Prairie State Generating Company
Next Generation of Coal

$785 MILLION in economic activity contributed annually
more than 500 NEW, PERMANENT JOBS

Welcome to the FUTURE OF ENERGY setting the standard as the NEXT GENERATION OF COAL
The Campus
The Energy Campus

• Power Plant and Coal Mine on same campus
• Best Available Control Technology allows for use of Illinois Basin Coal
• Nearly 7 Million Tons of Coal Mined Annually to fuel 1,600 megawatt Power Plant
• Largest coal power plant built in the U.S. since 1982
• 4,000 construction jobs at peak; more than 500 permanent jobs
Prairie State’s Owners Serve More Than 2.5 Million People In Eight States

- **Northern Illinois Municipal Power** 120 MW
- **Prairie Power, Inc.** 130 MW
- **Missouri Joint Municipal Electric Utility Commission** 195 MW
- **Southern Illinois Power Cooperative** 125 MW
- **Kentucky Municipal Power** 124 MW
- **Indiana Municipal Power** 200 MW
- **AMP** 368 MW
Lively Grove Mine
PRAIRIE STATE ENERGY CAMPUS
21st Century Technologies

SELECTIVE CATALYTIC REDUCTION (SCR)
An SCR will further control Prairie State’s nitrogen oxide (NOx) emissions by injecting product into the air stream as it passes over a catalyst, causing the NOx to be converted to nitrogen and water. The SCR also can assist with mercury control.

WET ELECTROSTATIC PRECIPITATORS (ESP)
The air stream will pass through the wet scrubber into a wet ESP which will remove fine particulates and other constituents. Wet ESPs use multiple high-voltage fields to attract the particles to an electrode, which is then washed with water to capture the constituents, including some mercury.

DRY ELECTROSTATIC PRECIPITATOR (ESP)
The dry ESP will be used to remove 99.9 percent of the particulates from the air stream in addition to some mercury. The dry ESP uses electrodes to place an electric charge on the particles, which are captured on an oppositely charged plate. The particles are then shaken from the plates for final collection.

TURBINE
The plant’s turbines will consist of fan-type blades attached to a shaft that is rotated by steam from the boiler, converting the kinetic energy of the steam into mechanical energy.

COOLING TOWER
Condensed steam from the generators is cooled through a high-efficiency water evaporation system and recycled back to the plant for reuse. Water vapor is emitted from the cooling towers during the process.

Sulfur dioxide (SO2) will be minimized by an advanced system known as a “scrubber.” The system works by injecting a limestone and water mixture into the air stream, where it reacts to capture or “scrub” 90 percent of the SO2. Scrubbing is also a system that helps control mercury.

GENERATOR
Prairie State’s two generating units will transform the mechanical energy into electric energy distributed over the grid for more than 1.5 million Midwest households.

BOILER
Prairie State will use modern technology where coal is ground to a powder-like consistency and used as fuel for a boiler to heat water and produce high-pressure steam.

LOW-NOx BURNER
Within the boiler, low-NOx burners impede the formation of nitrogen oxides by lowering the temperature of the flame to control the way coal combusts.

CENTRALIZED COMPUTER SYSTEM

This diagram demonstrates the environmental differences of the Prairie State Energy Campus, showing how they implement 21st Century Technologies to reduce emissions and protect the environment.
How Prairie State Reduces CO2

• Super Critical Technology

• Runs at a higher temperature and pressure

• Less coal needed = Less CO2

• Without accounting for $1 billion investment in air quality control system, produces 15 percent less CO2 than the typical U.S. coal plant

• Mine mouth design completely eliminates CO2 emissions associated with coal transportation
Why Coal? Why now?
Electricity Enables People to Live Longer and Better

United Nations Links Affordable Energy to Quality of Life

Every 10-Fold Increase in Per Capita Electricity Use Drives a 10-Year Increase in Longevity

Low-Cost Electricity from Coal

Electric Customers Pay Some of the Lowest Rates in the Nation Due to Coal-Fueled Generation

- $\circ = \text{average retail price per kilowatt hour for CY 2011}$
- $\% = \text{percent of total generation from coal for CY 2011}$

*Energy Information Administration, February 2012*
Decades of Declines: Lowest Income Pay Price for Inaction

As New Coal Generation Falls, Energy Costs Double for Poorest

Energy Costs for Those Beneath Poverty Line
Percentage of After-Tax Income 2001 to 2011

36% → 72%

Second Act for Illinois Coal

- 300-year history in the state
- 65 percent of the state’s geography
- 38 Billion Metric Tons of coal
- More BTUs than foreign oil supplies
- High energy producing 10,000 – 14,000 BTUs/lb
Why Coal is Here to Stay

Average Natural Gas Prices

Figure 103. Annual average Henry Hub spot natural gas prices, 1990-2035 (2010 dollars per million Btu)

Average Minemouth Coal Prices

Figure 120. Average annual minemouth coal prices by region, 1990-2035 (2010 dollars per million Btu)

Prairie State’s Economics

- Base load, responsible, reliable power for its Owners at low $50’s per Megawatt Hour
- Midwestern Megawatt Hour Prices = $200 - $2,500 during summer months
- PSGC’s coal cost is very stable
- Availability = Demand
Comparison of MISO Forecasts

Comparison of MISO - Illinois Forward Energy and Capacity Prices

- 2008 Forward Capacity Price ($/kW/Year)
- 2012 Forward Capacity Price ($/kW/Year)
- 2008 Forward ($/MWh)
- 2012 Forward ($/MWh)

Increase due to assumed GHG Pricing
Energy Procurement Cost Comparison

Comparison of Energy Procurement Cost - Prairie State vs. Market
(Assumes Customer with 60% Load Factor)
Clean Coal Technology, A Success Story

Over 80% Reduction in SO₂ and NOₓ in Last 40 Years
Expect over 20% Reduction in SO₂ and NOₓ in Next 3 Years

*EPA’s Clean Air Markets database, July 2011; Project Permits, FutureGen Environmental Impact Study, November 2007*
Questions?