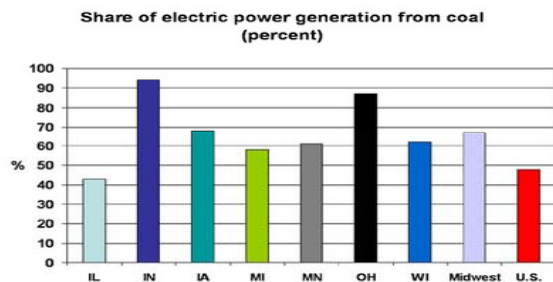


Coal's Role for Labor in the New Energy Economy

How Much Coal Do We Use?

How Much Coal Do We Use?



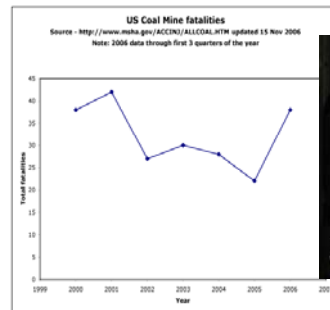
Note: Data for May 2007
Source: Electric Power Monthly (EPM)

Is That a Problem?

Is That a Problem?

- **Extraction**—environmental and safety problems
- **Emissions**—environmental and public health problems
- **Global Warming**—potential to cause violent storms, famine, loss of habitat for humans and other animals

Extraction



Extraction



Darrow: You have dissected miners, have you?

Kellar: Yes, sir.

Darrow: Did you ever find them where their lungs were black?

Kellar: Yes, sir.

Darrow: Is that any indication of unhealthfulness?

Kellar: No, sir.

Extraction



Black Lung Continues to Claim Thousands of Lives Every Year

Extraction



Open Pit Mines

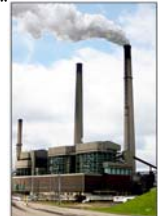


Mountain Top Removal

Emissions

Emissions from coal cause 24,000 premature U.S. deaths per year*

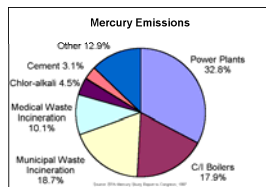
- ☠ Asthma and other respiratory issues
- ☠ Heart problems
- ☠ Cancer



*2004 Study commissioned by EPA

Emissions

Mercury Poses Greatest Risks to Children



MERCURY HEALTH EFFECTS

- ☐ Deteriorates nervous system
- ☐ Impairs hearing, speech, vision and gait
- ☐ Causes involuntary muscle movements
- ☐ Corrodes skin and mucous membranes
- ☐ Causes chewing and swallowing to become difficult

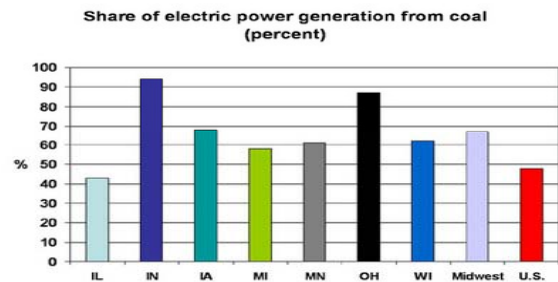
Global Warming Pollution

- Carbon Dioxide
- Nitrous Oxide
- NOx (=> Tropospheric Ozone)

These and other global warming pollutants are called "Greenhouse Gases" because they essentially act like the glass on a greenhouse. They allow the warm sunlight in, and then trap the warmed air inside. It is the same thing as what happens to your car on a hot summer day.

So Why Use Coal at All??

So Why Use Coal at All??



So Why Use Coal at All??

- Union mines safer than nonunion
- Existing technology could greatly reduce harm to public health
- Coal is domestic, abundant, and relatively inexpensive

Changes Ahead

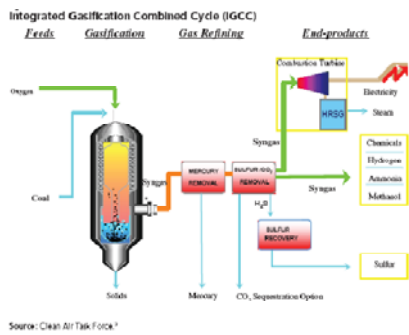
Carbon Regulation to slow global warming is being designed and debated in Congress

- Carbon Tax
- Cap and Trade
- Cap and Auction

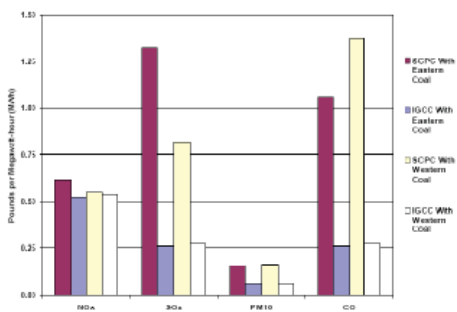
The New Energy Economy

- Wind
- Solar
- Efficiency
- Geothermal
- Micro tidal
- *Fossil Fuel + CCS*

IGCC



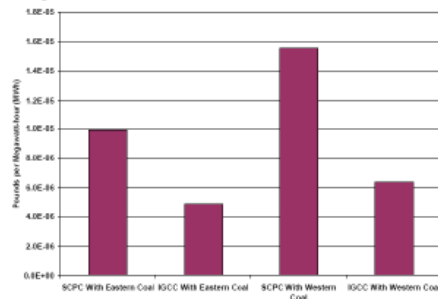
Emissions Comparison



Source: Wisconsin Public Service Commission.

Emissions Comparison

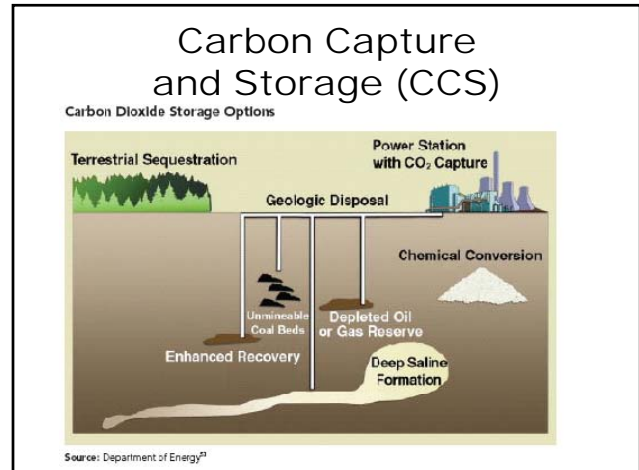
Mercury Emission Rates, IGCC vs. Pulverized Coal Plants



IGCC Plants of at Least 250 MW in Operation Today

Plant	Location	Startup Year	MW
Nuon ¹³	Netherlands	1994	250 MW
Wabash ¹⁴	Indiana	1995	260 MW
Polk ¹⁷	Florida	1996	250 MW
SUV ¹⁸	Czech Republic	1996	350 MW
Elcogas ¹⁹	Spain	1998	320 MW
ISAB Energy ²⁰	Italy	2000	510 MW
Sarlux ²¹	Italy	2000	548 MW
Api Energia ²²	Italy	2002	280 MW
Nippon ²³	Japan	2003	342 MW
Eri AGIF ²⁴	Italy	2006	250 MW

.....



- ### Large-Scale CCS
- **Weyburn Oil Fields**—Enhanced Oil Recovery
 - **Sleipner**—Saline Aquifer
 - **FuturGen**—To be announced this year

Biomass CCS

Co-fire biomass such as agricultural or forestry waste with other feedstock to reduce global warming pollution.

Use of CO₂ and other IGCC By-Products or Co-Products

- Enhanced Oil Recovery

Enhanced Oil Recovery

- Provides a good starting point for CCS because of revenue

“There do not appear to be unresolvable open technical issues underlying [geologic sequestration].”—MIT Report on the Future of Coal

Use of CO₂ and other IGCC By-Products or Co-Products

- Enhanced Oil Recovery
- Enhanced Methane Recovery
- Carbon Nanofibers
- Commercial Greenhouses
- Ammonia and other Chemicals
- Sulfur
- Slag
- Hydrogen
- Syngas

Syngas Production

Where CCS is not an option syngas can be piped in from other regions



New Energy Economy
Means New Industry

Jobs Will Be Created.

*Union strategy is needed to
make sure these are good jobs.*

IGCC: Opportunities for
Much of Labor Movement

- Mining (Eastern coal better than PRB coal for IGCC)

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- Mining (Midwestern coal better than PRB coal for IGCC)
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- Manufacturing (Components and stability of pricing)
- Utility Workers

New Energy Economy Means New Strategies

- Unions Across Various Industries Can Coordinate More Strategically to Maximize Benefits
 - ✓ Discussion with regulators
 - ✓ Lobbying
 - ✓ Assistance in organizing and bargaining
 - ✓ Community Outreach

New Energy Economy Means New Allies

Environmental Groups, Public Health Groups, Potential Allies for IGCC & CCS

- NRDC
- Clean Air Task Force
- NWF
- Ohio Environmental Council
- Michigan Environmental Council
- Clean Wisconsin
- American Lung Association...

Benefits of IGCC with CCS

- ✓ Reduced Air Pollution
- ✓ Reduced Water Pollution
- ✓ Reduced Greenhouse Gas Emissions
- ✓ New Jobs Across Wide Range of Industries
- ✓ Opportunities for New Allies

IGCC: What's in it for the Companies?

What's in it for the Companies?



Or....

What's in it for the Companies?



Successful Example of CCS

Dakota Gasification/Weyburn Oil Fields

- Captures 65% of CO₂ from syngas production in North Dakota
- Pipes it 300 miles to Alberta's Weyburn oil fields, where it is sold for a profit
- Will enable an additional 130 million barrels of oil to be extracted, while storing 20 million tons of CO₂

State	Existing Incentive
Colorado	Requires approval of IGCC facilities that use Colorado or western coal upon a showing of feasibility, environmental benefits, and cost-effectiveness.
Illinois	Provides up to \$300 million in bonds for new gasification facilities and \$5 million in public-private support for the \$1.1 billion IGCC Taylorville Energy Center, among other incentives.
Indiana	Provides a variety of financial incentives for "clean coal and energy projects" using Illinois Basin coal or gas that 1) occur at new or existing facilities, and/or 2) reduce regulated air emissions from existing generating facilities.
Kansas	Offers a property tax exemption to certain integrated coal gasification power plant property. Offers tax credits for the development of new coal gasification facilities.
Kentucky	Provides tax credits for integrated coal gasification power plants. Requires the Public Service Commission to approve certain long-term contracts by utilities for synthetic gas from coal.
Minnesota	Offered incentives for proposed Mesaba Energy gasification plant and entitles Excelsior Energy to sign a 450 MW power purchase agreement with Xcel Energy.
New Mexico	Provides the following tax credits to clean energy investments: advanced energy tax credit; gross receipts tax; compensating tax withholding tax. Includes IGCC in the definition of clean energy investments and allows for department of environment certification for IGCC.
Ohio	Offers conduit funding, loans, loan guarantees, grants, tax incentives, and funding for demonstration projects and the development of clean coal technology.
Pennsylvania	Includes IGCC in definition of "alternative sources" under its renewable energy requirement for utilities. Provides low interest loans for IGCC, and permits long-term power purchase contracts to assist with funding.
Texas	Funded site screening for potential FutureGen plant, approved \$22 million in grants and incentives for low-emission projects, and expedited permitting for FutureGen-type projects.
Virginia	Creates a Clean Coal Technology Research Fund to assess new clean coal investments and technology; provides a contingent expiration date of July 1, 2009.
West Virginia	Provides basic assistance for clean coal industry under the West Virginia Clean Coal Technology Act. Offers rate incentives for utility investment in qualified clean coal and clean air control technology facilities.
Wyoming	Offers a sales and use tax exemption for equipment purchased to make new IGCC or coal liquefaction facilities operational. Creates a clean coal research account where funds are deposited from Mine product taxes and used for clean coal research.

Source: National Congress of State Legislatures®

"If we aren't at the table, we are on the menu..."

"Capture Ready"

Most IGCC facilities can capture 15-30% of CO₂ at outset. Major retrofit or different initial design is needed to capture substantially more than that. Availability of CCS options should be evaluated to evaluate earnestness of company.

- Summary of Opportunities and Challenges**
- ✓ New jobs in a range of industries
 - ✓ Need for the jobs to be good union jobs
 - ✓ Opportunity to strengthen union alliances on energy issues
 - ✓ Opportunity to develop new allies in environmental or community groups
 - ✓ Need to hold companies accountable to their promises

Resources

- Obtain a copy of the report *IGCC with Carbon Capture and Storage: Opportunities and Challenges for Labor*.
- Receive IGCC/CCS Weekly Email Update
- Contact Gail Francis at gfrancis@cowi.org or 608-516-0350