Chapter 1
Background and Overview

The Governor's Initiative

A warming climate is already having serious and broad-scale impacts in Alaska, including flooding of villages; increased strength of fall storms, eroding coastal villages; thawing of permafrost, resulting in subsidence of land and structures; and a record number of forest fires, threatening lives, communities, and private property and resulting in severe air pollution-related health threats.

Comment [gf1]: This description will be adjusted to match whatever is determined to be included in the Executive Summary on the 7/31 call.

On September 14, 2007, Governor Sarah Palin signed Administrative Order 238, establishing the Alaska Climate Change Sub-Cabinet to advise her office on the preparation and implementation of a comprehensive Alaska Climate Change Strategy. The members of this ~~high level~~ Sub-Cabinet include the Commissioners of the Departments of Environmental Conservation (DEC); Natural Resources; Commerce, Community and Economic Development; Fish and Game; and Transportation and Public Facilities.

Governor Palin directed that the Strategy include, among other efforts, building the state's knowledge of the actual and foreseeable effects of climate warming in Alaska, developing appropriate measures and policies to prepare communities in Alaska for the impacts from climate change, and providing guidance regarding Alaska's participation in regional and national efforts addressing the cause and effects of climate change.

To accomplish the objectives of Administrative Order 238, the Sub-Cabinet formed a work group to address Immediate Actions that should be undertaken, and a second work group to identify critical Research Needs. In addition, two Advisory Groups were established to recommend measures that could be undertaken in Alaska addressing climate mitigation and adaptation. This report details the process, analyses, and recommendations of the former, the Mitigation Advisory Group (MAG). Consistent with Administrative Order 238, the MAG addressed opportunities to reduce greenhouse gas (GHG) emissions from Alaska sources, including the expanded use of alternative fuels, energy conservation, energy efficiency, renewable energy, land-use management, and transportation planning. Also of concern was identifying opportunities to reduce GHG emissions from the operations of the Alaska state government and opportunities to participate in carbon-trading markets, including the potential for carbon sequestration.

Structure of the Mitigation Advisory Group Report

This report documents the results of the work of the Alaska Climate Change Strategy MAG's deliberations and recommended policies. It begins with an Executive Summary, Acknowledgments, a list of MAG members, and a summary of their final recommendations.

This, Chapter 1, details the process and an overview of findings. Chapter 2: Inventory & Forecast, provides a summary of Alaska's historic and forecasted GHG emissions, incorporating recent actions that have already been planned or implemented in the state to reduce GHG emissions, and displays the potential to achieve significant GHG reductions. The work of the

MAG was substantially assisted by the efforts of Technical Work Groups (TWGs) convened to consider sector-specific issues and opportunities. Chapters 3 through 8 summarize each TWG sector and the MAG's recommended policies. Those sectors are Energy Supply and Demand; Forestry, Agriculture and Waste Management; Oil and Gas; Transportation and Land Use; and Cross-Cutting Issues. In a number of cases, the recommended policies outline scenarios but point out that further studies and analyses may be necessary prior to implementation. The recommendations are further documented, by sector, in greater detail in the appendices.

Appendix A of the report contains Governor Palin's Administrative Order. Appendix B provides a copy of the memorandum that outlines the process used by the state and its consultant, the Center for Climate Strategies (CCS), to guide the MAG process. Appendix C lists TWG members and their affiliations, and Appendix D provides Alaska's GHG emissions inventory and reference case projections. Details on how quantifiable recommendations were measured for direct costs or savings and the amount of emissions reduced are found in Appendix E.

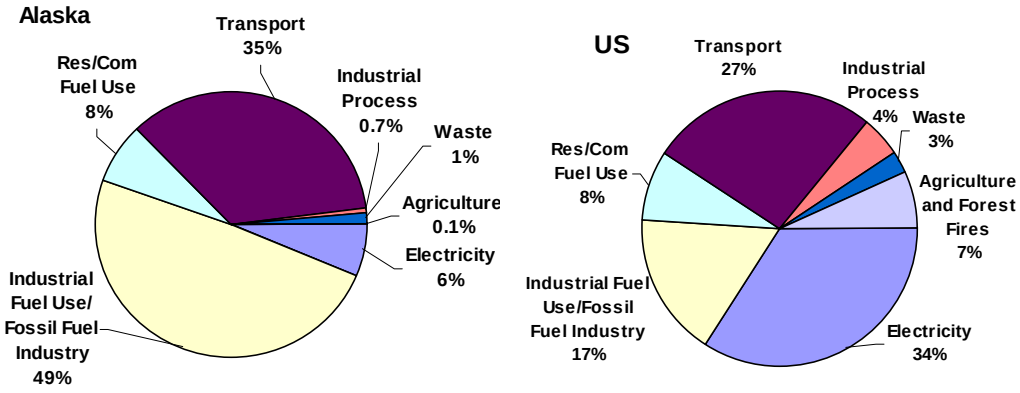
Appendices F though J represent each TWG sector and provide extensive details for each policy recommendation, including policy descriptions and designs, implementation measures, quantification methodologies and results, and qualitative discussions of indirect costs and benefits. Additionally the level of agreement and barriers to implementation are addressed in these analyses.

Alaska's Greenhouse Gas Inventory and Forecast

An initial step in developing the mitigation strategy was to gain an understanding of the sources of GHG gas emissions by sector. Alaska's GHG Inventory and Forecast (I&F)[1] looked at historical and projected emissions from 1990 to 2025. Specific sectors were reviewed and compiled with assistance of national and in-state subject matter experts. A comparison with U.S. overall emissions is useful in identifying the significant ways in which Alaska differs from the lower 48 states (Figure 1-1).

[1] See Appendix D: Greenhouse Gas Emissions Inventory and Reference Case Projections.

Figure 1-1. 2005 Alaska emissions by sector

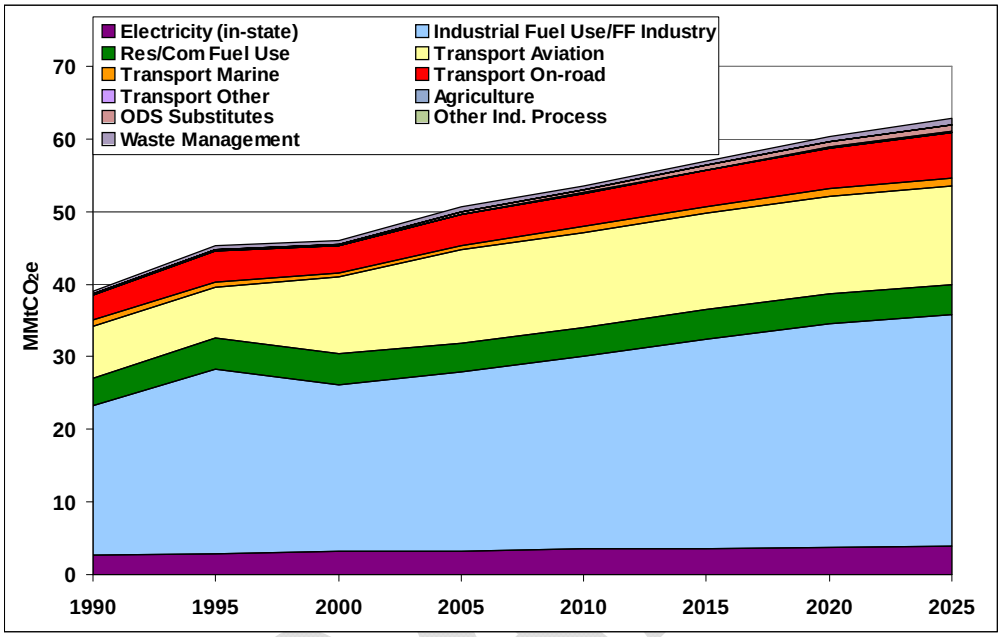


Notes: Res/Com = Residential and commercial fuel use sectors. Emissions for the residential and commercial fuel use sectors are associated with the direct use of fuels (natural gas, petroleum, coal, and wood) to provide space heating, water heating, process heating, cooking, and other energy end uses. The commercial sector accounts for emissions associated with the direct use of fuels by, for example, hospitals, schools, government buildings (local, county, and state), and other commercial establishments. The industrial fuel use/fossil fuel industry sector accounts for direct fuel combustion in the industrial sector as well as fugitive methane that occurs from leaks and venting during the production, processing, transmission, and distribution of fossil fuels. The industrial processes sector accounts for emissions associated with manufacturing and excludes emissions included in the industrial fuel use/fossil fuel industry sector. The transportation sector accounts for emissions associated with fuel consumption by all on-road and non-highway vehicles. Non-highway vehicles include jet aircraft, gasoline-fueled piston aircraft, railway locomotives, boats, and ships. Emissions from non-highway agricultural and construction equipment are included in the industrial sector. Electricity = Electricity generation sector emissions on a consumption basis. In Alaska, the electricity consumed is assumed to be the same as the electricity produced in the state.

The summary of historical emissions formed the basis of a projection of how emissions are likely to change over time should the state continue on its current course, adjusted for any known or anticipated activity. This baseline emissions trajectory is often referred to as "business as usual" or BAU. CCS and DEC made this preliminary GHG emissions inventory and reference case projection available to assist everyone involved in developing the Alaska Climate Change Strategy in understanding past, current, and projected future GHG emissions in Alaska and thus inform the policy development process. Results show substantial emissions growth since 1990, and, absent mitigation measures, emissions are expected to grow through 2025 (Figure 1-2).

Updates to the I&F continued throughout the development of the mitigation policy recommendations with assistance from DEC, CCS, and the TWGs. Refinements relied not only on established, reliable sources of data but also on the expertise of MAG and TWG members. When all input was finalized, the I&F was approved by the MAG.

Figure 1-2. Gross Alaska GHG emissions by sector, 1990–2025: historical and projected



GHG = greenhouse gas; $MMtCO_2e$ = million metric tons of carbon dioxide equivalent; FF = fossil fuel; Res/Com = direct fuel use in the residential and commercial sectors; ODS = ozone-depleting substance; Ind. = industrial.

Note: The Industrial Fuel Use/FF Industry category accounts for direct fuel combustion in the industrial sector as well as fugitive methane that occurs from leaks and venting during the production, processing, transmission, and distribution of fossil fuels.

One dilemma of seeking to reduce GHG emissions in Alaska is identifying those emissions that are normally counted toward a state's total emissions but where—in Alaska's case —the activity is beyond the control of the state. For example, by convention, aviation fuel dispensed in a state results in a per-gallon conversion to GHG emissions attributed to that state. However, aircraft refueling in Alaska are frequently just passing through en route to destinations outside of Alaska. Thus, some emissions are "charged" to Alaska but occur outside of Alaska as far as commerce or other purposes are concerned. Further, neither Alaskan fuel providers nor state authority can control the location or use of these fossil fuels and their related GHG emissions.

To ensure a more thorough understanding of Alaska's opportunities and limitations in addressing GHG emissions, forecast graphs show business as usual (BAU) projections with and without aviation fuel related to transit aircraft refueling (31% of jet fuel dispensed).

GHG emissions related to off-shore vessels, again most being from transient vessels in Alaskan waters and never coming to port, have been removed from all historic and future projections.

A full discussion of this issue is found in both Chapter 7: Transportation and Land Use Sectors and Appendix J: Transportation and Land Use Policy Recommendations.

Recent actions, such as the weatherization bonding initiative, fuel energy efficiency improvements, and other steps that result in GHG emission reductions are also included in the I&F, calculated separately from GHG reductions that would result from actions recommended in this plan. Appendix G: Energy Supply and Demand Policy Recommendations describes this effort in detail.

The Alaska Climate Change Strategy Mitigation Advisory Group Process

A Climate Change Strategy for Alaska must build upon the knowledge, expertise, and concerns of a broad representation of Alaskans because climate change is not just an environmental issue in the state. It also has far-reaching social, cultural, and economic consequences of great importance to all Alaskans. The Sub-Cabinet thus required that the draft recommendations on adaptation and mitigation be a product of a deliberative process embracing Alaska concerns and Alaska solutions from Alaska citizens. Based on the work of the MAG, additional input, and its own deliberations, the Sub-Cabinet will distill final recommendations to form, in aggregate, the Alaska Climate Change Strategy for the Governor's consideration. The Sub-Cabinet is also keenly aware that more than any other state, Alaska is already being measurably affected by climate change, so Alaska's choices and actions may directly influence national policy.

To address climate change mitigation in Alaska, the Sub-Cabinet sought expert advice from a cross-section of 26 stakeholders from widely diverse backgrounds to serve as members of the MAG. To assist the MAG, 75 other individuals and some MAG members were organized into five TWGs that provided in-depth, sector-specific expertise and uniquely Alaskan experiences and perspectives. The MAG also interfaced with the Research Needs Work Group by gaining information from it about latest research efforts and by forwarding to it recommended research topics. Likewise, the Immediate Action Work Group provided valuable insights to the MAG into the most pressing problems of Alaskans related to impacts from climate change.

The state chose CCS to facilitate the deliberative, consensus-building efforts of the MAG and its TWG members. CCS TWG facilitators and project coordinators also provided subject-matter expertise in analyses and methodologies for identifying GHG emission reductions and calculated direct costs for quantifiable policy options recommended by the MAG. CCS is a well-known organization that has assisted over 20 states in the development of state climate change action plans.

To ensure that the process possessed a clear state focus and strong connection to the state's academic institutions, Brian Rogers, Chancellor of University of Alaska Fairbanks, served as meeting facilitator for all formal meetings of the MAG.

As the convening body of the mitigation stakeholder process, the Sub-Cabinet provided ultimate oversight, with specific leadership and support from the Alaska DEC, whose staff provided vital assistance throughout, particularly with respect to existing measures and issues, data and analytical assistance, and logistical support.

The MAG met in seven formal meetings and two teleconferences to direct, review and approve the work of the TWGs and to provide strategic and technical guidance in the selection and

development of policy recommendations. TWG members frequently attended and presented material at MAG meetings. The five TWGs met from 12 to 25 times, primarily via teleconference, to first recommend specific policy options to the MAG and then to expand upon and analyze each approved option. Options were quantified, where possible, as to projected reductions of GHG emissions and the direct costs of such reductions. Qualitative observations and analyses were included in the detailed discussion of each policy option.

The process sought but did not require achieving consensus to bring a recommendation forward. Where unanimous consent could not be achieved, barriers to full support were identified. Where those barriers could not be eliminated through further discussion and modification, the number of dissenting opinions and the context of the dissention are noted. Of the 34 policy recommendations, only two did not secure unanimous consent.

After a draft GHG Emissions Inventory and Forecast was developed and presented to members, the MAG and TWGs were offered a draft catalog of GHG reduction policies and opportunities considered in other states. This catalog, a comprehensive compendium of over 350 ideas and opportunities that have surfaced during CCS's state efforts over the last five years, was just a starting point. The MAG's first task was to identify missing options, and the catalog grew further.

Each of those options was reviewed by the TWGs and rejected, modified, or expanded upon to reflect Alaska's unique values and conditions. After months of iteration, each TWG crafted a list of priority policy options, which the MAG reviewed, refined, and approved or turned back to the TWGs for further examination, clarification, and detail. The TWGs spent countless hours examining and refining the policy options as directed by the MAG. The MAG ultimately conducted multiple reviews on each policy option before approving them.

In most instances, the TWGs were able to characterize policy options with sufficient detail to allow their potential GHG emission reductions and the accompanying costs to be estimated. Assumptions, data sources, and methodologies were developed by the TWGs and approved by the MAG. All quantified options were evaluated consistently in terms of such constants as discount rate, time period, etc. Detailed quantification information is documented in the appendices to this report.

Emission reductions focused on the six GHGs most commonly measured, have the most significant effects on the atmosphere, and are included in the U.S. Greenhouse Gas Inventory:[2] carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Emissions of these GHGs are presented using a common metric, CO_2 equivalence, which indicates the relative contribution of each gas to atmospheric change as compared to CO_2. Not all of these gasses have the same climate impact per unit. For example, nitrous oxide is 310 times more potent than CO_2, methane 21 times more potent, sulfur hexafluoride 23,900 times more potent. Therefore, a common unit of measurement is essential. Accordingly, all GHGs are compared to CO_2 in terms of their "global warming potential" and are then reported in terms in

[2] U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2006*, EPA 430-R-08-005, April 15, 2008. Available at: http://epa.gov/climatechange/emissions/usinventoryreport.html.

million metric tons of carbon dioxide equivalents ($MMtCO_2e$). A metric ton is approximately 2,200 pounds, or 10% more than a common, or "short," ton of 2,000 pounds.

The costs of the policy recommendations that would bring about GHG reductions were quantified where possible. Only direct economic costs and savings were considered; indirect costs and benefits, ecological economics, ~~and~~ social impacts and the cost of inaction were not quantified. Costs were not estimated for the federal government imposing a cost for carbon either through a cap and trade program or through a carbon tax, thus carbon costs were set at zero. If costs are established for emitting carbon and other greenhouse gases, then the net costs to reduce emissions need to be adjusted accordingly. Indirect effects are qualitatively discussed in each sector's policy option document where appropriate. Additional, more refined analysis, as well as assessment of broader macroeconomic impacts, may be appropriate as the state considers implementation of the MAG recommendations.

After policy options were quantified, they were examined closely for potential overlaps with other policy options. The data were then adjusted as necessary to avoid double counting. Areas of overlap are identified and discussed in the appendices, and the adjusted values are reflected in the quantification tables that precede each sector's policy recommendations.

Overview of the MAG Recommendations

The policy recommendations covered a wide spectrum of possible actions. The Energy Supply and Demand (ESD) sector recommendations include: transmission optimization and expansion; energy efficiencies for residential, commercial, and industrial customers; renewable energy implementation; building standards; and energy efficiency for industrial installations. Other options deemed to require more knowledge were forwarded to the Research Needs Work Group.

The Forest, Agriculture and Waste Management (FAW) sector's recommended policies address forest management and reforestation strategies for carbon sequestration in coastal and boreal forests; community wildfire risk reduction plans; expanded use of biomass feedstocks for energy production (heat, power, alternative fuels); and advanced waste reduction and recycling.

The Oil and Gas (O&G) sector provided challenges due to the complex nature of the O&G industry in the state, but invited close scrutiny due to the contribution of this sector to Alaska's overall GHG emissions. A number of recommendations were generated, but many will require significant investments and further research to ensure technical efficacy and that the costs justify the benefits gained. The recommendations include: conservation practices; reducing fugitive methane emissions; electrification of North Slope operations with centralized power; improved equipment efficiency; renewable energy in O&G operations; and carbon capture, sequestration, and enhanced oil recovery strategies within and away from known geologic traps.

Transportation and Land Use (TLU) offers numerous opportunities for GHG emission reductions. The MAG recommends that the state consider greater commuter choices; heavy-duty vehicle idling; transportation system management; efficient development patterns; promotion of alternative-fuel vehicles; vehicle-miles-traveled and GHG reduction goals; efficiency improvements in heavy-duty vehicles and marine vessels; aviation emission reduction strategies; and alternative fuels research and development.

A number of policy recommendations that cover multiple sectors were addressed in the Cross-Cutting Issues (CC) sector. Establishing an Alaska GHG emission reporting program; establishing goals for statewide GHG emission reductions; encouraging the state government to lead by example; integrating this Climate Change Mitigation Strategy with Alaska's Energy Plan; exploring market-based systems to manage GHG emissions; and coordinating implementation of numerous existing and proposed statewide efforts to address climate change comprised the suite of CC analyses and recommendations.

Table 1-1 shows the cumulative emission reductions expected from implementing quantifiable policy options. Any potential double counting from overlaps in policy design and implemenation measures has been eliminated. The costs illustrated are directly related to the implementation of specific measures, and do not consider ancillary benefits/costs or indirect expenditures or savings. Negative costs indicate savings.

Table 1-1. Alaska cumulative emission reductions and costs

Alaska Cumulative Reductions and Costs/Savings	2015 ($MMtCO_2e$)	2020 ($MMtCO_2e$)	2025 ($MMtCO_2e$)	2010–2025 ($MMtCO_2e$)	NPV 2010–2025 Cost/Cost Savings (Million $)	Cost/Savings per tCO_2e
Energy Supply and Demand	1.9	3.0	5.3	40.7	–$191	–$5
Oil and Gas	0.751	4.8	4.8	46.2	$7,530	$163
Transportation and Land Use	0.19	0.31	0.42	3.85	$364	$95
Forestry, Agriculture, Waste Management	0.47	0.8	1.11	9.5	$84	$9
Cross-Cutting	NQ	NQ	NQ	NQ	NQ	NQ
Total	**3.3**	**9.0**	**11.7**	**100.2**	**$7,787**	**$~~0~~78.0**

CO_2e = carbon dioxide equivalent; $MMtCO_2e$ = million metric tons of carbon dioxide equivalent; NPV = net present value.; NQ = Not Quantified

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The issue of when, whether, and if so, who should set statewide GHG reduction goals created lively debate throughout the MAG process. Ultimately, a slim majority of MAG members recommend that the ~~Alaska~~ SubCabinet adopt an aspirational (not legislated) numeric GHG emission reduction goal. The CC TWG recommended ~~of~~ 20% below 1990 GHG emission levels by 2020, and 80% below 1990 levels by 2050, keeping in mind the emissions that are beyond the control of the State. The 2050 goal is consistent with the United Nations Intergovernmental Panel on Climate Change recommendation to keep atmospheric CO_2 levels at 450 parts per million[3] or lower to avoid major irreversible damage to the planet's ecosystems. In addition, Alaska should establish a baseline of emissions that will help measure progress toward these goals and refine it after federal legislation related to this matter is determined.

[3] Pachauri, Dr. R.K., Chairman, IPCC. "New Knowledge on Climate Change: Global Efforts for Meeting the Challenge." Presentation at GCEP Research Symposium, Stanford University, Oct. 2007. http://gcep.stanford.edu/pdfs/kUXNHroC3cAssx6wJoz_Mg/Pachauri-20071001-GCEP.pdf

Members objecting to this recommendation noted that many of Alaska's emissions are caused by activities out of the state's control, and that the Sub-Cabinet~~, rather than the MAG~~ should not set a numeric goal~~, should be the body that establishes goals~~.[4]

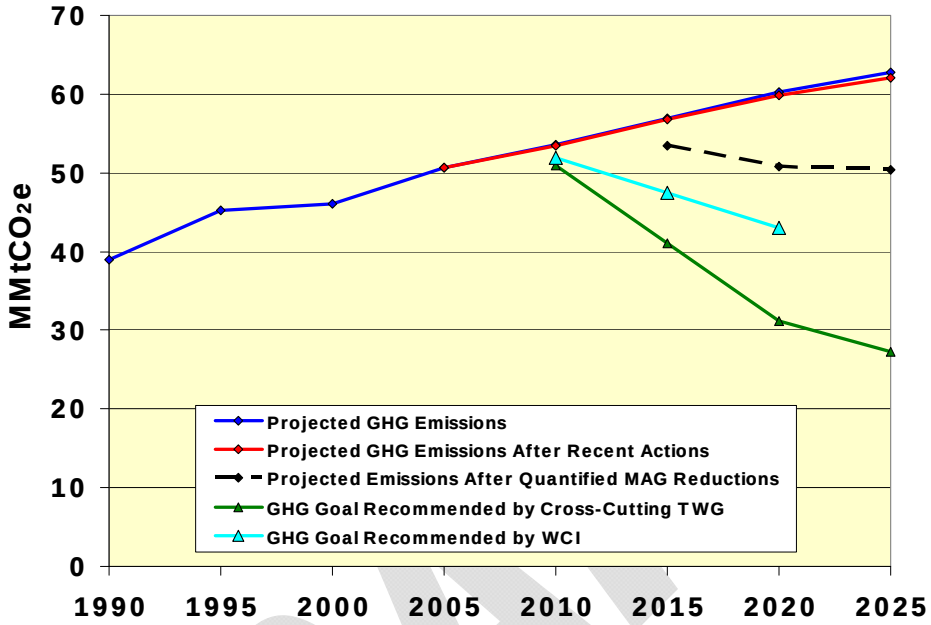
When the quantifiable recommendations were tallied, the trajectory of increasing emissions over time could be curtailed and reduced by almost 12 $MMtCO_2e$, or 19% from projected levels by 2025. More specifically, if all quantified actions were implemented, there would be a reduction in GHG emissions from 62.1 to 50.4 $MMtCO_2e$ by 2025, or 11.7 $MMtCO_2e$ below the BAU projection of no actions beyond federal corporate average fuel efficiency standards implemented. Figure 1-3a illustrates the projected results from different reduction strategies. Figure 1-3b illustrates the projected results after removing emissions from aviation refueling unrelated to Alaska activities and beyond the state's control from the baseline BAU. If all quantified actions were implemented, the BAU GHG emissions without transient aviation refueling would be reduced from 58.5 to 46.8 $MMtCO_2e$ by 2025.

The lowest line on both these figures illustrates the reduction target that the Cross-Cutting Issues (CC) TWG recommended that the Sub-Cabinet consider as a statewide goal. This represents reductions of 20% below 1990 GHG emissions levels by 2020, and 80% below 1990 levels by 2050. For comparison purposes, the recommended emission reduction goal from the Western Climate Initiative (WCI) is also shown on each. WCI is comprised of seven western states and four Canadian provinces as members; seven other U.S. states and six Mexican states are observers. Alaska is an observer state.

~~Figure 1-3 illustrates the projected results from different reduction strategies. The light blue line on this graph (second from the bottom) illustrates the recommended target that the CC TWG recommended as a statewide goal. For comparison, the recommended goal from the Western Climate Initiative (WCI) is shown. WCI is comprised of seven western U.S. states and four Canadian provinces as members; seven other U.S. states and six Mexican states are observers. Alaska is an observer state.~~

[4] See Chapter 3: Cross-Cutting Issues and Appendix F: Cross-Cutting Issues Policy Recommendations for more in-depth discussion.

Figure 1-3a. Projected Alaska GHG emission scenarios: historical to 2025 (gross consumption)



GHG = greenhouse gas; MAG = Mitigation Advisory Group; $MMtCO_2e$ = million metric ton of carbon dioxide equivalents; TWG = Technical Work Group; WCI = Western Climate Initiative.

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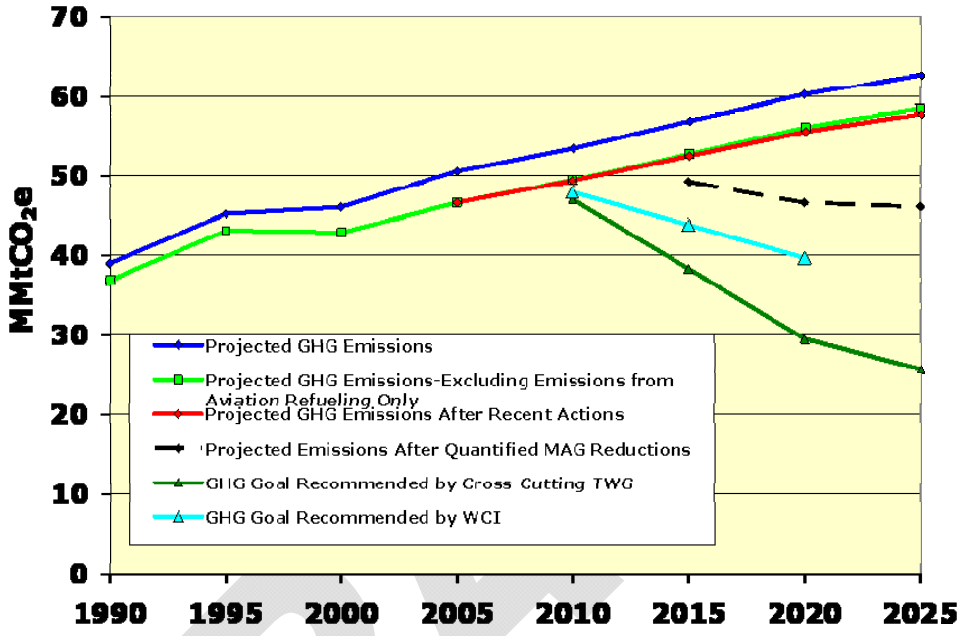
As is evident on both EX-1-3a and EX-1.3b, the quantified options recommended in this report are not sufficient to reach tentative goals. Unquantified options, such as conservation and state government leading-by-example, will reduce emissions further. Other emission-reducing actions beyond the scope of this report are anticipated. In particular, actions that save money and energy will be very advantageous for a broad range of individuals and businesses to implement independent of recommendations from the Sub-Cabinet. For example, a MAG member from an aviation-dependent delivery corporation outlined the aggressive sustainability measures implemented by the company that not only save money and fuel but also reduce GHG emissions.

Figure EX-1-3b. Projected Alaska GHG emission scenarios: historical to 2025 (consumption-based, gross emissions excluding refueling transient aircraft)



GHG = greenhouse gas; MAG = Mitigation Advisory Group. $MMtCO_2e$ = million metric tons of carbon dioxide equivalents; TWG = Technical Work Group; WCI = Western Climate Initiative.

Not shown on the graphs but of interest to the MAG is the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report goal of stabilizing the global atmosphere at 450 parts per million (ppm) of CO_2 (this does not include the five other GHGs, which when combined with CO_2 is already well above 450ppm). The TWG and MAG considered the IPCC goal of 450 ppmCO_2 when recommending the goals they did. The IPCC recognizes that this requires developed nations to achieve reductions of 25-40% below 1990 CO_2 emissions by 2020 and 80-95% reductions below 1990 levels by 2050. Another IPCC scenario is to consider a goal of 550 ppmCO2e, which means GHG emission reductions of 10-30% below 1990 levels by 2020 and 40-90% below 1990 levels by 2050 for developed nations.[5]

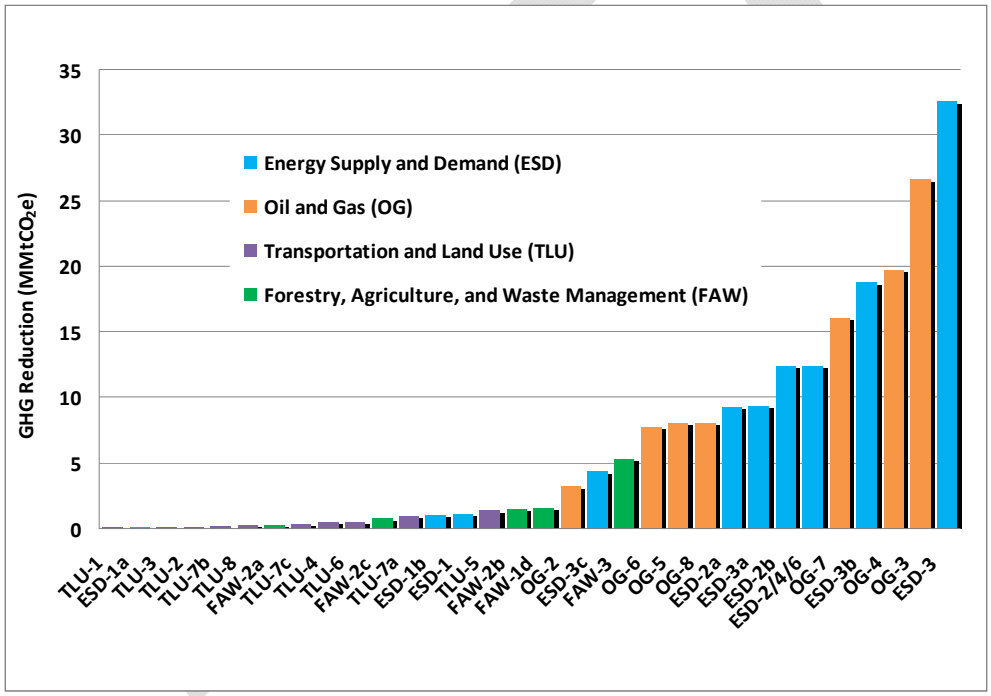
Again, by a small majority, the MAG recommends the Sub-Cabinet consider establishing an

[5] Pachauri, Dr. R.K., Chairman, IPCC. "New Knowledge on Climate Change: Global Efforts for Meeting the Challenge." Presentation at GCEP Research Symposium, Stanford University, Oct. 2007. http://gcep.stanford.edu/pdfs/kUXNHroC3cAssx6wJoz_Mg/Pachauri-20071001-GCEP.pdf

aspirational (not legislated) numeric state goal using the above information for guidance. Those who objected would prefer not to have a numeric goal.

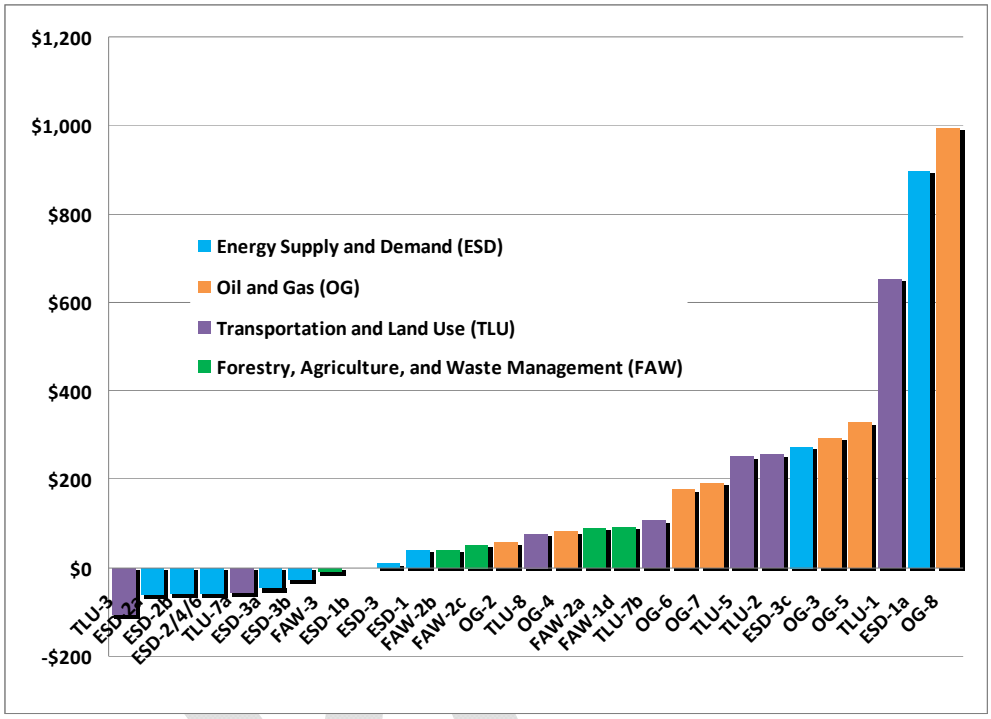
The recommended policies are displayed below in terms of relative amount of GHG reductions over the life of the strategy (Figure 1-4). For ease in identification, each policy is identified by the sector it represents and given a number. These identifiers can be cross-referenced in the chapters that follow; there is one chapter per sector. Figure 1-5 displays the quantified options by their cost or savings per $MMtCO_2e$ reduced. Note that bars below the baseline indicate cost savings.

Figure 1-4. Cumulative GHG reduction potential over the period 2010-2025 for each individual Alaska policy recommendation ~~Cumulative GHG reduction potential of Alaska policy recommendations 2010–2025~~



GHG = greenhouse gas; $MMtCO_2e$ = million metric tons of carbon dioxide equivalent

Figure 1-5. Alaska policy options ranked by cost/savings per ton of GHG reduced, 2010–2025



Negative values indicate a cost savings. GHG = greenhouse gas.

Public Involvement and Transparency

Consistent with CCS's emphasis on transparency and non-partisanship, and the desire of the Sub-Cabinet to keep Alaska citizens well informed throughout the process, the development of the mitigation recommendations was fully public. The state and CCS maintained Web sites that announced all meetings and provided relevant meeting materials, including policy recommendations at each stage of development, the I&F, and notes from previous meetings. That is, any materials provided for the MAG were accessible by the public at each step of the process, and will continue to be available for at least the next year.

All MAG and TWG meetings were open to the public, and call-in numbers to join the discussion by telephone were provided. The public was likewise invited to attend MAG meetings in person, and five to fifteen members of the public were typically in attendance. In addition, each meeting and teleconference provided a specific opportunity on its agenda for public comments and input.

As a facilitator, CCS compiled input from MAG and TWG members and edited it for clarity but did not generate original material other than the technical explanations and approach for the

quantification task. Each iteration of each policy option was reviewed and approved by the relevant TWG before being forwarded for review and approval by the MAG.

Members of the public attending the Alaska Forum on the Environment were also able to attend a day-long workshop devoted to the Alaska Climate Change Strategy. Presentations by TWG members covered each sector of concern thoroughly. DEC Commissioner Larry Hartig, other government officials, and process leaders held an open discussion with attendees to elicit personal stories of impacts, concerns, and ideas for enhancing Alaska's effectiveness in responding to global warming.

The Sub-Cabinet anticipates securing further public input and involvement regarding the recommendations of its Advisory Groups and Work Groups before formally adopting and submitting its suite of reports and recommendations to the Governor. This will enable the Sub-Cabinet to benefit from an even broader range of opinions and contributions from around the state.

Collaboration and Education

Numerous efforts are ongoing in Alaska and the region concurrent with this process. DEC brought in subject-matter experts to provide presentations to MAG meetings at nearly every meeting, and arranged for instructive field trips to facilitate awareness, knowledge exchange, and deeper understanding. Experts on cold-climate housing, permafrost research, arctic research, weather, volcanology, cross-cultural communication, geographical information system and climate mapping, green building, cap-and-trade systems, and federal policy developments helped educate MAG and TWG members. Likewise, leaders in the Alaska Energy Plan, WCI, and the Research Needs and Immediate Needs Work Groups also addressed the MAG.

A Continuing Spirit of Collaboration

Throughout the last 15 months of highly focused discussion and exchange of views, the MAG and its supporting TWGs have enjoyed lively debates. At the heart, were always the concerns for Alaska's prosperity and quality of life, mitigating the contributing causes of climate change that could disrupt those values, ensuring efficient energy for healthy communities, providing jobs for the economic security of the state, and conserving its natural resources for this and future generations. The understanding and relationships that have grown in this process will serve Alaska well as its citizen's move forward, in a continuing spirit of collaboration, to create Alaska's future.