Public Abstract

Applicant name: Indianapolis Power & Light Company, Indianapolis, IN 46217
Team Members: Phenix Limited, LLC, Oxnard, CA 93030 www.phenix-limited.com
Sargent & Lundy LLC Chicago, IL 60603
GE – Energy & Environmental Research Corporation, Irvine, CA 92618

Proposal Title: **The Clean Combustion System™ Demonstration at IPL Harding Street Station – Unit 6**

Commercial Application: [**X**] New Facilities [**X**] Existing Facilities [ ] Other

Technology Type: Advanced Coal-fired Hybrid Gasification / Combustion Process for Multipollutant Control of SO_2 and NO_x for PC coal-fired electric power generating plants.

Estimated Total Cost of Project:
Total Estimated Cost: $27.56 Million (design, construct and 1 year demonstration)
Estimated DOE Share: **$**13.17 million
Estimated Private Share: $14.39 million

Anticipated Project Site: IPL Harding Street Station, Indianapolis, and Marion County, Indiana, 46217

Type of coal to be used: Bituminous coals from local Indiana Farmersburg, Kindall and Triad mines

Size or Scale of Project: 100 MW_e generating plant; 1141.2 tons of coal /day input

Duration of Proposed Project: 28 months

Primary Contact:
For additional information, parties should contact: Gary Finchum
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Brief Description of Project:

Indianapolis Power & Light Company (IPL), incorporated in October 1926, provides retail electric service to more than 420,000 residential, commercial and industrial customers in Indianapolis, as well as portions of other Central Indiana communities surrounding Marion County.

IPL's dedication to the environment has never been more evident than it is today. Since 1992, our Company has spent nearly $250 million on environmental upgrades including scrubbers, low-NO_x burners and continuous emissions monitoring equipment. As a

responsible business, we cannot merely appreciate the environment; we must actively work to protect it.

To this end, IPL has teamed with Phenix Limited, LLC, located in Oxnard, California to respond to the Department of Energy's Clean Coal Power Initiative (CCPI). Phenix will provide an advanced coal-combustion process technology for the in-situ control of pollutants from the burning of fossil fuels. The process, called the *Clean Combustion System*™ (CCS) is a simple hybrid of coal gasification / combustion that can meet the stringent US environmental rules for SO_2 (sulfur dioxide) and NO_x (nitrogen oxides) within the burner / boiler itself. The only "chemical reagent" required is limestone, and the ash waste products have commercial use.

All coal-fired plants can be retrofitted at low-cost to incorporate CCS and CCS qualifies as a "repowering" technology, as defined by the CAAA (P.L.-509, Section 401) "as a technology capable of controlling multiple combustion emissions simultaneously with improved boiler or generation efficiency and with significantly greater waste reduction than technologies in use."

IPL operates the Harding Street Station, a 1000 MW gas, oil, and coal fired electric generating plant located in Indianapolis, Indiana. This facility includes three coal-fired tangential design steam generators; a 400MW unit, and two 100 MW units built in 1958. These units fire the local Indiana low / medium sulfur bituminous coals. IPL must now address the stringent new Indiana NO_x SIP Call and the Clean Air Act Amendment - Title IV environmental rules with new NO_x and SO_2 emission control technology. Unit 6, one of the 100 MW tangential steam generators has been selected as the CCS demonstration unit.

The "Clean Combustion System™ Demonstration at IPL Harding Street Station – Unit 6" project proposes an estimated $27.5 million, 28-month program to engineer and modify a commercial-scale 100 MW Tangential utility boiler with the CCS technology and then conduct a 12 month full-load demonstration. This project will demonstrate a fully environmentally compliant facility that will meet both the present and proposed new stringent EPA and Clean Air Act emissions regulations. The project will directly address the CCPI solicitation objectives to: (1) demonstrate an advanced coal-based technology; and (2) accelerate its deployment to commercial use.

The features of the CCS demonstration are shown in Figure 1, entitled "CCS-Tangential™ Boiler". The project objectives are to meet President Bush's "Clear Skies" SO_2 and NO_x emission goals for 2010 when firing the local Indiana bituminous coals, as well as the immediate Indiana NO_x SIP Call, by control of the unit 6's stack pollutant emissions.
The program emissions goals are:

- ✓ **0.6 lb. SO2 /10^6 Btu or less and**
- ✓ **0.15 lb. NO_x /10^6 Btu or less and**
- ✓ **Develop an accurate, detailed Mercury Balance across the CCS Tangential™ Boiler**.

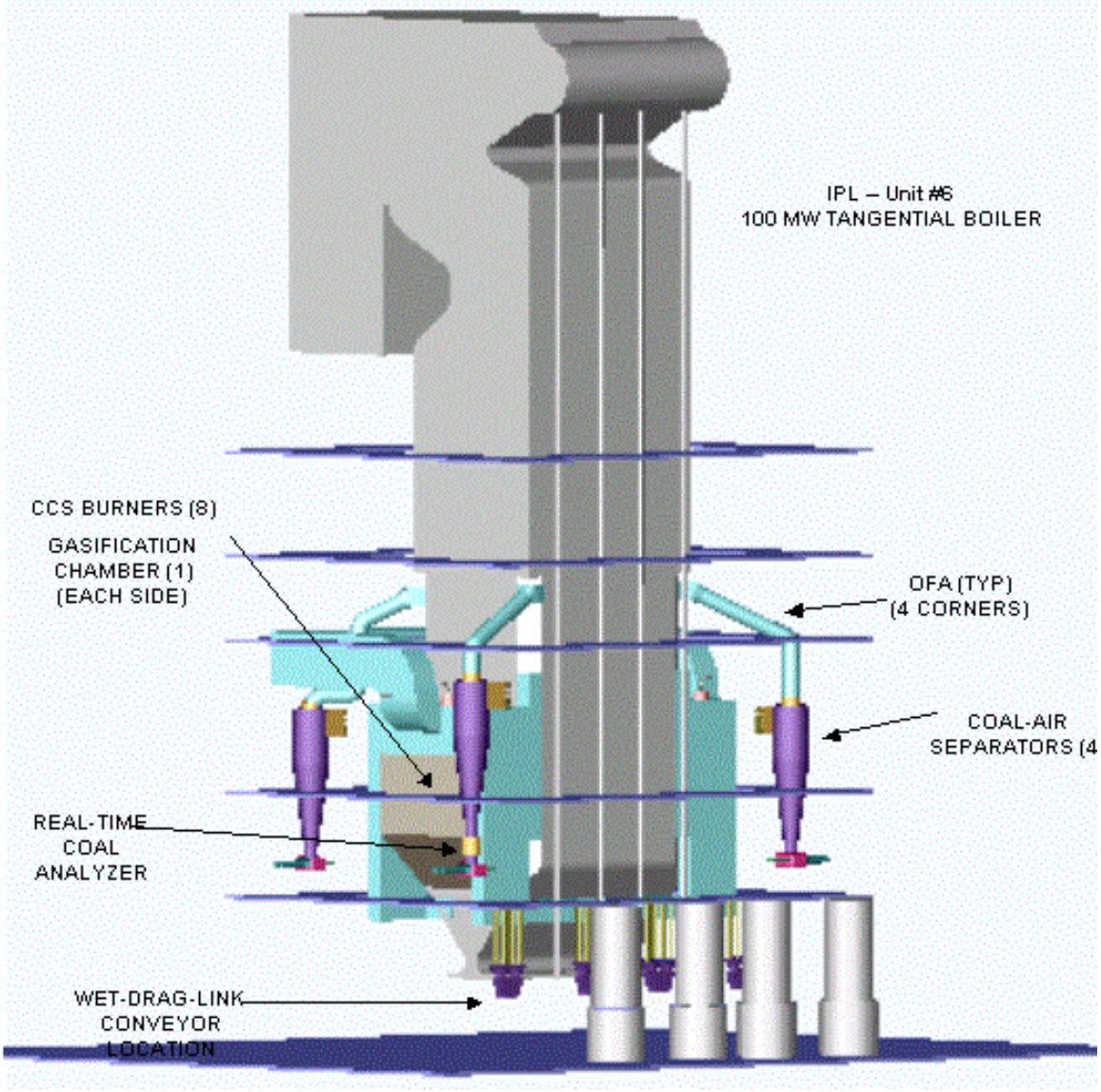

Figure 1. CCS-Tangential™ Boiler

IPL's proposed CCS-Tangential™ demonstration is expected to confirm the pre-commercial application of the CCS multipollutant control process for tangential boiler designs. These emissions performance will provide IPL's unit 6 and its other tangential units, when modified with the CCS, an extended clean, competitive operating life for another 20 years.

IPL's proposed DOE-CCPI project, "**Clean Combustion System™ Demonstration at IPL Harding Street Station – Unit 6"**, will demonstrate and prove the improved use of coal, the key US natural resource, to make it a broadly available, fully-effective, and low-cost, clean energy resource for US coal-fired power plants. Further, it will provide a small, but important new contribution to the energy security for the State of Indiana. And over time, worldwide commercial applications of the CCS technology will provide other countries a greater stability and growth through clean low-cost electrical energy from coal.