New Reactors and Nuclear Subsidies in the United States

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Cradle-to-Grave Nuclear Subsidies

- R&D Subsidies
- Licensing Subsidies
- Construction Subsidies
- Operating Subsidies
- Radioactive Waste Subsidies
- Shut-Down Subsidies

**Energy Policy Act of 2005:** More than $7 billion in subsidies for nuclear power, plus loan guarantees
R&D Subsidies

>$2.9 billion, including:

- *Generation IV*
- Reprocessing and transmutation R&D
- Student fellowships and training programs, government-industry research and infrastructure upgrades
Licensing Subsidies/Incentives

- **Nuclear Power 2010** – taxpayer-industry cost-share program to fund licensing of new reactors and reactor design certification
  - Obama Administration proposing to terminate the program; proposed legislation authorizes more funding

- **One-step construction and operation licensing application process** – EPACT 1992
  - Severely limits public participation
Construction Subsidies

- $18.5 billion in taxpayer-backed loan guarantees for up to 80% of the cost of a project
- $2 billion in “risk insurance” for delays in licensing
- $1.25 billion plus “such sums as necessary” for construction of reactor in Idaho
Operating Subsidies

>$5.7 billion, including:

- Production tax credits 1.8 cents per kilowatt-hour for first 8 years
- Reauthorization of Price-Anderson Act
- Incentives for “modular” reactor designs
Spent Fuel Management

- **DOE-utility waste contracts for new reactors**
  - Guarantees that spent fuel will be removed from sites within 10 years of shutdown or taxpayers pay for storage
  - 12 contracts signed for 21 proposed reactors

  - One-tenth of one cent per kilowatt-hour paid by ratepayers getting electricity from nuclear reactors to pay for a geologic repository for the spent fuel
  - Currently $22 billion
Shut-Down Subsidies

$1.3 billion, including:

- Changes decommissioning rules for closed reactor sites
- Repeals cost of service requirement
Result of EPACT 2005

- Even after licensing process was “streamlined” in 1992, no new licenses applications in the US in 30 years

- After Congress passed EPACT 2005 and authorized $18.5 billion of loan guarantees in 2007, NRC received 19 applications for licenses to build 28 new reactors

- Most of the proposed reactors are in the Southeastern US and in Texas
Industry Must-Have: Loan Guarantees

- Puts taxpayers – rather than investors – on the hook to pay back default on loans
  - CBO, 2003: “Very high – well over 50 percent” default
  - CBO, 2008: “Not necessarily” relevant today, but construction costs, technical risks, licensing delays no better now

- To get a loan guarantee, the borrower or the taxpayer must pay the “credit subsidy cost” (i.e., government’s cost)
  - GAO and CBO: very difficult to calculate
  - DOE is keeping credit subsidy cost secret

- Defaults not covered by subsidy cost will come directly out of the US Treasury
Status of Title XVII Loan Guarantee Program

- Congress has authorized:
  - $18.5 billion for nuclear, ~2 projects of 3-4 reactors (originally planned to cover 4 projects)
  - $4 billion for uranium enrichment
  - $18.5 billion for all renewables and transmission
  - $8 billion for coal

- President Obama proposing to triple nuclear guarantees in FY2011 to $54.5 billion (~6-8 reactors)

- Nuclear industry wants “a permanent financing platform” or at least $100 billion in guarantees
One guarantee has been offered for $8.3 billion for two reactors in Georgia

- DOE/Southern agreed on a “range” for the fee, to be determined when the guarantee is finalized

Program Mired in Secrecy:
- Subsidy fee?
- Evaluation criteria?
- Correspondence with applicants?
- Environmental impacts of the projects?

Congress unhappy with slow pace
State Subsidies

- Construction Work in Progress:
  - Utilities can recover construction costs from ratepayers before the license is even granted
  - States with CWIP: FL, GA, MS, NC, and SC
  - GA, FL, and SC ratepayers rebelling
  - Duke Energy lobbying for “SuperCWIP” in NC

- Tax Breaks:
  - Calvert County, Maryland: $300 million in tax breaks to Constellation
These Subsidies Aren’t Enough

- **Standard & Poor’s (Jan 2006):**
  - “from a credit perspective, these legislative measures may not be substantial enough to sustain credit quality”

- **Moody’s (June 2009):**
  - New reactors are a “bet the farm” investment

- **Citigroup (Nov 2009):**
  - Three risks from new reactors “could each bring even the largest utility company to its knees financially”
  - “at no time, anywhere in the world, has a utility built a new nuclear power station and taken the full Construction, Power Price, and Operational Risk”
So, More Nuclear Subsidies Proposed

- Additional loan guarantee authority
  - $36B more to unlimited in the Clean Energy Deployment Administration (CEDA)
- More Production Tax Credits
- Tripling risk insurance
- 10% investment tax credits
- 5-year accelerated depreciation
- Nuclear in a “Clean Energy Standard”
And More…

- Tax-exempt private bonds applied to new reactors
- Tax breaks available to public power in grants
- Nuclear worker training
- 10-year extension of the nuclear parts tariff
- Additional “streamlining” of licensing
- R&D funding for reprocessing
Meanwhile, Designs Aren’t Ready

- **AP1000:** NRC concerned design won’t withstand earthquakes or severe weather like hurricanes or tornados, among other issues; no schedule for completing certification
- **EPR:** NRC concerned that day-to-day and emergency systems could fail at the same time
- **US-APWR:** New seismic analysis being done; certification delayed by 6 months and possibly more
- **ESBWR:** Unlikely to get a loan guarantee?
- **ABWR:** Certification expires in 2012; no schedule for review of amended design

Design problems can lead to delays and cost increases
Status of New Reactor Projects

- NRC only reviewing 13 projects to build 22 new reactors (down from 19 projects/28 reactors)

- Nearly all proposed reactor projects have experienced one or more of the following: cancellation, suspension, delay, utility credit downgrade, and increases in estimated cost.

  - 7 Projects Suspended/Canceled: MO, AL (3 of 4 reactors), MS, LA, NY, TX, UT
  - More than 5 Projects Delayed: FL (2 projects), AL, SC, TX
  - Utility Credit Downgrades: FPL (Florida), SCG&E (South Carolina), PPL (Pennsylvania), Progress Energy (Florida)
Most Important:
Increased Cost Estimates

- Cost estimates have soared since 2008 (costs are for 2 reactors unless specified):
  - Texas ($5.8B to $18.2B)
  - Alabama ($6.4B to $10.4B)
  - South Carolina ($5B to $11B)
  - North Carolina ($4.4B to $9.3B)
  - Florida ($5.6B to $17B)
  - Florida ($8B to $24B)
  - Maryland ($2B to $9.6B) – one reactor
  - Pennsylvania ($4B to $13-15B) – one reactor
Leading Projects for Loan Guarantees Troubled

- **Calvert Cliffs, MD:**
  - Roussley report: EPR expensive/complex
  - EDF took provision against future losses in project
  - Constellation in dispute with EDF; cut spending on project

- **South Texas, TX**
  - San Antonio pulled out of 85% of investment; TEPCO offered mere $155 million
  - Market monitor report: cost exceeds revenue by 30-50%

- **VC Summer, SC**
  - SCG&E credit rating downgraded
  - SCE&Gis looking for other investors
Nuclear Can’t Compete

- Cheap natural gas: Less than $8 per million BTU expected until at least 2030
- Decreased demand for electricity
- Efficiency potential (3 cents per kWh): US uses more electricity per capita than other industrialized nations
- Large renewable resources cheaper than nuclear (5 to 10 cents per kWh)
Industry Saying the Same

- Constellation CEO Mayo Shattuck – market signals that indicate Calvert Cliff-3 is not viable: “persistently low natural gas prices, the inability of the U.S. Senate to pass comprehensive climate change and energy legislation, and seemingly less-than-ideal short- and long-term power price outlooks”

- Exelon CEO John Rowe – “As long as natural gas is anywhere near current price forecasts, you can't economically build a merchant nuclear plant.”
Not Just in Deregulated States

- **FPL President Olivera:** FPL may never build new nuclear reactors due to licensing and economic concerns, cheap natural gas prices, and unresolved design issues (June 2010).
- **Progress Energy in North Carolina** – May abandon plans for new reactors at Shearon Harris
- **NEI President and CEO Fertel** – Plans for new reactors delayed due to low gas prices and lack of electricity demand
Question for Policymakers

Does the US really want to perpetuate an industry completely dependent on indefinite public subsidies to survive?
Question for Utilities

Why start to build a bunch of new reactors at the same time, only to show once and for all that nuclear power is uneconomical?