

## **Proposed CCS Projects- Domestic**

### **IGCC Coal Power**

#### **AEP- West Virginia**

- **Status:** March 2008- AEP operating unit Appalachian Power received authority from the Public Service Commission of West Virginia to build an IGCC electric generating plant in West Virginia. CCS is being seriously considered for this project, but remains highly dependent on anticipated government CO<sub>2</sub> emission regulations.
- **Capture Method:** Pre-combustion; GE Energy RQ (Selexol)
- **CO<sub>2</sub> Destination:** Undetermined
- **Key Figures:** 629 MWe, 100 KtCO<sub>2</sub>/yr. stored, \$2.23 billion
- **Project Timeline:** Construction- 2009, Completion- 2012

#### **AEP- Ohio**

- **Status:** May 2007- The Ohio Power Siting Board (OPSB) approved the site selection of AEP's Great Bend IGCC plant in Meigs County, Ohio. The project was nearly derailed after the Ohio Supreme Court abolished AEP Ohio's rate stabilization plan in July 2006.
- **Capture Method:** Pre-combustion; GE Energy RQ (Selexol)
- **CO<sub>2</sub> Destination:** EOR
- **Key Figures:** 629 MWe, 1.5 MtCO<sub>2</sub>/yr. injected, \$1.1 billion
- **Project Timeline:** Completion- 2010

#### **Duke Energy-Edwardsport, Indiana**

- **Status:** November 2007- Duke Energy received final approval from the Indiana Utility Regulatory Commission to replace an existing 1940s 160 MWe PC plant with a new IGCC plant. The new plant will be built at the site of the existing plant.
- **Capture Method:** Pre-combustion; GE Energy RQ (Selexol)
- **CO<sub>2</sub> Destination:** Undetermined
- **Key Figures:** 630 MWe, 1.5 MtCO<sub>2</sub>/yr. stored, \$2.3 billion
- **Project Timeline:** Completion- 2012

#### **Excelsior Energy-Mesaba, Minnesota**

- **Status:** May 2008- The Excelsior-Mesaba Energy Project took a big step forward after receiving a \$133.5 million tax credit from the Treasury Department. The IGCC plant will be equipped with CCS technology, as required under the terms of its permit approval, but implementation still awaits further regulatory clarity.
- **Capture Method:** Pre-combustion; ConocoPhillips E-Gas (Selexol)
- **CO<sub>2</sub> Destination:** EOR
- **Key Figures:** 603 MWe, 3.0 MtCO<sub>2</sub>/yr. injected, \$1.6 billion
- **Project Timeline:** Construction- 2008, Completion- 2012

#### **FutureGen- Mattoon, Illinois**

- **Status:** July 2008- The FutureGen Alliance praised the Senate Appropriations Committee for legislatively protecting \$134 million in federal funding for FutureGen at Mattoon. FutureGen is a public-private partnership constructing an IGCC plant with deep saline aquifer CCS.
- **Capture Method:** Pre-combustion; Eltron Membrane System
- **CO<sub>2</sub> Destination:** Storage; deep saline aquifers
- **Key Figures:** 275 MWe, ~1.0 MtCO<sub>2</sub>/yr. stored, \$1.5 billion
- **Project Timeline:** Construction- 2009, Completion- 2011

### **NRG- Tonawanda, New York**

- Status: July 2008- NRG cancelled all plans to build an IGCC plant in Tonawanda after the NYPA announced its decision to allow its strategic alliance with NRG to expire. Without the alliance, NRG lacked the funding and subsidies necessary to offer market competitive electricity rates.
- Capture Method: Pre-combustion; Mitsubishi HI Gasification (KS-1)
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 680 MWe, 3 MtCO<sub>2</sub>/yr. stored, \$1.6 billion
- Project Timeline: Completion was projected for 2013

### **Tenaska- Taylorville, Illinois**

- Status: July 2008- The Illinois House approved a bill to require utilities to buy electricity from the Taylorville Energy Center (TEC), a proposed central Illinois IGCC plant. The bill is waiting for approval from the Illinois Senate. If approved, groundbreaking will occur within months.
- Capture Method: Pre-combustion; GE Energy RQ (Selexol)
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 630 MWe, CO<sub>2</sub> capture quantity undetermined, \$2.0 billion
- Project Timeline: Construction- Q4 2008, Completion- 2012

### **Xcel- Colorado**

- Status: October 2007- Xcel Energy suspended all plans to build an IGCC plant in Colorado after deciding the costs would be prohibitively expensive for the expected demand. Xcel promised to reconsider IGCC technology and the Colorado market again in a few years.
- Capture Method: Pre-combustion; (cancelled)
- CO<sub>2</sub> Destination: EOR
- Key Figures: 300 MWe, CO<sub>2</sub> capture quantity undetermined, ~\$1.0 billion
- Project Timeline: Completion was projected for 2013

## **IGCC Pet Coke Power**

### **Hydrogen Energy International (BP & Rio Tinto)- Carson, California**

- Status: July 2008- Hydrogen Energy International LLC filed for an AFC before the California Energy Commission for a proposed hydrogen fuel production facility and power plant. The filing initiates a comprehensive regulatory review process and, upon approval, grants permission for the construction of the nation's first industrial-scale low-carbon power plant with CCS.
- Capture Method: Pre-combustion; GE Energy RQ (Selexol)
- CO<sub>2</sub> Destination: EOR
- Key Figures: 500 MWe, 2 MtCO<sub>2</sub>/yr. stored, ~\$2.0 billion
- Project Timeline: Completion- 2012

## **Syngas Production**

### **Peabody Energy- Kentucky**

- Status: October 2007- Peabody Energy Corp. announced that it has selected Kentucky for a proposed \$3 billion coal gasification plant. The Thoroughbred Energy Campus will be constructed near Central City, Kentucky. The plant will actually be comprised of two independent 750 MWe electric generators working jointly.
- Capture Method: Pre-combustion; (ConocoPhillips E-Gas Gasification)
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 1500 MWe, CO<sub>2</sub> capture quantity undetermined, \$3 billion
- Project Timeline: Construction- 2009, Completion- 2012

## **PC Power**

### **AEP- Oklahoma**

- Status: December 2007- PSO, the Oklahoma unit of AEP, announced the termination of all plans to build a PC plant in Red Rock, Oklahoma. The decision stemmed from a September ruling by the Oklahoma Corporation Commission to deny the pre-approval permit for the plant, stating that PSO had not sufficiently demonstrated meaningful exploration of alternative forms of energy.
- Capture Method: Post-combustion; Alstom Chilled Ammonia Process
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 950 MWe, 1.5 MtCO<sub>2</sub>/yr. stored, \$1.8 billion
- Project Timeline: Completion was projected for 2011

### **Duke Energy- Cliffside, North Carolina**

- Status: January 2008- The North Carolina Department of Environment and Natural Resources' (DENR) Division of Air Quality today issued a final air permit for an advanced clean-coal power plant planned at Cliffside Steam Station, about 50 miles west of Charlotte. Duke Energy made headlines when it voluntarily requested higher emission air quality permit standards for the plant than legally required.
- Capture Method: Post-combustion; pending decision (testing chilled ammonia)
- CO<sub>2</sub> Destination: Undetermined; fully carbon-neutral operations set for 2018
- Key Figures: 800 MWe, 1.8 MtCO<sub>2</sub>/yr. stored , \$1.8 billion
- Project Timeline: Completion- 2012

## **PC Power (Retrofit)**

### **Basin Electric- Beulah, North Dakota**

- Status: March 2008- Basin Electric Power announced the selection of Powerspan's CO<sub>2</sub> capture technology, called 'ECO<sub>2</sub>' for a commercial demonstration at Basin Electric's Antelope Valley Station, a coal-based electrical generation facility located near Beulah, North Dakota. Approximately 1 Mt CO<sub>2</sub>/yr will be captured from the 120 megawatt slipstream project.
- Capture Method: Post-combustion; PowerSpan ECO<sub>2</sub> Process (non-chilled ammonia)
- CO<sub>2</sub> Destination: Dakota Gasification Synfuels Plant
- Key Figures: 120 MWe slipstream, 1.0 MtCO<sub>2</sub>/yr. captured, ~\$200 million
- Project Timeline: Construction- 2009, Completion- 2012

### **NRG- Sugar Land, Texas**

- Status: November 2007- NRG announced the selection of Powerspan's CO<sub>2</sub> capture technology, called 'ECO<sub>2</sub>' for a commercial demonstration at NRG's WA Parish plant near Sugar Land, Texas. Approximately 1 Mt CO<sub>2</sub>/yr will be captured from the 125 megawatt slipstream project.
- Capture Method: Post-combustion; PowerSpan ECO<sub>2</sub> Process (non-chilled ammonia)
- CO<sub>2</sub> Destination: EOR
- Key Figures: 125 MWe, 1.0 MtCO<sub>2</sub>/yr. injected, ~\$200 million
- Project Timeline: Construction-2009, Completion- 2012

## **SCPC Power**

### **Peabody Energy- Southern Illinois**

- Status: October 2007- Peabody Energy celebrated the groundbreaking of its SCPC Prairie State Energy Campus (PSEC) which will be supplied by an adjacent mine. PSEC will consist of two 800 MWe supercritical coal units in Lively Grove, Illinois, two miles from St. Louis.
- Capture Method: Post-combustion; (pending decision)
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 1600 MWe, CO<sub>2</sub> capture quantity undetermined, \$2 billion
- Project Timeline: Completion- 2011-2012

### **Seminole Electric Cooperative- Tampa, Florida**

- Status: August 2008- Seminole Electric Cooperative received final site certification for their Unit 3 Project from the state Department of Environmental Protection. Unit 3 will join two existing 650 MWe units at the Seminole Generating Station in Palatka, Florida.
- Capture Method: Post-combustion; (pending decision)
- CO<sub>2</sub> Destination: Undetermined
- Key Figures: 750 MWe, CO<sub>2</sub> capture quantity undetermined, \$1.4 billion
- Project Timeline: Construction- Q4 2008, Completion- 2012

### **Tenaska- Sweetwater, Texas**

- Status: February 2008- Tenaska has chosen Sweetwater, Texas for the site of the new Tenaska Trailblazer Energy Center. The SCPC plant will connect to the ERCOT power grid, and will be constructed with CCS technology for future use. A final proceed decision is expected early 2009.
- Capture Method: Post-combustion; (amine solvents)
- CO<sub>2</sub> Destination: EOR (Permian Basin)
- Key Figures: 600 MWe, 4.7 MtCO<sub>2</sub>/yr. injected, \$3.0 billion
- Project Timeline: Construction- 2009, Completion- 2014

## **Oxyfuel Coal Power**

### **Clean Energy Systems- Bakersfield, California**

- Status: May 2008- DOE pledges \$65 million to the WESTCARB project for a pilot CCS site to be constructed and run by CES at Bakersfield. The pilot project's approach is similar to injecting CO<sub>2</sub> for EOR in Texas, New Mexico, Wyoming, and Saskatchewan.
- Capture Method: Oxyfuel
- CO<sub>2</sub> Destination: On-site storage
- Key Figures: 50 MWe, 250 KtCO<sub>2</sub>/yr. stored, \$90 million
- Project Timeline: Completion- 2011

## **Oxyfuel Coal CFB Power**

### **Praxair/Jamestown Board of Public Utilities- Jamestown, New York**

- Status: March 2008- Proposal would replace boilers at existing Jamestown BPU PC plants with Circulating Fluidized Bed (CFB) oxyfuel boilers equipped with CCS technology
- Capture Method: Oxyfuel (CFB)
- CO<sub>2</sub> Destination: Storage; Potsdam Sandstone (Utica Shale seal) and Clinton-Medina Group (Hamilton Group seal).
- Key Figures: 43 MWe, 300 KtCO<sub>2</sub>/yr. stored, \$145 million.
- Project Timeline: Construction- 2010, Completion- 2013

## **Proposed CCS Projects- Domestic (Appendix)**

### **IGCC Coal Power**

#### **AEP- West Virginia**

- <http://www.aep.com/newsroom/newsreleases/?id=1440>
- <http://www.psc.state.wv.us/scripts/WebDocket/ViewDocument.cfm?CaseActivityID=229038&NotType=%27WebDocket%27>

#### **AEP- Ohio**

- <http://www.aep.com/newsroom/newsreleases/default.aspx?dbcommand=DisplayRelease&ID=1273>
- [http://www.accessmylibrary.com/coms2/summary\\_0286-30908107\\_ITM](http://www.accessmylibrary.com/coms2/summary_0286-30908107_ITM)

#### **Duke Energy- Edwardsport, Indiana**

- <http://www.duke-energy.com/power-plants/new-generation/edwardsport-overview.asp>

#### **Excelsior Energy- Mesaba, Minnesota**

- [http://www.excelsiorenergy.com/mesaba/description\\_frame.html](http://www.excelsiorenergy.com/mesaba/description_frame.html)

#### **FutureGen- Mattoon, Illinois**

- [http://www.futuregenalliance.org/news/releases/pr\\_07-11-08.pdf](http://www.futuregenalliance.org/news/releases/pr_07-11-08.pdf)
- [http://www.eltronresearch.com/docs/Hydrogen\\_Membrane\\_Technology\\_Summary.pdf](http://www.eltronresearch.com/docs/Hydrogen_Membrane_Technology_Summary.pdf)

#### **NRG- Tonawanda, New York**

- <http://www.snl.com/irweblinkx/file.aspx?IID=4057436&FID=6390248>
- <http://www.post-journal.com/page/content.detail/id/506685.html?nav=5018&showlayout=0>

#### **Tenaska- Taylorsville, Illinois**

- <http://www.cleancoalillinois.com/tec.html>

#### **Xcel- Colorado**

- [http://www.xcelenergy.com/XLWEB/CDA/0,3080,1-1-1\\_15531\\_26314-28427-0\\_0\\_0-0,00.html](http://www.xcelenergy.com/XLWEB/CDA/0,3080,1-1-1_15531_26314-28427-0_0_0-0,00.html)
- <http://denver.bizjournals.com/denver/stories/2007/10/29/daily26.html>

### **IGCC Pet Coke Power**

#### **H Energy (BP & Rio Tinto)- Carson, California**

- [http://www.bp.com/liveassets/bp\\_internet/alternativenergy/next\\_generation\\_hydrogen\\_carson.html](http://www.bp.com/liveassets/bp_internet/alternativenergy/next_generation_hydrogen_carson.html)
- [http://www.energy.ca.gov/2007\\_energy\\_policy/documents/2007-05-29\\_workshop/presentations/Kostrzewa\\_Carson\\_Hydrogen\\_Power\\_Project.pdf](http://www.energy.ca.gov/2007_energy_policy/documents/2007-05-29_workshop/presentations/Kostrzewa_Carson_Hydrogen_Power_Project.pdf)

### **Syngas Production**

#### **Peabody Energy- Kentucky**

- <http://www.courierpress.com/news/2007/oct/30/peabody-commits-to-kentucky/>
- <http://www.peabodyenergy.com/Operations/Thoroughbred.asp>

## **PC Power**

### **AEP- Oklahoma**

- <http://www.aep.com/newsroom/newsreleases/?id=1412>
- <http://www.psoklahoma.com/news/releases/viewrelease.asp?releaseID=467>
- [http://pepei.pennnet.com/display\\_article/323827/6/ARTCL/none/none/1/The-Evolution-of-Carbon-Capture-Technology-Part-1/](http://pepei.pennnet.com/display_article/323827/6/ARTCL/none/none/1/The-Evolution-of-Carbon-Capture-Technology-Part-1/)

### **Duke Energy- Cliffside, North Carolina**

- <http://www.duke-energy.com/news/releases/2008012901.asp>

## **PC Power (Retrofit)**

### **Basin Electric- Beulah, North Dakota**

- <http://www.nepnpartners.com/Files/Press%20Releases/Basin%20Electric%20Selects%20Powerspan%20for%20Large-Scale%20Demonstration%20of%20Carbon%20Capture%20at%20Antelope%20Valley%20Station.pdf>

### **NRG- Sugar Land, Texas**

- [http://www.powerspan.com/news/release\\_32.pdf](http://www.powerspan.com/news/release_32.pdf)
- [http://findarticles.com/p/articles/mi\\_m0EIN/is\\_2007\\_Nov\\_2/ai\\_n27431689/pg\\_6](http://findarticles.com/p/articles/mi_m0EIN/is_2007_Nov_2/ai_n27431689/pg_6)

## **SCPC Power**

### **Peabody Energy- Southern Illinois**

- <http://www.prairiestateenergycampus.com/news/100107.asp>

### **Seminole Electric Cooperative- Tampa, Florida**

- [http://www.seminole-electric.com/main/sections/generation/unit3/cbi\\_website/pdf/seci2008-08-20\\_PDN.pdf](http://www.seminole-electric.com/main/sections/generation/unit3/cbi_website/pdf/seci2008-08-20_PDN.pdf)

### **Tenaska- Sweetwater, Texas**

- <http://www.tenaska.com/userfiles/File/Sweetwater%20Fact%20Sheet.pdf>
- [http://www.redorbit.com/news/science/1433250/the\\_evolution\\_of\\_carbon\\_capture\\_technology\\_part\\_2/](http://www.redorbit.com/news/science/1433250/the_evolution_of_carbon_capture_technology_part_2/)

## **Oxyfuel Coal Power**

### **Clean Energy Systems- Bakersfield, California**

- [http://www.energy.ca.gov/releases/2008\\_releases/2008-05-06\\_global\\_warming.html](http://www.energy.ca.gov/releases/2008_releases/2008-05-06_global_warming.html)

## **Oxyfuel CFB Coal Power**

### **Praxair/Jamestown Board of Public Utilities- Jamestown, New York**

- [http://www.co2captureandstorage.info/docs/oxyfuel/3rd%20Mtg/07-05%20M.%20Shah%20\(Praxair\)%20&%20H.%20Hack%20\(FW\)%20ver%202.0.pdf](http://www.co2captureandstorage.info/docs/oxyfuel/3rd%20Mtg/07-05%20M.%20Shah%20(Praxair)%20&%20H.%20Hack%20(FW)%20ver%202.0.pdf)

## **Databases and Additional Information**

- <http://sequestration.mit.edu/tools/projects/index.html>
- <http://cmnow.org/Proposed%20Coal%20Plants.pdf>

- <http://www.oregon.gov/PUC/meetings/pmemos/2007/062707/OregonPUCCTCCS62707.ppt>
- <http://www.adb.org/Documents/events/2008/ACEF/Session9-JSwift.pdf>