



Clean Energy Systems, Inc.

power without pollution



Climate Neutral Combustion Technology

Economics and Technology Advancement

Advisory Committee Meeting

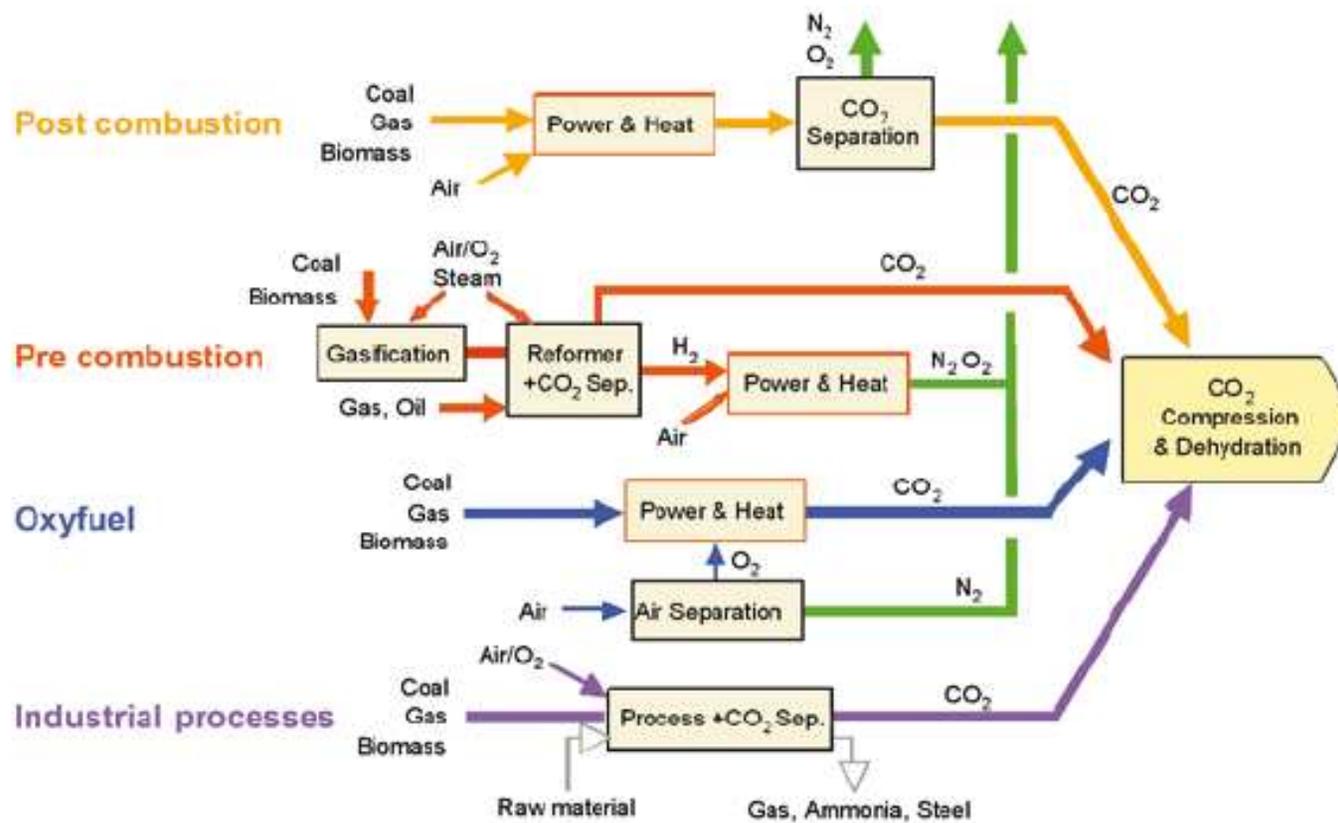
November 29, 2007



Presentation Outline

1. Climate Neutral Combustion Technologies
2. Clean Energy System's Oxy-Fuel Technology
3. Technology Economics
4. Early Stage Projects
5. ETAAC Considerations

CO₂ Capture Systems





Vision

Technology to make "Power without Pollution"™

We use aerospace technology to change the way power is produced and eliminate all atmospheric emissions including carbon dioxide. Our gas generation technology uses hydrogen, all hydrocarbon fuels and many renewable fuels.

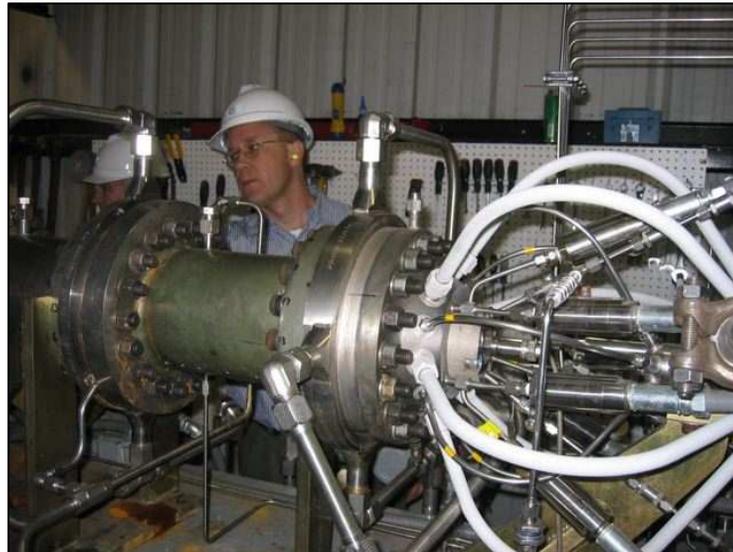




Investors and Partners

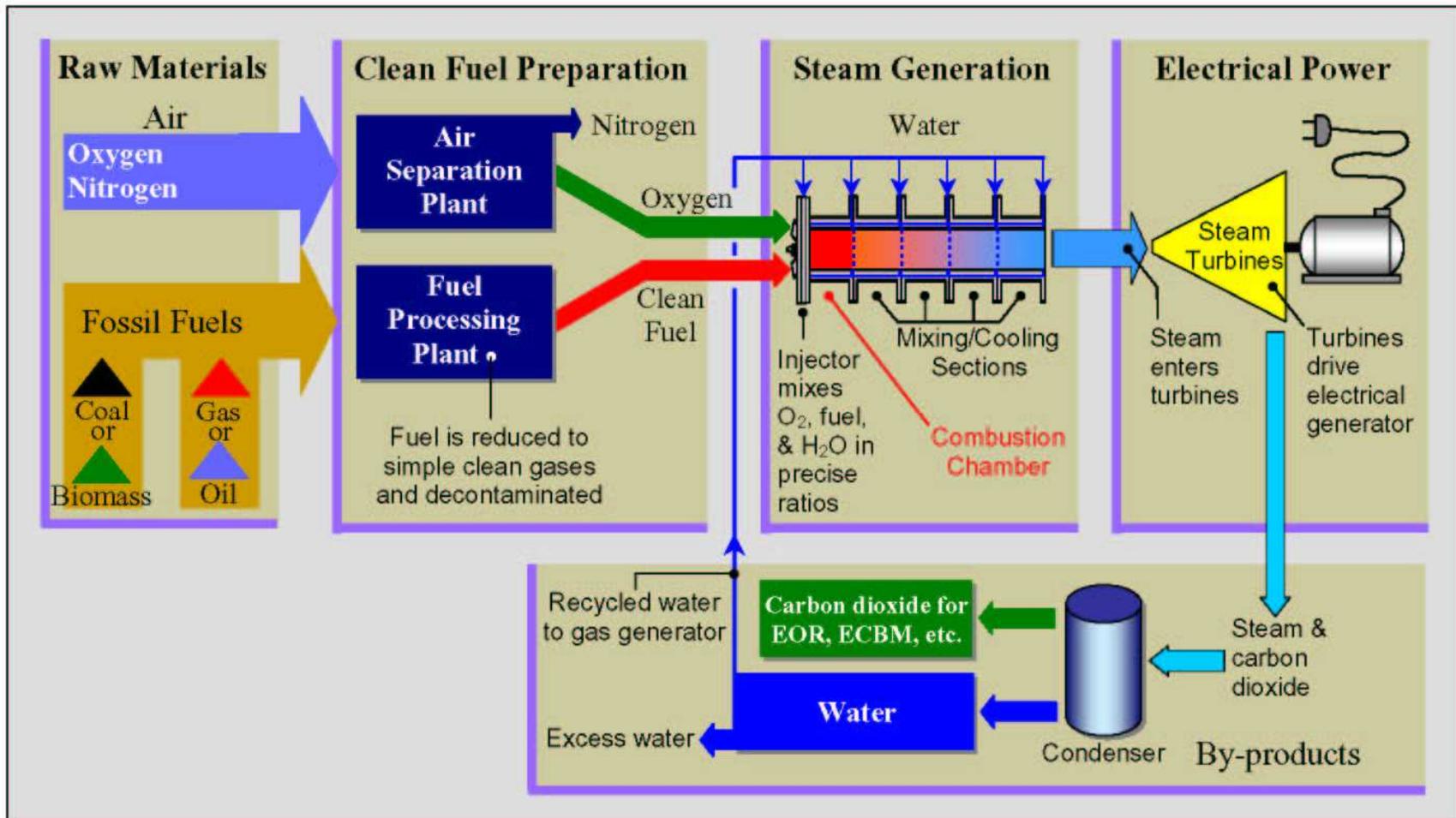
- **AES Corporation**
 - An investor since 2003, one of the largest global power companies, with 44,000 MW from 121 plants in 26 countries.
- **Southern California Gas Co.**
 - An investor since 2006, an energy services company, with \$12 billion in revenues. Largest gas distributor in the US.
- **Paxton/Quadrise**
 - Investors since 2007, two affiliated companies developing projects using “MSAR” made from emulsified heavy oils. Paxton is controlled by Paramount Resources, a publicly traded Canadian oil and gas exploration company.
- **Siemens Power Generation**
 - A partner through two US Department of Energy contracts to develop advanced turbines and combustion systems. DOE portion valued at \$19 million.
- **DOE and CEC PIER Grant Program**

Unique Factors



- Zero Emission
- The market's
“Other 85%”
- Base Load
- Scalability
- Speed to Market
- Patent Protected
- Proven Technology

Zero-Emission Power Plants





Kimberlina Power Plant

- 1700 hours of operation with 325+ starts
- Operated on natural gas, simulated syngas, and liquid fuels with sulfur
- Partners include US DOE, California Energy Commission, Air Liquide, Siemens, Air Products, and others





Kimberlina Power Plant

- Pollution control equipment: before and after the changeover to oxy-fuel combustion
- 95-98% sequestration ready CO₂





First Generation Gas Generator

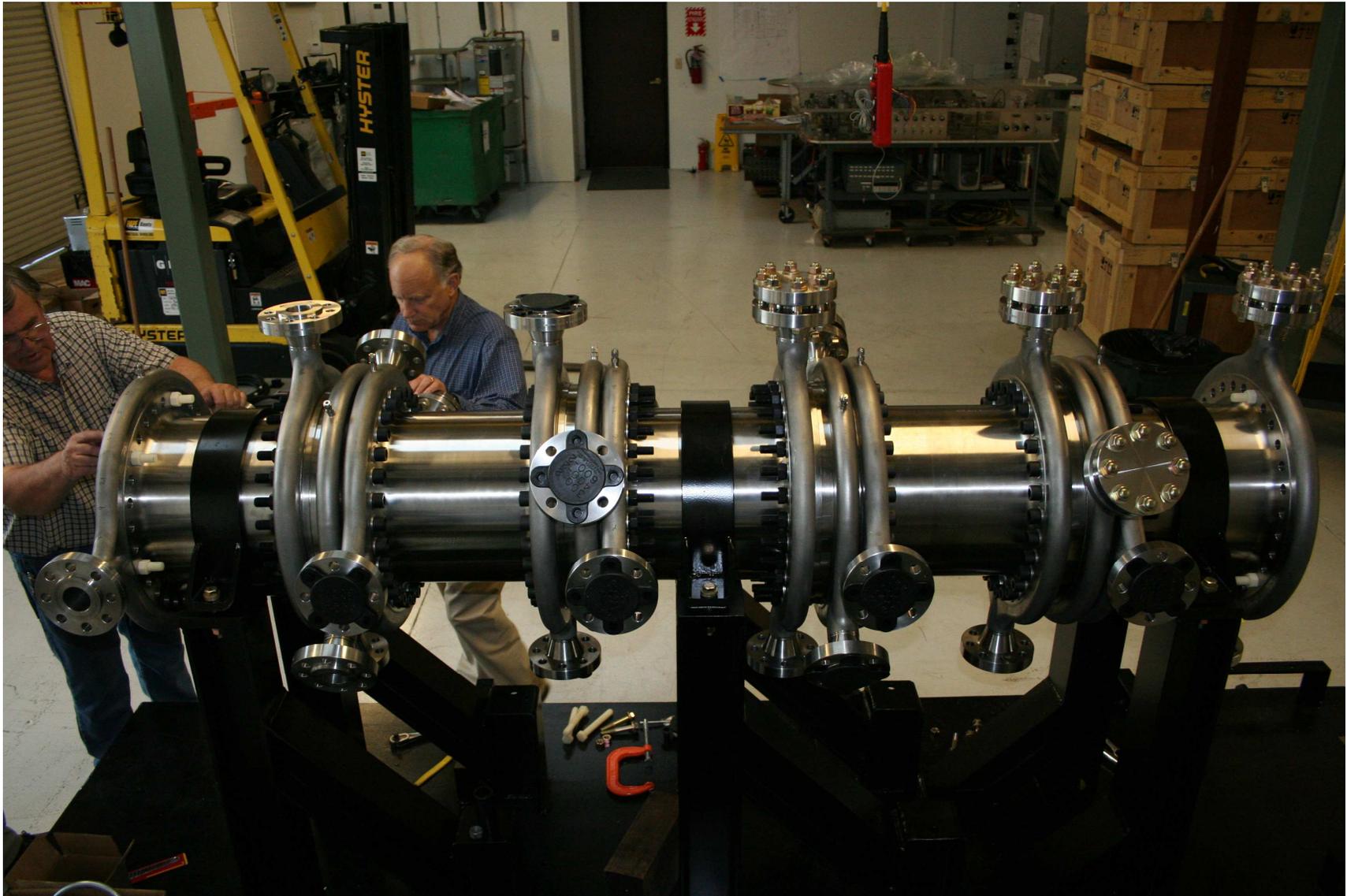


- Provides steam/CO₂ for 50 MW Power Plants
- Testing planned for 1Q 2008
- Same output as boiler below





Assembled Gas Generator

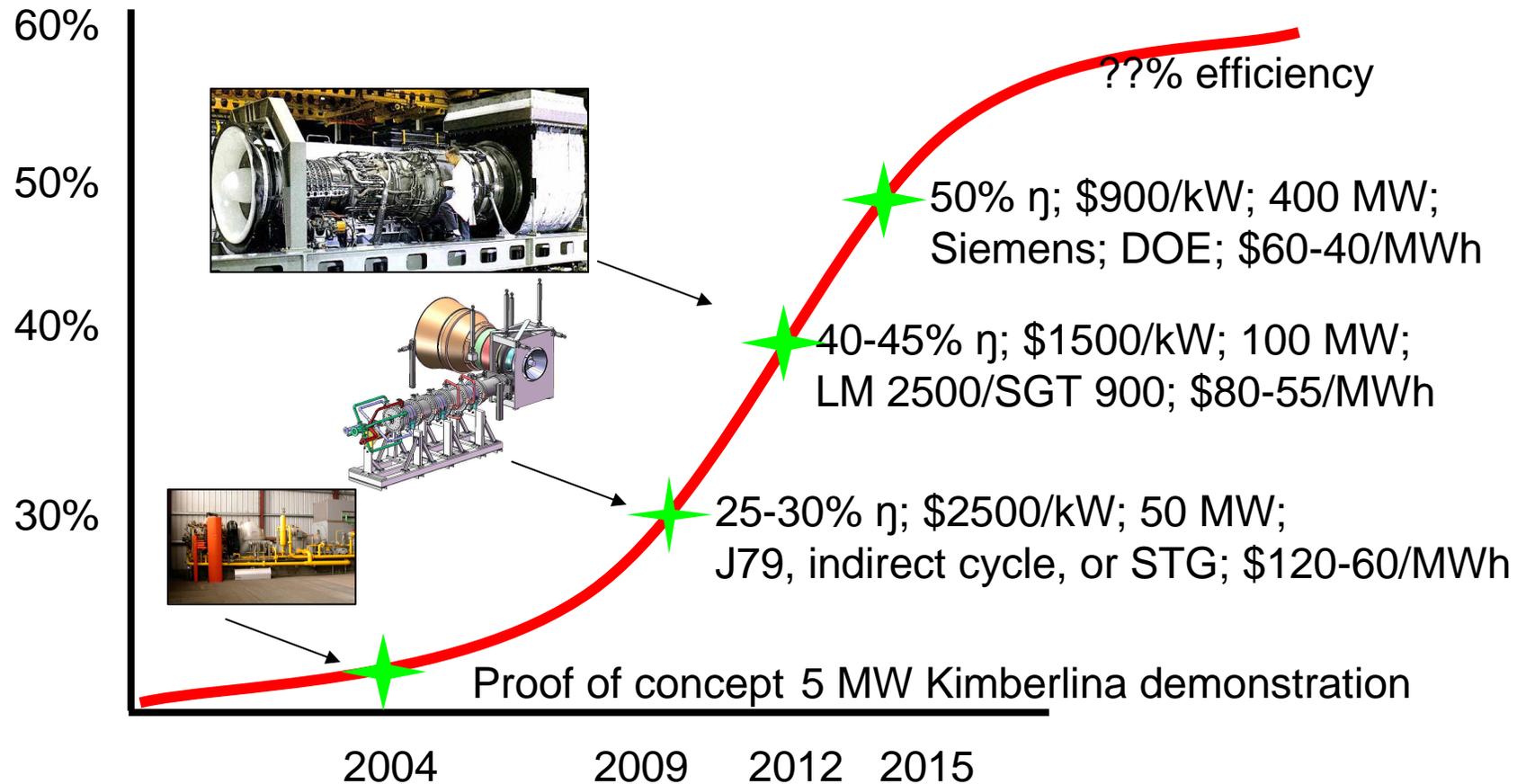




ENCLOSURE FABRICATION SHOP

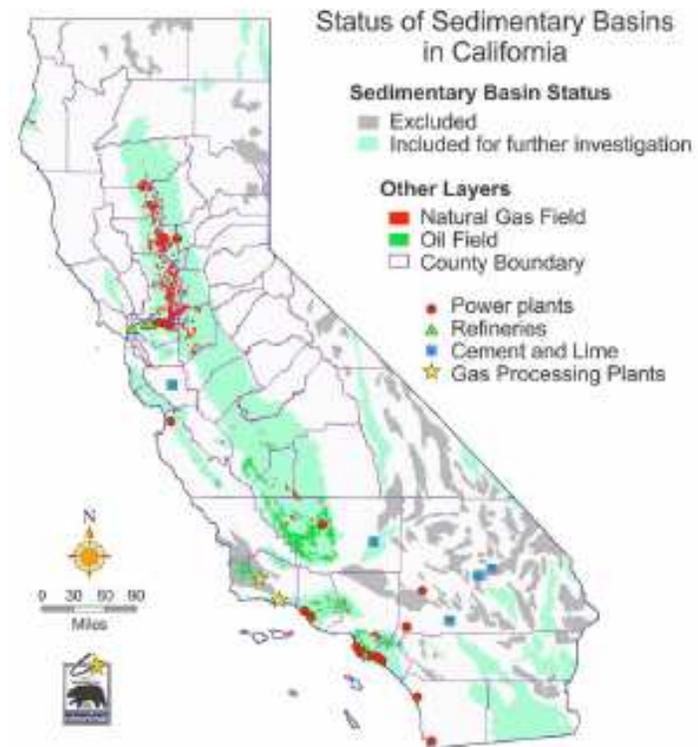


Technology Migration Path



CA Storage and EOR Potential

- In-state power plant emissions:
47 MMT CO₂/yr
- Oil and gas field storage
potential: 100+ yrs
- Saline formations: 1,500-
6,000+ yrs. @ 47MMT/yr
- CA recoverable stranded oil:
+250%
- Similar metrics for other US oil
production areas





Clean
Energy
Systems



GOVERNOR ARNOLD SCHWARZENEGGER

March 23, 2007

The Honorable Samuel W. Bodman
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Mr. Secretary,

California recently passed landmark legislation to reduce greenhouse gas emissions to 1990 levels by 2020. In California, 20 percent of our greenhouse gas emissions come from the electric power generation sector. Nationally, this figure is much higher. We recognize the crucial role technology advancement will play in helping California and the nation mitigate climate change emissions from the power generation sector. As such, I ask for your support for a California-based project that could provide the platform for significant reductions in criteria and greenhouse gas pollutants from the generation of electricity.

Title XVII of the Energy Policy Act of 2005, authorized the Department of Energy to issue loan guarantees to eligible projects that, "avoid, reduce or sequester air pollutants or anthropogenic emission of greenhouse gases." Clean Energy Systems, a Rancho Cordova, California-based company, has applied for a loan guarantee under this program. Clean Energy Systems, with the help of research and development assistance from both the California Energy Commission and the U.S. Department of Energy (DOE), has developed a power turbine fueled by natural gas that emits no criteria air pollution and has the ability to capture and sequester its greenhouse gas emissions. The company has successfully demonstrated its technology in a 5 MW pilot project currently operating in Bakersfield, California.

Clean Energy Systems is now planning on building the next stage of this technology – a 100 MW power turbine. The proposal would be the world's first commercial, hydrocarbon-fueled, oxy-combustion, zero-emission base load power plant, known as ZEPP-1. I encourage you to consider and approve the pending pre-application for the ZEPP-1 plant. Both California and the DOE will be able to take great pride when this technology proves to be successful.

Sincerely,

Arnold Schwarzenegger

/s/

STATE CAPITOL • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841





Early Phase Projects





CA ZEPP-1

- First US Zero Emission Power Plant (ZEPP)
- 50 MW using natural gas, MSARtm, petcoke and/or renewable fuels
- Possible upgrade of plant with a higher-temperature turbine
- Final phase of negotiations for 20 year PPA
- Facility will supply 1 million tons CO₂ to West Coast Regional Carbon Sequestration Project (WestCarb)
- Contract awards for preliminary detailed engineering and permitting preparation to be awarded in October 2007



Ongoing Europe ZEPP Projects

SEQ-1(www.seqnederland.nl)

- 40 MW SEQ-1 Project in the Netherlands. EGR use of CO₂
- First revenues (\$1,000,000) received, and full commitment expected in 2007. N₂ sold to gas transportation company.
- Eneco (Dutch utility), Wintershall (BASF), Siemens, and Visser Smit committed to project.

ZENG (www.zeng.no)

- 70 MW Project in Stavanger
- ZENG AS formed: Lyse Energi, CO₂ Global, Procom Ventures, NEBB Engineering. Additional funding from Shell, Statoil, and Norwegian government ~ \$1 million in funding
- CES to supply gas generator; decision to proceed expected in summer 2008

SEQ-1 Conceptual View





ETAAC Considerations

- Climate neutral combustion technologies, including Carbon Capture Storage (CCS), offer CO₂ reduction opportunities similar in magnitude to energy efficiency and renewable energy.
- Policy makers need to show manufacturers, entrepreneurs and capital providers a potential market for CCS technologies to facilitate technological advancements in these areas.
- CCS and other energy related emerging technologies are capital intensive and frequently fail as they encounter the financing Valley of Death.
- Utility Power Purchase Agreements (PPAs) are one of the means to get promising technologies across the financing Valley of Death.
- Utilities/regulators are well prepared to evaluate and select promising technologies but need State policy support.
- Emission auctioning revenues can also be utilized to offset the cost impact of “out of market” PPAs on utility customers.
- State and Federal governments need to provide climate neutral combustion technologies, including CCS, with the same incentives as currently provided to renewable energy: RPS, tax incentives, etc.



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