

Nuclear – Is EPACT Enough? A State Regulatory Perspective

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NUCLEAR PROVISIONS OF THE ENERGY POLICY ACT OF 2005

- ❑ Investment Stimulus For New Nuclear Plant Construction
- ❑ Investment Protection for New Nuclear Plants
- ❑ 20-Year Renewal of Price-Anderson Act
- ❑ New Tax Treatment for Decommissioning Funds
- ❑ Creates an R&D Portfolio

DESCRIPTION OF MAJOR NUCLEAR PROVISIONS OF EPACT 2005

- ❑ Investment Stimulus For New Nuclear Plant Construction
 - Production tax credit for new plants of 1.8 cents per kWh for the first eight years of operation. Only 6,000 MW of capacity is eligible. To receive the credit, the facility has to have received an allocation and be placed in service before 2021.
 - Loan guarantees for up to 80% of cost of eligible project (i.e., innovative technologies that avoid, reduce, or sequester air pollutants or emissions of greenhouse gases, which includes advanced design nuclear plants)

DESCRIPTION OF EPACT, Continued

- ❑ Investment Protection for New Nuclear Plants
 - Protection against delays during construction and until commercial operation caused by factors beyond the private sector's control
 - The full cost of delays for the first two reactors, up to \$500 million each; 50 percent of the cost of delays for the next four reactors, up to \$250 million each
 - Delays caused by NRC licensing processes and litigation covered

DESCRIPTION OF EPACT, Continued

- ❑ Renewal of Price-Anderson Act
 - New plants built within the next 20 years are covered for nuclear reactor accidents
- ❑ New Tax Treatment for Decommissioning Funds
- ❑ Creates an R&D Portfolio:
 - Nuclear Power 2010: a \$1 billion program cost-shared 50/50 with industry, including complete design/engineering on two advanced designs and testing and validating new licensing process
 - Next Generation Nuclear Plant: \$1.125 billion

ARE THESE ENOUGH?

CONCERNS THAT HAVE BEEN IDENTIFIED

- Whether a need for base load plants can be demonstrated;
- High construction costs, lengthy construction times, and potentially high financing costs;
- Uncertain capacity factors and production costs of new designs;
- Lack of experience with new designs;
- How these costs and uncertainties compare with alternatives;

CONCERNS, Continued

- Whether and when environmental externalities associated with fossil-fuel alternatives are internalized;
- Lack of resolution of spent fuel disposal issues;
- Whether there is sufficient public confidence and support to overcome dedicated opposition groups and NIMBY reactions;
- Whether a deregulation/merchant investment framework increases the cost of capital or otherwise makes nuclear investment unattractive; and
- Loss of nuclear expertise and infrastructure due to passage of time

A STATE REGULATORY PERSPECTIVE

❑ **Background Information On North Carolina**

- North Carolina still has traditional, cost-of-service regulation and is very unlikely to move to deregulation.
- It is served mainly by two traditional, vertically integrated utilities: Duke Power, a division of Duke Energy Corporation (Duke), and Progress Energy Carolinas, Inc. (PEC)
- Electric membership cooperatives and municipal power agencies are joint owners with investor-owned utilities of nuclear power plants

Energy Resources by Fuel Type for 2004*

	<u>PEC</u>	<u>Duke</u>	<u>U.S.</u>
Coal	48%	51%	50%
Nuclear	40%	46%	20%
Natural Gas and Oil	4%	0%	18%

The remaining energy for PEC and Duke is from hydro and purchased power, including contracts with QFs and natural gas-fired plants. EIA shows renewables providing 9%.

Source: For Progress Energy Carolinas, Inc., and Duke Power: Annual Report on the Long-Range Needs for Expansion of Generation Facilities for Service in NC, North Carolina Utilities Commission, July 1, 2005. For the U.S.: EIA's Annual Energy Outlook 2006

DUKE

Duke has approximately 2.3 million customers in North and South Carolina, with a peak load for 2005 of 18,687 MW. (About 70% of load is in NC.)

20,366 MW of installed capacity (summer rating)*

Over 700 MW of firm purchased power (contracts with non-utility generators) - mostly for peaking capacity

* This includes 100% of the Catawba nuclear plant, 87.5% of which is owned by the wholesale customers historically served by Duke. Duke owns only 12.5% of the Catawba plant.

DUKE

7,754 MW of conventional coal capacity (summer)

5,020 MW of nuclear capacity (summer rating)*

In 2005, approximately 98% of total generated energy came from Duke Power's coal (52.5%) and nuclear (45.7%) units.

* This includes only Duke's 12.5% ownership interest in the Catawba plant (282.25 MW).

DUKE

NEED FOR NEW CAPACITY

1.8% to 2.2% average summer peak system demand growth projected over the next 15 years

Expiration of purchased power contracts and retirements of old CTs expected

About 5,000 MW of capacity between 2006 and 2015 will need to be added (per Duke's 2005 Annual Resource Plan) to maintain Duke's 17% reserve margin.

DUKE

North Carolina requires a substantial amount of information to be pre-filed 120 days or more before the filing of an application for a certificate of public convenience and necessity for generating facilities of 300 MW or larger.

In May of 2005, Duke pre-filed the required information for up to 1600 MW of pulverized coal generation at an existing coal plant in NC and for a 600 MW natural gas combined cycle facility at an existing plant in NC. Duke has not yet filed an application for a certificate for either plant.

DUKE

Of all resource plans tested by Duke during 2005, Duke reports that the plan that outperformed all others featured:

1,600 MW of new coal capacity and
2,234 MW of new nuclear capacity

PROGRESS ENERGY CAROLINAS

PEC has 1.4 million customers, with a peak load for 2005 of 12,572. (About 86% of PEC's load is in NC.)

12,507 MW of installed capacity (summer rating)*

Over 1500 MW of firm purchased power (contracts with utilities and non-utilities) - over half of which are for peaking capacity

* Included in this number are the ownership shares of the North Carolina Eastern Municipal Power Agency of two nuclear plants and two coal-fired plants. Its load is included in peak load.

PROGRESS ENERGY CAROLINAS

5,285 MW of conventional coal capacity (summer)*

3,473 MW of nuclear capacity (summer rating)**

In 2005, approximately 89% of PEC's total generated energy came from coal (47%) and nuclear (42%) units.

* The North Carolina Eastern Municipal Power Agency (NCEMPA) owns 16.17% of the Mayo plant and 12.94% of the Roxboro plant.

** NCEMPA owns 18.33% of each Brunswick unit and 16.17% of the Shearon Harris unit.

PEC

NEED FOR NEW CAPACITY

Per PEC's 2005 Annual Resource Plan, PEC will need to add 2,585 MW of capacity between 2009 and 2015 to maintain a 13-15% reserve margin.

- 900 MW of peaking capacity;
- 1,185 MW of intermediate capacity; and
- 500 MW of base load capacity

Both nuclear and coal technologies are being considered.

PEC

1.8% average summer peak system demand growth projected over the next 15 years

Expiration of purchased power contracts

PEC found CTs to be most economical for peaking needs, combined cycle to be most economical for intermediate needs, and coal technologies to be most economical for base load needs (with nuclear continuing to be analyzed)

NC'S CLEAN SMOKESTACKS ACT

North Carolina's Clean Smokestacks Act requires over the next few years the installation of control technology to significantly reduce nitrogen oxide and sulfur dioxide emissions from Duke and PEC's coal-fired plants.

- Duke expects to spend in excess of \$1.5 billion.
- PEC expects to spend in excess of \$1 billion.

NUCLEAR PLANS

Duke and PEC are two of the eight members of NuStart Energy, which was formed in 2004 to obtain a combined construction and operating license (COL) from the NRC using the new streamlined licensing process and to complete the design engineering for selected reactor technologies

In January, PEC announced that it had selected its Harris nuclear plant site to evaluate for possible future nuclear generation expansion. A COL application is expected to be filed in late September or early October of 2007.

Duke has just announced the selection of a site in Cherokee County, SC, for further evaluation. It also announced an agreement with Southern Company, which jointly owns the site, for Duke to develop and operate a nuclear plant with Southern as a co-owner. A COL application is expected to be filed in late 2007 or early 2008.

NORTH CAROLINA REGULATORY LAWS AND POLICIES

- ❑ North Carolina Requires Least Cost Integrated Resource Planning (LCIRP)

LCIRP is an overall planning strategy – it considers both supply side resources (i.e., utility owned plants and non-utility purchase power contracts) and demand-side measures on an integrated basis to determine the least cost way of providing electric service.

NORTH CAROLINA REGULATORY LAWS AND POLICIES, continued

- ❑ **Certificate of Public Convenience and Necessity**
- Electric utilities have exclusive franchises (certificates) and the obligation to provide adequate service at reasonable rates.
- A separate certificate of public convenience and necessity is required (by utilities and “persons”) prior to construction of any generating facility to be used directly or indirectly for the furnishing of public utility service.

RATEMAKING

- ❑ **Rates are required to be as low as constitutionally permissible.**
- Rates are set using a historic 12-month test period
- Original cost of **used and useful** public utility property minus depreciation
- Reasonable pro forma revenues and operating expenses annualized upon used and useful plant at end of test year
- Construction-work-in-progress (CWIP) included only if found to be in the public interest and necessary to the financial stability of the utility

LEAST COST PLANNING

- ❑ **Least Cost Planning requires all alternatives to be considered**
 - Conservation and energy efficiency
 - Renewable technologies
 - Coal gasification and other types of generation

OTHER ISSUES

- Load forecasts – risk of over-estimation – growth could be below expectations
- Used and useful standard
 - Potential for abandoned plant cost recovery issues
 - Potential excess capacity issues
- Risk of after-the-fact determinations of imprudence and unreasonable costs

OTHER ISSUES, continued

- Potential need for extraordinary ratemaking treatment, such as automatic inclusion of CWIP in rate base
- Potential for opposition – high capital cost, potential cost and construction time overruns, lack of certainty, lack of long-term waste disposal solution, and push for conservation and demand-side management to delay need for base load construction

ARE THE EPACT PROVISIONS ENOUGH?

- ❑ These provisions address many of the specific concerns identified by the industry – at least for the first plants built
- Financial incentives provided - to offset the market risk of the first plants (i.e., higher capital costs) - described as being sufficient to make nuclear's capital costs comparable to alternatives
- Protection provided against regulatory risks associated with delays caused by factors beyond the private sector's control
- Progress has been made with respect to technology design and cost and licensing issues through the Nuclear Power 2010 program

ARE THEY ENOUGH?

□ BUT,

- There's substantial uncertainty about how the EPACT provisions will be interpreted and applied. There also could be cost overruns in excess of the statutory limits.
- Is nuclear the least cost option? Will its potential high cost, along with environmental requirements, lead to prices high enough to substantially reduce growth in usage? Could the cancellations of nuclear plants in the late 1970's and early 80's re-occur?

ARE THEY?

- Some investors are still expressing concerns about the high cost of future nuclear plants, particularly given expected environmental costs
- There appears to be public support, but would a proposed plant be susceptible to challenge by small but dedicated groups? Is radioactive material really “green”? There are always NIMBY concerns

MORE BAD NEWS

- There seems to be something for everything in EFACT. Are the nuclear provisions enough to push nuclear ahead of coal plants?
- A full and satisfactory resolution of spent fuel disposal issues is still needed
- Regulatory policy with respect to carbon emissions is uncertain in terms of scope and cost

CAN NUCLEAR OVERCOME ITS HISTORY?

As Paul Joskow noted at the EIA Outlook Conference last year:

- The nuclear industry has a poor historical record on construction cost and construction time estimates - plants begun in 1968 and after cost 200% to 400% more than estimates at the time construction started;
- No one has ever overestimated the construction costs of a nuclear power plant at the pre-construction stage

IN CLOSING, SOME GOOD NEWS FOR NUCLEAR

- There seems to be a growing consensus that the U.S. cannot continue to rely exclusively on natural gas for future electricity needs. Unless demand side management can be demonstrated to significantly reduce growth in base load demand, either coal or nuclear will have to be built.
- If a significant “price” is placed on carbon emissions, nuclear will gain compared to coal alternatives
- Success with the first few plants will breed success – a smooth licensing process, cost containment and predictable construction timetables will increase investor and public confidence