by statute in U.S. states that have enabled regulated utilities to free up capital that has been held in assets at risk of becoming stranded. For example, a coal facility that is on an electric utility’s balance sheet has a capital stack comprised of its equity value, depreciation and operating expense pegged in some cases to varying maturities and balances of securities that have been issued against the facility, which may not be well matched to the value to the utility, its community and its ratepayers of continuing to operate the facility. Securitization programs generally allow such assets to be removed from the utility’s balance sheet and decommissioned at a nearer time than would otherwise be possible, with a significant percentage of the asset’s book value made available to the utility. [20] The use of this freed up capital may be prescribed in some programs – for example, in Section 1706 of the Title 17 Clean Energy Financing Program administered by DOE (not a securitization program but in this respect a similar construct), advances must be used for certain approved “project costs”, which may not be the same as most utilities’ “business as usual” portfolio compositions. Nuclear power’s characteristics would increase its likelihood of fitting within any such prescriptive sets.

## forward capacity markets

In some areas of the United States, power generators are compensated by transmission operators and other entities for their ability to be available during periods of anticipated high demand. [21] Awards have historically been made based upon the results of auctions made in advance of the relevant capacity period. When the capacity period arrives, nuclear powered winners of capacity awards tend to be well-positioned, compared to other asset types, due to their relative fuel reliability and independence from fluctuations in weather conditions.

## cost overrun insurance

Governmental or private entities could agree to bear the risk of excess costs of construction of SMRs, whether in exchange for the payment of insurance premiums or other mechanisms. Such “cost overrun insurance” programs have been mentioned in the nuclear industry with increasing frequency and would likely involve considerable complexity to maintain proper incentives and ensure fairness, as well as potential expansion of existing legal authorities. [22], [23] Similarly, some experts have proposed using DOE’s loan guarantee authority to establish a “cost stabilization facility”, which could include access to low-interest debt to finance project costs above an agreed threshold combined with flexible repayment terms designed to maximize the likelihood of success for one or more covered projects. [24]

## Further information

Mr. Dua is a practicing attorney with Hunton Andrews Kurth LLP (“**Hunton**”) in New York, New York. Hunton has extensive experience in the establishment and development of nuclear power programs, supporting clients from across the globe in navigating virtually all aspects of the civilian nuclear industry. Hunton provides comprehensive legal and strategic guidance to advance its clients’ priorities. Hunton advises clients in legal, transactional, and policy matters surrounding the development, construction, and financing of conventional nuclear power programs, as well as advanced nuclear reactors or small modular reactor projects.

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