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McIntosh Response.

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

CHIEF OF STAFF

August 24, 1998

Dear Ms. Dobriansky:

Enclosed are responses to questions 15-34 of the March 13 letter from Chairman McIntosh to Council of Economic Advisers ("CEA") Chair Janet Yellen. Also enclosed are 6 boxes of documents related to economic analysis of climate change policies.

In addition, the Office of the Counsel to the President has determined that other CEA climate change documents include material that reflects Executive Branch policy-making deliberations. Please contact the Office of Counsel to the President to discuss the appropriate accommodation with regard to these materials.

Finally, as you know, on August 10, 1998, CEA Chair Janet Yellen was served with a subpoena to produce certain records related to climate change. This subpoena requires that the CEA provide the Committee within a 2 week period an extremely broad range of additional climate change materials that were not covered by Chairman McIntosh's March 13 letter. The August 10 subpoena will require a substantial and time consuming new search of CEA files. Moreover, given that much of the materials are likely to reflect policy deliberations, the Office of the Counsel to the President will need to review the documents to safeguard the interests of the Executive Branch in confidentiality of the policy-making process.

As you know, even though the CEA staff is extremely small, CEA is responsible for providing the President with information, analysis and advice on a range of domestic and international economic issues, including performance of the stock market, trends in the U.S. economy, Social Security reform, the Asian financial crisis and the economic troubles in Russia. We are simply unable to undertake the additional search required to respond on the timetable specified in the August 10 subpoena, while still fulfilling our statutory obligations related to the continued strength and vitality of the U.S. economy.

Please contact me at 395-5084 to discuss the nature and timing of the CEA's response to the August 10 subpoena.

Sincerely,

Michele Jolin

Michele Jolin

Ms. Larisa Dobriansky
Senior Counsel
Subcommittee on National Economic Growth,
Natural Resources and Regulatory Affairs
Committee on Government Reform and Oversight
U.S. House of Representatives
Room 2157 Rayburn House Office Building
Washington, D.C. 20515-6143

Enclosures

cc: Keith Ausbrook
Alys Campaigne

# Answers to March 13 Questions To CEA
# from Representative McIntosh
# Chair of the House Subcommittee
# on National Economic Growth, Natural Resources, and Regulatory Affairs

## C. Dr. Yellen's Testimony before the House Commerce Committee on March 4, 1998

15. *Please provide any and all analyses that support the Administration's conclusion that impacts on the U.S. economy of complying with the terms of the Kyoto Protocol are likely to be "modest".*

Response: Dr. Yellen's testimony concluded that the net costs of the Administration's policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and the United States is successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism. The analyses supporting this conclusion are presented in "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis" (hereafter, the AEA). (see pp. 39-72)

15. Continued. *Also, explain fully how the Administration can make such a forecast responsibly when as Dr. Yellen stated, "it is not yet possible to provide a full authoritative analysis of the Kyoto Protocol." Among other things, Dr. Yellen noted that there is still "much that we do not know" because much has been left unresolved by this treaty (for example, implementation issues, the rules and procedures governing international emissions trading, joint implementation projects, and the Clean Development Mechanism, and future emissions reduction obligations). Moreover, Dr. Yellen asserted that to her knowledge, "no [economic] model --whether used inside the government or not --has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old."*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs of the Kyoto Protocol have generally not taken into account the specific provisions of the Kyoto agreement and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these elements will raise the estimated cost. The Administration's conclusion, and the illustrative numerical estimates that support this conclusion, incorporate these policies and mechanisms.

16. *Please provide any and all analyses that support the following estimates:*

a. *U.S. electricity restructuring "will offer approximately $20 billion in cost savings".*

Response: The derivation of this estimate is explained in the AEA in the section entitled potential electricity restructuring cost-savings. (see Appendix C)

b. *Emissions trading among the Annex I countries "can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

c. *Emissions trading among a subset of Annex I countries (for example, the United States, Australia, Canada, New Zealand, and Russia) "can reduce costs by an estimated 60-70 percent."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

*Also, based on the estimates presented in Janet Yellen's testimony, please explain and fully document how more limited trading among this subset of countries would produce greater cost reductions than from either trading among all Annex I countries or trading with the full participation of Non-Annex I countries.*

Response: The market clearing price for greenhouse gas permits in an international trading system result from the supply and demand for internationally traded permits. If a country that is expected to be a net seller decided not to sell, then the actual supply falls, and the permit price and associated cost increases. If a country that is expected to be a net buyer decided not to buy, then demand falls, and the permit price and associated cost falls. In the case of trading under the Kyoto Protocol, both the United States and the European Union are projected by many economic models to be net buyers. If the European Union decides not to participate in international trading, then the demand for permits on the international market would decline, and the permit price and costs would fall, thereby benefiting countries that continue to buy permits internationally. Please also see the section on the effect of climate change policy on the United States in the AEA (see pp. 51-53).

d. *The Clean Development Mechanism "might shave costs by roughly another 20 to 25 percent".*

Response: The United States is seeking to ensure that the Clean Development Mechanism becomes a cost-effective way to allow developed country firms to give financing and technical assistance for projects to lower emissions and to receive credit for the reductions. Our best professional judgment, based on discussions with a variety of informed analysts, is that CDM could achieve at least 20 percent of the emissions reductions available under full global trading.

The statement that costs would fall by roughly another 20 to 25 percent is based on the SGM results given an assumption of 20 percent "effectiveness," and is further explained in the AEA. (see pp. 35, 48)

e. *Overall costs "would reach roughly one-tenth of one percent of projected GDP in 2010" (resource costs of achieving Kyoto targets for emissions reductions were estimated to be $7 to $12 billion per year in 2008 to 2012).*

Response: The forecasted changes in GDP were taken from the SGM model output based on certain assumptions. Please see the section on the effects of climate change policy on the United States in the attached AEA for a brief summary. (see pp. 51-53)

*Also, please explain how it is possible that compliance with the Kyoto Protocol, which has been projected by independent economists to be the most expensive environmental undertaking ever, could cost less than compliance with the recently issued U.S. air quality rules for particulate matter and ozone (the final Regulatory Impact Analysis for those rules estimated costs of $46 billion).*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs have generally not taken into account the flexibility mechanisms included in the Kyoto Protocol and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these flexibility mechanisms raises the cost estimates of these analyses.

f. *The assumption that the rate of improvement in energy efficiency (AEEI) will be 1.0 percent per year (which is greater than that assumed by the EIA).*

Response: Please see the section on energy efficiency improvement in the AEA for a brief summary. (see pp. 46-47)

*In particular, please reconcile this assumption with the statement of the CEA in its 1998 Annual Report that "[u]ntil an emissions cap and trading system are in place, however, the economic incentive to use [technologies supported by the Administration's budget] may be low."*

Response: No reconciliation is needed. The comment from the 1998 ERP implies simply that in the absence of a cap and trade system that would lower the price of using carbon-lean technologies relative to carbon-rich technologies, the incentives to adopt such carbon-lean technologies will be less than in a world with the target and trade system in place. Moreover, the AEEI represents the autonomous rate of technological improvement, i.e., the rate that would occur in the absence of price changes that the target and trade system might lead to, due merely to the greater availability of new technologies. Thus its value is a comment on the extent of one's technological optimism, and not about optimism of private parties to respond to price

incentives.

*Is the Administration assuming that such a system will be put into place in the short-run?*

Response: The Administration's position on the timing of a target and trade system has not changed. The Administration maintains that the system should be established in the 2008-12 time-frame with the benefit of 10 years of additional experience with similar market based mechanisms.

g. *The estimated effect on energy prices will range from $14 to $23 per ton of carbon equivalent.*

Response: Please see the section of the AEA that describes the effects of climate change policy on the United States (see pp. 54-58)

h. *"In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors --many of them high-tech jobs paying high wages."*

Response: According to standard economic analysis, in the long run, total employment is determined by the size of the labor force, incentives to work, and the productivity of labor. Changes in prices -- which result from developments in technology, trade, energy markets, or many other areas -- tend to have their effects on the composition of employment across sectors, more than on total employment.

As explained in Dr. Yellen's testimony and in the AEA, the energy price changes expected to result from the Kyoto protocol are likely to be modest. In particular, these price changes over the next decade are less than the average of year-to-year absolute price changes observed since 1960. Thus there is little reason to believe there will be large changes in employment even in the energy-intensive sectors. In the less energy-intensive sectors, there is no reason to expect any decline in employment at all due to climate change policies. Most economic models would not predict changes in the overall level of employment resulting from such small energy price changes 10 years in the future. (see pp. 54-62)

Furthermore, the United States has a strong competitive advantage in a variety of high-tech sectors. For example, recent innovations in battery technology, and in fuel cells were announced by U.S. companies. These innovations, and future ones expected from U.S. companies, will be in demand worldwide. The growth in associated production is likely to lead to growth in high-wage jobs in this country.

I. *As to each analysis, please indicate who prepared the analysis and provide records of comments from other federal agencies.*

*Response*: All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

17. *Please provide any and all analyses that support the Administration's estimate that benefits relating to traffic congestion, highway accidents, and air pollution unrelated to climate change "could offset approximately a quarter of the resource cost of the climate change policy."*

Response: This analysis is summarized in the section of the AEA describing ancillary benefits. (see pp. 66-68)

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

*As to each analysis, please indicate who prepared the analysis and provide all records of comments from other federal agencies.*

Response: All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

18a. *In her testimony, Dr. Yellen stated that, in evaluating the "likely net economic impact of the Kyoto Protocol," the Administration has "drawn upon a broad array of analytical tools", and a "wide range of models of the energy sector and economy over the next 25 years" to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Please specify all of the models and analytical tools that the Administration has used and describe in detail their strengths and weaknesses.*

Response: As explained in Dr. Yellen's testimony, the existence of modeling difficulties means that we should treat any model results with the caution that is warranted -- not that we should abandon rigorous economic analysis. We have employed a broad set of economic tools to analyze the policy options. Such tools include models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant

statistics, "meta-analyses" of existing models (such as that undertaken by Robert Repetto and David Austin of Resources for the Future), historical and sectoral examples, univariate and multivariate regression analysis, simulations, Hotelling-type theoretical models, CEA staff econometric forecasts of emissions in developing countries, stylized models of perfect competition and monopoly, basic economic reasoning and the various other sorts of theoretical and empirical tools of analysis that abound in the scholarly literature. Drawing on this broad array of analytical tools allowed a useful evaluation of the policy alternatives.

We have considered and evaluated the following specific large econometric and computable general equilibrium models of the economics of climate change mitigation: Second Generation Model, G-cubed, MERGE, and DICE. We have also looked at the results from many other models, such as GREEN, DRI, Markal Macro, Megabare, EPPA, FUND, MiniCAM, CETA, RIVM, and CETM/MRT.

18b. *According to the testimony, the Administration has relied particularly on the Second Generation Model of Battelle Laboratories for many of its estimates. However, the IAT report indicated that the SGM model "focusses on long-term transitions and measures the economy in 5 year intervals," so that it risks racing past short-term transition issues, such as GDP loss and impacts on specific industries.*

*Specify all of the Administration's estimates that were derived from this model.*

Response: The Administration used this model's estimates as one of several inputs in its calculations of likely permit prices and resource costs for the different emissions trading scenarios. Please see the methodology section in the AEA. (see pp. 42-49) Information of the marginal abatement cost curves of non-carbon dioxide greenhouse gases was missing from the SGM output and added to reflect provisions in the Protocol. Numerical estimates of expenditure changes and ancillary benefits used estimates of likely permit prices or emissions reductions as inputs.

*Also, indicate why many of the Administration's key estimates were derived from this model.*

Response: The SGM model, unlike many economic models of climate change, has an explicit model of emissions reductions in other countries, and so is exceptionally well suited for estimating emissions permit prices given international trade in permits. In addition, it has modules reflecting several major developing countries and data on all other developing countries as a group. Thus, it is well suited to address the effects of developing country participation on permit prices. Finally, the timely availability of sufficient information about a variety of SGM model runs made its use practical between the time the Kyoto Protocol was developed in December 1997 and our first testimony in March 1998.

*Finally, please identify the corresponding estimates derived from each model that the Administration has used in assessing the impacts of the Kyoto Protocol.*

Response: The development of corresponding estimates is a complicated technical task that is beyond the abilities of our small staff to complete in a timely manner. We expect that the Stanford Energy Modeling Forum, which conducts exercises with a set of energy-economic models to assess hypothetical energy policy scenarios, will continue to produce comparisons of various climate change models' forecasts of the effects of the Kyoto Protocol. Although some of these models have not yet incorporated the five categories of non-CO2 gases directly into their models, these comparisons should provide a full comparison of the SGM predictions with those of other models.

19. *What are the 1990 baseline, the Fiscal Year 1997, 1998 and 1999, data, and the annual outyear estimates until 2012 for the following outcome performance measures mentioned in Dr. Yellen's testimony: morbidity rates for some diseases, mortality rates for some causes, monetary damages from temperature increase, consequences from some catastrophes, traffic congestion, highway accidents, and air pollution unrelated to climate change.*

Response: For all these data we have no information on outcome performance measures for the Fiscal Years requested, or for year-to-year estimates through 2012. For baseline and projections of air pollution, please refer to the EPA Regulatory Impact Analysis for Ozone and Particulate Matter. For baseline and projections of traffic congestion and accidents, please refer to the following report:

> Texas Transportation Institute, Texas Department of Transportation, and the Federal Highway Administration. 1997. Urban Roadway Congestion -- 1982 to 1994. August.

20. *Why does the Administration maintain that the U.S. acid rain program experience "clearly demonstrates how programs like international permit trading, joint implementation and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs"?*

Response: Emissions trading programs and other market mechanisms, provide continuous economic incentives to reduce emissions further, which generally lead costs to be much lower than would be the case under a variety of more traditional regulatory approaches. The acid rain program, for example, has resulted in compliance costs far below those originally estimated.

*Why does the Administration believe that it is appropriate to extrapolate from that experience to the global arena.*

Response: The basic principle that there is gain from the ability to trade emissions permits is of quite wide applicability. Indeed the textbook theory of gains from trade is perhaps most familiar and well established at the international level. Economic incentives generally have similar effects in different countries and cultures: people everywhere are interested in higher incomes. International permit markets will lower compliance costs in all participating countries, because they provide financial incentives for sources to reduce emissions. These incentives will have the

effect of lowering the costs of emissions cuts relative to what would be the case without any trading of emissions permits.

*Won't the effectiveness of the international system, joint implementation, and the Clean Development Mechanism depend on different factors, such as the rules and procedures governing these mechanisms, the extent of participation by other countries, including developing countries?*

Response: The Administration believes that effective rules on trading, joint implementation and the Clean Development Mechanism are critical to the success of these mechanisms, and has asked other parties to support such rules.

21a. *In her testimony, Dr. Yellen stated that part of doing it smart (i.e., lowering the costs of reducing greenhouse gas emissions) under the Kyoto Protocol means "taking serious and responsible steps in the short-run to prepare us to meet our obligations in the longer-term." She indicated that these steps include a $6.3 billion program of tax cuts and R&D investments, industry-by-industry consultations to prepare emission reduction plans in key industrial sectors, and legislation to restructure the electrical industry. Under what authority is the Administration pursuing this unilateral executive branch course of action in furtherance of the treaty's emissions reductions targets and without Senate Ratification?*

Response: The programs you describe are not unilateral executive branch actions to implement the Kyoto Protocol. For example, the $6.3 billion Climate Change Technology Initiative (CCTI) is a 1999 budget proposal to Congress. Similarly, the electricity restructuring plan is a legislative proposal. Voluntary actions to reduce greenhouse gas emissions, such as exemplified by the CCTI and industry consultations are fully consistent with the U.S. obligations under the 1992 Framework Convention on Climate Change and existing agency authority. Moreover, these programs are not specifically intended to implement the Kyoto Protocol. Rather, they are meant to keep the United States on a path toward cleaner and more efficient energy use and promote a more competitive electricity industry.

21b. *If the Administration is delaying the submission of the treaty to the Senate until it obtains meaningful participation by developing countries, doesn't that decision also require the Administration to delay any unilateral executive branch action to address global warming until that cooperation is forthcoming.*

Response: The Administration is not embarking on unilateral Executive Branch action to implement the Kyoto Protocol without ratification. To the contrary, steps to ensure compliance with the Protocol's requirements will be undertaken only with the full advice and consent of the Senate. However, the Administration is pursuing a variety of policies that make good sense even independent of concerns about climate change and that has the additional desirable property of reducing greenhouse gas concentrations. Examples of such policies include the CCTI. These polices all reduce energy consumption, and thereby reduce dependence on foreign oil and emissions of air pollutants unrelated to climate change, policy goals that have enjoyed bipartisan

support in Congress and have been a long standing priority of this and previous administrations. The 1992 Framework Convention on Climate Change adopted by the Bush Administration and ratified by the Senate requires the United States to take measures to reduce its greenhouse gas emissions.

c. *Given that the Kyoto Protocol seeks to address a global issue, isn't [it] harmful to U.S. interests to proceed without the full participation of developing countries.*

Response: The President has said that he will not submit the Kyoto Protocol for Senate ratification without meaningful participation by key developing countries.

d. *Besides being unconstitutional, isn't it also premature and harmful to U.S. interests to take such unilateral actions, without ratification, when the Administration has characterized the Protocol as a "work in progress" a Protocol that is not yet fully complete nor ready for the President's submission to the Senate?*

Response: The President has clearly stated that the Administration will not circumvent the Congress and implement the Kyoto treaty before it is ratified. However, this does not mean that ongoing efforts to promote energy efficiency, reduce our reliance on foreign oil or improve our air quality should be rolled back. As stated above, these initiatives have enjoyed bipartisan support in Congress and are consistent with our obligations under the 1992 Framework Convention on Climate Change.

**D. Cost/Benefit Analysis of the Kyoto Treaty**

22a. *Please provide any and all analyses that the Administration or any federal agency prepared (or had prepared) or is preparing (or is having prepared) of the costs and benefits of imposing on the U.S. the binding targets and timetables set forth in the Kyoto Protocol for reducing greenhouse gas emissions, taking into account the global implications of the way in which this agreement is structured.*

Response: Please see the AEA for additional detailed information about the economic analysis of the Kyoto Protocol. (see pp. 39-72)

*Also please analyze and document the following:*

22b. *Whether the benefits of implementing this Protocol are justified by the costs.*

Response: It is extremely difficult to quantify the long-term economic benefits of climate change mitigation. We have not calculated a monetary value of these benefits. Although we do not think the benefits of mitigating climate change are, at this stage, quantifiable with adequate precision, they are nonetheless likely to be real and large in the long run. Estimates of costs for the United States to meet its Kyoto emissions targets are likely to be modest if these reductions

are undertaken in an efficient manner. (see AEA pp. iii.- iv.)

22c. *Evaluate the effectiveness of this agreement by comparing the marginal abatement costs of the most plausible alternative scenarios for meeting the Kyoto targets, given the way in which this agreement is structured, with the marginal costs of other reasonable alternative compliance schemes.*

Response: The Administration has presented a set of scenarios reflecting a variety of assumptions about international trading and participation by developing countries, both in trading and the Clean Development Mechanism. (see AEA pp. 51-53) However, it should be noted that the illustrative analysis in the AEA does not incorporate several components of the Administration's efforts to address the risks of climate change. For example, the illustrative analysis did not take into account cost-effective opportunities for mitigation through carbon sinks, the Administration's electricity restructuring proposal, the Climate Change Technology Initiative, industry consultations, and improved Federal energy management. All of these can provide additional opportunities for abatement domestically that are not reflected in the illustrative analysis because they are not amenable to analysis with a computable general equilibrium model such as SGM.

22d. *With respect to each scenario that is analyzed, identify the assumptions used, explain any uncertainties concerning the assumptions, and examine the sensitivity of net effects to the different compliance strategies, using a range of plausible assumptions about future economic development and about fundamental climate processes.*

Response: Please see the methodology section of the AEA. (see pp. 42-50)

22e. *Evaluate the opportunity costs of pursuing the Administration's strategy for the abatement of greenhouse gas emissions under the terms of the treaty;*

Response: As the Protocol is a work in progress its opportunity costs cannot be evaluated without also considering the additional flexibility mechanisms included as a result of continued United States efforts in ongoing diplomatic discussions. The opportunity costs of the Protocol and the flexibility mechanisms are extensively discussed in prior testimony by Dr. Janet Yellen, and in the AEA. (see pp. 51-68)

22f. *Evaluate how the benefits and burdens of complying with this treaty would be distributed on the national and household levels, describing, among other things, the disparate regional and industrial impacts, and the effects on different income levels.*

Response: We do not have estimates of the distribution of impacts across regions or industries.

23a. *In evaluating alternative scenarios, please examine the following.*

23b. *Compare the economic and environmental effects of not including developing countries in*

*the effort to reduce global emissions (with the potential for binding developed countries to even greater obligations, without limiting developing countries at all) against the effects of addressing greenhouse gas mitigation on a global scale by the international community.*

Response: Climate change is a global problem, so policy approaches encompassing more countries will likely be both more effective and more cost-effective than approaches involving only a few countries. Including developing countries will lower costs and permit prices substantially because of the many low cost abatement opportunities in these countries. Estimates from the Battelle Laboratory's Second Generation Model, which are in line with other models, suggest that developing country participation through the Clean Development Mechanism (CDM) along with trading among developed countries with emissions targets could reduce resource costs by 66 percent compared to a domestic only approach. Trading among developed countries with emissions targets without CDM could reduce resource costs by 57 percent compared to a domestic only approach. The model suggests that including key developing country participation through adopting emissions targets and participating in international permit markets along with developed countries could lower costs by nearly 80 percent. (see AEA pp. 51-53)

23c. *Compare the economic and environmental effects of complying with the timeframes set forth in the Kyoto Protocol with the effects of complying over longer time periods.*

Response: The AEA focuses on assessing the economic and environmental effects of complying with the Kyoto Protocol and the President's policies to address climate change.

23d. *Compare the impacts of reducing greenhouse gas emissions using international emissions trading, joint implementation, and the Clean Development Mechanism with the impacts of relying upon domestic emissions permit trading. In this regard evaluate alternative international trading scenarios: trading only among Annex I countries, trading that extends to a number of key developing countries, and trading in which all countries are fully participating.*

Response: Please see the results section of the AEA. (see pp. 51-68)

24. *With respect to any analysis provided, please identify and explain the basis for assumptions used regarding such factors as the rate of improvement in energy efficiency, the effectiveness of market incentives in increasing the market share of fuels that emit less carbon, and economic and demographic growth. Also, explain fully any assumptions on how emissions reductions will be achieved as, for example, through the early retirement of coal plants or nuclear plant life extensions.*

Response: Please refer to the section on energy efficiency improvement in the AEA. (see pp. 46-47) In addition, for a discussion on the effects of a permit trading system on energy efficiency improvement, please refer to p. 53 of the AEA. For a discussion of how emissions reductions are achieved in the Second Generation Model, please refer to Edmonds et al. 1992 (full cite is on p. 75 of the AEA).

25. *In considering the opportunity costs, evaluate the extent to which the Administration's climate change strategy will require the diversion of funds from savings and/or investments which would have provided other benefits, such as saving social security, or more funding for education, health care, etc.*

Response: The resource costs that are described in Dr. Yellen's testimony reflect the opportunity cost as it is usually understood by economists. The apportionment of these costs to foregone spending, whether on social security or education or some other program, is an unconventional analysis that we have not undertaken.

26. *In assessing the impacts on the U.S. of complying with the Kyoto targets and timetables, please explain in detail the potential effects on the following indicators of economic performance: gross domestic product (GDP), per capita GDP, unemployment, income and real wages, trade competitiveness, and energy prices.*

Response: Projected percentage changes in GDP, per capita GDP, energy prices and competitiveness, are outlined in Dr. Yellen's testimony, and discussed in the results section of the AEA. (see pp. 54-61) Given the Administration's policies, complying with the Kyoto targets should not have significant effects on aggregate employment. (see AEA p. 62 and the answer to Question 16h)

27. *In assessing the benefits of complying with the Kyoto treaty, please evaluate fully the potential offsetting negative effects of exempting developing countries and of "carbon leakage".*

Response: Exempting all developing countries would amount to a hypothetical departure from the President's policy. The Kyoto Protocol establishes a Clean Development Mechanism whereby Annex I countries such as the United States or their firms may undertake projects that reduce emissions in developing countries and receive credit for such reductions. CDM is likely to provide a broad range of cost savings to the United States, and this conclusion is consistent with our interpretation of SGM model results that suggest that CDM would reduce resource costs by about 20 to 25 percent relative to scenarios in which there is permit trading either among all or a subset of Annex I countries. Inclusion of developing countries in the CDM and in international emissions trading would mitigate carbon leakage.

28. *President Clinton has suggested that the U.S. economy can continue to grow under this agreement. Please indicate at what rate the Administration expects that the economy will continue to grow during the next 10 to 20 years if the treaty is ratified and at what rate it is expected to grow if the treaty is not ratified.*

Response: As shown in a figure on GDP in 2010 in the results section of the AEA (see p. 59), the effect on the GDP growth rate of the Kyoto Protocol, given the assumptions that we have elsewhere described, is minimal relative to the anticipated growth in GDP between now and 2010. Under business as usual, the Second Generation Model projects U.S. GDP to grow 2.0859% annually between 1995 and 2010. With a permit price of $14/ton, SGM projects the

annual growth rate to be 2.0851%, and less than $23/ton, the annual growth rate is projected to be 2.0822%. (see p. 59)

29. *Have any of the cost-benefit analyses performed by the Administration or any agency been peer-reviewed?*

Response: With the exception of the IAT report which was fully the work of many agencies under the direction of the Department of Commerce, and some of the studies by the Department of Energy's National Labs, we are unaware of any peer-review of Administration estimates. The Council of Economic Advisers took the lead on the AEA. This document has not been peer reviewed, consistent with the CEA's policy that it does not submit its analyses or reports for peer review.

30. *In connection with these cost-benefit analyses, fully explain how the baseline(s), against which costs and benefits were calculated, was determined.*

Response: Please see the AEA. (see pp. 42-50)

31a. *Please provide all records of written or oral comments from other agencies on each of the cost-benefit analyses that were performed.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

31b. *Please provide all records of comments submitted by federal agencies on Dr. Yellen's draft testimony about the economics of Kyoto for the hearing before the House Commerce Committee on March 4, 1998.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

32a. *Given the significant economic costs projected by private sector studies, why did the Administration abandon a year and a half-long effort to develop cost estimates of the President's proposed policies to reduce greenhouse gas emissions?*

Response: First, the significant costs projected by private sector studies are not derived from analyses of emissions reduction scenarios that include the whole range of flexible elements that comprise both the Kyoto Protocol and Administration policy. The Interagency Analytical Team work to which the question refers was a modeling effort that produced some useful lessons, but as we found from the peer reviewers' comments, it also suffered from some shortcomings. The Administration Economic Analysis (AEA) builds on the IAT exercise and also the insights of a wide range of models and other relevant literature to derive its conclusion that, with the

flexibility mechanisms included in the treaty, and with sound domestic policies, the economic impacts of complying with the Kyoto Protocol should be modest.

32b. *Please identify any and all private parties that are currently performing economic analyses of the Kyoto treaty or any aspect of it for the Administration. Describe their work and provide all products of their work in draft or final form.*

Response: CEA has no list of parties doing economic analysis of the Kyoto Protocol or any aspect of it for the Administration. Moreover, CEA has no contract or cooperative agreement with any modeler or modelers to undertake specific analyses regarding the Kyoto Protocol.

**E. International Emissions Trading**

33a. *Even assuming that effective rules and procedures can be developed for an international emissions trading system and for joint implementation projects and that key developing countries agree to participate, isn't there a real risk that these mechanisms could effect an enormous transfer of wealth and jobs out of this country overseas, especially to the countries of the former Soviet Union, China, India, South Korea, Brazil, and Mexico (i.e. that this system would be essentially a foreign aid program)? Some studies have estimated that more than 50% of our reductions would have to be purchased from other countries.*

Response: The Administration is committed to achieving as many cost-effective emissions reductions domestically as possible. At the same time, our analysis does suggest that for the 2008-2012 time frame it makes sense for the United States to pursue low cost emissions reductions abroad, as would happen with the full implementation of an international emissions trading program. The key point is that trading will be economically beneficial to U.S. firms. We expect the Annex B parties of the former Soviet Union and key developing countries will provide significant investment opportunities for U.S. firms to capture gains from emissions trading as those countries restructure and develop their economies. Developing countries will represent the greatest share of new energy, transportation, and building infrastructure investment worldwide in the coming decades, and U.S. firms can help provide clean technologies and financing that will build those economies and markets, help stave off disruptive climate effects, and allow U.S. firms to capitalize on their investments in environmentally superior products and processes.

Our analysis does not suggest that emissions trading will have a significant negative impact on U.S. employment. If anything, the lower costs associated with a comprehensive trading program will help protect American jobs.

33b. *Please provide and document estimates of the percentage of U.S. emissions reductions that might have to be purchased from other countries to minimize the costs of reducing emissions and which countries likely would be the beneficiaries.*

Response: Our analyses provide illustrative estimates of how emissions trading and other flexibility mechanisms can lower costs, but ascribing with precision the emissions reduction to

any particular country is impossible. The trades and emissions reductions undertaken by U.S. firms will depend on a whole host of factors such as the costs (including transactions costs) of emissions reductions in participating countries, the extent to which emissions can be cost-effectively offset through sinks at home and abroad, the role of the six categories of gases, and the development and deployment of climate-friendly technology. Further, the "beneficiaries" of trading would include the United States, particularly U.S. firms, due to the lowered costs of achieving our target.

34a. *What real incentive do developing countries have to participate in the international emissions trading system, which would require them to commit to mandatory reductions, when they can transfer emissions reductions credits in connection with joint implementation projects and obtain financing through the Clean Development Mechanism?*

Response: Developing countries would experience significant gains from trading in emissions permits. The economic and environmental rationales for a target and trade approach by developing countries include:

- Greater economic benefits to developing countries: With targets at or only slightly below their business-as-usual (BAU) projected emissions growth, emissions reductions in developing countries would produce many billions of dollars through the international sale of emission reductions achieved at lower cost than the world price.

- Target and trade yields greater benefits than CDM: While the Clean Development Mechanism will result in benefits for developing countries, an effective target and trade system can produce far greater benefits to developing countries. In contrast to the CDM, which is project based, countries that agree to emissions targets can employ a wide variety of measures to reduce emissions, and need not rely exclusively on project-based reductions. Nor do they always need to establish a baseline against which projects generate reductions. Like other trading parties, developing countries that agree to a target and trade system would need to follow the rules and guidelines for trading, but are otherwise free to pursue emissions reductions and sequestration in any and all sectors in the way they see fit. The advantage of trading is that they can be compensated for those reductions in a way in which they cannot be without a binding obligation, and the opportunities are more comprehensive than with CDM alone.

- Environmental benefits: Developing countries participating by adopting emissions targets would help to more effectively protect and manage the global environment. Reducing carbon dioxide emissions is in their interest, because in many cases, developing countries are especially vulnerable to the risks of climate change. In addition, lower carbon dioxide emissions in developing countries generate ancillary air quality benefits through lower particulate matter, sulfur dioxide, and nitrogen oxides emissions. Air quality is a key environmental concern in many developing countries

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List of
ccs attached

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

CHIEF OF STAFF

August 24, 1998

Dear Ms. Dobriansky:

Enclosed are responses to questions 15-34 of the March 13 letter from Chairman McIntosh to Council of Economic Advisers ("CEA") Chair Janet Yellen. Also enclosed are 6 boxes of documents related to economic analysis of climate change policies.

In addition, the Office of the Counsel to the President has determined that other CEA climate change documents include material that reflects Executive Branch policy-making deliberations. Please contact the Office of Counsel to the President to discuss the appropriate accommodation with regard to these materials.

Finally, as you know, on August 10, 1998, CEA Chair Janet Yellen was served with a subpoena to produce certain records related to climate change. This subpoena requires that the CEA provide the Committee within a 2 week period an extremely broad range of additional climate change materials that were not covered by Chairman McIntosh's March 13 letter. The August 10 subpoena will require a substantial and time consuming new search of CEA files. Moreover, given that much of the materials are likely to reflect policy deliberations, the Office of the Counsel to the President will need to review the documents to safeguard the interests of the Executive Branch in confidentiality of the policy-making process.

As you know, even though the CEA staff is extremely small, CEA is responsible for providing the President with information, analysis and advice on a range of domestic and international economic issues, including performance of the stock market, trends in the U.S. economy, Social Security reform, the Asian financial crisis and the economic troubles in Russia. We are simply unable to undertake the additional search required to respond on the timetable specified in the August 10 subpoena, while still fulfilling our statutory obligations related to the continued strength and vitality of the U.S. economy.

Please contact me at 395-5084 to discuss the nature and timing of the CEA's response to the August 10 subpoena.

Sincerely,

Michele Jolin

Michele Jolin

Ms. Larisa Dobriansky
Senior Counsel
Subcommittee on National Economic Growth,
Natural Resources and Regulatory Affairs
Committee on Government Reform and Oversight
U.S. House of Representatives
Room 2157 Rayburn House Office Building
Washington, D.C. 20515-6143

Enclosures

cc: Keith Ausbrook
Alys Campaigne

# Answers to March 13 Questions To CEA
# from Representative McIntosh
# Chair of the House Subcommittee
# on National Economic Growth, Natural Resources, and Regulatory Affairs

## C. Dr. Yellen's Testimony before the House Commerce Committee on March 4, 1998

15. *Please provide any and all analyses that support the Administration's conclusion that impacts on the U.S. economy of complying with the terms of the Kyoto Protocol are likely to be "modest".*

Response: Dr. Yellen's testimony concluded that the net costs of the Administration's policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and the United States is successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism. The analyses supporting this conclusion are presented in "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis" (hereafter, the AEA). (see pp. 39-72)

15. Continued. *Also, explain fully how the Administration can make such a forecast responsibly when as Dr. Yellen stated, "it is not yet possible to provide a full authoritative analysis of the Kyoto Protocol." Among other things, Dr. Yellen noted that there is still "much that we do not know" because much has been left unresolved by this treaty (for example, implementation issues, the rules and procedures governing international emissions trading, joint implementation projects, and the Clean Development Mechanism, and future emissions reduction obligations). Moreover, Dr. Yellen asserted that to her knowledge, "no [economic] model --whether used inside the government or not --has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old."*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs of the Kyoto Protocol have generally not taken into account the specific provisions of the Kyoto agreement and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these elements will raise the estimated cost. The Administration's conclusion, and the illustrative numerical estimates that support this conclusion, incorporate these policies and mechanisms.

16. *Please provide any and all analyses that support the following estimates:*

a. *U.S. electricity restructuring "will offer approximately $20 billion in cost savings".*

Response: The derivation of this estimate is explained in the AEA in the section entitled potential electricity restructuring cost-savings. (see Appendix C)

b. *Emissions trading among the Annex I countries "can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

c. *Emissions trading among a subset of Annex I countries (for example, the United States, Australia, Canada, New Zealand, and Russia) "can reduce costs by an estimated 60-70 percent."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

*Also, based on the estimates presented in Janet Yellen's testimony, please explain and fully document how more limited trading among this subset of countries would produce greater cost reductions than from either trading among all Annex I countries or trading with the full participation of Non-Annex I countries.*

Response: The market clearing price for greenhouse gas permits in an international trading system result from the supply and demand for internationally traded permits. If a country that is expected to be a net seller decided not to sell, then the actual supply falls, and the permit price and associated cost increases. If a country that is expected to be a net buyer decided not to buy, then demand falls, and the permit price and associated cost falls. In the case of trading under the Kyoto Protocol, both the United States and the European Union are projected by many economic models to be net buyers. If the European Union decides not to participate in international trading, then the demand for permits on the international market would decline, and the permit price and costs would fall, thereby benefiting countries that continue to buy permits internationally. Please also see the section on the effect of climate change policy on the United States in the AEA (see pp. 51-53).

d. *The Clean Development Mechanism "might shave costs by roughly another 20 to 25 percent".*

Response: The United States is seeking to ensure that the Clean Development Mechanism becomes a cost-effective way to allow developed country firms to give financing and technical assistance for projects to lower emissions and to receive credit for the reductions. Our best professional judgment, based on discussions with a variety of informed analysts, is that CDM could achieve at least 20 percent of the emissions reductions available under full global trading.

The statement that costs would fall by roughly another 20 to 25 percent is based on the SGM results given an assumption of 20 percent "effectiveness," and is further explained in the AEA. (see pp. 35, 48)

e. *Overall costs "would reach roughly one-tenth of one percent of projected GDP in 2010" (resource costs of achieving Kyoto targets for emissions reductions were estimated to be $7 to $12 billion per year in 2008 to 2012).*

Response: The forecasted changes in GDP were taken from the SGM model output based on certain assumptions. Please see the section on the effects of climate change policy on the United States in the attached AEA for a brief summary. (see pp. 51-53)

*Also, please explain how it is possible that compliance with the Kyoto Protocol, which has been projected by independent economists to be the most expensive environmental undertaking ever, could cost less than compliance with the recently issued U.S. air quality rules for particulate matter and ozone (the final Regulatory Impact Analysis for those rules estimated costs of $46 billion).*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs have generally not taken into account the flexibility mechanisms included in the Kyoto Protocol and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these flexibility mechanisms raises the cost estimates of these analyses.

f. *The assumption that the rate of improvement in energy efficiency (AEEI) will be 1.0 percent per year (which is greater than that assumed by the EIA).*

Response: Please see the section on energy efficiency improvement in the AEA for a brief summary. (see pp. 46-47)

*In particular, please reconcile this assumption with the statement of the CEA in its 1998 Annual Report that "[u]ntil an emissions cap and trading system are in place, however, the economic incentive to use [technologies supported by the Administration's budget] may be low."*

Response: No reconciliation is needed. The comment from the 1998 ERP implies simply that in the absence of a cap and trade system that would lower the price of using carbon-lean technologies relative to carbon-rich technologies, the incentives to adopt such carbon-lean technologies will be less than in a world with the target and trade system in place. Moreover, the AEEI represents the autonomous rate of technological improvement, i.e., the rate that would occur in the absence of price changes that the target and trade system might lead to, due merely to the greater availability of new technologies. Thus its value is a comment on the extent of one's technological optimism, and not about optimism of private parties to respond to price

incentives.

*Is the Administration assuming that such a system will be put into place in the short-run?*

Response: The Administration's position on the timing of a target and trade system has not changed. The Administration maintains that the system should be established in the 2008-12 time-frame with the benefit of 10 years of additional experience with similar market based mechanisms.

g. *The estimated effect on energy prices will range from $14 to $23 per ton of carbon equivalent.*

Response: Please see the section of the AEA that describes the effects of climate change policy on the United States (see pp. 54-58)

h. *"In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors --many of them high-tech jobs paying high wages."*

Response: According to standard economic analysis, in the long run, total employment is determined by the size of the labor force, incentives to work, and the productivity of labor. Changes in prices -- which result from developments in technology, trade, energy markets, or many other areas -- tend to have their effects on the composition of employment across sectors, more than on total employment.

As explained in Dr. Yellen's testimony and in the AEA, the energy price changes expected to result from the Kyoto protocol are likely to be modest. In particular, these price changes over the next decade are less than the average of year-to-year absolute price changes observed since 1960. Thus there is little reason to believe there will be large changes in employment even in the energy-intensive sectors. In the less energy-intensive sectors, there is no reason to expect any decline in employment at all due to climate change policies. Most economic models would not predict changes in the overall level of employment resulting from such small energy price changes 10 years in the future. (see pp. 54-62)

Furthermore, the United States has a strong competitive advantage in a variety of high-tech sectors. For example, recent innovations in battery technology, and in fuel cells were announced by U.S. companies. These innovations, and future ones expected from U.S. companies, will be in demand worldwide. The growth in associated production is likely to lead to growth in high-wage jobs in this country.

I. *As to each analysis, please indicate who prepared the analysis and provide records of comments from other federal agencies.*

*Response:* All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

17. *Please provide any and all analyses that support the Administration's estimate that benefits relating to traffic congestion, highway accidents, and air pollution unrelated to climate change "could offset approximately a quarter of the resource cost of the climate change policy."*

Response: This analysis is summarized in the section of the AEA describing ancillary benefits. (see pp. 66-68)

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

*As to each analysis, please indicate who prepared the analysis and provide all records of comments from other federal agencies.*

Response: All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

18a. *In her testimony, Dr. Yellen stated that, in evaluating the "likely net economic impact of the Kyoto Protocol," the Administration has "drawn upon a broad array of analytical tools", and a "wide range of models of the energy sector and economy over the next 25 years" to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Please specify all of the models and analytical tools that the Administration has used and describe in detail their strengths and weaknesses.*

Response: As explained in Dr. Yellen's testimony, the existence of modeling difficulties means that we should treat any model results with the caution that is warranted -- not that we should abandon rigorous economic analysis. We have employed a broad set of economic tools to analyze the policy options. Such tools include models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant

statistics, "meta-analyses" of existing models (such as that undertaken by Robert Repetto and David Austin of Resources for the Future), historical and sectoral examples, univariate and multivariate regression analysis, simulations, Hotelling-type theoretical models, CEA staff econometric forecasts of emissions in developing countries, stylized models of perfect competition and monopoly, basic economic reasoning and the various other sorts of theoretical and empirical tools of analysis that abound in the scholarly literature. Drawing on this broad array of analytical tools allowed a useful evaluation of the policy alternatives.

We have considered and evaluated the following specific large econometric and computable general equilibrium models of the economics of climate change mitigation: Second Generation Model, G-cubed, MERGE, and DICE. We have also looked at the results from many other models, such as GREEN, DRI, Markal Macro, Megabare, EPPA, FUND, MiniCAM, CETA, RIVM, and CETM/MRT.

18b. *According to the testimony, the Administration has relied particularly on the Second Generation Model of Battelle Laboratories for many of its estimates. However, the IAT report indicated that the SGM model "focusses on long-term transitions and measures the economy in 5 year intervals," so that it risks racing past short-term transition issues, such as GDP loss and impacts on specific industries.*

*Specify all of the Administration's estimates that were derived from this model.*

Response: The Administration used this model's estimates as one of several inputs in its calculations of likely permit prices and resource costs for the different emissions trading scenarios. Please see the methodology section in the AEA. (see pp. 42-49) Information of the marginal abatement cost curves of non-carbon dioxide greenhouse gases was missing from the SGM output and added to reflect provisions in the Protocol. Numerical estimates of expenditure changes and ancillary benefits used estimates of likely permit prices or emissions reductions as inputs.

*Also, indicate why many of the Administration's key estimates were derived from this model.*

Response: The SGM model, unlike many economic models of climate change, has an explicit model of emissions reductions in other countries, and so is exceptionally well suited for estimating emissions permit prices given international trade in permits. In addition, it has modules reflecting several major developing countries and data on all other developing countries as a group. Thus, it is well suited to address the effects of developing country participation on permit prices. Finally, the timely availability of sufficient information about a variety of SGM model runs made its use practical between the time the Kyoto Protocol was developed in December 1997 and our first testimony in March 1998.

*Finally, please identify the corresponding estimates derived from each model that the Administration has used in assessing the impacts of the Kyoto Protocol.*

Response: The development of corresponding estimates is a complicated technical task that is beyond the abilities of our small staff to complete in a timely manner. We expect that the Stanford Energy Modeling Forum, which conducts exercises with a set of energy-economic models to assess hypothetical energy policy scenarios, will continue to produce comparisons of various climate change models' forecasts of the effects of the Kyoto Protocol. Although some of these models have not yet incorporated the five categories of non-CO2 gases directly into their models, these comparisons should provide a full comparison of the SGM predictions with those of other models.

19. *What are the 1990 baseline, the Fiscal Year 1997, 1998 and 1999, data, and the annual outyear estimates until 2012 for the following outcome performance measures mentioned in Dr. Yellen's testimony: morbidity rates for some diseases, mortality rates for some causes, monetary damages from temperature increase, consequences from some catastrophes, traffic congestion, highway accidents, and air pollution unrelated to climate change.*

Response: For all these data we have no information on outcome performance measures for the Fiscal Years requested, or for year-to-year estimates through 2012. For baseline and projections of air pollution, please refer to the EPA Regulatory Impact Analysis for Ozone and Particulate Matter. For baseline and projections of traffic congestion and accidents, please refer to the following report:

> Texas Transportation Institute, Texas Department of Transportation, and the Federal Highway Administration. 1997. Urban Roadway Congestion -- 1982 to 1994. August.

20. *Why does the Administration maintain that the U.S. acid rain program experience "clearly demonstrates how programs like international permit trading, joint implementation and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs"?*

Response: Emissions trading programs and other market mechanisms, provide continuous economic incentives to reduce emissions further, which generally lead costs to be much lower than would be the case under a variety of more traditional regulatory approaches. The acid rain program, for example, has resulted in compliance costs far below those originally estimated.

*Why does the Administration believe that it is appropriate to extrapolate from that experience to the global arena.*

Response: The basic principle that there is gain from the ability to trade emissions permits is of quite wide applicability. Indeed the textbook theory of gains from trade is perhaps most familiar and well established at the international level. Economic incentives generally have similar effects in different countries and cultures: people everywhere are interested in higher incomes. International permit markets will lower compliance costs in all participating countries, because they provide financial incentives for sources to reduce emissions. These incentives will have the

effect of lowering the costs of emissions cuts relative to what would be the case without any trading of emissions permits.

*Won't the effectiveness of the international system, joint implementation, and the Clean Development Mechanism depend on different factors, such as the rules and procedures governing these mechanisms, the extent of participation by other countries, including developing countries?*

Response: The Administration believes that effective rules on trading, joint implementation and the Clean Development Mechanism are critical to the success of these mechanisms, and has asked other parties to support such rules.

21a. *In her testimony, Dr. Yellen stated that part of doing it smart (i.e., lowering the costs of reducing greenhouse gas emissions) under the Kyoto Protocol means "taking serious and responsible steps in the short-run to prepare us to meet our obligations in the longer-term." She indicated that these steps include a $6.3 billion program of tax cuts and R&D investments, industry-by-industry consultations to prepare emission reduction plans in key industrial sectors, and legislation to restructure the electrical industry. Under what authority is the Administration pursuing this unilateral executive branch course of action in furtherance of the treaty's emissions reductions targets and without Senate Ratification?*

Response: The programs you describe are not unilateral executive branch actions to implement the Kyoto Protocol. For example, the $6.3 billion Climate Change Technology Initiative (CCTI) is a 1999 budget proposal to Congress. Similarly, the electricity restructuring plan is a legislative proposal. Voluntary actions to reduce greenhouse gas emissions, such as exemplified by the CCTI and industry consultations are fully consistent with the U.S. obligations under the 1992 Framework Convention on Climate Change and existing agency authority. Moreover, these programs are not specifically intended to implement the Kyoto Protocol. Rather, they are meant to keep the United States on a path toward cleaner and more efficient energy use and promote a more competitive electricity industry.

21b. *If the Administration is delaying the submission of the treaty to the Senate until it obtains meaningful participation by developing countries, doesn't that decision also require the Administration to delay any unilateral executive branch action to address global warming until that cooperation is forthcoming.*

Response: The Administration is not embarking on unilateral Executive Branch action to implement the Kyoto Protocol without ratification. To the contrary, steps to ensure compliance with the Protocol's requirements will be undertaken only with the full advice and consent of the Senate. However, the Administration is pursuing a variety of policies that make good sense even independent of concerns about climate change and that has the additional desirable property of reducing greenhouse gas concentrations. Examples of such policies include the CCTI. These polices all reduce energy consumption, and thereby reduce dependence on foreign oil and emissions of air pollutants unrelated to climate change, policy goals that have enjoyed bipartisan

support in Congress and have been a long standing priority of this and previous administrations. The 1992 Framework Convention on Climate Change adopted by the Bush Administration and ratified by the Senate requires the United States to take measures to reduce its greenhouse gas emissions.

c. *Given that the Kyoto Protocol seeks to address a global issue, isn't [it] harmful to U.S. interests to proceed without the full participation of developing countries.*

Response: The President has said that he will not submit the Kyoto Protocol for Senate ratification without meaningful participation by key developing countries.

d. *Besides being unconstitutional, isn't it also premature and harmful to U.S. interests to take such unilateral actions, without ratification, when the Administration has characterized the Protocol as a "work in progress" a Protocol that is not yet fully complete nor ready for the President's submission to the Senate?*

Response: The President has clearly stated that the Administration will not circumvent the Congress and implement the Kyoto treaty before it is ratified. However, this does not mean that ongoing efforts to promote energy efficiency, reduce our reliance on foreign oil or improve our air quality should be rolled back. As stated above, these initiatives have enjoyed bipartisan support in Congress and are consistent with our obligations under the 1992 Framework Convention on Climate Change.

**D. Cost/Benefit Analysis of the Kyoto Treaty**

22a. *Please provide any and all analyses that the Administration or any federal agency prepared (or had prepared) or is preparing (or is having prepared) of the costs and benefits of imposing on the U.S. the binding targets and timetables set forth in the Kyoto Protocol for reducing greenhouse gas emissions, taking into account the global implications of the way in which this agreement is structured.*

Response: Please see the AEA for additional detailed information about the economic analysis of the Kyoto Protocol. (see pp. 39-72)

*Also please analyze and document the following:*

22b. *Whether the benefits of implementing this Protocol are justified by the costs.*

Response: It is extremely difficult to quantify the long-term economic benefits of climate change mitigation. We have not calculated a monetary value of these benefits. Although we do not think the benefits of mitigating climate change are, at this stage, quantifiable with adequate precision, they are nonetheless likely to be real and large in the long run. Estimates of costs for the United States to meet its Kyoto emissions targets are likely to be modest if these reductions

are undertaken in an efficient manner. (see AEA pp. iii.- iv.)

22c. *Evaluate the effectiveness of this agreement by comparing the marginal abatement costs of the most plausible alternative scenarios for meeting the Kyoto targets, given the way in which this agreement is structured, with the marginal costs of other reasonable alternative compliance schemes.*

Response: The Administration has presented a set of scenarios reflecting a variety of assumptions about international trading and participation by developing countries, both in trading and the Clean Development Mechanism. (see AEA pp. 51-53) However, it should be noted that the illustrative analysis in the AEA does not incorporate several components of the Administration's efforts to address the risks of climate change. For example, the illustrative analysis did not take into account cost-effective opportunities for mitigation through carbon sinks, the Administration's electricity restructuring proposal, the Climate Change Technology Initiative, industry consultations, and improved Federal energy management. All of these can provide additional opportunities for abatement domestically that are not reflected in the illustrative analysis because they are not amenable to analysis with a computable general equilibrium model such as SGM.

22d. *With respect to each scenario that is analyzed, identify the assumptions used, explain any uncertainties concerning the assumptions, and examine the sensitivity of net effects to the different compliance strategies, using a range of plausible assumptions about future economic development and about fundamental climate processes.*

Response: Please see the methodology section of the AEA. (see pp. 42-50)

22e. *Evaluate the opportunity costs of pursuing the Administration's strategy for the abatement of greenhouse gas emissions under the terms of the treaty;*

Response: As the Protocol is a work in progress its opportunity costs cannot be evaluated without also considering the additional flexibility mechanisms included as a result of continued United States efforts in ongoing diplomatic discussions. The opportunity costs of the Protocol and the flexibility mechanisms are extensively discussed in prior testimony by Dr. Janet Yellen, and in the AEA. (see pp. 51-68)

22f. *Evaluate how the benefits and burdens of complying with this treaty would be distributed on the national and household levels, describing, among other things, the disparate regional and industrial impacts, and the effects on different income levels.*

Response: We do not have estimates of the distribution of impacts across regions or industries.

23a. *In evaluating alternative scenarios, please examine the following.*

23b. *Compare the economic and environmental effects of not including developing countries in*

*the effort to reduce global emissions (with the potential for binding developed countries to even greater obligations, without limiting developing countries at all) against the effects of addressing greenhouse gas mitigation on a global scale by the international community.*

Response: Climate change is a global problem, so policy approaches encompassing more countries will likely be both more effective and more cost-effective than approaches involving only a few countries. Including developing countries will lower costs and permit prices substantially because of the many low cost abatement opportunities in these countries. Estimates from the Battelle Laboratory's Second Generation Model, which are in line with other models, suggest that developing country participation through the Clean Development Mechanism (CDM) along with trading among developed countries with emissions targets could reduce resource costs by 66 percent compared to a domestic only approach. Trading among developed countries with emissions targets without CDM could reduce resource costs by 57 percent compared to a domestic only approach. The model suggests that including key developing country participation through adopting emissions targets and participating in international permit markets along with developed countries could lower costs by nearly 80 percent. (see AEA pp. 51-53)

23c. *Compare the economic and environmental effects of complying with the timeframes set forth in the Kyoto Protocol with the effects of complying over longer time periods.*

Response: The AEA focuses on assessing the economic and environmental effects of complying with the Kyoto Protocol and the President's policies to address climate change.

23d. *Compare the impacts of reducing greenhouse gas emissions using international emissions trading, joint implementation, and the Clean Development Mechanism with the impacts of relying upon domestic emissions permit trading. In this regard evaluate alternative international trading scenarios: trading only among Annex I countries, trading that extends to a number of key developing countries, and trading in which all countries are fully participating.*

Response: Please see the results section of the AEA. (see pp. 51-68)

24. *With respect to any analysis provided, please identify and explain the basis for assumptions used regarding such factors as the rate of improvement in energy efficiency, the effectiveness of market incentives in increasing the market share of fuels that emit less carbon, and economic and demographic growth. Also, explain fully any assumptions on how emissions reductions will be achieved as, for example, through the early retirement of coal plants or nuclear plant life extensions.*

Response: Please refer to the section on energy efficiency improvement in the AEA. (see pp. 46-47) In addition, for a discussion on the effects of a permit trading system on energy efficiency improvement, please refer to p. 53 of the AEA. For a discussion of how emissions reductions are achieved in the Second Generation Model, please refer to Edmonds et al. 1992 (full cite is on p. 75 of the AEA).

25. *In considering the opportunity costs, evaluate the extent to which the Administration's climate change strategy will require the diversion of funds from savings and/or investments which would have provided other benefits, such as saving social security, or more funding for education, health care, etc.*

Response: The resource costs that are described in Dr. Yellen's testimony reflect the opportunity cost as it is usually understood by economists. The apportionment of these costs to foregone spending, whether on social security or education or some other program, is an unconventional analysis that we have not undertaken.

26. *In assessing the impacts on the U.S. of complying with the Kyoto targets and timetables, please explain in detail the potential effects on the following indicators of economic performance: gross domestic product (GDP), per capita GDP, unemployment, income and real wages, trade competitiveness, and energy prices.*

Response: Projected percentage changes in GDP, per capita GDP, energy prices and competitiveness, are outlined in Dr. Yellen's testimony, and discussed in the results section of the AEA. (see pp. 54-61) Given the Administration's policies, complying with the Kyoto targets should not have significant effects on aggregate employment. (see AEA p. 62 and the answer to Question 16h)

27. *In assessing the benefits of complying with the Kyoto treaty, please evaluate fully the potential offsetting negative effects of exempting developing countries and of "carbon leakage".*

Response: Exempting all developing countries would amount to a hypothetical departure from the President's policy. The Kyoto Protocol establishes a Clean Development Mechanism whereby Annex I countries such as the United States or their firms may undertake projects that reduce emissions in developing countries and receive credit for such reductions. CDM is likely to provide a broad range of cost savings to the United States, and this conclusion is consistent with our interpretation of SGM model results that suggest that CDM would reduce resource costs by about 20 to 25 percent relative to scenarios in which there is permit trading either among all or a subset of Annex I countries. Inclusion of developing countries in the CDM and in international emissions trading would mitigate carbon leakage.

28. *President Clinton has suggested that the U.S. economy can continue to grow under this agreement. Please indicate at what rate the Administration expects that the economy will continue to grow during the next 10 to 20 years if the treaty is ratified and at what rate it is expected to grow if the treaty is not ratified.*

Response: As shown in a figure on GDP in 2010 in the results section of the AEA (see p. 59), the effect on the GDP growth rate of the Kyoto Protocol, given the assumptions that we have elsewhere described, is minimal relative to the anticipated growth in GDP between now and 2010. Under business as usual, the Second Generation Model projects U.S. GDP to grow 2.0859% annually between 1995 and 2010. With a permit price of $14/ton, SGM projects the

annual growth rate to be 2.0851%, and less than $23/ton, the annual growth rate is projected to be 2.0822%. (see p. 59)

29. *Have any of the cost-benefit analyses performed by the Administration or any agency been peer-reviewed?*

Response: With the exception of the IAT report which was fully the work of many agencies under the direction of the Department of Commerce, and some of the studies by the Department of Energy's National Labs, we are unaware of any peer-review of Administration estimates. The Council of Economic Advisers took the lead on the AEA. This document has not been peer reviewed, consistent with the CEA's policy that it does not submit its analyses or reports for peer review.

30. *In connection with these cost-benefit analyses, fully explain how the baseline(s), against which costs and benefits were calculated, was determined.*

Response: Please see the AEA. (see pp. 42-50)

31a. *Please provide all records of written or oral comments from other agencies on each of the cost-benefit analyses that were performed.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

31b. *Please provide all records of comments submitted by federal agencies on Dr. Yellen's draft testimony about the economics of Kyoto for the hearing before the House Commerce Committee on March 4, 1998.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

32a. *Given the significant economic costs projected by private sector studies, why did the Administration abandon a year and a half-long effort to develop cost estimates of the President's proposed policies to reduce greenhouse gas emissions?*

Response: First, the significant costs projected by private sector studies are not derived from analyses of emissions reduction scenarios that include the whole range of flexible elements that comprise both the Kyoto Protocol and Administration policy. The Interagency Analytical Team work to which the question refers was a modeling effort that produced some useful lessons, but as we found from the peer reviewers' comments, it also suffered from some shortcomings. The Administration Economic Analysis (AEA) builds on the IAT exercise and also the insights of a wide range of models and other relevant literature to derive its conclusion that, with the

flexibility mechanisms included in the treaty, and with sound domestic policies, the economic impacts of complying with the Kyoto Protocol should be modest.

32b. *Please identify any and all private parties that are currently performing economic analyses of the Kyoto treaty or any aspect of it for the Administration. Describe their work and provide all products of their work in draft or final form.*

Response: CEA has no list of parties doing economic analysis of the Kyoto Protocol or any aspect of it for the Administration. Moreover, CEA has no contract or cooperative agreement with any modeler or modelers to undertake specific analyses regarding the Kyoto Protocol.

**E. International Emissions Trading**

33a. *Even assuming that effective rules and procedures can be developed for an international emissions trading system and for joint implementation projects and that key developing countries agree to participate, isn't there a real risk that these mechanisms could effect an enormous transfer of wealth and jobs out of this country overseas, especially to the countries of the former Soviet Union, China, India, South Korea, Brazil, and Mexico (i.e. that this system would be essentially a foreign aid program)? Some studies have estimated that more than 50% of our reductions would have to be purchased from other countries.*

Response: The Administration is committed to achieving as many cost-effective emissions reductions domestically as possible. At the same time, our analysis does suggest that for the 2008-2012 time frame it makes sense for the United States to pursue low cost emissions reductions abroad, as would happen with the full implementation of an international emissions trading program. The key point is that trading will be economically beneficial to U.S. firms. We expect the Annex B parties of the former Soviet Union and key developing countries will provide significant investment opportunities for U.S. firms to capture gains from emissions trading as those countries restructure and develop their economies. Developing countries will represent the greatest share of new energy, transportation, and building infrastructure investment worldwide in the coming decades, and U.S. firms can help provide clean technologies and financing that will build those economies and markets, help stave off disruptive climate effects, and allow U.S. firms to capitalize on their investments in environmentally superior products and processes.

Our analysis does not suggest that emissions trading will have a significant negative impact on U.S. employment. If anything, the lower costs associated with a comprehensive trading program will help protect American jobs.

33b. *Please provide and document estimates of the percentage of U.S. emissions reductions that might have to be purchased from other countries to minimize the costs of reducing emissions and which countries likely would be the beneficiaries.*

Response: Our analyses provide illustrative estimates of how emissions trading and other flexibility mechanisms can lower costs, but ascribing with precision the emissions reduction to

any particular country is impossible. The trades and emissions reductions undertaken by U.S. firms will depend on a whole host of factors such as the costs (including transactions costs) of emissions reductions in participating countries, the extent to which emissions can be cost-effectively offset through sinks at home and abroad, the role of the six categories of gases, and the development and deployment of climate-friendly technology. Further, the "beneficiaries" of trading would include the United States, particularly U.S. firms, due to the lowered costs of achieving our target.

34a. *What real incentive do developing countries have to participate in the international emissions trading system, which would require them to commit to mandatory reductions, when they can transfer emissions reductions credits in connection with joint implementation projects and obtain financing through the Clean Development Mechanism?*

Response: Developing countries would experience significant gains from trading in emissions permits. The economic and environmental rationales for a target and trade approach by developing countries include:

- Greater economic benefits to developing countries: With targets at or only slightly below their business-as-usual (BAU) projected emissions growth, emissions reductions in developing countries would produce many billions of dollars through the international sale of emission reductions achieved at lower cost than the world price.

- Target and trade yields greater benefits than CDM: While the Clean Development Mechanism will result in benefits for developing countries, an effective target and trade system can produce far greater benefits to developing countries. In contrast to the CDM, which is project based, countries that agree to emissions targets can employ a wide variety of measures to reduce emissions, and need not rely exclusively on project-based reductions. Nor do they always need to establish a baseline against which projects generate reductions. Like other trading parties, developing countries that agree to a target and trade system would need to follow the rules and guidelines for trading, but are otherwise free to pursue emissions reductions and sequestration in any and all sectors in the way they see fit. The advantage of trading is that they can be compensated for those reductions in a way in which they cannot be without a binding obligation, and the opportunities are more comprehensive than with CDM alone.

- Environmental benefits: Developing countries participating by adopting emissions targets would help to more effectively protect and manage the global environment. Reducing carbon dioxide emissions is in their interest, because in many cases, developing countries are especially vulnerable to the risks of climate change. In addition, lower carbon dioxide emissions in developing countries generate ancillary air quality benefits through lower particulate matter, sulfur dioxide, and nitrogen oxides emissions. Air quality is a key environmental concern in many developing countries

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List of CCs attached

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

CHIEF OF STAFF

August 24, 1998

Dear Ms. Dobriansky:

Enclosed are responses to questions 15-34 of the March 13 letter from Chairman McIntosh to Council of Economic Advisers ("CEA") Chair Janet Yellen. Also enclosed are 6 boxes of documents related to economic analysis of climate change policies.

In addition, the Office of the Counsel to the President has determined that other CEA climate change documents include material that reflects Executive Branch policy-making deliberations. Please contact the Office of Counsel to the President to discuss the appropriate accommodation with regard to these materials.

Finally, as you know, on August 10, 1998, CEA Chair Janet Yellen was served with a subpoena to produce certain records related to climate change. This subpoena requires that the CEA provide the Committee within a 2 week period an extremely broad range of additional climate change materials that were not covered by Chairman McIntosh's March 13 letter. The August 10 subpoena will require a substantial and time consuming new search of CEA files. Moreover, given that much of the materials are likely to reflect policy deliberations, the Office of the Counsel to the President will need to review the documents to safeguard the interests of the Executive Branch in confidentiality of the policy-making process.

As you know, even though the CEA staff is extremely small, CEA is responsible for providing the President with information, analysis and advice on a range of domestic and international economic issues, including performance of the stock market, trends in the U.S. economy, Social Security reform, the Asian financial crisis and the economic troubles in Russia. We are simply unable to undertake the additional search required to respond on the timetable specified in the August 10 subpoena, while still fulfilling our statutory obligations related to the continued strength and vitality of the U.S. economy.

Please contact me at 395-5084 to discuss the nature and timing of the CEA's response to the August 10 subpoena.

Sincerely,

Michele Jolin

Michele Jolin

Ms. Larisa Dobriansky
Senior Counsel
Subcommittee on National Economic Growth,
Natural Resources and Regulatory Affairs
Committee on Government Reform and Oversight
U.S. House of Representatives
Room 2157 Rayburn House Office Building
Washington, D.C. 20515-6143

Enclosures

cc: Keith Ausbrook
Alys Campaigne

# Answers to March 13 Questions To CEA
# from Representative McIntosh
# Chair of the House Subcommittee
# on National Economic Growth, Natural Resources, and Regulatory Affairs

## C. Dr. Yellen's Testimony before the House Commerce Committee on March 4, 1998

15. *Please provide any and all analyses that support the Administration's conclusion that impacts on the U.S. economy of complying with the terms of the Kyoto Protocol are likely to be "modest".*

Response: Dr. Yellen's testimony concluded that the net costs of the Administration's policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and the United States is successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism. The analyses supporting this conclusion are presented in "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis" (hereafter, the AEA). (see pp. 39-72)

15. Continued. *Also, explain fully how the Administration can make such a forecast responsibly when as Dr. Yellen stated, "it is not yet possible to provide a full authoritative analysis of the Kyoto Protocol." Among other things, Dr. Yellen noted that there is still "much that we do not know" because much has been left unresolved by this treaty (for example, implementation issues, the rules and procedures governing international emissions trading, joint implementation projects, and the Clean Development Mechanism, and future emissions reduction obligations). Moreover, Dr. Yellen asserted that to her knowledge, "no [economic] model --whether used inside the government or not --has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old."*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs of the Kyoto Protocol have generally not taken into account the specific provisions of the Kyoto agreement and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these elements will raise the estimated cost. The Administration's conclusion, and the illustrative numerical estimates that support this conclusion, incorporate these policies and mechanisms.

16. *Please provide any and all analyses that support the following estimates:*

a. *U.S. electricity restructuring "will offer approximately $20 billion in cost savings".*

Response: The derivation of this estimate is explained in the AEA in the section entitled potential electricity restructuring cost-savings. (see Appendix C)

b. *Emissions trading among the Annex I countries "can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

c. *Emissions trading among a subset of Annex I countries (for example, the United States, Australia, Canada, New Zealand, and Russia) "can reduce costs by an estimated 60-70 percent."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

*Also, based on the estimates presented in Janet Yellen's testimony, please explain and fully document how more limited trading among this subset of countries would produce greater cost reductions than from either trading among all Annex I countries or trading with the full participation of Non-Annex I countries.*

Response: The market clearing price for greenhouse gas permits in an international trading system result from the supply and demand for internationally traded permits. If a country that is expected to be a net seller decided not to sell, then the actual supply falls, and the permit price and associated cost increases. If a country that is expected to be a net buyer decided not to buy, then demand falls, and the permit price and associated cost falls. In the case of trading under the Kyoto Protocol, both the United States and the European Union are projected by many economic models to be net buyers. If the European Union decides not to participate in international trading, then the demand for permits on the international market would decline, and the permit price and costs would fall, thereby benefiting countries that continue to buy permits internationally. Please also see the section on the effect of climate change policy on the United States in the AEA (see pp. 51-53).

d. *The Clean Development Mechanism "might shave costs by roughly another 20 to 25 percent".*

Response: The United States is seeking to ensure that the Clean Development Mechanism becomes a cost-effective way to allow developed country firms to give financing and technical assistance for projects to lower emissions and to receive credit for the reductions. Our best professional judgment, based on discussions with a variety of informed analysts, is that CDM could achieve at least 20 percent of the emissions reductions available under full global trading.

The statement that costs would fall by roughly another 20 to 25 percent is based on the SGM results given an assumption of 20 percent "effectiveness," and is further explained in the AEA. (see pp. 35, 48)

e. *Overall costs "would reach roughly one-tenth of one percent of projected GDP in 2010" (resource costs of achieving Kyoto targets for emissions reductions were estimated to be $7 to $12 billion per year in 2008 to 2012).*

Response: The forecasted changes in GDP were taken from the SGM model output based on certain assumptions. Please see the section on the effects of climate change policy on the United States in the attached AEA for a brief summary. (see pp. 51-53)

*Also, please explain how it is possible that compliance with the Kyoto Protocol, which has been projected by independent economists to be the most expensive environmental undertaking ever, could cost less than compliance with the recently issued U.S. air quality rules for particulate matter and ozone (the final Regulatory Impact Analysis for those rules estimated costs of $46 billion).*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs have generally not taken into account the flexibility mechanisms included in the Kyoto Protocol and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these flexibility mechanisms raises the cost estimates of these analyses.

f. *The assumption that the rate of improvement in energy efficiency (AEEI) will be 1.0 percent per year (which is greater than that assumed by the EIA).*

Response: Please see the section on energy efficiency improvement in the AEA for a brief summary. (see pp. 46-47)

*In particular, please reconcile this assumption with the statement of the CEA in its 1998 Annual Report that "[u]ntil an emissions cap and trading system are in place, however, the economic incentive to use [technologies supported by the Administration's budget] may be low."*

Response: No reconciliation is needed. The comment from the 1998 ERP implies simply that in the absence of a cap and trade system that would lower the price of using carbon-lean technologies relative to carbon-rich technologies, the incentives to adopt such carbon-lean technologies will be less than in a world with the target and trade system in place. Moreover, the AEEI represents the autonomous rate of technological improvement, i.e., the rate that would occur in the absence of price changes that the target and trade system might lead to, due merely to the greater availability of new technologies. Thus its value is a comment on the extent of one's technological optimism, and not about optimism of private parties to respond to price

incentives.

*Is the Administration assuming that such a system will be put into place in the short-run?*

Response: The Administration's position on the timing of a target and trade system has not changed. The Administration maintains that the system should be established in the 2008-12 time-frame with the benefit of 10 years of additional experience with similar market based mechanisms.

g. *The estimated effect on energy prices will range from $14 to $23 per ton of carbon equivalent.*

Response: Please see the section of the AEA that describes the effects of climate change policy on the United States (see pp. 54-58)

h. *"In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors --many of them high-tech jobs paying high wages."*

Response: According to standard economic analysis, in the long run, total employment is determined by the size of the labor force, incentives to work, and the productivity of labor. Changes in prices -- which result from developments in technology, trade, energy markets, or many other areas -- tend to have their effects on the composition of employment across sectors, more than on total employment.

As explained in Dr. Yellen's testimony and in the AEA, the energy price changes expected to result from the Kyoto protocol are likely to be modest. In particular, these price changes over the next decade are less than the average of year-to-year absolute price changes observed since 1960. Thus there is little reason to believe there will be large changes in employment even in the energy-intensive sectors. In the less energy-intensive sectors, there is no reason to expect any decline in employment at all due to climate change policies. Most economic models would not predict changes in the overall level of employment resulting from such small energy price changes 10 years in the future. (see pp. 54-62)

Furthermore, the United States has a strong competitive advantage in a variety of high-tech sectors. For example, recent innovations in battery technology, and in fuel cells were announced by U.S. companies. These innovations, and future ones expected from U.S. companies, will be in demand worldwide. The growth in associated production is likely to lead to growth in high-wage jobs in this country.

I. *As to each analysis, please indicate who prepared the analysis and provide records of comments from other federal agencies.*

*Response:* All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

17. *Please provide any and all analyses that support the Administration's estimate that benefits relating to traffic congestion, highway accidents, and air pollution unrelated to climate change "could offset approximately a quarter of the resource cost of the climate change policy."*

Response: This analysis is summarized in the section of the AEA describing ancillary benefits. (see pp. 66-68)

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

*As to each analysis, please indicate who prepared the analysis and provide all records of comments from other federal agencies.*

Response: All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

18a. *In her testimony, Dr. Yellen stated that, in evaluating the "likely net economic impact of the Kyoto Protocol," the Administration has "drawn upon a broad array of analytical tools", and a "wide range of models of the energy sector and economy over the next 25 years" to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Please specify all of the models and analytical tools that the Administration has used and describe in detail their strengths and weaknesses.*

Response: As explained in Dr. Yellen's testimony, the existence of modeling difficulties means that we should treat any model results with the caution that is warranted -- not that we should abandon rigorous economic analysis. We have employed a broad set of economic tools to analyze the policy options. Such tools include models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant

statistics, "meta-analyses" of existing models (such as that undertaken by Robert Repetto and David Austin of Resources for the Future), historical and sectoral examples, univariate and multivariate regression analysis, simulations, Hotelling-type theoretical models, CEA staff econometric forecasts of emissions in developing countries, stylized models of perfect competition and monopoly, basic economic reasoning and the various other sorts of theoretical and empirical tools of analysis that abound in the scholarly literature. Drawing on this broad array of analytical tools allowed a useful evaluation of the policy alternatives.

We have considered and evaluated the following specific large econometric and computable general equilibrium models of the economics of climate change mitigation: Second Generation Model, G-cubed, MERGE, and DICE. We have also looked at the results from many other models, such as GREEN, DRI, Markal Macro, Megabare, EPPA, FUND, MiniCAM, CETA, RIVM, and CETM/MRT.

18b. *According to the testimony, the Administration has relied particularly on the Second Generation Model of Battelle Laboratories for many of its estimates. However, the IAT report indicated that the SGM model "focusses on long-term transitions and measures the economy in 5 year intervals," so that it risks racing past short-term transition issues, such as GDP loss and impacts on specific industries.*

*Specify all of the Administration's estimates that were derived from this model.*

Response: The Administration used this model's estimates as one of several inputs in its calculations of likely permit prices and resource costs for the different emissions trading scenarios. Please see the methodology section in the AEA. (see pp. 42-49) Information of the marginal abatement cost curves of non-carbon dioxide greenhouse gases was missing from the SGM output and added to reflect provisions in the Protocol. Numerical estimates of expenditure changes and ancillary benefits used estimates of likely permit prices or emissions reductions as inputs.

*Also, indicate why many of the Administration's key estimates were derived from this model.*

Response: The SGM model, unlike many economic models of climate change, has an explicit model of emissions reductions in other countries, and so is exceptionally well suited for estimating emissions permit prices given international trade in permits. In addition, it has modules reflecting several major developing countries and data on all other developing countries as a group. Thus, it is well suited to address the effects of developing country participation on permit prices. Finally, the timely availability of sufficient information about a variety of SGM model runs made its use practical between the time the Kyoto Protocol was developed in December 1997 and our first testimony in March 1998.

*Finally, please identify the corresponding estimates derived from each model that the Administration has used in assessing the impacts of the Kyoto Protocol.*

Response: The development of corresponding estimates is a complicated technical task that is beyond the abilities of our small staff to complete in a timely manner. We expect that the Stanford Energy Modeling Forum, which conducts exercises with a set of energy-economic models to assess hypothetical energy policy scenarios, will continue to produce comparisons of various climate change models' forecasts of the effects of the Kyoto Protocol. Although some of these models have not yet incorporated the five categories of non-CO2 gases directly into their models, these comparisons should provide a full comparison of the SGM predictions with those of other models.

19. *What are the 1990 baseline, the Fiscal Year 1997, 1998 and 1999, data, and the annual outyear estimates until 2012 for the following outcome performance measures mentioned in Dr. Yellen's testimony: morbidity rates for some diseases, mortality rates for some causes, monetary damages from temperature increase, consequences from some catastrophes, traffic congestion, highway accidents, and air pollution unrelated to climate change.*

Response: For all these data we have no information on outcome performance measures for the Fiscal Years requested, or for year-to-year estimates through 2012. For baseline and projections of air pollution, please refer to the EPA Regulatory Impact Analysis for Ozone and Particulate Matter. For baseline and projections of traffic congestion and accidents, please refer to the following report:

> Texas Transportation Institute, Texas Department of Transportation, and the Federal Highway Administration. 1997. Urban Roadway Congestion -- 1982 to 1994. August.

20. *Why does the Administration maintain that the U.S. acid rain program experience "clearly demonstrates how programs like international permit trading, joint implementation and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs"?*

Response: Emissions trading programs and other market mechanisms, provide continuous economic incentives to reduce emissions further, which generally lead costs to be much lower than would be the case under a variety of more traditional regulatory approaches. The acid rain program, for example, has resulted in compliance costs far below those originally estimated.

*Why does the Administration believe that it is appropriate to extrapolate from that experience to the global arena.*

Response: The basic principle that there is gain from the ability to trade emissions permits is of quite wide applicability. Indeed the textbook theory of gains from trade is perhaps most familiar and well established at the international level. Economic incentives generally have similar effects in different countries and cultures: people everywhere are interested in higher incomes. International permit markets will lower compliance costs in all participating countries, because they provide financial incentives for sources to reduce emissions. These incentives will have the

effect of lowering the costs of emissions cuts relative to what would be the case without any trading of emissions permits.

*Won't the effectiveness of the international system, joint implementation, and the Clean Development Mechanism depend on different factors, such as the rules and procedures governing these mechanisms, the extent of participation by other countries, including developing countries?*

Response: The Administration believes that effective rules on trading, joint implementation and the Clean Development Mechanism are critical to the success of these mechanisms, and has asked other parties to support such rules.

21a. *In her testimony, Dr. Yellen stated that part of doing it smart (i.e., lowering the costs of reducing greenhouse gas emissions) under the Kyoto Protocol means "taking serious and responsible steps in the short-run to prepare us to meet our obligations in the longer-term." She indicated that these steps include a $6.3 billion program of tax cuts and R&D investments, industry-by-industry consultations to prepare emission reduction plans in key industrial sectors, and legislation to restructure the electrical industry. Under what authority is the Administration pursuing this unilateral executive branch course of action in furtherance of the treaty's emissions reductions targets and without Senate Ratification?*

Response: The programs you describe are not unilateral executive branch actions to implement the Kyoto Protocol. For example, the $6.3 billion Climate Change Technology Initiative (CCTI) is a 1999 budget proposal to Congress. Similarly, the electricity restructuring plan is a legislative proposal. Voluntary actions to reduce greenhouse gas emissions, such as exemplified by the CCTI and industry consultations are fully consistent with the U.S. obligations under the 1992 Framework Convention on Climate Change and existing agency authority. Moreover, these programs are not specifically intended to implement the Kyoto Protocol. Rather, they are meant to keep the United States on a path toward cleaner and more efficient energy use and promote a more competitive electricity industry.

21b. *If the Administration is delaying the submission of the treaty to the Senate until it obtains meaningful participation by developing countries, doesn't that decision also require the Administration to delay any unilateral executive branch action to address global warming until that cooperation is forthcoming.*

Response: The Administration is not embarking on unilateral Executive Branch action to implement the Kyoto Protocol without ratification. To the contrary, steps to ensure compliance with the Protocol's requirements will be undertaken only with the full advice and consent of the Senate. However, the Administration is pursuing a variety of policies that make good sense even independent of concerns about climate change and that has the additional desirable property of reducing greenhouse gas concentrations. Examples of such policies include the CCTI. These polices all reduce energy consumption, and thereby reduce dependence on foreign oil and emissions of air pollutants unrelated to climate change, policy goals that have enjoyed bipartisan

support in Congress and have been a long standing priority of this and previous administrations. The 1992 Framework Convention on Climate Change adopted by the Bush Administration and ratified by the Senate requires the United States to take measures to reduce its greenhouse gas emissions.

c. *Given that the Kyoto Protocol seeks to address a global issue, isn't [it] harmful to U.S. interests to proceed without the full participation of developing countries.*

Response: The President has said that he will not submit the Kyoto Protocol for Senate ratification without meaningful participation by key developing countries.

d. *Besides being unconstitutional, isn't it also premature and harmful to U.S. interests to take such unilateral actions, without ratification, when the Administration has characterized the Protocol as a "work in progress" a Protocol that is not yet fully complete nor ready for the President's submission to the Senate?*

Response: The President has clearly stated that the Administration will not circumvent the Congress and implement the Kyoto treaty before it is ratified. However, this does not mean that ongoing efforts to promote energy efficiency, reduce our reliance on foreign oil or improve our air quality should be rolled back. As stated above, these initiatives have enjoyed bipartisan support in Congress and are consistent with our obligations under the 1992 Framework Convention on Climate Change.

**D. Cost/Benefit Analysis of the Kyoto Treaty**

22a. *Please provide any and all analyses that the Administration or any federal agency prepared (or had prepared) or is preparing (or is having prepared) of the costs and benefits of imposing on the U.S. the binding targets and timetables set forth in the Kyoto Protocol for reducing greenhouse gas emissions, taking into account the global implications of the way in which this agreement is structured.*

Response: Please see the AEA for additional detailed information about the economic analysis of the Kyoto Protocol. (see pp. 39-72)

*Also please analyze and document the following:*

22b. *Whether the benefits of implementing this Protocol are justified by the costs.*

Response: It is extremely difficult to quantify the long-term economic benefits of climate change mitigation. We have not calculated a monetary value of these benefits. Although we do not think the benefits of mitigating climate change are, at this stage, quantifiable with adequate precision, they are nonetheless likely to be real and large in the long run. Estimates of costs for the United States to meet its Kyoto emissions targets are likely to be modest if these reductions

are undertaken in an efficient manner. (see AEA pp. iii.- iv.)

22c. *Evaluate the effectiveness of this agreement by comparing the marginal abatement costs of the most plausible alternative scenarios for meeting the Kyoto targets, given the way in which this agreement is structured, with the marginal costs of other reasonable alternative compliance schemes.*

Response: The Administration has presented a set of scenarios reflecting a variety of assumptions about international trading and participation by developing countries, both in trading and the Clean Development Mechanism. (see AEA pp. 51-53) However, it should be noted that the illustrative analysis in the AEA does not incorporate several components of the Administration's efforts to address the risks of climate change. For example, the illustrative analysis did not take into account cost-effective opportunities for mitigation through carbon sinks, the Administration's electricity restructuring proposal, the Climate Change Technology Initiative, industry consultations, and improved Federal energy management. All of these can provide additional opportunities for abatement domestically that are not reflected in the illustrative analysis because they are not amenable to analysis with a computable general equilibrium model such as SGM.

22d. *With respect to each scenario that is analyzed, identify the assumptions used, explain any uncertainties concerning the assumptions, and examine the sensitivity of net effects to the different compliance strategies, using a range of plausible assumptions about future economic development and about fundamental climate processes.*

Response: Please see the methodology section of the AEA. (see pp. 42-50)

22e. *Evaluate the opportunity costs of pursuing the Administration's strategy for the abatement of greenhouse gas emissions under the terms of the treaty;*

Response: As the Protocol is a work in progress its opportunity costs cannot be evaluated without also considering the additional flexibility mechanisms included as a result of continued United States efforts in ongoing diplomatic discussions. The opportunity costs of the Protocol and the flexibility mechanisms are extensively discussed in prior testimony by Dr. Janet Yellen, and in the AEA. (see pp. 51-68)

22f. *Evaluate how the benefits and burdens of complying with this treaty would be distributed on the national and household levels, describing, among other things, the disparate regional and industrial impacts, and the effects on different income levels.*

Response: We do not have estimates of the distribution of impacts across regions or industries.

23a. *In evaluating alternative scenarios, please examine the following.*

23b. *Compare the economic and environmental effects of not including developing countries in*

*the effort to reduce global emissions (with the potential for binding developed countries to even greater obligations, without limiting developing countries at all) against the effects of addressing greenhouse gas mitigation on a global scale by the international community.*

Response: Climate change is a global problem, so policy approaches encompassing more countries will likely be both more effective and more cost-effective than approaches involving only a few countries. Including developing countries will lower costs and permit prices substantially because of the many low cost abatement opportunities in these countries. Estimates from the Battelle Laboratory's Second Generation Model, which are in line with other models, suggest that developing country participation through the Clean Development Mechanism (CDM) along with trading among developed countries with emissions targets could reduce resource costs by 66 percent compared to a domestic only approach. Trading among developed countries with emissions targets without CDM could reduce resource costs by 57 percent compared to a domestic only approach. The model suggests that including key developing country participation through adopting emissions targets and participating in international permit markets along with developed countries could lower costs by nearly 80 percent. (see AEA pp. 51-53)

23c. *Compare the economic and environmental effects of complying with the timeframes set forth in the Kyoto Protocol with the effects of complying over longer time periods.*

Response: The AEA focuses on assessing the economic and environmental effects of complying with the Kyoto Protocol and the President's policies to address climate change.

23d. *Compare the impacts of reducing greenhouse gas emissions using international emissions trading, joint implementation, and the Clean Development Mechanism with the impacts of relying upon domestic emissions permit trading. In this regard evaluate alternative international trading scenarios: trading only among Annex I countries, trading that extends to a number of key developing countries, and trading in which all countries are fully participating.*

Response: Please see the results section of the AEA. (see pp. 51-68)

24. *With respect to any analysis provided, please identify and explain the basis for assumptions used regarding such factors as the rate of improvement in energy efficiency, the effectiveness of market incentives in increasing the market share of fuels that emit less carbon, and economic and demographic growth. Also, explain fully any assumptions on how emissions reductions will be achieved as, for example, through the early retirement of coal plants or nuclear plant life extensions.*

Response: Please refer to the section on energy efficiency improvement in the AEA. (see pp. 46-47) In addition, for a discussion on the effects of a permit trading system on energy efficiency improvement, please refer to p. 53 of the AEA. For a discussion of how emissions reductions are achieved in the Second Generation Model, please refer to Edmonds et al. 1992 (full cite is on p. 75 of the AEA).

25. *In considering the opportunity costs, evaluate the extent to which the Administration's climate change strategy will require the diversion of funds from savings and/or investments which would have provided other benefits, such as saving social security, or more funding for education, health care, etc.*

Response: The resource costs that are described in Dr. Yellen's testimony reflect the opportunity cost as it is usually understood by economists. The apportionment of these costs to foregone spending, whether on social security or education or some other program, is an unconventional analysis that we have not undertaken.

26. *In assessing the impacts on the U.S. of complying with the Kyoto targets and timetables, please explain in detail the potential effects on the following indicators of economic performance: gross domestic product (GDP), per capita GDP, unemployment, income and real wages, trade competitiveness, and energy prices.*

Response: Projected percentage changes in GDP, per capita GDP, energy prices and competitiveness, are outlined in Dr. Yellen's testimony, and discussed in the results section of the AEA. (see pp. 54-61) Given the Administration's policies, complying with the Kyoto targets should not have significant effects on aggregate employment. (see AEA p. 62 and the answer to Question 16h)

27. *In assessing the benefits of complying with the Kyoto treaty, please evaluate fully the potential offsetting negative effects of exempting developing countries and of "carbon leakage".*

Response: Exempting all developing countries would amount to a hypothetical departure from the President's policy. The Kyoto Protocol establishes a Clean Development Mechanism whereby Annex I countries such as the United States or their firms may undertake projects that reduce emissions in developing countries and receive credit for such reductions. CDM is likely to provide a broad range of cost savings to the United States, and this conclusion is consistent with our interpretation of SGM model results that suggest that CDM would reduce resource costs by about 20 to 25 percent relative to scenarios in which there is permit trading either among all or a subset of Annex I countries. Inclusion of developing countries in the CDM and in international emissions trading would mitigate carbon leakage.

28. *President Clinton has suggested that the U.S. economy can continue to grow under this agreement. Please indicate at what rate the Administration expects that the economy will continue to grow during the next 10 to 20 years if the treaty is ratified and at what rate it is expected to grow if the treaty is not ratified.*

Response: As shown in a figure on GDP in 2010 in the results section of the AEA (see p. 59), the effect on the GDP growth rate of the Kyoto Protocol, given the assumptions that we have elsewhere described, is minimal relative to the anticipated growth in GDP between now and 2010. Under business as usual, the Second Generation Model projects U.S. GDP to grow 2.0859% annually between 1995 and 2010. With a permit price of $14/ton, SGM projects the

annual growth rate to be 2.0851%, and less than $23/ton, the annual growth rate is projected to be 2.0822%. (see p. 59)

29. *Have any of the cost-benefit analyses performed by the Administration or any agency been peer-reviewed?*

Response: With the exception of the IAT report which was fully the work of many agencies under the direction of the Department of Commerce, and some of the studies by the Department of Energy's National Labs, we are unaware of any peer-review of Administration estimates. The Council of Economic Advisers took the lead on the AEA. This document has not been peer reviewed, consistent with the CEA's policy that it does not submit its analyses or reports for peer review.

30. *In connection with these cost-benefit analyses, fully explain how the baseline(s), against which costs and benefits were calculated, was determined.*

Response: Please see the AEA. (see pp. 42-50)

31a. *Please provide all records of written or oral comments from other agencies on each of the cost-benefit analyses that were performed.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

31b. *Please provide all records of comments submitted by federal agencies on Dr. Yellen's draft testimony about the economics of Kyoto for the hearing before the House Commerce Committee on March 4, 1998.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

32a. *Given the significant economic costs projected by private sector studies, why did the Administration abandon a year and a half-long effort to develop cost estimates of the President's proposed policies to reduce greenhouse gas emissions?*

Response: First, the significant costs projected by private sector studies are not derived from analyses of emissions reduction scenarios that include the whole range of flexible elements that comprise both the Kyoto Protocol and Administration policy. The Interagency Analytical Team work to which the question refers was a modeling effort that produced some useful lessons, but as we found from the peer reviewers' comments, it also suffered from some shortcomings. The Administration Economic Analysis (AEA) builds on the IAT exercise and also the insights of a wide range of models and other relevant literature to derive its conclusion that, with the

flexibility mechanisms included in the treaty, and with sound domestic policies, the economic impacts of complying with the Kyoto Protocol should be modest.

32b. *Please identify any and all private parties that are currently performing economic analyses of the Kyoto treaty or any aspect of it for the Administration. Describe their work and provide all products of their work in draft or final form.*

Response: CEA has no list of parties doing economic analysis of the Kyoto Protocol or any aspect of it for the Administration. Moreover, CEA has no contract or cooperative agreement with any modeler or modelers to undertake specific analyses regarding the Kyoto Protocol.

**E. International Emissions Trading**

33a. *Even assuming that effective rules and procedures can be developed for an international emissions trading system and for joint implementation projects and that key developing countries agree to participate, isn't there a real risk that these mechanisms could effect an enormous transfer of wealth and jobs out of this country overseas, especially to the countries of the former Soviet Union, China, India, South Korea, Brazil, and Mexico (i.e. that this system would be essentially a foreign aid program)? Some studies have estimated that more than 50% of our reductions would have to be purchased from other countries.*

Response: The Administration is committed to achieving as many cost-effective emissions reductions domestically as possible. At the same time, our analysis does suggest that for the 2008-2012 time frame it makes sense for the United States to pursue low cost emissions reductions abroad, as would happen with the full implementation of an international emissions trading program. The key point is that trading will be economically beneficial to U.S. firms. We expect the Annex B parties of the former Soviet Union and key developing countries will provide significant investment opportunities for U.S. firms to capture gains from emissions trading as those countries restructure and develop their economies. Developing countries will represent the greatest share of new energy, transportation, and building infrastructure investment worldwide in the coming decades, and U.S. firms can help provide clean technologies and financing that will build those economies and markets, help stave off disruptive climate effects, and allow U.S. firms to capitalize on their investments in environmentally superior products and processes.

Our analysis does not suggest that emissions trading will have a significant negative impact on U.S. employment. If anything, the lower costs associated with a comprehensive trading program will help protect American jobs.

33b. *Please provide and document estimates of the percentage of U.S. emissions reductions that might have to be purchased from other countries to minimize the costs of reducing emissions and which countries likely would be the beneficiaries.*

Response: Our analyses provide illustrative estimates of how emissions trading and other flexibility mechanisms can lower costs, but ascribing with precision the emissions reduction to

any particular country is impossible. The trades and emissions reductions undertaken by U.S. firms will depend on a whole host of factors such as the costs (including transactions costs) of emissions reductions in participating countries, the extent to which emissions can be cost-effectively offset through sinks at home and abroad, the role of the six categories of gases, and the development and deployment of climate-friendly technology. Further, the "beneficiaries" of trading would include the United States, particularly U.S. firms, due to the lowered costs of achieving our target.

34a. *What real incentive do developing countries have to participate in the international emissions trading system, which would require them to commit to mandatory reductions, when they can transfer emissions reductions credits in connection with joint implementation projects and obtain financing through the Clean Development Mechanism?*

Response: Developing countries would experience significant gains from trading in emissions permits. The economic and environmental rationales for a target and trade approach by developing countries include:

- Greater economic benefits to developing countries: With targets at or only slightly below their business-as-usual (BAU) projected emissions growth, emissions reductions in developing countries would produce many billions of dollars through the international sale of emission reductions achieved at lower cost than the world price.

- Target and trade yields greater benefits than CDM: While the Clean Development Mechanism will result in benefits for developing countries, an effective target and trade system can produce far greater benefits to developing countries. In contrast to the CDM, which is project based, countries that agree to emissions targets can employ a wide variety of measures to reduce emissions, and need not rely exclusively on project-based reductions. Nor do they always need to establish a baseline against which projects generate reductions. Like other trading parties, developing countries that agree to a target and trade system would need to follow the rules and guidelines for trading, but are otherwise free to pursue emissions reductions and sequestration in any and all sectors in the way they see fit. The advantage of trading is that they can be compensated for those reductions in a way in which they cannot be without a binding obligation, and the opportunities are more comprehensive than with CDM alone.

- Environmental benefits: Developing countries participating by adopting emissions targets would help to more effectively protect and manage the global environment. Reducing carbon dioxide emissions is in their interest, because in many cases, developing countries are especially vulnerable to the risks of climate change. In addition, lower carbon dioxide emissions in developing countries generate ancillary air quality benefits through lower particulate matter, sulfur dioxide, and nitrogen oxides emissions. Air quality is a key environmental concern in many developing countries

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List of CCs attached

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

CHIEF OF STAFF

August 24, 1998

Dear Ms. Dobriansky:

Enclosed are responses to questions 15-34 of the March 13 letter from Chairman McIntosh to Council of Economic Advisers ("CEA") Chair Janet Yellen. Also enclosed are 6 boxes of documents related to economic analysis of climate change policies.

In addition, the Office of the Counsel to the President has determined that other CEA climate change documents include material that reflects Executive Branch policy-making deliberations. Please contact the Office of Counsel to the President to discuss the appropriate accommodation with regard to these materials.

Finally, as you know, on August 10, 1998, CEA Chair Janet Yellen was served with a subpoena to produce certain records related to climate change. This subpoena requires that the CEA provide the Committee within a 2 week period an extremely broad range of additional climate change materials that were not covered by Chairman McIntosh's March 13 letter. The August 10 subpoena will require a substantial and time consuming new search of CEA files. Moreover, given that much of the materials are likely to reflect policy deliberations, the Office of the Counsel to the President will need to review the documents to safeguard the interests of the Executive Branch in confidentiality of the policy-making process.

As you know, even though the CEA staff is extremely small, CEA is responsible for providing the President with information, analysis and advice on a range of domestic and international economic issues, including performance of the stock market, trends in the U.S. economy, Social Security reform, the Asian financial crisis and the economic troubles in Russia. We are simply unable to undertake the additional search required to respond on the timetable specified in the August 10 subpoena, while still fulfilling our statutory obligations related to the continued strength and vitality of the U.S. economy.

Please contact me at 395-5084 to discuss the nature and timing of the CEA's response to the August 10 subpoena.

Sincerely,

Michele Jolin

Michele Jolin

Ms. Larisa Dobriansky
Senior Counsel
Subcommittee on National Economic Growth,
Natural Resources and Regulatory Affairs
Committee on Government Reform and Oversight
U.S. House of Representatives
Room 2157 Rayburn House Office Building
Washington, D.C. 20515-6143

Enclosures

cc: Keith Ausbrook
Alys Campaigne

# Answers to March 13 Questions To CEA
# from Representative McIntosh
# Chair of the House Subcommittee
# on National Economic Growth, Natural Resources, and Regulatory Affairs

## C. Dr. Yellen's Testimony before the House Commerce Committee on March 4, 1998

15. *Please provide any and all analyses that support the Administration's conclusion that impacts on the U.S. economy of complying with the terms of the Kyoto Protocol are likely to be "modest".*

Response: Dr. Yellen's testimony concluded that the net costs of the Administration's policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and the United States is successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism. The analyses supporting this conclusion are presented in "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis" (hereafter, the AEA). (see pp. 39-72)

15. Continued. *Also, explain fully how the Administration can make such a forecast responsibly when as Dr. Yellen stated, "it is not yet possible to provide a full authoritative analysis of the Kyoto Protocol." Among other things, Dr. Yellen noted that there is still "much that we do not know" because much has been left unresolved by this treaty (for example, implementation issues, the rules and procedures governing international emissions trading, joint implementation projects, and the Clean Development Mechanism, and future emissions reduction obligations). Moreover, Dr. Yellen asserted that to her knowledge, "no [economic] model --whether used inside the government or not --has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old."*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs of the Kyoto Protocol have generally not taken into account the specific provisions of the Kyoto agreement and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these elements will raise the estimated cost. The Administration's conclusion, and the illustrative numerical estimates that support this conclusion, incorporate these policies and mechanisms.

16. *Please provide any and all analyses that support the following estimates:*

a. *U.S. electricity restructuring "will offer approximately $20 billion in cost savings".*

Response: The derivation of this estimate is explained in the AEA in the section entitled potential electricity restructuring cost-savings. (see Appendix C)

b. *Emissions trading among the Annex I countries "can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

c. *Emissions trading among a subset of Annex I countries (for example, the United States, Australia, Canada, New Zealand, and Russia) "can reduce costs by an estimated 60-70 percent."*

Response: Please see the section on the effects of climate change policy on the United States in the AEA. (see pp. 27-32, 45, 48, 51-52)

*Also, based on the estimates presented in Janet Yellen's testimony, please explain and fully document how more limited trading among this subset of countries would produce greater cost reductions than from either trading among all Annex I countries or trading with the full participation of Non-Annex I countries.*

Response: The market clearing price for greenhouse gas permits in an international trading system result from the supply and demand for internationally traded permits. If a country that is expected to be a net seller decided not to sell, then the actual supply falls, and the permit price and associated cost increases. If a country that is expected to be a net buyer decided not to buy, then demand falls, and the permit price and associated cost falls. In the case of trading under the Kyoto Protocol, both the United States and the European Union are projected by many economic models to be net buyers. If the European Union decides not to participate in international trading, then the demand for permits on the international market would decline, and the permit price and costs would fall, thereby benefiting countries that continue to buy permits internationally. Please also see the section on the effect of climate change policy on the United States in the AEA (see pp. 51-53).

d. *The Clean Development Mechanism "might shave costs by roughly another 20 to 25 percent".*

Response: The United States is seeking to ensure that the Clean Development Mechanism becomes a cost-effective way to allow developed country firms to give financing and technical assistance for projects to lower emissions and to receive credit for the reductions. Our best professional judgment, based on discussions with a variety of informed analysts, is that CDM could achieve at least 20 percent of the emissions reductions available under full global trading.

The statement that costs would fall by roughly another 20 to 25 percent is based on the SGM results given an assumption of 20 percent "effectiveness," and is further explained in the AEA. (see pp. 35, 48)

e. *Overall costs "would reach roughly one-tenth of one percent of projected GDP in 2010" (resource costs of achieving Kyoto targets for emissions reductions were estimated to be $7 to $12 billion per year in 2008 to 2012).*

Response: The forecasted changes in GDP were taken from the SGM model output based on certain assumptions. Please see the section on the effects of climate change policy on the United States in the attached AEA for a brief summary. (see pp. 51-53)

*Also, please explain how it is possible that compliance with the Kyoto Protocol, which has been projected by independent economists to be the most expensive environmental undertaking ever, could cost less than compliance with the recently issued U.S. air quality rules for particulate matter and ozone (the final Regulatory Impact Analysis for those rules estimated costs of $46 billion).*

Response: As mentioned in Dr. Yellen's testimony, many analyses estimating costs have generally not taken into account the flexibility mechanisms included in the Kyoto Protocol and the Administration's policies with respect to reducing greenhouse gas emissions. In particular they have omitted the cost-savings likely to result from international permit trading, the Clean Development Mechanism, meaningful participation by key developing countries, trading across six categories of greenhouse gases, and the flexibility provided by including carbon sinks. Omitting these flexibility mechanisms raises the cost estimates of these analyses.

f. *The assumption that the rate of improvement in energy efficiency (AEEI) will be 1.0 percent per year (which is greater than that assumed by the EIA).*

Response: Please see the section on energy efficiency improvement in the AEA for a brief summary. (see pp. 46-47)

*In particular, please reconcile this assumption with the statement of the CEA in its 1998 Annual Report that "[u]ntil an emissions cap and trading system are in place, however, the economic incentive to use [technologies supported by the Administration's budget] may be low."*

Response: No reconciliation is needed. The comment from the 1998 ERP implies simply that in the absence of a cap and trade system that would lower the price of using carbon-lean technologies relative to carbon-rich technologies, the incentives to adopt such carbon-lean technologies will be less than in a world with the target and trade system in place. Moreover, the AEEI represents the autonomous rate of technological improvement, i.e., the rate that would occur in the absence of price changes that the target and trade system might lead to, due merely to the greater availability of new technologies. Thus its value is a comment on the extent of one's technological optimism, and not about optimism of private parties to respond to price

incentives.

*Is the Administration assuming that such a system will be put into place in the short-run?*

Response: The Administration's position on the timing of a target and trade system has not changed. The Administration maintains that the system should be established in the 2008-12 time-frame with the benefit of 10 years of additional experience with similar market based mechanisms.

g. *The estimated effect on energy prices will range from $14 to $23 per ton of carbon equivalent.*

Response: Please see the section of the AEA that describes the effects of climate change policy on the United States (see pp. 54-58)

h. *"In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors --many of them high-tech jobs paying high wages."*

Response: According to standard economic analysis, in the long run, total employment is determined by the size of the labor force, incentives to work, and the productivity of labor. Changes in prices -- which result from developments in technology, trade, energy markets, or many other areas -- tend to have their effects on the composition of employment across sectors, more than on total employment.

As explained in Dr. Yellen's testimony and in the AEA, the energy price changes expected to result from the Kyoto protocol are likely to be modest. In particular, these price changes over the next decade are less than the average of year-to-year absolute price changes observed since 1960. Thus there is little reason to believe there will be large changes in employment even in the energy-intensive sectors. In the less energy-intensive sectors, there is no reason to expect any decline in employment at all due to climate change policies. Most economic models would not predict changes in the overall level of employment resulting from such small energy price changes 10 years in the future. (see pp. 54-62)

Furthermore, the United States has a strong competitive advantage in a variety of high-tech sectors. For example, recent innovations in battery technology, and in fuel cells were announced by U.S. companies. These innovations, and future ones expected from U.S. companies, will be in demand worldwide. The growth in associated production is likely to lead to growth in high-wage jobs in this country.

I. *As to each analysis, please indicate who prepared the analysis and provide records of comments from other federal agencies.*

*Response:* All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

17. *Please provide any and all analyses that support the Administration's estimate that benefits relating to traffic congestion, highway accidents, and air pollution unrelated to climate change "could offset approximately a quarter of the resource cost of the climate change policy."*

Response: This analysis is summarized in the section of the AEA describing ancillary benefits. (see pp. 66-68)

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

*As to each analysis, please indicate who prepared the analysis and provide all records of comments from other federal agencies.*

Response: All of the analysis for Dr. Yellen's testimony on climate change and the AEA was prepared by current and former CEA staff under the direction of the Members of the Council, with the collaboration of staff at several other government agencies.

Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

18a. *In her testimony, Dr. Yellen stated that, in evaluating the "likely net economic impact of the Kyoto Protocol," the Administration has "drawn upon a broad array of analytical tools", and a "wide range of models of the energy sector and economy over the next 25 years" to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Please specify all of the models and analytical tools that the Administration has used and describe in detail their strengths and weaknesses.*

Response: As explained in Dr. Yellen's testimony, the existence of modeling difficulties means that we should treat any model results with the caution that is warranted -- not that we should abandon rigorous economic analysis. We have employed a broad set of economic tools to analyze the policy options. Such tools include models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant

statistics, "meta-analyses" of existing models (such as that undertaken by Robert Repetto and David Austin of Resources for the Future), historical and sectoral examples, univariate and multivariate regression analysis, simulations, Hotelling-type theoretical models, CEA staff econometric forecasts of emissions in developing countries, stylized models of perfect competition and monopoly, basic economic reasoning and the various other sorts of theoretical and empirical tools of analysis that abound in the scholarly literature. Drawing on this broad array of analytical tools allowed a useful evaluation of the policy alternatives.

We have considered and evaluated the following specific large econometric and computable general equilibrium models of the economics of climate change mitigation: Second Generation Model, G-cubed, MERGE, and DICE. We have also looked at the results from many other models, such as GREEN, DRI, Markal Macro, Megabare, EPPA, FUND, MiniCAM, CETA, RIVM, and CETM/MRT.

18b. *According to the testimony, the Administration has relied particularly on the Second Generation Model of Battelle Laboratories for many of its estimates. However, the IAT report indicated that the SGM model "focusses on long-term transitions and measures the economy in 5 year intervals," so that it risks racing past short-term transition issues, such as GDP loss and impacts on specific industries.*

*Specify all of the Administration's estimates that were derived from this model.*

Response: The Administration used this model's estimates as one of several inputs in its calculations of likely permit prices and resource costs for the different emissions trading scenarios. Please see the methodology section in the AEA. (see pp. 42-49) Information of the marginal abatement cost curves of non-carbon dioxide greenhouse gases was missing from the SGM output and added to reflect provisions in the Protocol. Numerical estimates of expenditure changes and ancillary benefits used estimates of likely permit prices or emissions reductions as inputs.

*Also, indicate why many of the Administration's key estimates were derived from this model.*

Response: The SGM model, unlike many economic models of climate change, has an explicit model of emissions reductions in other countries, and so is exceptionally well suited for estimating emissions permit prices given international trade in permits. In addition, it has modules reflecting several major developing countries and data on all other developing countries as a group. Thus, it is well suited to address the effects of developing country participation on permit prices. Finally, the timely availability of sufficient information about a variety of SGM model runs made its use practical between the time the Kyoto Protocol was developed in December 1997 and our first testimony in March 1998.

*Finally, please identify the corresponding estimates derived from each model that the Administration has used in assessing the impacts of the Kyoto Protocol.*

Response: The development of corresponding estimates is a complicated technical task that is beyond the abilities of our small staff to complete in a timely manner. We expect that the Stanford Energy Modeling Forum, which conducts exercises with a set of energy-economic models to assess hypothetical energy policy scenarios, will continue to produce comparisons of various climate change models' forecasts of the effects of the Kyoto Protocol. Although some of these models have not yet incorporated the five categories of non-CO2 gases directly into their models, these comparisons should provide a full comparison of the SGM predictions with those of other models.

19. *What are the 1990 baseline, the Fiscal Year 1997, 1998 and 1999, data, and the annual outyear estimates until 2012 for the following outcome performance measures mentioned in Dr. Yellen's testimony: morbidity rates for some diseases, mortality rates for some causes, monetary damages from temperature increase, consequences from some catastrophes, traffic congestion, highway accidents, and air pollution unrelated to climate change.*

Response: For all these data we have no information on outcome performance measures for the Fiscal Years requested, or for year-to-year estimates through 2012. For baseline and projections of air pollution, please refer to the EPA Regulatory Impact Analysis for Ozone and Particulate Matter. For baseline and projections of traffic congestion and accidents, please refer to the following report:

> Texas Transportation Institute, Texas Department of Transportation, and the Federal Highway Administration. 1997. Urban Roadway Congestion -- 1982 to 1994. August.

20. *Why does the Administration maintain that the U.S. acid rain program experience "clearly demonstrates how programs like international permit trading, joint implementation and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs"?*

Response: Emissions trading programs and other market mechanisms, provide continuous economic incentives to reduce emissions further, which generally lead costs to be much lower than would be the case under a variety of more traditional regulatory approaches. The acid rain program, for example, has resulted in compliance costs far below those originally estimated.

*Why does the Administration believe that it is appropriate to extrapolate from that experience to the global arena.*

Response: The basic principle that there is gain from the ability to trade emissions permits is of quite wide applicability. Indeed the textbook theory of gains from trade is perhaps most familiar and well established at the international level. Economic incentives generally have similar effects in different countries and cultures: people everywhere are interested in higher incomes. International permit markets will lower compliance costs in all participating countries, because they provide financial incentives for sources to reduce emissions. These incentives will have the

effect of lowering the costs of emissions cuts relative to what would be the case without any trading of emissions permits.

*Won't the effectiveness of the international system, joint implementation, and the Clean Development Mechanism depend on different factors, such as the rules and procedures governing these mechanisms, the extent of participation by other countries, including developing countries?*

Response: The Administration believes that effective rules on trading, joint implementation and the Clean Development Mechanism are critical to the success of these mechanisms, and has asked other parties to support such rules.

21a. *In her testimony, Dr. Yellen stated that part of doing it smart (i.e., lowering the costs of reducing greenhouse gas emissions) under the Kyoto Protocol means "taking serious and responsible steps in the short-run to prepare us to meet our obligations in the longer-term." She indicated that these steps include a $6.3 billion program of tax cuts and R&D investments, industry-by-industry consultations to prepare emission reduction plans in key industrial sectors, and legislation to restructure the electrical industry. Under what authority is the Administration pursuing this unilateral executive branch course of action in furtherance of the treaty's emissions reductions targets and without Senate Ratification?*

Response: The programs you describe are not unilateral executive branch actions to implement the Kyoto Protocol. For example, the $6.3 billion Climate Change Technology Initiative (CCTI) is a 1999 budget proposal to Congress. Similarly, the electricity restructuring plan is a legislative proposal. Voluntary actions to reduce greenhouse gas emissions, such as exemplified by the CCTI and industry consultations are fully consistent with the U.S. obligations under the 1992 Framework Convention on Climate Change and existing agency authority. Moreover, these programs are not specifically intended to implement the Kyoto Protocol. Rather, they are meant to keep the United States on a path toward cleaner and more efficient energy use and promote a more competitive electricity industry.

21b. *If the Administration is delaying the submission of the treaty to the Senate until it obtains meaningful participation by developing countries, doesn't that decision also require the Administration to delay any unilateral executive branch action to address global warming until that cooperation is forthcoming.*

Response: The Administration is not embarking on unilateral Executive Branch action to implement the Kyoto Protocol without ratification. To the contrary, steps to ensure compliance with the Protocol's requirements will be undertaken only with the full advice and consent of the Senate. However, the Administration is pursuing a variety of policies that make good sense even independent of concerns about climate change and that has the additional desirable property of reducing greenhouse gas concentrations. Examples of such policies include the CCTI. These polices all reduce energy consumption, and thereby reduce dependence on foreign oil and emissions of air pollutants unrelated to climate change, policy goals that have enjoyed bipartisan

support in Congress and have been a long standing priority of this and previous administrations. The 1992 Framework Convention on Climate Change adopted by the Bush Administration and ratified by the Senate requires the United States to take measures to reduce its greenhouse gas emissions.

c. *Given that the Kyoto Protocol seeks to address a global issue, isn't [it] harmful to U.S. interests to proceed without the full participation of developing countries.*

Response: The President has said that he will not submit the Kyoto Protocol for Senate ratification without meaningful participation by key developing countries.

d. *Besides being unconstitutional, isn't it also premature and harmful to U.S. interests to take such unilateral actions, without ratification, when the Administration has characterized the Protocol as a "work in progress" a Protocol that is not yet fully complete nor ready for the President's submission to the Senate?*

Response: The President has clearly stated that the Administration will not circumvent the Congress and implement the Kyoto treaty before it is ratified. However, this does not mean that ongoing efforts to promote energy efficiency, reduce our reliance on foreign oil or improve our air quality should be rolled back. As stated above, these initiatives have enjoyed bipartisan support in Congress and are consistent with our obligations under the 1992 Framework Convention on Climate Change.

**D. Cost/Benefit Analysis of the Kyoto Treaty**

22a. *Please provide any and all analyses that the Administration or any federal agency prepared (or had prepared) or is preparing (or is having prepared) of the costs and benefits of imposing on the U.S. the binding targets and timetables set forth in the Kyoto Protocol for reducing greenhouse gas emissions, taking into account the global implications of the way in which this agreement is structured.*

Response: Please see the AEA for additional detailed information about the economic analysis of the Kyoto Protocol. (see pp. 39-72)

*Also please analyze and document the following:*

22b. *Whether the benefits of implementing this Protocol are justified by the costs.*

Response: It is extremely difficult to quantify the long-term economic benefits of climate change mitigation. We have not calculated a monetary value of these benefits. Although we do not think the benefits of mitigating climate change are, at this stage, quantifiable with adequate precision, they are nonetheless likely to be real and large in the long run. Estimates of costs for the United States to meet its Kyoto emissions targets are likely to be modest if these reductions

are undertaken in an efficient manner. (see AEA pp. iii.- iv.)

22c. *Evaluate the effectiveness of this agreement by comparing the marginal abatement costs of the most plausible alternative scenarios for meeting the Kyoto targets, given the way in which this agreement is structured, with the marginal costs of other reasonable alternative compliance schemes.*

Response: The Administration has presented a set of scenarios reflecting a variety of assumptions about international trading and participation by developing countries, both in trading and the Clean Development Mechanism. (see AEA pp. 51-53) However, it should be noted that the illustrative analysis in the AEA does not incorporate several components of the Administration's efforts to address the risks of climate change. For example, the illustrative analysis did not take into account cost-effective opportunities for mitigation through carbon sinks, the Administration's electricity restructuring proposal, the Climate Change Technology Initiative, industry consultations, and improved Federal energy management. All of these can provide additional opportunities for abatement domestically that are not reflected in the illustrative analysis because they are not amenable to analysis with a computable general equilibrium model such as SGM.

22d. *With respect to each scenario that is analyzed, identify the assumptions used, explain any uncertainties concerning the assumptions, and examine the sensitivity of net effects to the different compliance strategies, using a range of plausible assumptions about future economic development and about fundamental climate processes.*

Response: Please see the methodology section of the AEA. (see pp. 42-50)

22e. *Evaluate the opportunity costs of pursuing the Administration's strategy for the abatement of greenhouse gas emissions under the terms of the treaty;*

Response: As the Protocol is a work in progress its opportunity costs cannot be evaluated without also considering the additional flexibility mechanisms included as a result of continued United States efforts in ongoing diplomatic discussions. The opportunity costs of the Protocol and the flexibility mechanisms are extensively discussed in prior testimony by Dr. Janet Yellen, and in the AEA. (see pp. 51-68)

22f. *Evaluate how the benefits and burdens of complying with this treaty would be distributed on the national and household levels, describing, among other things, the disparate regional and industrial impacts, and the effects on different income levels.*

Response: We do not have estimates of the distribution of impacts across regions or industries.

23a. *In evaluating alternative scenarios, please examine the following.*

23b. *Compare the economic and environmental effects of not including developing countries in*

*the effort to reduce global emissions (with the potential for binding developed countries to even greater obligations, without limiting developing countries at all) against the effects of addressing greenhouse gas mitigation on a global scale by the international community.*

Response: Climate change is a global problem, so policy approaches encompassing more countries will likely be both more effective and more cost-effective than approaches involving only a few countries. Including developing countries will lower costs and permit prices substantially because of the many low cost abatement opportunities in these countries. Estimates from the Battelle Laboratory's Second Generation Model, which are in line with other models, suggest that developing country participation through the Clean Development Mechanism (CDM) along with trading among developed countries with emissions targets could reduce resource costs by 66 percent compared to a domestic only approach. Trading among developed countries with emissions targets without CDM could reduce resource costs by 57 percent compared to a domestic only approach. The model suggests that including key developing country participation through adopting emissions targets and participating in international permit markets along with developed countries could lower costs by nearly 80 percent. (see AEA pp. 51-53)

23c. *Compare the economic and environmental effects of complying with the timeframes set forth in the Kyoto Protocol with the effects of complying over longer time periods.*

Response: The AEA focuses on assessing the economic and environmental effects of complying with the Kyoto Protocol and the President's policies to address climate change.

23d. *Compare the impacts of reducing greenhouse gas emissions using international emissions trading, joint implementation, and the Clean Development Mechanism with the impacts of relying upon domestic emissions permit trading. In this regard evaluate alternative international trading scenarios: trading only among Annex I countries, trading that extends to a number of key developing countries, and trading in which all countries are fully participating.*

Response: Please see the results section of the AEA. (see pp. 51-68)

24. *With respect to any analysis provided, please identify and explain the basis for assumptions used regarding such factors as the rate of improvement in energy efficiency, the effectiveness of market incentives in increasing the market share of fuels that emit less carbon, and economic and demographic growth. Also, explain fully any assumptions on how emissions reductions will be achieved as, for example, through the early retirement of coal plants or nuclear plant life extensions.*

Response: Please refer to the section on energy efficiency improvement in the AEA. (see pp. 46-47) In addition, for a discussion on the effects of a permit trading system on energy efficiency improvement, please refer to p. 53 of the AEA. For a discussion of how emissions reductions are achieved in the Second Generation Model, please refer to Edmonds et al. 1992 (full cite is on p. 75 of the AEA).

25. *In considering the opportunity costs, evaluate the extent to which the Administration's climate change strategy will require the diversion of funds from savings and/or investments which would have provided other benefits, such as saving social security, or more funding for education, health care, etc.*

Response: The resource costs that are described in Dr. Yellen's testimony reflect the opportunity cost as it is usually understood by economists. The apportionment of these costs to foregone spending, whether on social security or education or some other program, is an unconventional analysis that we have not undertaken.

26. *In assessing the impacts on the U.S. of complying with the Kyoto targets and timetables, please explain in detail the potential effects on the following indicators of economic performance: gross domestic product (GDP), per capita GDP, unemployment, income and real wages, trade competitiveness, and energy prices.*

Response: Projected percentage changes in GDP, per capita GDP, energy prices and competitiveness, are outlined in Dr. Yellen's testimony, and discussed in the results section of the AEA. (see pp. 54-61) Given the Administration's policies, complying with the Kyoto targets should not have significant effects on aggregate employment. (see AEA p. 62 and the answer to Question 16h)

27. *In assessing the benefits of complying with the Kyoto treaty, please evaluate fully the potential offsetting negative effects of exempting developing countries and of "carbon leakage".*

Response: Exempting all developing countries would amount to a hypothetical departure from the President's policy. The Kyoto Protocol establishes a Clean Development Mechanism whereby Annex I countries such as the United States or their firms may undertake projects that reduce emissions in developing countries and receive credit for such reductions. CDM is likely to provide a broad range of cost savings to the United States, and this conclusion is consistent with our interpretation of SGM model results that suggest that CDM would reduce resource costs by about 20 to 25 percent relative to scenarios in which there is permit trading either among all or a subset of Annex I countries. Inclusion of developing countries in the CDM and in international emissions trading would mitigate carbon leakage.

28. *President Clinton has suggested that the U.S. economy can continue to grow under this agreement. Please indicate at what rate the Administration expects that the economy will continue to grow during the next 10 to 20 years if the treaty is ratified and at what rate it is expected to grow if the treaty is not ratified.*

Response: As shown in a figure on GDP in 2010 in the results section of the AEA (see p. 59), the effect on the GDP growth rate of the Kyoto Protocol, given the assumptions that we have elsewhere described, is minimal relative to the anticipated growth in GDP between now and 2010. Under business as usual, the Second Generation Model projects U.S. GDP to grow 2.0859% annually between 1995 and 2010. With a permit price of $14/ton, SGM projects the

annual growth rate to be 2.0851%, and less than $23/ton, the annual growth rate is projected to be 2.0822%. (see p. 59)

29. *Have any of the cost-benefit analyses performed by the Administration or any agency been peer-reviewed?*

Response: With the exception of the IAT report which was fully the work of many agencies under the direction of the Department of Commerce, and some of the studies by the Department of Energy's National Labs, we are unaware of any peer-review of Administration estimates. The Council of Economic Advisers took the lead on the AEA. This document has not been peer reviewed, consistent with the CEA's policy that it does not submit its analyses or reports for peer review.

30. *In connection with these cost-benefit analyses, fully explain how the baseline(s), against which costs and benefits were calculated, was determined.*

Response: Please see the AEA. (see pp. 42-50)

31a. *Please provide all records of written or oral comments from other agencies on each of the cost-benefit analyses that were performed.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

31b. *Please provide all records of comments submitted by federal agencies on Dr. Yellen's draft testimony about the economics of Kyoto for the hearing before the House Commerce Committee on March 4, 1998.*

Response: Documents responsive to this request reflect internal deliberations of the Executive Office of the President with regard to ongoing policies of the Administration. As to such materials, please contact the Office of the Counsel to the President.

32a. *Given the significant economic costs projected by private sector studies, why did the Administration abandon a year and a half-long effort to develop cost estimates of the President's proposed policies to reduce greenhouse gas emissions?*

Response: First, the significant costs projected by private sector studies are not derived from analyses of emissions reduction scenarios that include the whole range of flexible elements that comprise both the Kyoto Protocol and Administration policy. The Interagency Analytical Team work to which the question refers was a modeling effort that produced some useful lessons, but as we found from the peer reviewers' comments, it also suffered from some shortcomings. The Administration Economic Analysis (AEA) builds on the IAT exercise and also the insights of a wide range of models and other relevant literature to derive its conclusion that, with the

flexibility mechanisms included in the treaty, and with sound domestic policies, the economic impacts of complying with the Kyoto Protocol should be modest.

32b. *Please identify any and all private parties that are currently performing economic analyses of the Kyoto treaty or any aspect of it for the Administration. Describe their work and provide all products of their work in draft or final form.*

Response: CEA has no list of parties doing economic analysis of the Kyoto Protocol or any aspect of it for the Administration. Moreover, CEA has no contract or cooperative agreement with any modeler or modelers to undertake specific analyses regarding the Kyoto Protocol.

**E. International Emissions Trading**

33a. *Even assuming that effective rules and procedures can be developed for an international emissions trading system and for joint implementation projects and that key developing countries agree to participate, isn't there a real risk that these mechanisms could effect an enormous transfer of wealth and jobs out of this country overseas, especially to the countries of the former Soviet Union, China, India, South Korea, Brazil, and Mexico (i.e. that this system would be essentially a foreign aid program)? Some studies have estimated that more than 50% of our reductions would have to be purchased from other countries.*

Response: The Administration is committed to achieving as many cost-effective emissions reductions domestically as possible. At the same time, our analysis does suggest that for the 2008-2012 time frame it makes sense for the United States to pursue low cost emissions reductions abroad, as would happen with the full implementation of an international emissions trading program. The key point is that trading will be economically beneficial to U.S. firms. We expect the Annex B parties of the former Soviet Union and key developing countries will provide significant investment opportunities for U.S. firms to capture gains from emissions trading as those countries restructure and develop their economies. Developing countries will represent the greatest share of new energy, transportation, and building infrastructure investment worldwide in the coming decades, and U.S. firms can help provide clean technologies and financing that will build those economies and markets, help stave off disruptive climate effects, and allow U.S. firms to capitalize on their investments in environmentally superior products and processes.

Our analysis does not suggest that emissions trading will have a significant negative impact on U.S. employment. If anything, the lower costs associated with a comprehensive trading program will help protect American jobs.

33b. *Please provide and document estimates of the percentage of U.S. emissions reductions that might have to be purchased from other countries to minimize the costs of reducing emissions and which countries likely would be the beneficiaries.*

Response: Our analyses provide illustrative estimates of how emissions trading and other flexibility mechanisms can lower costs, but ascribing with precision the emissions reduction to

any particular country is impossible. The trades and emissions reductions undertaken by U.S. firms will depend on a whole host of factors such as the costs (including transactions costs) of emissions reductions in participating countries, the extent to which emissions can be cost-effectively offset through sinks at home and abroad, the role of the six categories of gases, and the development and deployment of climate-friendly technology. Further, the "beneficiaries" of trading would include the United States, particularly U.S. firms, due to the lowered costs of achieving our target.

34a. *What real incentive do developing countries have to participate in the international emissions trading system, which would require them to commit to mandatory reductions, when they can transfer emissions reductions credits in connection with joint implementation projects and obtain financing through the Clean Development Mechanism?*

Response: Developing countries would experience significant gains from trading in emissions permits. The economic and environmental rationales for a target and trade approach by developing countries include:

- Greater economic benefits to developing countries: With targets at or only slightly below their business-as-usual (BAU) projected emissions growth, emissions reductions in developing countries would produce many billions of dollars through the international sale of emission reductions achieved at lower cost than the world price.

- Target and trade yields greater benefits than CDM: While the Clean Development Mechanism will result in benefits for developing countries, an effective target and trade system can produce far greater benefits to developing countries. In contrast to the CDM, which is project based, countries that agree to emissions targets can employ a wide variety of measures to reduce emissions, and need not rely exclusively on project-based reductions. Nor do they always need to establish a baseline against which projects generate reductions. Like other trading parties, developing countries that agree to a target and trade system would need to follow the rules and guidelines for trading, but are otherwise free to pursue emissions reductions and sequestration in any and all sectors in the way they see fit. The advantage of trading is that they can be compensated for those reductions in a way in which they cannot be without a binding obligation, and the opportunities are more comprehensive than with CDM alone.

- Environmental benefits: Developing countries participating by adopting emissions targets would help to more effectively protect and manage the global environment. Reducing carbon dioxide emissions is in their interest, because in many cases, developing countries are especially vulnerable to the risks of climate change. In addition, lower carbon dioxide emissions in developing countries generate ancillary air quality benefits through lower particulate matter, sulfur dioxide, and nitrogen oxides emissions. Air quality is a key environmental concern in many developing countries