

***Federal Incentives Provided by  
EPA Act 2005 for  
Advanced Coal Technology***

Presentation to  
Advanced Coal Technology Work Group

David Berg  
DOE Office of Policy and International Affairs

# *EPAAct 2005: Toolkit of Incentives*

- EPAAct 2005 contains several incentives for a range of energy technologies and locations:
  - Tax credits of various types
  - Authority for loan guarantees (Title XVII)
  - Authority for continued RD&D
- This toolkit allows government to work artfully with industry and states to strengthen the U.S. energy economy.
- The incentives may best be used:
  - To complement one another and State incentives
  - To target *specific* risks that inhibit private investment...
  - To more efficiently address business and public risk
- Our work suggests that these incentives can stimulate early commercial use of advanced coal technologies.

## *Work to Date*

- “The Business Case for Commercial Deployment of Integrated Gasification Combined Cycle Power Plants” (2005) (unpublished) (sponsored by DOE, EPA, EPRI)
- “The Business Case for Coal Gasification with Co-Production” (in progress) (sponsored by DOE, DOD, EPA, EPRI, ACC, TFI, GTC, AISI)
- Evaluations of business risks and potential incentives
- Both studies:
  - Defined and described reference case plants
  - Performed sensitivity analyses on key variables
  - Performed modeling on the impact of incentives
  - Developed risk ratings from interviews with the value chain
- Both analyses suggest that, with incentives, commercial prospects are bright for both technologies.

## *Value of EPA Act 2005 Incentives*

- Help implement the President's "Advanced Energy Initiative".
- Improve U.S. energy security and ...
- Protect the environment... by expanding...
- America's clean advanced energy portfolio (energy sources, efficiency of use).
- Commercial use is the reward for successful RD&D; it is the payoff for prior / current RD&D investment.
- The value of incentives is measurable under the President's Management Agenda... and helps build...
- International leadership and reduce energy dependency.
- Bottom line: Incentives help industry and Wall Street bridge the last step in the technology life cycle... ***into commercial use.***

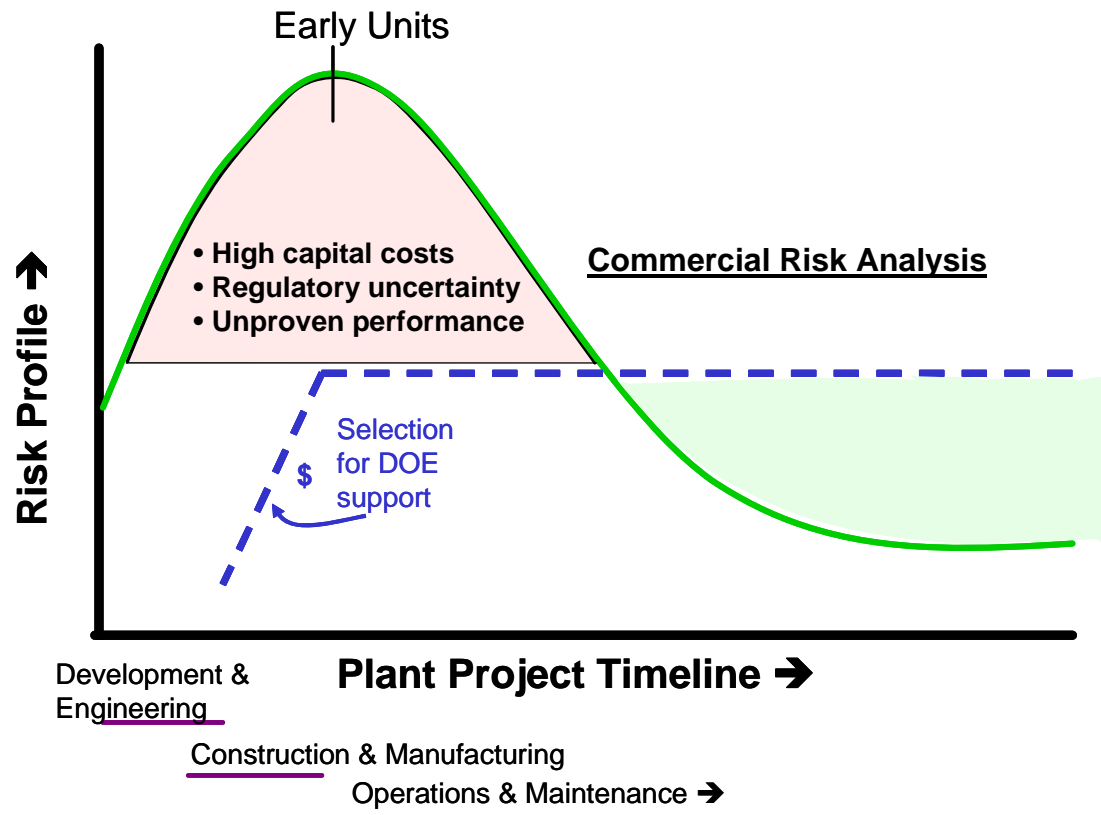
# Incentives for Projects that Employ Innovative Technologies

## Policy Challenge:

Mobilize private capital for *innovative* energy infrastructure, while managing the Federal deficit.

## Management Challenge:

Develop a transparent decision system for allocating incentives which meets both public and private sector objectives and, in some cases, enhances prospects for repayment.



# *Tax Credits for Clean Coal Projects*

- EPAAct 2005, section 1307 authorizes \$1.65 billion in tax credits for clean coal projects:
  - \$800 million of credits to support Integrated Gasification Combined Cycle (IGCC) projects for electricity generation
  - \$500 million to support advanced coal electricity generation projects that utilize innovative technologies other than IGCC
  - \$350 million to gasification projects that support activities other than electricity generation such as the production of gases used in chemical production
- Treasury received 49 responses to tax credit guidance it issued in February 2006 for projects in 29 states.
  - 18 for IGCC plants and 4 for advanced coal-based generation in 19 states, and
  - 27 for gasification in 17 states

# *Tax Credits for Clean Coal Projects*

In November 2006, DOE and Treasury announced \$1B in tax credit awards to 9 clean coal and advanced gasification plants:

Technology	Recipient	Location	Output	Tax Credit (\$ millions)
IGCC Bituminous	Duke Energy	Edwardsport, IN	795 MW	\$133.5
IGCC Bituminous	Tampa Electric	Polk County, FL	789 MW	\$133.5
IGCC Lignite	Mississippi Power Company	Kemper County, MS	700 MW	\$133.0
Advanced Coal	Duke Energy Cliffside Modernization Projects	Cleveland and Rutherford Counties, NC	1600 MW	\$125.0
Advanced Coal	E.On U.S., Kentucky Utilities Co. and Louisville Gas and Electric	Bedford, KY	1744 MW	\$125.0
Gasification	Carson Hydrogen Power, LLC: Carson Hydrogen Power Project	Carson, CA	Hydrogen and 390 MW electricity	N/A
Gasification	TX Energy, LLC: Longview Gasification and Refueling Project	Longview, TX	Synthetic gas for chemical feedstock	N/A

# **Title XVII: Incentives for Innovative Technologies**

EPAAct 2005, Title XVII authorizes the Secretary of Energy to issue *loan guarantees* for projects that...

- “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and
- “employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.”
- Have a “reasonable prospect of repayment of the principal and interest on the obligation by the borrower.”

[www.lgprogram.energy.gov](http://www.lgprogram.energy.gov)



## *Title XVII: Incentives for Innovative Technologies*

- “...a guarantee by the Secretary shall not exceed an amount equal to 80 percent of the project cost of the facility.”
- Preference for limiting guarantees to 80% of 80%, but will consider other cases as long as the guarantee is for less than 100% of the debt instrument.
- No guarantee shall be made unless--
  - an appropriation for the cost has been made; or
  - [ SELF-PAY ] the Secretary has received from the borrower a payment in full for the cost of the obligation and deposited the payment into the Treasury.
- DOE is utilizing the “self-pay” approach.
- In addition, the project sponsor must pay DOE for the administrative costs of issuing the loan guarantee.

# **Title XVII: Incentives for Innovative Technologies**

Under Title XVII, ten discrete categories of projects can be eligible for loan guarantees, including:

1. Renewable energy systems;
2. Advanced fossil energy technology (including coal gasification meeting the criteria in subsection 1703(d));
3. Hydrogen fuel cell technology for residential, industrial, or transportation applications;
4. Advanced nuclear energy facilities;
5. Carbon capture and sequestration practices and technologies, including agricultural and forestry practices that store and sequester carbon;
6. Efficient electrical generation, transmission, and distribution technologies;
7. Efficient end-use energy technologies;
8. Production facilities for fuel efficient vehicles, including hybrid and advanced diesel vehicles;
9. Pollution control equipment; and
10. Refineries, meaning facilities at which crude oil is refined into gasoline.

## *Title XVII: Implementation Status*

- DOE issued guidelines and an initial solicitation in August.
- A quantitative limit (\$2 billion of Federal exposure) applies to the loan guarantee portfolio issued under the guidelines.
- The Solicitation includes all or part of eight of the ten project categories eligible by statute. Nuclear power and petroleum refinery projects are excluded.
- Dec. 31: Closing date for Pre-Application submissions.
- Important details include:
  - DOE cannot fully guarantee any loan.
  - The lender must have significant exposure.
  - Two legislative corrections must be made before DOE can issue any loan guarantees.
  - DOE lacks appropriations for operating costs (e.g., for reviews).
- DOE will soon issue a Notice of Proposed Rulemaking. The final rule will be the basis for future solicitations.

# *Value of a Loan Guarantee to Applicants*

- **Lack of operating track record:** Innovative technologies lack a commercial performance record; lenders require external guarantees before providing loans to “first mover” projects.
- **No balance sheet:** In classic “project finance”, the to-be-built facility is the only asset; projects need credit enhancement.
- **Short debt tenors:** With first units or where long-term off-take agreements are not commercially available, banks may offer only short-term debt (< 5-7 years), if any.
- **More debt leverage:** Higher-cost “first units” often can be competitive only with more leverage (e.g., 80% debt / 20% equity vs. 40-50% equity); credit support makes the higher debt load more affordable – or even possible.
- **Public benefits:** Some projects provide public value (e.g., emissions avoided, regional development) beyond what the project itself captures in revenues or income.

# **Statutory Rating Criteria for Loan Guarantee Applications**

## **Mandatory (or statutory) criteria**

- M1. Curbs emissions of air pollutants** (criteria pollutants [e.g., SO<sub>x</sub>, NO<sub>x</sub>], Hg) or **GHGs** – section 1703(a)
- M2. Innovative technology** (post-RD&D, but not yet in widespread commercial use in the United States) – section 1703(a)
- M3. Very favorable prospects for repayment of guaranteed loan** – section 1702(h)

## *Other Incentives for Clean Coal*

- The Clean Coal Power Initiative (CCPI) creates industry/government partnerships to demonstrate at large scale promising new advanced Clean Coal Technologies.
- DOE's Carbon Sequestration Program is investing \$450 million over the next 10 years in 7 Regional Partnerships throughout the U.S. to validate safe, permanent, and economical capture, transportation, injection, and long term storage of carbon dioxide (CO<sub>2</sub>).
- DOE is sponsoring R&D for development of carbon capture and sequestration: \$24 million to nine organizations to develop novel and cost-effective technologies.

## *A Few Bottom Lines*

- By using incentives that align with the business risks associated with a clean coal project, government can encourage and accelerate commercial adoption of advanced technologies more efficiently.
- Collaboration between Federal agencies and state governments can achieve mutual objectives and reduce overlap.
- Although money is fungible, Wall Street is very reluctant to invest (equity and debt) in first-of-a-kind plants. So, it is a “must” for policy-makers to risk-align incentives and collaborate between levels (Federal and state).
- David Berg, 202-586-1117, david.berg@hq.doe.gov