

FOIA MARKER

This is not a textual record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

Collection/Record Group: Clinton Presidential Records
Subgroup/Office of Origin: Office of Environmental Initiatives
Series/Staff Member: Roger Ballentine
Subseries:

OA/ID Number: 19516
FolderID:

Folder Title:
Climate Change Other Coal

Stack:	Row:	Section:	Shelf:	Position:
S	62	1	3	1

**Statement of
Robert S. Kripowicz
Principal Deputy Assistant Secretary
for Fossil Energy
U.S. Department of Energy
to the
Subcommittee on Energy and Power
Committee on Commerce
U.S. House of Representatives
June 8, 2000**

Mr. Chairman and Members of the Subcommittee. I appreciate the opportunity to discuss the important role that coal – and especially cleaner coal technology – can play in continuing to strengthen our nation's economic future while at the same time, improving our environment.

Today, coal is an indispensable part of our nation's energy mix. Because of its abundance and low cost, coal now accounts for more than half of the electricity generated in this country.

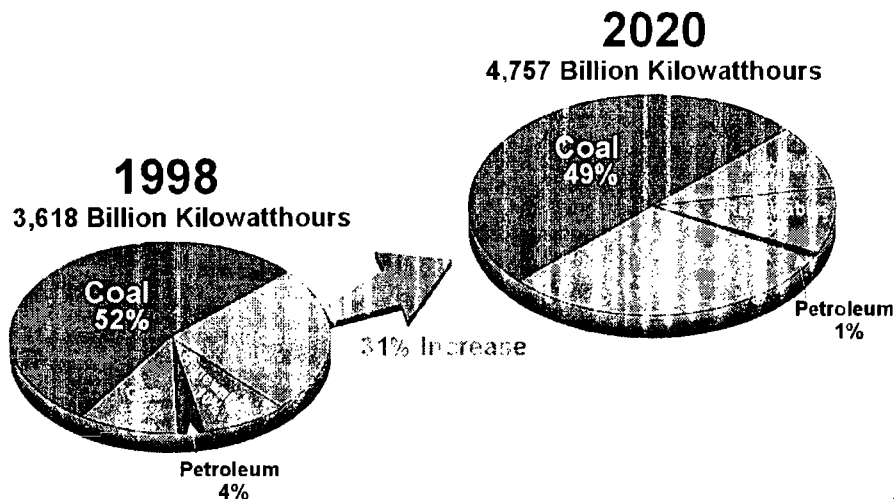
Coal is our nation's most abundant domestic energy resource. One quarter of all the world's known coal supplies are found within the United States. In terms of energy value (Btus), coal constitutes approximately 95 percent of U.S. fossil energy reserves. Our nation's recoverable coal has the energy equivalent of about one trillion barrels of crude oil – comparable in energy content to all the world's known oil reserves. At present consumption rates, U.S. coal reserves are expected to last at least 275 years.

Coal has also been an energy bargain for the U.S. Historically it has been the least expensive fossil fuel available to the country, and in contrast to other primary fuels, its costs are likely to continue to decline as mine productivity continues to increase. Between 1988 and 1997, minemouth coal prices (in real 1992 dollars) declined by \$9.40 per ton, or 37 percent; between 1998 and 2020, prices could decline by another \$5.00 per ton (1998 \$), or about 1.5 percent a year. The low cost of coal is a major reason why the United States enjoys some of the lowest electricity rates of any free market economy.

Coal Consumption for Electricity Projected to Continue Rising

America's coal industry – 81,000 miners working in 25 states – produces approximately 1.1 billion tons of coal per year. Just under 950 million tons goes to U.S. power plants (the rest is used for industrial purposes, such as steelmaking, or is exported).

According to the Department's Energy Information Administration (EIA), domestic coal demand could increase by 20 percent by 2020, growing to 1,316 million tons, primarily because of increasing coal use for electricity generation.

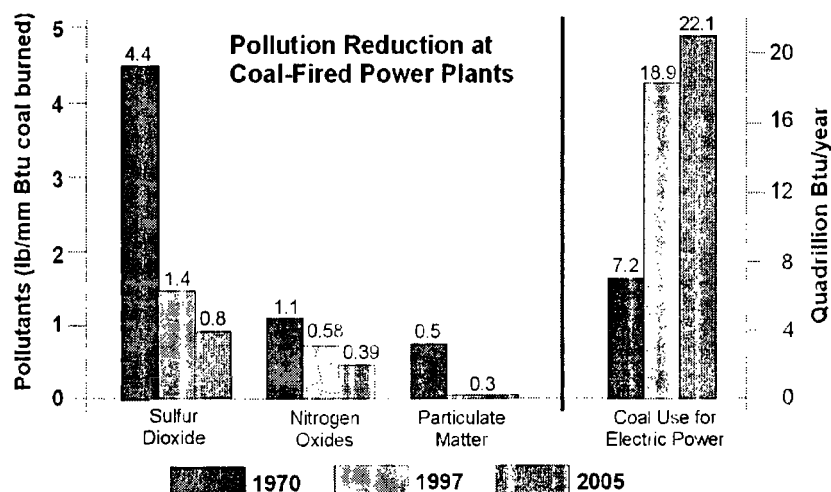


As this chart shows, although coal's overall contribution to the nation's electric power supply is projected to decline somewhat – from 52 percent in 1998 to 49 percent in 2020 – the substantial growth in U.S. power consumption means that the U.S. will mine and use more coal in the foreseeable future.

A key element in EIA's projection is that very little new capacity is planned during that time period, about 7% of existing capacity (or around 21 gigawatts). Most of the increased generation from coal-fired units will come from existing plants increasing their hours of operation. The primary barrier to construction of new coal-fired power plants will be intense competition from natural gas combined cycle powerplants. These natural gas-fired plants have much lower capital costs than coal plants and are very low pollutant emitters.

Electricity restructuring is another important development in the industry. Using authorities provided by Congress in the Energy Policy Act of 1992 and other statutes, the Federal Energy Regulatory Commission has taken action to make wholesale electricity markets more competitive. To date, 25 states have taken action to introduce competition into retail electricity markets and many others are considering this option. The Administration sent its own comprehensive legislative proposal to Congress more than two years ago. Both the House Commerce Committee and the Senate Energy and Natural Resources Committee have announced plans to mark up legislation this month to update the federal statutory framework for the electricity industry. A comprehensive restructuring bill will both protect the reliability of our electric system and facilitate the smooth functioning of restructured electricity markets. Properly implemented, restructuring will be good for consumers, the economy, and the environment. Restructuring can also be good for coal – the Administration's analysis of its comprehensive restructuring proposal projects that coal-fired generation would continue to increase through 2015 under competition, and that competition modestly increases coal-fired generation above reference-case levels in the near-term.

Coal and the Environment



Largely because of improving pollution control technology, the nation has been able to use more coal while improving the quality of its air. Coal use has *more than doubled* since 1970 while emissions of sulfur and nitrogen pollutants *have declined* by 70 percent and 45 percent respectively.

EIA's coal projections reflect existing environmental regulations only. Whether expectations for future growth in coal demand actually materialize will depend largely on the nation's coal users' ability to comply with increasingly stringent environmental regulations. Increased compliance costs can lead to early retirement of a unit, or to less use of the coal-fired generating unit as it becomes more costly to operate. The most critical regulations and policy initiatives are air pollution related and include:

- **Rules to address the Regional Transport of Ozone (the ozone "SIP Call" and related rules promulgated by EPA).** The SIP Call rule required 22 Eastern states and the District of Columbia to reduce nitrogen oxide (NOx) emissions by specified amounts by May 2003. Although the rules are being revised to comply with judicial direction, the primary mechanism to achieve the required reductions will be additional NOx reduction requirements at coal-fired power plants.
- **Revised National Ambient Air Quality Standards for Particulate Matter and for Ozone.** These revised standards were promulgated in 1997, with anticipated annual compliance costs of \$37 billion per year and \$10 billion per year, respectively. The Supreme Court will be reviewing the EPA rules. The more significant rule for power plants is the particulate matter standard, which will likely lead to additional reductions in emissions of sulfur dioxide (SO₂) which is a precursor to fine airborne particles.
- **Mercury regulations.** Under a court sanctioned agreement, EPA is scheduled to decide by December 15 whether or not it is necessary to control mercury from coal-fired power plants. If EPA deems it necessary, the agency must promulgate regulations by December 2003.

Enforcement initiative. On November 3, 1999, EPA filed lawsuits against seven utility companies, and issued an administrative order against an eighth, charging violation of new source review requirements. The civil actions, now in the discovery stage, all seek retrofit of state-of-the-art control technology. A total of 33 gigawatts of capacity is involved in EPA's initiative -- over 10% of total U.S. coal-fired capacity. The basic allegation is that activities at these plants were modifications requiring new source permits. In the only settlement to date, the Tampa Electric Company (TECO) agreed to 85% reductions in NO_x and SO₂ by 2010, retirement of significant coal capacity, and payment of a \$3.5 million civil penalty.

The 305 gigawatts of existing coal-fired powerplants can be categorized into three groups: (1) very large and relatively new plants, (2) very small and relatively old plants, and (3) those in between. The first category will probably be able to continue to operate economically, even with the new regulations. Many of the smaller plants in the middle category will not, and in fact several utilities have recently announced plans to replace some older coal units with new natural gas-fired units.

The pivotal group is the third group -- moderate size coal plants with significant remaining operational lifetimes. It is this group which will benefit most from development and deployment of advanced emission control technologies. The greater the success of DOE and its private sector partners in developing more effective, and lower cost mitigation technologies, the more of these plants which will continue to operate, and the lower the overall cost of electric power will be to the consumer.

A major caveat is that none of the projections assumes the implementation of new regulation to address climate change concerns. DOE is also pursuing technologies to reduce greenhouse gas emissions from coal (and natural gas) power plants -- both by increasing efficiency of the power generating process and by capturing and sequestering carbon gases. Although these technologies are longer term and unlikely to be available prior to 2015, they could allow for the use of coal as a fuel for new generating plants while substantially reducing or even eliminating emissions of greenhouse gases to the atmosphere.

Measures to reduce carbon dioxide emissions before 2015 could lead to significant reductions in domestic coal use. Impacts on domestic coal use would likely be directly related to the amount of reduction in carbon dioxide emissions that takes place within U.S. borders. For a given level of carbon reduction obligation, provisions that allow the U.S. to meet the obligation by relying on purchased reductions in carbon emissions from sources in other countries would reduce the impact of any such obligation on the level of domestic coal use.

Clean Coal Technology - The Investment is Paying Off

With coal expected to remain one of the nation's lowest cost energy sources, its future will be determined largely by the availability of affordable technology that can reduce the impact of its use on the environment.

In the mid-1980s, the United States began an unprecedented joint public-private investment in a new generation of cleaner coal technologies. The Clean Coal Technology Program led to 40 projects in 18 states, over half successfully completed. More than \$5.6 billion has been committed to this program, with private industry and states investing two dollars for every one from the federal government.

Today, because of the Clean Coal Technology Program and the research efforts that undergird it:

*** Pollution control costs are significantly lower.**

In the mid-1980s, the only options to reduce smog-causing nitrogen oxide (NOx) pollutants from coal-fired power plants cost \$3,000 per ton of NOx. Today, technologies such as low-NOx burners demonstrated in the Clean Coal Technology Program have reduced NOx control costs to less than \$200 per ton. Nearly 75 percent of the nation's coal-fired generating capacity now uses low-NOx burners. The cost of selective catalytic reduction, which removes NOx from coal flue gases, has been cut in half because of technology advances.

Similarly, in the 1970s, scrubbers – the flue gas treatment devices that remove sulfur pollutants from the exhausts of coal-fired boilers – were expensive, unreliable, and posed waste handling problems. The Federal Government's R&D program (both at DOE and EPA) and DOE's Clean Coal Technology Program helped improve scrubber technologies. Today, flue gas scrubbers are one-fourth as expensive as the vintage-1970s units and operate much more reliably. The reduced costs, alone, have saved American ratepayers more than \$40 billion since 1975. Today, advanced scrubbers produce a waste product that can be recycled into wallboard or easily disposed of in a safe, powder form, rather than the sludge of older systems.

*** Coal combustion is cleaner.**

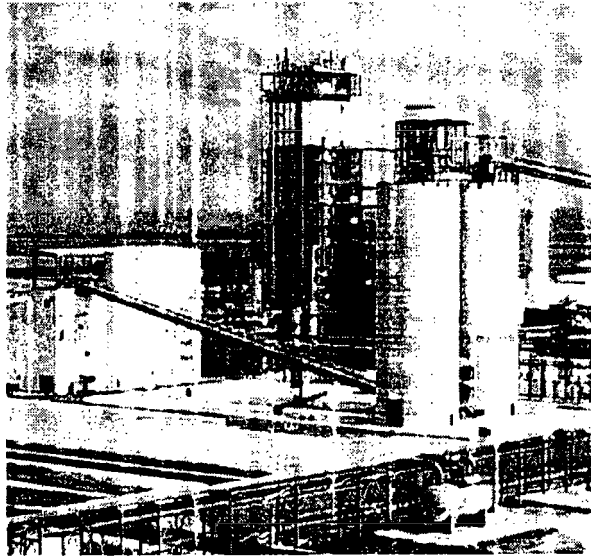
In the 1970s and 80s, DOE's R&D program helped develop the fluidized bed coal combustor – an advanced coal-burning technology that removed sulfur pollutants and limited the formation of NOx pollutants inside the boiler, eliminating the need for scrubbers or other post-combustion controls. The new technology found widespread acceptance in the industrial boiler market.

The Clean Coal Technology Program helped move this clean-burning technology into the larger-size, utility market. Using this technology, coal-fired power plants can reduce sulfur emissions by more than 95 percent and NOx emissions by more than 90 percent, even when burning high-sulfur coal.

*** Utilities have a new option for coal-based power.**

The Clean Coal Technology Program also pioneered a fundamentally new way to use coal to generate electricity. Rather than burning it in a boiler, gasification-combined

cycle technology first converts coal into a combustible gas, cleans the gas of virtually all



of its pollutants, then burns the gas in a turbine, much like natural gas. More than 99 percent of sulfur, nitrogen, and particulate pollutants can be removed in the process. Moreover, heat from the turbine can be used in a conventional steam cycle to generate a second source of electricity, increasing overall power plant efficiencies.

Because of the Clean Coal Technology Program, the nation now has three full-scale, pioneering coal gasification combined cycle power plants located in Florida, Indiana, and Nevada. These are among the cleanest fossil fuel power generating facilities in the world.

*** Steel mills have an environmentally attractive alternative to coke ovens.**

Much of the nation's coal not used by power plants is shipped to steel mills for use in making the coke needed for the steelmaking process. Coke production, however, is a significant source of air pollutants, including air toxics. The Clean Coal Technology Program demonstrated a way to use coal directly in the blast furnace, displacing coke virtually on a pound-for-pound basis. Direct coal injection offers the steel industry a clearly superior economical and environmental alternative to traditional coke-making.

The Future

When the Department of Energy issued the *Comprehensive National Energy Strategy* in April 1998, the first of its five overarching goals was to:

Improve the efficiency of the energy system – making more productive use of energy resources to enhance overall economic performance while protecting the environment....

One of the major strategies to achieve this goal is to demonstrate cost-effective power systems that can achieve electrical generating efficiencies greater than 60 percent.

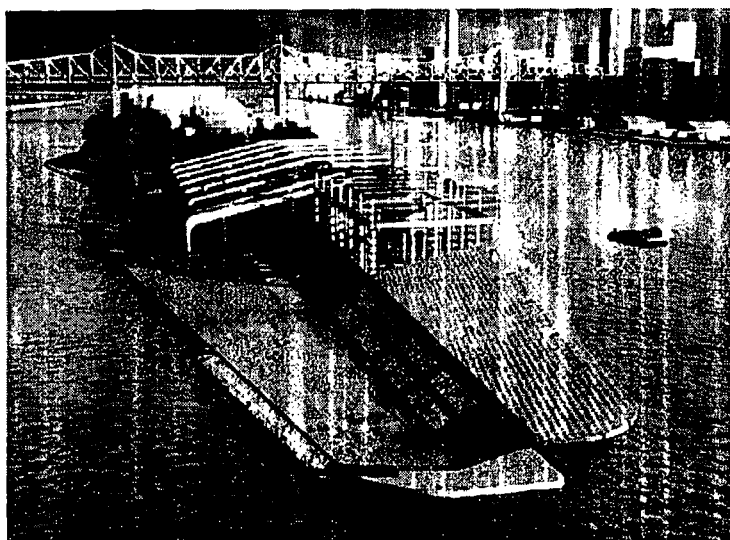
Today's coal-fired power plants convert only about a third (between 33-35 percent) of the energy

value of coal into electricity. The rest is typically discarded as waste heat. The Clean Coal Technology Program has demonstrated new technologies that can boost efficiencies to nearly 45 percent. Advances now in the DOE research and development program – for example, more energy-efficient gas separation technologies, improved turbines, and coal-capable fuel cells – could push coal power plant efficiencies into the 60-percent range.

What are the benefits of a more efficient coal-fired power plant?

Cleaner operation is one, since a coal plant that uses less fuel to generate the same amount of power will emit fewer emissions. Reduced greenhouse gas emissions is another benefit; a 60-percent efficient coal power plant can cut carbon dioxide emissions by more than 40 percent. A third is cost to consumers. Improving the efficiency of a power plant can lower costs of the electricity generated, perhaps by up to 20 percent.

The Vision 21 Concept. It may be possible in the future to eliminate virtually all of the environmental concerns at a coal-based power plant.



DOE is developing a concept for a new fleet of energy facilities that would incorporate breakthrough technologies in advanced power generation and pollution controls. With a target date of 2015, this new energy concept, called *Vision 21*, would incorporate technologies that would reduce SO₂ (sulfur dioxide) and NO_x emissions to near zero, and cut in half the amount of carbon dioxide emitted from the plant.

Moreover, the *Vision 21* concept could incorporate various coproduction options – producing not only electricity but other high-value products such as hydrogen, clean transportation fuels, chemicals and other commercial commodities. By developing a multi-product energy facility – rather than just a single-product electrical generating plant – it may be possible to boost overall coal use efficiencies to more than 80 percent.

Improving the efficiency of tomorrow's coal-fueled energy facilities can be beneficial companion to improving end-use energy conservation efforts. For example, by raising the efficiency of U.S.

coal-fired power plants to 50 percent, the nation could achieve fuel savings equivalent to weatherizing 400 million homes – more than 5 times the number of homes in the United States.

Carbon sequestration. Even with improved efficiencies, a future coal-fired power plant still may not be able to achieve the substantial greenhouse gas reductions that may be necessary to counter concerns about global climate change. Therefore, one of the keys to coal's long-term future (and to the future of other fossil fuels) may be the emerging technology of carbon sequestration.

Only a few years ago, concepts for capturing greenhouse gases at their point of emission, or even from the ambient air, and either storing them for centuries or recycling them into useful products were considered laboratory curiosities. Today, the opinion is much different.

DOE has set a goal of developing technologies that can capture and sequester carbon dioxide at costs as low as \$10 per ton of carbon. This is equivalent to adding only 2/10ths of a cent per kilowatt-hour to electricity rates that today range from 4 to 12 cents per kilowatt hour.

Carbon sequestration – if the technology can be successfully developed – could be the only option that doesn't require large-scale turnover of the world's energy infrastructure. Along with low-carbon and carbon-free energy supply technologies, such as natural gas and renewable energy systems, and more energy-efficient end-uses, carbon sequestration could become an important 3rd option in reducing the buildup of greenhouse gases.

Conclusion

The United States needs a variety of energy sources to continue the unprecedented economic expansion that has made us the envy of the world. At the same time, Americans have consistently ranked environmental quality as one of their highest priorities for both current and future generations.

While the U.S. will continue to expand the role of renewable and other alternative energy resources in its energy portfolio, coal will continue to provide a large share of the overall energy – and the dominant share of electricity – required to keep our economy growing for well into this century.

New technologies can make it possible to use all of our domestic energy resources – including our largest resource, coal – in ways that are compatible with our goals to protect the environment.

Over the past 20-year history of the Department of Energy, we have made substantial progress in improving the environmental acceptability of coal use while, at the same time, keeping the costs of coal-derived energy low. Through the continued public and private investment into advanced, more efficient, and cleaner coal technologies, coal can remain a beneficial contributor to America's energy future.

CLIMATE CHANGE AND THE COAL SECTOR

Highlights of Administration's Efforts

1. The current picture, recent trends and outlook.

As a policy matter, the Administration believes that coal plays an important role in the nation's energy portfolio. Our National Energy Strategy makes clear the importance of maintaining a diverse energy supply -- including coal, which now fuels 54% of U.S. power generation. Equally important is the need to ensure that the environmental impacts of energy production are addressed -- meaning that in climate terms, we are committed to ensuring that the coal our nation consumes is used in the cleanest, most efficient way.

Our efforts to address climate change are likely to provide incentives to the private sector to consume energy-efficient and less greenhouse gas intensive products. In terms of energy use, fossil fuels that produce relatively large amounts of carbon dioxide from combustion (such as coal) will become less economically attractive than fuels that produce lower amounts of greenhouse gases (such as natural gas and renewables). The necessity of shifting away from coal use has spurred some criticism that the Kyoto Protocol will result in significant job losses in the coal industry. We are convinced that some of these concerns are overly pessimistic, given our analysis of the trends in this industry and the likely employment effects portrayed in some of the existing modeling analyses.

Overview of the Coal Industry:

The coal industry has experienced substantial productivity gains over the past half-century. While coal prices climbed significantly during the energy crisis of the 1970s, prices in real terms have now declined to nearly the lowest levels experienced over the past 40 years, and are forecast to decline even further under business as usual projections through 2020.

Much of the decline in coal prices reflects improvements in productivity (measured by tons of coal produced per hour of labor). Since the decline in productivity of the mid-1970s, coal mining productivity has improved at an astounding 7% rate per year. Surface mining operations, which tend to be more prevalent in the west, have much higher absolute levels of productivity while underground mining operations have experienced slightly faster rates of productivity *growth* over the past 15 years. Surface coal miners were 2.6 times and underground miners were 2.8 times more productive in 1995 than they were in 1980.

While mining employment increased in response to increased demand for coal during the 1970s energy crisis, the last two decades have witnessed a steady decline in employment. Current mining employment is one-third of its peak in 1978 of 245,000. However, overall coal production has tended to increase as gains in productivity have outpaced the decline in employment. Since 1980, mining employment has declined at an average rate of 6.1% per year, while production has increased by an average of 1.6% per year. By 2010, coal mining employment under a continuation of current policies (the "business as usual" case) is projected to be about 62,000, reflecting an average 2.1% annual rate of decline between 1996 and 2010. Some have claimed that the faster average annual rate of decline (7.3%) in the 1990s reflects the effects of Clean Air Act rules, such as the limits on SO₂ emissions and the SO₂ trading program (which have spurred the development of lower-sulfur western surface coal at the expense of higher-sulfur eastern underground coal).

Overview of Modeling Analyses

The model used by the Administration to illustrate the economic effects of the Administration's climate change policies, the Second Generation Model, is a long-run economic model that assumes no aggregate employment impacts (because the model assumes that the economy is in equilibrium, which implies that demand for labor exactly equals supply). Indeed, most of the models in the Stanford Energy Modeling Forum exercise and the OECD model comparison effort are similar long-run (general equilibrium) economic models that assume no aggregate employment impacts. While this is an appropriate assumption for small energy price increases over a long time horizon, it cannot provide information on short-term employment effects in any particular industry, such as the coal industry. However, short-run economic models, such as the macroeconomic model constructed by DRI, can provide information about industry-specific employment effects. While some have expressed concern about using these short-run models to evaluate time periods as long as 10 to 20 years, we provide two sets of results that describe the potential range of employment effects in the coal mining industry. These results are based on the same macroeconomic model, but incorporate different estimated permit prices --two lower ones from the Administration's analysis and a higher one from an analysis commissioned by the United Mine Workers.

The United Mine Workers commissioned a study using the DRI macroeconomic model to evaluate the economic effects of abating carbon dioxide emissions. This study analyzed three separate scenarios, but provided detailed results on only the middle scenario. This more detailed analysis assumes that 58 percent of the reductions from the "business as usual" projection necessary for the United States to meet its Kyoto Protocol target will be achieved from the domestic energy sector, generating an estimated 2010 permit price of \$113/ton of carbon equivalent. Alternatively, the Environmental Protection Agency used the DRI macroeconomic model to assess the economic effects associated with permit prices of \$14 and \$23/ton of carbon equivalent.

Coal Mining Industry	\$14/ton (EPA)	\$23/ton (EPA)	\$113/ton (UMW)
Employment Losses	3,470	6,750	28,740
Employment Losses (% below 2010 BAU)	5.1%	9.9%	36.1%
2010 BAU Employment Level	68,200	68,200	79,550

Note: EIA projects 2010 BAU employment in the coal mining industry to be 62,190.

As shown in the table, higher permit prices rise lead to larger employment loss in the coal sector. The employment losses with permit prices of \$14 to \$23/ton are projected to be in the range of 5 to 10% of BAU employment in the coal industry in 2010. It is interesting to note that the variation in estimates of BAU employment range from a low of 62,190 by EIA to a high of 79,550 by UMW, a range of 28%. Given the large variation in "business as usual" employment projections for 2010, employment changes projected in the 5-10 percent range could be considered small to negligible.

Minimizing Employment Losses

The models indicate that the key to minimizing coal mining industry dislocation is to limit the amount of emissions reductions that occur in the domestic energy sector, especially electricity generation. In general, this is consistent with achieving relatively low permit prices for meeting greenhouse gas abatement targets. International emissions trading can significantly reduce estimated greenhouse gas permit prices and the projected burden on the domestic energy sector. Moreover, opportunities to abate greenhouse gas emissions other than carbon dioxide and to promote sink activities can further minimize estimated permit prices and the likely effect on the domestic energy sector, including the coal mining industry.

2. Current efforts to mitigate impacts on coal.

We are working to promote policies and strategies that meet our climate objectives in ways that mitigate the impact on coal & coal mining communities. These efforts include both international and domestic initiatives.

International Policy Architecture

The Administration's international policy priorities combine serious environmental targets and maximum economic flexibility. As described above, the flexibility measures included in the Kyoto Protocol -- all six major greenhouse gases, sinks, international emissions trading, joint implementation, the Clean Development Mechanism and multi-year emissions targets -- all work to bring down domestic costs and consequently reduce the impact on coal. "Maximum flexibility" has been our priority for multiple reasons: good environmental and science policy as well as solid energy policy, because it helps reinforce our energy diversity goals.

DOE's Research, Development and Deployment Programs

R&D programs. Our climate-related energy efficiency programs include advanced coal technology programs that will help drive down costs and increase penetration of advanced technologies at power plants. DOE's Coal Power R&D program is focused through a strategy dubbed "*Vision 21*" on doubling the current power generation efficiencies within the next 10 - 15 years while keeping electricity costs 10% - 20% below those of today's plants. We see particular promise -- growing out of the Clean Coal Technology program -- in *Integrated Gasification Combined Cycle* and *Pressurized Fluidized Bed Combustion*, for which DOE continues to develop improved technological components.

The funding level for the DOE Coal and Power R&D Program for FY2000 is \$214M -- a level higher than rumored, in part due to recognition by the White House climate team of the importance of a solid r&d program to develop even more advanced technologies for using the nation's abundant supply of coal.

	<u>FY1998</u>	<u>FY1999</u>	<u>Final</u>
Generation Efficiency r&d	157.6	170.4	168.2
Fuels r&d	15.8	15.5	14.5
Sequestration r&d	1.6	5.9	9.1
Advanced research	17.6	19.9	23.2
Total	192.6	211.8	214.0

Sequestration. DOE is also engaged in research and development on sequestration technologies that can absorb and hold waste carbon gases from coal combustion. When combined with ultra-high efficiency coal burning techniques, these sequestration technologies could make coal benign in climate terms. Sequestration R&D at DOE is in its earliest stages. The first significant funding from Congress was approved in FY 1999 (\$6 million for applied research in the Office of Fossil Energy and \$13 million in more basic, exploratory research in the Office of Science).

The Administration has strong interest in future funding increases for sequestration r&d. The proposed FY2000 level for sequestration is a 54% increase over FY99, which represents a good

ramp-up level.

Industries of the Future: The Mining Industry. In 1998, the DOE Office of Industrial Technology launched a "Industries of the Future" collaborative with mining companies. It is seeking to bring the entire industry together behind a CEO vision of energy, economic and environmental improvements they seek by the year 2020. To achieve that vision, the industry will develop a technology roadmap that can be used to help target public and private investment toward strategies to achieve their vision. This follows similar initiatives with aluminum, steel, forest products and others that have proven extremely valuable in improving R&D partnerships.

This program is slated for increased funding as part of the CCTI-- up from \$53 m. in FY 98(enacted), \$58 million in FY 99 (enacted) to \$74.0 m. in our FY2000 request.

Tax Incentives

While we are not prepared to discuss specifics of our tax package, we want you to know that we are working to improve the biomass provisions to permit more co-firing with coal. And we will likely change other provisions -- some to make substantive changes, some to keep the costs down. All of the improvements are made in response to valuable input from constituencies -- but they will not necessarily hit the mark perfectly for those groups. We have high hopes of advancing this in the legislative process this year.

Sequestration in abandoned mineland reclamation.

One promising area for improved carbon management relates to reforestation of mined lands that can be done to mitigate carbon -- perhaps even creating carbon emissions credits in an early action crediting regime.

The Department of Interior's Office of Surface Mining began about a year ago to focus mined land reclamation work more intensively on carbon mitigation. In essence, this could be accomplished by promoting techniques that maximize the carbon uptake of trees planted on these sites. There are important employment advantages to this approach, as the dollars spent and jobs created in the reclamation work flow to directly into communities that have been heavily coal dependent, where the mining is completed and workers are already unemployed. Electric power companies have advocated this program as an important vehicle for achieving low cost reductions through sinks.

The funding profile for this program is greatly improved. This office takes in fees from mining companies at a rate of about \$300 million per year, but much to the consternation of the industry, they only spend about \$200 million per year -- the rest used for budget offsets. In recent years, they got very modest increases-- in FY99, they got a \$2 million increase. In the FY 2000 budget, this program will get an increase of \$25 million (10 times last year's), and OMB plans on ramping it up \$25 million for the following 3 years so that it will be allowed to invest all that it raises.

Credit for Early Action

The current Chafee-Mack-Lieberman bill to provide credit for early action could be another important way of providing incentives to business for low cost carbon mitigation. The President highlighted his support for passing bipartisan legislation in this regard as part of his State of the Union message. While we have not reached policy conclusions on the details of the Chafee bill, we plan to engage seriously in the most constructive way possible -- which may involve keeping a low

profile for a while. We are likely to testify in the Environment & Public Works Committee on the principles we would use to guide our policy development. We want to work closely with the Senate to get a bill passed this Congress. We are also working closely with industry (AEP & others) and NGO's to ensure that this is a workable program with high environmental credibility.

3. We recognize that we need to do even better and have launched a process to examine new policy initiatives that might help.

While the government's coal related activities may offer benefits that have not been well appreciated, we also know that there is more that could be done. In particular, we have met with industry groups advocating other improvements, notably tax incentives to spur adoption of clean coal technologies as well as tax provisions to support advanced coking technologies.

At this stage, we have not completed review and consultation on these items -- and our tax package could not accommodate increases of the magnitude contemplated in those proposals -- we want to continue the dialogue with coal groups, electric utilities, steel firms and labor in hopes of finding common ground, should we find ourselves in a posture where more money was available in a tax bill.

4. International Issues

China. We know there is tremendous potential for clean coal technology development in China. We are evaluating some potential strategies that we may want to discuss further as the year proceeds. The President raised the climate issue in his trip to China -- as Sen. Byrd suggested -- and we will continue to use every diplomatic means to engage China constructively on this issue.

Senate. We've read of some possible legislative efforts that Sen. Hagel is considering. Though we do not know specifics, we would like to work closely with you if this interest materializes.

Clean Coal Technology Budget and Tax Incentives Meeting

February 10, 1999
SC-4 The Capitol
2:00 - 3:30 p.m.

I. Welcome & Introductions

Franz Wuerfmannsdobler
Office of Senator Byrd

II. FY 2000 R&D budget & incentives package for coal

Todd Stern - White House &
Bob Kripowicz - DOE

III. Energy challenges & fuel diversity

Charles Goodman
Southern Company

IV. CURC's R&D Roadmap

-- Industry reaction to DOE's initiatives

Ben Yamagata
CURC

V. Incentives for early commercial application of CCT

- CCT tax incentives
- Revenue requirements
- International options
- Carbon sequestration potential

John Wootten
Peabody Group

VI. Q & A / Discussion

Franz Wuerfmannsdobler
Office of Senator Byrd

VII. Future activities

All

Clean Coal Technology

Incentives and R&D Program
for Early Commercial Applications of
Clean Coal Technology

Winter 1999

COAL UTILIZATION RESEARCH COUNCIL

Clean Coal Technologies

Technology Promise

- Climate Change Technology Initiative proposed in Administration's FY 2000 budget
 - designed to promote energy efficiency, develop low carbon energy sources and reduce greenhouse gas emissions
 - \$1.4 billion R&D spending on energy efficiency and renewable energy technologies
 - \$0.4 billion for tax credits to stimulate adoption of energy efficient technologies in building, industrial processes, vehicles, and power generation
- FY 2000 budget proposes \$321 million in bilateral and multilateral environmental assistance to address climate change issues in developing countries
- ***Clean Coal Technologies (CCTs) can be further developed and deployed to cause or induce real increases in efficiency and decreases in carbon emissions from domestic and international electricity generation***

Clean Coal Technologies

Incentive and R&D Program Objectives

- **Fuel Diversity**

- coal largest source of electricity generation
 - U.S. - 57%
 - World - 38%
- coal is projected to remain the largest source of electricity
 - EIA AEO98 - 51% in 2020 even with a 400% increase in natural gas
 - OECD/IEA - 43% of the world's electricity in 2020

- **Technology Promise**

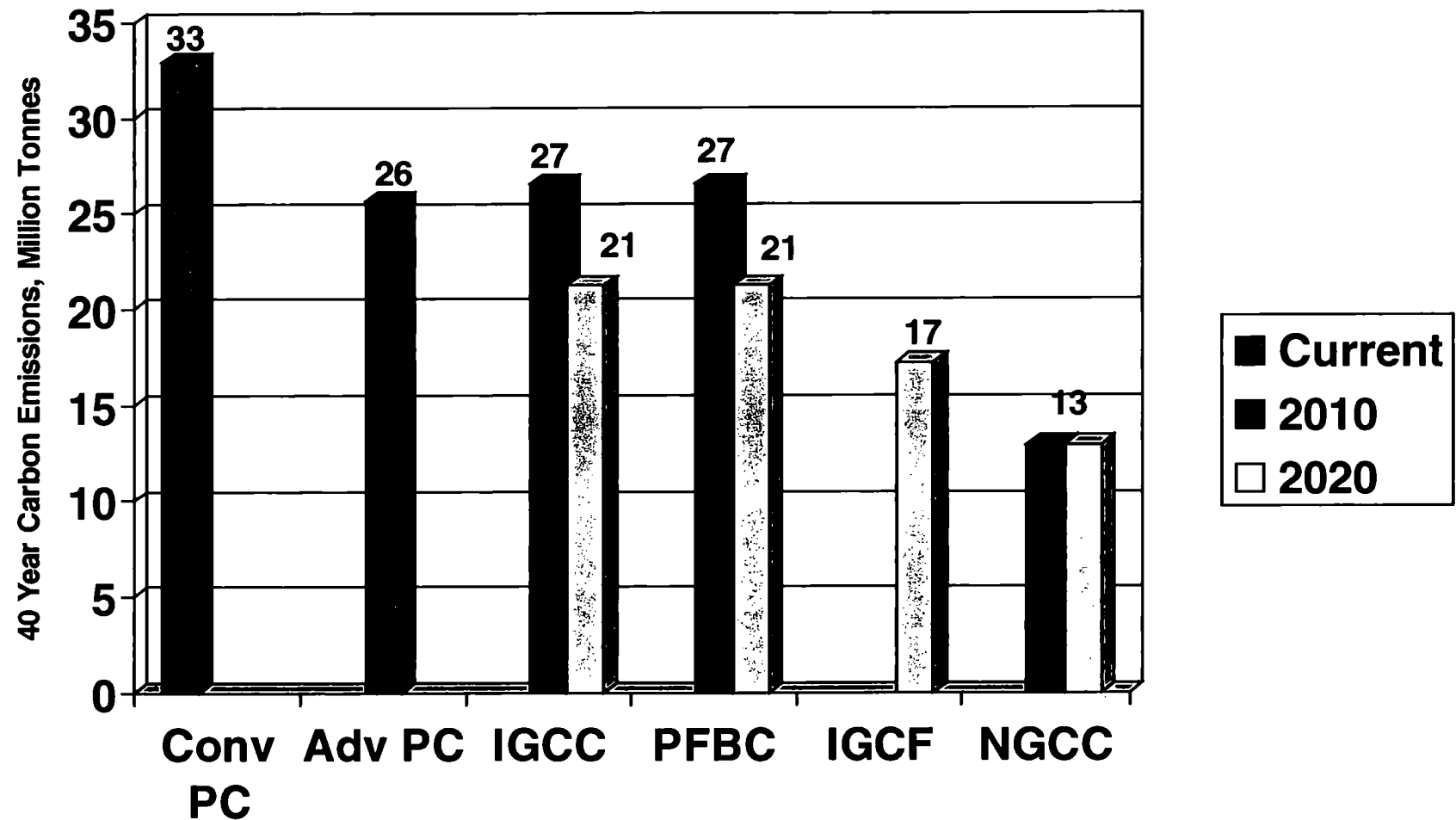
- further R&D and deployment of early commercial applications will result in increased generating efficiency and lower carbon emissions

- **Sustainable Economy**

- coal must remain a viable, readily available, competitive source of fuel for electricity generation, transportation fuels and chemical feed stocks to promote economic growth, price stability and energy security

Clean Coal Technologies

Carbon Emission Reduction Potential



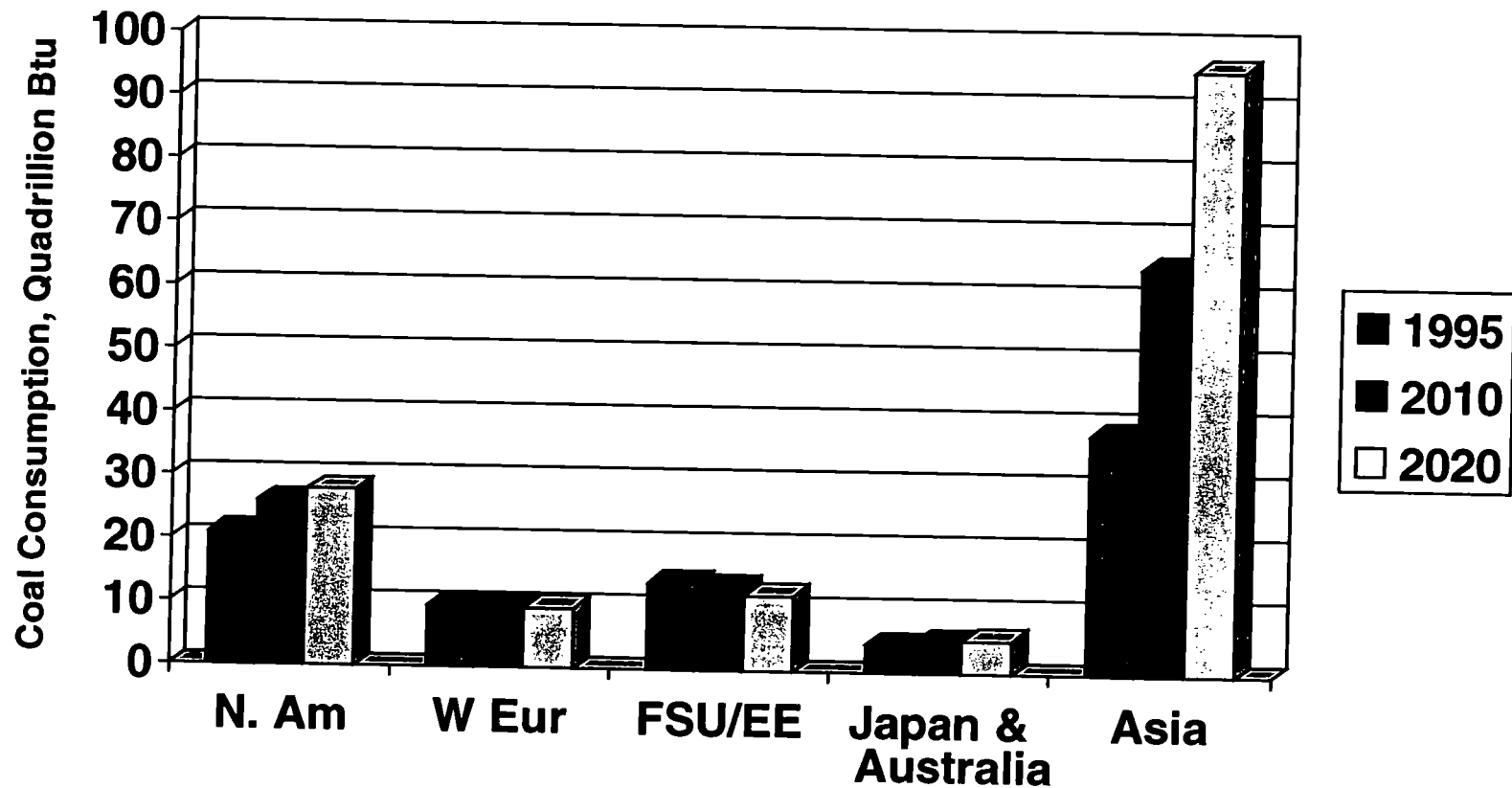
Clean Coal Technologies

Background

- CCT program will be successfully completed with demonstrated “first-of-a-kind” technologies to increase efficiency and reduce pollutants
- full commercial penetration requires 2-3 early commercial applications of these promising technologies
- developers unable to accept technical and financial risk of a “not yet fully commercial” application
 - lack of need for new base load capacity
 - utility deregulation - become more risk adverse
 - competition from natural gas
- Developing countries require large amounts of new capacity - much of it coal fired, but CCTs will not be utilized

Clean Coal Technologies

Projected World Coal Consumption



Source: EIA International Energy Outlook, 1998, April 1998

Clean Coal Technologies

Key Issues

- Coal will continue to be used domestically and internationally
- Carbon emissions will continue to rise
- Conventional coal combustion is 37% efficient
- CCTs offer the promise of efficiencies exceeding 50%
- Full commercial deployment of CCTs can cause or induce real reductions in carbon emissions
- ***Full commercial deployment of CCTs will require incentives for a limited number of early commercial applications***
- ***Achievement of the CCTs full efficiency gain and emission reduction potential will require a continued R&D effort to support the early commercial applications***

Clean Coal Technologies

Criteria for Incentives

- Tax incentives preferred over direct subsidies
- Address technical and economic risks of early commercial applications of CCTs
- Program should focus on coal fired CCTs, but be robust enough to address co-firing with renewables
- Apply only to those technologies that measurably increase thermal efficiency and reduce carbon emissions
- Place priority on early commercial applications in the US, but allow for international applications, if domestic opportunities fail to materialize
- Address the higher capital and operating costs and the increased potential, inherent with new technology, for modifications to achieve design specifications

Clean Coal Technologies

Proposed Incentives

- Investment tax credit
 - 10% of the project owner or parent company investment
- Production tax credit
 - variable incentive based on the production rate and efficiency of the technology over the first 10 years of operation

(To cover increased op. cost)
Does this take into account depreciation of new capital? (assumes equal depreciation)

Operation beginning during or before	Design Average Heat Rate Btu/kWh (HHV)	Incentive for First 5 years of Operation, cents/kWh Generated	Incentive for Second 5 years of Operation, cents/kWh Generated
2004	8400 or less	1.30	1.15
	8401-8550	1.00	0.80
	8551-8750	0.75	0.60
2008	7770 or less	1.35	1.10
	7771-8125	1.15	0.90
	8126-8350	0.90	0.80
2012	7380 or less	1.55	1.35
	7381-7720	1.35	1.15

Clean Coal Technologies

Proposed Incentives (Continued)

- Risk pool
 - 5% of the installed cost available from the Federal Gov't to cover repairs or modifications required to achieve design performance level during start-up and the initial 3 year operating period
- Qualification and selection criteria
 - limited capacity - 6000MW
 - limited period for installation - 2004 to 2012
 - every increasing efficiency threshold to qualify (39% to 46%), higher in later years
 - selection based on maximum efficiency and lowest cost to government

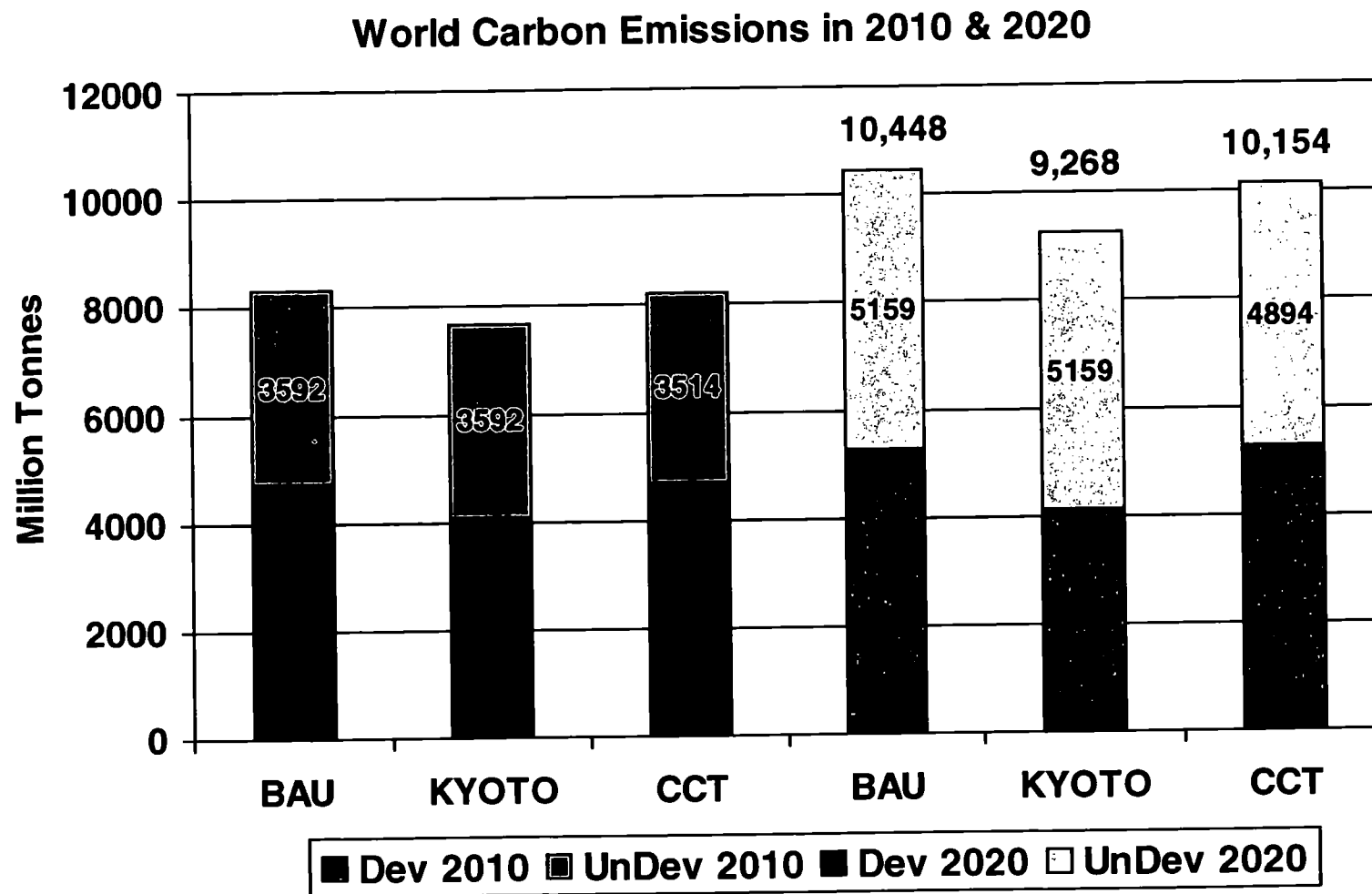
Clean Coal Technologies

Environmental Impacts

- Example of worldwide commercial applications:
 - 10% of coal combustion by 2010
 - 50% of new coal combustion between 2010 and 2015
 - 75% of new coal combustion between 2015 and 2020
- Potential environmental benefits:
 - 10 million metric ton reduction in domestic carbon emissions from the incentives program
 - 294 million metric ton reduction in worldwide carbon emissions per year by 2020 from deployment of CCTs worldwide
 - 25% of the developed country reduction required under a Kyoto type agreement

Clean Coal Technologies

Environmental Impacts



Clean Coal Technologies

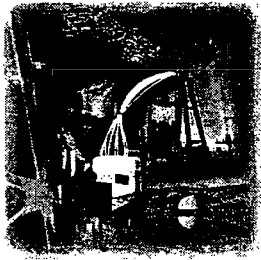
Revenue Impacts

- Revenue impacts over 22 year period (2000 -2021)

Incentive	2000- 2004	2005- 2009	2010- 2014	2000- 2021
		(Million 1998 \$ NPV)		
Investment Tax Credit	\$180	\$145	\$81	\$406
Production Tax Credit	\$59	\$383	\$485	\$1,214
Risk Pool	\$34	\$136	\$107	\$276
Total	\$273	\$664	\$673	\$1,896



The FY 2000 Fossil Energy Budget



Coal Research and Development

Program	FY1999	FY2000
Advanced Clean/ Efficient Power Systems	\$87,676	\$84,737
Clean Fuels Research	15,528	14,500
Advanced Research	19,939	23,195
Subtotal	\$123,143	\$122,432

Dollars in Thousands

What is Possible...

- New clean air regulatory costs cut in half
- A virtually pollution-free power plant
- No net carbon emissions from energy sources
- High performance fuels for future engines

FY2000 Budget Highlights

Advanced Clean/Efficient Power Systems

- 2nd year of R&D on *Vision 21* power plant of the future
- R&D to assist State/Federal implementation of air quality standards (PM2.5, air toxics)
- Expanded research in potentially revolutionary, low cost carbon sequestration

Clean Fuels Research

- Research to use coal for high value transportation fuels, chemicals and carbon products as part of *Vision 21* concept

Advanced Research

- Undergirds *Vision 21* with R&D on high-strength materials, "virtual demonstrations," enhanced catalysts, etc.



Clean Coal Technology Program

Program	FY1999	FY2000
Deferral of Unobligated Balances	-\$40,000	-\$256,000
Advance Appropriations (new Budget Authority)	0	10,000
Subtotal	-\$40,000	-\$246,000

Dollars in Thousands

What is Possible...

- 40 first-of-a-kind projects in 18 States (\$2.1 billion-DOE; \$3.6 billion-Industry) previewing a new generation of environmentally superior technologies that use American coal.

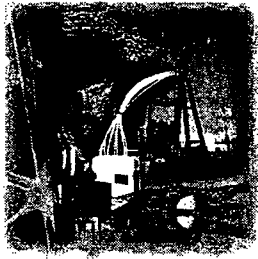
What Has Been Achieved...

- Low-NOx burners now on 50% of U.S. coal power plants; 75% by 2000
- Ultra-clean gasification power plants pioneered in Florida, Indiana, and Nevada
- More than 20 new pollution control processes now available for commercial use in U.S. and overseas

FY2000 Budget Highlights

Clean Coal Technology Demonstrations

- 38 of 40 projects have full funding; final 2 projects likely not to require appropriations in FY2000, allowing funding to be deferred.
- 32 projects now operating or have completed demonstration test runs.



Clean Coal Technology Program

Out-Year Funding Profile

(Dollars in Thousands)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
CCT Projects	\$137,879						
Prior Rescissions	(140,000)						
FY98 Rescission		(\$101,000)					
FY99 Deferral			(\$40,000)	\$10,000	\$15,000	\$15,000	
FY00 Request				(256,000)	189,000	40,000	\$27,000
Total	(\$2,121)	(\$101,000)	(\$40,000)	(\$246,000)	\$204,000	\$55,000	\$27,000

Todd Stern / 11/23/98 07:49:03 PM

Record Type: Record

To: Dirk Forrister/WHCCTF/EOP
cc: See the distribution list at the bottom of this message
Subject: labor

I've located my notes of the meeting that I held with Karen, Dirk, Dan Reicher, David Luna and maybe a few others to follow up on our two meetings with labor leaders on September 25. At the meeting on the 25th, we undertook to get three processes going: (1) to look into potential labor impacts of the electricity restructuring bill; (2) to look into potential near and longer term proposals with respect to the coal industry; and (3) to look into transition issues.

My notes indicate that Dirk, Dan, Bill Samuels, CEQ and NEC were going to get together on the electricity issue. I understand that some meeting was held, but I don't know where the process is.

On the coal industry, my notes suggest that a group including Dirk, Denise Swink, Bob Kripovicz, Bob Perciaseppe, CEQ and NEC was going to meet. I don't know whether anything has happened yet. I understand that many of us were crunching to prepare for Buenos Aires. But we do need to get this going. Particularly if we find ourselves with a Bob Byrd/POTUS meeting coming up, which is a possibility.

Same point on transition. I think nothing much has happened yet other than that Karen has talked with Sally and I have touched base briefly with Ron. But we clearly need an interagency group pulled together that includes David Luna, maybe someone else from Labor, Treasury, CEA, and others. We need to do some initial thinking and then offer to sit down with David Smith and others to begin discussing ideas. My general untutored sense about this is that while we may well not want to create a special climate change transition program -- i.e., may want it to be part of whatever our general programs are in this regard -- we almost surely do want to be thinking about a special climate/coal miner program. And we need to get thinking under way quickly enough so that if a meeting with Byrd pops up on the President's schedule, we can staff him properly.

Dirk -- let's talk in the morning to see where we are on electricity and coal. Ron -- if it would be helpful we can talk about who would make sense for the interagency transition team. Though Sally may well have thoughts on this as well. tds

Message Copied To:

Karen Tramontano/WHO/EOP
Roger S. Ballentine/WHO/EOP
Sally Katzen/OPD/EOP
Ronald Minsk/OPD/EOP
George T. Frampton/CEQ/EOP

From: Dirk Forrister on 01/20/99 05:32:21 PM

Record Type: Record

To: Todd Stern/WHO/EOP, Roger S. Ballentine/WHO/EOP, David B Sandalow/CEQ/EOP

cc:

Subject:



COALMTG.M

Please find a short background paper for the meeting with Senator Byrd's staff tomorrow. This updated version incorporates the topics we covered in the 1:00 prep session. Here's a short-short version of our key messages to use as you prepare your own cheat-sheet.

Economic Analysis: While we recognize that the nation's climate response will have some effects on coal, our analysis shows that an economically efficient policy framework will minimize those impacts. Coal will continue to play an important role in America's energy mix for many years to come.

Technology Initiatives: Our portfolio of climate programs includes continued work on advanced coal R&D, sequestration and efficiency in mining. Our tax incentives will be changing modestly -- but still hold some potential for coal-based strategies to play a role through combined heat and power as well as improved biomass cofiring provisions.

Credit for Early Action: The President expressed interest in the State of the Union. We're committed to work with you to get a bill done.

Surface Mining: We see a valuable role emerging for our mined land reclamation programs -- they are focusing more on ways of including reforestation strategies to play a larger role. While not by any means the total solution, his program has the advantage of putting dollars and jobs into coal mining communities.

New Issues: We Know We Can Do Even Better: We know your interest in the tax incentive proposal by the Coal Utilization Research Council -- and we are continuing to examine it. We are also working with the steel and coke industries on their interest in tax incentives for advanced coking technologies. We have concerns with both proposals -- and we have funding constraints that kept us from adding new initiatives on the tax side. That said, we will continue to work with them should the funding prospects change later in the year.

International: We know your interest in China, and we are developing some alternatives to prompt more clean coal technology partnerships there. We are also hearing soundings from Sen. Hagel that he may be planning a legislative effort this year -- and we hope that we can work closely with you if anything materializes on that front.

CLIMATE CHANGE AND THE COAL SECTOR

Highlights of Administration's Efforts

1. The current picture, recent trends and outlook.

As a policy matter, the Administration believes that coal plays an important role in the nation's energy portfolio. Our National Energy Strategy makes clear the importance of maintaining a diverse energy supply -- including coal, which now fuels 54% of U.S. power generation. Equally important is the need to ensure that the environmental impacts of energy production are addressed -- meaning that in climate terms, we are committed to ensuring that the coal our nation consumes is used in the cleanest, most efficient way.

Our efforts to address climate change are likely to provide incentives to the private sector to consume energy-efficient and less greenhouse gas intensive products. In terms of energy use, fossil fuels that produce relatively large amounts of carbon dioxide from combustion (such as coal) will become less economically attractive than fuels that produce lower amounts of greenhouse gases (such as natural gas and renewables). The necessity of shifting away from coal use has spurred some criticism that the Kyoto Protocol will result in significant job losses in the coal industry. We are convinced that some of these concerns are overly pessimistic, given our analysis of the trends in this industry and the likely employment effects portrayed in some of the existing modeling analyses.

Overview of the Coal Industry:

The coal industry has experienced substantial productivity gains over the past half-century. While coal prices climbed significantly during the energy crisis of the 1970s, prices in real terms have now declined to nearly the lowest levels experienced over the past 40 years, and are forecast to decline even further under business as usual projections through 2020.

Much of the decline in coal prices reflects improvements in productivity (measured by tons of coal produced per hour of labor). Since the decline in productivity of the mid-1970s, coal mining productivity has improved at an astounding 7% rate per year. Surface mining operations, which tend to be more prevalent in the west, have much higher absolute levels of productivity while underground mining operations have experienced slightly faster rates of productivity *growth* over the past 15 years. Surface coal miners were 2.6 times and underground miners were 2.8 times more productive in 1995 than they were in 1980.

While mining employment increased in response to increased demand for coal during the 1970s energy crisis, the last two decades have witnessed a steady decline in employment. Current mining employment is one-third of its peak in 1978 of 245,000. However, overall coal production has tended to increase as gains in productivity have outpaced the decline in employment. Since 1980, mining employment has declined at an average rate of 6.1% per year, while production has increased by an average of 1.6% per year. By 2010, coal mining employment under a continuation of current policies (the "business as usual" case) is projected to be about 62,000, reflecting an average 2.1% annual rate of decline between 1996 and 2010. Some have claimed that the faster average annual rate of decline (7.3%) in the 1990s reflects the effects of Clean Air Act rules, such as the limits on SO₂ emissions and the SO₂ trading program (which have spurred the development of lower-sulfur western surface coal at the expense of higher-sulfur eastern underground coal).

Overview of Modeling Analyses

The model used by the Administration to illustrate the economic effects of the Administration's climate change policies, the Second Generation Model, is a long-run economic model that assumes no aggregate employment impacts (because the model assumes that the economy is in equilibrium, which implies that demand for labor exactly equals supply). Indeed, most of the models in the Stanford Energy Modeling Forum exercise and the OECD model comparison effort are similar long-run (general equilibrium) economic models that assume no aggregate employment impacts. While this is an appropriate assumption for small energy price increases over a long time horizon, it cannot provide information on short-term employment effects in any particular industry, such as the coal industry. However, short-run economic models, such as the macroeconomic model constructed by DRI, can provide information about industry-specific employment effects. While some have expressed concern about using these short-run models to evaluate time periods as long as 10 to 20 years, we provide two sets of results that describe the potential range of employment effects in the coal mining industry. These results are based on the same macroeconomic model, but incorporate different estimated permit prices --two lower ones from the Administration's analysis and a higher one from an analysis commissioned by the United Mine Workers.

The United Mine Workers commissioned a study using the DRI macroeconomic model to evaluate the economic effects of abating carbon dioxide emissions. This study analyzed three separate scenarios, but provided detailed results on only the middle scenario. This more detailed analysis assumes that 58 percent of the reductions from the "business as usual" projection necessary for the United States to meet its Kyoto Protocol target will be achieved from the domestic energy sector, generating an estimated 2010 permit price of \$113/ton of carbon equivalent. Alternatively, the Environmental Protection Agency used the DRI macroeconomic model to assess the economic effects associated with permit prices of \$14 and \$23/ton of carbon equivalent.

Coal Mining Industry	\$14/ton (EPA)	\$23/ton (EPA)	\$113/ton (UMW)
Employment Losses	3,470	6,750	28,740
Employment Losses (% below 2010 BAU)	5.1%	9.9%	36.1%
2010 BAU Employment Level	68,200	68,200	79,550

Note: EIA projects 2010 BAU employment in the coal mining industry to be 62,190.

As shown in the table, higher permit prices rise lead to larger employment loss in the coal sector. The employment losses with permit prices of \$14 to \$23/ton are projected to be in the range of 5 to 10% of BAU employment in the coal industry in 2010. It is interesting to note that the variation in estimates of BAU employment range from a low of 62,190 by EIA to a high of 79,550 by UMW, a range of 28%. Given the large variation in "business as usual" employment projections for 2010, employment changes projected in the 5-10 percent range could be considered small to negligible.

Minimizing Employment Losses

The models indicate that the key to minimizing coal mining industry dislocation is to limit the amount of emissions reductions that occur in the domestic energy sector, especially electricity generation. In general, this is consistent with achieving relatively low permit prices for meeting greenhouse gas abatement targets. International emissions trading can significantly reduce estimated greenhouse gas permit prices and the projected burden on the domestic energy sector. Moreover, opportunities to abate greenhouse gas emissions other than carbon dioxide and to promote sink activities can further minimize estimated permit prices and the likely effect on the domestic energy sector, including the coal mining industry.

2. Current efforts to mitigate impacts on coal.

We are working to promote policies and strategies that meet our climate objectives in ways that mitigate the impact on coal & coal mining communities. These efforts include both international and domestic initiatives.

International Policy Architecture

The Administration's international policy priorities combine serious environmental targets and maximum economic flexibility. As described above, the flexibility measures included in the Kyoto Protocol -- all six major greenhouse gases, sinks, international emissions trading, joint implementation, the Clean Development Mechanism and multi-year emissions targets -- all work to bring down domestic costs and consequently reduce the impact on coal. "Maximum flexibility" has been our priority for multiple reasons: good environmental and science policy as well as solid energy policy, because it helps reinforce our energy diversity goals.

DOE's Research, Development and Deployment Programs

R&D programs. Our climate-related energy efficiency programs include advanced coal technology programs that will help drive down costs and increase penetration of advanced technologies at power plants. DOE's Coal Power R&D program is focused through a strategy dubbed "*Vision 21*" on doubling the current power generation efficiencies within the next 10 - 15 years while keeping electricity costs 10% - 20% below those of today's plants. We see particular promise -- growing out of the Clean Coal Technology program -- in *Integrated Gasification Combined Cycle* and *Pressurized Fluidized Bed Combustion*, for which DOE continues to develop improved technological components.

The funding level for the DOE Coal and Power R&D Program for FY2000 is \$214M -- a level higher than rumored, in part due to recognition by the White House climate team of the importance of a solid r&d program to develop even more advanced technologies for using the nation's abundant supply of coal.

	<u>FY1998</u>	<u>FY1999</u>	<u>Final</u>
Generation Efficiency r&d	157.6	170.4	168.2
Fuels r&d	15.8	15.5	14.5
Sequestration r&d	1.6	5.9	9.1
Advanced research	17.6	19.9	23.2
Total	192.6	211.8	214.0

Sequestration. DOE is also engaged in research and development on sequestration technologies that can absorb and hold waste carbon gases from coal combustion. When combined with ultra-high efficiency coal burning techniques, these sequestration technologies could make coal benign in climate terms. Sequestration R&D at DOE is in its earliest stages. The first significant funding from Congress was approved in FY 1999 (\$6 million for applied research in the Office of Fossil Energy and \$13 million in more basic, exploratory research in the Office of Science).

The Administration has strong interest in future funding increases for sequestration r&d. The proposed FY2000 level for sequestration is a 54% increase over FY99, which represents a good

ramp-up level.

Industries of the Future: The Mining Industry. In 1998, the DOE Office of Industrial Technology launched a "Industries of the Future" collaborative with mining companies. It is seeking to bring the entire industry together behind a CEO vision of energy, economic and environmental improvements they seek by the year 2020. To achieve that vision, the industry will develop a technology roadmap that can be used to help target public and private investment toward strategies to achieve their vision. This follows similar initiatives with aluminum, steel, forest products and others that have proven extremely valuable in improving R&D partnerships.

This program is slated for increased funding as part of the CCTI-- up from \$53 m. in FY 98(enacted), \$58 million in FY 99 (enacted) to \$74.0 m. in our FY2000 request.

Tax Incentives

While we are not prepared to discuss specifics of our tax package, we want you to know that we are working to improve the biomass provisions to permit more co-firing with coal. And we will likely change other provisions -- some to make substantive changes, some to keep the costs down. All of the improvements are made in response to valuable input from constituencies -- but they will not necessarily hit the mark perfectly for those groups. We have high hopes of advancing this in the legislative process this year.

Sequestration in abandoned mineland reclamation.

One promising area for improved carbon management relates to reforestation of mined lands that can be done to mitigate carbon -- perhaps even creating carbon emissions credits in an early action crediting regime.

The Department of Interior's Office of Surface Mining began about a year ago to focus mined land reclamation work more intensively on carbon mitigation. In essence, this could be accomplished by promoting techniques that maximize the carbon uptake of trees planted on these sites. There are important employment advantages to this approach, as the dollars spent and jobs created in the reclamation work flow to directly into communities that have been heavily coal dependent, where the mining is completed and workers are already unemployed. Electric power companies have advocated this program as an important vehicle for achieving low cost reductions through sinks.

The funding profile for this program is greatly improved. This office takes in fees from mining companies at a rate of about \$300 million per year, but much to the consternation of the industry, they only spend about \$200 million per year -- the rest used for budget offsets. In recent years, they got very modest increases-- in FY99, they got a \$2 million increase. In the FY 2000 budget, this program will get an increase of \$25 million (10 times last year's), and OMB plans on ramping it up \$25 million for the following 3 years so that it will be allowed to invest all that it raises.

Credit for Early Action

The current Chafee-Mack-Lieberman bill to provide credit for early action could be another important way of providing incentives to business for low cost carbon mitigation. The President highlighted his support for passing bipartisan legislation in this regard as part of his State of the Union message. While we have not reached policy conclusions on the details of the Chafee bill, we plan to engage seriously in the most constructive way possible -- which may involve keeping a low profile for a while. We are likely to testify in the Environment & Public Works Committee on the

principles we would use to guide our policy development. We want to work closely with the Senate to get a bill passed this Congress. We are also working closely with industry (AEP & others) and NGO's to ensure that this is a workable program with high environmental credibility.

3. We recognize that we need to do even better and have launched a process to examine new policy initiatives that might help.

While the government's coal related activities may offer benefits that have not been well appreciated, we also know that there is more that could be done. In particular, we have met with industry groups advocating other improvements, notably tax incentives to spur adoption of clean coal technologies as well as tax provisions to support advanced coking technologies.

At this stage, we have not completed review and consultation on these items -- and our tax package could not accommodate increases of the magnitude contemplated in those proposals -- we want to continue the dialogue with coal groups, electric utilities, steel firms and labor in hopes of finding common ground, should we find ourselves in a posture where more money was available in a tax bill.

4. International Issues

China. We know there is tremendous potential for clean coal technology development in China. We are evaluating some potential strategies that we may want to discuss further as the year proceeds. The President raised the climate issue in his trip to China -- as Sen. Byrd suggested -- and we will continue to use every diplomatic means to engage China constructively on this issue.

Senate. We've read of some possible legislative efforts that Sen. Hagel is considering. Though we do not know specifics, we would like to work closely with you if this interest materializes.