

CLIMATE CHANGE MITIGATION GEOGRAPHY

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THE WHITE HOUSE

WASHINGTON

October 18, 1993

Dear Colleague:

I would like to take this opportunity to extend an invitation for you to attend the President's unveiling of his Climate Change Action Plan. The ceremony will be held on the South Lawn of the White House at 12:00 noon on Tuesday, October 19, 1993.

In his Earth Day Address, the President announced this Administration's intention to return U.S. greenhouse gas emissions to 1990 levels by the year 2000. President Clinton will be announcing his Climate Change Action Plan to accomplish his goals as outlined on Earth Day in April.

If you are coming from outside the White House, you will need to plan on arriving at the East Visitors Gate of the White House with picture identification by 11:00 a.m. for the announcement on Tuesday. If you have any questions, please feel free to contact Mr. Trey Lindseth or Ms. Jennifer Colamonico on my staff at 456-6224.

I hope you will be able to join us at the ceremony, and I look forward to seeing you soon.

Sincerely,

A handwritten signature in black ink, appearing to read "Katie McGinty", written over the word "Sincerely,".

Kathleen A. McGinty
Director, White House Office on
Environmental Policy

KAM/avl

SELECTED QUESTIONS AND ANSWERS ON THE
PRESIDENT'S CLIMATE CHANGE ACTION PLAN

THE APPROACH: PARTNERSHIPS/FLEXIBILITY/VOLUNTEERISM

Q: What percentage of the plan is voluntary?

A: The plan is really a strategic combination of carrots and sticks -- for example, efficiency standards for appliances are reinforced by market-enhancing programs with the private sector. We are all responsible for causing greenhouse gas emissions, and through this plan we will all be responsible for helping to reduce them. This approach has demonstrated results where it has been tried -- our plan expands this approach to new areas.

Most of the estimates for the partnership programs include a certain amount of reenforcement from utility demand-side management programs, where utilities pay people to be efficient, and from standards -- so it's a little bit misleading to try to split out the effect of the programs alone. But as a rough estimate, it's one-half to two-thirds. Keep in mind that if we're not on track, we will adjust our programs and efforts so that the President's target is reached.

Q: How much of the plan is under existing authority? How much needs legislation?

A: The plan is designed for rapid implementation and minimizes actions likely to be delayed through legislative or regulatory processes, in order to meet the year 2000 goal. About 90% of the emissions reductions are from administrative actions. About 10% require legislation. The parking "cash-out" reform, and the hydroelectric leasing reform require legislation.

Q: Let me get this straight: You ducked everything politically difficult. You squeaked by on voluntary programs -- but only because you added sinks. You backed away from a campaign pledge to do CAFE. You won't commit to anything beyond 2000 -- and you won't commit to renegotiate a good treaty. What would Senator Gore say?

A: Some people have very short memories. Just a year ago, the US was a world FOLLOWER on the environment. George Bush was pulled to Rio by the American people and by other countries. President Clinton, with this plan, re-establishes the United States as the world leader on the global environment. President Clinton has committed the U.S. to reaching a target within a time-table and this Administration will do whatever is necessary to get there.

I heard someone say this plan could have been George Bush's. Whether or not he could have prepared this plan, HE DID NOT.

Q: But didn't Bush have a program like this?

A: No he didn't. Although the Bush Administration did outline a series of climate initiatives, there are major differences.

The first is Leadership: President Bush was largely a follower on international environmental issues. Under his Administration, the U.S. was among the most reluctant nations to participate in the development of the climate convention in Rio, and did so only after the commitment reduce to 1990 levels in 2000 had been taken away. President Clinton made that commitment, and with this plan, the U.S. is regaining its leadership position.

Second: Funding. The Bush plan was a plan that existed mostly on paper. The Bush program was proposed, but left essentially unfunded -- in the agencies, nothing really changed and most of the new programs were never initiated. The Clinton strategy is accompanied by real resources -- almost \$2 billion in mostly redirected funding between now and 2000.

Finally, the program itself: The Clinton strategy is broader and more diverse (has two times as many initiatives). The Bush programs that were working have been built into our "baseline" -- the starting place for our strategy, and some of the successful programs operating in the agencies on shoestring budgets during the Bush years are being expanded.

(see side-by-side comparison, below)

Q: This voluntary stuff seems pretty squishy. How real are these programs?

A: THE PARTNERSHIP PROGRAMS ARE BASED ON SUCCESS. For example, the EPA Green Lights program began in January, 1991. So our savings projections are based on two and a half years of successful program experience. Participants in the program sign a voluntary contract with EPA which establishes their commitment to achieving results. The Green Lights savings estimates have received substantial independent review. The "voluntary" program estimates are based not only on the success of the program itself, but also on the fact that they are strengthened by utility DSM programs and in many cases, standards. (We took extreme care not to "double count".)

THE PARTNERSHIP PROGRAMS WILL BE STRICTLY MONITORED. For example, partners in the Green Lights, Energy Star Buildings and Rebuild America Programs will report their progress in completing energy-efficient upgrades at least once each year. EPA collects and analyzes the implementation data, thus tracking program success. If program results were to fall below expectations, the recruiting of participants could be accelerated. EPA's experience with Green Lights has shown that recruitment is primarily limited by internal staff and budget constraints, not by the interest of outside parties.

(See the voluntary section for more detail -- below)

Q: How did you choose the programs?

A: President Clinton instructed his administration to produce a cost-effective plan and issued a "clarion call, not for more bureaucracy or regulation or unnecessary costs, but instead for American ingenuity and creativity, to produce the best and most energy-efficient technology."

In response to that call the White House formed a groundbreaking interagency task force, the Climate Change Mitigation Group, to identify the best opportunities for reducing greenhouse gas emissions. This interagency group relied on the expertise of scores of program managers, analysts, and economists and the experience of people around the country who have been engaged in energy efficiency work, technology development, and agriculture.

EMISSIONS PROJECTIONS

Q: How much do emissions rise without your plan between 1990 and 2000?

A: Emissions grow from 1462 to 1568 million metric tons of carbon equivalent (MMTCE), an increase of 7 percent.

Q: What happens to CO2 emissions in this plan?

A: CO2 rises slightly, about 2% -- that's about 24 MMT. HFCs also rise, although their growth is cut in one-half. Cuts in methane and nitrous oxide emissions make up the difference.

(The carbon number above includes CO2 offset by forestry)

Q: What percentage of the reductions come from non-CO2 sources?

A: About one-third.

(For other questions about numbers, see the first few pages of the plan following the overview)

CONTINUOUS MONITORING

Q: What if the plan doesn't deliver the promised reductions?

A: Remember, this is NOT a set and forget plan! In order to meet the goal of returning greenhouse gas emissions to 1990 levels, the President is committing his Administration to a biannual evaluation of emission trends and program effectiveness. In reality, we will be updating the plan even sooner in order to meet international commitments associated with the treaty. The Office on Environmental Policy will chair an interagency task force to monitor progress and pursue additional policy initiatives if needed to attain our goal.

In addition, to ensure that we are rolling, a major climate conference will be held in Washington six months from now with all of the key stakeholders -- from government, business and the environmental community.

The Action Plan detailed here is the beginning of a process, not a one-time product. This Administration is committed to seeking out all cost-effective actions that will reduce greenhouse gas emissions and improve our quality of life through economic growth, job creation and environmental protection.

Q: What were the next actions? If something happens and you need another good program, what would it be?

A: We're confident that the plan will achieve its expected results. Of course, our plan does call for extensive monitoring and adjustments to keep the emissions reductions on track. If for some reason the plan needs adjusting, we'll look again at all of the options available -- new initiatives, changes to existing programs, or more resources for the programs that are working best.

Q: How committed are you to the 1990 goal? If, in 1997 you discover that the plan is falling short, will you be willing to take strong measures to make the target?

A: Yes. Monitoring and evaluation is one of the most important elements of this plan (see above). Starting next year, and every two years after that we'll take a long hard look at our programs, and modify them accordingly. We're absolutely confident that we'll meet our commitment.

INTERNATIONAL NEGOTIATIONS

Q: If you are so sure about the plan making its goal, will you renegotiate the treaty? If were really serious about climate change, you would agree to hard targets and timetables, in a treaty that has teeth.

A: This plan establishes the U.S. as a world leader in climate. We're doing everything called for under the treaty and more. Our position in the next negotiating session will certainly reflect this progress, and reflect whatever progress is made by the other countries.

POST-2000

Q: What happens after the year 2000?

A: The initiatives in the President's plan will continue to achieve emission reductions relative to expected levels beyond the year 2000. Climate change is a long term problem; and the Administration will sustain a long term effort.

This plan by itself is unlikely to stabilize emissions at 1990 levels under reasonable assumptions regarding economic growth, the diffusion of existing technologies, and new technology development.

Therefore, we will continue to develop policies to address the longer term trends in greenhouse gas emissions. The White House National Economic Council, Office on Environmental Policy and Office of Science and Technology Policy will lead a task force to recommend strategies beyond 2000. This long term strategy will build on this plan's support of the development and diffusion of technologies that reduce greenhouse gas emissions. The group will examine all budget, technology, R&D, regulatory and economic policies that could impact emissions beyond 2000, and make initial recommendations by the end of 1994.

Much of the anticipated growth in greenhouse gas emissions after the year 2000 will be in the transportation sector. As such, the President is directing his Administration to develop cost-effective measures to significantly reduce greenhouse gas emissions from personal motor vehicles, including light cars and trucks, and make recommendations in one year (see above).

Q: How short are you in 2010?

A: We haven't fully evaluated the impacts of these new programs beyond the year 2000. The R&D programs and the programs that create markets for efficiency will lead to technical innovation and new designs in ways that haven't yet been quantified.

Q: Why won't you COMMIT to stabilizing emissions in 2010?

A: We're not going to stop when we reach the first milestone. Climate change is a long-term problem that will require sustained effort, and the United States will continue to cut greenhouse gases. The treaty calls us to stabilize emissions at a level that prevents "dangerous anthropogenic interference with the climate system" in a "time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner" -- and that's what we'll do.

BUDGET, ECONOMICS AND JOBS

Q: How much do the programs cost to operate?

A: This climate plan is backed up with real resources, about \$1.9 billion in Federal funding between 1994 and 2000, most of which is redirected money.

However, the plan as a whole reduces the deficit, through two new policies. One would allow commuters the option of "cashing-out" employer-paid parking, by taking the value of the fringe benefit as taxable income. The second would permit private development at existing Federal hydroelectric facilities in exchange for lease payments. These reforms would raise \$2.7 billion between 1994 and 2000.

Q: Congress has historically left many of these programs underfunded. Even this year, a Democratic Congress did not fully fund the President's FY 1994 request for some of these programs, such as the EPA programs. What makes you think they will be funded in the future?

A: The President and Vice President have made their commitment to the climate programs abundantly clear, and we will ensure that this plan is funded -- this year, and every year. And it will be funded at levels that get us to our commitment.

Congress made this year's decisions without knowing how the pieces of the plan fit together toward the overall climate strategy. With the release of the plan, and with a concerted Administration effort in the future appropriations bills, we will get the funding necessary to meet the President's goal.

Q: How do these programs benefit the economy? Do they really create jobs?

A: Through the programs, businesses and homeowners will have greater access to technologies that save them money. Now it is difficult to find energy efficient technologies and the expertise needed to get them in place. Using these technologies cuts costs, makes companies more competitive and allows them to invest in new designs, new manufacturing and new jobs. (It also is more labor-intensive to install energy efficiency than build power plants.)

TRANSPORTATION

Q: If transportation GHG emissions are increasing faster than emissions in other sectors, why isn't more action being taken in the transportation sector?

A: The plan emphasizes long-run strategies to deal with an issue that has long-term implications. As part of the action plan, President Clinton is directing the White House National Economic Council, Office on Environmental Policy, and Office of Science and Technology Policy to develop measures within one year that will significantly reduce greenhouse gas emissions from personal motor vehicles.

This task force will:

- Seek broad public input from industry, state and local government, the environmental community and others
- Cut greenhouse gas emissions from cars and light trucks while meeting or exceeding all vehicle safety and clean air requirements
- Include regulatory and/or non-regulatory actions.

Q: Why did you break your campaign pledge and not increase the CAFE standard?

A: The Administration is taking a different approach at this point.

1. Transportation Strategy Task Force: In addition to the transportation measures included in the plan, we've established a White House group to prepare a transportation strategy. (see above)

2. Clean Car: By working with the auto industry through the Clean Car Initiative, we're pursuing a whole new generation of cars. These cars are not incrementally more fuel efficient -- they're miles ahead. And we're helping to position Detroit for world-leadership into the 21st century. These new cars should have fuel efficiency 300% better than the current standard and all the safety and affordability of their competition, and they could hit the market in just 10 years.

Due to the lead time needed to change CAFE standards and have those changes reflected in vehicle design, CAFE is unlikely to produce significant improvements in the technology of new vehicle offerings before model year 1998 or 1999. Then, since new vehicles replace less than a tenth of the on-the-road fleet in any given year, the impact of CAFE on GHG emissions before the year 2000 would be minimal -- less than 5% of our total.

(Note: We don't want to rule out CAFE, just point out that it isn't the silver bullet it's cracked up to be.)

FORESTRY

Q: What are "sinks" and why are they in the Plan?

A: Scientifically, what matters to the climate system is the atmospheric concentration of greenhouse gases -- and it doesn't matter how you reduce them. Since atmospheric concentrations are the result of both emissions and uptake (plants take in CO₂ from the atmosphere as they grow, through photosynthesis), a good plan should address both -- and use the most cost-effective options available. This plan does.

In fact, the forestry actions themselves address both emissions and uptake: By reducing cutting of forests, the plan prevents additional emissions, and extra tree planting and tree growth take carbon dioxide out of the atmosphere (that's why they are called "sinks"). The forestry actions are some of the most cost-effective actions in the plan.

CLIMATE CHANGE ACTION PLAN

Background Briefing

October 19, 1993

- Scientists and the environmental community agree that climate change is the highest-risk environmental problem we face.
- The President committed his Administration to respond by issuing a dual directive: to reduce our nation's emissions of greenhouse gases to 1990 levels by the year 2000, and to do so in a cost-effective way.
- After Earth Day, the White House Office on Environmental Policy (OEP) established a process to produce the plan.
 - OEP hosted the White House Conference on Global Climate Change on June 10-11, where 300 invited participants shared their views with about 800 who attended.
 - Climate Change Mitigation Group selected; Six working groups established: Energy Demand, Energy Supply, Transportation, Methane and other Gases, Sinks, Joint Implementation. The group consisted of representatives from EPA, DOE, DOT, Treasury, DOC, USDA, DOI, and White House Offices: CEA, OSTP, OMB, and DPC.
 - Interagency Analysis Team tasked with analyzing policy options. Co-chaired by OEP and CEA, involved economists and analysts from OSTP, OMB, EPA, DOE, USDA, DOC, DOT, Treasury. The policy options were analyzed as individual actions and in an integrated modeling framework.
- The President's Climate Change Action Plan is a detailed global warming strategy that demonstrates world leadership on a crucial issue. It reduces greenhouse gas emissions and is good for the economy.
 - The Plan relies on the positive link between environment and the economy -- relying on cost-effective and profitable pollution reductions.
 - The Action Plan takes the important first step toward protecting the Earth's climate system -- reducing U.S. greenhouse gas emissions to 1990 levels by the year 2000. But further actions will be required to protect the climate in the long term. The U.S. will lead both through domestic actions and international agreements.

OVERVIEW AND KEY ELEMENTS OF THE PLAN

THE CLIMATE CHANGE ACTION PLAN:

- Contains nearly **50 initiatives**, covering **all sectors of the economy**. This is an economy-wide problem that requires economy-wide solutions.
- Covers **all greenhouse gases** -- carbon dioxide, methane, nitrous oxide and other gases. Also includes forestry actions that preserve carbon stored in U.S. forests.
- Is designed for **rapid and aggressive implementation** and minimizes actions subject to legislative or regulatory delay.
- **Fosters partnerships** with business where focused government guidance and flexible approaches can produce cost-effective emission reductions. The plan stimulates investments in the technologies of the future, strengthening the American position in the global environmental technology marketplace.
- Is backed up with **real Federal resources** -- between \$200 and \$300 million per year annually of new and redirected funding between 1994 and 2000, a total of \$1.9 billion between 1994 and 2000.
- **Reduces the deficit** through two new policies. One would allow commuters the option of "cashing-out" employer-paid parking, by taking the value of the fringe benefit as taxable income. The second would permit private developers to upgrade existing Federal hydroelectric facilities and sell the extra generation in exchange for lease payments. These reforms generate revenues from new market transactions that help reduce greenhouse gases, and raise \$2.7 billion between 1994 and 2000.
- **Leverages over \$60 billion in private investment** between 1994 and 2000 in environmental technologies. These investments pay off for U.S. businesses and citizens -- the investments lead to over \$60 billion in reduced energy costs between 1994 and 2000, with continued benefits of over \$200 billion in energy savings between 2001 and 2010.
- Includes a **pilot program of joint implementation** to gain experience in evaluating investments in other countries for emission reduction benefits.
- **Will be actively monitored to review progress** toward meeting the President's goal, and will institute new programs as needed to ensure that emission reductions are made.
- **Establishes a White House team to develop strategies for long term emission reductions**, including emissions from automobiles and trucks.

KEY PROGRAMS BY SECTOR

Residential Sector

- **Energy-efficient mortgage initiative** to allow homeowners to finance efficiency improvements under conventional mortgages where the decreased energy bills more than offset the increased mortgage payment.
- More aggressive **appliance efficiency standards** on a wide range of household appliances to help reduce consumer energy consumption and utility bills. Standards are complemented with **innovative public/private consortia** that encourage manufacturers to develop more energy efficient appliances by offering guaranteed markets to the best technology.

Commercial Sector

- **Significantly expanded partnership programs** for energy efficiency in commercial buildings. These are modeled on successful efforts at EPA, and include an expanded EPA Green Lights program, and a new coordinated effort between EPA and DOE called the Energy Star Buildings (EPA) and Rebuild America program (DOE).
- Help fund **cost-shared demonstration** projects for commercial building technology in federal, state, and local government buildings and private buildings.

Industrial Sector

- **Motor Challenge** -- a partnership between industrial motor users (one of the biggest energy uses), manufacturers, utilities and DOE to promote efficient motor systems.
- Establish **market consortia to purchase advanced energy-saving industrial equipment.**

Transportation

- **Parking reform** that gives a worker the option to take the cash value of employer-paid parking as an incentive to reduce solo-commuting -- and to generate revenues (the "cash-out" accepted in lieu of parking benefit is taxable income).
- **One-year transportation strategy.** OEP/NEC/OSTP will lead a team to identify an implement regulatory or non-regulatory means to reduce greenhouse gas emissions from transportation -- the fastest growing sector.

Electric Utilities

- **Voluntary commitments from utilities** to reduce greenhouse gases. DOE has received letters of intent to negotiate limits on greenhouse gas emissions from about 60 utilities, representing over 60 percent of generation and CO₂ emissions from this sector.
- Expand **Integrated Resource Planning** assistance for state utility regulators to improve performance of utility conservation programs and renewable energy development.
- Electric **transformer standards** to increase transmission efficiency.

Methane and other Gases

- Aggressive **landfill methane capture rule** from EPA to limit methane emissions from landfills and to encourage capture for energy use.
- Expanded **Natural Gas Star** program at EPA to reduce methane leaks from natural gas pipeline distribution systems.
- **Voluntary agreements and partnerships with HFC and aluminum producers** to encourage state of the art process equipment to reduce potent greenhouse gas emissions from manufacturing operations.

Forestry Actions

- Expand USDA technical assistance to small landowners for **better forest management**, which increases carbon storage in standing forests.
- Expand EPA/USDA **recycling programs** that help reduce the demand for virgin timber for paper and pulp.

International

- **Joint Implementation pilot program.** Joint Implementation is undertaking emission reduction projects overseas, and will be a large part of many countries' plans in the future. However, the international framework needs further development. The President's pilot program will help build experience and advance international framework. The plan meets the 2000 target with domestic actions.

Monitoring and Assessment

- The Action Plan includes provisions for ongoing monitoring, evaluation, and possible revision if emissions trends indicate that more needs to be done to achieve the goal of returning emissions to 1990 levels. The plan also establishes White House chaired interagency task forces to develop long term climate change strategy, including emissions from transportation sector.

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STAKEHOLDER SUPPORT

Business Support

- Expect broad business support because of the flexibility inherent in the partnership and technical assistance programs. Many business interests stand to benefit from the plan -- e.g. firms who manufacture energy efficient products, methane capture equipment, building trades.
- The electric utility industry, aluminum and chemical industries have indicated a willingness to negotiate voluntary reductions in greenhouse gases.
- No industry, sector, fuel, or technology has been singled out to carry a heavy burden of emission reduction. The plan is fair to American business and workers.

Congressional Support

- Many Members of Congress who are concerned about climate change or energy efficiency have indicated support for the Action Plan. It expands some popular EPA programs and breathes some life into the Energy Policy Act of 1992, which received wide support. Forestry measures have wide support on the Hill, and we are moving the joint implementation agenda forward, which also has much Congressional support.

Environmental Community

- Environmental groups should support the Plan because it proposes to expand programs that they have long supported and because the Plan represents a serious step toward greenhouse gas emission reductions.

International

- The U.S. will regain leadership on climate change by proposing a detailed plan that takes direct aim at returning U.S. greenhouse gas emissions to 1990 levels by the year 2000.
- Including control measures for HFCs sends a strong international signal for other countries to follow suit.
- Pilot program on joint implementation will signal support for the concept of international mitigation strategies, while strict rules and criteria proposed will alleviate concerns regarding exaggerated emission reduction claims.

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State of Scientific Understanding of Climate Change

J. D. Mahlman, D. Albritton, and R. T. Watson

This brief summary is largely based on the IPCC scientific assessments and summarizes our views of what already is known and what remains uncertain concerning the greenhouse warming issue.

What Scientists Understand Very Well

- * The atmospheric abundances of greenhouse gases (carbon dioxide, methane, nitrous oxide, and halocarbons) are increasing due to human activities.
- * Greenhouse gases absorb infrared radiation, altering the atmospheric radiative balance.
- * Greenhouse gases affect the Earth's climate for centuries because of their very long residence times and the associated time response of the climate system.
- * Changes in other substances partially offset the impact of greenhouse gases (stratospheric ozone depletion and increases in sulfate aerosols and carbonaceous soot).
- * Natural climate variability makes it difficult to detect an enhanced greenhouse warming.
- * Global surface temperatures have increased (0.3 to 0.6°C) over the past century.
- * Global surface temperatures were anomalously high in the late 1980s, 1990 and 1991.
- * No inconsistency is found between surface, radiosonde and satellite observations of temperature trends during the 1980's.
- * Substantial reduction of key uncertainties (detailed quantification of the timing, magnitude and regional patterns of climate change) needs a decade or more.
- * The stratosphere is expected to cool significantly because of increases in carbon dioxide and decreases in stratospheric ozone.

What Scientists Understand Reasonably Well

- * Observed global temperature changes are not inconsistent with model predictions especially if allowance is made for the cooling effect due to anthropogenic aerosols and stratospheric ozone depletion. Natural climate variability could be the cause of the observed temperature increase, alternatively, natural variability could have masked an even larger human-induced increase.
- * Doubled carbon dioxide abundances are predicted to increase temperatures by 1.5 to 4.5 °C.
- * Significant warming is expected by the mid-21st century (1-5 °C), assuming that the global emissions of greenhouse gases continue at the levels of the central IPCC scenarios.
- * Sea level is expected to rise for many centuries (4-12 inches by the middle of the next century)
- * Greater warming is likely in the northern polar winter.
- * Reductions in northern, but not southern, sea ice are expected.
- * Global mean precipitation will increase: changes in regional distribution are less certain.
- * Climate change will impact ecological and socio-economic systems. Changes in temperature, precipitation and soil moisture will affect water availability, agricultural productivity, and will alter the productivity and boundaries of natural terrestrial ecosystems.

What Greenhouse Predictions are Less Certain

- * The prediction of mid-continental summer dryness.
- * The prediction that ocean overturning will diminish.

The Most Serious Uncertainties that Need to be Resolved

- * Future atmospheric abundances of carbon dioxide.
- * Cloud-radiation feedbacks.
- * Regional-scale predictions of climate change.
- * Changes in the frequency and intensity of tropical storms.

Clinton Presidential Records Digital Records Marker

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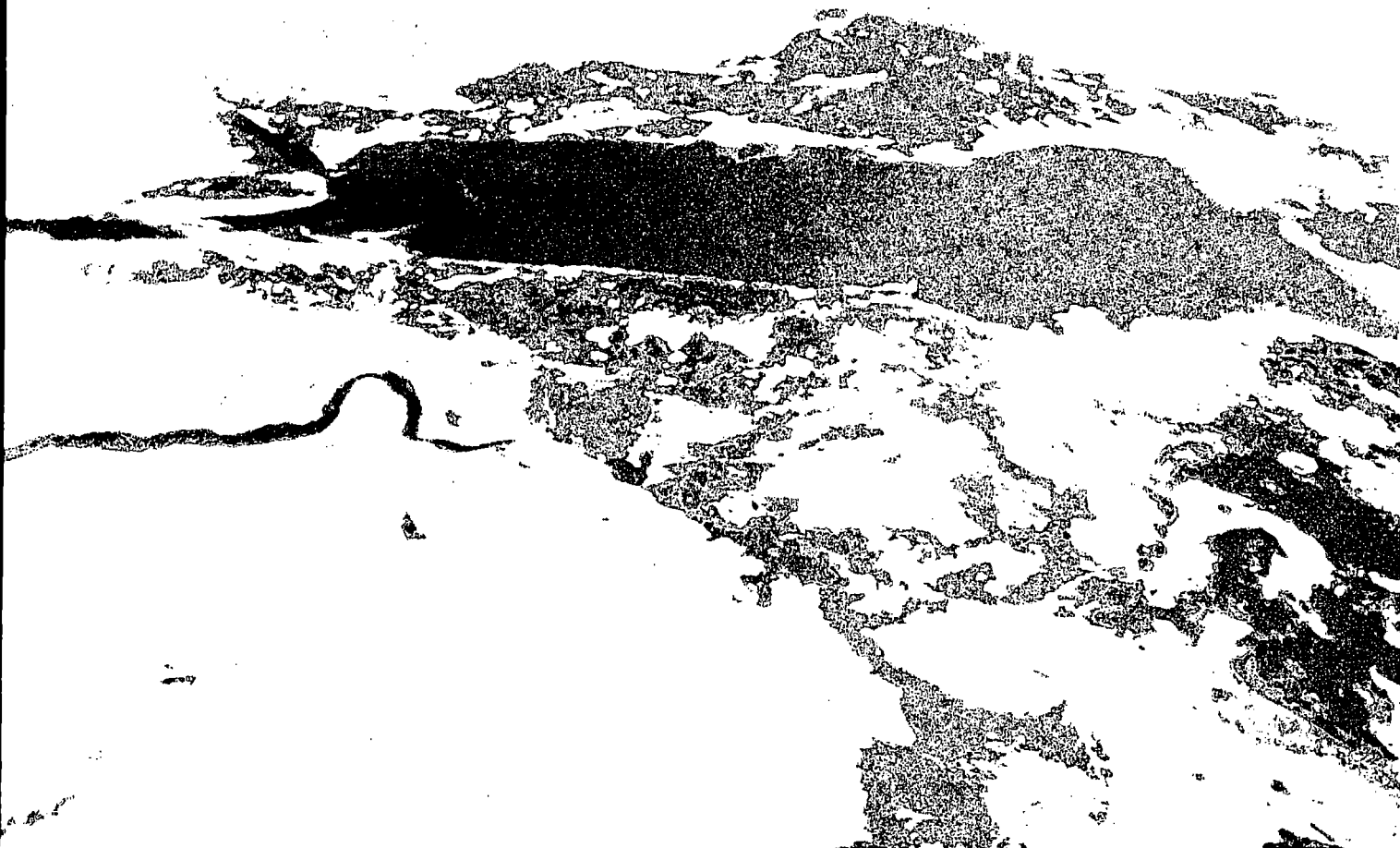
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THE CLIMATE CHANGE ACTION PLAN

President William J. Clinton
Vice President Albert Gore, Jr.

October 1993



07/27/93

KEY POINTS ON VOLUNTARY CLIMATE COMPACT PROGRAM

Climate Compacts: Electric utilities and DOE will sign letters of intent to enter into voluntary Climate Compacts under which utilities will:

- (1) (A) Reduce greenhouse gas (GHG) emissions to 1990 levels of by the year 2000; or
(B) Meet alternative requirements for emission reduction if unable to stabilize emissions because of special circumstances;
- (2) Establish and submit a historic baseline pursuant to section 1605 of EPACT; and
- (3) Submit periodic greenhouse gas reduction reports.

Compacts will be finalized once accounting rules under section 1605 are finalized (Spring, 1994).

Post 2000: Participants in voluntary Climate Compact program are not asked to agree to cap their post 2000 emissions, but are asked to maintain levels of investment after 2000.

Verification: DOE will accredit independent verification organizations (IVOs) which have the technical capability to verify reductions and which are not controlled by the sources seeking credit for GHG reductions. Such organizations may provide a mechanism for making contractual commitments for future GHG reductions.

Joint Implementation: A company may receive credit under a Climate Compact for its GHG reductions outside the U.S. The ground rules for crediting these reductions will be finalized before compacts are signed in Spring, 1994, and will be consistent with U.S. negotiating position taken in international fora.

Sinks: Verifiable creation and enhancement of sinks (both within and without the U.S.) will be allowed in Climate Compacts, but must conform to 1605 and joint implementation rules.

Relationship to Potential Future Reduction Mandates: The compact will provide assurance that credited voluntary reductions will continue to be recognized by the Administration in future policies and programs, and that, in Clinton Administration policy development in the future, the same historic (87-90) baseline would be used as a benchmark for measuring program effectiveness.

Pooling, Banking, and Trading: Trading of GHG emission reductions, banking of excess emission reductions, and multi-company GHG reduction pooling arrangements will be accommodated under the Climate Contracts.

Accounting: Accounting methodology to "score" reductions and deal with potential "double-counting" will be developed in guidelines under section 1605.

Electrotechnologies: Appropriate credit will be given to participants in electrotechnology programs, providing that direct fuel displacement can be adequately verified.

July 28, 1993

MEMORANDUM FOR MARC CHUPKA, OFFICE OF ENVIRONMENTAL POLICY

FROM: ALICIA MUNNELL *am*
Assistant Secretary for Economic Policy
Department of the Treasury

SUBJECT: Additional Climate Change Options

You and Abe Haspel have accomplished a great deal since the last round of analysis of the options. We are moving toward a list of options that will fulfill the President's pledge to protect the atmosphere in a cost-effective manner.

Treasury would like to see more attention to total social costs, rather than simply Federal budget costs. Even though total social cost is difficult to measure, it is the correct measure of resources used, and the one we should be focusing on.

Further, Treasury would like to see the following options added to the list under consideration.

Sinks

We will not fulfill the President's pledge of a cost effective program if sinks and joint implementation are excluded. Treasury would like to see USDA's "Low Cost" set of options added to the list under discussion, in particular:

Reduce timber harvest on NFS lands
Stimulate tree planting on private lands
Reduce timber stand depletion
Promote accelerated recycling

Joint implementation

Treasury believes the Action Plan should clearly endorse Joint Implementation, even if details of administration and monitoring are left to be worked out later.

Demand

1. Remove rural electrification subsidies.
2. Remove subsidies for federal Power Marketing Authorities (PMAs).

Transport

1. Pay at the pump insurance. The DOE table evidently contains a California-only program. We believe pay-at-the-pump is likely to be a winner on both environmental and economic grounds--although not without political difficulties--and that a national program should be included in the set of options under consideration.

2. Elimination of State Feebate Preemption.

3. Modifications to CAFE. All the evidence we have seen indicates that CAFE standards are not an efficient way to achieve carbon reductions. We believe alternatives to CAFE, such as tradable CAFE credits, should be pursued.



EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

MEMBER

July 28, 1993

MEMORANDUM FOR MARC CHUPKA
OFFICE OF ENVIRONMENTAL POLICY

FROM: ALAN S. BLINDER *AB*
SUBJECT: Additional Climate Change Options

Thank you for the opportunity to suggest additions to the list of options distributed for discussion at yesterday's meeting. You and the DOE policy office have done a nice job of analyzing the options under severe time pressure.

CEA suggests, first, that more attention be given to the **total social cost** of the options, rather than to government budget expenditures only. We now claim that every option on the DOE list will have zero or negative total costs. While there is some chance this claim is correct, it is sharply at variance with what many believe, and may undermine the credibility of the effort. At the very least, we must be prepared to justify our estimates of zero or negative costs, option by option.

CEA also suggests the following options be added to the list for consideration by the principals. We believe these options may be cost-effective; many offer other desirable attributes as well.

Demand

Remove rural electrification subsidies. These programs have outlasted their original purpose. They drain the federal till, inequitably cross-subsidize rural and suburban consumers, and encourage overconsumption of electricity.

Remove subsidies for federal Power Marketing Authorities (PMAs). The same reasoning applies.

An alternative to both options above would be to "cash out" the subsidies, offering a payment equivalent to the present subsidies, which would then decline over time.

ID11 **Incentives for fuel switching and co-firing.** This option would, among other things, allow NOx trading and banking, and eliminate the confiscation of shutdown credits.

Transport

ATXa **Pay at the pump insurance**, nationwide program. We believe this is the most attractive of the transport options, as it addresses several issues at once, without creating perverse incentives. If a nationwide program is infeasible, then a group of states (perhaps NESCOM) might be offered SIP credits to implement such a program.

T15 **Elimination of State Feebate Preemption.**
Correct loopholes in Federal Gas Guzzler rules. This may require a change in the way the current rules are interpreted by Treasury.

Modifications to CAFE. Tradable CAFE credits are one option that could allow companies to achieve the goals of CAFE while providing the incentive for greater fuel efficiency and reducing compliance costs. CEA believes that the CCMG should not propose increasing CAFE standards, as this would result in particularly high costs per unit of CO2 reduction.

Sinks and Joint Implementation. CEA strongly believes that the Climate Change Action plan must fulfill the President's pledge to formulate a "cost-effective program." Much evidence points to the cost effectiveness both of carbon sequestration (sinks), and of joint implementation. It is clearly net, not gross, emissions that matter. We believe that the plan must reiterate the President's pledge of cost-effective actions by a clear commitment both to sinks and to joint implementation, even if details of administration, monitoring, etc., remain to be worked out.

Sinks

We believe that several of the options presented by the Department of Agriculture should be added to the list, as they appear to offer significant carbon sequestration potential at relatively low cost. In particular, we suggest adding the "Low Cost" set of options from the USDA table:

SK1	Reduce timber harvest on NFS lands
SK2a	Stimulate tree planting on private lands
SK7a	Reduce timber stand depletion
SK3	Promote accelerated recycling

Joint implementation

- JII1 **Allow JI as an offset to domestic carbon tax.** While we are not likely to see a carbon tax in the short-term, allowing JI to offset a carbon tax would clearly signal the U.S. commitment to the concept.
- JII1 **Allow JI as insurance/banking against future restrictions.** Early reductions achieved in this way would provide a bonus to the atmosphere.

Other Options

CEA would like to see the following options analyzed for comparison with options now under consideration.

Emissions caps, with trading. A trading program should cover all sources and sinks, not just electric utilities, as some have suggested.

Mandatory emissions reporting. Section 1605 of the Energy Policy Act provides for voluntary reporting of greenhouse gas emissions. An extension could require companies to report their emissions, as the first step to allowing credits against future restrictions.

Energy Supply Working Group:

Eliminate Below Market Rate Loans through Rural Electrification Administration Credits

Description: The Rural Electrification Administration (REA) was established in the late 1930's to help provide electricity to rural areas where costs were high and service density was low. Residents of rural areas were invited to form electrification cooperatives (distribution cooperatives), owned by their members, and offered the opportunity to buy low-cost bulk power from newly built Federal dams. The distribution cooperatives were also offered long-term loans at a 2% interest rate. This rate approximated the market rate for long-term Government debt at the inception of the program, but as inflation and interest rates rose during and after World War II, it gradually came to incorporate a growing subsidy element. In 1973, the interest rate for new loans was raised to 5%, where it has remained.

Generation and transmission cooperatives receive loan guarantees from REA, with the actual loan provided by another U.S. Government agency, the Federal Financing Bank, at an interest rate which approximates the current 30-year U.S. Government bond rate.

REA thus provides subsidies through the issuance of below market-rate loans and the provision of loan guarantees. At the end of 1990, there were \$43 billion outstanding loans and guarantees.

Below market rate for capital spur excessive investment in supply options and keep prices below economically efficient levels, thus spurring an over consumption of electricity and construction of additional fossil-fired capacity to meet excessive demand.

Implementation: Legislative and administrative changes to ensure market rates for loans and loan guarantees.

Emissions Reduction: Not yet quantified. Likely to be medium.

Cost: Elimination of this subsidy will reduce government spending roughly \$1.2 billion. Since the removal of a subsidy will ultimately improve economic performance, there are little or no social costs associated with this option. There may be adjustment costs while the subsidy is being phased-out.

Cost Effectiveness: No cost in dollars per tonne of CO₂ reduced.

Stakeholders: REA and cooperative utilities will oppose. Environmental and energy efficiency advocates will favor.

Status of Agency Analysis: Analysis currently underway. Will be completed within three weeks.

Staff Contacts: Michael Shelby, EPA/OPPE, 260-5492 (voice), 260-0512 (fax).

ENERGY SUPPLY WORKING GROUP

ELIMINATE SUBSIDIES ON RURAL ELECTRIFICATION ADMINISTRATION LOANS
TO ELECTRIC UTILITIES

DESCRIPTION - The Rural Electrification Administration (REA) is a credit agency of the U.S. Department of Agriculture. Among its programs are loans to electric utilities serving in rural America. It was established in the 1930s when most of the rural areas did not have power because of low service density and high costs. Loans were made at interest rates that fluctuated with the cost of money to the Government. In 1944, Congress established a fixed interest rate of 2 percent, which then was about the cost of money. This rate remained in effect until the early 70s, even though the Government's cost of borrowing increased over the years. In 1973, the rate was increased to 5 percent, with a special provision for lower rates for borrowers meeting certain criteria. Again, the 5 percent rate approximated the then cost of borrowing by the Government. Interest costs to the Government have of course increased since then, resulting in a growing subsidy element.

The President's Budget for Fiscal Year 1994 proposed eliminating this subsidy by increasing REA loan interest rates to Treasury borrowing costs. A small amount of 5 percent loans would still be made to hardship borrowers. The estimated savings to the Government is \$374 million over four years.

IMPLEMENTATION - Legislative changes to provide for the proposals contained in the President's Budget.

CURRENT STATUS - Both the House and Senate Reconciliation Bills contain language that largely accomplish the President's proposals. In addition, the Bills contain authorization for REA to provide funding for demand-side management.

EMISSIONS REDUCTION - Not yet quantified. Likely to be minimum.

COST EFFECTIVENESS - No cost in dollars per ton of CO₂ reduced.

STAKEHOLDERS - There appears to be no opposition to this proposal by any of the major stakeholders.

STAFF CONTACT - Tom Scanlon, REA, Tel. 720-1946, Fax 720-1915

Supply Group
ES - 21-a
7/2/93

Energy Supply Working Group:

Reform Subsidized Pricing of Federal Power

Description: Publicly owned utilities get access to Federal power from Power Marketing Agencies (PMA) at a price that is typically lower than the fully amortized cost or of alternative supplies. Total sales of PMA account for approximately 10% of national electricity generation.

The lower cost and price encourage energy consumption and the addition of fossil-fired generation capacity.

Implementation: Price federal power competitively. Administrative action by DOE may be enough to reform PMA's pricing policies. Or, change Congressional mandate, which currently sets PMA electricity "at the lowest possible rate," to "a rate equal to the lowest priced alternative."

Emissions Reduction: Medium to large.

Cost: Federal government would save \$1.8 billion in subsidies to PMAs. Since the removal of a subsidy will ultimately improve economic performance, there are little or no social costs associated with this option. There may be adjustment costs while the subsidy is being phased-out.

Cost Effectiveness: Low- or no-cost in dollars per tonne of CO₂ offset.

Stakeholders: Public power will oppose. Environmental and energy efficiency advocates will favor.

Status of Agency Analysis: Analysis currently underway. Will be completed within three weeks.

Staff Contacts: Michael Shelby, EPA/OPPE, 260-5492 (voice), 260-0512 (fax).

7/12/93

Title: The Greening of Hoover Dam -- Adopt Green Prices for Federal Power -- Eliminate Some or All Current Subsidies. This is a hybrid option involving both Energy Supply and Energy Demand.

Background:

- o The Federal government generates 7 percent of the electricity produced in this country at 125 Federal dams. DOE sells this power through five power marketing administrations (PMAs) -- Bonneville, Western, Southwestern, Southeastern and Alaska.
- o At issue is the price at which the power is sold. Current law requires prices be set to fully recover costs. The PMAs claim they comply with the law. Studies by GAO and OMB contest the claim, asserting the PMAs set prices based on practices not standard in the power industry and designed to keep prices low for current customers.
- o The Energy Information Administration, in a recent study mandated by Congress, concluded the following: The PMAs sell power worth \$4.5 billion per year; that's its value if it were sold competitively. The power costs \$4.6 billion to produce. The PMAs sell this power for \$2.7 billion per year. Using EIA estimates to bound the discussion, the Federal government subsidizes PMA power some \$1.8 billion per year.

Options include the following:

- a. Make no change in current policy.
- b. Phase out all pricing subsidies over ten years.
- c. Raise prices for PMA power sold to *Federal* entities (e.g. national labs).
- d. An environmental group is litigating pricing policy for power produced at one WAPA dam. Review that litigation in light of its environmental and fiscal implications.
- e. Create a new entity, a "Federal Independent Power Producer," selling power from one dam at market prices. This would be a pilot project to reinvent how we sell federal power, emphasizing fiscal and environmental responsibility.
- f. Support modest (\$200 million per year) pricing reform for Bonneville in the President's budget.
- g. Devise a mechanism to give current stakeholders the option to trade away cheap power voluntarily, creating a "win-win" solution to the PMA pricing log-jam.

Note: Measures are available to reduce political risks on this issue. E.g., the proposal leaves TVA untouched. It does the same for Bonneville (except for option f above). Changes can be slowly phased in over time (option b). We can start with a low profile (options c, d, and e). Increased receipts in the budget can be dedicated, in part, to pay for aid to the truly needy now getting subsidized power or for environmental concerns, the homeless, or other meritorious purposes.

Implementation: DOE advises Secretary O'Leary has discretionary authority to change PMA prices administratively (need legal citation). This should be examined. As a practical matter, for any major change, legislation would likely be needed. Committees: Senate Energy and House Interior. Effect on the budget would be positive, up to \$1.8 billion per year when fully implemented. Ten year subsidy phase out would yield \$1.8 billion in increased receipts over five years.

Greenhouse gas reduction: To be determined. Energy conservation from price increases on some 7 percent of the country's electricity would reduce or postpone the need for new power generating capacity. This might be partially offset if PMA power were cheap for new buyers.

Estimated cost: PMA prices would increase \$1.8 billion per year for current customers. They would fall for customers for whom PMA power at market prices was a good deal. There would be a benefit rather than a cost to the Federal government.

Cost-effectiveness: To be determined but likely to be quite favorable.

Stakeholders: In favor: Environmentalists and others in favor of energy efficiency. Parties (and their representatives in Congress) now denied access to cheap Federal power whose power bills would fall with this change. Advocates of reducing the budget deficit. Members of Congress looking for revenue sources. Opposed: American Public Power. National Rural Electric Cooperative Association. Aluminum manufacturers and Las Vegas casinos. Consumers and businesses whose utilities now have access to Federal power.

Status of analysis: EIA analysis is a useful start. Next steps: Agree on suboptions worth pursuing. Assess ongoing litigation, for example, the Energy Secretary's administrative discretion for setting PMA prices, the termination date for current PMA sales contracts and GHG emission reductions.

Staff contacts: Jim Mietus (OMB/395-3183, 395-3165); Bill Palmer (OMB/395-3811, 395-3165)

6/19/93 Discussion Draft

July 14, 1993
 3:00 PM
 Adam Klinger
 233-9122, 9584(fax)

Low
Implementation

High
Implementation

Description:

Make regulation more flexible to allow for greater use of natural gas at industrial facilities:

- Extend the WEPCO exemption to all stationary sources.
- Allow the use of seasonal gas to meet RACT requirements.

Low
 Seasonal gas use for
 RACT pursued only
 in NESCAUM.

High
 Seasonal gas use
 pursued nationwide.

Energy Reductions

- in 2000	.02 Quad	.093 Quad
- in 2010	.021 Quad	.104 Quad

**Emissions Reduction
From Base(mmtc-e)**

- in 2000	0.37 MMT	1.7 MMT
- in 2010	0.39 MMT	1.9 MMT

Compliance Cost

- | | |
|--|----------|
| - Life cycle private costs | Negative |
| - Initial private investment cost (cumulative) | n/a |

Federal Budget Cost: Costs relate to regulatory development and are the same for both levels of implementation.

- FY'94	\$0.85 Million	\$0.85 Million
- FY'95	\$0.85 Million	\$0.85 Million
- FY'96	\$0.31 Million	\$0.31 Million
- FY 2000(cumulative)	\$2.01 Million	\$2.01 Million

Cost-Effectiveness

\$0/MTCe

\$0/MTCe

**Interaction with
Other Options:**

- Penetration of fuel switching, even allowing for additional regulatory flexibility will depend upon a number of factors, many of which are being affected by other policy options:
- price of natural gas affected by cumulative demand for natural gas.
 - development and deployment of other technologies (e.g. clean coal technology) may reduce the competitiveness of lower carbon fuels.

ASSUMPTIONS USED IN IAT FORMAT

Description

These options focus on removing regulatory disincentives for fuel switching at industrial facilities. The focus would be the substitution of natural gas for current coal usage. Natural gas combustion emits 45% less carbon dioxide than does coal. Increasing regulatory flexibility with regards to fuel switching would require policy action by the EPA.

Currently, a facility that switches fuels may be subject to New Source Review (NSR) and the application of appropriate control technology. The NSR provisions were designed to prevent new air pollution problems by regulating newly-constructed sources and changes occurring at existing sources that result in emissions increases. There has been a great deal of debate about what constitutes a change or modification and what before and after comparison should be used to establish whether emissions will increase as a result of the modification.

For electric utilities, recent guidance has been issued by the EPA (6/21/92) that adopts a broad NSR exclusion for utility pollution control projects (the WEPCO exemption). This policy also adopts a methodology for utility modifications that compares actual emissions to future actual emissions (rather than to future potential emissions) for determining whether all other nonroutine physical or operational changes at utilities are subject to NSR. Together, these positions grant utilities a flexibility to pursue control measures and fuel switching. Industrial sources are requesting similar treatment regarding modifications to their facilities and the applicability of New Source Review.

The Agency currently considers fuel switching modifications from industrial facilities on a case by case basis. For example, facilities owned and operated by General Motors recently received (4/6/93) clearance from the EPA that a proposed fuel switch from coal/oil to gas would not be considered a major modification under NSR. Such clearance was contingent upon the demonstration that the utilization rate of the boilers would not be affected by the proposed fuel switch. The Agency is concerned that utilization at facilities will increase following a fuel switch and would result in an increase in emissions (for natural gas, carbon monoxide emissions are of particular concern). The Agency is currently reviewing the regulations implementing New Source Review.

Industrial sources are also subject to the Title I provisions of the Clean Air Act that implements the health based ambient air quality standards (NAAQS). Sources in areas that have not met these standards (non-attainment areas) must comply with additional control provisions that depend on the severity of the area's non-attainment. For ozone non-attainment areas, including most large cities and the entire Northeast corridor, title I requires EPA to set prescriptive technological requirements (reasonably available control technology or RACT) to control NO_x emission rates for boilers. States must adopt these RACT requirements or more stringent standards unless they can prove that RACT is unachievable at reasonable cost.

EPA seeks to encourage the adoption of incentive based, innovative programs that will assist States in meeting air quality goals through flexible approaches. In February, 1993, EPA proposed an Economic Incentive Program guidance to help structure such approaches. States may use emissions caps and annual emissions averaging that yield reductions in emissions at least equivalent to those which would result from unit-by-unit compliance with the traditional RACT limit for that source category. The summer seasonal use of natural gas appears to be one such alternative approach.

Seasonal gas use in a coal boiler will significantly reduce nitrogen oxide (NO_x) emissions in the ozone season while lowering annual emissions on NO_x and CO₂. In addition, the reduction of NO_x could provide credits for facilities to use in the context of state trading programs. There has been some debate on the winter NO_x emissions allowed under a policy for seasonal gas use. If an annual equivalence of NO_x emissions is to be the standard, then conceivably winter NO_x emissions could increase relative to the status quo, when summer emissions are brought down significantly. Another interpretation of this policy would allow summer gas use, compare annual emissions, but not allow winter emissions to increase.

Emission Reductions

High Case

There do not appear to be any existing estimates of fuel switching potential in the industrial sector and the resultant savings in carbon emissions. The following estimates should help provide orders of magnitude of savings from these policies. Carbon savings from each individual regulatory action have not been separated.

According to the IDEAS output from 6/25/93, a complete substitution of natural gas for steam coal (i.e. coal used in energy rather than feedstock uses) would result in a savings of 19.5 million metric tons of carbon by 2000 and 20.9 million metric tons of carbon by 2010. This figure is, of course, an upper limit. Because little information is available on the stock of industrial boilers burning coal, their installed pollution control equipment, their accessibility to natural gas or their ability to accommodate gas, industrial fuel switching was calculated in relation to fuel switching in the electric utility industry, about which more is known. Whether these numbers are legitimate depend upon how well the stock of electric utility boilers and their access to gas reflects industrial boilers. More analysis is needed in this area.

An analysis performed by the Gas-Based NO_x Control Information Center estimated gas accessible capacity in the U.S. to be approximately 129.5 gigawatts. This number is compared to both total coal-fired capacity and total coal-fired capacity without scrubbers. Facilities that already have scrubbers installed would be unlikely to switch to gas, although some have suggested that such switches might be attractive after 1995 (post RACT). The percentage of plants that are gas capable, therefore ranges between 36.1 and 44.8%, depending upon whether industrial facilities installed scrubbers to the same extent as utility units. Applying these percentages to the total carbon savings expected in 2000 gives a range between 7.0 and 8.7 million metric tons. Applying these percentages to the total carbon savings expected in 2010 gives a range of 7.5 and 9.4 million metric tons.

Fuel switching would be voluntary and it is not clear that all those that could switch would switch, even if these regulatory changes were made. Suppose 20 percent of these gas capable industrial plants switch from coal to gas, then we might expect to save between 1.4 and 1.7 million metric tons in 2000, and between 1.5 and 1.9 million metric tons in 2010.

In considering the New England NESCAUM region separately for the low case (see below), I found a much higher percentage of gas capable coal plants than in the country as a whole (85.5% vs. 36.1%). In addition, because of the more stringent NO_x limits in this region, one might expect a higher percentage of switches. I, therefore, separated this region from the rest of the country using the proportion of industrial steam coal in these states (4.4%) vs. the industrial steam coal used in the rest of the country (95.6%). I then applied the above assumptions to the rest of the country and applied an 85.5% capable rate and a 50% expectation of switching to New England. Together, these assumptions give a range for the whole country between 1.7 and 2.0 million metric ton for 2000 and between 1.8 and 2.2 million metric tons in 2010.

Comparing these two estimates, I've selected 1.7 million metric tons saved in 2000 and 1.9 million metric tons saved in 2010.

Low Case

For this case, I've assumed that half of those able to switch will switch, but only in the New England NESCAUM region. Using the same methodology as above, this gives a savings of 0.37 MMT in 2000 and 0.39 MMT in 2010.

Federal Budget Cost Numbers

FY'94 and FY'95 were assumed to be the timeframe for regulatory development related to extending the WEPCO exemption and providing guidance to the states on acceptable RACT. For these two years, I assumed that 3 FTE's would be working full-time and 4 would be working one-quarter time. I assumed that these FTEs would cost the government \$75,000/yr (salary + benefits). I assumed an

additional one-half FTE for management oversight (representing many managers at many levels). Managers cost a bit more (\$100,000/yr). Finally, I assumed contracting support (development of EIA's and the like) at \$500,000/yr.

(3 FTEs) (\$75,000/yr)	= \$225,000
(4) (1/4 FTEs) (\$75,000/yr)	= \$ 75,000
(1/2 FTE) (\$100,000/yr)	= \$ 50,000
Contracting at \$500,000	= \$500,000

	= \$850,000

For FY'96, I assumed some lingering work on applicability questions. I assumed 2 FTEs, one-eighth of a manager, and \$150,000 in contracting.

(2 FTEs) (\$75,000/yr)	= \$150,000
(1/8 FTE) (\$100,000/yr)	= \$ 12,500
Contracting at \$150,000	= \$150,000

	= \$312,500

Cost Effectiveness

Cost effectiveness is determined relative to Federal expenditures. As a worst case, assume that all dollars were spent in 2000 or 2010 and that the only carbon savings were those that occurred in 2000 or 2010:

$$(0.85 + 0.85 + 0.31 \text{ million}) = \$2.01 \text{ million}$$

Low Case - 2000: \$2.01 million / 0.37 million metric ton = \$5.43/metric ton
 Low Case - 2010: \$2.01 million / 0.39 million metric ton = \$5.15/metric ton

High Case - 2000: \$2.01 million / 1.7 million metric ton = \$1.18/metric ton
 High Case - 2010: \$2.01 million / 1.9 million metric ton = \$1.06/metric ton

Transportation Working Group
Personal Transport Vehicle Sub-Group

Option Title: END FEDERAL PREEMPTION OF STATE FEEBATE PROGRAMS

Description: Many states have considered implementing fuel economy-based fee/rebate systems to promote fuel efficiency and/or raise revenue. Maryland passed a feebate law in 1992, but did not implement it after being informed by the National Highway Traffic Safety Administration (NHTSA) that it considered the Maryland law preempted by the Motor Vehicle Cost and Savings Act. However, DOT could review this legal finding, perhaps reverse it, or seek legislative clarification to allow such programs. The analysis here assumes that several large states adopt mild feebate programs (about \$100 per vehicle) by 1997, and that this will elicit some consumer, but little manufacturer, response.

Implementation: The Clinton Administration issues a new position on the issue, i.e. that it will not attempt to challenge state feebate laws on the basis of CAFE-law preemption. If necessary, a legislative clarification of the law could be sought.

- o **Statutory Authority:** unclear whether Congressional Directive required
- o **Required Regulatory or Other Actions:** Reverse previous administration's position on preemption
- o **Additional Federal Funding:** none

Estimated Reduction from Greenhouse Gas Emission Baseline:

- o **0-1 MMTc in 2000 (0 - 25 MB/D)**
- o **1-5 MMTc in 2010 (25 - 125 MB/D)**

Public and Private Costs: vehicle manufacturers: revenue losses for manufacturers from decreased sales of "high profit" larger, lower fuel economy cars; for all manufacturers and consumers: increased costs for fuel economy technology and lost vehicle attributes. Assuming an average net cost of \$100 per vehicle and 5 million affected vehicles sold in 2000, costs of fuel economy improvement are 500 million dollars minus net present value of fuel savings to consumers.

Cost-Effectiveness: NA

Affected Stakeholders: Conservation community will be strongly in favor, auto industry will be against.

Status of Analysis: LBL feebate analysis will include analysis of Maryland proposal (demand-side response only); will be available week of 6/28; full equilibrium impact estimates required from IDEAS model.

Staff Contacts:

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UPDATED POLICY DESCRIPTIONS

ENERGY SUPPLY OPTIONS STILL UNDER CONSIDERATION

30
JULY ~~29~~, 1993

FERC Regulatory Reform

Strategic Policy: *Facilitate fuel substitution from high greenhouse gas emitting fuels, such as coal and oil, to natural gas, a lower emitting fuel.*

Supply Option: Reform FERC policies on gas transportation.

Description: Natural gas is a cost-effective substitute for coal and oil in many applications. The main impediment to natural gas use has been regulatory barriers that make it difficult to use gas even when it might otherwise be the cheapest energy option. Much progress has been made in the last decade in removing regulatory impediments to gas use (i.e., third party access to pipeline facilities, wellhead competition, and rate design reform). Gas use has increased about 33% between 1986 (15 quads) and 1991 (20 quads), largely resulting from reforms that allowed options to use natural gas.

The Federal Energy Regulatory Commission (FERC) regulates natural gas pipelines. Additional regulatory reform by FERC to reduce impediments would result in increased opportunities to use natural gas. This option would encourage the FERC to adopt regulatory policies that permit more flexible use of existing natural gas pipeline facilities, lower the cost of using these facilities, or permit the construction of new facilities on an expedited basis. This option would include actions such as ensuring the development of a robust secondary market for pipeline capacity (to make use of underutilized capacity in off-peak periods), removing impediments to the construction of new pipeline capacity, and improving pipeline pricing incentives to lower costs.

These reform actions would work synergistically with options being proposed by the EPA to increase gas use for environmental compliance (seasonal gas burn and CAAA allowance trading).

Implementation: FERC action under the Natural Gas Act.

Greenhouse Gas Reduction: Preliminary estimate based on the assumption that each additional quad of gas used to displace coal or oil would result in about 10 MMT per year emissions reduction. In combination with seasonal gas use as an enhanced natural gas utilization option, the estimate is between 7.1-9.7 MMT reductions in carbon by the year 2000.

Costs: No net national costs. In fact, there is an economic benefit estimated at \$100 million by the year 2000 by removing impediments to more efficient transactions. No new Federal budget costs in FY94 and decreased costs in the future due to reduced FERC budget.

Cost Effectiveness: Highly cost effective. Net economic benefits and a reduction in emissions.

Staff Contact: Ken Malloy, DOE/Policy, 586-2040, 586-4341 (fax)

FERC Regulatory Reform

Affected Stakeholders/Political Analysis: The three distinct reforms outlined in this option yield different combinations of support and opposition. Removing impediments to the construction of new pipeline capacity will have widespread support among the industry, state regulatory commissions, Congress and consumers. There may be some environmental hesitancy, but an appropriate siting and permitting process at the state level should alleviate that concern. FERC response to this reform is unknown.

Expanding the secondary market for capacity will be supported by the industry, state regulatory commissions (recent NARUC Gas Committee resolution as an example), and consumers. The level of Congressional interest is unknown, since this reform is an expansion of current FERC Order 636 policy. Historically, the FERC has been resistant to a more open secondary market.

Improving pipeline pricing incentives to lower costs includes several techniques. Those that share benefits between pipelines and customers will be supported by most stakeholders. Consumer advocacy groups might be skeptical of any proposal that doesn't flow all benefits through to the customer. Those that share costs between parties will be more controversial. The cost sharing, as in the case of transition costs, could result in a lower cost to the customer, which they and their Congressional representatives will support, and a higher cost to the seller, which they and their Congressional representatives will oppose. FERC response to this reform is unknown.

Modeling the economic impacts of regulatory policy is difficult and can be subjected to Congressional scrutiny if significant interests are affected. Congress was skeptical with the FERC's claimed benefits resulting from Order 636.

Staff Contact: Ken Malloy, DOE/Policy, 586-2040, 586-4341 (fax)

Option: Demonstration and Commercialization of Fuel Cells

Description: Fuel cells are an ultra-high efficiency and environmentally benign method of producing electricity and by-product thermal energy. Their extremely low emissions enable them to be utilized in heavily populated areas as dispersed power generators or cogenerators yet there are market entry hurdles for fuel cells which must be overcome.

Implementation: Co-funding by DOE in consortia with the private sector (likely to involve utilities, GRI, AGA, EPRI, equipment manufacturers, state organizations and other federal agencies) to cause market entry of phosphoric acid fuel cells which have completed the RD&D process. This option would provide for rebates for a portion of the cost of 100 200kw phosphoric acid fuel cells each year during 1995-97. DOE would provide one third of the rebate funds with anticipated payback of funding from royalties on future sales. (This portion of the option is more fully explained in the attached "Market Entry Initiative").

This option also includes a second round of demonstrations for advanced fuel cells such as molten carbonate and solid oxide (total capacity of demo units is 3.5 mw). The second round of demos is also anticipated to cause market entry of the advanced fuel cells. This portion of the option would also be cofunded with the private sector.

Emission Reduction: Less than 1 MMT of carbon in 2000 with annual reductions growing to 17 MMT carbon by 2010. Quantitative analysis is attached.

Cost: The market entry initiative and demonstrations would be jointly funded by DOE, AGA, GRI, EPRI, technology developers, utilities and others. The DOE share would be \$61.5 million during 1995-97. DOE funding for the phosphoric acid market entry initiative would be \$11.5 million in FY 95 and \$15 million in each of FY 96 and 97. DOE's cost for demonstrations of molten carbonate and solid oxide would total \$20 million during FY 95-97.

The funding for this option is consistent with a continuation of DOE's on-going program of research, development, demonstration and commercialization of fuel cells.

Cost-Effectiveness: Based on the reduction of approximately 70 MMT of carbon between 1995 and 2010, the cost-effectiveness based on the DOE expenditure is approximately \$1/ton removed.

Analysis: Attached. Apparently, this option will be rolled into a broader R&D option.

Staff Contact: Richard Dye, DOE, FE-4, 586-6499, Fax-586-1188

ES-3

7/29

Option: Demonstration and Commercialization of Fuel Cells

Stakeholders: This option would likely be supported by AGA, GRI, EPRI, equipment manufacturers, gas and electric utilities, state organizations and other federal agencies. Commercial and industrial cogenerators would also be highly supportive.

1) Energy Supply: Retain/Improve Hydro Generation at Existing Dams**2) Description**

a. The Federal Energy Regulatory Commission should work with other interested agencies to remove regulatory barriers to low-impact, non-Federal hydroelectric development at existing dams.

b. Remove regulatory barriers to private funding of generation improvements at existing Federal water facilities. The Department of Energy should review all Federal water facilities to identify opportunities to economically improve hydro generation. The Bureau of Reclamation and the Corps of Engineers would conduct feasibility studies as they currently do. Instead of asking Congress for appropriations to make generation improvements they would request bids for the lease of the development rights.

3) Implementation: Action items "a" could be accomplished through improved Commission policies and regulations (18 CFR, Parts 1-399). Action item "b" would be initiated under section 2404 of the Energy Policy Act which requires the Department of Energy to review Federal water facilities. Legislation will be needed to allow private investment in improvements at Federal water facilities.

4) Benefits: Moderate. Estimated carbon emission reduction is approximately 2.5 MMT per year by 2000, resulting from about 3 GW of new hydro capacity. Additional benefits would be achieved by the year 2010. The total potential that is cost-effective and environmentally acceptable has been estimated by workshop participants to be as high as 12 GW. Of the 3 GW, 2.0 GW would come from efficiency upgrades, 0.5 GW would come from expansion at existing plants, and 0.5 GW would come from additional capacity at non-power dams. Approximately 2.5 GW would be at Federal water facilities and the remaining 0.5 GW would be at non-Federal dams.

5) Costs: It would cost approximately \$1.2 million to implement regulatory and policy changes. A review of all Federal water facilities would cost approximately \$2 million. These Federal costs would be incurred in FY 94 and FY 95. Reclamation and the Corps would continue to fund feasibility studies at current projected levels of funding. The non-Federal construction costs for project upgrades and new development at existing dams would be approximately \$500 per kW or approximately \$1.25 billion for 2.5 GW of generating capacity. Assuming a 30 percent capacity factor, power being sold at 4 cents/kWh, and a discount rate of 12 percent the Federal treasury would receive lease payments of approximately \$200 million per year between 1998 and 2000 for a total of \$600 million. Construction and lease costs for the developer would be less than or comparable to other sources of electric power. These costs would be fully recovered by the developer from the sale of the additional electricity generated.

6) Cost Effectiveness: The 2.5 MMT of carbon reductions come at no cost because only cost-effective hydro upgrades and new capacity would be developed. The costs identified in 5) above are one-time costs whereas the benefits will accrue for each of the 50 years or more that a project operates.

7) Status of Agency Analysis/Data: The Department of Energy has several studies which estimate the potential for increased development if regulatory barriers are reduced. Approximately 74 GW of hydroelectric capacity is currently installed at several thousand sites. Much of this capacity is aging. Upgrades of older projects can achieve efficiency improvements of up to 20 percent or more. There are an additional 70,000 dams with no power development. Development at non-power dams is very difficult to estimate because other environmental and economic conditions may preclude development.

8) Staff Contact: Paul Carrier, Dept. of Energy, Phone:(202)586-5659, FAX:(202)586-0328.

Energy Supply: Retain/Improve Hydro Generation at Existing Dams

Political Analysis and Affected Stakeholders: This option supports Clinton's goals to improve the Nation's infrastructure and create jobs. Electric utilities and their unregulated subsidiaries and their customers would benefit from low-cost electricity. Hydro developers would gain from the increased business and jobs. Public utilities that are customers of the Power Marketing Administrations will likely oppose this option because they now have preference to power from Federal hydro projects. Environmental organizations with a strong interest in water resources or fisheries would likely oppose any hydro development even at existing dams where impacts are minimized. The Senate Committee on Energy and Natural Resources will likely support this option. In the House of Representatives Congressman Dingell has in the past opposed reducing the level of regulation of non-Federal hydro projects by the Federal Energy Regulatory Commission. This opposition may be muted by limiting this option to existing dams and the reliance on a collaborative approach to identify the types of projects that will be affected.

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Conversion of Defense Facilities and Equipment for Renewable Energy Project Development

Summary: There are currently 80 military installations slated for closure, representing over 150,000 acres of land that could be made available for renewable energy development. There are thousands of additional acres that could be available from scaled back operations at other bases and DOE facilities, like the Nevada Test Site. Renewable energy proposals are also likely to be prominent in the first round of Technology Reinvestment Project under ARPA's \$472 million program. This effort would complement and if possible leverage these proposals, and the overall defense conversion effort. Under this effort DOE would facilitate the development of solar energy projects on unused portions of military bases and other Federal facilities affected by defense conversion, employing underutilized resources at the sites to prepare them for energy development as they scale back operations or prepare for closure. Using these sites as host locations for renewable energy projects would encourage expanded renewable energy development and accompanying environmental and energy benefits. In addition the activity would reduce the impact of defense reconversion on local economies and lay the foundation for offsetting displaced military activity with a self-sustaining renewable energy industry.

The Nevada Test Site is being assessed for conversion to a solar energy production and manufacturing facility as a result of Congressional mandates in the Defense Authorization Act, and is thus the most well-developed prototype. The scenarios for the Nevada Test Site would involve privately owned solar generating and/or manufacturing facilities at the site and its accompanying facilities in Las Vegas to produce power for sale to utilities in the region and to manufacture renewable energy products for sale domestically and internationally. Power would be transmitted through the Western Area Power Administration's transmission system or other utility's lines.

To foster private development at the NTS the Federal government would provide a package of incentives including free federal land, upgraded transmission and natural gas supply for hybrid applications, and assistance from Nevada Test Site personnel and equipment in site construction and permitting. Additional incentives could include access to Federal financing, loan guarantees, interest buydowns or other support, in particular for technologies like photovoltaics whose deployment at the test site could help foster major improvements in manufacturing and performance that are needed for broader competitiveness.

Use of the site would be offered to developers on a competitive basis to the best proposals; developers would be responsible for project development, management, power sales and outside financing. Near term projects could be initiated as early as 1996, and would be expected to stimulate additional construction on a phased basis through 2000 and beyond.

	Low Implementation Case	High Implementation Case
(1) Description	See summary. Assumes 1000 MW of commercial installations attracted to site by 2000; additional 1000 MW by 2010.	Same as low implementation case
(2) Emissions reduction (mmtc-e) - 2000 - 2010	0.94 2.0	
(3) Compliance cost (\$M) - 2000 - 2010	no compliance cost; private investment funds expected for for-profit venture	
(4) Federal budget cost (\$M) - FY '94 - FY '95 - FY '96 - FY 2000 (est.)	\$0 \$49 \$49 \$0	
(5) cost-effectiveness (\$/mtc-e) ¹ - 2000 - 2010	\$10.41/MT for initial project \$5.20/MT for later projects	
(6) interaction with other options	2000 results independent of other options; 2010 results likely to be independent.	

¹ Calculated based on total cost/average annual carbon reduction over life of projects.

BIOMASS COFIRING: ZERO-NET CO₂ POWER GENERATION

July 19, 1993

Summary: Options for reducing CO₂ emissions from coal-fired units include fuel switching to natural gas, installing CO₂ scrubbers, repowering to improve efficiency, reducing electric output, and retiring units. Another option involves cofiring coal with biomass, a renewable energy resource. Because they remove CO₂ from the atmosphere during growth, biomass feedstocks can be utilized to offer a zero-net CO₂ power generation technology. Biomass cofiring capacity can be added for \$185/kW - \$400/kW, costs well below the \$1000 - \$1500/kW required for greenfield biomass installations. In terms of its impacts on the cost of electricity, the cofiring alternative is projected to add, at most, 0.2 cents/kWh to the COE of the existing facility, although at biomass fuel prices equal to or below \$0.50/MMBtu the effect is a reduction in COE. By expanding the EPACT production credits to all cofired units regardless of biomass feedstock, cofiring projects result in a reduction in generating costs for biomass fuel prices at or below \$1.55/MMBtu. When the incentives are applied, the incremental COE for cofiring retrofits fueled with \$1.55/MMBtu biomass feedstocks is effectively transferred from the utility, its ratepayers, and its stockholders, to the Federal government. The majority of biomass feedstocks for cofiring will come from wood and forest product industry wastes, silvicultural practices, and urban wood waste. These resources are typically priced in the \$0.50-\$2.00/MMBtu range. Assuming the expanded definition of the EPACT production incentive, it is projected that each coal fired boiler in the United States can be retrofit to provide an average of approximately 10 MW of biomass cofiring. Therefore over 17,000 MW of biomass capacity can be introduced in existing coal-fired utility boilers, displacing nearly 80 million metric tons of CO₂ to supply 20% of the industry's required reduction. Over 1 quad (1 quad = 10¹⁵ Btu) of wood wastes and residues required is currently available, although many of these resources have previously been under-utilized and/or unaccounted; end-use demand and a positive market price will bring these materials to market.

	Low Implementation Case	High Implementation Case
(1) Description	Expand EPACT incentives to all publicly owned cofired units regardless of biomass feedstock. Technical assistance to investor owned utilities.	Expand EPACT incentives to all investor-owned utility cofired units regardless of biomass feedstock.
(2) Emissions reduction (mmtc-e) - 2000 - 2010	4.8 4.8	14.1 14.1
(3) Compliance cost (\$M) - 2000 - 2010	Cost to utilities is offset by 1.5 cent/kWh production incentives.	Cost to utilities is offset by 1.5 cent/kWh production incentives.
(4) Federal budget cost (\$M) ^{2,3} - FY '94 - FY '95 - FY '96 - FY 2000 (est.)	32 \$M 71 \$M 118 \$M 225 \$M	100 \$M 238 \$M 405 \$M 797 \$M
(5) Cost-effectiveness (\$/mmtc-e) ¹ - 2000 - 2010	44 \$/mmtc-e 0 \$/mmtc-e	53 \$/mmtc-e 0 \$/mmtc-e
(6) Interaction with other options		

- 1 Calculated on the basis of total cost/carbon reduction as of given year.
- 2 In 1992, biomass power produced approximately 375 \$M in federal tax revenue and 94 \$M in state tax revenue. By 2000 tax revenue is anticipated to grow to 713 \$M and 78 \$M in federal and state tax revenue, respectively. The cofiring option will account for nearly 25% of these totals.
- 3 Renewables accounted for approximately 50 \$M in FY '92 budget outlays compared to 1.7 \$B for natural gas, 1.1 \$B for coal, 0.9 \$B for nuclear, 1.8 \$B for electricity, and 0.6 \$B for conservation.

SUPPLY/DEMAND WORKING GROUP (Draft, July 29, 1993: 2:00pm)

Option Title: EXPANDED INTEGRATED RESOURCE PLANNING (ES8, SU5, SU2):

Expand Technical and Financial Support to Encourage State Regulatory Commissions, and Public and Private Utilities to take Actions To Reduce Greenhouse Gas Emissions

Description: Through DOE's Integrated Resource Planning Program, informational and technical and financial support would be provided to encourage State Regulatory Commissions, and Public and Private Utilities to take actions to reduce greenhouse gas emissions. The expanded IRP program would focus on areas determined to support good IRP, and would include both supply and demand facets. Areas that may be considered include but are not limited to: (1) removing barriers to increased use of natural gas ³; (2) regulatory changes that encourage utilities to make cost-effective investments in efficiency measures in generation, transmission and distribution of power; (3) regulatory reform to make utility investments in energy efficiency and conservation at least as profitable as supply-side investments (e.g., decoupling utility profits from sales); (4) demand side management (DSM) for electric and natural gas utilities; (5) rate design reform that is economically efficient and consistent with DSM activities (e.g., seasonal marginal cost pricing for gas and electric utilities); (6) cost-effective approaches to incorporation of environmental externalities into utility resource decisions; and (7) least cost Clean Air Act compliance.

Delivery mechanisms would include:

- direct technical assistance
- direct financial assistance
- performing analysis of state experiences and disseminating the results of such experiences
- providing training opportunities and tools for PUCs
- providing support to regulatory proceedings that may include participating in State regulatory proceedings to provide information on good IRP

These delivery mechanisms would expand the scope of, and strengthen the effect of mechanisms already employed in the existing IRP program. In addition, several new delivery mechanisms would be introduced into the existing IRP activity portfolio.

Implementation: This is an administrative option that could be implemented under DOE's current authority. The mission and budget of DOE's IRP program would be expanded. DOE's IRP program would coordinate with the EPA and other Federal agencies in the development and provision of relevant technical and financial assistance to the States.

Benefits: An estimate of the likely carbon reduction impacts is 2 MMT by the year 2000 (1 MMT for activities that aim to remove barriers to increased use of natural gas, and 1.05 MMT for

³

Removing barriers to natural gas use includes the following initiatives:

- providing access to natural gas distribution systems
- efficient retail prices for electricity
- efficient retail prices for natural gas distribution services
- fuel switching to natural gas, when cost effective

expanded demand-side management activities). There will be additional benefits from supply-side efficiencies which are non-quantifiable. In addition to the direct incremental effect of expanded IRP, *this foundation option which serves to facilitate the achievement of another 2 MMTC and 10 Bkwh of utility-induced DSM savings opportunity, driven by specialized utility program elements in GREEN LIGHTS, MOTOR CHALLENGE, etc. Expanded IRP activities will encourage states to take action sooner and realize GHG reductions quicker than would occur otherwise.*

For the expanded demand-side management activities the direct incremental effect of **5.0 Bkwh** deferred electricity has been estimated. These are savings that would be achieved above & beyond the IDEAS Clinton baseline over the time frame 1994 to 2000. It is also incremental to DSM savings already attributed to specialized utility-DSM elements of the GREEN LIGHTS and MOTOR CHALLENGE options, and assumed utility-driven DSM savings arising from the market-pull effects of other proposed GHG options.

It is estimated that the likely DSM savings opportunity (yr 2000) is about 15 Billion Kwh. The expanded IRP option is considered a foundation option. It makes two contributions to the overall DSM savings opportunity of 15 Bkwh:

- it facilitates the capturing of DSM savings through other programs that have specialized utility-DSM elements, such as GREEN LIGHTS Super Ally program element, MOTOR CHALLENGE, and other utility-induced DSM savings that could arise from the market-pull effects of other proposed GHG options
- it has a direct incremental effect of achieving DSM savings above and beyond DSM savings expected to arise from other programs that have induced-DSM effects.

Roughly 65% of the overall DSM savings opportunity would be induced-DSM savings attributed to programs such as GREEN LIGHTS, MOTOR CHALLENGE, and other utility-induced DSM savings that could arise from the market-pull effects of other proposed GHG options. The remaining 35%, or **5 Bkwh** can be attributed to the direct effect of expanded IRP activities on PUCs and utilities.

Likely DSM savings potential (See Mark Friedrick's analysis sheet)		15.0 Bkwh (YEAR 2000)
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DSM savings reportedly attributable to specialized utility-DSM elements from other GHG options	=	4.2 Bkwh (GREEN LIGHTS), and 3.8 Bkwh (MOTOR CHALLENGE)
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Assumed DSM savings arising from the market-pull effects of other proposed GHG options (assumes about 10% of 15 Bkwh)	=	2.0 Bkwh
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Direct incremental effect of expanded IRP activities	=	5.0 Bkwh
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Timeline of DSM savings:				
	1994	1996	1998	2000
IRP impacts (Bkwh)	0	1	3	5

(Divided 50% Industrial DSM, and the remainder equally split between Residential & Commercial)

Costs: The Federal IRP budget under the proposed expanded IRP should increase above the current FY94 request of \$6.8 million by \$3 million in FY94, and \$6 million annually from 1995 to 2000. The cumulative (1994 thru 2000) Federal cost (incremental to a constant level of \$6.8 million) is \$39 million.

Cost Effectiveness: NA

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ES-8 7/30

SUPPLY/DEMAND WORKING GROUP (Draft, July 29, 1993: 2:00pm)

Option Title: EXPANDED INTEGRATED RESOURCE PLANNING (ES8, SU5, SU2):

Expand Technical and Financial Support to Encourage State Regulatory Commissions, and Public and Private Utilities to take Actions To Reduce Greenhouse Gas Emissions

Extended Political Analysis/Affected Stakeholders:

Support: Environmentalists would favor Demand-Side management and marginal cost pricing of electricity (One of the natural gas initiatives). Utilities like DSM as long as they get cost recovery. State regulators generally favor DSM.

Opposition: Opposition should not be great because this proposal deals only with information and technical assistance. Utilities and State regulators in general do not favor marginal cost pricing for electricity. Utilities often oppose marginal cost pricing because they are afraid they will not receive full cost recovery. Large industrial consumers (represented by ELCON) are sensitive to any action that may increase their electricity rates. They oppose DSM activities that result in interclass subsidies (industrial supporting residential customers) or intraclass subsidies (one industrial favored over another). There may be some Congressional resistance to additional appropriations.

Summary: An estimated \$10 billion in combined U. S. private and public research and capital investment expenditures for renewables has brought them to the starting point of commercial availability. Consensus is that increased purchases will initiate significant production cost learning and user confidence resulting in sustainable markets and widespread cost competitiveness. National leadership through a market mobilization challenge would stimulate this final development stage. This challenge issued to American utilities and independent power producers (IPP) calls for forming a collaborative that would accelerate market acceptance of all appropriate renewable technologies and applications and supported by an appropriate market infrastructure. This collaborative has two levels of federal involvement. The first supports a voluntary utility/IPP consortium formed to aggregate near term markets of developed or near-commercial renewable based technology small scale power systems in order to enable the industry to attract capital and achieve production economies of scale. The second level of participation would be to partner with the consortium and states through cost-shared demonstrations to spread the risks of fielding new technologies and new applications not yet cost effective and to share in the evaluation of prototypes and performance of technologies in these initial applications. This support would allow investors to acquire field experience with the technologies--increasing familiarity, testing operability with specific systems and lowering risks. This two part challenge would provide a huge incentive for renewable technology manufacturers enabling them to attract investment capital and achieve production economies of scale resulting in significant and important outcomes. Within four years annual domestic sales will more than quadruple, five times the current number of utilities and IPPs will have working experience and confidence for making future purchases, production capacity will increase and costs will be lowered by 25% to 50%. Cumulative capacity additions will total more than 17,000 by year 2000 --all bringing increases in U. S. jobs and attendant economic benefits and creating a downward trajectory of greenhouse gas emissions.

	Low Implementation Case	High Implementation Case
(1) Description	Federal cost share of purchase consortium for aggregating markets for small cost effective systems. Cost \$5M	Federal cost share of purchase consortium and participating in heavily cost shared demonstration of new technologies and/or applications to induce 12,300 cumulative installed capacity by 2000. collaborat. Cost \$434M over 4 to 6 years.
(2) Emissions reduction (mtc-e) -2000 -2010	0.1 0.75 Supports only small scale photovoltaics and wind; no central station projects.	1.6 6.4 Supports a wide variety of technologies and applications.
(3) Compliance cost (\$M) -2000 -2010	no compliance cost; private cost sharing expected to be \$5M/yr	no compliance cost; private cost sharing expected to be \$372M/yr, varied by technology
(4) Federal budget cost (\$M) -FY '94 -FY '95 -FY '96 -FY '97 -FY '98 -FY '99	\$0 \$5 \$5 \$5	\$72 \$72 \$72 \$72 \$72 \$72
(5) Cost-effectiveness (\$/mtc-e) ¹ -2000 -2010	Average \$2.00/MT over life of assumed projects	Average of \$5.82/MT over all technologies.
(6) interaction with other options	Leveraged by IRP, Fed Gov. purchases, other information options	Leveraged by renewable consortium, information options

¹ Calculated on the basis of total cost/average carbon reduction per year over life of facilities induced by investment.

Energy Supply Working Group

Option: Increase Generation at Existing Nuclear Plants

Description

Nuclear power is one of two major, commercially available baseload electricity generation sources that emit no greenhouse gases. Generation from current nuclear units has the potential to be increased. Expanding the utilization of nuclear units can result in large reductions in greenhouse gas emissions at relatively low cost.

Implementation

The Department of Energy assists utilities in examining areas key to performance improvement at current nuclear plants.

Greenhouse Gas Reductions

By increasing the industry average capacity factor to 75 percent for current plants, approximately 44 billion kilowatt-hours of zero-emission generation can be added annually. This additional generation can result in a large reduction in greenhouse gas emissions (9.2 million metric tons carbon per year can be displaced in 2000 - assuming that the increased nuclear power generation would displace generation at the margin).

Both a Federal program and the continuation of relevant industry programs are necessary for the average capacity factor to reach the 75 percent level. The federal program alone is expected to raise the industry average by two percentage points.

Increasing generation at low-performance nuclear plants not only can increase the industry average capacity factor, but can improve the likelihood that the units will operate until the end of their licenses. This avoidance of premature shutdown is important to validate the base-case.

Relevant Costs

The Federal program is expected to cost \$10 million per year for three years (\$30 million total). For individual plants, increasing generation probably will be cost-neutral or result in savings.

Cost Effectiveness

The Federal program will result in an annual reduction of 3.7 million metric tons carbon at a cost of \$0.82 per metric ton carbon reduced.

Contact

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Energy Supply Working Group

Option: Increase Generation at Existing Nuclear Plants

Affected Stakeholders

The nuclear industry would support this program since it would be conducted in conjunction with its cost reduction program. Public utility commissions would support this program since it potentially would result in lower costs for the ratepayers. Polls have shown that the public supports the use of nuclear power to address greenhouse gas emissions and global warming. Some others may criticize any increased expenditures for nuclear energy.

Contact

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Energy Supply Working Group:
ES-29 — Seasonal Gas Use for NO_x Control

DESCRIPTION: EPA will aggressively promote the summer use of natural gas in utility coal and oil plants as an innovative, low-cost NO_x reduction strategy, which will have the concurrent benefits of reducing ozone-season NO_x emissions and annual CO₂ emissions.

Title I of the Clean Air Act requires the EPA to establish presumptive *reasonably available control technology* (RACT) NO_x emissions rates for boiler categories in ozone nonattainment areas and in the ozone transport region. RACT is "the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." EPA has proposed presumptive RACT standards for six types of coal, oil, and gas boiler technologies. States must adopt the presumptive RACT or more stringent standards unless they can prove that the RACT is unachievable at a reasonable cost. Existing utility boilers must install NO_x RACT by 1995. In addition, in many areas of the country, NO_x controls beyond these initial RACT standards will be necessary to ensure attainment and maintenance of the ozone standard. Implementation of controls capable of meeting "NO_x attainment" standards must be completed as soon as possible, but no later than 1999.

In February 1993, EPA published proposed Economic Incentive Program (EIP) rules. The EIP rules are intended to stimulate the adoption of incentive-based, innovative programs that will assist States in meeting air quality goals through flexible approaches which allow for less costly control strategies and which provide stronger incentives for the development and implementation of innovative emission reduction technologies. The CAA encourages the development of incentive-based strategies, and, in certain cases mandates their use. The EIP rules allow States to use emissions caps and annual emissions averaging that yield reductions in emissions at least equivalent to those which would result from unit-by-unit compliance with the traditional RACT limits for source categories.

EPA will promote EIP strategies that will allow and encourage seasonal gas use. EPA is preparing and planning to release a guidance document describing how states may use an EIP to meet the NO_x RACT requirements. Specifically, the guidance document discusses the summer (i.e., ozone season) use of natural gas in coal boilers. The guidance document requires affected stationary sources using a seasonal gas strategy to meet two requirements: (1) annual emissions of NO_x must be less than or equal to the annual emissions that would result from compliance with presumptive NO_x RACT (or an alternative standard adopted by States into their State Implementation Plans); and, (2) during the ozone season, an affected source must emit at a rate no greater than the presumptive NO_x RACT. Thus, the summer use of natural gas in a coal boiler will *significantly* reduce NO_x emissions in the ozone season while also lowering annual emissions of CO₂. The EIP also allows states to consider emissions averaging among units. Thus, groups of affected sources can combine technological and fuel-switching NO_x reduction strategies to achieve emissions reductions in a least-cost manner with the broadest environmental benefits.

IMPLEMENTATION: Administrative action by EPA to aggressively promote the seasonal use of natural gas wherever economically feasible as a joint NO_x / CO₂ mitigation strategy. Administrative action would be tied to rules and guidance issued in response to NO_x RACT requirements, the Economic Incentive Program, and State Implementation Plans related to National Ambient Air Quality Standards attainment in Title I of the Clean Air Act.

EMISSIONS REDUCTION: 4 MMTC.

COST: Likely savings as a NO_x / ozone control strategy, making this a low- or no-cost CO₂ reduction measure.

COST EFFECTIVENESS: Low- or no-cost in dollars per tonne of CO₂ offset.

STATUS OF AGENCY ANALYSIS: Analysis ongoing.

STAFF CONTACTS: Bruce Schillo, EPA/OPPE, 260-1030 (voice), 260-0512 (fax).

Energy Supply Working Group:
ES-29 — Seasonal Gas Use for NO_x Control

STAKEHOLDERS: Gas producers and pipelines will strongly favor. State environmental agencies should also favor flexibility and low cost. Coal producers lose sales. Some environmental groups may not favor the annual emissions averaging provisions, as this may result in higher NO_x emissions in winter months (non-ozone season) than would occur under command-and-control NO_x RACT regime. Some environmental groups may also favor a requirement that sources adopting an EIP strategy obtain emission reduction beyond those required by presumptive RACT; such a requirement may unnecessarily penalize the seasonal gas use option, raising its cost, and thus severely restricting its adoption.

**ENERGY SUPPLY: ACCELERATE DEVELOPMENT OF
EFFICIENCY STANDARDS FOR ELECTRIC TRANSFORMERS**

Description: Under Sec. 124 of the Energy Policy Act of 1992, DOE is charged with developing testing requirements for distribution transformers (by March 1995), and prescribing energy conservation standards for transformers (by September 1996). DOE is also supposed to complete by March 1994 a study of the potential for cost-effective replacement of utility transformers. Based on this timeline, new efficiency standards would not likely take effect until approximately 1998/1999. DOE could accelerate the development of efficiency standards, and implement the new standards by 1995/96 in order to get maximum energy savings by 2000.

Implementation: This is an administrative option that could be implemented under DOE's current authority under the Energy Policy Act.

Carbon Reductions: If standards were set at a level equivalent to what a high-efficiency silicon steel transformers could meet, and standards were made effective by 1995, 0.1 MMT of Carbon reduction could be obtained by 2000. Total potential by 2010 is approximately 0.35 MMT Carbon.

Costs: Utilities would incur some incremental costs associated with purchasing transformers that meet the new standards, but this equipment would be cost-effective for the majority of utilities, and so the net impact is negative costs. In addition, the cost differential would decline as the sales volume of the higher-efficiency transformers increases, due to economies of scale in the production process.

Cost Effectiveness: Dollars per ton of Carbon avoided would be a negative number or very small positive number.

Status of Analysis: Analysis is complete.

Staff Contact: Linda Latham, EPA, PH: 233-9091, FAX: 233-9578.

ES-47

**ENERGY SUPPLY: ACCELERATE DEVELOPMENT OF
EFFICIENCY STANDARDS FOR ELECTRIC TRANSFORMERS**

Political Analysis: Manufacturers of higher-efficiency transformers and transformer inputs would benefit (most manufacturers produce transformers in all efficiency ranges). Environmental groups would also support this type of effort. Utilities in some areas that currently purchase the lowest efficiency equipment might oppose a new standard.

REDUCE ELECTRIC GENERATION LOSSES THROUGH TRANSMISSION PRICING REFORM

DESCRIPTION: In 1991, about 211 billion kWh, or 7.4% of U.S. electric generation, was lost while being distributed from power plants to end-users. Many of the inter-utility, interregional transmission corridors in the U.S. are heavily loaded during peak hours. Marginal line losses on heavily loaded lines can be as high as 12-18% of marginal generation -- about 6 to 8 times the average line loss. Transactions that go against prevailing power flows reduce total line losses, and hence total fuel consumption, within a region. Reverse flows decrease total line losses because 1) the amount of power carried over a line with relatively high line losses decreases (i.e., more demand is served by local generation) and 2) lighter loading reduces the average loss on the line.

The Federal Energy Regulatory Commission regulates the pricing of wholesale electric transmission service. In general, the Commission's transmission pricing policy has not accounted for the benefits created by reverse flows. Most transmission service is priced at the embedded (average) cost of the transmitting utility's system. Embedded cost pricing does not give prospective generators an incentive to locate power plants at sites that reduce congestion on regional transmission interties.

IMPLEMENTATION: On June 30, 1993, the Commission issued a notice of inquiry on transmission pricing issues. Respondents to the inquiry will undoubtedly identify many complex issues requiring the Commission's consideration. As the Commission addresses these issues, it should not overlook the economic and environmental benefits to be gained by pricing reverse flows more accurately.

CARBON IMPACT: Transmission pricing that provides better price signals and, in particular, credits transactions that reduce line losses could reduce total U.S. line losses in the year 2000 by 2%. The resulting reduction in fuel consumption would yield annual carbon reductions of about 1.0 million metric tons per year.

COSTS: No net cost to the Commission since it has initiated a generic proceeding on transmission pricing issues. The economic and environmental benefit provided by reverse flows can be readily addressed in that proceeding. No or minimal net cost to the electric industry since many if not all utilities will have to file revised transmission tariffs if the Commission implements a new pricing policy. Transmitting utilities may have to do additional modeling and thus incur increased computer costs.

COST EFFECTIVENESS: Highly cost effective; this policy would produce net economic benefits apart from greenhouse gas reduction. Lower line losses yield lower fuel costs. Generation would be used more efficiently. Also, reverse flows help avoid or defer the need for additional transmission capacity.

ANALYSIS/DATA: Estimated impacts developed for "off-line" analysis.

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REDUCE ELECTRIC GENERATION LOSSES THROUGH TRANSMISSION PRICING REFORM

EXTENDED POLITICAL ANALYSIS/AFFECTED STAKEHOLDERS:

Most transmission users (independent power producers, transmission-dependent utilities) would support this option. Transmission owners (largely investor-owned utilities) would be divided: some may oppose the option because under current policy they can charge embedded cost for transmission service even when the transaction reduces their costs. Some transmission owners would support the option because they think that utilities and independent power producers need better incentives to site new plants in locations that minimize the combined cost of generation and transmission. Customer groups are unlikely to oppose the option since it does not foster any cross-subsidies.

Any new pricing policy implemented by the FERC is likely to be controversial. If adopted, this option would be part of a comprehensive reform of transmission pricing and would probably attract little direct criticism.

586 0328

Description: EPA would implement a voluntary program to encourage electric utilities to invest in energy-efficient transformers that reduce transformer losses (approximately 50 billion kWh are lost per year in transformers). EPA would work with industry to establish minimum efficiency levels, and all qualifying equipment would be designated with the Energy Star logo. Participating utilities would agree to purchase only Energy Star transformers and to upgrade system (early retirement) where economically warranted. EPA would distribute information regarding energy-efficient transformers to utilities and state PUC's, and help participating utilities to organize group purchases of energy-efficient transformers in order to obtain lower prices. Program would be launched in 1993, and savings could start to accrue by 1994.

Implementation: This is an administrative option that could be implemented under EPA's current authority.

Carbon Reductions: With modest escalation in participants, and inclusion of an early-replacement component, annual carbon reductions of 0.64 MMT could be obtained by 2000. Total potential by 2010 is approximately 2 MMT Carbon.

Costs: Utilities would incur incremental costs of 25-35% as compared to regular transformers. (For a 25 kva transformer the incremental cost is approximately \$125.) This cost differential would decline as the sales volumes increases, due to economies of scale in the production process. The costs would be incurred annually as utilities replace their transformers (i.e., natural turnover), or undertake cost-effective early replacement. Since only cost-effective upgrades would be undertaken, however, the impact on utilities would be a net benefit. To organize and promote the program to utilities, EPA would require 2 FTE's and approximately \$2.0 million.

Cost Effectiveness: Only cost-effective upgrades would be undertaken, so the cost of carbon reductions (e.g., dollars per ton of Carbon avoided) would be a negative number.

Status of Analysis: Complete.

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ENERGY SUPPLY: ENERGY STAR TRANSFORMERS

Political Analysis: Manufacturers of higher-efficiency transformers and transformer inputs (i.e., amorphous metal steel) would benefit. Environmental groups and consumer groups would also support this type of effort. It is voluntary for utilities, so they should not oppose it.