Executive Summary

New nuclear power plants are large, capital-intensive projects. They provide major long-term benefits, however—stable, competitive electricity prices and reliable, carbon-free power. These benefits lead many utilities and state regulators to favor new nuclear reactor construction as a strategic resource when planning to meet future electricity demand. To assist regulated utilities with the financing for these large projects and to provide the lowest cost to consumers, many states have policies in place to lower the cost of financing and expedite regulatory reviews.

For regulated utilities, the most effective tool to lower the cost of these large infrastructure projects is for state regulators to permit the collection of interest costs and return on equity during construction. Similar rate treatment is allowed by the Federal Energy Regulatory Commission (FERC) to encourage the construction of new transmission lines. This mechanism is also known as “Construction Work in Progress,” or CWIP. The cost savings from CWIP, which will be passed on to consumers, can amount to billions of dollars over the life of a project.

1 For a more thorough discussion of the costs of new nuclear generating capacity, see NEI’s white paper, “The Cost of New Generating Capacity in Perspective.”
What is Construction Work in Progress?

The term “Construction Work in Progress” (CWIP) is borrowed from an accounting definition that refers to a line item on a utility’s balance sheet to reflect construction work that is not yet complete. When used to describe a financing incentive, CWIP is when a state allows or directs a utility to collect from customers the carrying costs of a project during construction. The carrying costs include interest costs on the money used for construction expenses and a return on equity employed during construction. Collection of carrying costs during construction significantly reduces the allowance for funds used during construction (AFUDC) when the completed project is added to the customer rate base. If these carrying costs were not recovered during construction, they would be capitalized, rolled into total project cost, and recovered when the facility goes into commercial operation.

CWIP is one of the tools state regulators and FERC can use to support capital-intensive projects such as new base load generation or new transmission lines or upgrades.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Nuclear</th>
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</thead>
<tbody>
<tr>
<td>Project Structure</td>
<td>Rate Base No CWIP 50/50</td>
</tr>
<tr>
<td>EPC Cost ($/kWe)</td>
<td>$4,500</td>
</tr>
<tr>
<td>Total Cost ($/kWe)</td>
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</tr>
<tr>
<td>Fuel Cost ($/MWh)</td>
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<tr>
<td>O&amp;M Cost ($/MWh)</td>
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<tr>
<td>Capacity (MWe)</td>
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<tr>
<td>Capacity Factor</td>
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<tr>
<td>Levelized Busbar (2011 $/MWh)</td>
<td>$104.0</td>
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</tbody>
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Notes: Cases assume 48-month construction, 6-month start-up, owner’s cost of $420 million plus 10% contingency, 6.0% interest rate on commercial debt, 12% return on equity.

The Benefits of Construction Work in Progress

By paying carrying costs as they are incurred, the utilities and their customers benefit from:

- Reduced financing costs since carrying costs are not accumulated and capitalized over the life of the asset. This avoids having to pay “interest on interest” when the carrying costs are rolled into total project cost.
- Reduced rate shock for consumers by minimizing financing costs and gradually introducing small rate increases during construction.
- Improved utility cash flows through inclusion of carrying costs in the rate base as they are incurred. Improved cash flows support stronger financial ratings which result in lower interest costs for the project and all other utility investments over the long term.

A simple financial analysis illustrates the power of CWIP to lower the levelized busbar cost of electricity (see Table 1). These results were generated using the Nuclear Energy Institute (NEI) financial model and do not represent.

2 The NEI Financial Model is a detailed financial pro-forma model used to estimate total project, first year and levelized busbar costs for new generating capacity built in either utility-regulated rate base or private sector project finance environments. The model was constructed and tested by NEI staff in consultation with financial, utility, and other industry experts.
sent a specific project. For example, owners’ costs, specific technology cost and output, project structure, and financing costs will all vary based on the project specifics.

**Examples of CWIP Legislation**

On April 21, 2009, Senate Bill 31, the Georgia Nuclear Energy Financing Act, was signed into law. This law allows Georgia Power to include approved carrying costs in the rate base during construction of two additional reactors at the Vogtle site. The company has calculated a savings of over $300 million in “interest on interest.” By paying the interest during the construction period, rather allowing these charges to accumulate for gradual repayment during the project’s amortization period, the in-service cost of Vogtle Units 3 and 4 will be reduced by nearly $2 billion.

Similarly in South Carolina, the Base Load Review Act enacted in May 2007 allows the state Public Service Commission to grant a project development order for nuclear generation facilities. The project development order permits the utility to collect carrying costs through annual rate requests. For SCANA, the owner of 55 percent of the V.C. Summer site in Jenkins, South Carolina, the

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### Financing New Generating Capacity

**Under Rate-of-Return Regulation**

Many states regulate the generation, transmission, and distribution of electricity. In these states, public utility commissions (PUCs) control electricity prices by regulating a utility’s allowed costs and rate of return on investment. Electricity rates are determined such that utilities can recover their investments and operating costs and provide a reasonable return on equity to their investors. Rate-of-return regulation can be summarized using the following equations:

\[
\text{(rate of return)} \times \text{(rate base)} = \text{(utility’s return)}
\]

\[
\text{(electricity price)} \times \text{(electricity sold)} = \text{(rate base)} + \text{(utility’s return)} + \text{(operating costs)}
\]

The **rate base** is a measure of the value of the utility’s prudent capital investments. The utility’s allowed return to its investors is equal to the **rate of return** set by the PUC times the utility’s rate base. The utility will charge an electricity price that generates revenues to cover the rate base (its investments), its allowed return, and its operating costs.

When an electric company builds a new power plant, large upfront investment is required. In most regulated states, utilities recover the interest on the debt and the return on equity associated with this upfront investment through rates. The interest cost and equity return or “carrying costs” can be capitalized, added to the rate base, and recovered in rates when the plant goes into operation and is deemed “used and useful.” These accumulated costs are called “allowance for funds used during construction” or **AFUDC**.

Before capital investment and operating costs can be passed on to electric customers through rates, the PUC must determine that they were prudently incurred. PUCs review the costs being added to the rate base during rate cases and during periodic prudence reviews. A PUC can disallow the recovery of costs that are deemed extravagant or imprudent.

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1. For simplicity, utility revenue is expressed as a single electricity price times the quantity of electricity generated. In reality, electricity prices differ by class (residential, industrial, commercial) and sometimes include pass-throughs for items such as fuel and public benefits.

2. Investments for a new power plant are capitalized over the expected life of the plant. The depreciable portion of the rate base is recovered through rates each year.
CWIP policy will result in savings of $1 billion in capitalized interest costs through the construction cycle alone for its portion of Units 2 and 3.

Florida’s Senate Bill 888 (enacted in June 2006) and its implementing Public Service Commission (PSC) regulation (Docket 060508-EL), adopted in February 2007, permits utilities to recover the carrying costs of construction in rates after the PSC has issued a determination of need order for the proposed plant. Progress Energy received a determination of need order for a proposed two-unit site in Levy County in July 2008. Progress Energy credits Florida’s CWIP policy for an estimated $13 billion savings to consumers over the life of the proposed Levy County units. The new units also provide a conservatively estimated annual fuel cost savings of $1 billion.

Central Maine Power received approval from the Maine Public Utilities Commission in May 2010 for its proposed Maine Power Reliability Program (MPRP), a project to invest $1.4 billion in the bulk transmission system in the region. FERC authorized CWIP for 100 percent of the prudently incurred expenses. The October 20, 2008, FERC order (125 FERC ¶ 61,079) explains the Commission’s rationale for awarding the CWIP incentive:

"Consistent with Order No. 679, we find that authorizing 100 percent of CWIP will enhance Central Maine’s cash flow, reduce interest expense, assist Central Maine with financing, and improve the coverage ratios used by rating agencies to determine Central Maine’s credit quality by replacing non-cash AFUDC with cash earnings. This, in turn, will reduce the risk of a down grade in Central Maine’s debt ratings. Considering the relative size of Central Maine’s $1.4 billion investment in the Project, we find that authorization of the CWIP incentive is appropriate.

We also find that allowing Central Maine to recover 100 percent of CWIP in its rate base will result in better rate stability for customers. As we have explained in prior orders, when certain large-scale transmission projects come on line, there is a risk that consumers may experience "rate shock" if CWIP is not permitted in rate base. By allowing CWIP in rate base, the rate impact of the Project can be spread over the entire construction period and will help consumers avoid a return on and of capitalized AFUDC.

In addition to CWIP, state legislation to promote new power plant construction, like the FERC orders for new transmission lines, frequently provides other incentives such as annual prudency reviews for construction costs, inclusion of project development costs in annual rate reviews, and recovery of prudently incurred costs if the project is cancelled. All of these measures aid companies in securing financing for new reactors at favorable rates since the overall project risk is reduced.

**Why CWIP Is Good Public Policy**

Access to utility service is considered a basic necessity in modern societies. The costs of service are spread evenly in electricity rates based on usage, with the cost of infrastructure borne by all consumers in a service territory—regardless of the precise costs and requirements to service locations that may be more complex or remote than others. Like roads and schools, electricity is a benefit to society as a whole, so the costs of providing that infrastructure are shared.

America’s electric power industry faces a formidable and unprecedented investment challenge. Approximately $1.5-2.0 trillion in new investment will be required by 2030 for new generating capacity, new transmission and distribution, efficiency pro-
grams, and environmental controls on operating plants. This is larger than the book value of the entire U.S. electricity supply system and does not include the potential costs of controls on carbon.

CWIP can reduce the impact of large cost increases that occur when new electricity generating units or transmission lines are placed on line and lower electricity rates for years to come. CWIP is being used to finance expansion of transmission lines to allow increased use of renewable energy and to modernize the transmission infrastructure. Also, by improving utility cash flows, CWIP helps lower interest rates for all utility investment. Lower interest rates will further reduce the impact on electricity bills.

The benefits of new nuclear power plants extend beyond carbon-free power. New plant construction creates up to 3,500 construction jobs at peak and 400-700 permanent high-paying jobs associated with plant operation. Studies of operating units show that the average nuclear plant generates approximately $430 million in sales of goods and services (economic output) in the local community and nearly $40 million in total labor income each year. This results in average annual state and local tax payments of $20 million and federal taxes of $75 million.