

NUCLEAR ENERGY | FEBRUARY 2010

Breaking the Nuclear Financing Barrier

By Matt Bennett, Josh Freed, and Jeremy Ershow

The United States has not built a new nuclear reactor in more than 30 years, in large part because of high financing costs for such projects. Not only are we losing out on a major source of job creation and development of our clean energy sector, we have been abdicating a technology essential to addressing climate change.¹ That is why Third Way proposes expanding and reforming the federal loan guarantee program for nuclear construction and improving predictability of the regulatory approval process. This will help spur new nuclear energy production, create jobs and address climate change with a clean, predictable, baseload energy source.

Nuclear reactors are expensive to build, and the entities that build them—electric utilities—are comparatively small. Indeed, construction costs of a new plant often constitute as much as 50% of a utility's market capitalization. Exacerbated by the uncertainty of an untested regulatory process, nuclear construction entails much higher financing costs than other large-scale energy sources, where costs are spread more evenly across the lifetime of the power plant. President Obama's proposal to increase the nuclear power loan guarantee program to \$54 billion is a critical first step toward reducing that financial strain. Third Way has long advocated and strongly supports the expansion of loan guarantees, ultimately to at least \$100 billion.² But more needs to be done—we should couple loan guarantee expansion with other steps that can reduce the finance costs for new reactor construction. Specifically, the United States needs a strong Clean Energy Bank to give utilities access to lower-cost financing for standardized designs, as well as some regulatory reforms to promote transparency, predictability and efficiency in the new reactor licensing process. This will help utilities obtain the affordable financing they need to build nuclear reactors and help return the United States to the forefront in developing clean energy jobs and tackling the climate crisis.

THE PROBLEM

High financing costs stand in the way of building the new nuclear power we need.

We need new nuclear power generation.

Over the next 20 years, U.S. electricity demand will increase 23%.³ Most analysts believe that renewable power will not be sufficient to keep pace with electricity demand, let alone scale back our current use of fossil fuels.⁴ Nuclear power can displace conventional coal power plants, producing consistent, large-scale power 24 hours a day.⁵ It has a small geographic footprint, and it is an easily expandable and deployable clean energy source.⁶

Today the United States gets just 19% of its electricity from nuclear energy, and no reactor project initiated by a utility since 1973 has been brought on-line.⁷ Japan, France, and China, meanwhile, have built 119 reactors in that time, with another 20 now under construction.⁸ Moreover, if the U.S. does not invest in new reactors before existing reactors reach the end of their life spans, our nuclear power fleet will drop from 104 reactors in 2009 to 4 reactors in 2050.⁹ If those reactors are lost without replacements, we are likely to see a significant, additional increase in the use of carbon-intensive energy.

High finance costs are a barrier to nuclear expansion.

A large portion of the costs of new nuclear power is the high cost of capital required by utilities to finance construction. Like hydro-electric power plants, nuclear plants are cheap to operate but relatively costly to build, frontloading lifetime expenses and necessitating greater levels of financing. In 2004, the Department of Energy commissioned a study finding that financing will account for, *on average*, 25% of a reactor's lifetime costs.¹⁰ Meanwhile, a 2003 MIT report found that the total, lifetime costs of nuclear power would be reduced by 13% if debt for new nuclear reactors carried the same interest rates as coal or natural gas plant construction.¹¹

And the high cost of capital often will impact consumers. Southern Company, one of the first movers in the new construction of nuclear power, found that financing debt increased the projected overall cost of construction of its two new reactors at the Vogtle power plant by 50%—a \$2 billion difference for ratepayers.¹²

U.S. utility market structure and regulatory uncertainty drive financing costs.

It is a huge undertaking for U.S. electric utilities to build a nuclear reactor—construction alone is estimated to cost utilities between \$4-5 billion.¹³ The market capitalization of the largest 20 electric utilities in the U.S. averages \$17 billion,

and the largest (Exelon) is only \$32 billion.¹⁴ Thus, even for bigger utilities, taking on billions of dollars of debt can compromise their credit rating, subjecting them to high borrowing costs.¹⁵ For small utilities, financing a \$5 billion reactor project exclusively with their own resources is simply impossible.¹⁶

The cost of capital hurdle for new nuclear construction is a relatively new phenomenon. When the existing reactor fleet was built, in the period before deregulation, recovery of construction costs via rates was almost guaranteed and utilities could get more favorable financing.¹⁷ Since that is no longer the case, utilities turning to the capital markets face higher interest rates to carry their debt for long periods of time.

The bottom line is that finance costs can be crippling. Compounded over the 5-7 year period between the start of construction and the first electricity sales from the reactor, finance costs can add billions to the all-in cost of the project.¹⁸

Recent federal policy changes don't sufficiently address financing costs.

The 2005 Energy Policy Act (EPACT) established a Department of Energy loan guarantee program dedicated to nuclear power projects.¹⁹ This program is an important start, and recent rule changes by the Obama administration have made it far more effective.²⁰ However, it has proven too small to meet our nuclear power needs. The program's current funding level of \$185 million can guarantee \$18.5 billion in loans, enough to back just four of the 21 planned reactor projects.²¹ Third Way has been calling for a major increase in the loan guarantee program for several years, and we were encouraged by President Obama's 2011 budget request to triple the loan volume.

But increasing loan volume addresses only part of the problem. The program is temporary, providing no predictability or support to utilities planning future projects. And it lacks a clear mechanism for assessing the subsidy cost to participants.²² On the regulatory side, much has been done in the past 20 years to make the reactor licensing process reliable and efficient while keeping safety first. Yet the regulatory framework still contains the prospect of lengthy, duplicative reviews. Meanwhile, there is little operational transparency, without much information publicly available about the progress of individual license applications.

THE SOLUTION

Restructure and expand the clean energy financing program, and send confidence-building signals to investors.

Create a Clean Energy Bank, with a larger, reformed loan guarantee program.

The United States should establish a technology-neutral Clean Energy Bank (CEB) to support clean energy deployment. Such a financing platform would be capable of issuing loan guarantees for new reactor projects that we need. As a permanent, independent entity, CEB would determine on a case-by-case basis how to structure loan guarantees that facilitate credit. Moreover, investors would benefit from the stability of an entity not dependent on the ups and downs of year-to-year appropriations. CEB's technology neutrality would empower its expert review boards to determine the most effective use of its funding through a competitive application process.

Under the current programs, nuclear loan guarantee recipients pay an up-front premium to cover the federal government's credit default risk exposure. Consequently, the Congressional Budget Office has scored the nuclear loan guarantee program at just one penny for every dollar guaranteed.²³ That means that CEB could leverage relatively little appropriated federal money into very large loans for nuclear projects. (By contrast, renewable energy loan guarantees, which don't require borrowers to pay a default premium, are projected to have a CBO score of 10 cents on the dollar, making them ten times as expensive for the federal government to underwrite.)²⁴

Because CEB would be a part of a broader clean energy strategy, its initial funding level should be set at \$10 billion to support a range of clean energy projects, in addition to assuming operational control of any existing clean energy loans or loan guarantees. This would be a robust investment level that could finance both nuclear and other clean energy projects. If nuclear were to receive just 10% of that amount (\$1 billion), it would enable CEB to guarantee \$100 billion in new loans—in addition to managing any loan guarantees issued under the EPACT program.

The President has proposed expanding the current loan guarantee program to provide \$54 billion in loans, which is a very good start. But \$100 billion in new nuclear loan guarantees would make available enough guarantees to fully match the current nuclear market demand, while leaving 90% of CEB's funding to support grants and loans for renewable energy projects.

Doing this successfully will require effective implementation. The ideal CEB would be endowed with full operational independence and flexibility and be

free to establish diverse credit structures that meet U.S. energy needs. Accordingly, The CEB administrator should have the power to decide whether nuclear loan guarantee recipients would be responsible for the guarantee's risk premium. It remains important that the risk premium be calculated fairly for each applicant. In the unlikely event of a default, the risk premium should account for the percentage of credit likely to be recoverable, the default's timing in the construction process, and the time lapse between when a default occurs and when credit recovery begins. But the administrator also must ensure that the loan guarantees do not serve to shift substantial risk from utilities to the federal government.

Work with the NRC on efficiency and transparency.

The modern NRC licensing process is now going through its first paces, with the Commission conducting its initial reviews of new applications based on modern reactor designs. As a result, we do not yet know in detail which processes may need further legislative reform, and Congress is understandably reluctant to direct any changes before those first reviews are complete. Still, there are a few steps that should be adopted once the NRC successfully completes three or four such first-of-a-kind reviews.

First, Congress should ask the NRC to commit to holding its final hearing on a license application as a short, legislative-style hearing, taking 3-14 days, rather than a judicial-style hearing that can take up to a year. Because this hearing exclusively covers material considered at other points in the licensing process, its potential for long delays should be limited. Second, many utilities apply for an early site permit ahead of their reactor construction and operating license. In these cases, the NRC should use any overlapping information from the early site permit's environmental impact statement (EIS) when conducting the EIS of the reactor license application. This will enable the NRC to save time by building on completed environmental assessments.

Congress should also immediately direct the NRC to establish a licensing schedule for each application and report every 6 months on its progress. This would give investors more predictability and create an external accountability mechanism to facilitate a more efficient process. Such transparency measures not only would be directed at Commission delay, it would reinforce the responsibility that utilities and their suppliers have for ensuring an efficient licensing process. Indeed, the NRC has reported that some license applicants have submitted applications that have required substantial revision, which makes the process less predictable for investors and drives up the cost of capital.

■ CONCLUSION

The global race for clean energy is on. Countries around the world, from France and Spain to Japan and China, are building new nuclear plants as part of comprehensive strategies to reduce carbon emissions, creating thousands of new jobs and strengthening technical expertise. The United States lags far behind in large part because of financing roadblocks that we can overcome. Combining a large increase in the loan guarantee program with a clean energy bank that lowers financing costs and regulatory reforms is critical if the United States is to restore its leadership in clean energy, including nuclear power, for the 21st century.

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Third Way is the leading think tank of the moderate wing of the progressive movement. We work with elected officials, candidates, and advocates to develop and advance the next generation of moderate policy ideas.

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■ ENDNOTES

- 1 Third Way Memo, "Keeping the Senate's Energy Loan Guarantees in the Stimulus," available at http://content.thirdway.org/publications/143/Third_Way_Memo_-_Senate_Energy_Loan_Guarantees.pdf.
- 2 \$54 billion in federal loan guarantees to construct new nuclear power plants requires only \$540 million in federal budget authority.
- 3 Energy Information Administration Forecasts and Analyses, "Electricity Supply and Demand Projections to 2030," available at <http://www.eia.doe.gov/oiaf/forecasting.html>.
- 4 Energy Information Agency data: <http://www.eia.doe.gov/basics/quicknuclear.html>; <http://www.eia.doe.gov/cneaf/nuclear/page/analysis/nuclearpower.html>.
- 5 Nuclear Regulatory Commission, "Map of Current Nuclear Power Stations," available at <http://www.nrc.gov/reactors/operating/map-power-reactors.html>; National Atlas of the United States, "Maps of Renewable Energy Potential," available at http://www.nationalatlas.gov/articles/people/a_energy.html#two.
- 6 Energy Information Agency data, available at <http://www.eia.doe.gov/basics/quicknuclear.html>.
- 7 World Nuclear Association Information, available at <http://www.world-nuclear.org/info>.
- 8 Nuclear power plants are licensed to operate for 40 years, extendable through relicensing to 60 years. So far 50 of the 104 operating reactors have been re-licensed (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/license-renewal-bg.html>). Massachusetts Institute of Technology Interdisciplinary Study, "The Future of Nuclear Power," July 2003, updated 2009, pg 37 available at <http://web.mit.edu/nuclearpower/>.
- 9 Tolley, G., Jones, D., University of Chicago, "The Economic Future of Nuclear Power," commissioned by the Department of Energy, August 2004, available at <http://www.ne.doe.gov/np2010/reports/NuclIndustryStudy-Summary.pdf>.
- 10 MIT Interdisciplinary Study, "The Future of Nuclear Power," July 2003, updated 2009, available at <http://web.mit.edu/nuclearpower/pdf/nuclearpower-ch4-9.pdf> (Table 5-1).
- 11 Southern Company submission to Georgia Public Service Commission, "Plant Vogtle Units 3 & 4 Semi-Annual Construction Monitoring Report," August 2009.
- 12 In 2007 dollars. Parsons, J., Yangbo, D., "Update on the Cost of Nuclear Power," page 46, May 2009, available at <http://web.mit.edu/ceepr/www/publications/workingpapers/2009-004.pdf>.
- 13 Google Finance, retrieved October 19, 2009, available at http://www.google.com/finance?catid=66859495&sort=MARKET_CAP#link_Market%20Cap.
- 14 Moody's Investor Services, "New Nuclear Generating Capacity: Potential Credit Implications for Investor Owned Utilities," May 2008, available at <http://massimobray.italianieuropei.it/080527MoodyNewNukeGenCapacity.pdf>.
- 15 By contrast, in France, where the national utility has a market value of \$107 billion, such costs are backed by the national government. BusinessWeek.com, retrieved October 19, 2009, available at <http://investing.businessweek.com/research/stocks/snapshot/snapshot.asp?ric=EDF.PA>.
- 16 Today, the state of Georgia avoids this problem by allowing utilities to charge ratepayers for financing costs as they are incurred. It is no coincidence that a Georgia-based project, 2 new reactors at Southern Company's Vogtle site, is likely to be the first new reactor to come onto line.

17 Tolley, G., Jones, D., University of Chicago, "The Economic Future of Nuclear Power," commissioned by the Department of Energy, August 2004, available at <http://www.ne.doe.gov/np2010/reports/NuclIndustryStudy-Summary.pdf>.

18 The Energy Policy Act Pub.L. 109-58, 2005, available at <http://www.gpo.gov/fdsys/pkg/PLAW-109publ58/content-detail.html>.

19 The Energy Daily, "Antinuclear Groups Blast DOE Loan Guarantee Changes," December 10, 2009, available at http://www.theenergydaily.com/nuclear/Antinuclear-Groups-Blast-DOE-Loan-Guarantee-Changes_3591.html.

20 DOE Press Release, "DOE Announces Loan Guarantee Application for Nuclear Power Plant Construction," October 2, 2008, available at <http://www.lgprogram.energy.gov/press/100208.pdf>.

21 To participate in the loan guarantee program, recipients must pay the risk premium of the loan's default upfront to the fund.

22 Title 17 Loan Guarantee Program Information, available at <http://www.lgprogram.energy.gov/features.html>.

23 Apollo Alliance, "Comparing Senate and House Versions of Stimulus," available at <http://apolloalliance.org/feature-articles/data-points-comparing-senate-and-house-versions-of-stimulus/>.