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cc: PL
Leigh

TO: Bob Cumby, CEA
Mark Friedrichs, DOE
Joe Aldy, CEA
David Doniger, EPA
Bill White, EPA
David Festa, Commerce
Margot Anderson, USDA
Ron Minsk, CEA

FROM: DAVID GARDINER

JULY 22, 1999

Attached are the most recent versions of the papers on early credit for the topics that we have discussed at previous meetings - capping the size of an early credit program, options for baselines and benchmarks, and retroactive credit. We don't plan to discuss these in today's meeting, but I wanted to be sure that you had them. Reminder: We are meeting at the CEQ Conference Room at 1PM.

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Should an Early Credit Program be Open-Ended or Limited in Size?

Should the overall size of the program be limited?

Three concerns have been voiced by those favoring limiting the size of an early credit program.

Anyway Tons: Some have raised questions about the extent to which the emissions reductions credited under an early credit program will be real, additional, and permanent reductions. A goal of the program should be to give credit only to those emissions reductions that would not have been undertaken otherwise. The extent possible credit should not be given for actions that would have taken place otherwise. In practice, this may prove difficult to do, and even a well-designed program might end up crediting a significant quantity of "anyway tons."

Over-Mortgaging: It is difficult to tell either how many participants might be attracted to an early credit program or the overall volume of credit that might be allocated under such a program. Some have expressed concerns that the total allocated is potentially quite large. These concerns are often linked either implicitly or explicitly to the size of an overall emissions budget for a future emissions reduction program, whether that budget is determined by the Kyoto Protocol or some other greenhouse gas program. If this were to happen, the early credit program might overly constrain future choices about how a program might operate.

Equity: Some firms and some sectors are more natural candidates for participating in an early credit program than others. Those that do not expect to benefit from an early credit program are concerned about the impact on them of a large allocation going to others under an early credit program.

The main problem with limiting the quantity of credits to be made available is that a limit — especially a very small one — is the potential to create the impression that there would not be enough credit available to go around, thereby discouraging genuine participation and real change from business as usual.

One possibility would be to create a limited quantity of credit to be made available. If the credits are fully allocated and the early credit program appears to be successful in generating real, additional, and permanent reductions in emissions, an additional allotment of credits can be made available.

Should the amount of retrospective credit that can be given for actions reported as part of existing voluntary programs be limited separately?

The rules for participating in an early credit program (and for receiving credit for actions after the program begins) will differ significantly from the requirements for participation in previous voluntary programs. If the quantity of credit to be made available is to be limited, should retrospective and prospective credits be subject to separate limits, or should the two be

**** EPA's base program in FY98 was \$90.0 million, so total spending for their climate change programs include that figure plus the annual figure shown for the Climate Change Technology Initiative.**

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combined?

The differences in circumstances seem to indicate that the two should be dealt with separately. The standards for prospective credit will almost certainly be more rigorous than for existing voluntary programs. For example, the 1605 inventory includes self-reported reductions in both direct emissions (those from facilities owned by the reporter) and indirect emissions (those "caused" by the reporter) with no attempt to deal with double counting. In addition, most of the reductions reported in the 1605 inventory are computed relative to the reporter's estimate of what would have happened in the absence of some action rather than relative to a historical baseline.

Some have argued that they should be handled in a way that insures that previous actions do not receive credit on more generous terms than future actions. This would argue against providing ton-for-ton credit for all reductions reported in existing inventories. There are at least two ways of dealing with retrospective credits.

Audits: Criteria could be set either in legislation or in regulations that would guide an examination of reductions reported under existing voluntary programs. Detailed audits would probably be extremely expensive and, in many instances, would encounter severe data problems.

Fractional Credit: An alternative to detailed audits to determine the credit given for individual projects would be to take all of the reported reductions and provide less than ton-for-ton credit.

If limits are placed on the quantity of credit to be made available, how large should those limits be?

Some groups have made proposals that would imply limits in the range of 350-400 million metric tons of carbon equivalent, about one-fifth of which would be for retrospective credit and four-fifths of which would be for prospective credit. (Converting from carbon equivalent to carbon dioxide equivalent yields about 1280 - 1470 million metric tons of CO₂ equivalent.) An early credit program, even of this size, would allocate claims with significant monetary value to participants. Some trading in greenhouse gas permits has already occurred. An early credit program and the credits that it would create would likely add to interest in trading.

If the amount of credit that can be granted is limited, how should credit be allocated?

There are a number of possibilities for the allocation of credits. If the quantity of credits claimed exceeds the program limit some rationing rule must be adopted. Two possibilities are allocating credits on a first-come-first-served basis and allocating credits proportionally.

First Come First Served: One alternative would provide credits that have a set, predetermined value (such as one credit equals one ton of emissions) and would allocate the credits on a first-come-first-served basis. This approach would provide firms certainty over the value of their actions. It would also address the greatest need of an early action system: to provide incentive

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for action when the policy/price signal is weakest. Under this system, businesses will earn credits in the near term when future policy is most uncertain and the price signal is weakest.

Proportional Credit: An alternative would "true up" the quantity of credits at the end of the period, by comparing the number of credits claimed with the level of the cap. The credits could, for example, be worth up to one ton each, and perhaps less if there are more credits claimed than the size of the cap. This creates uncertainty over the value of early action credits but does not run the risk that some might be excluded from the program because of binding caps.

If retrospective and prospective credits are treated separately, they could be allocated under different rules. For example, proportional allocation might be used for retrospective credits because the uncertainty is less important for actions already taken and first-come-first-served allocation could be used for prospective credits.

Should baseline protection be limited only to participants in the early credit program or is broader baseline protection desirable and feasible?

Many firms express the fear that they will be penalized for taking early actions to reduce greenhouse gas emissions when future legislation is enacted establishing a mandatory emission reduction program. If the allocation of emissions allowances or permits under a future program are based on firms' emissions *as of a baseline year*, they fear that if they have reduced their emissions before that baseline year, they will be shortchanged in that allocation. The bill currently provides baseline protection only for participants in the early credit program.

An advantage of extending baseline protection to non-participants is that it would reduce the uncertainty faced by these non-participants and would remove the disincentives for early action created by that uncertainty.

A disadvantage is that it would require a change in the way that baseline protection is granted. One alternative would be to state now that any future program would be implemented in a way that would not penalize businesses for actions that they take after the onset of an early credit program. There are at least three options could be adopted in the future that would insure that businesses would not be penalized. Importantly, there is no need to make any decisions now about what mechanism will be adopted in the future. Instead, the legislation would only need to make clear that whatever option is adopted will be constructed in a way that avoids penalizing those who reduce emissions before the future program is implemented.

Baseline protection Assure that if a future program allocates allowances according to firms' emissions in a baseline year, only a *past* year (e.g., 1998) will be chosen for the baseline. Firms would then be free to make emission reductions any time after the baseline year knowing that they will not prejudice their allowance allocations.

Performance benchmarks. Alternatively, a future program could allocate emissions allowances

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according to a performance-based benchmark (e.g., emissions per unit of output). Under this approach a firm's historical performance or emissions level is irrelevant. As above, a firm would know that it can reduce emissions at any time without affecting the number of allowances it will receive.

Auction. Finally, a future program could allocate emissions allowances by auction. Here again, historical emissions would be irrelevant. Firms would need to purchase only enough allowances to cover their emissions when the program takes effect, and acting early would reduce the amount that they ultimately need to purchase.

REVISED DRAFT, 7/15/99
MARK FRIEDRICHS

BASELINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS - Pros & Cons

A key issue in creating an early credit program is how baseline emissions will be determined. This paper addresses four possible ways of setting baseline emissions - actual emissions in some base period, actual emissions per unit of output in some base period, an efficiency or other performance benchmark for a firm that is unrelated to the firm's historical emissions, or a performance benchmark for specified technologies or types of equipment - and discusses some of the advantages and disadvantages of each approach. After that discussion, the paper considers a few examples of how some of the approaches might be applied to individual sectors. No single approach appears to dominate the others for all sectors. Instead, a number of alternatives might work well for some sectors, while other sectors have many fewer workable alternatives.

1. A TONS-BASED APPROACH. Credits would be granted if an entity reduced its total emissions below a firm-specific historical baseline, regardless of changes in output. For example, a company or utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

Key Features:

- Historical baseline
- Actual emissions *levels* used both for setting baseline and determining changes from baseline
- Entity-specific baseline

Pros

- Could be applied to any entities that maintain verifiable records of energy use or ghg emissions.
- Addresses total emissions directly
- Modest Federal administrative costs when applied to large entities/energy users.

Cons

- Probably too costly to apply to most small companies or consumers
- Impossible to assure additionality or equitable treatment of beneficiaries, because of large variations in emissions histories and business-as-usual trends of individual utilities, companies and institutions.
- Would result in unintended market distortions, such as rewarding downsizing and spin-offs or exports of ghg-intensive operations.
- Impossible to predict or to limit likely eligibility for early credits.

2. A RATES-BASED APPROACH. Credits would be granted based on entity-specific improvements in their emissions per unit of output (e.g. kilowatt hours, dollars or tons of

cement). For example, one utility or manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry). Such an approach could be applied either to individual facilities (e.g. a powerplant or a cement plant) or to corporate entities (e.g., a utility company or manufacturing corporation), or both.

Key Features:

- Historical baseline
- Actual emissions rates used both for setting baseline and determining changes from baseline
- Entity-specific baseline

Pros

- Probably could be applied to most electric utilities, large private companies or manufacturing plants, or large public institutions.
- Addresses both technology and operational efficiency
- Reduces double counting problems that arise if credit is given to efficiency improvements by electricity users
- Minimal administrative costs and delays when applied to electric sector.
- Unlikely to constrain future options for allocation of emission allowances

Cons

- Probably too costly to apply to most small companies or consumers
- Difficult to assure additionality or equitable treatment of beneficiaries because of large variations in efficiency histories and business-as-usual trends of individual utilities, companies, plants and institutions.
- Could be difficult and costly to establish benchmarks and to verify changes in performance of multi-product/service companies.
- Could result in unintended market distortions, such as rewarding outsourcing, spin-offs or exports of ghg-intensive operations.
- Difficult to predict or to limit eligibility for early credits.

3. A PERFORMANCE STANDARD. The baseline or benchmark would be in the form of emissions per unit of output (or quantity of sequestration per unit of output) but that benchmark would not be determined by historical emissions rates. Credit would be granted based on the amount by which the performance standard is surpassed. This option requires identification of a fixed unit of output, such as kilowatt hours, and the ability to measure and verify fuel inputs or actual ghg emissions.

Key Features:

- Baseline determined by present or future performance standard, not historical emissions or efficiency
- Actual emissions rates used both for determining changes from baseline

- Baseline common to all participants in an industry

Pros

- Could be applied to all of electric power sector, and possibly certain industrial processes. (roughly 30% of ghg emissions)
- Can be designed to maximize additionality (minimize "free riders").
- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to electric sector.
- The likely eligibility for early credits could be reliably predicted or limited
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for the allocation of allowances under a future domestic emissions trading system.
- Avoids double-counting if credits are offered both to electric utilities and electricity end-users.

Cons

- Probably cannot be applied to most ghg emission sources outside the electric sector.
- Would not address electricity demand.

4. A TECHNOLOGY-BASED APPROACH. This option requires establishment of a standardized procedure to measure the emissions per unit of output and typical usage of specific technologies or categories of equipment or buildings, and a means for independently verifying this measure (e.g., Federal fuel economy test procedures for light duty vehicles, combined with a typical usage factor).

Key Features:

- Baseline determined by present or future performance standard, not historical emissions or efficiency
- Standard test procedures rather than actual emissions determine amount of credit
- Benchmarks applies to specific technologies or categories of equipment and are common across all users

Pros

- Can be easily applied to new light duty vehicles, most new residential and commercial appliances and equipment, and possibly new homes, and may be applicable to certain categories of new commercial buildings, and industrial equipment and processes (covers products and equipment that ultimately account for over 50% of energy demand)
- In general, works better than others in sectors where there are a large number of sources because of the cost of measuring and monitoring entity-specific emissions
- Enables focus on new technology
- Can be designed to maximize additionality (minimize "free riders").

- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to sources already covered by Federal test procedures (e.g. light duty vehicles, appliances, equipment).
- The likely eligibility for early credits could be reliably predicted or limited.
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for allocating allowances under domestic trading system.

Cons

- Probably could not be applied to most industrial energy uses, heavy duty vehicles or non-vehicle transport energy use.
- Could not address operational efficiency or level of services/demand
- Could involve significant administrative costs and delays if applied to types of equipment or processes not yet covered by standardized test procedures.

SECTOR-SPECIFIC EXAMPLES

1. ELECTRICAL UTILITIES.

All four approaches can be applied to the utility sector.

- Tons or Rates-Based Approaches
 - Data exist to set historical, firm-specific baselines and monitoring of firm-specific emissions present no problems.
 - Firms typically have multiple sources so acquisitions and divestitures would need to be tracked so that baselines could be adjusted.
 - Output is homogeneous (kwh) so a rates-based approach is straightforward.
- Performance benchmarks for new electric power generating plants:
 - One (generic) benchmark for all new capacity
 - Fuel-specific and/or size-specific benchmarks for new capacity
- Technology-Based Approach
 - Credit could be given for particular types of new generation facilities employing a particular technology
 - Credit could be given for fuel switching (i.e. coal to natural gas)

2. TRANSPORTATION.

The diverse number of sources makes monitoring actual emissions excessively costly. A workable early credit program would probably need to focus on technologies or vehicle performance benchmarks.

- Vehicles covered by existing fuel economy tests (and CAFE standards): autos and light duty trucks, including minivans and SUV's

- Performance benchmarks could be set for individual new vehicles in different forms:
 - traditional: miles per gallon, or
 - modified: miles per gallon per passenger (or per unit of interior space, or other measure)
- Performance benchmarks could be set for average fuel economy of new cars produced by a manufacturer
- Technology-specific credits could be given for the production of new vehicles with certain predetermined characteristics

3. INDUSTRIAL

The diversity of this sector creates difficulties for applying only one approach to all industries.

- Tons or Rates-Based Approaches
 - Data to set historical, firm-specific baselines and monitoring of firm-specific emissions present problems for many industries.
 - Output is heterogeneous in many industries so a rates-based approach is more problematic than with utilities.
- Approaches Using Performance Benchmarks
 - Specific technologies or types of equipment could be targeted in individual industries.
 - In some cases actual emissions could be used to determine credit, in others predicted emissions based on test results would need to be used.

4. RESIDENTIAL AND COMMERCIAL SECTORS.

Residential, Commercial and Industrial Appliance and Equipment

- Covered by existing energy efficiency test procedures (and minimum efficiency standards): furnaces, air conditioners (room and central), heat pumps, water heaters, space heaters, refrigerators, dishwashers, clothes washers, dryers, fluorescent lamps and ballasts, 1-200 hp electric motors, packaged heating, air conditioning and water heating equipment used in commercial buildings and possibly electric transformers, less than 1 hp electric motors, high intensity discharge lamps, windows.
- Performance benchmarks could be set at some level above the established minimum efficiency standards: manufacturers that produced new appliances or equipment that exceeded this benchmarks would qualify for credits.

Residential and Commercial Buildings

- Performance benchmarks could be set for new residential and possibly certain categories of new commercial buildings based on standardized home energy ratings or other building energy use estimation tools.
- Credits could be provided for investments in specific building, industrial or agricultural technologies (e.g. ground source heat pumps) or processes (e.g. processes that eliminated the use of chemicals that produced greenhouse gases)

[illegible]

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Lessons from Voluntary Programs for Crediting Early Action

Existing voluntary programs can provide insights for the design of an early action credit system. An evaluation of emissions reducing actions, their measurement, and their reporting can inform an assessment of the value of past and current voluntary actions. Further, lessons can be drawn from the current voluntary programs to inform the design of a prospective crediting system. This memo outlines some of the key issues on both retrospective and prospective crediting.

Retrospective Crediting

In evaluating voluntary actions under existing programs, it becomes clear that the wide array of programs employ different approaches to measuring emissions reductions because of these programs' different sectoral and technology foci. Some programs estimate emissions reductions based on fuel use, while others estimate emissions based on the waste stream, and others estimate emissions based on technology use. Even within these categories, different methodologies are used to calculate emissions reductions. In some programs, there have been a limited number of on-site audits to assess a facility's emissions reductions. The level of accuracy of the various approaches can vary, with the more analytically rigorous and time-intensive approaches appearing to yield more accurate results.

Some experts familiar with these programs have claimed that the nature of reporting voluntary actions can promote misestimation of emissions reductions in some cases. Firm-level emissions reductions could be overestimated because of some reported reductions might have taken place otherwise and other factors, and some have suggested adjusting the value of these claimed reductions.¹

Reasons for Adjusting Estimated Emissions Reductions

- **"Anyway Tons":** In some cases, a firm would have undertaken an action that results in lower emissions regardless of the existence of the voluntary program simply because the action is economic for the firm. These actions do not result in reductions from what emissions would have been without the voluntary program – that is the reductions are not truly additional. This is commonly called the "anyway tons" problem.

¹ However, some counter that a program's emissions reductions could be underestimated if some firms take advantage of available programs without formally reporting participation. Since this overview focuses on firm-level emissions reductions, and not program-level reductions, we do not address this possibility.

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- Duration of Additionality: A firm could adopt a technology in an action that is truly additional, however, given a long lifetime of the technology, there may be some point in time when the technology is no longer more efficient than the industry standard. Thus, the emissions reductions from the early action are not the sum over the lifetime of the new technology, but the time the new technology is used when a less-efficient technology would have been used absent the voluntary program.
- Estimation Methodologies: Since estimation methodologies are not uniform across programs, and indeed, not uniform within some programs, the calculation of emissions reductions may be more rigorous for some actions than for others. The lack of rigor in some approaches could result in under- or over-estimation.

Approaches to Adjusting Emissions Reductions

To address the potential misassessment of reductions, some have proposed adjustments to the claimed emissions reductions. Below is a set of possible adjustments that could be undertaken. These should not necessarily be considered completely mutually exclusive. Further, additional analysis may be warranted to fully evaluate which adjustment approach, or combination of adjustment approaches, would be most appropriate in a retrospective credit system.

- Eliminate credit for actions that are not identified as voluntary. Under the 1605(b) reporting system, firms are asked to identify if the action is: 1) a plant closing; 2) response to state or federal regulation; or 3) a voluntary action. Actions falling under the first two categories could then be removed from the pool of actions receiving credits.
- Adjust across the board based on free rider percentage. In estimating aggregate program effects, some programs attempt to deduct energy-efficiency improvements that would have occurred anyway in the industry based on forecast business-as-usual energy use. This approach could be used to adjust all actions by a specific percentage.
- Adjust across the board based on credit pool size. A decision could be made about the size of the credit pool set aside for retrospective credit, and this could then be the basis for adjusting emissions credits.
- Adjust case-by-case by evaluating methodologies. A review of methodologies across and within programs could be used, and in cases where methodologies were found to misestimate emissions reductions, credits could be appropriately adjusted.
- Adjust case-by-case through site audits. In some programs, a subset of participants have been evaluated through extensive site audits. These could serve as the basis for the credits for those with previous audits, and additional audits could be performed on other participants.

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Prospective Crediting

The existing voluntary programs also provide some lessons learned for designing a prospective crediting system.

- Data reporting system is important. Some EPA and DOE programs have computer software to assist program participants calculate, track, and report their data. These could serve as useful prototypes by reducing the burden on participants and thereby promote higher participation rates.
- Firms could benefit from guidance for estimation methodologies. Many voluntary programs provide guidance to participants about how they can calculate their emissions reductions. This is important for transparency and to promote consistency, at least within common industries and technologies.
- Minimizing the "anyway tons" problem may be difficult. Program staff recognize that some free-riding goes on in most programs, but find it very difficult to distinguish anyway tons from reductions that are real and additional. This illustrates the importance of designing appropriate baselines for evaluating actions so as to maximize additionality.

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Voluntary Reporting Program (1605(b))

	1994	1995	1996	1997	1998P	Total
Number of Entities Reporting	108	142	149	156	172	
Number of Projects Reported	645	967	1,038	1,229	1,420	
Number of Entity-Level (Organization-Wide) Reports	40	51	57	56	64	
Entity-Level Reductions Reported (mmt CO2 equiv.)	78	120	132	128	NA	NA
Project-Level Reductions Reported (mmt CO2 equiv.)	74	146	154	166	263	803

P Preliminary

Voluntary Reporting Program (1605(b))

	1994	1995	1996	1997	1998P	Total
Number of Entities Reporting	108	142	149	156	172	
Number of Projects Reported	645	967	1,038	1,229	1,420	
Number of Entity-Level (Organization-Wide) Reports Rece	40	51	57	56	64	
Entity-Level Reductions Reported (mmtce)	21	33	36	35	NA	NA
Project-Level Reductions Reported (mmtce)	20	40	42	45	72	219

P Preliminary

Conversion factor: CO2 to carbon = 12/44 0.27273

Notes:

1. Includes Climate Challenge (utilities), Climate Wise (manufacturers) reporting along with some reporting under other CCAP voluntary programs.
2. Included direct emissions (those emitted by equipment or facilities owned by the reporter) and indirect emissions (those caused but not owned by the reporter).
3. Reporter chooses an absolute baseline (based on a prior year's -- generally 1990's -- emissions level or rate) or a relative baseline (based on the reporter's estimate of what emissions would have been without some specified action). Most of the reductions reported are computed by the reporter using the second approach.
4. Entity-level and project-level emissions are not additive. Of the 56 companies reporting entity-wide reductions in 1997, 45 also reported project-related emissions reductions.
5. Joint EPA/DOE reports to Congress add 41 million metric tons of carbon equivalent reported under voluntary programs other than 1605 for 1998.

CAO Report on potential for private land sales.

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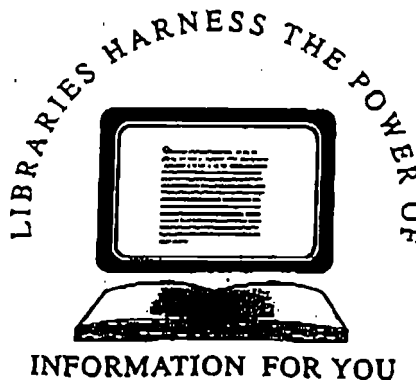
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DATE: 8/11 FAX NUMBER: 56870TO: Mr. Leigh LyndonFROM: Amy BNUMBER OF PAGES: 12
(including cover page)

COMMENTS:

Title 49 (Transportation)
sections 32304 - 32309
plus pocket part



SECTOR-SPECIFIC EXAMPLES

The transportation sector example can be as well recast as a refinery-based example--Here's a rough cut, in the same motif as was used in the Sector Specific examples:

2. TRANSPORTATION

Although the diverse number of sources makes monitoring actual emissions excessively costly, carbon dioxide emissions can be reliably projected based on fuel sales and carbon content, both of which can be monitored without difficulty. Methane and nitrous oxide emissions are small relative to carbon dioxide, but could also be projected using gram-per-gallon emission factors.

--Fuels are covered by existing federal regulations (e.g., unleaded gasoline, highway diesel fuel).

--Different forms of benchmarks could be set for fuels:

- metric tons of carbon, or
- metric tons of projected carbon-equivalent emissions (accounting for biofuels, methane, nitrous oxide)

--Credits could be given based on the volume and characteristics of fuel sold.

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Initial Draft, August 11, 1999
Mark Friedrichs, DOE
202-586-0124; Fax: 586-3047
mark.friedrichs@hq.doe.gov

OPTIONS FOR GRANTING EARLY CREDITS TO GOVERNMENT AGENCIES

Background

Federal Government

- **Energy Use and GHG Emissions:** The Federal government accounts for roughly 2% of total U.S. energy demand and GHG emissions. A little less than half is consumed in buildings and facilities, and the remainder in vehicles, equipment and energy-intensive operations. Over two-thirds of all Federal emissions are associated with DOD buildings and operations, and nearly 50% of DOD's emissions are from military aircraft.
- **Trends:** Largely because of reductions in Defense spending and the closing of many DOD facilities, Federal GHG emissions have declined in recent years. Increased efficiency and fuel switching has also contributed to some modest reductions, especially over the last few years.
- **Efforts to Reduce GHG Emissions:** A recent Executive Order directed Federal agencies to cut GHG emissions associated with Federal buildings by 30% below 1990 levels by 2010 and to take other actions to improve energy efficiency and reduce emissions in other areas as well.

State and Local Governments

- **Energy Use and GHG Emissions:** State and local governments account for roughly three percent of total U.S. energy demand and GHG emissions, most of which is in buildings and street lighting. Schools represent the single largest category of state and local government buildings. Water supply and treatment, and government vehicles are other significant sources of emissions.
- **Trends:** State and local government energy use and emissions trends are not known, but are likely to have been relatively stable or increasing in recent years because of rising student populations.
- **Efforts to Reduce GHG Emissions:** DOE has an initiative called Energy Smart Schools which is directed at urging and assisting schools to improve energy management, and DOE's State Energy Program provides grants that can be used by States to bolster energy management efforts in schools, hospitals and other government or non-profit buildings.

Options

Option 1: Treat all government agencies just like private industries, utilities or building owners. Under this option, any Early Credit legislation would not have to address the treatment of government agencies separately, but would simply indicate that early credits could be granted to government agencies on the same basis as other industries, power generators and building operators. The legislation could provide the special authority that is probably necessary for

Federal agencies to accept such early credits, or it could remain silent on this question. This approach could benefit government agencies, either directly or indirectly:

- If credits were provided to utilities that reduced emissions per Kwh of output, agencies that generated electricity (which DOD, TVA and other agencies often do) would be able to qualify for such credits.
- If credits were provided to industries that demonstrated significant reductions from an emissions benchmark based on prior year emissions per unit of output, some Federal agencies would be able to qualify by establishing output based benchmarks for their industry-like operations (such as uranium enrichment).
- If credits were provided to utilities that cut the emissions associated with power production or to manufacturers of energy efficient light duty vehicles, appliances or equipment, government agencies that purchase power, vehicles and equipment would be indirect beneficiaries of such credits.

Federal agencies that received credits directly could be required by the President or the Congress to treat these credits in one of at least two ways:

- as receipts to be turned over to Treasury, or
- as receipts to be retained by the agency, but reported to OMB and the Congress, and taken into consideration in future budgets and appropriations.

State and local government agencies probably would be subject to similar requirements.

Pros:

- Would provide some direct incentive to Federal and other government agencies to reduce emissions.
- Recognizes the highly disparate sources of GHG emissions from government agencies and that many government emissions are from sources identical to those of private entities that would be eligible to receive credits.
- Does not require the development of special legislative or administrative requirements for Federal and other government agencies.
- Would ensure that eligibility for early credits was the same for private and public entities.

Cons:

- Depending on the coverage and eligibility criteria ultimately included in any early credit legislation, this approach may not provide a direct incentive for reductions of most greenhouse gas emissions from Federal and other government agencies.
- Does not recognize the unique character (military operations) of nearly half of all Federal emissions.
- The value of credits would still have to be treated as part of the Federal agency budgeting and appropriations process.
- Might provide early credits for Federal agency implementation of an existing Presidential directive.

Option 2: Develop a special method for qualifying federal and possibly state and local agencies for early credit. Under this option, the legislation would either define a special process for Federal agencies to qualify for early credit (such as granting credits to Federal agencies that exceeded the President's direction to cut emissions associated with Federal buildings by 30%

below 1990 by 2010) or could direct the administrator of an early credit program to develop special procedures for qualifying Federal and State and local government agencies.

Pros:

- Would enable an early credit program to provide a direct incentive for emission reductions by all Federal and other government agencies.
- Could enable the Congress or Administration to reward agencies that exceeded reductions called for by the recent Presidential Executive Order.

Cons:

- Federal and other government agencies are likely to be treated differently than comparable private entities.
- Probably would require the development of unique, output based benchmarks for Federal and other government agency emissions.
- The value of credits would still have to be treated as part of the Federal agency budgeting and appropriations process.
- Special legislative provisions for coverage of government agencies would have to be developed and agreed to.

Option 3: Prohibit Federal (and possibly State and local) government agencies from receiving early credits for reductions in greenhouse gas emissions. Under this option, the legislation would specifically exclude Federal agencies from eligibility for early credits. Early credits not dispensed to Federal agencies could ultimately be used by the Federal government for other purposes that might provide equal or greater benefits to the Federal government (such as being auctioned for sale centrally, converted into the emission allowances needed to account for Federal emissions or allocated other, non-Federal emitters). Since dispensing credits to Federal agencies would, fundamentally, be a circular financial transaction, it might be argued that forbidding Federal agencies eligibility would simply avoid a cumbersome administrative process.

Pros:

- Would avoid the administrative complexity of taking into account the value of credits in the Federal budgeting and appropriations process.
- Would not require the development of special legislative provisions or rules for government agencies.
- Government agencies are still likely to benefit indirectly from an early credit program.

Cons:

- Would not provide any direct incentive for emission reductions by Federal (and possibly other) government agencies.
- Would not give any agencies any direct incentive to exceed the reductions called for by the recent Presidential Executive Order.

Office of Economic Policy

Department of the Treasury
Washington, D.C. 20220

FAX

Date: 4/20/99

Number of pages including cover sheet: _____

	Name	Fax Number	Phone Number
To:	David Doniger	260-5155	
	David Gardiner	260-0275	
	Joe Aldy	395-6870	
	Victoria Greenfield	647-5713	
	David Sandalow	456-2710	
	David Festa	482-4636	
	Janet Anderson	395-2311	
	Mark Freidrichs	586-3047	
From:	Robert Cumby	202-622-2633	202-622-0572

Remarks: ☒ **URGENT** ☐ For your review ☐ Reply ASAP ☐ Please comment

Todd has asked us to get together to discuss design issues for an early credit program. I have attached a revised version of the document that we had agreed to last fall, along with the memo that I sent to Todd setting out our view on the issues.

Could we meet Wednesday, May 5 at 2:00 ~~in~~ ^{Thurs 11am Lincoln Rm, WH} room 2127 of the Treasury building? Please let me or Nancy Chryst know if you can make it. We will need your date of birth and social security number for clearance.

Conf
C + r

The agenda is:

1. Discussion of any changes to last fall's consensus.
2. Discussion of the Chafee bill. (If you haven't seen the bill, you can get it via links from the committee's web site.)
3. Concerns that various interested parties have with the Chafee bill.

EPA is currently updating a table summarizing the key features of several early credit proposals. They will send it to everyone when the update is completed.

December 1, 1998

MEMORANDUM FOR TODD STERN

From: Bob Cumby
Subject: Credit for Early Action

The group working on early credit has reached consensus on several issues concerning the design of an early credit mechanism. A copy of the latest draft of the memo is attached.

We did not, however, reach consensus on what we believe to be the single most important issue: should an early credit mechanism be capped or left open ended. Because of this issue's importance, we believe that it should be resolved at a higher level.

As with many of the design issues that we have considered, the tradeoff with caps is between maximizing the change from "business as usual" (BAU) emissions and maximizing the number of participants in the program. Overly lax criteria could result in large early credit awards for small real gains (the "anyway tons" problem). Overly stringent criteria could choke off participation; while each qualifying action would be a clear change from BAU, there would be too few participants overall to make a difference.

Our discussion of these substantive issues mirrored views about likely support for the program. While an unlimited early credit pool or easy qualifying criteria will broaden appeal to potential supporters, it will also stimulate stronger opposition from those who do not expect to qualify and see the early credit awards as diminishing their allocations. Potential supporters are also likely to have different interests. Some firms are seeking credit for actions that would satisfy relatively stringent criteria. Others will seek to condition their support on making the program's criteria easier to meet, with some advocating credit for actions that produce little or no benefit or are clearly happening anyway. We should look for ways to structure the program so that there will be some natural check on this pressure for overly lax criteria.

Here is where each of the agencies involved in the process stands:

- Climate Change Task Force: In favor of an open-ended system to encourage broad participation.
- Commerce: In favor of caps in the form of a series of tranches.
- Council of Economic Advisers: In favor of caps.
- EPA: In favor of caps.
- State/EB: In favor of caps.
- Treasury: In favor of caps.

The group's views on the other issues are:

1. A two-part system that treats backward-looking reductions separately is preferred.
2. *First Come First Served, "Truing Up" at End of Period, and Competitive Allocation:* If caps are adopted, all believe that giving credit on a first-come-first-served basis is far superior to an ex-post true up. There was some support for a possible a set-aside to be used for competitive allocations.
3. *What is the Appropriate Measure for Early Credit?:* There was no consensus regarding whether emissions levels, emissions rates, or project-by-project evaluation should be adopted. The general feeling was that flexibility is probably needed to accommodate differences across sectors but the group agreed that individual firms should not be allowed to choose the most advantageous option from a menu.
4. *Options for Defining the Baseline:* The consensus of the group is that either changes from a starting point or changes from a projected reduction schedule is the preferred option and that some scope be allowed for a predefined set of eligible actions or technologies. Changes from business as usual is agreed to be an unacceptable option because of problems in defining what emissions would have been under business as usual.
5. *The Scope of Emissions Measurement:* The group recognizes that allowing credit for both direct and indirect emissions is necessary for a variety of industries to participate. The consensus of the group is that care needs to be taken to insure that emission reductions are not double counted and that administrative burdens do not escalate.
6. *Universal vs. Industry-Specific Programs:* Again, the group recognizes that industry-specific programs are necessary if a variety of industries is to participate. The consensus of the group is that, while some variation in the design of the program across industries is necessary and desirable, individual firms should not have the opportunity to choose the most advantageous from a menu of options.

Principles and Design Issues for an Early Credit Mechanism

President Clinton promised in his October 1997 speech that companies that "showed the way" in reducing emissions early would receive appropriate credit for their efforts. The Administration is committed to assuring that firms will not be penalized for acting early and is exploring ways to provide positive incentives to reduce emissions through voluntary, cost-effective measures. An early credit mechanism, while complementing efforts to reduce emissions through a cap and trade program during the commitment period, should not restrict or prejudice the design of the cap and trade program or other aspects of implementation of greenhouse gas policies.

Why Early Credit?

- To reduce the costs to the U.S. economy of compliance with the Kyoto Protocol. Economic costs are minimized when firms adjust to their required changes in production patterns over time, rather than suddenly in 2008. By acting early, firms can incorporate carbon considerations into their natural pattern of capital turnover. New technologies can help lower compliance costs. An early credit program can reward pioneers and risk takers who develop, implement, and disseminate these new technologies.
- To provide the environmental benefit of earlier emissions reductions. The ultimate concentration of greenhouse gasses in the atmosphere determines global warming, so there are benefits to reducing the flow of emissions in years prior to the commitment period. To the extent that an early credit mechanism reduces pre-2008 emissions below what they would otherwise have been, we reap these benefits (and any ancillary, e.g., air quality and health-related benefits).

Guiding Principles for Early Action Mechanisms

Any mechanism for providing credit for early action should:

- be comprehensive, covering any gas, source, sector, and sink
- be predictable, understandable, and not impose undue administrative burden
- provide fair reward for real environmental gain
- have broad appeal to both historic and future emitters
- minimize free riders
- be transparent to the public
- avoid prejudging the design of a future domestic cap-and-trade system

No Penalty for Early Action in the Design of the Ultimate Climate Change Program

When the domestic cap-and-trade program is eventually implemented, it must be designed in a way that does not penalize those who acted early to reduce emissions. Regardless of whether an early action program is adopted, designing a climate change program that does not penalize early action is imperative in order to avoid perverse incentives.

There are at least three ways to make sure that those acting early to reduce greenhouse gas emissions will not be penalized. It would not be necessary to specify what means would be chosen, but only to provide assurances that the approach ultimately adopted will not penalize early action.

- *Baseline protection.* If emissions allowances were allocated according to a formula based on firms' past emissions, two mechanisms could be used to avoid penalizing firms that acted early.
 - The first would be to choose a reference year for the allocation formula (the baseline) that is early enough not to penalize early action. The exact year is subject to discussion, but years before 1999 could lead to potentially large data difficulties.
 - The second would be to use a future year to determine the allocation (for example, a year between 1999 and 2007), and add back into each firm's baseline any emissions reductions that were achieved through certified early actions. This approach would avoid the data problems inherent in using past baseline years, and would build instead on the monitoring and verification requirements of the early credit system.
- *Performance standards.* If emissions allowances were allocated according to some performance-based benchmark, the standard could be set without reference to historical performance or the reference year for the standard could be set early enough so as not to penalize early action.
- *Auction.* If emissions allowances were allocated by auction, there would be no penalty for early action. Firms would only need to purchase enough permits to cover their emissions. Acting early will reduce the amount that they would need to purchase.

Credits for Early Action

Even if the ultimate climate change program does not penalize reductions prior to the first budget period, positive rewards could be given to those who take early action to reduce emissions.

- *Credits for early actions.* Explicit credits could be allocated for actions taken before

2008. These credits could be redeemed in some fashion for permits in 2008.

- The total quantity of permits that are given away through an early credit mechanism would be subtracted from the amount of permits allocated in the first budget period through other mechanisms. But it is important to recognize that an early credit mechanism would not affect our assigned amount for the first commitment period. It would only affect the distribution of the assigned amount by shifting some permits from those who would otherwise have been allocated permits in the first budget period to those who took early actions.
- Credit for early action and an allocation mechanism that does not penalize early action could be combined in some way.

A Two Part Early Credit System

We could implement a two-part early action system.

- In the first part, we could give credit for actions taken before the system is announced. If there is a limit to the quantity of credits available in an early action program, there could be a separate cap for this period. This part would rely on the best available data from firms for the past, and could involve auditing firm-specific reports on emissions.
- In the second part, we could give credit for actions taken after the mechanism has been announced but before 2008. If caps are adopted, this part could have its own cap, but the value of that cap may depend on the level of early credits claimed for the first period. Before the beginning of the second part, we could establish a consistent data reporting system to ease the monitoring and measurement of early credit.

Issues with an Early Credit System

Our goal should be to adopt baselines and other participation rules which assure that the early credit program will leverage real change in the country's emissions path. To accomplish this, we will have to find a balance between the goals of maximizing the change from "business as usual" (BAU) emissions and maximizing the number of participants in the program. Overly lax criteria could result in large early credit awards for small real gains (the "anyway tons" problem). Overly stringent criteria could choke off participation; while each qualifying action would be a clear change from BAU, they would be too few overall to make a difference.

Several of the design issues (especially determining the appropriate measure for early credit and the baseline) raise the question of whether baselines refer to a firm or to some other unit (such as a plant). In addition they raise the corresponding questions (discussed below) of how to define an entity in a consistent way over time and deals with divestitures, mergers and acquisitions and how to deal with new entities.

Caps vs. an open-ended System

We could limit how many tons of early action credits are allocated (to reflect a given percentage of our five-year assigned amount), or we could place no upper limit on that number. This issue has significant interactions with other issues discussed below (e.g., baselines and criteria for eligible actions) and involves potential trade-offs:

- A limit would avoid the risk that the early credit system might over mortgage the allocation available for the first budget period. A limit would also impose discipline on pressures to adopt overly loose criteria, reducing the risk of allocating anyway tons: firms planning genuine actions would have an interest in disciplining efforts by others to get credit for actions that produce no benefit. In the worst case, a limit would "limit the damage" if the early credit rules turn out too lax and do not require real change from BAU. Finally, a capped system would reduce the risk that the early credit system would prejudice the ultimate allocation mechanism. Finally, a capped system would reduce the risk that the early credit system would prejudice the ultimate allocation mechanism.
- On the other hand, a cap -- especially a very small one -- could discourage genuine participation and real changes from BAU if it created the impression that there would not be enough credit available to reward all those who make reduce emissions.

First Come First Served, "Truing Up" at End of Period, and Competitive Allocation

If caps are adopted, there could be at least three alternatives for allocating credits, the first of which is preferred to the second.

- One alternative would provide credits that have a set, predetermined value (such as one credit equals one ton of emissions) and would allocate the credits on a first-come-first-served basis. This approach provides firms certainty over the value of their actions. It also addresses the greatest need of an early action system: to provide incentive for action when the policy/price signal is weakest. Under this system, businesses will earn credits in the near term years when future policy is most uncertain and the price signal is weakest.
- An alternative would "true up" the quantity of credits at the end of the period, by comparing the number of credits claimed with the level of the cap. The credits could, for example, be worth up to one ton each, and perhaps less if there are more credits claimed than the size of the cap. This creates uncertainty over the value of early action credits but does not run the risk that some might be excluded from the program because of binding caps.
- A third possibility is that a fixed quantity of credits could be available for allocation by competitive proposals. Potential participants could offer proposals that could be evaluated on the basis of their potential environmental gain.

What is the Appropriate Measure for Early Credit?

Emissions Levels: This is the ultimate metric for meeting our Kyoto targets. But this approach could reward firms for shrinking and penalize firms for growing, potentially creating difficulties with mergers or divestitures, and firm definition.

Emissions Rates (e.g., carbon per unit of output): This approach could appropriately adjust for changes in scale of business to reward firm efforts to reduce carbon intensity. But it doesn't solve problems with firm definition and could create additional difficulties with aspects of measurement (e.g., what is a unit of output?).

Project-by-Project Evaluation (akin to JI): This approach could limit problems with defining the firm, since it doesn't require firm-wide baseline measurement and emissions tracking (as project is evaluated assuming no change in other firms' behavior). But it could be administratively burdensome and non-comprehensive (if, for example, firms are able to claim credits for their activities that reduce emissions without claiming debits for activities that increase emissions).

Options for Defining the Baseline

Changes from Starting Point (reductions in emissions levels or rates from some base year credited for early action): This approach could provide relatively easy administration of the early action system, and it may make it relatively easy for firms to qualify because, for example, there is a naturally occurring level of emissions rate reductions over time.

Changes from Projected Reduction Schedule (e.g., firms only rewarded for early action if they reduce emissions rates by more than 1% per year): This remains relatively straightforward to administer, and could more tightly reward those firms that are truly increasing efficiency. But it may, for steep reduction schedules, limit the breadth of participation in an early action system and therefore potentially limit the economic and environmental gains.

Changes from Business As Usual (project business as usual trajectories for emissions levels or rates, and reward only improvements from those business as usual projections): This approach could account for changes in firm size and other developments over time that naturally affect emissions levels or rates. But it would likely introduce substantial administrative complexities.

Predefined set of eligible actions or technologies (set up a menu of actions that would be eligible to receive credit, e.g., improving the carbon efficiency of a boiler by a prespecified amount): This approach may be the easiest to administer, particularly for early action credits given for past actions. But it could run into potential administrative difficulties with "picking winners" (eligible actions or technologies), and may exclude legitimate but harder to define activities.

The Scope of Emissions Measurement

Direct and Indirect Emissions from Production: Direct and Indirect Emissions from Production: Firms could be given credit for reducing both direct emissions (those coming out of their stacks) and indirect emissions (those emissions occurring beyond the boundary of the firm as a result of the firm's activity). These indirect emissions reductions might be related to either upstream or downstream activities. Downstream, firms may want credits for reducing the carbon intensity of their products (for example, if an automobile manufacturer improves the mileage of its fleet sales). Upstream, firms that reduce electricity consumption may want credit for electric utility emission reductions. The question of whether to include these indirect emissions raises a tradeoff between comprehensiveness (including only direct emissions may preclude cost-effective indirect reduction opportunities) and administrative tractability (reporting indirect emissions could be very burdensome). It also raises difficult issues of double-counting across firms.

Universal vs. Industry-Specific Programs

An early credit mechanism could allow for industry-specific programs with potentially different measures, choices of baseline, and scope of emissions measurement or it could adopt a common set of choices on these design issues.

Data and Measurement Issues

Defining a Firm: Firm level, rather than plant level, measurement could provide a more comprehensive system of accounting for early action. If, for example, the full range of a firm's activities are not taken into account, early credit might be granted to units that are performing well on emissions or efficiency but not subtracted for units that are not. But environmental regulation is traditionally focused at the plant level, and firm-level measurement raises a host of new issues such as joint ownership of plants and mergers and divestitures.

Measuring Carbon Efficiency: The basic concept of carbon efficiency is to compare carbon utilization to production. If production is measured by dollars of sales, this is fairly straightforward; but dollars of sales has a number of problems, such as the fact that changes in market prices which have nothing to do with energy or carbon efficiency will change the measured efficiency. For example, how would we account for the fact that auto prices are rising over time while computer prices are falling. If production is measured by units of sales or production, we face a new issue of how to measure units when a company's product mix may be changing.

Measuring Emissions: Measuring emissions becomes more problematic looking back than looking forward. Emissions data looking back are not comprehensive and comparable data do not exist on emissions for all entities to whom permits may be allocated.

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF THE ADMINISTRATOR

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NOTES/COMMENTS:

As background for Bob Cumby's Wednesday meeting, please find attached an updated comparison chart for several early credit proposals and related bills.

Distribution List:

Name	Agency	Fax	Phone
David Gardiner	EPA	260-5155	
David Doniger	EPA	260-0275	
Joe Aldy	CEA	395-6870	
Victoria Greenfield	State	647-5713	
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Bob Cumby	Treasury	622-2633	

Early Reduction Credit Proposals

Issue	Center for Clean Air Policy <i>June 1998</i>	Credit for Voluntary Early Reductions Act (Chafee Proposal) <i>October 1998</i>	Environmental Defense Fund <i>March 1998</i>	Pew Center on Global Climate Change <i>October 1998</i>	Natural Resources Defense Council ERC Principles <i>February 1999</i>	Energy and Climate Policy Act of 1999 (Murkowski Proposal) <i>April 1999</i>	Coalition to Advance Sustainable Technology <i>April 1998</i>
Eligibility to Participate in Early Action Program	Large direct emitters of greenhouse gases, e.g. powerplants and large industrial boilers.	Any entity that enters into an early action agreement with the President – could include large direct emitters and manufacturers of end-use products.	Direct emitters and manufacturers of end-use products;	Not Addressed	Not Addressed	No restrictions on participation	Restricted to incorporated business entities with direct emissions.
Basis for Credits	Credits are earned against a declining baseline drawn between 1998 and 2008 emissions cap (7% below 1990 emissions levels); no credits for shutting down or selling facilities. Utilities would use generation performance standards (C/kWh). Alternative System – “Bounty Schedule” that lists a set of creditable actions and the quantity of credit that would be awarded for those actions.	Credits are earned when emissions fall below a firm's 1996-98 average annual emissions. Alternative baselines are possible if adequate historical data are unavailable. Sequestration projects use 1996-98 average carbon reservoirs as a baseline to credit net increases in carbon sequestration.	Credits are earned when emissions fall below a firm's 1996-98 average annual.	Program should stimulate real reductions. Recommends the use of baselines tied to current emissions and performance levels.	NRDC favors two approaches for awarding credits: <i>Baselines</i> set at recent historic levels that decline over time; or <i>Performance-based</i> approaches (e.g., carbon emissions per unit of output) that reward efficiency improvements, regardless of whether market share is expanding.	Murkowski legislative proposal would not award credit for early reductions.	Uses efficiency improvements measured by CO ₂ /\$ of sales to award credits (C/kWh for utilities). Participants must first exceed a 1% efficiency improvement baseline. A sliding scale would award 50% credit for annual efficiency improvements that exceed the baseline by 0.5%-1%, and award 100% credit for annual efficiency improvements that exceed the baseline by 2%
Funding of Early Action Pool	Withdrawn from the first GHG emission commitment period.	Withdrawn from U.S. international obligations	Withdrawn from the first GHG emission commitment period.	Withdrawn from the first GHG emission commitment period.	Withdrawn from the first GHG emission commitment period.	Not Applicable	Withdrawn from the first GHG emission commitment period.

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Size of Pool	5% of first budget period	No limit as long as the U.S. does not violate its international obligations.	Not Addressed	Program should limit the quantity of credit awarded.	Program should limit the quantity of credit awarded.	Not Applicable	No limits until allowances from the first budget period have been exhausted.
Treatment of Reductions under Energy Policy Act 1605b	Company's annual average of 1605b reductions is added to company's 1998 starting point. Policy decision required about "quality" of reductions.	Reductions reported to 1605(b) by the end of 1998, or reductions reported under CCAP, would be creditable if they are verifiable, not double counted, and represent actual reductions in GHG emissions or increases in net carbon sequestration	Not Addressed	The program should provide some form of recognition for past voluntary GHG reductions. However, only real, quantifiable, verified, Emissions reductions should not be double-counted.	Before awarding credits for actions in the 1605(b) registry, NRDC proposes that legislation be enacted to establish a procedure for evaluating the credibility of 1605(b) reductions.	Voluntary reductions would continue to be reported to the Voluntary Reporting Program (1605b) administered by DOE.	Not Addressed
Sequestration	Not Addressed	Creates credits for actions not covered under the Kyoto Protocol	Sequestration projects are eligible if accurate baselines can be established.	Not Addressed	NRDC believes that legislation should avoid awarding credits for sequestration activities that may not be recognized under the Kyoto Protocol.	Allows reporting of sequestration activities to the 1605(b) registry.	Not Addressed
USJI & CDM	Not Addressed	USJI projects approved before the 2000 would be eligible to receive credit under an early action agreement. Proposed legislation validates CDM credits.	Credits generated by CDM activities would turn into domestic emission allowances.	Domestic early action program should not recognize any foreign reductions unless they are reductions that will increase US emissions reductions.	Not Addressed	Not Addressed	Not Addressed

Early Reduction Credit Proposals

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Leakage	Not Addressed	Agreements must contain provisions to ensure only net emission reductions will be credited when emissions could be displaced to sources not covered by an agreement.	Companies claiming credits would be required to certify that such reductions were not the result of shifting production to locations outside the United States.	Not Addressed	NRDC believes that any proposed legislation should address the potential for activity shifting, reduced utilization, and changes in facility ownership.	Not Addressed	Not Addressed
Reporting of Emissions	Company-wide basis	Company-wide basis, but excludes small or diverse sources and sources with more than one owner.	Company-wide basis	Program should be flexible and tailored to the needs of the industry.	Company-wide basis	Flexible reporting – Participants may report emissions reductions at the project- or company-level.	Company-wide basis
Verification of Early Action	Not Addressed	Annual public reporting of emissions and third party verification.	Annual public reporting of emissions and third party verification.	The program should establish simple rules to avoid double counting and account for domestic leakage.	Not Addressed	Self-reporting, but legislation allows Secretary of Energy to promulgate stricter guidelines if deemed beneficial.	CAST would publish members' progress, protocols developed, and other benchmarking information.
Emissions Levels vs. Emissions Rates	Uses both levels and rates to measure emissions reductions	Emissions levels, but emissions rates can be used if appropriate.	Uses emissions rates for manufacturers of end-use equipment	Recommends use of emissions levels and emissions rates where appropriate.	NRDC prefers the use of emissions rates, but views emissions levels as an acceptable alternative.	Flexible baselines. Participants have great flexibility in choosing what metric to use in measuring their reductions	Uses emission rates per dollar of sales

Early Reduction Credit Proposals

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Mechanism for the Allocation of Early Credit	Emission allowances	Emission allowances	Emission allowances	Emission allowances	Primarily emissions allowances, but NRDC recognizes that early action legislation could take a number of forms (tax credits, pollution limits, etc).	Proposed legislation provides public recognition to reward early actors who reported to the 1605(b) program. Murkowski's legislative proposal would not grant formal credit.	Credits would be convertible into allowances, tax credits, or fair economic value in the incentive program implemented in 2008.

BASLINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS – Pros & Cons

sector-wide
1. Preset performance benchmarks based on actual emissions/unit of output The baseline or benchmark would always be in the form of emissions per unit of output (or quantity of sequestration per unit of output). This option requires identification of a fixed unit of output, such as kilowatt hours, and the ability to measure and verify fuel inputs or actual ghg emissions.

Pros

- Could be applied to all of electric power sector, and possibly certain industrial processes. (roughly 30% of ghg emissions)
- Can be designed to maximize additionality (minimize “free riders”).
- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to electric sector.
- The likely eligibility for early credits could be reliably predicted or limited
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for the allocation of allowances under a future domestic emissions trading system.

Cons

- Probably cannot be applied to most ghg emission sources outside the electric sector.
- Would not address electricity demand.

2. Preset performance benchmarks based on predicted emissions of specific technologies or categories of equipment This option requires establishment of a standardized procedure to measure the emissions per unit of output and typical usage of specific technologies or categories of equipment or buildings, and a means for independently verifying this measure (e.g., Federal fuel economy test procedures for light duty vehicles, combined with a typical usage factor).

Pros

- Can be easily applied to new light duty vehicles, most new residential and commercial appliances and equipment, and new homes, and may be applicable to certain categories of new commercial buildings, and industrial equipment and processes. (covers equipment that ultimately accounts for over 50% of energy demand)
- Enables focus on new technology
- Can be designed to maximize additionality (minimize “free riders”).
- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to sources already covered by Federal test procedures (e.g. light duty vehicles, appliances, equipment).
- The likely eligibility for early credits could be reliably predicted or limited.
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for allocating allowances under domestic trading system.

Cons

- Probably could not be applied to most industrial energy uses, heavy duty vehicles or non-vehicle transport energy use.
- Could not address operational efficiency or level of services/demand
- Could involve significant administrative costs and delays if applied to types of equipment or processes not yet covered by standardized test procedures.

3. Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output). Credits would be granted based on entity-specific improvements in their emissions per unit of output (e.g. dollars or tons of cement). For example, one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).

Pros

- Probably could be applied to most electric utilities, large private companies or public institutions.
- Addresses both technology and operational efficiency
- Minimal administrative costs and delays when applied to electric sector.
- Unlikely to constrain future options for allocation of emission allowances

Cons

- Probably too costly to apply to most small companies or consumers.
- Difficult to assure additionality or equitable treatment of beneficiaries, because of large variations in efficiency history and trends of individual utilities, companies and institutions.
- Could be difficult and costly to establish benchmarks and to verify changes in performance of multi-product/service companies.
- Could result in unintended market distortions, such as rewarding spin-offs or exports of ghg-intensive operations.
- Difficult to predict or to limit eligibility for early credits.

4. Entity-specific emission reductions (actual emissions) from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. For example, a company or utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

Pros

- Could be applied to any entities that maintain verifiable records of energy use or ghg emissions.
- Addresses total emissions directly
- Modest Federal administrative costs when applied to large entities/energy users.

Cons

- Probably too costly to apply to most small companies or consumers
- Impossible to assure additionality or equitable treatment of beneficiaries, because of large

- variations in emissions history and trends of individual utilities, companies and institutions.
- Would result in unintended market distortions, such as rewarding downsizing and spin-offs or exports of ghg-intensive operations.
 - Impossible to predict or to limit likely eligibility for early credits.

for same reason, this applies to all options
likewise small other options

Conclusions

Options 1 and 2, neither of which are based on historical baselines of emissions or energy use, appear to have the most desirable attributes when evaluated using the full range of criteria identified.

In combination, options 1 & 2 could cover a significant majority of all sources, but probably could not address operational efficiency (or level of service) outside the electricity sector. In addition, it would be difficult to apply either option to much of the industrial sector or to the transport energy uses other than light duty vehicles.

Option 3 might be able to be used to provide broader coverage of the industrial sector, and possibly the other parts of the transport sector.

Option 4, which relies exclusively on historical baselines of emissions or energy use, appears to be undesirable from numerous perspectives.

Next Steps

Viable sector-specific options will be identified and assessed. These sector-specific options will be based generally on options 1 and 2, but will also include the possible application of option 3 to large corporate entities or public institutions.

BASELINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS – Pros & Cons

1. Preset performance benchmarks based on actual emissions/unit of output The baseline or benchmark would always be in the form of emissions per unit of output (or quantity of sequestration per unit of output). This option requires identification of a fixed unit of output, such as kilowatt hours, and the ability to measure and verify fuel inputs or actual ghg emissions.

Pros

- Could be applied to all of electric power sector, and possibly certain industrial processes. (roughly 30% of ghg emissions)
- Can be designed to maximize additionality (minimize “free riders”).
- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to electric sector.
- The likely eligibility for early credits could be reliably predicted or limited
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for the allocation of allowances under a future domestic emissions trading system.

Cons

- Probably cannot be applied to most ghg emission sources outside the electric sector.
- Would not address electricity demand.

2. Preset performance benchmarks based on predicted emissions of specific technologies or categories of equipment This option requires establishment of a standardized procedure to measure the emissions per unit of output and typical usage of specific technologies or categories of equipment or buildings, and a means for independently verifying this measure (e.g., Federal fuel economy test procedures for light duty vehicles, combined with a typical usage factor).

Pros

- Can be easily applied to new light duty vehicles, most new residential and commercial appliances and equipment, and new homes, and may be applicable to certain categories of new commercial buildings, and industrial equipment and processes. (covers equipment that ultimately accounts for over 50% of energy demand)
- Enables focus on new technology
- Can be designed to maximize additionality (minimize “free riders”).
- Can be designed to treat all beneficiaries equitably.
- Minimal administrative costs and delays when applied to sources already covered by Federal test procedures (e.g. light duty vehicles, appliances, equipment).
- The likely eligibility for early credits could be reliably predicted or limited.
- Is unlikely to result in unintended market distortions
- Is unlikely to constrain options for allocating allowances under domestic trading system.

Cons

- Probably could not be applied to most industrial energy uses, heavy duty vehicles or non-vehicle transport energy use.
- Could not address operational efficiency or level of services/demand
- Could involve significant administrative costs and delays if applied to types of equipment or processes not yet covered by standardized test procedures.

3. Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output). Credits would be granted based on entity-specific improvements in their emissions per unit of output (e.g. dollars or tons of cement). For example, one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).

Pros

- Probably could be applied to most electric utilities, large private companies or public institutions.
- Addresses both technology and operational efficiency
- Minimal administrative costs and delays when applied to electric sector.
- Unlikely to constrain future options for allocation of emission allowances

Cons

- Probably too costly to apply to most small companies or consumers.
- Difficult to assure additionality or equitable treatment of beneficiaries, because of large variations in efficiency history and trends of individual utilities, companies and institutions.
- Could be difficult and costly to establish benchmarks and to verify changes in performance of multi-product/service companies.
- Could result in unintended market distortions, such as rewarding spin-offs or exports of ghg-intensive operations.
- Difficult to predict or to limit eligibility for early credits.

4. Entity-specific emission reductions (actual emissions) from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. For example, a company or utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

Pros

- Could be applied to any entities that maintain verifiable records of energy use or ghg emissions.
- Addresses total emissions directly
- Modest Federal administrative costs when applied to large entities/energy users.

Cons

- Probably too costly to apply to most small companies or consumers
- Impossible to assure additionality or equitable treatment of beneficiaries, because of large variations in emissions history and trends of individual utilities, companies and institutions.

- Would result in unintended market distortions, such as rewarding downsizing and spin-offs or exports of ghg-intensive operations.
- Impossible to predict or to limit likely eligibility for early credits.

Conclusions

Options 1 and 2, neither of which are based on historical baselines of emissions or energy use, appear to have the most desirable attributes when evaluated using the full range of criteria identified.

In combination, options 1 & 2 could cover a significant majority of all sources, but probably could not address operational efficiency (or level of service) outside the electricity sector. In addition, it would be difficult to apply either option to much of the industrial sector or to the transport energy uses other than light duty vehicles.

Option 3 might be able to be used to provide broader coverage of the industrial sector, and possibly the other parts of the transport sector.

Option 4, which relies exclusively on historical baselines of emissions or energy use, appears to be undesirable from numerous perspectives.

Next Steps

Viable sector-specific options will be identified and assessed. These sector-specific options will be based generally on options 1 and 2, but will also include the possible application of option 3 to large corporate entities or public institutions.

	Not Based on Historical Emissions	Does Not Credit Output Reductions	Coverage	New Electric Generators	Existing Generators	Light Duty Vehicles	Other Transport	Appliances & Equip.	New Buildings	Existing Buildings	Manufacturing Plants/Processes	Sinks	Corporate Entities & Institutions	Consumers	Technology v. Operations	Additionality	Equity	Few Admin Costs/Delays	Few Market Distortions	Ability to Predict Eligibility	Future Options Open
<u>1. Benchmarks based on actual performance</u>						0	0	0	?	0	?		0	0	T&O						
<u>2. Benchmarks based on predicted performance and use</u>					0		?				?				T						
<u>3. Entity-specific performance benchmarks</u>	0						0	0	0	?		0	?	0	T&O	?	0	?	?	?	?
<u>4. Entity-specific emission reductions</u>	0	0		0		0	?	0	0					?	O	0	0	?	0	0	0

Criteria (each option evaluated relative to other options):

- **Coverage/Participation:** Potential coverage of sources/sinks and likelihood of broad participation
- **Technology or Operational Focus:** Would the option tend to focus entities on technology investments or operational changes.
- **Additionality:** Ability to maximize additionality, and minimize free riders and double counting
- **Equity:** Ability to provide comparable rewards for comparable actions (equity)
- **Administrative Costs/Delays:** Ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program
- **Market Distortions:** Ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners.
- **Ability to Predict Eligibility:** Ability to reliably predict the number of credits which entities are likely to be eligible to receive based on specific assumptions about the benchmarks or baselines to be used in determining eligibility.
- **Future Options:** Ability to maximize (not limit) future options for domestic allocation of emission allowances

Sectoral Sources/Sinks for Carbon and Other Greenhouse Gas Emissions

- Electric Utilities
 - New powerplants
 - Combined Heat and Power
 - Existing
- Manufacturing Industries
 - New Plants/Industrial Processes
 - Industrial Equipment
 - Existing Plants/Industrial Process
 - Key Industries
 - Iron & Steel
 - Chemicals
 - Oil & Gas
 - Cement
 - Pulp and Paper
 - Aluminum
 - Magnesium
 - Semiconductors
 - Utility transformers
 - Inflatables
 - CHP
 - Military/AWACs
- Buildings
 - New buildings
 - New appliances/equipment
 - Existing buildings
- Government
 - Buildings
 - Other
- Transportation
 - New light duty motor vehicles
 - New heavy duty motor vehicles
 - Existing vehicles/vmt
 - Non-highway transportation sources
- Agriculture/Forestry Sources and Sinks

Relevant Characteristics of the Cement Sector

- In 1997, approximately 80 million tons of cement were produced at 118 plants owned by 47 companies in the U.S., with a value of \$6.5 billion.
- Each ton of cement manufactured results in roughly a ton of CO₂ emissions; half of which are from energy use and half from calcination (CO₂ released when the limestone is heated to make cement).
- Cement production is the most energy-intensive manufacturing process in the U.S., however the average energy intensity declined by approximately 1.5% per year between 1974 and 1996.
- Over the last twenty five years the industry has shifted away from natural gas to coal (in 1972, natural gas represented 45% of the fuel mix and coal made up 36%; by 1996, natural gas had declined to 7% and coal had risen to 74%), resulting in more carbon emissions.
- Due to the concentrated nature of the industry, the likely recipients of early credits will be similar for all of the crediting options with any differences generally being a function of the age and technology of a plant.
- There are a limited number of technologies available to reduce energy use in the industry. This, in conjunction with a limited number of agents, indicates that the political process will result in similar outcomes for both of the preset performance benchmark crediting options.

Preset Performance Benchmarks

- One technology option for reducing carbon emissions is the production of blended cement, incorporating with materials like fly ash and blast-furnace slag. Other countries allow cement to consist of up to 5% of these materials, but the U.S. currently differentiates between blended cement and portland cement (which is required for most applications). Blending reduces the carbon emissions from calcination in equal proportion to the amount of blending materials.
- Between 1999 and 2010, the use of blended cement would result in a reduction in carbon emissions of 12.3 million tons by the industry.

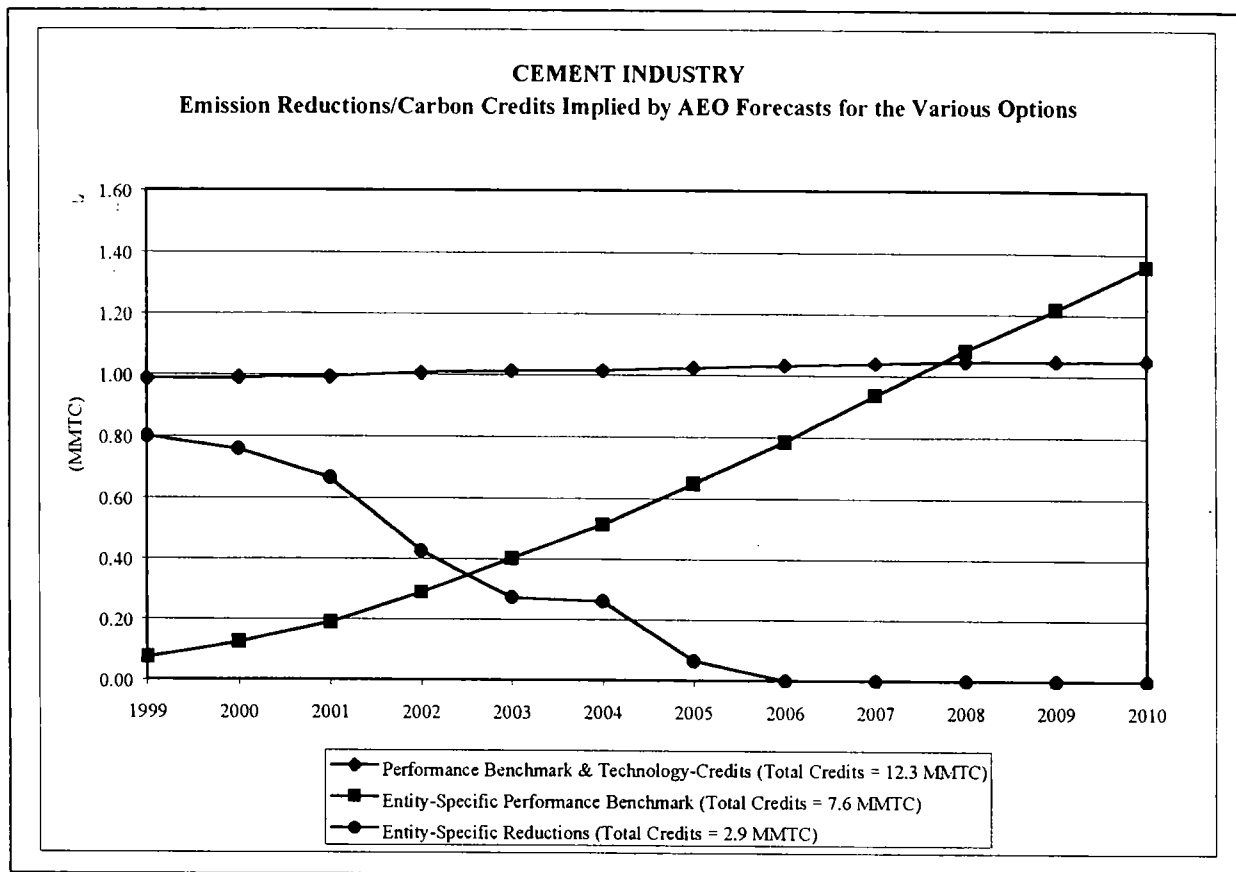
Entity-Specific Performance Benchmarks

- The EIA predicts that energy efficiency in the cement industry will improve by 1.2% per year between 1999 and 2010. Using entity-specific performance benchmarks based on historical emissions per unit of output implies that credits will be granted for these expected improvements.
- Between 1999 and 2010, these predicted energy-efficiency improvements would result in a reduction in carbon emissions of 7.6 million tons by the industry.
- This figure represents a lower bound on the number of credits granted under this option, in the absence of additional actions by the industry.

Entity-Specific Emission Reductions

- Combining the EIA predictions for energy efficiency with their expectations about cement production in the future gives the carbon reductions beyond those that historically (an average for 1997-1998).
- Expected improvements in energy intensity cause carbon emission reductions, while expected increases in output cause carbon emission increases.
- Between 1999 and 2010, these forecasts of future production and shifts in fuel mix imply that the cement industry would be granted 2.9 million carbon credits.
- This figure represents a lower bound on the number of credits granted under this option, in the absence of additional actions by the industry.

Figure 1



DRAFT

Early Credit for Light Vehicle Manufacturers

What activities could result in early credit?

There are several possible ways that early credits could be structured in the light vehicle industry. The major early credit options include the following:

Preset or entity specific performance benchmarks

1. Improvements in the fuel economy of the new vehicle fleet
 - a) improvements in average fuel economy
 - b) improvements in the fuel economy of individual vehicles
2. Increased sales of vehicles that use lower-carbon fuels (in lieu of vehicles that use gasoline)

Preset technology-specific credits

3. Sale of new vehicles using specified technology

Any baseline/benchmark option

4. Reductions in fuel used or increases in efficiency of manufacturing and assembling facilities
5. Reductions in the gasoline combusted in vehicles on the road

Actions 1, 2, and 3 both entail changes that manufacturers could make in the mix of new vehicles that they sell each year. Action 4 is not discussed further here, as it is more appropriate in a discussion of early credit for industrial or commercial buildings. Action 5 requires that auto manufacturers have some way to affect the behavior of individual drivers.

For those actions that involve the fuel efficiency of the new vehicle fleet, the only way to ensure that early credits reflect real reductions is to require that any fuel economy improvements be above and beyond CAFE. Otherwise, any improvements in the fuel economy of individual vehicles would likely be offset by increased sales of lower fuel economy vehicles. Nevertheless, it may be desirable to provide auto manufacturers with an incentive to significantly increase the fuel economy of individual vehicles and/or introduce leapfrog technology via early credits.

How could early credit tons and baselines be established for each type of action?

Improvements in the average fuel economy of the new vehicle fleet

Calculating early credit tons

To calculate tons of carbon based on fuel economy information, we need good baseline and new vehicle fuel economy data, sales data, and activity data (i.e., vehicle miles traveled). Good data exist on fuel economy of the new vehicle fleet of each manufacturer, and the number of vehicles sold. Currently, EPA certifies the fuel economy of each new vehicle sold and receives sales information from the manufacturers. DOE uses this data to calculate each manufacturer's fleet average fuel

economy (separately for cars and light trucks) to determine compliance with Corporate Average Fuel Economy (CAFE) standards. Therefore, it is relatively easy to track improvements from baseline average fuel economy of each manufacturer's new vehicle fleet.

The fuel economy data collected for the purpose of CAFE compliance is in terms of miles per gallon. For calculating early credits, this metric should be converted into tons of carbon per mile (requiring carbon emissions factors for each type of fuel, which is readily available). This allows for comparison among fuels (important for the alternative fuel option described below) and avoids problems related to harmonic averaging.

The more difficult step is translating average fuel economy improvements into tons of carbon reduced. To do this, we need to know how many miles each vehicle is driven, and over what period of time. There is at this time no way to accurately track vehicle miles traveled (VMT), particularly not on a vehicle-by-vehicle basis. There is, however, reasonably good data on the nationwide average VMT per car and light truck. There is also good reason to believe that, on average, differences in VMT are as great within a manufacturer's fleet as between different manufacturers. Therefore, we could develop a formula for converting CAFE improvements into tons by stipulating a certain yearly VMT that applies to all manufacturers (and which could be different for cars and light trucks), e.g., 12000 miles per year.

We still face the question of how many years of VMT to include. Assigning each new vehicle the tons associated with its full lifetime of use (roughly 15 years) would ensure that the manufacturer gets credit for all the carbon reduced, but would also give credit in year 1 for carbon that will not be reduced until future years. Table 1 illustrates the impact of choosing different VMT scenarios on what the manufacturers must do to reduce one ton of carbon, under the scenario that the fleetwide fuel economy average improves by 1 mpg.

Table 1--Effect of Years of VMT Credited for a 1 mpg Improvement

years of VMT	1	5	10	15
cars at 28.5 mpg				
reduction in gallons/veh	15.31	76.56	153.11	229.67
Reduction in lbs C/veh	83.51	417.57	835.15	1252.72
Reduction in metric tons C/veh	0.04	0.19	0.38	0.57
# vehs needed to be sold for 1 mMTc reduction	26,342,708	5,268,542	2,634,271	1,756,181
light trucks at 21.7 mpg				
reduction in gallons/veh	26.71	133.57	267.15	400.72
Reduction in lbs C/veh	145.72	728.58	1457.17	2185.75
Reduction in metric	0.07	0.33	0.66	0.99

tons C/veh				
# vehs needed to be sold for 1 mMTc reduction	15,097,775	3,019,555	1,509,778	1,006,518

Establishing the baseline

There are two options for establishing the baseline for this option: (1) applying the same CAFE standard to all manufacturers; and (2) using each manufacturer's actual fuel economy level from a specific year or average of years. For many years, all of the major manufacturers have hovered fairly close to the CAFE standards. Still, choosing the manufacturer-specific baseline approach would mean that Honda's slightly better-than-CAFE average, for example, would start them off at a disadvantage relative to the domestic companies. Conversely, using the CAFE standards as the baseline would give Honda a relative advantage. Table 2 shows the CAFE status of each major manufacturer as of 1998.

Table 2—Model year 1998 Fuel Economy Performance (fleetwide miles per gallon) by Manufacturer

Manufacturer	Passenger Cars	Light-Duty Trucks (vans, minivans, SUVs, pickups)
DOMESTIC		
Chrysler	28.7	20.5
Ford/Mazda	27.6	20.1
GM	27.8	21.1
Honda	29.5	--
Nissan	29.9	--
Toyota	28.6	--
Domestic Sales-Weighted Average	28.0	20.5
IMPORT		
BMW	25.2	--
Chrysler	25.8	--

Fiat	13.4	--
Ford/Mazda	29.5	--
GM	28.9	--
Honda	34.6	27.1
Hyundai	31.5	--
Isuzu	--	21.4
Kia	30.6	23.7
Land Rover	--	17.2
Mercedes-Benz	27.1	21.3
Mitsubishi	29.7	22.5
Nissan	30.7	22.2
Porsche	24.5	--
Subaru	27.6	--
Suzuki	35.8	27.2
Toyota	30.7	23.5
Volvo	25.7	--
Volkswagen	28.7	--
Import Sales-Weighted Average	29.9	22.9
Total Fleet Average	28.7	20.9
Fuel Economy Standards	27.5	20.7

Improvements in the fuel economy of individual vehicles

Calculating early credit tons

For each model for which fuel economy was improved by a minimum specified amount (e.g., 2X), reductions could be calculated based on sales of the model and stipulated VMT. However, these reductions may be offset by increased sales of lower fuel economy vehicles.

Establishing the baseline

The baseline for this option would be historic average (or otherwise standardized) fuel economy of

each vehicle class.

Increased sales of vehicles that use lower-carbon fuels (in lieu of vehicles that use gasoline)

Calculating early credit tons

Just as data are collected on the fuel economy of new vehicles, so are data on the number and type of vehicles that use alternative fuels. For those fuels that have lower carbon emissions per unit combusted, the reduced emissions could be factored into the tons early credit calculation. Including alternative fuels in this way would give manufacturers an incentive to sell more alternative fueled vehicles. It would be important that only those vehicles that are dedicated alternative fueled vehicles are included for the purposes of early credit. Dual and flex fuel vehicles may use only gasoline, or only rarely use the alternative fuel.

Establishing the baseline

The baseline could be manufacturer specific, or an industry average based on total sales of dedicated alternative fueled vehicles in a certain year.

Sale of new vehicles using specified technology

An example includes certain hybrid vehicles, as in the current tax credit proposal.

Calculating early credit tons

Reductions under this option, if any, would be highly uncertain. If the technology requirement is coupled with a fuel economy requirement, reductions could be calculated in the same way as for improvements in the fuel economy of individual vehicles.

Establishing the baseline

The baseline options are essentially the same as those for improvements in the fuel economy of individual vehicles.

Reductions in the gasoline combusted in vehicles on the road

There are two ways in which reductions in carbon emissions from vehicles on the road could be achieved: through reductions in VMT and through scrappage programs. VMT reductions require that individual drivers change their behavior and would be very difficult for vehicle manufacturers to achieve and, perhaps more importantly, to demonstrate. It is possible that large fleet managers could implement programs to reduce the VMT of their fleet, but again these reductions would be difficult to demonstrate. Such reductions would also be difficult to enforce.

Scrappage programs are under the control of vehicle manufacturers, but the reductions from such programs are very uncertain. Any reductions depend on the behavior of the individual drivers that participate in the programs. These drivers may not switch to lower emitting vehicles, and/or may have intended to scrap their vehicles without the program.

**BASELINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS IN
NEW RESIDENTIAL BUILDINGS**

1. Preset performance benchmarks. Projections of energy use per square foot (psf) for space conditioning and water heating in new homes could be the basis for crediting further reductions. Because of likely continued electrification of homes, translation of energy use psf into carbon emissions is likely to require use of estimated future home energy mixes. Regional variations would probably be necessary to reflect climate and fuel use differences already found within the US. Four regions would probably largely capture this regional variation. Measurement of energy savings compared to this baseline could be based on DOE's draft Home Energy Rating System (HERS) for documenting energy performance. Credits would accrue to the builder.

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation). This option is applicable to all construction types and regions (although highly unusual materials or designs might be difficult to verify) for all new residential buildings of less than 3 stories. HERS guidelines were developed by consensus and are already used in many states. The energy savings reported by HERS are tied to the 1992 Model Energy Code for ease of use by builders and the benchmark energy use psf could similarly be converted to a HERS rating that builders would understand.
- **Technology or Operational Focus** (would the option tend to focus entities on technology investments or operational changes): This approach would tend to focus the incentives offered on investments in new technology, rather than operational improvements. The more sophisticated HERS raters are capable of documenting energy savings associated with building design improvements and construction techniques, as well as product and technology choices used the home. This allows for coverage of energy savings options such as passive solar design that are hard to incorporate in many other policy approaches.
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting): By incorporating expected energy efficiency improvements in the benchmark, this approach would help focus credits on actions that would result in additional savings. Double-counting would be minimized by removing from the allowed credits any credits already associated with those appliances and equipment included in the HERS rating (such as water heaters).
- **Equity** (ability to provide comparable rewards for comparable actions): Absent an equivalent existing home provision, these credits would likely accrue predominantly to those who can afford new homes, or the builders thereof. It is possible that incorporation of new energy saving features in homes increases employment in this sector, including in the skilled trades.

- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program). Minimum. This provision could be implemented within months. Some effort would have to be made to augment the existing draft HERS guidelines to reflect the future carbon-content focus of the credits, as well as to provide for certification of the performance of HERS providers. It would likely also be necessary to include required testing for air infiltration as a part of the HERS rating, since this is a large source of unrealized expected energy savings. Administrative costs include the costs of certifying raters and verifying accuracy. The latter costs are minimized by random testing of the rated performance.
- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners). This approach would be technology neutral because it is performance-based, rather than technology-specific.
- **Ability to Predict (and limit) Eligibility** About 1 % of housing stock is built each year as new or replacement housing. Total credits could be limited in one of two ways. First, some increment above the projected average efficiency could be used (e.g., instead of a required rating of 90, the required rating could be 95). (Because each HERS rating costs about \$300, it is unlikely that applications for credits would be made for homes that barely exceeded the benchmark anyway.)
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances). This approach is unlikely to affect the future distribution of emission allowances.



"Friedrichs, Mark" <Mark.FRIEDRICHS@hq.doe.gov>

06/21/99 01:56:46 PM

Record Type: Record

To: See the distribution list at the bottom of this message

cc:

Subject: RE: Wednesday, 10 AM meeting?

Based on the responses I've received already, I think we should stick with the Wednesday, 10 am meeting (7C-034 Forrestal, 1000 Independence Ave., S.W.).

I will plan to put EPA Ann Arbor on the speaker phone.

Please try to circulate sectoral assessment drafts sometime tomorrow to give others a chance to review before the meeting, otherwise bring copies to the meeting. Thanks.

-----Original Message-----

From: Friedrichs, Mark

Sent: Monday, June 21, 1999 12:01 PM

To: Cindy Jacobs (E-mail); Dowd, Jeff; Janice Mazurek (E-mail); Jean Luppinacci (E-mail); Jeanne Briskin (E-mail); Kevin James (E-mail); Krishna Chivukula (E-mail); Lisa Snapp (E-mail); Martin Ross (E-mail); McNUTT, Barry; Michael Shelby (E-mail); Quindi Franco (E-mail)

Subject: Wednesday, 10 AM meeting?

Importance: High

The higher level interagency group discussing Early Crediting issues in general met on Thursday and will meet again this afternoon at 3 pm.

I summarized the work of our group to date (the identification of options, criteria and sectors, and the initial assessment of the options using the criteria), and presented my draft pros and cons paper. Generally our work seem to be well received, although our approach to baselines and benchmarking differs from the approach taken by many up to now.

The interagency group is trying to determine what the Administration should say about the specific contents of Senator Chaffee's bill. The need for more administrative/regulatory flexibility seems to be one theme.

I think our group should get together in the next few days. How many can make it at 10 am on Wednesday? Would 11 am on Thursday be better?

Before we meet I would like to receive initial drafts of some of the sector-specific analyses. Who expects to circulate something shortly?

Please let me know by return e-mail ASAP. Thanks.

Relevant Characteristics of the Cement Sector

- In 1997, approximately 80 million tons of cement were produced at 118 plants owned by 47 companies in the U.S., with a value of \$6.5 billion.
- Each ton of cement manufactured results in roughly a ton of CO₂ emissions; half of which are from energy use and half from calcination (CO₂ released when the limestone is heated to make cement).
- Cement production is the most energy-intensive manufacturing process in the U.S., however the average energy intensity declined by approximately 1.5% per year between 1974 and 1996.
- Over the last twenty five years the industry has shifted away from natural gas to coal (in 1972, natural gas represented 45% of the fuel mix and coal made up 36%; by 1996, natural gas had declined to 7% and coal had risen to 74%), resulting in more carbon emissions.
- Due to the concentrated nature of the industry, the likely recipients of early credits will be similar for all of the crediting options with any differences generally being a function of the age and technology of a plant.
- There are a limited number of technologies available to reduce energy use in the industry. This, in conjunction with a limited number of agents, indicates that the political process will result in similar outcomes for both of the preset performance benchmark crediting options.

Preset Performance Benchmarks

- One technology option for reducing carbon emissions is the production of blended cement, incorporating with materials like fly ash and blast-furnace slag. Other countries allow cement to consist of up to 5% of these materials, but the U.S. currently differentiates between blended cement and portland cement (which is required for most applications). Blending reduces the carbon emissions from calcination in equal proportion to the amount of blending materials.
- Between 1999 and 2010, the use of blended cement would result in a reduction in carbon emissions of 12.3 million tons by the industry.

Entity-Specific Performance Benchmarks

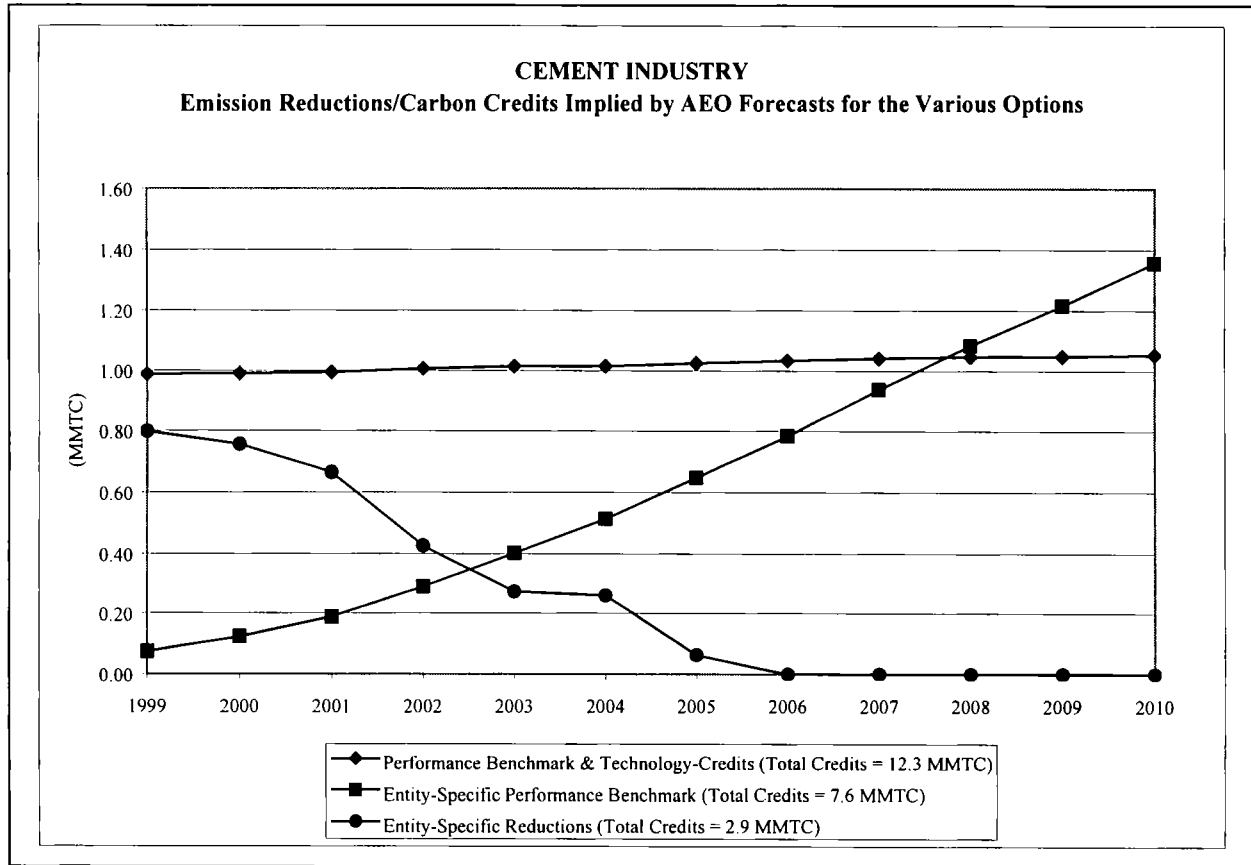
- The EIA predicts that energy efficiency in the cement industry will improve by 1.2% per year between 1999 and 2010. Using entity-specific performance benchmarks based on historical emissions per unit of output implies that credits will be granted for these expected improvements.
- Between 1999 and 2010, these predicted energy-efficiency improvements would result in a reduction in carbon emissions of 7.6 million tons by the industry.
- This figure represents a lower bound on the number of credits granted under this option, in the absence of additional actions by the industry.

Entity-Specific Emission Reductions

- Combining the EIA predictions for energy efficiency with their expectations about cement production in the future gives the carbon reductions beyond those that historically (an average for 1997-1998).
- Expected improvements in energy intensity cause carbon emission reductions, while expected increases in output cause carbon emission increases.
- Between 1999 and 2010, these forecasts of future production and shifts in fuel mix imply that the cement industry would be granted 2.9 million carbon credits.
- This figure represents a lower bound on the number of credits granted under this option, in the absence of additional actions by the industry.

?

Figure 1



? - Does this give credit to c/psf or total c used? ^{projected}

DRAFT, 5/28/99

MARY BETH ZIMMRMAN

BASLINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS IN NEW RESIDENTIAL BUILDINGS

1. Preset performance benchmarks. Projections of energy use per square foot (psf) for space conditioning and water heating in new homes could be the basis for crediting further reductions. Because of likely continued electrification of homes, translation of energy use psf into carbon emissions is likely to require use of estimated future home energy mixes. Regional variations would probably be necessary to reflect climate and fuel use differences already found within the US. Four regions would probably largely capture this regional variation. Measurement of energy savings compared to this baseline could be based on DOE's draft Home Energy Rating System (HERS) for documenting energy performance. Credits would accrue to the builder.

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation). This option is applicable to all construction types and regions (although highly unusual materials or designs might be difficult to verify) for all new residential buildings of less than 3 stories. HERS guidelines were developed by consensus and are already used in many states. The energy savings reported by HERS are tied to the 1992 Model Energy Code for ease of use by builders and the benchmark energy use psf could similarly be converted to a HERS rating that builders would understand.
- **Technology or Operational Focus** (would the option tend to focus entities on technology investments or operational changes): This approach would tend to focus the incentives offered on investments in new technology, rather than operational improvements. The more sophisticated HERS raters are capable of documenting energy savings associated with building design improvements and construction techniques, as well as product and technology choices used the home. This allows for coverage of energy savings options such as passive solar design that are hard to incorporate in many other policy approaches.
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting): By incorporating expected energy efficiency improvements in the benchmark, this approach would help focus credits on actions that would result in additional savings. Double-counting would be minimized by removing from the allowed credits any credits already associated with those appliances and equipment included in the HERS rating (such as water heaters).

Equity (ability to provide comparable rewards for comparable actions): Absent an equivalent existing home provision, these credits would likely accrue predominantly to those who can afford new homes, or the builders thereof. It is possible that incorporation of new energy saving features in homes increases employment in this sector, including in the skilled trades.

energy efficiency reduction - it is a credit to the owner, not the builder

- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program). Minimum. This provision could be implemented within months. Some effort would have to be made to augment the existing draft HERS guidelines to reflect the future carbon-content focus of the credits, as well as to provide for certification of the performance of HERS providers. It would likely also be necessary to include required testing for air infiltration as a part of the HERS rating, since this is a large source of unrealized expected energy savings. Administrative costs include the costs of certifying raters and verifying accuracy. The latter costs are minimized by random testing of the rated performance.

- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners). This approach would be technology neutral because it is performance-based, rather than technology-specific.

*no, we do not propose
to give credits based on
e/usage*

*However,
it does
not affect
buyer activity!*

- **Ability to Predict (and limit) Eligibility** About 1 % of housing stock is built each year as new or replacement housing. Total credits could be limited in one of two ways. First, some increment above the projected average efficiency could be used (e.g., instead of a required rating of 90, the required rating could be 95). (Because each HERS rating costs about \$300, it is unlikely that applications for credits would be made for homes that barely exceeded the benchmark anyway.)

*what does this
mean? as a % of total?*

*→ not the
actual
procedure?*

- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances). This approach is unlikely to affect the future distribution of emission allowances.

June 16, 1999

Options for Crediting Early Actions to Reduce GHG Emissions in Appliances and Equipment Used in Buildings

and size of the building and use of appliances therein.

Relevant Characteristics of Subsector: The ghg emissions associated with building energy use are determined by ⁴three factors: (1) the ghg intensity of the energy being used, (2) the efficiency of the appliances or equipment in which the energy is consumed; and (3) for space heating and cooling, the thermal efficiency and leakage of the building shell, the amount of mechanical ventilation and the efficiency of the distribution of the heating or cooling provided. All energy used in buildings is used in appliances or equipment, most of which is mass produced by product manufacturers. Most major building appliances and equipment are already covered by Federal minimum efficiency standards, based on Federally-established test procedures. Products exempted from such standards tend to be either small or custom made. While building energy use is universally metered, rarely is the energy used by specific types of equipment separately metered. Furthermore, because of the variability of energy uses and needs of individual building owners and occupants, there are no accepted measures of performance for existing buildings that could be based on actual energy consumption.

Setting Baselines or Benchmarks: Because energy use in appliances and equipment is not separately metered (and it would very costly to do so), early credits directed at such products would, almost certainly, have to be based on their estimated energy efficiency and expected usage. Efficiency is now estimated for all appliances and equipment covered by Federal labeling or efficiency standards requirements. Typical usage is estimated for most of these products as well.

Performance benchmarks that, if exceeded, would qualify new appliances and equipment for early credits could be set at levels designed to limit eligibility for credits, although it would be impossible to predict precisely how many qualifying products would be manufactured and sold.

Likely Recipients of Early Credits: It appears that the most viable option for granting early credits for energy efficient appliances and equipment would be to disperse credits directly to manufacturers based on the manufacture and domestic sale of qualifying new products.

Because tens of millions of major energy using products are purchased every year, and there are hundreds of millions of such products in U.S. homes, commercial buildings and institutions, it ^(is) unlikely to be practical to grant early credits directly to consumers or even commercial building owners. [For example, a single residential heat pump water heater might reduce greenhouse gas emissions over its useful life by approximately ___ tons of carbon equivalent. If a ton of carbon was valued at \$20, this would be might be worth \$___ at the time of purchase. In order for the government to grant this credit would require some form of application and dispersal procedure, which itself is likely to cost a comparable amount.]

It might be possible to disperse credits directly to very large purchasers, such as utilities and large companies or institutions, but it most early credits would still have to be dispersed to manufacturers. Since manufacturers could resell such credits to utilities or other large purchasers

Surely a credit system would be that much better.

as a condition of product purchases (or simply retain the credit for later sale in emission allowance markets), it appears to be unnecessary to for the Government to disperse any credits directly ~~to~~ *do consumers.*

453684 - AX - "reflect"

DRAFT

Early Credit for Light Vehicle Manufacturers

What activities could result in early credit?

There are several possible ways that early credits could be structured in the light vehicle industry. The major early credit options include the following:

Preset or entity specific performance benchmarks

1. Improvements in the fuel economy of the new vehicle fleet
 - a) improvements in average fuel economy
 - b) improvements in the fuel economy of individual vehicles
2. Increased sales of vehicles that use lower-carbon fuels (in lieu of vehicles that use gasoline)

could these be combined? - improved carbon economy of fleet.

Preset technology-specific credits

3. Sale of new vehicles using specified technology

Any baseline/benchmark option

4. Reductions in fuel used or increases in efficiency of manufacturing and assembling facilities
5. Reductions in the gasoline combusted in vehicles on the road

Actions 1, 2, and 3 both entail changes that manufacturers could make in the mix of new vehicles that they sell each year. Action 4 is not discussed further here, as it is more appropriate in a discussion of early credit for industrial or commercial buildings. Action 5 requires that auto manufacturers have some way to affect the behavior of individual drivers.

alternatively, credit could be given to owners of fleets - allow credits for reduced fuel use.

For those actions that involve the fuel efficiency of the new vehicle fleet, the only way to ensure that early credits reflect real reductions is to require that any fuel economy improvements be above and beyond CAFE. Otherwise, any improvements in the fuel economy of individual vehicles would likely be offset by increased sales of lower fuel economy vehicles. Nevertheless, it may be desirable to provide auto manufacturers with an incentive to significantly increase the fuel economy of individual vehicles and/or introduce leapfrog technology via early credits.

Point is fleet vs. ind. not CAFE.

How could early credit tons and baselines be established for each type of action?

Improvements in the average fuel economy of the new vehicle fleet

Calculating early credit tons

To calculate tons of carbon based on fuel economy information, we need good baseline and new vehicle fuel economy data, sales data, and activity data (i.e., vehicle miles traveled). Good data exist on fuel economy of the new vehicle fleet of each manufacturer, and the number of vehicles sold. Currently, EPA certifies the fuel economy of each new vehicle sold and receives sales

information from the manufacturers. DOE uses this data to calculate each manufacturer's fleet average fuel economy (separately for cars and light trucks) to determine compliance with Corporate Average Fuel Economy (CAFE) standards. Therefore, it is relatively easy to track improvements from baseline average fuel economy of each manufacturer's new vehicle fleet.

The fuel economy data collected for the purpose of CAFE compliance is in terms of miles per gallon. For calculating early credits, this metric should be converted into tons of carbon per mile (requiring carbon emissions factors for each type of fuel, which is readily available). This allows for comparison among fuels (important for the alternative fuel option described below) and avoids problems related to harmonic averaging.

The more difficult step is translating average fuel economy improvements into tons of carbon reduced. To do this, we need to know how many miles each vehicle is driven, and over what period of time. There is at this time no way to accurately track vehicle miles traveled (VMT), particularly not on a vehicle-by-vehicle basis. There is, however, reasonably good data on the nationwide average VMT per car and light truck. There is also good reason to believe that, on average, differences in VMT are as great within a manufacturer's fleet as between different manufacturers. Therefore, we could develop a formula for converting CAFE improvements into tons by stipulating a certain yearly VMT that applies to all manufacturers (and which could be different for cars and light trucks), e.g., 12000 miles per year.

We still face the question of how many years of VMT to include. Assigning each new vehicle the tons associated with its full lifetime of use (roughly 15 years) would ensure that the manufacturer gets credit for all the carbon reduced, but would also give credit in year 1 for carbon that will not be reduced until future years. Table 1 illustrates the impact of choosing different VMT scenarios on what the manufacturers must do to reduce one ton of carbon, under the scenario that the fleetwide fuel economy average improves by 1 mpg.

Table 1—Effect of Years of VMT Credited for a 1 mpg Improvement

years of VMT	1	5	10	15
cars at 28.5 mpg				
reduction in gallons/veh	15.31	76.56	153.11	229.67
Reduction in lbs C/veh	83.51	417.57	835.15	1252.72
Reduction in metric tons C/veh	0.04	0.19	0.38	0.57
# vehs needed to be sold for 1 mMTc reduction	26,342,708	5,268,542	2,634,271	1,756,181
light trucks at 21.7 mpg				
reduction in gallons/veh	26.71	133.57	267.15	400.72

Reduction in lbs C/veh	145.72	728.58	1457.17	2185.75
Reduction in metric tons C/veh	0.07	0.33	0.66	0.99
# vehs needed to be sold for 1 mMTCe reduction	15,097,775	3,019,555	1,509,778	1,006,518

Establishing the baseline

There are two options for establishing the baseline for this option: (1) applying the same CAFE standard to all manufacturers; and (2) using each manufacturer's actual fuel economy level from a specific year or average of years. For many years, all of the major manufacturers have hovered fairly close to the CAFE standards. Still, choosing the manufacturer-specific baseline approach would mean that Honda's slightly better-than-CAFE average, for example, would start them off at a disadvantage relative to the domestic companies. Conversely, using the CAFE standards as the baseline would give Honda a relative advantage. Table 2 shows the CAFE status of each major manufacturer as of 1998.

Table 2—Model year 1998 Fuel Economy Performance (fleetwide miles per gallon) by Manufacturer

Manufacturer	Passenger Cars	Light-Duty Trucks (vans, minivans, SUVs, pickups)
DOMESTIC		
Chrysler	28.7	20.5
Ford/Mazda	27.6	20.1
GM	27.8	21.1
Honda	29.5	--
Nissan	29.9	--
Toyota	28.6	--
Domestic Sales-Weighted Average	28.0	20.5
IMPORT		

BMW	25.2	--
Chrysler	25.8	--
Fiat	13.4	--
Ford/Mazda	29.5	--
GM	28.9	--
Honda	34.6	27.1
Hyundai	31.5	--
Isuzu	--	21.4
Kia	30.6	23.7
Land Rover	--	17.2
Mercedes-Benz	27.1	21.3
Mitsubishi	29.7	22.5
Nissan	30.7	22.2
Porsche	24.5	--
Subaru	27.6	--
Suzuki	35.8	27.2
Toyota	30.7	23.5
Volvo	25.7	--
Volkswagen	28.7	--
Import Sales-Weighted Average	29.9	22.9
Total Fleet Average	28.7	20.9
Fuel Economy Standards	27.5	20.7

Improvements in the fuel economy of individual vehicles

Calculating early credit tons

For each model for which fuel economy was improved by a minimum specified amount (e.g., 2X), reductions could be calculated based on sales of the model and stipulated VMT. However, these

reductions may be offset by increased sales of lower fuel economy vehicles.

Establishing the baseline

The baseline for this option would be historic average (or otherwise standardized) fuel economy of each vehicle class.

Increased sales of vehicles that use lower-carbon fuels (in lieu of vehicles that use gasoline)

Calculating early credit tons

Just as data are collected on the fuel economy of new vehicles, so are data on the number and type of vehicles that use alternative fuels. For those fuels that have lower carbon emissions per unit combusted, the reduced emissions could be factored into the tons early credit calculation. Including alternative fuels in this way would give manufacturers an incentive to sell more alternative fueled vehicles. It would be important that only those vehicles that are dedicated alternative fueled vehicles are included for the purposes of early credit. Dual and flex fuel vehicles may use only gasoline, or only rarely use the alternative fuel.

Establishing the baseline

The baseline could be manufacturer specific, or an industry average based on total sales of dedicated alternative fueled vehicles in a certain year.

Sale of new vehicles using specified technology

An example includes certain hybrid vehicles, as in the current tax credit proposal.

Calculating early credit tons

Reductions under this option, if any, would be highly uncertain. If the technology requirement is coupled with a fuel economy requirement, reductions could be calculated in the same way as for improvements in the fuel economy of individual vehicles.

Establishing the baseline

The baseline options are essentially the same as those for improvements in the fuel economy of individual vehicles.

Reductions in the gasoline combusted in vehicles on the road

There are two ways in which reductions in carbon emissions from vehicles on the road could be achieved: through reductions in VMT and through scrappage programs. VMT reductions require that individual drivers change their behavior and would be very difficult for vehicle manufacturers to achieve and, perhaps more importantly, to demonstrate. It is possible that large fleet managers could implement programs to reduce the VMT of their fleet, but again these reductions would be difficult to demonstrate. Such reductions would also be difficult to enforce.

Scrappage programs are under the control of vehicle manufacturers, but the reductions from such programs are very uncertain. Any reductions depend on the behavior of the individual drivers that

as do reductions in any of these options - it is the consumers living that makes!

gasoline used would be too hard to demonstrate.
+
as this is voluntary enforcement is an issue.

participate in the programs. These drivers may not switch to lower emitting vehicles, and/or may have intended to scrap their vehicles without the program.

Quindi C. Franco
06/22/99 03:40:18 PM

Record Type: Record

To: LISA SNAPP <SNAPP.LISA@epamail.epa.gov>
cc:
bcc: Records Management@EOP
Subject: Re: transportation early credits paper 

First of all, i appologize for not getting you comments earlier. I found the draft paper very usefull and learned a lot. A few general points and some specific comments (I've marked up a copy, so if that would help understand what i mean in places, send me a fax number):

+ Could options 1) and 2) be combined into "improved carbon economy of the new vehicle fleet"? If not, im not sure i understand how option 2 is distinct from option 3 where the "technology" is a non-gasoline vehicle.

+ The paper starts from the premise that credits will be provided to manufacturers. This may in fact be the case, but we may want to outline why this is so, or further develop an option that would encompass end-users (at least large fleet owners).

If you have any questions, or would like to discuss, please let me know.

Thanks,

Quindi Franco
202-395-3142

DETAILS:

p.1, 2nd text par.: "industrial or commercial buildings" -- i assume this is industrial processes? Suggest inserting the word "processes" or 'manufacturing' after industrial.

- Last sentence of this paragraph (action 5). An alternative way to look at this is to give credit to fleet operators, and allow credit for reduced fuel use. This does not require manufacturers to be able to do anything about driver behaviour.

p.1, 3rd par: This paragraph makes two distinctions -- crediting above CAFE, and crediting individual vehicles versus fleet averages. We do not understand why real reductions only occur above CAFE.

p.2, 2nd par: What is "harmonic" averaging? Should maybe put an explanation in a footnote?

p.2, 3rd par: You state that differences in VMT are important even within a manufacturer's fleet. Are they important enough that we should think of taking vehicle specific attributes into account for assigning credit? For example, if movement to more efficient vehicles induces more driving (the marginal cost has decreased), it would be incorrect to provide credit improvements based on a static VMT assumption. Is this important enough to worry about?

p.2, 4th par.: The question of how long to give credit for is common to most sectors and options (do you give buildings credit for their lifetime emissions saved or just the period until real trading starts?). This could possibly be pulled out to the overview piece?

p.5, second to last par.: I don't understand why it would be so hard to demonstrate reduced VMT of a fleet (a bunch of auditors checking odometers should be easy), nor why one would need to enforce any such changes in a voluntary program such as this.

LISA SNAPP <SNAPP.LISA@epamail.epa.gov>

I'm resending the transportation sector early credits paper that Cindy Jacobs and I wrote and routed around a while back. It's not in the format developed by Mark Friedrichs, but it answers many (not all!) of the same questions. I would appreciate comments on any of the concepts in it, if you have reactions.

I plan at some point (soon!) to rework this into the group's format, if that is the direction the group continues to take. But in the meantime, I would appreciate any feedback you might have.

Thanks.

 - EC_VEH~1.WPD

Office of Economic Policy

Department of the Treasury
Washington, D.C. 20220**FAX**Date: 5-13-99Number of pages including cover sheet: 4

	Name	Fax Number	Phone Number
To:	✓ Mark Friedrichs	586-3047	
	✓ Jeff Dowd	586-4447	
	✓ Jean Vernet	586-2062	
	✓ Barry McNutt	586-4447	
	✓ Bob Tuccillo	395-5836	
	✓ Joe Aldy	395-6870	
	✓ Janet Anderson	395-2310	
	✓ Krishna Chivukula	260-0512	
	✓ Jeanne Briskin	565-2134	
	✓ Reid Harvey	565-2077	
	✓ Cindy Jacobs	734-214-4573	
	✓ Kevin James	260-0512	
	✓ Janice Mazurek	564-6672	
	✓ Martin Ross	260-0512	
	Quindi Franco	395-6870	
From:	Robert Cumby	202-622-2633	202-622-0572
Remarks: <u>URGENT</u> <u>For your review</u> <u>Reply ASAP</u> <u>Please comment</u>			
RE: ATTACHED			

Credit for Early Action Working Groups

I have received the following volunteers for the working groups and have asked the first person each list to convene the working group. Time is probably short, so it would be helpful if the working groups could move on a fast track. Tentative timetable: working groups report back to the larger group in about 2 weeks (May 27). The administrative cost group does not need to be on the same timetable. Perhaps that group could wait and begin work after the others report back.

1. Review of Voluntary Programs

Joe Aldy (CEA)
Bob Tuccillo (OMB)
Janice Mazurek (EPA)
Reid Harvey (EPA)
Krishna Chivulkula (EPA)
Bob Cumby (Treasury)
Jeff Dowd (Energy)
Jean Vernet (Energy)

2. Baselines (This group will break up into four subcommittees, one on utilities, one on industrial emitters, one on buildings and end-users, and one on vehicles.)

Mark Friedrichs (Energy)
Quindi Franco (CEA)
Janice Mazurek (EPA) (Utilities)
Martin Ross (EPA) (Utilities)
Jeanne Briskin (EPA) (Industrial emitters)
Kevin James (EPA) (Industrial emitters)
Jean Luppinnacci (EPA) (Buildings/end-users)
Krishna Chivulkula (EPA) (Buildings/end-users)
Cindy Jacobs (EPA) (Vehicles)
Martin Ross (EPA) (Vehicles)
Jeff Dowd (Energy) (Vehicles)
Barry McNutt (Energy) (Vehicles)

3. Size of Pools

Janet Anderson (CCTF)
Bob Cumby (Treasury)
Joe Aldy (CEA)

4. Administrative Costs for Early Credit Program

Janice Mazurek (EPA)
Krishna Chivulkula (EPA)

Contact Information

Mark Friedrichs
202-586-0124
Fax: 586-3047
E-mail: mark.friedrichs@hq.doe.gov

Jeff Dowd
202-586-7258
Fax: 586-4447
E-mail: jeff.dowd@hq.doe.gov

Jean Vernet
202-586-4755
Fax: 586-2062
E-mail: jean.vernet@hq.doe.gov

Barry McNutt
202-586-4448
Fax: 586-4447
E-mail: barry.mcnutt@hq.doe.gov

Bob Tuccillo
395-5609
Fax: 395-5836
E-mail: RTuccillo@omb.eop.gov

Bob Cumby
622-0572
Fax: 622-2633
E-mail: robert.cumby@do.treas.gov

Joe Aldy
395-1455
395-6870
E-mail: joseph_e._aldy@oa.eop.gov

Janet Anderson
395-2234
395-2310
E-mail: janet_anderson@chcctf.eop.gov

Krishna Chivukula
202-260-9710
Fax: 202-260-0512
E-mail: Chivukula.Krishna@epamail.epa.gov

Jeanne Briskin
202-564-9135
Fax: 202-565-2134
E-mail: Briskin.Jeanne@epamail.epa.gov

Reid Harvey
202-564-9429
Fax: 202-565-2077
E-mail: Harvey.Reid@epamail.epa.gov

Cindy Jacobs
734-214-4857
Fax: 734-214-4573
E-mail: Jacobs.Cindy@epamail.epa.gov

Kevin James
202-260-2424
Fax: 202-260-0512
Email: James.Kevin@epamail.epa.gov

Janice Mazurek
202-564-9211
Fax: 202-564-6672
E-mail: Mazurek.Janice@epamail.epa.gov

Martin Ross
202-260-6451
Fax: 202-260-0512
E-mail: Ross.Martin@epamail.epa.gov

Quindi Franco
395-3142
Fax: 395-6870
E-mail: Quindi@usa.net

DRAFT

Early Credit for Light Vehicle Manufacturers

What activities could result in early credit?

There are several possible ways that early credits could be structured in the light vehicle industry. The major early credit options include the following:

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→ No! only that you meas. unit by users!

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*what about
preliminary
VMT link?*

The more difficult step is translating average fuel economy improvements into tons of carbon reduced. To do this, we need to know how many miles each vehicle is driven, and over what period of time. There is at this time no way to accurately track vehicle miles traveled (VMT), particularly not on a vehicle-by-vehicle basis. There is, however, reasonably good data on the nationwide average VMT per car and light truck. There is also good reason to believe that, on average, differences in VMT are as great within a manufacturer's fleet as between different manufacturers. Therefore, we could develop a formula for converting CAFE improvements into tons by stipulating a certain yearly VMT that applies to all manufacturers (and which could be different for cars and light trucks), e.g., 12000 miles per year.

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There are two options for establishing the baseline for this option: (1) applying the same CAFE standard to all manufacturers; and (2) using each manufacturer's actual fuel economy level from a specific year or average of years. For many years, all of the major manufacturers have hovered fairly close to the CAFE standards. Still, choosing the manufacturer-specific baseline approach would mean that Honda's slightly better-than-CAFE average, for example, would start them off at a disadvantage relative to the domestic companies. Conversely, using the CAFE standards as the baseline would give Honda a relative advantage. Table 2 shows the CAFE status of each major manufacturer as of 1998.

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Chrysler	25.8	--
Fiat	13.4	--
Ford/Mazda	29.5	--
GM	28.9	--
Honda	34.6	27.1
Hyundai	31.5	--
Isuzu	--	21.4
Kia	30.6	23.7
Land Rover	--	17.2
Mercedes-Benz	27.1	21.3
Mitsubishi	29.7	22.5
Nissan	30.7	22.2
Porsche	24.5	--
Subaru	27.6	--
Suzuki	35.8	27.2
Toyota	30.7	23.5
Volvo	25.7	--
Volkswagen	28.7	--
Import Sales-Weighted Average	29.9	22.9
Total Fleet Average	28.7	20.9
Fuel Economy Standards	27.5	20.7

Improvements in the fuel economy of individual vehicles

Calculating early credit tons

For each model for which fuel economy was improved by a minimum specified amount (e.g., 2X), reductions could be calculated based on sales of the model and stipulated VMT. However, these

reductions may be offset by increased sales of lower fuel economy vehicles.

Establishing the baseline

The baseline for this option would be historic average (or otherwise standardized) fuel economy of each vehicle class.

Increased sales of vehicles that use lower-carbon fuels (in lieu of vehicles that use gasoline)

Calculating early credit tons

Just as data are collected on the fuel economy of new vehicles, so are data on the number and type of vehicles that use alternative fuels. For those fuels that have lower carbon emissions per unit combusted, the reduced emissions could be factored into the tons early credit calculation. Including alternative fuels in this way would give manufacturers an incentive to sell more alternative fueled vehicles. It would be important that only those vehicles that are dedicated alternative fueled vehicles are included for the purposes of early credit. Dual and flex fuel vehicles may use only gasoline, or only rarely use the alternative fuel.

Establishing the baseline

The baseline could be manufacturer specific, or an industry average based on total sales of dedicated alternative fueled vehicles in a certain year.

Sale of new vehicles using specified technology

An example includes certain hybrid vehicles, as in the current tax credit proposal.

Calculating early credit tons

Reductions under this option, if any, would be highly uncertain. If the technology requirement is coupled with a fuel economy requirement, reductions could be calculated in the same way as for improvements in the fuel economy of individual vehicles.

Establishing the baseline

The baseline options are essentially the same as those for improvements in the fuel economy of individual vehicles.

Reductions in the gasoline combusted in vehicles on the road

There are two ways in which reductions in carbon emissions from vehicles on the road could be achieved: through reductions in VMT and through scrappage programs. VMT reductions require that individual drivers change their behavior and would be very difficult for vehicle manufacturers to achieve and, perhaps more importantly, to demonstrate. It is possible that large fleet managers could implement programs to reduce the VMT of their fleet, but again these reductions would be difficult to demonstrate. Such reductions would also be difficult to enforce.

Scrappage programs are under the control of vehicle manufacturers, but the reductions from such programs are very uncertain. Any reductions depend on the behavior of the individual drivers that

participate in the programs. These drivers may not switch to lower emitting vehicles, and/or may have intended to scrap their vehicles without the program.

BASELINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS

Baseline/Benchmark Options Not Based on Entity- or Project-Specific Emissions

1. Preset performance benchmarks (based on emission/output measures) would be established, mainly for "new" sources or sinks. The baseline or benchmark would always be in a form reducible to emissions per unit of output (or quantity of sequestration per unit of output). This option requires (a) identification of a fixed unit of output, such as kilowatt hours, and the ability to measure and verify fuel inputs or actual ghg emissions (or amounts sequestered), or (b) the establishment of a standardized procedure to measure the emissions per unit of output, and provides the means for independent verification of this measure. **Variation #1:** Entities might be required to report on the average emissions associated with all new sources, rather than being credited for individual units (e.g., vehicles, plants) that bettered the performance benchmark. **Variation #2:** Existing sources which better the benchmark performance level might qualify if their useful life was extended beyond some preset period (e.g. if the life a nuclear power plant was extended beyond 35 years).

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation). In general, this option will work well when applied to sources with standardized units of output, such as the electric utility sector, or to energy end-uses that are currently governed by efficiency standards, which are based on standardized test procedures. End-uses that are currently governed by efficiency standards include: light duty vehicles, all major residential appliances and heating/cooling equipment, new fluorescent-lighting, packaged heating and cooling equipment used in commercial buildings, and standardized electric motors. It may also be possible to use this approach for new home construction, using home energy rating systems, and certain standardized manufacturing outputs (e.g.). This means that this option could be used to provide early credits for investments in new energy technologies that would ultimately represent well over half of all ghg emissions from the energy sector, enabling broad participation. However, it is unlikely that this approach could be applied to most industrial or agricultural energy uses, or to transportation energy uses other than light duty vehicles. It is also not well suited to emission reductions in existing facilities that are not attributable to new uses.
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting): By only crediting new investments, and by setting the qualifying baselines/benchmarks sufficiently high to exclude most conventional investments, this option could effectively maximize additionality and minimize free riders. Double-counting could also be minimized by limiting credits to only the savings attributable to specific investments.
- **Equity** (ability to provide comparable rewards for comparable actions): This approach

if sufficient effort is given to setting... for diff. and...

is likely to provide comparable rewards for comparable actions for those sources/end-uses that it covers. ~~Some attention, however, would have to be given to setting comparable benchmarks for different end-uses.~~

- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program). Because this approach would rely heavily on existing regulatory systems for measuring output or efficiency, the public administrative costs and delays in these sectors are likely to be minimal. In addition, private administrative costs are likely to be minimal in these sectors as well. Creating new methods of measuring emissions per unit of output for additional sectors or end-uses is likely to be time consuming. Once established, the public administrative costs of implementing a new measure of emissions/output is likely to be small, although the private testing costs could be significant.

- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners). Because benchmarks are performance-based, rather than technology-specific, this approach is likely to minimize unintended market distortions. However, since this approach cannot cover all sectors, it will tend to shift investment toward covered sectors.

- **Limiting Total Credits** (ability to cap or predictably limit the total number of credits distributed). Since all investments in technologies that have emissions/output below the qualifying benchmark would be expected to qualify automatically for credits, it would be difficult to place an absolute cap on credits. On the other hand, the qualifying benchmarks could easily be set at levels that strictly limited the number of credits that were likely to be granted in any given year (much like the revenue losses associated with a tax credit can be estimated and limited by modifying the qualifying criteria).

- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances). Because this option does not use historical emission baselines, it is unlikely to affect future decisions regarding the possible use of such baselines or other approaches to allocating emission allowances.

2. Preset technology-specific credits (preset credits for investments in identified technologies, which might vary depending on the capacity or output of the technology or the size of the investment). The amount of credit would be predetermined by rule, based on the expected emissions reductions that would typically result from the use of the technology). For example the purchase (or sale) of a residential geothermal (ground source) heat pump might be designated a specific number of credits.

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation).
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting).
- **Equity** (ability to provide comparable rewards for comparable actions (equity)).
- **Administrative Costs/Delays** (ability to minimize total public and private administrative

- costs, and minimize delays associated with establishment of Federal program).
- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners).
- **Limit Total Credits** (ability to cap or predictably limit the total number of credits distributed).
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances).

3. Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output) would be established based on rules/formulas issued at the national level. Credits would be granted based on entity-specific improvements in their emissions per unit of output. Measures of output might vary from one entity to another, but the types of performance measures that could be used and the historical period to be considered would be determined by rule at the national level. E.g., one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation).
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting).
- **Equity** (ability to provide comparable rewards for comparable actions (equity)).
- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program).
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- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances).

4. Entity-specific emission reductions (actual emissions) from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. E.g. a utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

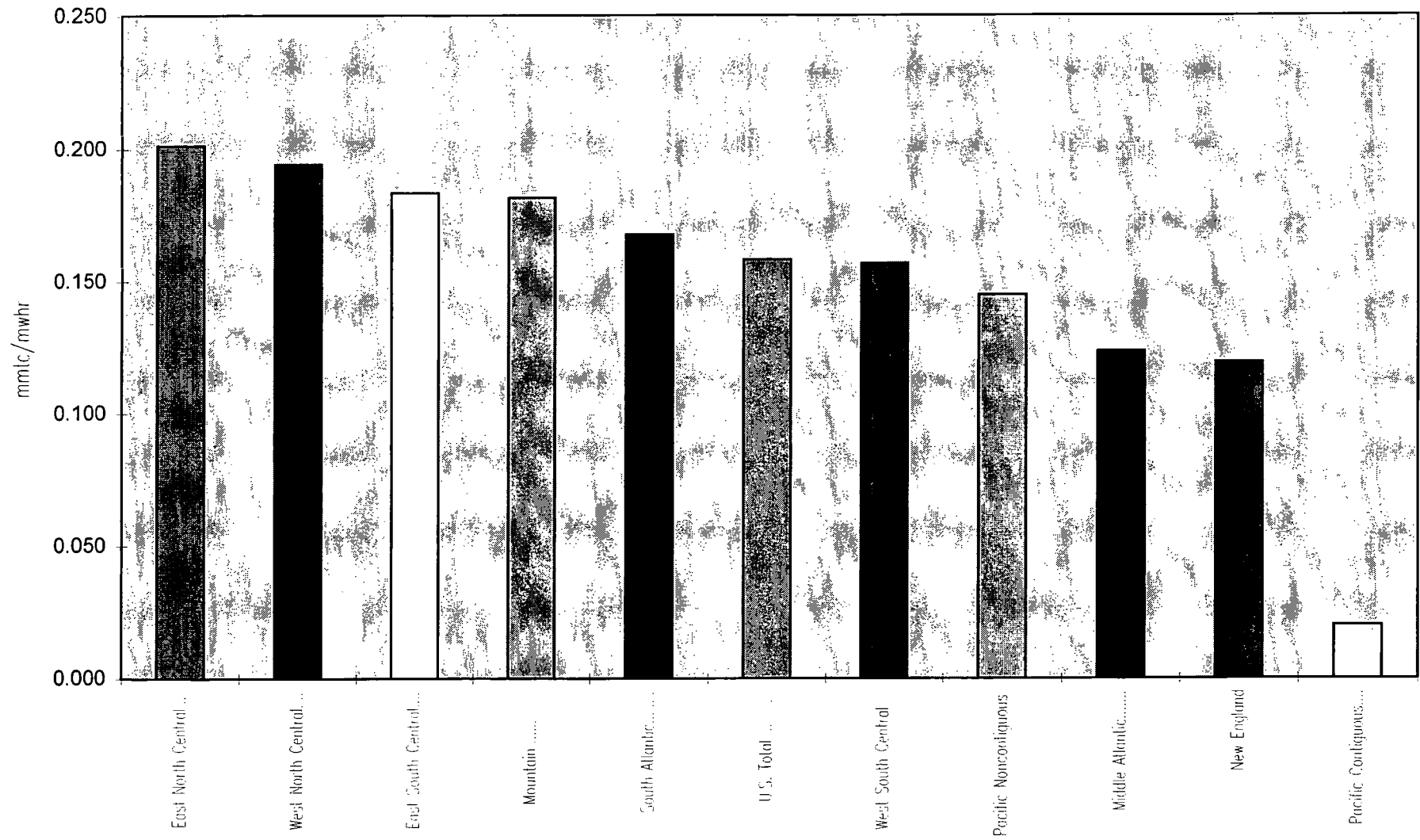
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- **Limit Total Credits** (ability to cap or predictably limit the total number of credits distributed).

- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances).

	Based on Historical Emissions	Credits Output Reductions	Coverage	New Electric Generators	Existing Generators	Light Duty Vehicles	Other Transport	Appliances & Equip.	New Buildings	Existing Buildings	Manufacturing Plants/Processes	Sinks	Corporate Entities	Consumers	Additionality	Equity	Few Admin Costs/Delays	Few Market Distortions	Limit Total Credits	Future Options Open
<u>1. Preset performance benchmarks</u>	0	0		Y	?	Y	0	Y	?	0	?	0	0	0	Y	Y	Y	Y	Y	Y
<u>2. Preset technology-specific credits</u>	0	0		Y	0	0	?	Y	?	Y		Y	?	?	Y	?	Y	0	Y	Y
<u>3. Entity-specific performance benchmarks</u>	Y	0		Y	Y	Y	0	0	0	?	Y	0	?	0	0	0	?	?	?	?
<u>4. Entity-specific emission reductions</u>	Y	Y		0	Y	0	?	0	0	Y	Y	Y	Y	?	0	0	?	0	Y	0

coverage

Average CO2 Emissions





SECOND MEETING OF INTERAGENCY DOMESTIC BASELINES WORKING GROUP
WEDNESDAY, MAY 26, 1999
10 AM - NOON
RM 7C-016, 1000 INDEPENDENCE AVE., S.W.

DRAFT AGENDA

- Introductions and Discussion of Relevant Work Completed or Underway
- Quick Review of First Meeting, including Options, Sectors, Criteria (revised draft)
- Review of Draft Summary Analysis of Options and Preliminary Conclusions (incomplete draft)
- Discussion of Next Steps, Including:
 - Completion of Summary Analysis of Options
 - More drafting
 - Comments & Revisions
 - Addition of Pros and Cons?
 - Addition of Conclusions?
 - Key Conclusion? Preference for Options 1 & 2, with use of Option 3 as a means of extending coverage?
 - Analysis of Sector-Specific Options
 - Sector groupings and leads?
 - Use of key conclusion as guide?
 - Timing/format/length of sector analyses?

BASELINE/BENCHMARKING ISSUES FOR DOMESTIC EARLY CREDITS

Options:

- **Preset performance benchmarks (based on emissions intensity and output measures)** would be established, probably for “new” sources or sinks. If a new powerplant, vehicle, appliance, piece of equipment or other identifiable new source had fewer emissions per unit of output than a preset benchmark for that source/sink, the owner or manufacturer of that new source would receive a formula determined credit. E.g., if a new powerplant emitted fewer ghg gases per unit kwh produced than the national benchmark (for that type of powerplant?), it would be granted a credit based on its actual (or estimated) emissions intensity relative to the benchmark, times its kwh output (each year?). **Variation #1:** Entities might be required to report on the average emissions associated with all new sources, rather than being credited for individual units (e.g., vehicles, plants) that bettered the performance benchmark. **Variation #2:** Existing sources which better the benchmark performance level might qualify if their useful life was extended beyond some preset period (e.g. if the life a nuclear power plant was extended beyond 35 years).
- **Preset technology-specific credits** (preset credits for investments in identified technologies, which might vary depending on the capacity or output of the technology or the size of the investment). The amount of credit would be predetermined by rule, based on the expected emissions reductions that would typically result from the use of the technology). For example the purchase (or sale) of a residential geothermal (ground source) heat pump might be designated a specific number of credits.
- **Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output)** would be established based on rules/formulas issued at the national level. Credits would be granted based on entity-specific improvements in their emissions per unit of output. Measures of output might vary from one entity to another, but the types of performance measures that could be used and the historical period to be considered would be determined by rule at the national level. E.g., one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).
- **Entity-specific emission reductions (actual emissions)** from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. E.g. a utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

Sectoral Sources/Sinks for Carbon and Other Greenhouse Gas Emissions

- Electric Utilities
 - New powerplants
 - Combined Heat and Power
 - Existing
- Manufacturing Industries
 - New Plants/Industrial Processes
 - Industrial Equipment
 - Existing Plants/Industrial Process
 - Key Industries
 - Iron & Steel *- Auto mobile?*
 - Chemicals
 - Oil & Gas
 - Cement
 - Pulp and Paper
 - Aluminum
 - Magnesium
 - Semiconductors
 - Utility transformers
 - Inflatables *→ SF6 is used to inflate tires, used air sealant*
 - CHP
 - Military/AWACs
- Buildings
 - New buildings
 - New appliances/equipment
 - Existing buildings?
- Government
 - Buildings
 - Other
- Transportation
 - New light duty motor vehicles
 - New heavy duty motor vehicles?
 - Existing vehicles/vmt?
 - Non-highway transportation sources?
- Agriculture/Forestry Sources and Sinks

Criteria (each option evaluated relative to other options):

- **Coverage/Participation:** Potential coverage of sources/sinks and likelihood of broad participation
- **Technology or Operational Focus:** Would the option tend to focus entities on technology investments or operational changes. }
- **Additionality:** Ability to maximize additionality, and minimize free riders and double counting
- **Equity:** Ability to provide comparable rewards for comparable actions (equity) ?
- **Administrative Costs/Delays:** Ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program
- **Market Distortions:** Ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners.
- **Limit Total Credits:** Ability to cap or predictably limit the total number of credits distributed
- **Future Options:** Ability to maximize (not limit) future options for domestic allocation of emission allowances }

ability to predict
of credits that

BASELINE/BENCHMARKING OPTIONS FOR DOMESTIC EARLY CREDITS**Baseline/Benchmark Options Not Based on Entity- or Project-Specific Emissions**

1. Preset performance benchmarks (based on emission/output measures) would be established, mainly for "new" sources or sinks. The baseline or benchmark would always be in a form reducible to emissions per unit of output (or quantity of sequestration per unit of output). This option requires (a) identification of a fixed unit of output, such as kilowatt hours, and the ability to measure and verify fuel inputs or actual ghg emissions (or amounts sequestered), or (b) the establishment of a standardized procedure to measure the emissions per unit of output, and provides the means for independent verification of this measure. **Variation #1:** Entities might be required to report on the average emissions associated with all new sources, rather than being credited for individual units (e.g., vehicles, plants) that bettered the performance benchmark. **Variation #2:** Existing sources which better the benchmark performance level might qualify if their useful life was extended beyond some preset period (e.g. if the life a nuclear power plant was extended beyond 35 years).

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation). In general, this option will work well when applied to sources with standardized units of output, such as the electric utility sector, or to energy end-uses that are currently governed by efficiency standards, which are based on standardized test procedures. End-uses that are currently governed by efficiency standards include: light duty vehicles, ~~all~~ major residential appliances and heating/cooling equipment, new fluorescent lighting, packaged heating and cooling equipment used in commercial buildings, and standardized electric motors. It may also be possible to use this approach for new home construction, using home energy rating systems, and certain standardized manufacturing outputs (e.g.). This means that this option could be used to provide early credits for investments in new energy technologies that would ultimately represent well over half of all ghg emissions from the energy sector, enabling broad participation. However, it is unlikely that this approach could be applied to most industrial or agricultural energy uses, or to transportation energy uses other than light duty vehicles. It is also not well suited to emission reductions in existing facilities that are not attributable to new uses.

- **Technology or Operational Focus** (would the option tend to focus entities on technology investments or operational changes): This approach would tend to focus the incentives offered on investments in new technology, rather than operational improvements.
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting): By only crediting new investments, and by setting the qualifying baselines/benchmarks sufficiently high to exclude most conventional investments, this option could effectively maximize additionality and minimize free riders. Double-counting could also be minimized by limiting credits to only the savings attributable to specific investments.

only for new activities.
- if benchmark is a coal -

- **Equity** (ability to provide comparable rewards for comparable actions): This approach is likely to provide comparable rewards for comparable actions for those sources/end-uses that it covers. Some attention, however, would have to be given to setting comparable benchmarks for different end-uses.
- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program). Because this approach would rely heavily on existing regulatory systems for measuring output or efficiency, the public administrative costs and delays in these sectors are likely to be minimal. In addition, private administrative costs are likely to be minimal in these sectors as well. Creating new methods of measuring emissions per unit of output for additional sectors or end-uses is likely to be time consuming. Once established, the public administrative costs of implementing a new measure of emissions/output is likely to be small, although the private testing costs could be significant.
- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners). Because benchmarks are performance-based, rather than technology-specific, this approach is likely to minimal unintended market distortions. However, since the this approach cannot cover all sectors, it will tend to shift investment toward covered sectors.
- **Limiting Total Credits** (ability to cap or predictably limit the total number of credits distributed). Since all investments in technologies that have emissions/output below the qualifying benchmark would be expected to qualify automatically for credits, it would be difficult to place an absolute cap on credits. On the other hand, the qualifying benchmarks could easily be set at levels that strictly limited the number of credits that were likely to be granted in any given year (much like the revenue losses associated with a tax credit can be estimated and limited by modifying the qualifying criteria).
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances). Because this option does not use historical emission baselines, it is unlikely to affect future decisions regarding the possible use of such baselines or other approaches to allocating emission allowances.

2. Preset technology-specific credits (preset credits for investments in identified technologies, which might vary depending on the capacity or output of the technology or the size of the investment). The amount of credit would be predetermined by rule, based on the expected emissions reductions that would typically result from the use of the technology). For example the purchase (or sale) of a residential geothermal (ground source) heat pump might be designated a specific number of credits.

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation).
- **Technology or Operational Focus** (would the option tend to focus entities on technology investments or operational changes):
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting).
- **Equity** (ability to provide comparable rewards for comparable actions (equity)).
- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program).

- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners).
- **Limit Total Credits** (ability to cap or predictably limit the total number of credits distributed).
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances).

3. Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output)

would be established based on rules/formulas issued at the national level. Credits would be granted based on entity-specific improvements in their emissions per unit of output. Measures of output might vary from one entity to another, but the types of performance measures that could be used and the historical period to be considered would be determined by rule at the national level. E.g., one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation). The approach would work well for utilities and manufacturing industries, where dollar added value or physical output measures existed that could be used to create entity-specific benchmarks. Once created, new plants (e.g. new power plants or production facilities) or existing plants could be credited for reductions from this benchmark. This approach would not work as well for residential or commercial buildings, equipment, or sinks, where entity-level output measures would be difficult or impossible to create, or would be less meaningful. The data collection and reporting requirements may make it difficult or impossible for small firms, public institutions or consumers to participate.
- **Technology or Operational Focus** (would the option tend to focus entities on technology investments or operational changes): This approach would tend to focus eligible entities on operational improvements, except in those industries where new investments were a major contributor to total emissions.
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting). This approach would not be able to assure additionality as well as the first two options. Less efficient firms would be able to obtain more credit than other, more efficient firms, for investing in the same technologies. However, it would perform better than option 4 by ensuring that an entity that simply reduced its output would not receive credit.
- **Equity** (ability to provide comparable rewards for comparable actions (equity)). As noted above, this option not likely to be perceived as equitable by competitors in the same industry.
- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program). Because verifiable records of emissions and added value or output would have to be obtained and rules would have to be developed for creating benchmarks using this data, there could be significant costs and delays associated with the establishment of a credit program using this approach.
- **Market Distortions** (ability to minimize unintended market distortions, such as penalizing

growth, rewarding reduced output, or picking technology winners). If this option limited participation in an early credit program to large corporate entities, this would create some unintended market distortions. In addition, the tendency of this option to favor entities that are now less efficient entities, and penalize those firms that have consistently invested in more efficient technology would also result in some unintended distortions or wealth transfers.

- **Limit Total Credits** (ability to cap or predictably limit the total number of credits distributed). Once the rules for the establishment of benchmarks had been set, it would be difficult to modify them to further constrict eligibility for credits. Because there has been very little experience with these types of performance benchmarks, it would be difficult to predict accurately the quantity of credits that would be issued.
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances). The creation of entity-specific benchmarks using historical emissions and output data may tend to encourage the use of a similar approach for the allocation of emission allowance credits.

4. Entity-specific emission reductions (actual emissions) from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. E.g. a utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

- **Coverage/Participation** (potential coverage of sources/sinks and likelihood of broad participation).
- **Additionality** (ability to maximize additionality, and minimize free riders and double counting).
- **Equity** (ability to provide comparable rewards for comparable actions (equity)).
- **Administrative Costs/Delays** (ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program).
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- **Limit Total Credits** (ability to cap or predictably limit the total number of credits distributed).
- **Future Options** (ability to maximize (not limit) future options for domestic allocation of emission allowances).

	Not Based on Historical Emissions	Does Not Credit Output Reductions	Coverage	New Electric Generators	Existing Generators	Light Duty Vehicles	Other Transport	Appliances & Equip.	New Buildings	Existing Buildings	Manufacturing Plants/Processes	Sinks	Corporate Entities	Consumers	Technology v. Operations	Additionality	Equity	Few Admin Costs/Delays	Few Market Distortions	Limit Total Credits	Future Options Open
<u>1. Preset performance benchmarks</u>					?		0		?	0	?	0	0	0	T						
<u>2. Preset technology-specific credits</u>					0	0	?								T		?		0		
<u>3. Entity-specific performance benchmarks</u>	0						0	0	0	?		0	?	0	0	0	0	?	?	?	?
<u>4. Entity-specific emission reductions</u>	0	0		0		0	?	0	0					?	0	0	0	?	0		0

would it apply

Industries
End-consumers
Utility
Sinks

Process
Products

Appliances/Equipment
New Buildings
New Generation
Manufacture

Consumers

DRAFT, 5/21/99
MARK FRIEDRICHS

SECOND MEETING OF INTERAGENCY DOMESTIC BASELINES WORKING GROUP
WEDNESDAY, MAY 26, 1999
10 AM - NOON
RM 7C-016, 1000 INDEPENDENCE AVE., S.W.

DRAFT AGENDA

- Introductions and Discussion of Relevant Work Completed or Underway
- Quick Review of First Meeting, including Options, Sectors, Criteria
- Review of Draft Summary Analysis of Options and Preliminary Conclusions
- Discussion of Next Steps, Including Analysis of Sector-Specific Options

BASELINE/BENCHMARKING ISSUES FOR DOMESTIC EARLY CREDITS

Options:

Sec 405

Details
→

- **Preset performance benchmarks (based on emissions intensity and output measures)** would be established, probably for “new” sources or sinks. If a new powerplant, vehicle, appliance, piece of equipment or other identifiable new source had fewer emissions per unit of output than a preset benchmark for that source/sink, the owner or manufacturer of that new source would receive a formula determined credit. E.g., if a new powerplant emitted fewer ghg gases per unit kwh produced than the national benchmark (for that type of powerplant?), it would be granted a credit based on its actual (or estimated) emissions intensity relative to the benchmark, times its kwh output (each year?). **Variation #1:** Entities might be required to report on the average emissions associated with all new sources, rather than being credited for individual units (e.g., vehicles, plants) that bettered the performance benchmark. **Variation #2:** Existing sources which better the benchmark performance level might qualify if their useful life was extended beyond some preset period (e.g. if the life a nuclear power plant was extended beyond 35 years).
- **Preset technology-specific credits** (preset credits for investments in identified technologies, which might vary depending on the capacity or output of the technology or the size of the investment). The amount of credit would be predetermined by rule, based on the expected emissions reductions that would typically result from the use of the technology). For example the purchase (or sale) of a residential geothermal (ground source) heat pump might be designated a specific number of credits.
- **Entity-specific performance benchmarks (reductions from historical emission baselines, adjusted for changes in output)** would be established based on rules/formulas issued at the national level. Credits would be granted based on entity-specific improvements in their emissions per unit of output. Measures of output might vary from one entity to another, but the types of performance measures that could be used and the historical period to be considered would be determined by rule at the national level. E.g., one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).
- **Entity-specific emission reductions (actual emissions)** from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. E.g. a utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).

Sectoral Sources/Sinks for Carbon and Other Greenhouse Gas Emissions

- Electric Utilities
 - New powerplants
 - Combined Heat and Power
 - Existing
- Manufacturing Industries
 - New Plants/Industrial Processes
 - Industrial Equipment
 - Existing Plants/Industrial Process
 - Key Industries
 - ??
 - ??
 - ??
 -
- Buildings
 - New buildings
 - New appliances/equipment
 - Existing buildings?
- Government
 - Buildings
 - Other
- Transportation
 - New light duty motor vehicles
 - New heavy duty motor vehicles?
 - Existing vehicles/vmt?
 - Non-highway transportation sources?
- Agriculture/Forestry Sources and Sinks

Criteria (each option evaluated relative to other options):

- **Coverage/Participation:** Potential coverage of sources/sinks and likelihood of broad participation
- **Additionality:** Ability to maximize additionality, and minimize free riders and double counting
- **Equity:** Ability to provide comparable rewards for comparable actions (equity)
- **Administrative Costs/Delays:** Ability to minimize total public and private administrative costs, and minimize delays associated with establishment of Federal program
- **Market Distortions:** Ability to minimize unintended market distortions, such as penalizing growth, rewarding reduced output, or picking technology winners.
- **Limit Total Credits:** Ability to cap or predictably limit the total number of credits distributed
- **Future Options:** Ability to maximize (not limit) future options for domestic allocation of emission allowances and form of trading program.

EARLY CREDITING BASELINES/BENCHMARKS WORKING GROUP

Meeting Thursday, May 20

11 am to 1 pm, Room 7C-016

Host: Mark Friedrichs, Policy Office, 586-5316

			Thursday Meeting?	Friday Meeting?
DOE	Mark Friedrichs	Utilities/Buildings	Yes	Yes
	Jeff Dowd	Industry/Vehicles	No	No
	Barry McNutt	Vehicles	No	No
EPA	Janice Mazurek	Utilities	Yes	No
	Martin Ross	Utilities/Vehicles	No ✓	Yes
	Jeanne Briskin	Industry	Yes?	No?
	Kevin James	Industry	No	Yes
	Jean Luppinacci	Buildings	No	?
	Krishna Chivulkula	Buildings	Yes	Yes
	Cindy Jacobs	Vehicles	No (by ✓ phone?)	No
CEA	Quindi Franco	All	Yes	No

Mike Shelby
- EPA

FIRST MEETING OF INTERAGENCY DOMESTIC BASELINES WORKING GROUP
THURSDAY, APRIL 20, 1999
11 AM - 1 PM
RM 7C-016, 1000 INDEPENDENCE AVE., S.W.

DRAFT AGENDA

- Introductions
- Round Table Discussion of Relevant Analyses Completed or Underway
- Discussion of Main Options
- Discussion of Sectors and Subsectors
- Discussion of Criteria for Evaluating Options
- Discussion of Next Steps

*EPH/DOE analysis of
benchmarks for
SI/COM*

BASELINE/BENCHMARKING ISSUES FOR DOMESTIC EARLY CREDITS

Options:

- ① Nationwide performance benchmarks (output adjusted emissions) would be established for "new" sources. If a new powerplant, vehicle, appliance, piece of equipment or other identifiable new source with an established benchmark had fewer emissions per unit of output than the benchmark, the owner or manufacturer of that new source would receive a formula determined credit. E.g., if a new powerplant emitted fewer ghg gases per unit kwh produced than the national benchmark (for that type of powerplant?), it would be granted a credit based on its actual (or estimated) emissions relative to the benchmark. Variation #1: Entities might be required to report on the average emissions associated with all new sources, rather than being credited for individual units that bettered the performance benchmark Variation #2: Existing sources which better the benchmark performance level might qualify if they their useful life was extended beyond some predetermined period..
- ② Entity-specific performance benchmarks (output adjusted emissions) based on historical emissions would be established based on rules/formulas issued at the national level. Credits would be granted based on entity-specific improvements in their emissions per unit of output. Measures of output might vary from one entity to another, but the types of performance measures that could be used and the historical period to be considered would be determined by rule at the national level. E.g., one manufacturer might claim credit if it significantly improved its own emissions performance (regardless of how their emissions performance compared to others in the same industry).
- ③ Entity-specific emission reductions (actual emissions) from historical levels. Credits would be granted if an entity reduced its total emissions, regardless of changes in output. E.g. a utility would be granted credits based on net reductions in emissions from historical levels (the historical period considered would be determined by national rules).
- Others?? Combinations, varying by sector or sub-sector??

*- good of
standard products*

"Banding Schedule" - technology based perf. b.m.

Sectors

- Electric Utilities
 - New powerplants
 - Existing?
- Industry
 - New sources?
 - Existing?
- Buildings
 - New buildings
 - New appliances/equipment
 - Existing buildings?
- Transportation
 - New light duty motor vehicles
 - New heavy duty motor vehicles?
 - Existing vehicles/vmt?
 - Non-highway transportation sources?
- Others??

- real time

- Energy Transf. - utilities

- up-front lifetime

- assess

- up-front lifetime

Industry

- easy - to manage. up-front - lifetime

tough

reg. Segregation

Criteria (each option evaluated relative to other options):

- Potential coverage
 - New sources
 - Existing sources
- Likelihood of broad participation
- ? [- Strength of incentive (assuming equivalent credit values) ?
- Ability to minimize free riders/allocation of credits to entities that take no special action
- ① - Ability to maximize (not limit) future options for domestic allocation of emission allowances [i.e. use existing infra.]
- Ability to provide comparable rewards for comparable actions (equity)
- Ability to minimize total public and private administrative costs
- ② - Ability to minimize unintended market distortions
- Ability to develop and issue Federal rules in a timely fashion
- Ability to cap or predictably limit the total number of credits distributed
- Others??

Minimize gaming & double counting

① Efficient - Economically

② Env. Real

③ Min. Admin costs / "implementable"

④ Don't Preclude eventual domestic trading program.