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Protecting Taxpayers from a Financial Meltdown

Calculating the Credit Subsidy Fee on a Loan Guarantee for a New Nuclear Reactor

Richard Caperton March 8, 2010

President Obama has made two major announcements in recent weeks regarding loan guarantees for nuclear power. Loan guarantees commit the government to repaying a loan if the original borrower can't pay back the loan. His proposed fiscal year 2011 budget would triple nuclear loan guarantees to $54.5 billion. And on February 16, the Department of Energy issued an $8 billion guarantee for two proposed Southern Company nuclear reactors in Georgia. Both of these measures will help utilities finance new nuclear reactors, but the underlying terms of the guarantees will determine the risk to American taxpayers and the number of new nuclear plants that will be built.

Building a nuclear reactor today will involve dealing with tremendous financial uncertainty. Cost projections for nuclear plants keep going up because of variability in material costs, a new licensing process, limited suppliers for key parts, and inevitable delays in construction projects. The projected cost for two new reactors in Canada shot from $7 billion to $26 billion in just two years. And in the United States, costs for two new reactors at the South Texas Project have ballooned from $5.4 billion to an estimated $18.2 billion since 2007. Neither of these reactors has been built, so there's no way to predict what the final cost will be. But cost overruns are virtually certain in nuclear construction, which greatly increases the risk the nuclear companies will default on their loans. Private lenders are well aware of the risk of building new reactors, which is why they're unwilling to finance the projects without government support.

The huge cost of nuclear power means that taxpayers will have to provide nuclear loan guarantees to finance new projects if the president and Congress are serious about building new reactors. The terms on these guarantees must include adequate protections for taxpayers. Most important, the so-called "credit subsidy cost" must be calculated accurately. The credit subsidy cost represents the price tag of the guarantee to the government, and in the case of new reactors, must be paid by the utility company borrowing the money.

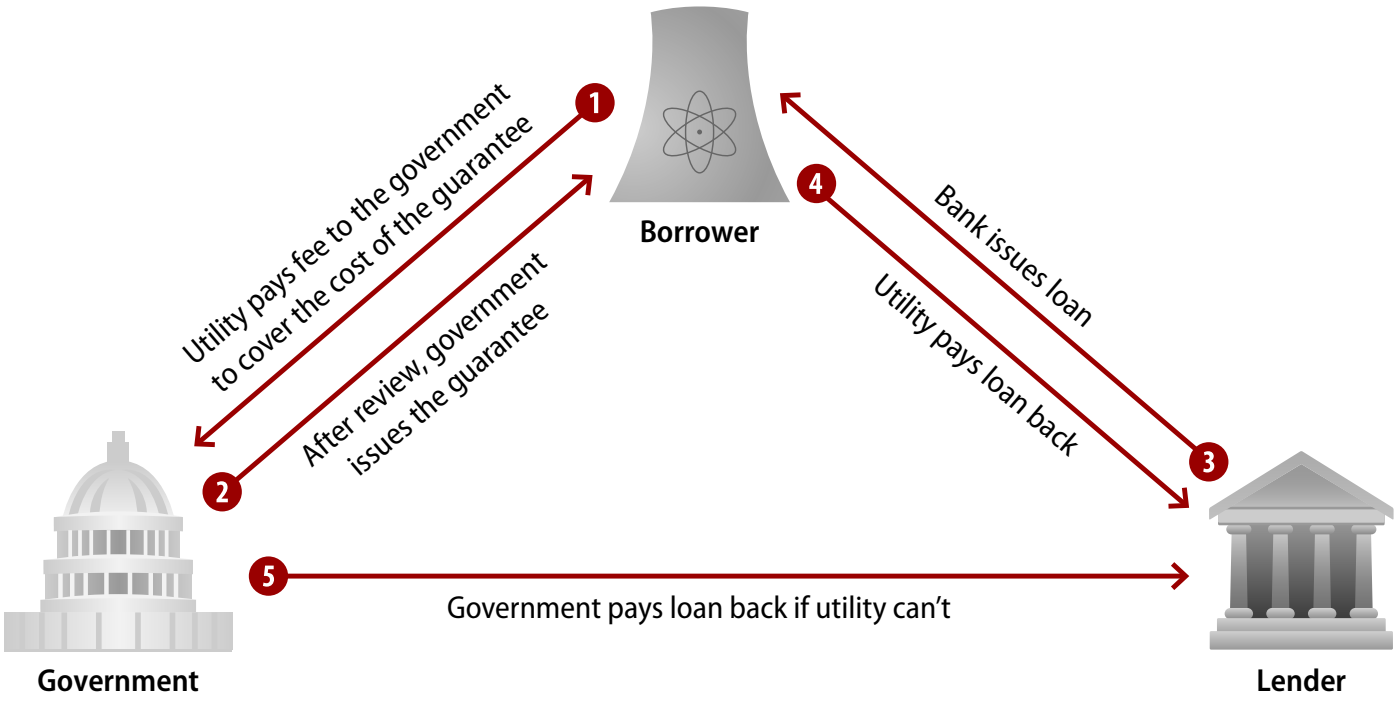
Estimates of what this cost should be run the gamut from 1 percent or less to 30 percent of the total guarantee. If the cost is too low, then it will increase risks for taxpayers. If the cost is too high, then it will unnecessarily decrease the number of reactors financed. Surveys of outside estimates and calculations detailed below indicate that the cost should be at least 10 percent and possibly much more.

Loan guarantees, a valuable tool for borrowers

When the government issues a loan guarantee, taxpayers are assuming the risk if the borrower is unable to pay back the loan. Most borrowers under the nuclear loan guarantee program will get a loan from the Federal Financing Bank, which will now charge a much lower interest rate and provide more favorable terms. In exchange for this valuable service, the guarantor (the federal government) has to account for the risk of default. They do this by calculating the "credit subsidy cost."

The exact credit subsidy cost is impossible to project because it is determined by an Office of Management and Budget model that is not made public, but it is essentially the present value of the expected payouts that the government will have to make on the loan. This is

The mechanics of a nuclear loan guarantee



determined by estimating a likelihood of default—the "default rate"—and the amount that the lender will recover in bankruptcy proceedings—the "recovery rate." The government makes up the difference so the lender receives all that is due. The pay out is then discounted back to present dollars, taking account for the time value of money. The total cost is usually quoted as a percentage of the guarantee.

The nuclear loan guarantee program

There were no loan guarantees available for nuclear reactors until 2005. Title XVII of the Energy Policy Act of 2005 provided significantly more protection for lenders. According to the program rules, the government can guarantee up to 80 percent of the cost of the project, and the borrower has to find at least 20 percent elsewhere. This remaining 20 percent can either come from 1) raising equity, potentially through utility customers who pay higher rates before the reactor is actually built, known as "construction work in progress" or 2) debt financing, potentially via French or Japanese Export-Import Banks that will provide loan guarantees and/or loans for the portion not covered by the U.S. government.

Debt holders get paid first in bankruptcy proceedings, but DOE has changed its loan guarantee rules and no longer requires the U.S. government to hold a "right of first lien," which means that the U.S. government doesn't necessarily get paid before other debt holders. The result is that in the event of a default, taxpayers would have to share proceeds from a liquidation with other creditors, such as the French or Japanese Export-Import Banks.*

Just like under other loan guarantee programs, the government has to have the credit subsidy cost in hand before issuing a loan guarantee. This cash can come from one of two places: an appropriation from Congress or a cash payment from the borrower, known as a "credit subsidy fee." U.S. government rules require the government to have the credit subsidy fee on hand before it can issue the loan guarantee. And the nuclear loan guarantee program mandates that because there hasn't been a congressional appropriation to cover the credit subsidy cost, the Department of Energy must charge a credit subsidy fee.

Since this fee must be paid upfront, it can add significant costs to the project. Utilities that borrow money obviously want to keep this fee as low as possible, but responsible government management dictates that the fee must reflect the true likelihood of default. Not surprisingly, the nuclear industry wants the fee to be 1 percent or less, while the Congressional Budget Office has estimated that it should be 30 percent, which reflects the CBO's 2003 determination of "risk of default on such a loan guarantee to be very high—well above 50 percent." In a blog on March 5, CBO declined to refine this estimate to reflect any specific projects, but reiterated that "it would be difficult to set the fee so as to entirely cover the estimated cost to the government."

These two are bookend estimates, but they are hardly the only ones. For example, Standard and Poor's thinks it should be at least 4 percent to 6 percent, with the potential to be much higher, depending on the borrower's credit rating. The Government Accountability Office has

estimated the loss rate at 25.42 percent. This loss rate is different from a true estimate of the credit subsidy cost in important ways—primarily, it doesn't involve discounting to present values—but it does give some guidance in calculating the true cost. Unfortunately, none of these estimates is perfect:

- The nuclear industry's 1 percent doesn't seem to be based on any calculation that includes all appropriate risks. If this estimate reflected the true risk, utilities would probably be able to get traditional financing without the guarantee. Indeed, the added benefit of the guarantee probably wouldn't outweigh the transaction costs of getting the guarantee.

- The Congressional Budget Office assumptions on recovery and default rates aren't clear, but appear to be extremely pessimistic. And the assumption of very low construction costs is extremely optimistic. This estimate was constructed while analyzing a bill that never became law and assumes the guarantee only covers 50 percent of the project—today's program allows for loan guarantees to cover up to 80 percent of the project. Because none of these assumptions fully represent today's financing or regulatory environment, this estimate needs to be updated.

- The Government Accountability Office helpfully estimates the loss rate, but hasn't discounted the payouts or otherwise constructed an estimate of the credit subsidy costs.

- Standard and Poor's assumes lower capital costs than current construction costs, and assumes a 70 percent recovery rate on bankrupt plants. This is not only higher than other estimates, but seems especially unrealistic given that some reactors will likely default while under construction and may have no salvageable value.

None of these estimates is the "right" credit subsidy cost, but each gives helpful guidance in calculating a credit subsidy cost that more accurately accounts for the risk of default and the value of any unfinished reactor.

A new model for estimating the appropriate credit subsidy fee for a nuclear loan guarantee

Our new model employs a simplified framework for estimating the appropriate credit subsidy fee for a nuclear loan guarantee. The model doesn't give a precisely correct fee that a borrower should pay, but it provides a ballpark estimate and is useful for showing how the fee is sensitive to changes in major inputs.

The model is based on a series of assumptions:

- Every project is different and should be evaluated independently, but the generic default rate is 50 percent. This serves as a proxy for the credit rating of the borrower, which will vary dramatically from project to project.

- The recovery rate in liquidation is 50 percent. This is the GAO estimate, and it is also implied by Standard and Poor's.** But this may be optimistic since DOE no longer requires that the U.S. government have a right of first lien.

- The loan term is 30 years, the maximum term allowed under the law; the discount rate is 4.7 percent, based on current yields on 30-year Treasury notes; and the guarantee covers 80 percent of the project, the maximum amount allowed under the law.

- The default risk is spread evenly over the life of the loan, even though it's more likely that a project would default early in the loan rather than later. This has the effect of underestimating the actual credit subsidy cost.

These assumptions indicate that the credit subsidy fee on a nuclear loan guarantee should be at least 10 percent. The fee goes up as the guarantee is for a greater portion of the total project cost, as the default rate goes up, as the recovery rate goes down, as the discount rate goes down, and as the risk of default is concentrated earlier in the loan. For example, just changing the recovery rate to 40 percent leads to a fee of about 13 percent. If the projected recovery rate is 40 percent and projects only default in the first year of the loan, the appropriate credit subsidy fee would be about 24 percent.

The table on page six illustrates how the credit subsidy fee depends on both the default rate and the recovery rate. Estimates in this table assume that the guarantee is for 80 percent of the cost of the reactor, that DOE does maintain a right of first lien, and that the risk of default is spread evenly over 30 years. These last two assumptions have the effect of lowering the credit subsidy cost, so these are low-end estimates.

Steps to estimate a credit subsidy fee

These are the key steps in estimating a credit subsidy fee. Our spreadsheet-based model performs calculations based on these inputs to estimate the fee.

1. Determine the likelihood that the builder of the reactor won't be able to pay back the loan—the "default rate."

2. Determine the percentage of the total reactor cost that will be covered by the loan guarantee.

3. Determine the amount of the total cost that will be recovered in the event that the borrower defaults and the reactor is sold in liquidation—the "recovery rate."

4. The first three steps give a total payout that the U.S. government will have to make. Spread these payouts out over the lifetime of the loan, based on when defaults will occur.

5. Discount payouts in future years to determine a "present value" of the total payouts. This is the credit subsidy fee that the borrower must pay the government.

Each of these steps requires an input that can vary widely, which makes precise estimates very difficult.

To put this in perspective, if a developer gets a guarantee for 80 percent of the cost of a $10 billion plant, the loan guarantee is for $8 billion. A 10 percent credit subsidy fee means that the utility has to pay an extra $800 million to the government at the start of the project.

There are very serious questions about a developer's ability to pay that sort of fee. If the administration decides to explore financing options for the fee, it must make absolutely certain that the financing doesn't place the guarantee's cost back on taxpayers.

Without looking at details of specific nuclear projects, it's impossible to say with 100 percent certainty what the credit subsidy fee on these loan guarantees should be. But based on these calculations, the credit subsidy fee should be at least 10 percent, which would

be $800 million for a loan guarantee for a $10 billion reactor.*** The administration must keep in mind, however, that credit subsidy fees should be set at a rate that protects taxpayers, not at an artificially low rate as a handout to big utilities.

Low-end estimates for credit subsidy fees

		Default rate										
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Recovery rate	0%	0%	5%	11%	16%	21%	27%	32%	37%	42%	48%	53%
	10%	0%	5%	9%	14%	19%	23%	28%	33%	37%	42%	46%
	20%	0%	4%	8%	12%	16%	20%	24%	28%	32%	36%	40%
	30%	0%	3%	7%	10%	13%	17%	20%	23%	27%	30%	33%
	40%	0%	3%	5%	8%	11%	13%	16%	19%	21%	24%	27%
	50%	0%	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
	60%	0%	1%	3%	4%	5%	7%	8%	9%	11%	12%	13%
	70%	0%	1%	1%	2%	3%	3%	4%	5%	5%	6%	7%
	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Grey boxes represent represent most likely scenarios

Notes

*If the United States guarantees either the only creditor or a creditor with a right of first lien, taxpayers will not have to pay any money for the defaulted loan if the reactor brings in 80 percent of the value of the reactor in a liquidation sale. Another way to think about this is that even if there's a 100 percent chance of default, the credit subsidy cost would be 0 percent if selling the reactor would generate more money than the value of the loan.

**Standard and Poor's assumes a 70 percent recovery rate on a reactor that costs $6,000 per kilowatt, or a liquidation value of $4,200 per kilowatt. Recent estimates of new nuclear construction are roughly twice that liquidation value, ranging all the way up to $10,800 on the high end (implying a 40 percent recovery rate).

***Assuming a loan guarantee for 80 percent of the reactor, $10 billion x 80 percent guaranteed x 10 percent credit subsidy fee = $800 million.

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