THE GUIDANCE

I. INTRODUCTION

The Council on Environmental Quality (CEQ) issues this guidance to provide Federal agencies direction on when and how to consider the effects of greenhouse gas (GHG) emissions[1] and climate change in their evaluation of all proposed Federal actions[2] in accordance with the National Environmental Policy Act (NEPA) and the CEQ Regulations Implementing the Procedural Provisions of NEPA (CEQ Regulations).[3] The guidance will facilitate compliance with existing legal requirements under NEPA, thereby improving the efficiency and consistency of reviews of proposed Federal actions for agencies, decisionmakers, project proponents, and the interested public.[4] This guidance is designed to encourage consistency in the approach Federal

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[1] For purposes of this guidance, CEQ defines GHGs in accordance with Section 19(i) of Executive Order 13514 (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). Also for purposes of this guidance, "emissions" includes release of stored GHGs as a result of destruction of natural GHG sinks such as forests and coastal wetlands, as well as future sequestration capability. The common unit of measurement for GHGs is metric tons of CO_2 equivalent (mt CO_2-e). "Tons" in this guidance generally refers to mt CO_2-e.

[2] The CEQ 2010 draft guidance had carved out the question of how land and resource management actions should be considered in NEPA reviews. That distinction is no longer retained.

[3] 42 U.S.C. § 4321 et seq.; 40 CFR Parts 1500–1508.

[4] This guidance is not a rule or regulation, and the recommendations it contains may not apply to a particular situation based upon the individual facts and circumstances. This guidance does not change or substitute for any law, regulation, or other legally binding requirement, and is not legally enforceable. The use of non-mandatory language such as "guidance," "recommend," "may," "should," and "can," is intended to describe CEQ policies and recommendations. The use of mandatory terminology such as "must" and "required" is intended to describe controlling requirements under the terms of NEPA and the CEQ regulations, but this document does not establish legally binding requirements in and of itself.

agencies employ when assessing their proposed actions, while also recognizing and accommodating a particular agency's unique circumstances.

Overall, this guidance is designed to provide for better and more informed Federal decisions regarding GHG emissions and effects of climate change consistent with existing NEPA principles. Climate change is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action, and impacts; however, analyzing the proposed action's climate impacts and the effects of climate change relevant to the proposed action's environmental outcomes can provide useful information to decisionmakers and the public and should be very similar to considering the impacts of other environmental stressors under NEPA. Climate change is a fundamental environmental issue, and the relation of Federal actions to it falls squarely within NEPA's focus.[5] Focused and effective consideration of climate change in NEPA reviews[6] will allow agencies to improve the quality of their decisions. Environmental outcomes will be improved by identifying important interactions between a changing climate and the environmental impacts from a proposed action, and can contribute to safeguarding Federal infrastructure against the effects of extreme weather events and other climate related impacts.

Agencies meet their NEPA responsibilities using a Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS). This guidance will help Federal agencies ensure their analyses of GHG emissions and climate change in an EA or an

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[5] NEPA recognizes "the profound impact of man's activity on the interrelations of all components of the natural environment." (42 U.S.C. § 4331). It was enacted to, *inter alia,* "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." (42 U.S.C. § 4321).

[6] The term "NEPA review" is used to include analysis, process, and documentation. While this document focuses on NEPA reviews, agencies are encouraged to analyze greenhouse gas emissions early in the planning and development of proposed projects.

EIS are useful by focusing on assessing those proposed actions that involve emissions, or that have a long lifespan such that a changing climate may alter the environmental consequences associated with the proposed action. CEQ expects that agencies will continue to consider potential GHG emissions and climate impacts when applying an existing CE or when establishing a new CE.[7] The analysis in an EA or EIS should be proportionate to the effects of the proposed action. More consistent and appropriately proportioned NEPA reviews can help agencies minimize controversy, thereby avoiding potential project delays. This guidance should also reduce the risk of litigation driven by uncertainty in the assessment process as it will provide a clearer expectation of what agencies should consider and disclose.

Agencies should consider the following when addressing climate change:

(1) the potential effects of a proposed action on climate change as indicated by its GHG emissions; and

(2) the implications of climate change for the environmental effects of a proposed action.

Agencies continue to have substantial discretion in how they tailor their NEPA processes to accommodate the concerns raised in this guidance, consistent with the CEQ Regulations and their respective implementing regulations and policies, so long as they provide the public and decisionmakers with explanations of the bases for their determinations. This approach is on par with the consideration of any other environmental effects and this guidance is designed to be implemented without requiring agencies to develop new NEPA implementing procedures. CEQ recommends that when agencies conduct their usual review of their NEPA implementing policies

[7] CEQ Memorandum to Heads of Federal Agencies, "Establishing, Applying, and Revising Categorical Exclusions under the National Environmental Policy Act," November 23, 2010, *available at* ceq.doe.gov/ceq_regulations/NEPA_CE_Guidance_Nov232010.pdf.

and procedures, they then make any updates they deem necessary or appropriate to facilitate their consideration of GHG emissions and climate change.

This guidance also reviews the application of other routine and fundamental NEPA principles and practices to the analysis of GHG emissions and climate change. This guidance:

- Discusses direct, indirect, and cumulative impacts analysis of a proposed action's reasonably foreseeable emissions and effects;
- Highlights the consideration of reasonable alternatives and points to the need to consider the short-term and long-term effects and benefits in the alternatives analysis and mitigation to lower emissions;
- Recommends that agencies use a reference point to determine when GHG emissions warrant a quantitative analysis taking into account available GHG quantification tools and data that are appropriate for proposed agency actions;
- Recommends that an agency select the appropriate level of action for NEPA review at which to assess the effects of GHG emissions and climate change, either at a broad programmatic or landscape-scale level or at a project- or site-specific level, and that the agency set forth a reasoned explanation for its approach;
- Counsels agencies to use the information developed during the NEPA review to consider alternatives that are more resilient to the effects of a changing climate; and
- Advises agencies to use existing information and tools when assessing future proposed actions, and provides examples of some existing sources of scientific information.

Agencies should apply this guidance to the NEPA review of new proposed agency actions moving forward and, to the extent practicable, to build its concepts into on-going reviews.

II. BACKGROUND

A. NEPA Fundamentals

NEPA is designed to promote disclosure and consideration of potential environmental effects on the human environment[8] resulting from proposed actions, and to provide decisionmakers with alternatives to mitigate these effects. NEPA ensures that agencies take account of environmental effects as an integral part of the agency's own decision-making process before decisions are made. It informs decisionmakers by ensuring agencies consider environmental consequences as they decide whether to proceed with a proposed action and, if so, how to take appropriate steps to eliminate or mitigate adverse effects. NEPA also informs the public, promoting transparency of and accountability for consideration of significant environmental effects. A better decision, rather than better—or even excellent—paperwork is the goal of such analysis.[9]

Inherent in NEPA and the CEQ Regulations is a rule of reason which ensures that agencies are afforded the discretion, based on their expertise and experience, to determine whether and to what extent to prepare an analysis based on the availability of information, the usefulness of that information to the decision-making process and the public, and the extent of the anticipated environmental consequences.[10] It is essential, however, that Federal agencies not

[8] 40 CFR § 1508.14 ("Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment.).

[9] 40 CFR § 1500.1(c).

[10] *See e.g.*, *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519 (9th Cir. 1992).

rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation.[11]

B. Climate Change

The science of climate change is evolving, and is briefly summarized here to illustrate the sources of scientific information that are presently available for consideration. CEQ's first Annual Report in 1970 discussed climate change, concluding that "[m]an may be changing his weather."[12] At that time, the mean level of atmospheric carbon dioxide had been elevated to 325 parts per million (ppm). Since 1970, the concentration of atmospheric carbon dioxide has increased at a rate of about 1.6 ppm per year (1970–2012) to approximately 395 ppm in 2014 (current globally averaged value).[13]

It is now well established that rising global atmospheric GHG emission concentrations are significantly affecting the Earth's climate. These conclusions are built upon a scientific record that has been created with substantial contributions from the United States Global Change Research Program (USGCRP), formerly the Climate Change Science Program, which informs our response to climate and global change through coordinated Federal programs of research, education, communication, and decision support.[14] Studies have projected the effects of

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[11] 40 CFR §§ 1500.2, 1502.2. For example, providing a paragraph that simply asserts, without qualitative or quantitative assessment, that the emissions from a particular proposed action represent only a small fraction of local, national, or international emissions or are otherwise immaterial is not helpful to the decisionmaker or public.

[12] "Environmental Quality: The First Annual Report" at 93.

[13] *See* U.S. Department of Commerce, National Oceanic and Atmospheric Administration Earth Systems Research Laboratory, *available at* www.esrl.noaa.gov/gmd/ccgg/trends/global.html.

[14] Public Law 101–606. For additional information on the Global Change Research Program, go to www.globalchange.gov. USGCRP coordinates and integrates the activities of 13 Federal agencies that conduct research on changes in the global environment and their implications for society. USGCRP began as a Presidential initiative in 1989 and was codified in the Global

increasing GHGs on water availability, ocean acidity, sea-level rise, ecosystems, energy production, agriculture and food security, and human health.[15]

Based primarily on the scientific assessments of the USGCRP and the National Research Council, the Environmental Protection Agency (EPA) has issued a finding that the changes in our climate caused by increased concentrations of atmospheric GHG emissions endanger public health and welfare.[16] Adverse health effects and other impacts caused by elevated atmospheric concentrations of GHGs occur via climate change.[17] Broadly stated, the effects of climate change observed to date and projected to occur in the future include more frequent and intense heat waves, more severe wildfires, degraded air quality, more heavy downpours and flooding,

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Change Research Act of 1990 (Public Law 101--606). USGCRP-participating agencies are the Departments of Agriculture, Commerce, Defense, Energy, Interior, Health and Human Services, State, and Transportation; the U.S. Agency for International Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Science Foundation, and the Smithsonian Institution.

[15] U.S. Global Change Research Program, "Climate Change Impacts in the United States: The Third National Climate Assessment" (Jerry M. Melillo, Terese (T.C.) Richmond, and Gary W. Yohe eds.) (2014) [hereinafter "Third National Climate Assessment"], *available at* nca2014.globalchange.gov; "Fifth Assessment Report," Intergovernmental Panel on Climate Change, 2014, *available at* www.ipcc.ch/report/ar5/index.shtml; *see also* www.globalchange.gov.

[16] "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act," 74 FR 66496 (December 15, 2009). *See also* "Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units," 79 FR 1429–1519 (January 8, 2014).

[17] 74 FR at 66497–98 (For example, "[t]he evidence concerning how human-induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.").

increased drought, greater sea-level rise, more intense storms, harm to water resources, harm to agriculture, and harm to wildlife and ecosystems.[18]

III. CONSIDERING THE EFFECTS OF GHG EMISSIONS AND CLIMATE CHANGE

This guidance is applicable to all Federal proposed actions, including individual Federal site-specific actions, Federal grants for or funding of small-scale or broad-scale activities, Federal rulemaking actions, and Federal land and resource management decisions.[19] Federal agencies, to remain consistent with NEPA, should consider the extent to which a proposed action and its reasonable alternatives contribute to climate change through GHG emissions and take into account the ways in which a changing climate over the life of the proposed project may alter the overall environmental implications of such actions.

A. Considering the Impacts of the Proposed Action

In light of the difficulties in attributing specific climate impacts to individual projects, CEQ recommends agencies use the projected GHG emissions and also, when appropriate, potential changes in carbon sequestration and storage, as the proxy for assessing a proposed action's potential climate change impacts.[20] This approach allows an agency to present the

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[18] *See* www.globalchange.gov/climate-change/impacts-society.

[19] 40 CFR § 1508.18 (Federal actions that require a NEPA evaluation include policies, plans, programs, and specific projects. They do not include bringing judicial or administrative civil or criminal enforcement actions. They also do not include actions over which the agency has no discretion or control such as ministerial actions carrying out the direction of Congress or funding assistance solely in the form of general revenue sharing with no Federal agency control over the subsequent use of the funds.).

[20] 40 CFR §§ 1502.16, 1508.9 (providing that environmental impact statements and environmental assessments must succinctly describe the environmental impacts on the area(s) to be affected or created by the alternatives under consideration). This guidance only addresses analyzing the impacts of GHG emissions and climate change under NEPA.

environmental impacts of the proposed action in clear terms and with sufficient information to make a reasoned choice between the no-action and proposed alternatives and mitigations, and ensure the professional and scientific integrity of the discussion and analysis.[21]

CEQ recognizes that many agency NEPA analyses to date have concluded that GHG emissions from an individual agency action will have small, if any, potential climate change effects. Government action occurs incrementally, program-by-program and step-by-step, and climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, including decisions made by the government.[22] Therefore, the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA. Moreover, these comparisons are not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations. This approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact.

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[21] 40 CFR §§ 1500.1, 1502.24 (requiring agencies to use high quality information and ensure the professional and scientific integrity of the discussions and analyses in environmental impact statements).

[22] *See Massachusetts v. EPA*, 549 U.S. 497, 523–25, (2007) ("Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop. They instead whittle away at them over time, refining their preferred approach as circumstances change and as they develop a more nuanced understanding of how best to proceed.").

In addressing GHG emissions, agencies should be guided by the principle that the extent of the analysis should be commensurate with the quantity of projected GHG emissions. This concept of proportionality is grounded in the fundamental purpose of NEPA to concentrate on matters that are truly important to making a decision on the proposed action.[23] When an agency determines that evaluating the effects of GHG emissions from a proposed Federal action would not be useful to the decision-making process and the public to distinguish between the no-action and proposed alternatives and mitigations, the agency should document the rationale for that determination.

Agencies are required to consider direct, indirect, and cumulative effects when analyzing any proposed Federal actions and projecting their environmental consequences.[24] When assessing the potential significance of the climate change impacts of their proposed actions, agencies should consider both context and intensity, as they do for all other impacts.[25]

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[23] 40 CFR § 1500.1(b).

[24] 40 CFR §§ 1508.7, 1508.8 (stating that: (1) NEPA analyses shall consider direct and indirect effects and cumulative impacts; (2) indirect effects include reasonably foreseeable future actions such as induced growth and its effects on air and water and other natural systems; and (3) cumulative impacts consider the incremental addition to other past, present, and reasonably foreseeable future actions. This NEPA requirement applies to all proposed actions and calls for the disclosure of the full range of effects that flow from the action, regardless of the ability to control or regulate those effects.). *See also* 52 FR 22517 (June 12, 1987) ("The scope of analysis issue addresses the extent to which the proposed action is identified as a [F]ederal action for purposes of compliance with NEPA. ... Once the scope of analysis is determined, the agency must then assess the direct, indirect and cumulative effects of the proposed [F]ederal action.").

[25] 40 CFR §§ 1508.27(a), 1508.27(b) (context is the situation in which something happens, and which gives it meaning; intensity is the severity of impact).

When assessing direct and indirect climate change effects, agencies should take account of the proposed action – including "connected" actions[26] – subject to reasonable limits based on feasibility and practicality. In addition, emissions from activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for the agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions) should be accounted for in the NEPA analysis.[27]

After identifying and considering the direct and indirect effects, an agency must consider the cumulative impacts of its proposed action and reasonable alternatives.[28] CEQ does not expect that an EIS would be required based on cumulative impacts of GHG emissions alone. In the context of GHG emissions, there may remain a concern that an EIS would be required for any emissions because of the global significance of aggregated GHG emissions. "Cumulative impact" is defined in the CEQ Regulations as the "impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions."[29] Consequently, agencies need to consider whether the

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[26] 40 CFR § 1508.25 (actions are connected if they: automatically trigger other actions which may require environmental impact statements; cannot or will not proceed unless other actions are taken previously or simultaneously; or are interdependent parts of a larger action and depend on the larger action for their justification).

[27] 40 CFR § 1508.8.

[28] CEQ Memorandum to Heads of Federal Agencies, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," June 24, 2005, *available at* ceq.doe.gov/nepa/regs/Guidance_on_CE.pdf.

[29] 40 CFR § 1508.7.

reasonably foreseeable incremental addition of emissions from the proposed action, when added to the emissions of other relevant actions, is significant when determining whether GHG emissions are a basis for requiring preparation of an EIS.

Agencies can rely on basic NEPA principles to determine and explain reasonable temporal and spatial parameters of their analyses to disclose the reasonably foreseeable effects that may result from their proposed actions.[30] For example, a particular NEPA analysis for a proposed open pit mine could include the reasonably foreseeable effects of various components of the mining process, such as clearing land for the extraction, building access roads, transporting the extracted resource, refining or processing the resource, and using the resource. Depending on the relationship between any of the discrete elements in the process, as well as the authority under which such elements may be carried out, the analytical scope that best informs decision-making may be to treat these elements as the direct and indirect effects of phases of a single proposed action.

Furthermore, agencies should take into account both the short- and long-term effects and benefits based on what the agency determines is the life of a project and the duration of the generation of emissions. For example, development of a coal resource on Tribal trust lands (requiring the approval of a lease by the Bureau of Indian Affairs), or approval of solar energy development zones may offer important short-term socioeconomic benefits to a particular community or region at the same time that the development produces GHG emissions with potential long-term climate change impacts. Similarly, a prescribed burn of forest or grasslands conducted to limit ecosystem destruction through wildfires or insect infestations may result in

[30] *See* 40 CFR §§ 1502.16, 1508.9(b); *see also* "Considering Cumulative Effects Under the National Environmental Policy Act," CEQ, January 1997, *available at* ceq.doe.gov/publications/cumulative_effects.html.

short-term GHG emissions and loss of stored carbon at the same time that a restored, healthy ecosystem provides long-term carbon sequestration.

It is important to recognize that land management practices such as prescribed burning, timber stand improvements, fuel load reductions, scheduled harvesting, and grazing land management can result in both carbon emissions and carbon sequestration. Biogenic sources of carbon emissions from land management activities such as vegetation management in the form of prescribed burning, timber stand improvements and fuel load reductions present some unique considerations that are not included in fossil fuel source analyses and an agency's evaluation should reflect these unique considerations.

For such vegetation management practices, NEPA analyses should include a comparison of net GHG emissions and carbon stock changes that would occur with and without implementation of the anticipated vegetation management practice. The analysis should take into account the GHG emissions (biogenic and fossil), carbon sequestration potential, and the net change in carbon stocks that are relevant in light of the proposed actions and timeframes under consideration. In some cases, analysis of climate impacts and GHG emissions have been considered during larger scale analysis supporting policy or programmatic decisions. In such cases, calculating GHG emissions and carbon stocks when implementing specific projects (e.g., a proposed vegetation management activity) may provide information of limited utility for decision makers and the public to distinguish between alternatives and mitigations. Rather, as appropriate, these NEPA analyses can incorporate by reference earlier programmatic studies or information such as management plans, inventories, assessments, and research that consider potential changes in carbon stocks, as well as any relevant programmatic NEPA reviews (see discussion in section III.C below).

Finally, when discussing GHG emissions, as for all environmental impacts, it can be helpful to provide the decisionmaker and the public with a frame of reference. To provide a frame of reference, agencies can incorporate by reference applicable agency emissions targets such as applicable Federal, state, tribal, or local goals for GHG emission reductions to provide a frame of reference and make it clear whether the emissions being discussed are consistent with such goals.[31] For example, Bureau of Land Management projects in California, especially joint projects with the State, look at how the agency action will help or hurt California in reaching its emission reduction goals under the State's Assembly Bill 32 (Global Warming Solutions Act), which helps frame the context for the BLM NEPA analysis.

B. Emissions Analyses

Agencies should be guided by a "rule of reason" in ensuring that the level of effort expended in analyzing GHG emissions or climate change effects is reasonably proportionate to the importance of climate change related considerations to the agency action being evaluated. This concept of proportionality is grounded in the fundamental purpose of NEPA to concentrate on matters that are truly significant to the proposed action.[32] An agency must present the environmental impacts of the proposed action in clear terms and with sufficient information to ensure the professional and scientific integrity of the discussion and analysis.[33]

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[31] *See* 40 CFR §§ 1502.16(c), 1506.2(d). For example, see Executive Order 13514, October 5, 2009, 74 FR 52117, *available at* www.WhiteHouse.gov/assets/documents/2009fedleader_eo_rel.pdf (The Executive Order defines scope 1, 2, and 3 emissions which are typically separate and distinct from analyses and information used in an EA or EIS.).

[32] 40 CFR §§ 1500.4(b), 1500.4(g), 1501.7.

[33] 40 CFR § 1502.24 (requiring agencies to ensure the professional and scientific integrity of the discussions and analyses in environmental impact statements).

An agency's determination regarding the type of analysis – quantitative or qualitative – to be prepared for any proposed action should also be informed by the tools and information available to conduct the analysis. GHG estimation tools have become widely available, and are already in broad use not only in the Federal sector, but also in the private sector, by state and local governments, and globally. If tools or methodologies are available to provide the public and the decision-making process with information that is useful to distinguishing between the no-action and proposed alternatives and mitigations, then agencies should conduct and disclose quantitative estimates of GHG emissions and sequestration. For example, tools exist that can provide estimates of GHG emissions and sequestration for many of the sources and sinks potentially affected by proposed land and resource management actions.[34] Tools have been developed to assist institutions, organizations, agencies, and companies with different levels of technical sophistication, data availability, and GHG source profiles. These widely available tools address GHG emissions, including emissions from fossil fuel combustion and other activities. They also typically provide a choice of methods so that agencies can, for example, devote more time and effort to large sources while achieving efficient coverage for smaller sources. When considering tool options, it is important to consider the size of the project, spatial and temporal scale, and the availability of input data. It is also important to consider the investment of time and resources required by each tool, and agencies should determine which tool(s) to use by ensuring that the level of effort is reasonably proportional to the importance of climate change

[34] For example, USDA's COMET-Farm tool can be used to assess the carbon sequestration of existing activities along with the reduction in carbon sequestration (emissions) of project-level activities, *available at* www.comet-farm.com.

related considerations. When an agency determines that a quantitative analysis is not appropriate, an agency should complete a qualitative analysis and explain its basis for doing so.

Monetizing costs and benefits is appropriate in some, but not all, cases and is not a new requirement.[35] A monetary cost-benefit analysis need not and should not be used in weighing the merits and drawbacks of the alternatives when important qualitative considerations are being considered. If a cost-benefit analysis is relevant to the choice among different alternatives being considered, it must be incorporated by reference[36] or appended to the statement as an aid in evaluating the environmental consequences. When an agency determines it appropriate to monetize costs and benefits, then, although developed specifically for regulatory impact analyses, the Federal social cost of carbon, which multiple Federal agencies have developed and used to assess the costs and benefits of alternatives in rulemakings, offers a harmonized, interagency metric that can provide decisionmakers and the public with some context for meaningful NEPA review. When using the Federal social cost of carbon, the agency should disclose the fact that these estimates vary over time, are associated with different discount rates and risks, and are intended to be updated as scientific and economic understanding improves.[37]

C. Special Considerations for Biogenic Sources of GHG Emissions from Land Management Actions.

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[35] 40 CFR § 1502.23.

[36] 40 CFR § 1502.21 (material may be cited if it is reasonably available for inspection by potentially interested persons within the time allowed for public review and comment).

[37] *See* "Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis," (November 2013), *available at* www.WhiteHouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf.

With regard to biogenic GHG emissions from land management actions such as prescribed burning, timber stand improvements, fuel load reductions, scheduled harvesting, and livestock grazing,[38] it is important to recognize that these actions contribute both carbon emissions and carbon sequestration to the global carbon cycle. For example, using prescribed fire to maintain natural ecosystem resilience is a human-caused influence on a natural system that both emits GHGs and results in enhanced regrowth and biological sequestration. Notably, the net effect of these agency actions resulting in biogenic emissions may lead to reductions of GHG concentrations through increases in carbon stocks or reduced risks of future emissions. In the forest management context, for example, whether a forest practice is a net carbon sink or source will depend on the climate region (i.e., growth), the rotation length (e.g., southern pine versus old growth), and the human activity (e.g., salvage logging, wood products, bioenergy, etc.).

Federal land management agencies are developing agency-specific principles and guidance for considering biological carbon in management and planning decisions.[39] This guidance acknowledges the importance of: sustaining long-term ecosystem function and resilience even when this goal may lead to short-term impacts from carbon dioxide emissions; considering carbon within the context of other management objectives and ecosystem service goals; and integrating carbon considerations as part of a balanced and comprehensive program of sustainable management and climate change adaptation.

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[38] These land management actions differ from biomass production for energy production.

[39] *See* "Priority Agenda Enhancing the Climate Resilience of America's Natural Resources," Council on Climate Change Preparedness and Resilience, at 52 (October 2014), *available at* www.whitehouse.gov/sites/default/files/docs/enhancing_climate_resilience_of_americas_natural_resources.pdf.

In addressing biogenic GHG emissions, land management agencies should include a comparison of net GHG emissions and carbon stock changes that would occur with and without implementation of the proposed land management actions. This analysis should take into account the GHG emissions(biogenic and fossil), carbon sequestration potential, and the change in carbon stocks that are relevant to decision-making that are relevant in light of the proposed actions and timeframes under consideration. CEQ recognizes that land management agencies have considered climate impacts and GHG emissions to be most important in analyses at a forest or landscape scale, including programmatic NEPA reviews supporting policy or programmatic decisions. In such cases, land management agencies may be able to reasonably conclude that calculating GHG emissions and carbon stocks for site-specific projects (e.g., a proposed forest restoration) would provide information that is not useful to the public and the decision-making process. Rather, as appropriate, site-specific NEPA analyses can incorporate by reference landscape-scale or other programmatic studies or analyses, or tier to NEPA reviews that considered potential changes in carbon stocks (see section V.D., Programmatic – Broad Based – NEPA Reviews, below).

D. GHG Emissions That Warrant Quantitative Disclosure

Providing a detailed quantitative analysis of emissions regardless of the quantity of emissions is not in keeping with the rule of reason or the concept of proportionality. In considering when to disclose projected quantitative GHG emissions, CEQ is providing a reference point of 25,000 metric tons of $CO_{2\text{-}e}$ emissions on an annual basis below which a GHG emissions quantitative analysis is not warranted unless quantification below that reference point is easily accomplished. This is an appropriate reference point that would allow agencies to focus their attention on proposed projects with potentially large GHG emissions.

When using this reference point, agencies should keep in mind that the reference point is for purposes of disclosure and not a substitute for an agency's determination of significance under NEPA. The ultimate determination of significance remains subject to agency practice for the consideration of context and intensity, as set forth in the CEQ Regulations.[40]

E. Alternatives

Fundamental to the NEPA process is the consideration of alternatives when preparing an EIS or an EA.[41] The requirement to consider alternatives is meant to ensure that agencies consider approaches with no, or less, adverse environmental effects as compared to the proposed action or preferred alternative. This requirement seeks to ensure that each agency decisionmaker has the information needed to take into account possible approaches to a particular project (including the no-action alternative) that would alter the environmental impact or the balance of other factors considered in making the decision. Consideration of alternatives provides an opportunity to make the best informed, and potentially most beneficial, decision. Such decisions are aided when there are comparisons among preferred and other reasonable alternatives in GHG emissions and carbon sequestration potential, in trade-offs with other environmental values, and in the risk from and the resilience to climate change inherent in a proposed design.

Agencies are required to consider a range of reasonable alternatives consistent with the purpose and need for the proposed action, as well as reasonable mitigation alternatives if not already included in the proposed action (see mitigation discussion below).[42] Accordingly, if a comparison of these alternatives based on GHG emissions, and any potential mitigation to reduce

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[40] 40 CFR § 1508.27.

[41] 42 U.S.C. §§ 4332(2)(C), 4332(2)(E); 40 CFR §§ 1502.14 and 1508.9(b).

[42] *See* 42 U.S.C. §§ 4332(2)(C), 4332(2)(E), and 40 CFR §§ 1502.14(f), 1508.9(b).

emissions, would be useful to advance a reasoned choice among alternatives and mitigations, then an agency should compare the levels of GHG emissions caused by each alternative—including the no-action alternative—and mitigations to provide information to the public and enable the decisionmaker to make an informed choice.

F. Mitigation

Mitigation is an important component of an agency's considerations under NEPA, and this is no less true as it pertains to climate change. Mitigation, by definition, includes considering the avoidance of the impacts, minimizing them by limiting them, rectifying the impact, reducing or eliminating the impacts over time, or compensating for them.[43] Consequently, agencies should consider reasonable mitigation measures and alternatives as provided for under the existing regulations to lower the level of the potential GHG emissions.

As Federal agencies evaluate proposed mitigation of GHG emissions or of interactions involving the affected environment, the quality of that mitigation – including its permanence, verifiability, enforceability, and additionality[44] – should be carefully evaluated. Among the alternatives that may be considered for their ability to reduce or mitigate GHG emissions and climate effects are enhanced energy efficiency, lower GHG-emitting technology (e.g., using renewable energy), carbon capture, carbon sequestration (e.g., forest and coastal habitat restoration), sustainable land management practices, and capturing or beneficially using fugitive GHG emissions such as methane.

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[43] 40 CFR §§ 1508.20, 1508.25 (Mitigation includes avoiding the impact, limiting the degree or magnitude of the action, reducing or eliminating the impact over time. Alternatives include mitigation measures not included in the proposed action).

[44] Regulatory additionality requirements are designed to ensure that a GHG reduction credit is limited to an entity with emission reductions that are above regulatory requirements. *See* www.eia.doe.gov/oiaf/1605/FAQ_GenInfoA.htm#Additionality.

Finally, the CEQ Regulations recognize the value of monitoring to ensure that mitigation is carried out as provided in a Finding of No Significant Impact or Record of Decision. In cases where mitigation measures are designed to address the effects of climate change, the agency's final decision should identify those mitigation measures and the agency should consider adopting an appropriate monitoring program.[45]

IV. CONSIDERING THE EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENTAL CONSEQUENCES OF A PROPOSED ACTION

An agency should identify the affected environment so as to provide a basis for comparing the current and the future state of the environment should the proposed action or any of its reasonable alternatives proceed.[46] The current and expected future state of the environment without the proposed action represents the reasonably foreseeable affected environment that should be described based on available climate change information, including observations, interpretive assessments, predictive modeling, scenarios, and other empirical evidence.[47] The temporal bounds for the future state of the environment are determined by the expected lifespan

[45] 40 CFR § 1505.3; CEQ Memorandum to Heads of Federal Agencies, "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact," January 14, 2011, *available at* ceq.doe.gov/current_developments/docs/Mitigation_and_Monitoring_Guidance_14Jan2011.pdf.

[46] 40 CFR §§ 1502.16 and 1508.9 (providing that environmental impact statements and environmental assessments must succinctly describe the environmental impacts on the area(s) to be affected or created by the alternatives under consideration).

[47] *See* "Considering Cumulative Effects" (CEQ 1997), *available at* ceq.doe.gov/current_developments/docs/Improving_NEPA_Efficiencies_06Mar2012.pdf.

of the proposed project.[48] Agencies should remain aware of the evolving body of scientific information and its clarification of climate impacts at a more localized level.[49]

The analysis of impacts on the affected environment should focus on those aspects of the human environment that are impacted by both the proposed action and climate change. Climate change can affect the environment of a proposed action in a variety of ways. Climate change can increase the vulnerability of a resource, ecosystem, human community, or structure, which would then be more susceptible to climate change and other effects and result in a proposed action's effects being more environmentally damaging. For example, a proposed action may require water from a stream that has diminishing quantities of available water because of decreased snow pack in the mountains, or add heat to a water body that is exposed to increasing atmospheric temperatures. Such considerations are squarely within the realm of NEPA, informing decisions on whether to proceed with and how to design the proposed action so as to minimize impacts on the environment, as well as informing possible adaptation measures to address these impacts, ultimately enabling the selection of smarter, more resilient actions.

According to the National Research Council,[50] USGCRP, and others, GHGs already in the atmosphere will continue altering the climate system into the future, even with current or

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[48] *Id.* Agencies should consider their work under Executive Order 13653 that considers how capital investments will be effected by a changing climate over time.

[49] *See, e.g.*, nca2014.globalchange.gov/report/regions/coasts.

[50] The National Research Council is the operating arm of the National Academy of Sciences and National Academy of Engineering. Through its independent, expert reports, workshops, and other scientific activities, NRC's mission is to improve government decision-making and public policy, increase public understanding, and promote the acquisition and dissemination of knowledge in matters involving science, engineering, technology, and health. For more information about NRC, see www.nationalacademies.org/nrc/index.html.

future emissions control efforts.[51] Therefore, climate change adaptation[52] and resilience[53] — defined as adjustments to natural or human systems in response to actual or expected climate changes — are important considerations for agencies contemplating and planning actions with effects that will occur both at the time of implementation and into the future.

As called for under NEPA, the CEQ Regulations, and CEQ guidance, the NEPA review process should be integrated with planning at the earliest possible time.[54] Decades of NEPA practice have shown that a NEPA process that is integrated with the planning process provides useful information that program and project planners can consider in the design of the proposed action and the alternatives. Climate change effects should be considered in the analysis of

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[51] *See* "Second National Climate Change Assessment," USGCRP, 2009, *available at* www.globalchange.gov/what-we-do.

[52] Action that can be implemented as a response to changes in the climate to harness and leverage its beneficial opportunities (e.g., expand polar shipping routes) or ameliorate its negative effects (e.g., protect installations from sea level rise) National Research Council, "Adapting to the Impacts of Climate Change" (2010), *available at* nas-sites.org/americasclimatechoices/sample-page/panel-reports/panel-on-adapting-to-the-impacts-of-climate-change.

[53] Capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment (NRC 2010). Ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, capacity for self-organization, and capacity to adapt to stress and change, M.L. Parry et al., "Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change," (2007), *available at* www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm.

[54] 42 U.S.C. § 4332 (agencies of the Federal Government shall … utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making); 40 CFR § 1501.2 (Agencies shall integrate the NEPA process with other planning at the earliest possible time); CEQ Memorandum to Heads of Federal Agencies, "Improving the Process for Preparing Efficient and Timely Environmental Reviews under the National Environmental Policy Act," March 6, 2012, *available at* ceq.doe.gov/nepa/regs/scope/scoping.htm.

projects that are located in areas that are considered vulnerable to specific effects of climate change, such as increasing sea level or other ecological change, within the project's anticipated useful life. In such cases, a NEPA review will provide relevant information that agencies can use to consider alternatives with preferable overall environmental outcomes. For example, an agency considering a proposed action involving long-term development of transportation infrastructure on a coastal barrier island will want to take into account climate change to avoid the environmental and, as applicable, economic consequences of rebuilding should potential climate change impacts such as sea level rise and more intense storms shorten the projected life of the project.[55] Given the length of time involved in present sea level projections, such considerations typically will not be relevant to short-term actions. Individual agency adaptation plans and interagency adaptation strategies, such as the National Fish, Wildlife and Plants Climate Adaptation Strategy, and the National Action Plan for managing freshwater resources in a changing climate, provide good examples of relevant and useful information that can be considered.[56]

In addition, the particular impacts of climate change on vulnerable communities may be considered in the design of the action or the selection among alternatives so that the proposed action will be more resilient and sustainable and thereby have lesser impacts on those

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[55] *See* "Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study," (www.globalchange.gov/browse/reports/sap-47-impacts-of-climate-change-and-variability-on-transportation-systems- and), and "Abrupt Climate Change" (library.globalchange.gov/sap-3-4-abrupt-climate-change (discussing the likelihood of an abrupt change in sea level).

[56] *See* sustainability.performance.gov for agency sustainability plans, which contain agency adaptation plans. *See also* www.wildlifeadaptationstrategy.gov and www.whitehouse.gov/sites/default/files/microsites/ceq/2011_national_action_plan.pdf.

communities.[57] For example, chemical facilities located near the coastline could have increased risk of spills or leakages due to sea level rise or increased storm surges, putting local communities and environmental resources at greater risk. Finally, considering climate change effects can help ensure that agencies do not generate additional GHGs – or expend additional time and funds – if the project has to be replaced, repaired, or modified.

V. TRADITIONAL NEPA TOOLS

A. Scoping and Framing the NEPA review

To effectuate integrated decision-making, avoid duplication, and focus the NEPA review, the CEQ Regulations provide for scoping.[58] In scoping, the agency determines the issues that the EA or EIS will address and identifies the impacts related to the proposed action that will be considered in the analyses.[59] An agency can use the scoping process to help it determine whether analysis is relevant and, if so, the extent of analysis appropriate for a proposed action, consistent with the purpose and need.[60] When scoping for the issues associated with the

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[57] *See* www.blm.gov/epl-front-office/projects/nepa/5251/42462/45213/NPR-A_FINAL_ROD_2-21-13.pdf.

[58] *See* 40 CFR § 1501.7 ("There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping."); *See also* "Memorandum for Heads of Federal Departments and Agencies: Improving the Process for Preparing Efficient and Timely Environmental Reviews under the National Environmental Policy Act" (CEQ 2012), *available at* ceq.doe.gov/current_developments/docs/Improving_NEPA_Efficiencies_06Mar2012.pdf (the CEQ Regulations explicitly address scoping for preparing an EIS, agencies can also take advantage of scoping whenever preparing an EA).

[59] 40 CFR §§ 1500.4(b), 1500.4(g), 1501.7.

[60] *See* 40 CFR § 1501.7 (stating that the agency preparing the NEPA analysis use the scoping process to, among other things, determine the scope and identify the significant issues to be analyzed in depth) and CEQ, "Memorandum for General Counsels, NEPA Liaisons, and Participants in Scoping," (1981), *available at* ceq.doe.gov/publications/cumulative_effects.html.

proposed agency action that may be related to climate change, the nature, location, timeframe, and type of the proposed action will help determine the degree to which consideration of climate projections is warranted. Scoping a proposed action can help an agency determine whether climate change considerations warrant emphasis and detailed analysis and disclosure, and provide a basis for an agency determination that a detailed consideration of emissions is or is not appropriate for a proposed action.

Consistent with this guidance, agencies can develop practices and guidance for framing the NEPA review by determining whether an environmental aspect of the proposed action merits detailed analysis and disclosure. Grounded on the principles of proportionality and the rule of reason, such aids can help an agency determine the extent to which an analysis of GHG emissions and climate change impacts are useful to the public and the decision-making process for distinguishing between the no-action and proposed alternatives and mitigations.[61] The agency should explain such a framing process and its application to the proposed action to the decisionmakers and the public during the NEPA review and in the EA or EIS document.

B. Incorporation by Reference

In accordance with NEPA's rule of reason and standards for obtaining information regarding reasonably foreseeable effects on the human environment, action agencies need not

[61] *See* for example: Matthew P. Thompson, Bruce G. Marcot, Frank R. Thompson, III, Steven McNulty, Larry A. Fisher, Michael C. Runge, David Cleaves, and Monica Tomosy, "The Science of Decisionmaking: Applications for Sustainable Forest and Grassland Management in the National Forest System," *available at* www.fs.fed.us/rm/pubs_other/rmrs_2013_thompson_m004.pdf; General Technical Report WO–88, July 2013; "US Forest Service Comparative Risk Assessment Framework And Tools," *available at* www.fs.fed.us/psw/topics/fire_science/craft/craft; and Julien Martin, Michael C. Runge, James D. Nichols, Bruce C. Lubow, and William L. Kendall 2009. "Structured decision making as a conceptual framework to identify thresholds for conservation and management." Ecological Applications 19:1079–1090, *available at* dx.doi.org/10.1890/08-0255.1.

undertake exhaustive research or analysis of potential climate change impacts in the project area or on the project itself, but may instead summarize and incorporate by reference the relevant scientific literature.[62] Incorporation by reference is of value in considering GHG emissions where an agency is considering the implications of climate change for the environmental effects of the proposed action. For example, agencies may summarize and incorporate by reference the major peer-reviewed assessments from the USGCRP and underlying technical reports such as their Synthesis and Assessment Products.[63] Particularly relevant are the reports on climate change impacts on water resources, ecosystems, agriculture and forestry, health, coastlines, and arctic regions in the United States.[64]

When using scenarios or climate modeling information (including seasonal, interannual, long-term, and regional-scale predictions), agencies should consider their inherent limitations and uncertainties and disclose these limitations in explaining the extent to which they rely on particular studies or projections.[65] Agencies should take into account that the outputs of coarse-resolution global climate models, commonly used to predict or project climate change contingent on a particular emission scenario at a continental or national scale, may have limitations on how they can be used in regional or local impact studies.[66]

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[62] 40 CFR § 1502.21 (material may be incorporated by reference if it is reasonably available for inspection by potentially interested persons during public review and comment).

[63] www.globalchange.gov/browse/reports.

[64] *See* "Third National Climate Assessment."

[65] 40 CFR §§ 1502.21, 1502.22.

[66] *See* "Climate Models: An Assessment of Strengths and Limitations," *available at* data.globalchange.gov/assets/91/7e/0df45f584b652ea95e947ef813d0/sap3-1-final-all.pdf.

C. Using Available Information

Agencies are expected to make decisions using current scientific information and methodologies. Agencies are not required to conduct original research in NEPA analyses to fill scientific gaps. Consequently, agencies are not expected to await the development of new tools or scientific information to conclude their NEPA analyses and documentation.[67] Agencies should exercise their discretion to select and utilize the tools, methodologies, and scientific and research information that are of high quality and most appropriate for the level of analysis and the decisions being made.

Agencies should be aware of the ongoing efforts to address the impacts of climate change on human health and vulnerable communities. Certain groups, including children, the elderly, and the poor, are most vulnerable to climate-related health effects and frequently lack the capacity to engage on issues that disproportionately affect them. We recommend that agencies periodically engage their environmental justice experts, and potentially the Federal Interagency Working Group on Environmental Justice,[68] to identify interagency approaches to impacts that may have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.[69]

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[67] 40 CFR § 1502.24 (requiring agencies to ensure the professional and scientific integrity of the discussions and analyses in environmental impact statements).

[68] For more information on the Federal Interagency Working Group on Environmental Justice co-chaired by EPA and CEQ, see www.epa.gov/environmentaljustice/interagency/index.html.

[69] President's Memorandum for the Heads of All Departments and Agencies, Executive Order on Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, February 11, 1994, *available at* ceq.doe.gov/nepa/regs/eos/ii-5.pdf; "Environmental Justice Guidance Under the National Environmental Policy Act," CEQ, December 1997, *available at* ceq.doe.gov/nepa/regs/ej/justice.pdf.

D. Programmatic – Broad Based – NEPA Reviews

Agency decisions can address different geographic scales that can range from the programmatic or landscape level, to the site- or project-specific level. Agencies sometimes conduct analyses or studies at the national level or on other broad scales (e.g., landscape, regional, or watershed) to assess the status of one or more resources or to determine trends in changing environmental conditions.[70] In the context of long-range energy, transportation, and resource management actions, for example, an agency may decide that it would be useful and efficient to provide an aggregate analysis of GHG emissions or climate change effects in a programmatic analysis and then incorporate by reference that analysis into future NEPA reviews.

A tiered, analytical decision-making approach using a programmatic NEPA review is used for many types of Federal actions[71] and can be particularly relevant to addressing proposed land, oceanic, and resource management plans. Under such an approach, a broad-scale programmatic NEPA analysis is conducted for actions such as USDA Forest Service land and resource management plans, Bureau of Land Management resource management plans, or Natural Resources Conservation Service conservation programs. Subsequent NEPA analyses for site-specific decisions – such as projects that implement land, oceanic, and resource management plans – are tiered from the broader programmatic analysis, drawing upon its basic framework analysis to avoid repeating analytical efforts for each tiered decision. Examples of project- or

[70] Such a programmatic study is distinct from a programmatic NEPA review which is appropriate when the action being considered is subject to NEPA requirements and is establishing formal plans, establishing agency programs, and approving a suite of similar projects.

[71] 40 CFR §§ 1502.20, 1508.28. A programmatic NEPA review is appropriate when a decision is being made that is subject to NEPA, such as establishing formal plans, establishing agency programs, and approving a suite of similar projects.

site-specific actions that can benefit from a programmatic NEPA review include: constructing transmission towers; conducting prescribed burns; approving grazing leases; granting a right-of-way; authorizing leases for oil and gas drilling; authorizing construction of wind turbines; and approving hard rock mineral extraction.

A programmatic NEPA review may also serve as an efficient mechanism to describe Federal agency efforts to adopt sustainable practices for energy efficiency, GHG emissions avoidance or reduction, petroleum product use reduction, and renewable energy use, as well as other sustainability practices.[72] While broad department- or agency-wide goals may be of a far larger scale than a particular program or proposed action, an analysis that informs how an action affects that broader goal can be of value.

VI. CONCLUSION AND EFFECTIVE DATE

This guidance document informs Federal agencies on how to apply fundamental NEPA principles to the analysis of climate change through assessing GHG emissions and the effects of climate change for Federal actions subject to NEPA. It identifies opportunities for using information developed during the NEPA review process to take into account appropriate adaptation opportunities. Applying this guidance will promote an appropriate and measured consideration of GHG emissions and the effects of climate change in the NEPA process through a clearer set of expectations and a more transparent process, thereby informing decisionmakers

[72] *See* Executive Order 13514 – Federal Leadership in Environmental, Energy, and Economic Performance, 74 FR 52117–52127 (October 5, 2009); Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, 72 FR 3919 (January 26, 2007), *available at* www.gpo.gov/fdsys/pkg/FR-2007-01-26/pdf/07-374.pdf.

and the public and resulting in better decisions. This guidance also addresses questions raised by other interested parties.[73]

Agencies are encouraged to apply this guidance to all new agency actions moving forward and, to the extent practicable, to build its concepts into currently on-going reviews.

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[73] Recommendations of the State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience, November 2014, at page 20 (recommendation 2.7), *available at* www.WhiteHouse.gov/sites/default/files/docs/task_force_report_0.pdf; GAO report: Future Federal Adaptation Efforts Could Better Support Local Infrastructure Decision Makers, April 12, 2012, *available at* www.gao.gov/products/GAO-13-242.