Recommendations for a Clean Air Strategy

A report to the CASA Board from the Clean Air Strategy Project Team

June 2009

Acknowledgements

CASA and the Clean Air Strategy Project Team are greatly indebted to Martha Kostuch for her determined efforts to achieve clean air for all Albertans. Martha was a founding member of the project team and her vision, wisdom and enthusiasm were invaluable in the early stages of our work. She did not live to see the completion of this project, and we dedicate our efforts to her memory. We are optimistic that Alberta's new Clean Air Strategy will reflect her goals and aspirations.

The team is grateful to CASA for its project management and administrative support and to Alberta Environment, ENMAX and other stakeholders for their financial and in-kind contributions. In addition to team members, many individuals and organizations provided comments and feedback to improve the report. All members of the team showed remarkable commitment to meeting the challenges of this project, contributing their time, expertise and energy to bring it to a successful conclusion. The project team would especially like to thank Kim Sanderson, whose subject matter knowledge and ability to translate hours of debate and discussions into coherent minutes and eventually this report, contributed immensely to the successful completion of this project.

Note to Reader

This report makes recommendations for the Government of Alberta to consider as it develops a new Clean Air Strategy for the province. The document acknowledges, aligns with and supports other Government of Alberta policy frameworks and suggests some new directions for Alberta's approach to managing air quality.

The Clean Air Strategy Project Team worked diligently and in good faith to develop recommendations for a Clean Air Strategy that will serve Alberta for at least two decades to come. The team reached consensus on the recommended goals, which were tested with stakeholders and received strong support. In the process, team members engaged in wide-ranging and forward-thinking discussions about potential actions to achieve the goals. These potential actions are not part of the consensus agreement, but all members of the team viewed this work as a starting point for the cross-ministry analysis that the Government of Alberta will undertake as it drafts the Clean Air Strategy. The team understands that the potential actions in Appendix A will be reviewed and considered by the cross-ministry team, and acknowledges that many other factors will need to be contemplated as the Strategy is developed.

Throughout the process, representatives from all sectors provided their views, identified concerns and offered alternative solutions. Perspective and background are provided to help decision makers better understand the context in which each recommendation is made.

About CASA

The Clean Air Strategic Alliance (CASA) is a multi-stakeholder partnership composed of representatives selected by industry, government and non-government organizations. Stakeholders are committed to developing and applying a comprehensive air quality management system for all Albertans. All CASA groups and teams, including the board of directors, make decisions and recommendations by consensus. Recommendations are likely to be more effective and long lasting than those reached through adversarial processes. This report was approved by the CASA Board of Directors at its June 24, 2009 meeting.

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1 Introduction

Air quality is a fundamental component of our quality of life. Alberta's first Clean Air Strategy was published in 1991 and since then, many initiatives and programs have led to improved air quality in the province. The Government of Alberta is committed to the wise management of the province's air quality for the benefit of Albertans now and in the future, and asked the Clean Air Strategic Alliance (CASA) to develop recommendations for a renewed Clean Air Strategy for Alberta. These recommendations recognize the critical importance of sustainability and incorporate such elements throughout the document.

This report contains 14 recommended goals. Potential actions in support of the goals are proposed in Appendix A for consideration by the Government of Alberta as it prepares the new Clean Air Strategy. Readers should consult this Appendix to obtain more details on how the goals might be achieved and to gain further insight into the thinking behind the recommendations. The recommendations for a Clean Air Strategy provide guidance to support four overarching strategic directions:

Governance: Alberta will have an effective, accountable and coordinated air quality management system.

Regional Planning: Alberta's seven land-use regions will undertake proactive air quality planning.

Pollution Prevention and Control: Alberta will embrace both pollution prevention and pollution control as means to improve air quality.

Knowledge and Information: Albertans' decisions are informed by a strong base of knowledge and information.

During the public consultations undertaken for this project, participants raised concerns about two important issues that are outside the scope of recommendations for a Clean Air Strategy: indoor air quality and climate change. Indoor air quality is an important factor in maintaining a healthy indoor living environment for people. Approaches to dealing with indoor air quality cover many broad areas, including national standards for consumer goods and building products, occupational health and safety, and construction requirements under national codes. Indoor air quality is also heavily influenced by an individual's behaviour in the home, requiring approaches that focus particularly on personal responsibility. Indoor air quality issues will continue to be dealt with through relevant regional, provincial and federal program areas. Alberta Health and Wellness is responsible for addressing indoor air quality policy issues in Alberta.

Climate change is also a critical element of our time. Increasing concentrations of greenhouse gases in the Earth's atmosphere are important because of their contribution to climate change, irrespective of where they are produced. Unlike air pollution, the effects of which are largely regional or local, the effects of climate change are much more widely felt. These two issues are related nonetheless. For example, many sources of air pollution are also sources of greenhouse gases; climate change can affect air quality, and efforts to control air pollutants may increase or decrease greenhouse gas emissions, and vice versa. Alberta already has a Climate Change Strategy,[1] and the recommendations in this report do not consider greenhouse gases at length.

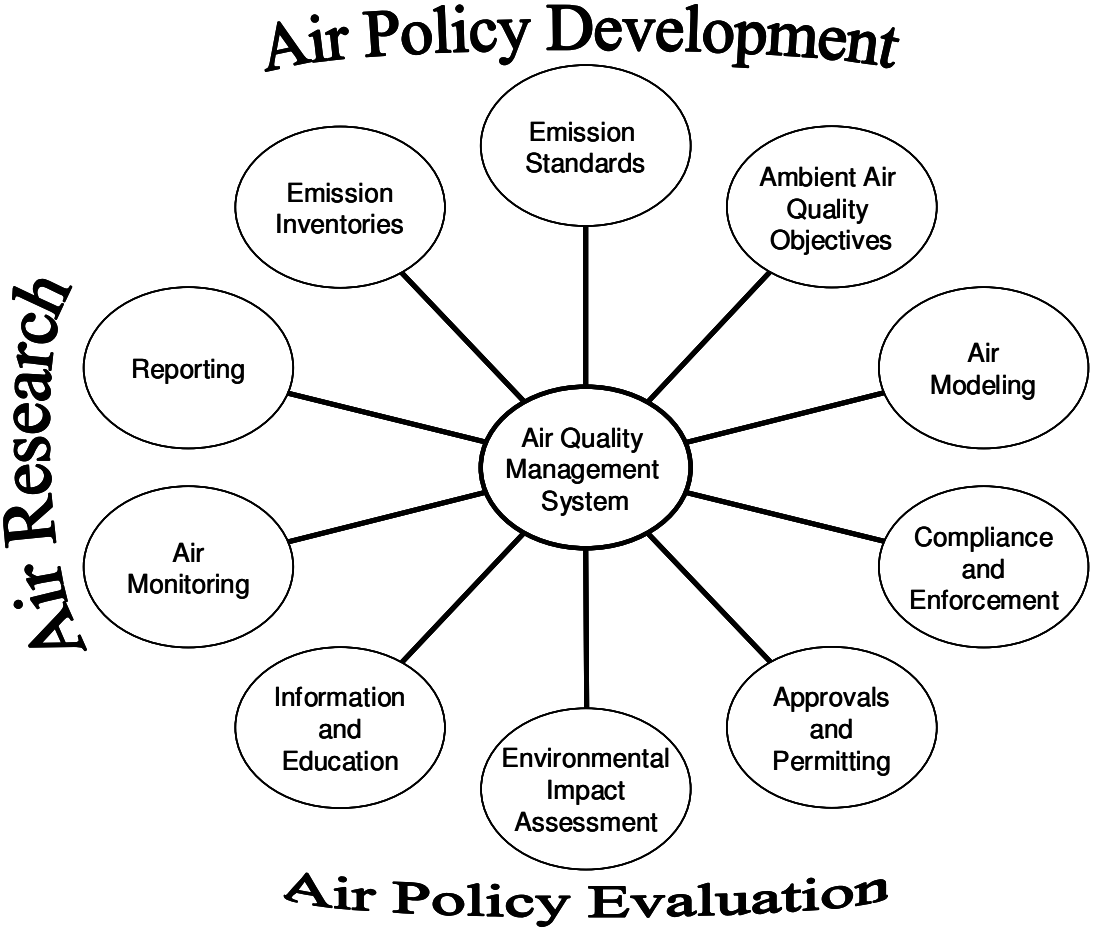
[1] See http://www.environment.alberta.ca/1319.html for details.

While this report is not intended to address climate change and indoor air quality, some recommended goals, such as those related to municipal planning and design, and pollution prevention, may provide direct or indirect benefits to help meet both these challenges.

2 Alberta's Air Quality Management System

Alberta Environment, on behalf of the Government of Alberta, is accountable for air quality in the province. Alberta Environment's comprehensive approach to managing air quality uses scientific, economic and social information to achieve its objectives. The components, or functions, of the current air quality management system are illustrated in Figure 1.

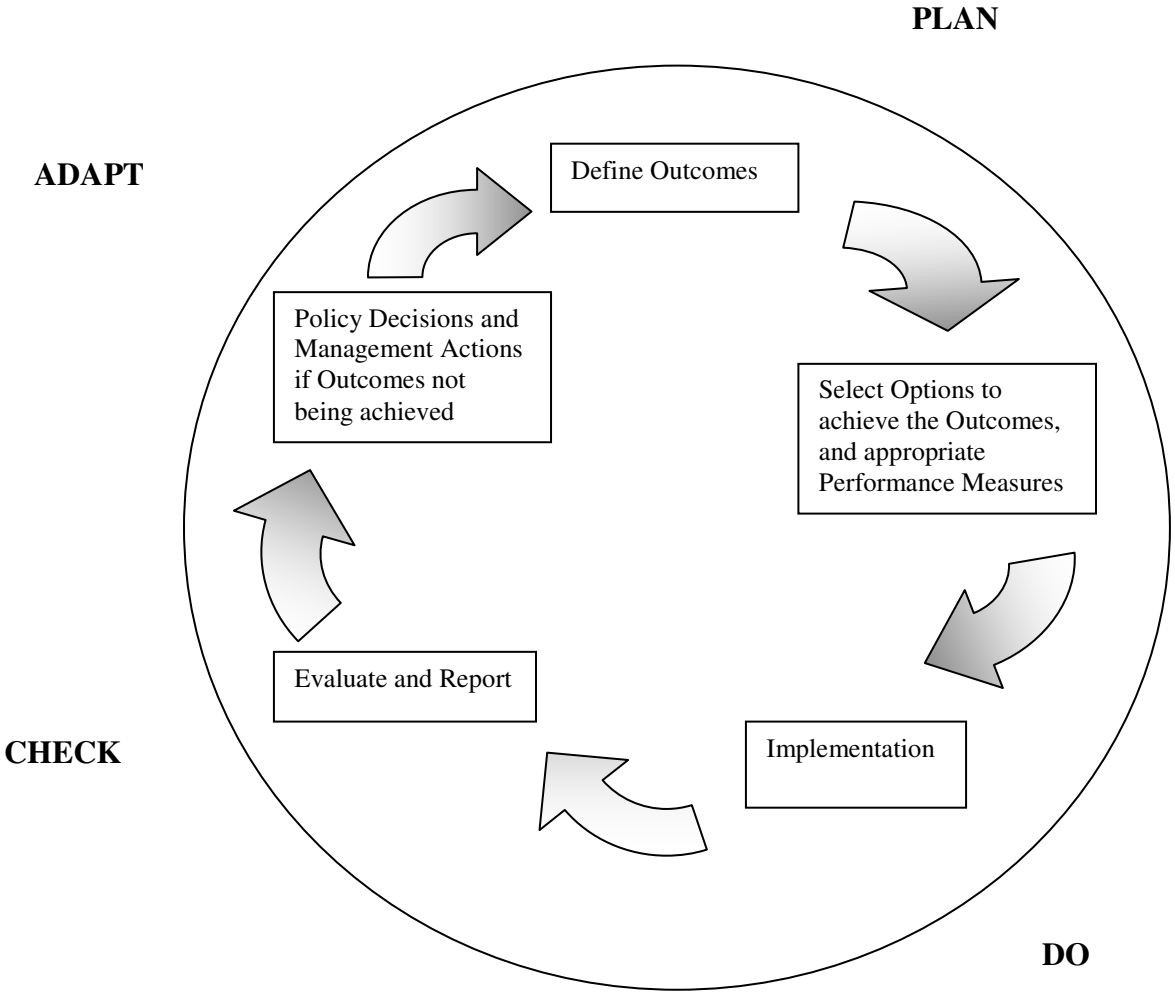
Figure 1: Components of Alberta's Air Quality Management System



The generic planning cycle of "Plan, Do, Check, Adapt," illustrated below in Figure 2 and further discussed in the Governance section of this document, applies to each component of the Air Quality Management System (AQMS) and is a fundamental principle for overall air quality management. Each component has a range of associated tools that can be used to achieve the intended purpose. Further, each component of the system requires:

- **Policy** to be developed for the component,
- **Evaluation** to determine if it is accomplishing what it is intended to accomplish to support good air management, and
- **Research** to identify relevant tools, information and new technology.

Figure 2: Generic Planning Cycle



Public participation is an important ingredient in the AQMS and Alberta Environment engages stakeholders in various ways at numerous points in the system.

Partnerships are a unique and important aspect of the AQMS in Alberta. Non-profit organizations such as CASA, the Cumulative Environmental Management Association (CEMA) and airsheds bring together stakeholders who are involved in ambient air monitoring and/or the development of policy recommendations to government. The roles of CASA and airshed zones in particular are considered in Recommendation 4.

3 Why Alberta Needs a New Clean Air Strategy

Alberta has achieved considerable success in understanding air quality and managing emissions since the recommendations in the 1991 Clean Air Strategy were implemented. These successes include substantial reductions in industrial emissions such as reductions in solution gas flaring and venting, and management plans to address issues related to particulate matter and ozone in the province's most populated areas. Nevertheless, there are significant and growing pressures on Alberta's air, and a new Clean Air Strategy is needed because:

1. Continuing industrial and population growth could compromise the gains made since 1991. The increased pace of development in the oilsands, ongoing development of Alberta's conventional energy reserves, an influx of people to the province, and strong urban growth all have the potential to affect air quality, in some areas more than others. Development in the energy sector has spurred substantial growth in related industrial activities, as well as a significant increase in infrastructure requirements. All of these activities are sources of air emissions.

2. Some aspects of air quality management need renewed attention, such as preventing and controlling emissions from non-regulated and non-point sources – so-called "area" sources, such as residential and commercial heating, transportation, and agriculture. Emissions from these sources have increased since 1991. While area sources were recognized in the original Clean Air Strategy, responses to this complex issue are still needed; to succeed, adjustments to the current governance model will likely be required.

3. Public interest in health issues remains high, and air quality continues to be a health concern in some regions. Considerable work is underway to better understand cumulative effects and the need for limits to protect human, animal and ecosystem health.

4. In the last few years, the Government of Alberta has made a number of commitments that have implications for how air quality is managed. These include a desire to better integrate decision making to ensure alignment and consistency across government departments and agencies; an interest in shared governance and shared responsibility; and the creation of several new provincial resource management strategies, at least some of which will influence air quality management (e.g., the *Provincial Energy Strategy*, the *Climate Change Strategy*, the *Land-use Framework* and *Water for Life*).

Alberta needs a Clean Air Strategy that can anticipate and respond to current and emerging challenges. The strategic directions and goals recommended in this report represent an integrated approach for managing air quality that will address these issues and ensure that clean air is part of a healthy and sustainable future for Albertans. The team reached consensus on the goals, which were tested with stakeholders and received strong support. Team members also engaged in wide-ranging and forward-thinking discussions about potential actions to achieve the goals. These potential actions (presented in Appendix A) are not part of the consensus agreement, but all members of the team viewed this work as a starting point for the cross-ministry analysis that the Government of Alberta will undertake as it drafts the Clean Air Strategy. The team understands that the potential actions in Appendix A will be reviewed and considered by the cross-ministry team, and acknowledges that many other factors will need to be contemplated as the Strategy is developed.

4 Consulting with Albertans about a New Clean Air Strategy

The consensus-based process used by CASA incorporates consultation in many forms. The Clean Air Strategy Project Team[2] recognized the importance of public input in developing its recommendations, and established a subgroup to oversee the consultation. A consultant was hired to develop and implement the two phases of the consultation plan, starting in spring 2008. The input was compiled and considered by the team in refining its recommendations.

Phase 1 – Initial Stakeholder Consultation
During Phase 1, fifteen CASA stakeholders, including non-governmental organizations, government and industry representatives, participated in a telephone interview to test their reaction to the team's initial priorities and solicit their input on other areas that may affect the team's recommendations.

Phase 2 – Engaging Albertans and Aboriginal Groups
Phase 2 was an open and transparent public consultation program. Various tools were used to gather input from the public during phase two, and the *Clear the Air* discussion guide was used to focus discussion at seven town hall meetings in September and October 2008. Comments were provided at the town hall meetings and through a dedicated website, a telephone hotline and written submissions. A proactive Aboriginal engagement process was designed to engage First Nations, and a successful meeting with Treaty 6 Elders did occur.

Over 440 Albertans provided input during the consultations, including 328 survey respondents and 122 individuals who attended the town hall meetings. The input received was of high quality but cannot necessarily be generalized as representing a wider population due to the limited number of people who chose to participate.

Phase two participants were generally of the view that overall air quality in Alberta is good now, but there are some localized air quality issues. They supported and encouraged strong action to ensure Alberta's overall air quality remains good for future generations. They identified three major air quality issues: industrial emissions, vehicle emissions, and health problems related to air quality.

From government, participants wanted to see stronger legislation and regulation, along with adequate resources for monitoring, inspection and enforcement of regulations. They also supported the use of financial and other instruments to encourage innovation and adoption of best practices and to ensure compliance.

Participants wanted industry to accept responsibility for emission reductions, as well as commit to transparency in monitoring and access to information. They thought industry should also invest in new technologies to reduce pollution and should allocate staff resources for monitoring and maintenance.

To encourage and promote action by individuals, participants wanted accessible and understandable information on air quality, and felt there should be a long-term public education campaign to promote personal responsibility. Reduced use of vehicles should be encouraged through enhanced public transportation, urban infrastructure and workplace supports.

[2] See Appendix B for a list of project team members.

Key input from the Aboriginal consultations included a desire for a Clean Air Strategy that is flexible and adaptable to changing times and issues, and addresses health impacts of poor air quality.

More detailed information on input from phases 1 and 2 appears in Appendix C.

Additional Stakeholder Consultation
The Clean Air Strategy Project Team also shared its draft report and recommendations with stakeholders and considered their feedback. The CASA Board of Directors held a special workshop to provide input to the draft report prior to discussing it at the June 2009 board meeting.

The team members hope that the recommendations in this report will inform the Government of Alberta as it develops the Clean Air Strategy, and is of the view that Albertans should have an opportunity to review the draft Strategy when it is ready and to provide their input.

5 Policy Context

Economic growth in Alberta has driven the need for a new strategy to manage air issues in a coordinated manner. A new Clean Air Strategy is expected to reflect both the public interest as it relates to air and the Government of Alberta's commitment to clean air by laying out innovative and effective strategies for making choices around air quality and for responding to issues that result from rapid economic growth.

The recommendations for a new Clean Air Strategy were developed against a complex backdrop of existing and changing provincial, federal and international policy considerations. In Alberta alone, policy developed through the 2008 Climate Change Strategy, the Provincial Energy Strategy, and the Land-use Framework will influence provincial decisions that can directly or indirectly affect air quality. Review of and changes to Alberta's Ambient Air Quality Objectives, approvals for new developments (issued by the Energy Resources Conservation Board, the Natural Resources Conservation Board, and Alberta Environment), and regional frameworks (e.g., Industrial Heartland) aim to manage cumulative environmental effects, including impacts on air quality. At the federal level, a regulatory framework for air emissions has been proposed (the Clean Air Regulatory Agenda, or CARA), while at the same time provinces, territories, industry, and health and environmental groups are working on a proposal for a national alternative to CARA. The overall goal is to ensure that air quality is managed effectively and that federal and provincial policies are aligned.

The Government of Alberta has indicated that the various environmentally-related strategic initiatives in the province will, together, provide a high-level coherent vision, integrating environmental, economic and social considerations. Although each focuses on a specific medium or subject (i.e., air, water, land), all require the use of cross-ministry coordinating mechanisms to achieve success.

The project team members also recognize that cost will be a consideration in implementing the eventual Clean Air Strategy. A plan will be needed to ensure adequate and appropriate allocation of resources toward implementation. The Government of Alberta should ensure that its plan for funding implementation of the Clean Air Strategy is simple, fair, objective, transparent, and understandable.

The remainder of this report focuses on the recommendations from the Clean Air Strategy team to the CASA Board and to the Government of Alberta for its consideration as it develops a new Clean Air Strategy.

6 Vision, Mission, Values, Principles and Beliefs

Recommendation 1: Mission, Values, Principles and Beliefs

The Clean Air Strategy Project Team recommends that the vision, mission, values, principles and beliefs noted below be included in a Clean Air Strategy for Alberta.

GOAL 1: The Clean Air Strategy is founded on the aspirations of Albertans for clean air, and is guided by beliefs, values and principles that reflect a commitment to long-term sustainability.

The **vision** below is an expression of our ambition for the future quality of Alberta's air.

> *The air will have no adverse odour, taste or visual impact and have no effect on Albertans, animals or the environment.*

The mission is: The Clean Air Strategy will guide Albertans toward achieving the vision for clean air through shared responsibility of all Albertans.

Values, Principles and Beliefs: In the context of the recommendations for a Clean Air Strategy, values are what we think is important, principles are how we conduct ourselves, and beliefs are what we hold to be true.

Values: Albertans value the health and well-being of all people and communities, ecosystems and environments, and the economy. Of importance is achieving a harmony among these values, integrating economic, social and environmental benefits.

Principles: While the vision describes what sort of air quality we are working towards in Alberta, and values indicate the priorities, principles are what guide our decisions and shape the actions we take. All aspects of air quality management will reflect the high priority the province places on clean air. Those solutions that provide co-benefits are most desired.

The recommendations in this report are grounded in the understanding that approaches to air quality management in Alberta will:

Be sustainable

The harmony and integration of environmental, economic and social interests in decision making will be reflected in the management of air quality on a sustainable basis and will include consideration of cumulative effects. This means that management of the Clean Air Strategy, its elements and its actions should:

- protect the capabilities that the natural environment has to maintain the living conditions for people and other species,
- enhance community quality of life, and
- be cost-effective, leading to air quality improvements at minimal cost to society.

Prevent and control pollution

Pollution will be minimized to keep clean areas clean,[3] source performance standards for existing and new developments will be applied, and those standards will be reassessed periodically to encourage and drive continuous improvement.

Be inclusive

Air quality management activities will seek to involve stakeholders and provide an opportunity for public participation. Decisions will include scientific, evidence-based assessment of risk, and recognition of who bears that risk so those at risk will be informed, adverse risk will be mitigated, and people will be protected from harm. Decision making will be equitable and informed and free of a singular vested interest. Externalities will be incorporated into decision-making processes.

Seek policy efficiency

Decision makers will seek elegant solutions that satisfy multiple policy objectives and minimize tradeoffs. Innovative and creative decision making will help us choose wisely and avoid the perceived need to sacrifice one thing for something else. Wise choices now, based on the principles of sustainability, will preserve options for future generations without compromising our ability to secure the things we need today.

Be transparent

Information will be shared and there will be transparent reporting and open communication among stakeholders.

Beliefs:

The recommendations in this report are grounded in the understanding that approaches to air quality management in Alberta will hold the following to be true:

- Human activity can affect the health of people, plant and animal life, and environmental quality.
- Effects on future generations must be considered in the decisions made by the current generation.
- There are limits to acceptable change to Alberta's natural environment.
- Within these limits, Albertans are free to innovate to maximize economic opportunity.
- All government departments, industry, and people have a role in protecting environmental quality.

[3] The Canadian Council of Ministers of the Environment has defined what it means to keep clean areas clean; see www.ccme.ca/assets/pdf/1389_ci_kcac_e.pdf for more details. The phrase is also included in the glossary of this report.

7 Strategic Directions

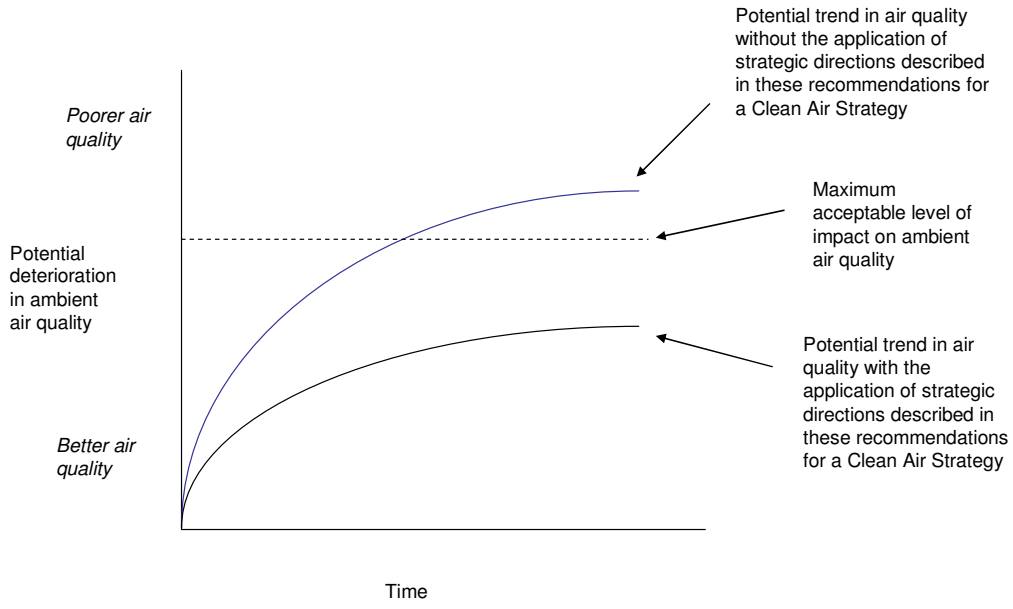
The recommendations for a Clean Air Strategy have as their foundation four strategic directions that are interrelated and, together, will guide air quality management in Alberta for the coming years:

1. Governance
2. Regional Planning
3. Pollution Prevention and Control
4. Knowledge and Information

Actions under each strategic direction will vary, covering a range of possible regulatory and non-regulatory policy options. In the broadest sense, policy tools and instruments include: 1) regulatory tools, 2) market-based instruments and fiscal mechanisms, 3) negotiated agreements, 4) voluntary stewardship, and 5) supportive programming and incentives. The potential actions in Appendix A are in no way intended to limit the scope of innovation and creativity in identifying other solutions.

Implementation of the eventual Clean Air Strategy will need to be assessed to determine progress toward achieving the set goals and, ultimately, the vision. For example, emissions or air quality trends showing a downward trend over time can indicate that the policy tools and actions are working. If trends continue to rise or if a threshold is reached, it suggests that the effectiveness of the tools being applied is lessening and that a different approach may be needed. When undesirable trends begin to emerge and an impact is increasing over time, the factors causing the trend need to be identified and solutions developed to reverse the trend and reduce the impact; that is, "bend the curve." Bending the curve may require new approaches to effectively address the issue. Drivers that affect these air quality trends include population growth and development, additional impact per unit of activity, and many others. The concept of "bending the curve" is illustrated in Figure 3. Figure 3 represents a hypothetical scenario of rising air emissions leading to declining air quality in order to illustrate the application of air policy and management tools to bend the curve. Each strategic direction helps to improve ambient air quality, thereby bending the curve.

Figure 3: **Bending the Curve**



The strategic directions in this document were developed in the context of the vision, mission, principles, beliefs and values described above and should be considered as an integrated package.

7.1 Governance

Air and air quality are influenced by many activities, actions and decisions of governments, industries and individuals. Integrated decision making is essential to achieve desired air quality outcomes. This document suggests potential roles for each of these parties to enhance the governance system that is necessary to maintain and improve air quality in Alberta.

"Governance" refers to the institutions and processes used to make decisions and take action. The design and operation of a governance system help determine how decisions are made and implemented. Important considerations include:

- Who makes decisions?
- Who and what influence decisions?
- How are decision makers held accountable for their decisions?
- What decision-making processes are used?

Air quality management is an area of concurrent jurisdiction between the federal, provincial and territorial governments. The Government of Alberta is the primary regulator of its industry and manager of air quality in Alberta. It can delegate authority but is ultimately accountable for air

quality in the province. Alberta Environment has primary responsibility for clean air, although other departments and agencies also share authority for certain emissions sources and management functions (e.g., the Energy Resources Conservation Board, the Natural Resources Conservation Board). Alberta Environment's policy and regulatory system focuses mainly on assessing the state of air quality, defining air quality outcomes and regulating industrial point and area sources. Multi-stakeholder organizations such as airshed associations and the Clean Air Strategic Alliance are also part of Alberta's governance structure for air management, and stakeholder consultation is an important component of the governance system.

Municipalities, too, have a decision-making role in areas that can affect air quality, such as planning and development approvals. The provincial *Municipal Government Act* defines what a municipality is and why it exists, and describes and enables the functions and scope of decision-making authority for municipalities under the Act. The *Municipal Government Act* also outlines where the province may supercede municipal planning and development authority. Some examples include requirements for a municipality, through its planning and approvals, to align with the project approvals of certain provincial boards such as the Energy Resources Conservation Board, the Natural Resources Conservation Board, and the Alberta Utilities Commission.

The recommendations for a Clean Air Strategy affirm the fundamental role of government in protecting the public interest, and the accountability of the Government of Alberta in particular, for protecting public health and the environment.

Table 1 shows the accountability mechanisms for the Government of Alberta and third parties involved in the province's proposed Air Quality Management System. These accountability mechanisms are also reflected later in this document in Figure 5, which illustrates the proposed governance system for a new Clean Air Strategy.

Table 1: Description of Accountability Mechanisms for Government of Alberta (GoA) and Third Parties Involved in the Proposed Air Quality Management System

Accountability Mechanism	Description
Electorate Vote	Elected officials are ultimately accountable to the public.
Cabinet Approval (e.g., regional plans, GoA policy)	Cabinet is the decision maker on provincial policy. Government ministers are accountable to Cabinet. Cabinet approval of GoA policy and regional plans ensures GoA objectives are consistent across ministries.
Auditor General Review (e.g., GoA program delivery and financial)	Independent auditor of every provincial government ministry, department, regulated fund and agency. Audits on the financial statements and systems are used by the Auditor General to meet its duty to ensure ministerial accountability on how public funds are spent. Reports to the Legislative Assembly of Alberta.[1]
Third party Auditing by GoA and others	Refers to third party independent auditing of organizations other than the Government of Alberta (e.g., Alberta Environment's auditing of airshed zones to ensure accurate monitoring data).
Public Reporting (e.g., Annual reports, data warehouse and state of the airshed reports)	In addition to publishing its financial results, the Alberta government also reports on the general well-being and quality of life of Albertans in both government and ministry annual reports. This includes information on the government's progress in meeting social and economic goals published in the previous year's Government Business Plan.[2] Municipalities and various stakeholder organizations also issue annual public reports. The focus of the reports ranges from a fiscal focus only, to reporting on progress in achieving organizational goals and performance measures. Public access to environmental monitoring data and State of the Environment reports also provide assurance that environmental issues are being addressed appropriately.
Appeals (e.g., appeal of decisions that are not in conformance with GoA policy or regional plans)	Provincial government policy and planning decisions are not addressed by the appeal mechanism. Appeals of operational decisions would be on the basis of the decision alleged as being inconsistent with approved GoA policy, regional plan or process.
Lead Minister Accountability	This is the provincial government minister with responsibility for the management actions and results. The Minister is accountable to Cabinet and other higher level government accountability mechanisms.
GoA membership on Board (e.g., GoA membership on CASA and Airshed Boards)	GoA representation on the boards of agencies involved in environmental management provides a mechanism to ensure the agency is accountable for meeting objectives.

[1] Source: Office of the Auditor General website, www.oag.ab.ca
[2] Source: Government of Alberta, Ministry of Finance website, www.finance.alberta.ca

From the perspective of a new Clean Air Strategy, a good governance system would enable coordinated action to manage air quality effectively. Alberta's governance system for air quality management should have three key characteristics:

1. The implications for air quality are taken into account by decision makers when making decisions that are likely to have significant consequences for air quality or for the determinants[4] of air quality in the future.

2. Air quality management occurs through an integrated governance system that facilitates coordination among departments and agencies. In this way, outcomes for air quality can be set and achieved, taking into consideration the range of relevant values and interests.

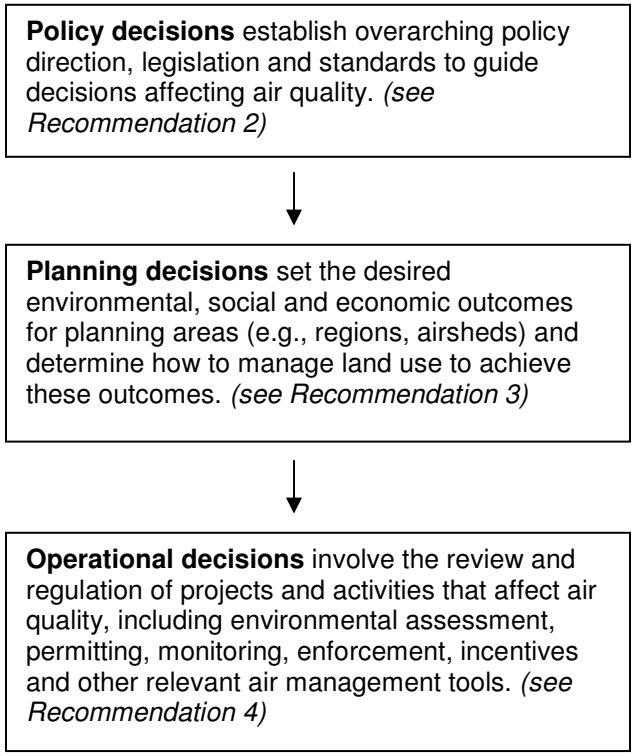
3. Decision makers are held accountable for the consequences of their air quality management decisions and a point of accountability is identified for each important policy area that is relevant to air quality management.

A hierarchy of decision points affects air quality decision making, as illustrated in Figure 4. Decisions at each point in this hierarchy can have important implications for air quality and its determinants. The governance system should ensure that:

- Impacts on air quality are addressed at each stage in the hierarchy;
- Higher level decisions provide direction and context for lower level ones; and
- Decision making at each stage is integrated across policy areas and activities that affect air quality.

[4] The determinants or "drivers" of air quality in the future include broad social and economic trends, such as patterns and rates of population growth and economic development, and the decisions that affect these trends. Determinants of air quality also include specific decisions that may have significant long-term implications for Alberta's air emissions. For example, decisions about industrial design and technology, urban design, transportation infrastructure, energy infrastructure and mix of energy sources, agricultural practices, environmental management systems and other factors such as information, education, economic incentives and regulation that influence individual and corporate behaviour can all have significant implications for future emissions trajectories and air quality.

Figure 4: Hierarchy of Decision Points



Governments and others also use a standard planning cycle within which decisions are made. This generic planning cycle, illustrated previously in Figure 2, is helpful in understanding where specific governance decision points occur and how they are connected.

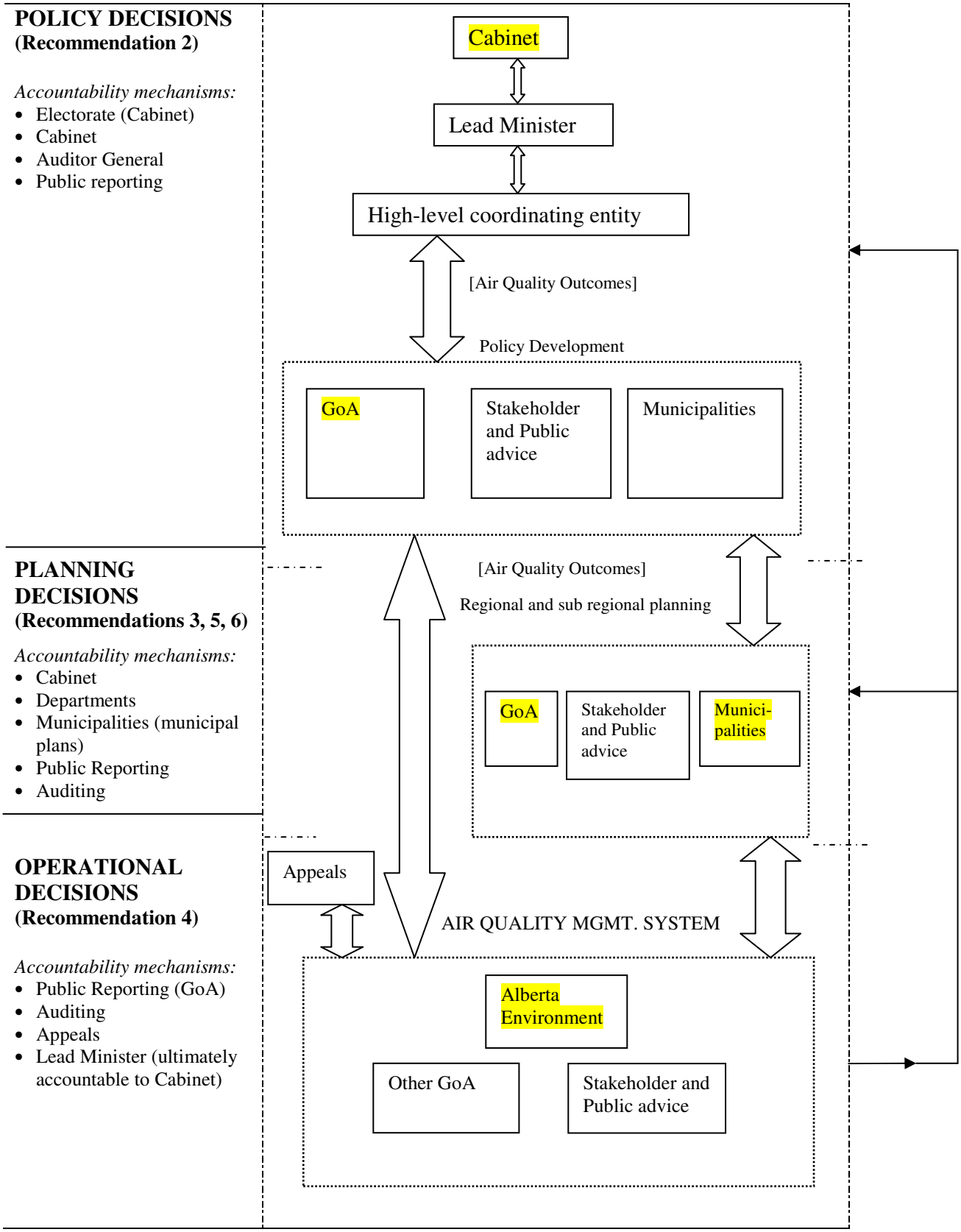
Alberta's governance model has been effective in many ways, but it needs to be modified to reflect lessons learned from the 1991 Clean Air Strategy and to meet the challenges of increasing population and economic development. Specifically:

- Experience with the 1991 Strategy has revealed obstacles to implementing recommendations that fell outside Alberta Environment's clean air mandate, as the mandate does not extend to all decisions that affect air quality or the determinants of air quality in the future.
- Lack of integration and coordination in making decisions at policy, planning and operational levels can negatively affect air quality. For example, managing the cumulative effects of air emissions from non-point sources, such as vehicles, homes, commercial enterprises and agriculture, is a significant challenge for Alberta's current governance structure.
- Some decisions that lead directly or indirectly to air emissions are exempted from the air management system.
- In other cases, decisions that have important implications for air quality over the long term are made without fully considering those implications because clean air is not seen as part of the decision maker's mandate. For example, opportunities to implement pollution prevention may be missed because potential initiatives in these areas have no institutional home within the current governance structure.

The Government of Alberta has acknowledged the need for improved cumulative effects management, and the *Land-use Framework* established an integrated regional planning process that will apply to all land uses, including projects and activities that affect air quality. The recommendations for a new Clean Air Strategy align with and support the *Land-use Framework* by identifying regional planning as a strategic direction and by recommending improvements to the governance structure that will strengthen the government's ability to manage the cumulative effects of air emissions from point and non-point sources.

A Clean Air Strategy as a whole is expected to articulate the public interest as it relates to air in Alberta. Figure 5 builds on Figure 4 and illustrates the framework of how choices, based upon the principles of these recommendations for a Clean Air Strategy, are made over time to achieve sustainability goals. The figure shows that choices are made at all scales, from policy-level decisions through to on-the-ground operational decisions. The figure also illustrates, in broad terms, who is involved in the choices at each level, and who is accountable.

Figure 5: Clean Air Strategy Governance



NOTE: The entities accountable for decisions are highlighted.

The first three recommendations for the Governance strategic direction reflect the hierarchy of decision points noted in Figure 4: policy, planning and operational decisions. See Appendix A for details on potential actions to support the following three goals related to governance.

Recommendation 2: Policy Development and Integration

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 2: Bodies accountable for developing policies that may affect air quality are clearly identified, mechanisms are in place to set priorities and integrate policies across departments and agencies whose decisions affect air quality, and the impacts of policy decisions on air quality are taken into account by decision makers.

Some air quality issues are without a clearly identified body that is responsible and accountable for policy development. In some cases there is no responsible department or agency in the province and in others there may be several groups working in departmental and agency isolation. Policy decisions that have significant implications for air quality or determinants of air quality can also be made without careful consideration of those implications by decision makers.

In addition to assuring accountability for air quality policy development and implementation, this goal also seeks to ensure that strategies and policies affecting air quality and its drivers are aligned and consistent and that the impacts of major policy initiatives on air quality are regularly reviewed.

Recommendation 3: Integrated Planning to Achieve Air Quality Outcomes

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 3: Alberta's governance system supports integrated regional and sub-regional (e.g., airshed basis) planning as a means of setting and achieving outcomes for air quality.

Provincially-set air quality outcomes and emissions performance requirements should be translated by these regional plans to a regional policy context. This governance system, to be established by the Government of Alberta should:

- Manage cumulative impacts by integrating all decisions that affect air quality or the determinants of air quality through planning decisions;
- Ensure that decision makers consider air quality by requiring that their decisions be consistent with regional or sub-regional plans;
- Hold decision makers accountable for meeting air quality outcomes through their use of monitoring, enforcement mechanisms and other incentives linked to planning; and
- Apply principles of pollution prevention and control, continuous improvement and keeping clean areas clean when establishing and implementing plans.

Integrated regional planning is a key strategic direction in these recommendations for a new Clean Air Strategy and is central to the government's approach for managing cumulative effects through the *Land-use Framework*. Planning is an important stage in the decision-

making hierarchy and requires a supportive governance structure to be effective. Air quality criteria that are set through integrated planning processes, including management thresholds and caps on total emissions, should apply to all activities that contribute to air emissions, including non-point, or area, sources.[5]

Recommendation 4: The Air Quality Management System

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 4: Alberta's governance system ensures effective and efficient decision making within the Air Quality Management System.

The Government of Alberta is accountable for air quality in Alberta. The comprehensive Air Quality Management System (AQMS) now in place has served the province well, particularly with respect to managing industrial emissions. The government's intent to develop a new Clean Air Strategy provides a timely opportunity to recommend ways to strengthen the system and, importantly, enable the coordinated management of non-industrial sources of air emissions. Such enhancements will assure present and future Albertans that their air quality will continue to be protected.

The following criteria for good governance were applied to the existing AQMS with the aim of identifying places where the system could be improved. Good governance has the following characteristics:

- It is:
  - effective and efficient
  - accountable
  - transparent
  - responsive
  - equitable and inclusive
  - participatory
- It follows the rule of law.
- It strives for "win-win."

Figure 1 in section 2 identified the various components of the AQMS which are described briefly below. The AQMS subgroup of the Clean Air Strategy Project Team reviewed many aspects of these components and proposed a number of potential actions to strengthen the AQMS in most of the areas noted below; these potential actions for the Government of Alberta's consideration are presented in Appendix A.

- Ambient Air Quality Objectives.[6] AAQOs are developed to protect Alberta's air quality. Objectives are based on an evaluation of scientific, social, technical and economic factors.
- Emission Standards. Emission standards are a regulatory tool used to assure the air quality outcome. Standards are developed in various ways and are often adapted from other jurisdictions for use in Alberta.

[5] This goal is linked with the Regional Planning strategic direction in this document.
[6] For more information on AAQOs, see Alberta Environment's Alberta Ambient Air Quality Objectives and Guidelines document, online at www.environment.gov.ab.ca/info/library/5726.pdf.

- Environmental Impact Assessments (EIAs). EIAs are used for industrial sources that may have a significant impact on the environment. They consider the emissions contributions of the proposed new source and all other industrial and non-industrial air pollution sources.
- Permitting. A permit authorizes a facility, a commercial operation or an individual activity to emit certain substances up to a certain limit; in the context of this document, it refers to permits for processes that affect air quality.
- Compliance and Enforcement. Compliance with respect to air refers to the activities undertaken to meet the rules that govern air emissions, activities undertaken to ensure the rules are being met, and activities that help people to follow the rules. Enforcement is the response to non-compliance.
- Information and Education. An informed population can play an important role in protecting and improving air quality. Various agencies provide information on air quality, and coordination of their activities enables a wider reach.
- Monitoring. Ambient air and emissions monitoring is a key part of the overall air quality management system and involves several players, including industry, Alberta Environment, and airshed zones.
- Emission Inventories and Air Modeling. The generation of comprehensive air emission inventories and the use of air modeling provide essential knowledge and information to successfully manage air. In Alberta air modeling is done by industry, most often through consultants. Alberta-related air modeling and inventories have also been completed by Environment Canada. Emission inventories have been prepared by industry, airshed organizations and Alberta Environment through use of consultants. Emission inventory and air modeling expertise is being developed within Alberta Environment.
- Reporting. Reporting of emissions and ambient air quality information is used for many purposes including the preparation of inventories and state of air quality reports, assessment of adherence to regulations, and as information for policy development and evaluation.
- Air Policy Development. Air policy development clarifies and sets direction on how air quality goals will be achieved using the various air management mechanisms. In Alberta, this is mainly Alberta Environment's responsibility.
- Air Policy Evaluation. Air policy evaluation on a regular basis ensures that the policies do what they were intended to do and that new and existing policies are coordinated.

The team also considered the roles of key institutions that contribute to air quality management at different levels of the governance hierarchy, specifically Alberta's airshed zones and the Clean Air Strategic Alliance (CASA). While a detailed review of the roles of CASA and airshed zones was outside the scope of the CAS project team, it may be timely to review their roles and consider new opportunities.

7.2 Regional Planning

Many of Alberta's air quality issues are local, both in their cause and the solutions to address them. The first Clean Air Strategy recommended that airshed zones be formed to deal with local and regional air quality concerns. By early 2009, nine such zones had been established, covering most of the populated area of the province. Although the airshed zones have played an important role in air quality monitoring, only very recently have some of them begun to exercise a planning or management function.

Although sustainability and the drive for continuous improvement are fundamental elements of these recommendations for a Clean Air Strategy, two major challenges have been: a) economic growth exceeding normal planning capabilities, and b) finding ways to manage cumulative effects, both of which have implications for managing air quality. Effective integration and implementation of the various provincial resource management strategies and good planning at the regional level will be the keys to a more sustainable future for Alberta.

These recommendations recognize that fragmented planning and piecemeal decisions may lead to land uses and urban development patterns that compromise air quality. Such decisions can have incremental impacts on air pollution that may not be acknowledged until long after major investments in infrastructure and other developments have occurred. This fragmented approach and the problems it creates can also discourage potential investors.

The province is advancing a regional approach with both water and land. The *Water for Life* strategy stresses the important roles of Watershed Planning and Advisory Councils and Watershed Stewardship Groups. The *Land-use Framework* recognizes the increasing pressure being put on Alberta's landscapes by the rapid growth in population and economic activity. One of its strategies is to develop land-use plans based on seven new land-use regions. These plans will "integrate provincial policies at the regional level; set out regional land-use objectives and provide the context for land-use decision-making within the region; and reflect the uniqueness and priorities of each region."[7]

The Regional Planning strategic direction acknowledges the importance of integrated and anticipatory decision making as a fundamental basis for maintaining and improving Alberta's air quality. Because land use planning has a significant effect on local air quality, much of a new Clean Air Strategy needs to be delivered on the ground according to the same boundaries as the *Land-use Framework*, and also at a sub-regional level. This report uses the term "regional" to mean the seven regions as defined in the *Land-use Framework*, and is intended to guide the Regional Advisory Councils as they contemplate air quality management in developing their recommendations for regional plans. However, the project team recognizes that air quality may not necessarily be managed on the basis of these regions.

See Appendix A for details on potential actions to support the following two goals related to regional planning.

[7] Government of Alberta, *Land-use Framework*. December 2008; p. 3.

Recommendation 5: Regional Air Quality Management Plans

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 5: Air quality management plans that effectively address current and emerging air quality issues are in place for each of Alberta's seven land-use regions.

Air quality management plans may stand alone or they may be part of integrated regional plans (e.g., the air component of the Land-use Framework's regional plans). They should address the cumulative effects of air emissions by considering **both point and non-point sources** of air pollution.

Air quality management should be done based on air movement, which does not necessarily align with administrative boundaries. This means that the Government of Alberta should take a leadership role in defining zones that are practical and efficient for managing air quality. Where these air zones extend across more than one land-use region, as defined in the *Land-use Framework*, clear communications and collaborative effort will be needed among the Regional Advisory Councils (RACs) as they develop their regional plans. These regional plans should be consistent with and take direction from the Clean Air Strategy, and air quality management plans should be monitored and stewarded by the same entity that is monitoring implementation of the regional land-use plans.

In the event that regional plans do not materialize or do not include air quality management plans, multi-stakeholder groups should develop air quality management plans at a regional level under the new Clean Air Strategy. The goals of regional air quality management plans would be to: a) maintain good air quality where it already exists, b) improve air quality wherever possible, and c) minimize emissions under Alberta's Ambient Air Quality Objectives. To achieve these goals, the regional plans may include, among other things:

- Limits, management objectives, indicators, targets and the means to achieve management objectives. Limits and management objectives should be informed by sound science and by the protection of receptors.
- A commitment that all management planning for industrial facilities should drive better emissions performance for both existing and new facilities.
- A commitment to implement or to advocate for the implementation of management mechanisms for identified non-point sources.

These plans would first require the development of provincial trigger levels for all air pollutants of concern, as has been done for particulate matter and ozone via the CASA PM and Ozone Management Framework. Ambient trigger levels would be a simple, proactive "green, yellow, red" system, described below. Further action may or may not be needed, depending on the designation given under this system. The ambient trigger levels would be set as follows:

- "Green" indicates that Ambient Air Quality Objectives (AAQOs) are in no danger of being exceeded in the foreseeable future. "Green" areas would likely be places with little to moderate development.
- "Yellow" indicates that a significant upward trend of ambient levels is developing. AAQOs could be exceeded in the short to medium term and measures are needed to reverse this trend.
- "Red" indicates that AAQOs will be exceeded in the near future without prompt action.

Any area with a "red" designation would require more intensive management and may be identified as a sub-regional air management planning area. Such areas would include both the emitter(s) and the area that is affected by those emissions. If non-point sources are contributing to sub-regional air quality problems, they would need to be addressed in the management plan. Areas with a "green" designation would be subject to a level of effort that is appropriate.

Air quality management plans will rely on a solid understanding of the airshed, major emission sources that contribute to ambient air concentrations and the associated circumstances, and robust projections that reflect improvements already underway through provincial and industry initiatives (e.g., vehicle or fuel programs). Regional air quality modeling and the 2009 CASA Ambient Monitoring Strategic Plan are two examples of resources that could provide the needed information.

Recommendation 6: Municipal Planning and Design

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 6: Municipal planning and design incorporates sound air quality management principles.

The physical characteristics and patterns of land development in a region can affect air quality by influencing the behaviour of the citizens who live there. For example, when jobs and homes are far from each other and mass transit is not available, people depend on cars for daily travel. Settlement designs that make automobile travel a necessity contribute to air quality problems.

Studies suggest that changing the current patterns of development (which tend to be low density, single use, and auto-oriented) can reduce the overall environmental impact of a human population, including air pollution and greenhouse gas emissions. While changes in the form of human settlements may take years to occur, the best regional transportation models suggest that altering urban form in particular can reduce travel and emissions measurably within a time frame of 10 to 20 years.

Although many planning principles can be applied anywhere, the recommendations for a Clean Air Strategy recognize that potential approaches for sustainability will differ for larger urban centers, smaller communities and rural areas due to their diverse needs and scales. The potential actions in Appendix A accommodate these differences and will help to bend the curve in the direction of sustainability and cleaner air.

In the context of our settlement patterns, "sustainable form" refers to a built human environment that is designed to minimize the environmental impact of its residents and maximize the efficient use of natural resources such as energy, land and water.

Sustainability plans are the primary contribution of municipalities to the regional plans being developed under the *Land-use Framework* (described in Recommendation 5), and are the main way for them to address non-point sources of emissions. Municipalities should consider using a multi-stakeholder process to develop their plans and the provincial government should support them in these endeavours.

7.3 Pollution Prevention and Control

Pollution prevention and control are the management mechanisms used to enable continued economic growth and improve or maintain desirable ambient air quality. "Pollution prevention" means avoiding or minimizing the use of toxic chemicals, improving efficiency, or reducing waste and potentially harmful emissions by changing processes, practices and materials, or implementing new and cleaner alternatives. In short, instead of cleaning up or capturing emissions and wastes after they've been produced, we simply don't generate them in the first place.

"Pollution control" is the process of attempting to limit air pollution by addressing the emission of pollutants or their precursors to maintain a standard purity of air that ensures good public health, protects plant and animal life and property, and ensures good visibility.[8] While pollution prevention seeks to avoid producing emissions, traditional pollution control strategies rely more on technologies to capture emissions and keep them from being released to the atmosphere; these are often referred to as "end-of-pipe" solutions. For example, for primary pollutants, such as sulphur dioxide, pollution control strategies include scrubbing sulphur dioxide from the combustion products before releasing them into the atmosphere. For secondary pollutants that are not emitted directly but are created by chemical reactions involving other substances (e.g., the formation of ground level ozone), control is achieved by changing the emissions of one or more of the primary reactants.[9]

Pollution prevention is a more proactive approach to dealing with emissions, but pollution control and prevention both play important roles in managing air quality. It is essential for all orders of government to work together to implement pollution prevention and control measures.

Pollution prevention and control provide many benefits;[10] they:

- accelerate the reduction and/or elimination of pollutants;
- minimize health risks;
- promote the development of source reduction technologies;
- use energy, materials and resources more efficiently;
- minimize the need for costly enforcement;
- limit future liability with greater certainty; and
- avoid costly clean-up in the future.

Pollution prevention has the potential to bend the curve by reducing the amount of air pollution created per unit of production (efficiency), reducing the toxicity of air pollution produced (material substitution), or eliminating an air pollution source by providing a product or service by alternate means (e.g., practicing conservation instead of increasing supply).

By starting to account for the long-term environmental and social costs and benefits as well as the economic costs and benefits, it becomes clear that preventing pollution offers substantial opportunities for forward-thinking decision makers. We can take advantage of these opportunities by:

- Improving our understanding of the long-term direct and indirect costs associated with future pollution, which makes investments in pollution prevention more attractive today.

[8] Adapted from American Meteorology Society Glossary, online at amsglossary.allenpress.com/glossary/browse; and Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997; online at http://stats.oecd.org/glossary/detail.asp?ID=87.
[9] Adapted from American Meteorology Society Glossary, online at amsglossary.allenpress.com/glossary/browse.
[10] Adapted from CCME, online at: http://www.ccme.ca/ourwork/pollution.html

- Developing and implementing cost-effective approaches for pollution prevention, including technology.
- Removing barriers in the form of existing policies, regulations, practices and organizational cultures that impede adoption of pollution prevention measures, even when they make sense in terms of sustainability.
- Establishing a champion within government with the mandate and resources to promote and encourage all Albertans to adopt pollution prevention measures.
- Exploring fiscal and regulatory means to promote and require investment in pollution prevention.

Pollution prevention and control should be implemented within a cycle of continuous improvement. This concept has been described by the Canadian Council of Ministers of the Environment in the Canada Wide Standards (CWS) for Particulate Matter and Ozone to include incremental reductions in ambient concentrations of air pollution on an ongoing basis. Continuous improvement in air quality can be achieved over the long term in two distinct ways:

- a series of small reductions due to process modifications; and
- dramatic reductions due to process innovations.

Growth, whether manifested as more homes or new industrial facilities, has often resulted in an increase in emissions and degradation to air quality in the long term. However, if new growth includes more efficient technologies the lower intensity of these new facilities could result in lower emissions in the long term, once older technology becomes obsolete. While instruments such as ambient air quality objectives set a limit within which unacceptable risk to human health and the environment will not occur, continuous improvement assures that the magnitude of the increase will not be permanent and the acceptable risk to human health and the environment will decline over time.

Pollution prevention approaches can be more efficient in reducing emissions than end-of-pipe solutions, but the direct costs of implementing pollution prevention can be more costly in the near term. It may be in the government's interest to provide incentives to encourage broader application of pollution prevention options to increase efficiency in emission reductions, get more experience in using pollution prevention techniques and further reduce the societal costs of pollution.

See Appendix A for details on potential actions to support the following three goals related to pollution prevention and control.

Recommendation 7: Policy Support for Pollution Prevention and Control

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 7: Provincial government legislation, regulation and policy promote and support pollution prevention and control measures across all sectors and activities that produce air emissions.

Policy tools define rules and incentives for action and enforcement, provide a "level playing field" for all players and make the costs of future pollution a significant factor in decision making. Legislation, regulation and regulatory policies need to be periodically reviewed and updated to promote pollution prevention and control measures. Various policy tools[11] can be used to achieve these ends, including:

- Incentives
- Supportive programming
- Voluntary stewardship and corporate responsibility
- Negotiated agreements
- Market based instruments and fiscal mechanisms
- Regulatory approaches

This goal aims to: eliminate barriers to achieving pollution prevention, identify and fill gaps to encourage pollution prevention and control, and encourage Albertans to make choices that reduce air emissions through the application of appropriate and effective policy tools.

Recommendation 8: Alberta as a Clean Technology Leader

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 8: Alberta leads in the research, development and adoption of clean, efficient technologies that prevent and control pollution.

Alberta has made significant strides in controlling emissions from existing activities, and recognizes the important role that continuous improvement can play in doing even better. But ongoing research and development hold the key to technology breakthroughs. Leadership in this area means that Alberta is as good as or better than any jurisdiction at promoting and implementing technology that will achieve outcomes for both pollution prevention and control. Alberta can do this by drawing upon existing best management practices globally; stimulating and supporting research into better, more efficient technologies that reduce impacts on air quality; and establishing conditions that promote investment in pollution prevention technology.

[11] See Appendix D.

Recommendation 9: Pollution Prevention Co-benefits

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 9: Specific strategies are in place, with consideration of leading practices in other jurisdictions, to prevent air pollution from all major sources and simultaneously produce other environmental, social and economic benefits.

Emissions from non-point, or area, sources such as transportation are a particular challenge for the air quality management system because current management mechanisms do not effectively address these sources of pollution. This goal encourages the development of strategies to prevent pollution and achieve other environmental, economic and social benefits in the areas of transportation system design and alternative energy systems. It complements goal 6 in the Regional Planning strategic direction, related to municipal planning and design.

7.4 Knowledge and Information

Knowledge and information are essential elements for good air management. The purpose of this strategic direction is threefold:

- To provide knowledge and information required for air management;
- To raise awareness so individual Albertans can take appropriate action; and
- To promote accountability within the air quality management system.

Knowledge and information are also the precursors to the awareness and behavioural change needed to achieve cleaner air. Increased public interest in environmental issues combined with economic factors has increased the need for information about what people can do to save money and contribute to a healthier environment. At the same time, we now have many technical and logistical opportunities for disseminating information. Various tools and approaches along with different forms of media are widely available, and creative partnerships present many opportunities for getting information to a wide audience.

Information is essential to create the knowledge and greater understanding to set outcomes, make decisions and take action. Having a sound base of knowledge and information supports a number of important components of good air quality management; it:

- Enhances our understanding of the state of Alberta's air;
- Allows policy makers to anticipate and prevent emerging air issues;
- Provides the tools to make effective management decisions and develop appropriate management responses, taking into account environmental, economic and social considerations;
- Helps raise Albertans' awareness of the issues and the importance of their own choices in contributing to improved air quality;
- Gives Alberta an economic and social advantage by promoting the province as a place that has clean air; and
- Provides a monitoring, evaluation and reporting system to ensure outcomes are achieved and opportunities for continuous improvement are identified.

Since the first Clean Air Strategy was developed in the early 1990s, a great deal of solid information about air quality and its management has been compiled and made available. Air quality continues to

be an important issue for Albertans who want clean air, but overall awareness and understanding of air quality is often limited. This suggests that a new Clean Air Strategy needs to:

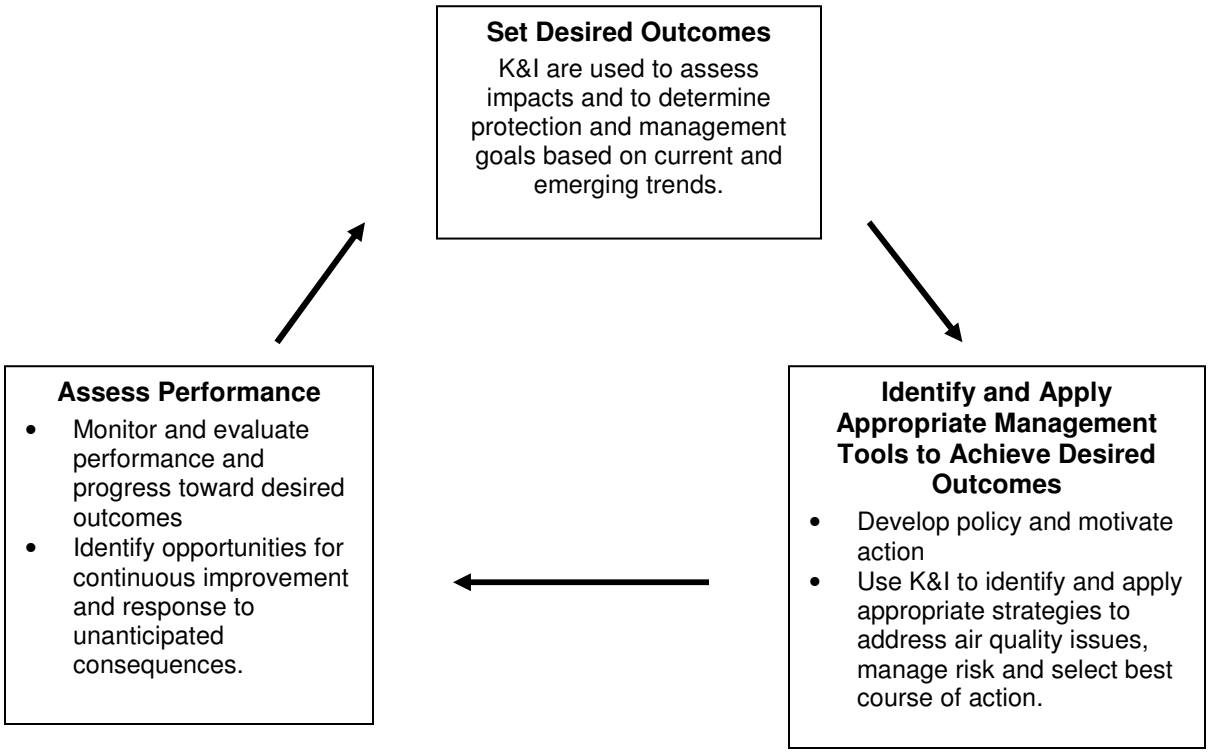
- Identify ways to increase the uptake and application of existing air quality information by individuals, corporations, and decision makers;
- Show the links between information and action so that all Albertans can respond appropriately and effectively to the air issues that concern them; and
- Point out the gaps in our current information on management approaches, and ways to fill them to ensure that Alberta has the best tools available to protect air quality.

Four types of information support all aspects of a new Clean Air Strategy and it is in the interest of all parties to work together to acquire this information:

- Information on air itself – air quality, emissions and projections;
- Information on management options and tools to protect air quality and mitigate harmful impacts;
- Information about how well the air quality management system is working – the policy and decision-making aspects and the more widespread sharing of information with Albertans; and
- Objective and accurate information on the costs of technology, its associated emission reductions, and the societal benefits accrued through these reductions.

Figure 6 illustrates the cycle of decision making and action. Knowledge and information (K&I) are essential for each of these steps; as new information is acquired, it is incorporated into the appropriate stage. Transparency of information at each stage will help Albertans, policy makers and decision makers understand the importance of their choices in contributing to better air quality. See Appendix A for details on potential actions to support the following five goals related to knowledge and information.

Figure 6: Cycle of Decision Making and Action



Recommendation 10: Comprehensive Base of Knowledge and Information

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 10: Alberta has a reliable, comprehensive and objective base of knowledge and information on emissions, ambient air quality, health and environmental impacts, and potential management and mitigation mechanisms.

A fundamental component of a new Clean Air Strategy should be a reliable and objective information base for making decisions about desired outcomes and appropriate policy and technology applications. This will help us set targets and determine the best approaches for reducing emissions. Among other things, this goal envisions: the implementation of a new ambient monitoring strategic plan consistent with regional planning initiatives, the development and maintenance of a comprehensive air emissions inventory, and coordinating mechanisms for sharing air data and information.

Recommendation 11: Timely and Accessible Information

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 11: Timely information on air quality and its management is generated and is easily accessible to all Albertans.

Consultations on recommendations for the Clean Air Strategy indicated that the public is interested in air quality, particularly at the local and regional level. This goal seeks to ensure that Albertans have access to reliable, timely information about air and air quality, as this will help to: a) develop a good understanding about the air monitoring and governance system, and b) create the awareness that can help individuals contribute to cleaner air.

Recommendation 12: Albertans Protect and Improve Air Quality

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 12: Albertans understand their impacts on air quality, know what they can do to protect and improve it, and are motivated to make the necessary behavioural changes.

Because everyday actions can affect air quality, keeping the air clean is everyone's responsibility – industry, governments and individual citizens. With current, reliable information, it is much easier to make the right choices to maintain and protect air quality. Information enables people to gain knowledge and insight into an issue and is an important and necessary foundation for action. For some, having the appropriate knowledge and information is enough to motivate them to change their behaviour and decision-making patterns. Knowledge also enables people to understand and accept decisions that may affect them. For others, motivation must be provided in the form of rewards or incentives to encourage the desired behaviour, or in the form of penalties if the desired behaviour does not materialize. A range of policy tools can be used to these ends, some of which are described in the Pollution Prevention and Control strategic direction.

Recommendation 13: Albertans are Informed

The Clean Air Strategy Project Team recommends that the following goal be included in a Clean Air Strategy for Alberta:

GOAL 13: Albertans are informed of the impacts that air quality can have on them.

Some individuals are more sensitive than others to air pollution. By having current and accurate information about potential acute and long-term effects of air quality, they will be better able to make decisions about protecting their own health. Local governments can also use such information to advise their citizens in the event of a potentially harmful air quality event. This goal aims to ensure that Albertans have the information they need to make the necessary decisions and take appropriate action.

Recommendation 14: Comprehensive Air Research Strategy

The Clean Air Strategy Project Team recommends that the following goal and its associated actions be included in a Clean Air Strategy for Alberta:

GOAL 14: Alberta has a comprehensive Air Research Strategy that is supported by a robust research infrastructure.

Identifying and establishing research priorities will help Alberta meet its present and future air quality management needs. A robust research infrastructure includes technical expertise to do basic research, the ability to move proven technology into the field, and the ability to innovate and respond to emerging issues. Among other things, this goal seeks to ensure that Alberta has a process to coordinate air research initiatives, and that the province's air management and research efforts are informed by the best knowledge and information available and are supported by appropriate technical expertise and funding.

8 Clean Air Strategy Consultation, Implementation and Review

All of these recommendations are provided to the Government of Alberta, which will subsequently develop the Clean Air Strategy. As described in section 4, the CASA project team consulted with Albertans about what they thought the new strategy should address. Many participants in these consultations indicated a desire to also provide input on the eventual draft Strategy. Once the draft Clean Air Strategy is completed, the project team believes that the Government of Alberta should take it out for broader consultation, to validate the draft strategy.

In its deliberations, the Clean Air Strategy Project Team gave considerable thought to the development and implementation of the strategy. Future actions taken in response to the recommendations in this report should be assessed to determine success towards achieving the strategy's goals. Performance measures should also be developed to determine implementation progress and success.

The project team recognizes that implementation will take time, but is optimistic that it will proceed expeditiously and that both the Strategy and its implementation progress will be reviewed and evaluated from time to time to ensure ongoing alignment with other government policies and to ensure that the Strategy continues to address emerging priorities.

The project team envisions the application of short-, medium- and long-term timelines for implementation; short-term timelines would be within five years of the strategy being adopted, medium-term is envisioned as five to ten years following adoption, and long-term as more than ten years.

Glossary

Note: Unless otherwise noted, the definitions in this glossary were provided by Alberta Environment.

Air pollution
A condition of the air, that endangers the health, safety, or welfare of persons, interferes with normal enjoyment of life or property, endangers the health of animal life, or causes damage to plant life or property.

Air quality
The status of the atmosphere with respect to the presence of potential pollutants.

Air quality model
A mathematical relationship between emissions and air quality that incorporates the transport, dispersion, and transformation of compounds emitted into the air.

Airshed
An airshed is a geographic area that, because of emissions, topography and meteorology, typically experiences similar air quality.

Airshed zone
In Alberta, airshed zones have been formed to enable stakeholders to design local solutions to address local air quality issues. Airshed zones are guided by regional multi-stakeholder non-profit societies who use the CASA consensus model to make decisions. These societies work within a designated area to monitor, analyze, and report on air quality and they recommend and implement actions to improve air quality within that zone. Stakeholders involved in airshed zone management may also develop a response plan to deal with air quality concerns in their region. [adapted from CASA Airshed Zone Guidelines]

Air zone
A regional area in which air quality will be managed. Definition of air quality management zone boundaries should focus primarily on the pollutants that contribute to acid deposition, ozone and $PM_{2.5}$. These are: NOx, SO_2, VOCs, NH3 and PM. These pollutants have impacts that are regional in nature. Air quality management zone boundaries are guided by the location of emission sources, meteorology and geography/ topography, areas of impacts and political boundaries.

Ambient air
All air that humans, plants and animals breathe, except the air inside buildings.

Approval
To accept, permit or officially agree to something. Under the *Environmental Protection and Enhancement Act* (EPEA), "approval" means an approval issued under the Act in respect of an activity, and includes the renewal of an approval.

Co-benefits
By coordinating decisions and policies, it is possible to take actions to reduce emissions that contribute to more than one problem (e.g., air pollution and poor air quality, climate change and stratospheric ozone depletion). The goal is to find ways to invest once and not twice in order to address concerns with all of these issues. Shared positive results are known as co-benefits. [adapted

from Environment Canada, http://www.ec.gc.ca/cleanair-airpur/Co-Benefits_of_Action-WSB46D31B6-1_En.htm]

Compliance
Conformity with the law.

Continuous improvement
The ongoing evaluation and change of processes, products, programs and services to make them work better. Continuous improvement is based on the need to continuously monitor performance and success and to strive for improvement at all levels, across all activities and sectors, and with all participants. The goal is ongoing improvement in the performance in achieving environmental and resource outcomes, as well as improvements in the management systems used to achieve the outcomes (i.e., policies, delivery, performance assessment and information systems). [from Alberta Sustainable Resource and Environment Management glossary]

Cumulative effects
Changes to the environment that are caused by a project in combination with other past, present, and planned projects in the region. [Glossary of Environmental Assessment Terms and Acronyms Used in Alberta, February 2009; http://environment.gov.ab.ca/info/library/8003.pdf]

Emissions
The term used to describe the gases and particles which are put into the air or "emitted" by various sources. [US EPA]

Enforcement
To compel people to obey a law.

Externalities
Effects or costs generated by one party that create costs for someone else but are not paid for by the party generating them. [adapted from Dictionary of Natural Resource Management, by Julian and Katherine Dunster; UBC Press, Vancouver, 1996]

Guideline
A basis for determining a course of action. An environmental guideline can be either procedural, directing a course of action, or numerical, providing a numerical value that is generally recommended to support and maintain a specified use.

Keep Clean Areas Clean
In areas where an environmental cushion exists because pollution (i.e., ambient air levels or deposition) is below environmental limits, the consumption of this cushion will be minimized and opportunities for improvement will be sought. (from "Towards a National Acid Rain Strategy," submitted to the National Air Issues Coordinating Committee of the CCME in 1997 by the Acidifying Emissions Task Group, and subsequently taken up by CCME in the CWS for PM and Ozone) The CCME further notes that: With respect to Keeping Clean Areas Clean (KCAC), Canada has vast sparsely populated territories where, inevitably, even minimal development such as a small increase in population or vehicles can cause ambient levels to rise. Such areas would still retain relatively clean air in comparison to highly populated or industrial areas. Nevertheless, KCAC as the focus of efforts for such areas means that ambient levels would be tracked directly or indirectly and action would be taken to avoid or minimize degradation whenever reasonable and possible. Over

time, as a result of KCAC actions, increases in ambient levels would be less than those resulting from no action. The KCAC concept is expected to apply in the majority of Canada's less populated territory. (Source: Canadian Council of Ministers of the Environment; www.ccme.ca/assets/pdf/1389_ci_kcac_e.pdf)

Limit
A limit is a transition point beyond which an unacceptable risk to a desired objective (or outcome) occurs. The limit is the value of an indicator representing the point at which, if exceeded, the system moves to an undesirable state and cannot recover. The point, line, or edge where something ends or must end, which if exceeded has unacceptable consequences to society. [Lower Athabasca Regional Plan]

Non-point source (also called an "area" source)
A pollution source that is not recognized to have a single point of origin. Common non-point sources are agriculture, forestry, urban, mining, construction, and city streets.

Objective
A numerical concentration, value or narrative statement which is intended to provide protection of the environment and human health to the extent that is technically and economically feasible, and is socially and politically acceptable.

Point source
A stationary location or fixed facility from which substances are discharged; e.g., a smokestack.

Pollutant
Any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems

Region
A geographical are or district having definable boundaries or characteristics. Regions can be based on natural regions, watersheds or administrative boundaries. (Alberta Land-use Framework)

Regional plans
[In the context of the Land-use Framework], the Government of Alberta will create seven land-use regions and will develop land-use plans for each of these regions. The regional plans will integrate provincial policies at the regional level, set out regional land-use objectives and provide the context for land-use decision making within the region, and reflect the uniqueness of the landscape and priorities of each region. Municipalities and provincial government departments will be required to comply with regional plans in their decision making. (*Alberta Land-use Framework*, Strategy 1)

Shared governance
Shared governance refers to a governance structure in which both government and external parties share responsibility for policy development and delivery of planning, programs or services, but where government retains accountability. The extent of government involvement varies with the level of control that is desired and/or the capacity of the external parties to carry out the functions. Shared governance requires a clear accountability framework with clear roles, responsibilities and relationships. [from Alberta Sustainable Resource and Environment Management glossary]

Source (of Emissions)
There are many sources of emissions, but these have generally been grouped into two categories: point source emissions and non-point, or area, sources of emissions. Both of these terms are defined in the glossary.

Source performance standards
A numerical value that is set to restrict the emissions of air pollutants from emissions sources that cause or contribute significantly to air pollution. They are intended to promote the use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements. These standards apply to sources that have been constructed or modified since the standard was approved or promulgated. [Alberta Environment and US EPA]

Standard
A definite rule established by authority. Environmental standards often take the form of prescribed numerical values that must be met.

Trigger level
The level (of an emission) that will initiate (management) action.

Appendix A: Potential Actions for Consideration by the Government of Alberta

In developing the goals recommended in this report, members of the Clean Air Strategy Project Team engaged in wide-ranging and forward-thinking discussions about potential actions that could be considered to achieve goals 2 through 14. These potential actions are not part of the consensus agreement that exists for the recommended goals, but all members of the team viewed this work as a starting point for the cross-ministry analysis that the Government of Alberta will undertake as it drafts the Clean Air Strategy. The team understands that the potential actions in this appendix will be reviewed and considered by the cross-ministry team, and acknowledges that many other factors will need to be contemplated as the Strategy is developed. Some of the potential actions were subject to more review by the team than others, and the team recognizes that opinions may vary on the actions described in this appendix.

Goals and Potential Actions for Governance Strategic Direction

Goal 2: Bodies accountable for developing policies that may affect air quality are clearly identified, mechanisms are in place to set priorities and integrate policies across departments and agencies whose decisions affect air quality, and the impacts of policy decisions on air quality are taken into account by decision makers.

Some air quality issues are without a clearly identified body that is responsible and accountable for policy development. In some cases there is no responsible department or agency in the province and in others there may be several groups working in departmental and agency isolation. Policy decisions that have significant implications for air quality or determinants of air quality can also be made without careful consideration of those implications by decision makers.

Potential Actions:

2.1 The Government of Alberta should identify, designate and adequately fund bodies that are accountable for policy development and implementation in areas relevant to managing air quality and the determinants of air quality. Areas where there are opportunities to strengthen the current governance system include, but are not limited to, energy efficiency, renewable energy, and transportation demand management.

2.2 These accountable bodies should have established policies, plans and implementation tools to capitalize on opportunities for promoting clean air and influencing the determinants of air quality in each of the areas noted.

2.3 The Government of Alberta should establish a high-level coordination mechanism to ensure alignment and avoid inconsistencies among strategies (e.g., Clean Air Strategy, Provincial Energy Strategy) and policies affecting air quality and the drivers of air quality, and to ensure consistent policy direction to regional and sub-regional planning processes and to operational decision making. This could be done through a multi-department, high-level council (e.g., Council of Deputy Ministers) that oversees the integration of provincial strategies and policies affecting air quality and the determinants of air quality and its mandate could include setting priorities and making important choices. This Council could**:**

- Establish a review committee for significant provincial strategies and policies as they relate to air;

- Consult with stakeholders and the public regarding policy issues affecting air quality;
- Resolve conflicts or unanticipated issues;
- Report to Cabinet through a lead minister.

2.4 The Government of Alberta should establish a formal review process to evaluate the impacts of major policy initiatives on air quality and the determinants of air quality. This process would ensure that policy development in areas such as energy, transportation and agriculture includes explicit consideration of implications for air quality management. It could be undertaken by the department initiating a proposed policy, by an interdepartmental committee, or by an arm's length agency, and it should include opportunities for comment by stakeholders and the public. Findings and conclusions of the process, including recommendations for mitigating impacts on air quality, should be released to the public along with the reasons for recommendations or decision.

Goal 3: Alberta's governance system supports integrated regional and sub-regional (e.g., airshed basis) planning as a means of setting and achieving outcomes for air quality.

Provincially-set air quality outcomes and emissions performance requirements will be translated by regional plans to a regional policy context. Planning is an important stage in the decision-making hierarchy and requires a supportive governance structure to be effective. This goal involves making plans, objectives for which are addressed in potential actions 3.1, 3.2 and 3.3 below; specifically 3.1 involves setting plan outcomes, 3.2 involves determining if plan outcomes are being met, and 3.3 indicates what to do if the plan outcomes are not being met.

Potential Actions:

3.1 The Government of Alberta should specify air quality outcomes in regional and sub-regional plans, and these should apply to all activities within a region.

3.2 The Government of Alberta should establish a single point of accountability for ensuring compliance with air quality outcomes established through regional and sub-regional plans, through one of the following mechanisms:

- Empowering one department, namely Alberta Environment, to oversee all proposed and existing activities affecting air quality in relation to the plan, to ensure regional plan objectives are met; OR
- Establishing an inter-departmental review mechanism to review and coordinate regional and sub regional plans, existing and proposed projects and activities affecting air quality; OR
- Empowering the Land-use Secretariat under the *Land-use Framework* to play a coordinating and oversight role with respect to regional plans and existing and proposed projects and activities that could affect the achievement of air quality outcomes.

3.3 The Government of Alberta should establish a coordination mechanism to ensure that decision making in one region does not have adverse implications for an adjoining region. Where sub-regional issues must be addressed by adjacent regions, or where decisions in one region could have implications for an adjoining region, clear communication

mechanisms should be in place to ensure that decision making is coordinated and does not work at cross purposes.

3.4 The Government of Alberta should establish a process for mitigating increasing trends in air emissions when those trends appear likely to cause a failure to meet air quality outcomes established through regional or sub-regional plans. This process would ensure compliance with the air quality outcomes within planning areas. It would apply to all emissions sources, including point sources, non-point sources, non-regulated sources, and sources that are not subject to project review processes. The process would identify and coordinate policy, regulatory and management responses, which may include changes to existing policies and regulations, the adoption of new management tools, and the decisions that may be required to meet air quality outcomes. It could be combined with the accountability mechanism identified in action 3.2 above, and could report to the high-level coordinating body proposed in action 3.3.

3.5 The Government of Alberta should have an appeal mechanism or ombudsman to ensure accountability of decision makers by enabling Albertans to challenge decisions affecting air quality on the grounds of inconsistency with regional or sub-regional plans. This mechanism could be part of an existing governance structure. It should be accessible to all Albertans, and subject to reasonable procedural requirements to avoid abuse of the process and to ensure the fair and efficient adjudication of appeals. The appeal mechanism would enforce accountability, but this process should acknowledge and not duplicate existing appeal mechanisms.

3.6 The Government of Alberta should use an independent audit process and report publicly on the implementation of regional and sub-regional plans to evaluate the success in achieving outcomes set for air quality. Implementation audits should be undertaken by arm's length experts whose findings and conclusions are released to the public. The terms of reference for implementation audits should specify that the auditors review the role of integrated regional and sub-regional planning in contributing to air quality management in Alberta.

Goal 4: Alberta's governance system ensures effective and efficient decision making within the Air Quality Management System.

The following text reflects efforts to examine the various components of the Air Quality Management System with the intent of identifying opportunities to strengthen and improve an already good system. The potential actions associated with Goal 4 were developed by the Air Quality Management System subgroup of the CAS project team.

Ambient Air Quality Objectives

The Alberta ambient air quality objectives are not-to-be-exceeded numerical values that direct management actions. While not directly enforceable themselves, compliance with the objectives is achieved through the setting of enforceable emission limits for industrial facilities, commercial best management practices and/or regulation, the setting of standards for vehicle emissions, and municipal bylaws (e.g., a prohibiting the burning of certain fuels in residential areas).

The numerical values for ambient air quality objectives represent choices about what risk to health and ecosystems is acceptable. Various circumstances are considered, including:

- the need to balance health and environmental effects and concerns,
- achievability within a reasonable time frame,
- existing background levels,
- the type of actions that will be triggered, and
- trends and forecasts of future emissions.

The numerical values chosen for particular objectives most often reflect social, technological, economic and political factors, and they try to balance the need to address public health concerns against air pollutant levels that can be practically achieved within a reasonable time period. It is therefore desirable, within the socio-economic context, to pursue lower ambient air quality objectives in situations where public health and environmental effects are still a concern.

Potential Actions:

4.1 The Government of Alberta should periodically review the Alberta Ambient Air Quality Objectives, evaluate the need for amending the objectives and identify any substances for which new ambient air quality objectives are required.

Emission Standards

Emission standards are the regulatory tool used to assure the air quality outcome. Minimizing air emissions maximizes the emissions room to ensure that new entrants into Alberta's economy and population growth can be accommodated without compromising the generally good air quality in Alberta. Emission standards are developed in various ways and, given the size of Alberta, it often is sensible to adapt or "translate" standards developed in other jurisdictions for use in Alberta. In making such translations, the challenge is to ensure that standards and technology requirements are appropriate and compatible for the emissions source and satisfy the air quality management goals for this province. It is instrumental for the successful management of air emissions that Alberta has the capacity to assess and adapt work done elsewhere as well as to develop standards that reflect the unique nature of the province's air pollutant sources.

Potential Actions:

4.2 The Government of Alberta should have the capacity to lead or influence the development and updating of emission standards by:

i. Conducting a needs assessment and identifying gaps in the emissions standards that currently exist and in the processes for setting and enforcing those standards.

ii. Reinvigorating the national collaborative process for setting standards to enhance the efficiency with which standards are set in Canada and ensure a "level playing field" across the country;

iii. Identifying areas where Alberta-specific standards are necessary and developing and implementing these standards.

iv. Identifying responsibility for periodic review and updating of standards and establishing accountability mechanisms to support this process.

v. Consulting with stakeholders in the standard-setting process.

Environmental Impact Assessments

Environmental Impact Assessments (EIAs) are a tool that is utilized for industrial sources that may have a significant impact on the environment. EIAs strive to take a comprehensive look at the impact a given source will have on the environment. This is accomplished by considering the emissions contributions of the proposed new source **and** all other industrial and non-industrial air pollution sources. EIAs rely heavily on modeling exercises as they attempt to predict what impacts will occur under various emission scenarios. Comprehensive and accurate inventories and datasets, use of appropriate models, model settings and knowledge of limitations and assumptions of models are required to evaluate the information provided in an EIA, and translate those into regulatory requirements. In Alberta, the industrial proponents are responsible for preparing EIAs. The EIA is then reviewed by the government. In past years large numbers of applications from proponents whose projects were often located in close proximity raised the question of the efficiency of the current EIA process.

Potential Actions:

4.3 The Government of Alberta should review the EIA process and improve effectiveness and efficiency where required.

Permitting

A permit authorizes a facility, a commercial operation or an individual activity to emit certain substances up to a certain limit; in the context of recommendations for a Clean Air Strategy, this refers to permits for processes that affect air quality. Various regulators issue various forms of permits, among them Alberta Environment, the Energy Resources Conservation Board (ERCB) and the Natural Resources Conservation Board (NRCB).

The Alberta regulatory bodies set enforceable limits for industry in approvals, regulations, Codes of Practice, directives and licences. For air emissions, two parallel assessments are conducted to determine the emission limit:

- The achievable emission release limit based on the capability of the best available pollution prevention and control technologies economically achievable, and
- The emission limit required to maintain ambient air quality.

The results of these two assessments are compared and the more stringent result is used as the release limit for a specific facility or process. These limits can be developed on a facility-by-facility basis and are specified in the facility's licence, permit or approval, or they can be expressed initially as a source performance standard that is then translated into a facility specific limit. It is implicit within this policy and the process for setting air emission limits that ambient air quality objectives are not "pollute up to" levels.

Good coordination, clarity regarding roles and responsibilities, and transparency in the overall approval and permitting process are needed to achieve effectiveness, efficiency and consistency.

With respect to non-point, or area, sources, many agencies make decisions that have implications for air quality; these agencies include both urban and rural municipalities, as well as the Alberta departments of Municipal Affairs, Transportation, Sustainable Resource Development, and Agriculture and Rural Development. For the most part, effects on air

quality are not considered when these decisions are made and permits are issued, and the cumulative impacts can be significant.

Potential Actions:

4.4 The Government of Alberta and municipalities should review the existing permitting processes and improve effectiveness and efficiency where required.

4.5 The Government of Alberta should utilize standardized source performance requirements wherever possible to improve transparency and consistency of the emission requirements. Clear criteria should be developed and made available for situations in which deviations from the standardized source performance requirements would be allowed.

4.6 The Government of Alberta should develop a standard approach to public involvement in the permitting processes, thus ensuring the consistent application of *basic principles* for public involvement across all the players involved. For some aspects of the permitting systems (industrial and non-industrial sources of air pollutants) there is already an opportunity for public participation in the permitting system. It is not the intent to duplicate existing processes but rather to identify any gaps or unnecessary inconsistencies in the basic principles of public involvement. However, new consultation processes may need to be created where such processes do not now exist.

4.7 Agencies that permit activities that could affect air quality should be responsible for mitigating the impacts of these activities on air quality in their jurisdiction. Examples of such activities include patterns of land development, vehicle use, transportation planning, the use of wood burning stoves, and many others**.**

Compliance and Enforcement

Compliance in the context of clean air refers to the activities undertaken to meet the rules that govern air emissions, activities undertaken to ensure the rules are being met, and activities that help people to follow the rules. Enforcement is the response to non-compliance (that is, what happens when the rules are not met). Government agencies, industry and members of the public all have roles to play when it comes to ensuring compliance, and it is desirable that these roles be strengthened.

As part of the efforts proposed in the potential actions below, the Government of Alberta should consider enhancing opportunities for public involvement, and should focus on the proactive educational and assurance value provided by a compliance program; for example, random spot audits require few resources but can have a significant impact. Participants in the public consultations on a Clean Air Strategy particularly noted the need for increased compliance activity related to small industries.

Potential Actions:

4.8 The Government of Alberta should strengthen its compliance and enforcement programs by using clear performance targets and measures.

4.9 The Government of Alberta should reinforce transparency by enhancing its public reporting on enforcement actions undertaken and the findings.

4.10 Regulated sources of air emissions should provide information to the public on measures they have undertaken to comply with their regulatory requirements. Many facilities undertake significant efforts to assure compliance with their regulatory requirements. Providing information on those efforts would give the public a better understanding of the initiatives a facility is undertaking to ensure good performance.

4.11 The Government of Alberta or an independent auditor on behalf of the Government of Alberta should conduct random audits from time to time of continuous emissions monitoring systems and audit stack surveys undertaken by industry.

4.12 The Government of Alberta or an independent auditor on behalf of the Government of Alberta should conduct annual audits of both industry and ambient monitoring stations in the province.

4.13 The Government of Alberta should promote the availability of the 24-hour incident reporting telephone number.

Information and Education

An informed population that understands issues related to air quality and how they as individuals and consumers can contribute to improving it will be essential in reaching Alberta's desired state of air quality. Accurate and reliable information should be available and accessible in formats that are meaningful to people. This means providing information at different levels of complexity so that users can decide what is most appropriate for them. At present, a variety of agencies and institutions provide information on air management and air quality; enhanced coordination would better utilize resources and expertise and would enable a wider audience to be reached.

Potential Actions:

4.14 The Government of Alberta, in conjunction with air experts from institutions and agencies undertaking air related work in Alberta, should annually convene an air forum for the purpose of exchanging technical and other information on air research and management practices in the province. The forum would bring together those working on air management and research to explore opportunities for coordination. This would also include air education experts who would work together on developing a plan to communicate provincial and local air quality information. These forums should also evaluate policies against the desired air quality outcomes and should include all governments and agencies that develop air policy.

4.15 Industry sector organizations that already have education programs that communicate to their members the benefits and appropriate processes for community involvement should continue and strengthen those programs. Those industry sector organizations that do not presently have such programs should develop them. A key message in such programs should be explaining the benefit of educating the communities in which they operate about the operations and impacts of their facilities.

Monitoring

Ambient air and emissions monitoring is a key part of the overall air quality management system, and involves several players. Emissions monitoring is conducted by industry.

Industry, Alberta Environment and airshed zones all operate ambient monitoring stations in Alberta. Alberta Environment oversees provincial monitoring needs and the meeting of national commitments, directs local monitoring requirements (that is, facility specific, or fenceline, monitoring by industry), and is a stakeholder in airshed zones. Airshed zones, which are overseen by a multi-stakeholder board, identify regional monitoring needs and may also operate air monitoring stations on behalf of industry and the National Air Pollutant Surveillance (NAPS) program.

Potential Actions:

4.16 In the short term, the Government of Alberta should assess the options for operation of non-fenceline air monitoring stations and assess the efficiency and effectiveness, performance, reliability and cost of operating monitoring stations by various service providers, or having the monitoring stations run through a central agency. This review should include the reporting of ambient air quality data and the quality of the data provided. Options could include having an independent organization or a government agency operate all non-fenceline monitoring stations in the province.

4.17 The Government of Alberta should develop criteria to clarify expectations for monitoring in Alberta, particularly with respect to industrial facility requirements.

4.18 Industry ambient air monitoring data should be included in the CASA Data Warehouse, which would make it more easily accessible to the public and for use in making air management decisions.

Reporting

The reporting of emissions from an air pollution source along with reporting of ambient air quality information is essential to: prepare comprehensive inventories, report on the state of air quality, assess if rules and regulations have been adhered to, and provide information for policy development and evaluation. In Alberta, industry reports emissions from industrial sources. Ambient air quality is reported by industry, airshed zone organizations on behalf of industry, and government, mostly in the form of paper reports.

Potential Actions:

4.19 The Government of Alberta and agencies should evaluate the adequacy of the information currently reported and eliminate any unnecessary duplication of reporting of air data and information, or add reporting requirements for missing information.

4.20 The Government of Alberta and agencies should develop clear guidance and protocols for the reporting of air data and information where required.

4.21 The Government of Alberta should develop mechanisms for electronic reporting of air data and information.

Air Policy Development

All components of the air management system require that policy be developed that clarifies and sets direction as to how the air quality goals will be achieved using the various air management mechanisms. Essential to good policy development is the availability of sound science, understanding of technology and the broader policy context.

In Alberta, air policy development is mainly the responsibility of Alberta Environment, with some policy setting occurring at the municipal government level. Nationally, the Canadian Council of Ministers of the Environment (CCME) has had a longstanding role in air policy development, although CCME processes are perhaps now less inclusive than they were in the past. In Alberta, multi-stakeholder organizations such as the Clean Air Strategic Alliance have made policy recommendations to the Government of Alberta; also the general public and industry have had opportunity to participate in policy development through public consultation processes.

There is increasing awareness that actions of other government departments (such as Agriculture, Energy, Transportation, and Municipal Affairs) can have a significant effect on air quality; thus policies that affect air quality must be coordinated.

For all governments, government agencies and other participants in the policy development arena, transparency in policy development is very important.

Potential Actions:

4.22 All orders of government should consistently and publicly provide the foundation of information used to develop and apply policy.

4.23 The Government of Alberta should work with the CCME to devise tools to improve stakeholder involvement with respect to the non-government sector to increase its inclusiveness, effectiveness and participation.

4.24 The Government of Alberta should work within the CCME to coordinate efforts between jurisdictions and respond to national needs (e.g., national standard setting). Efficient inter-agency coordination will reduce duplication of efforts across the country.

Air Policy Evaluation

Alberta has more than 100 policies related to air management. Evaluation of these policies to ensure they are doing what they were intended to do is essential for good air management. In addition, thorough assessment of potential policy consequences should be done prior to implementing new policies. Increased effort is needed to ensure that performance indicators are in place for each policy and that performance is regularly evaluated against these indicators.

Potential Actions:

4.25 The Government of Alberta, municipal governments and agencies should include performance indicators in all new air quality policies as these policies are developed, and should complete the development of performance indicators for existing policies.

4.26 The Government of Alberta, municipal governments and agencies should develop criteria and a prioritization process for evaluating policies. Criteria could include frequency of use, frequency of evaluation, and age of the policy.

4.27 At a minimum, every ten years the Government of Alberta, municipal governments and agencies should evaluate air quality policies against their performance indicators. If stakeholders were involved in developing the policy, they should have an opportunity to provide input to the review. Evaluation should include**:**

- Assessing whether the policy was implemented as planned and if it had the desired effect using the performance indicators relevant to the policy, and
- Assessment of policies for effectiveness.

Key Institutions Involved in Air Quality Management

The original Clean Air Strategy described in some detail the role envisioned for airshed zones and for CASA because both were new institutions conceived within that Strategy. Both institutions now have a great deal of experience as part of Alberta's Air Quality Management System, and it is timely to evaluate their roles and consider new opportunities.

Alberta's Airshed Zones

Alberta's airshed zones were established to respond to local and regional air quality concerns. The current airshed zone guidelines stipulate that the zone undertake an air management and monitoring role. However, the main role of airshed zones has been regional ambient air quality monitoring, and airsheds have also participated in developing air monitoring policy. The question arises as to whether it is essential for a multi-stakeholder board to run the zone's monitoring stations, and potential action 4.16 above seeks to address this matter. If monitoring responsibilities were assumed by someone else, the multi-stakeholder board could focus on policy and planning advice, and potentially, on management for their airshed zone. Given the need for regional management across the province, the existing airshed zone boundaries should be reviewed to facilitate the most efficient and effective air management.

Funding has also been a challenge at times for some airshed zones. At present, some participants in airsheds do so voluntarily, and especially in the absence of large industrial facilities, obtaining adequate funding can be difficult. This makes the financial situation for airshed zones inequitable across the province.

Potential Actions:

4.28 The Government of Alberta in consultation with stakeholders should undertake a review of the current boundaries, guidelines and coordination mechanisms in the province. This would involve a review of administrative boundaries of current airsheds, looking for ways to improve efficiency and effectiveness, in the context for the need for regional air management. Alberta Environment in consultation with stakeholders should also examine the role and responsibilities of airshed zones, examining the benefits these multi-stakeholder organizations bring to the air management system and recommending opportunities for involving these multi-stakeholder groups in the future air management system.

4.29 The Government of Alberta should develop a funding mechanism by which all sources of emissions contribute to funding the ambient monitoring system.

The Clean Air Strategic Alliance (CASA)

Since its establishment in 1994, CASA has had considerable success in bringing stakeholders together to develop sound and innovative advice to the Government of Alberta on managing air quality issues, particularly emissions from point sources. A number of key air stakeholders have worked collaboratively through CASA to reach consensus on difficult issues. The benefit of this process has been collaborative development of recommendations of air policies rather than adversarial relationships.

Management of non-point sources and other emerging air issues mean that CASA could expand its current reach and begin to take on issues and engage stakeholders that have not been involved with the organization to date.

Further, while consensus recommendations are valuable, not all issues lend themselves to consensus decision making. Given CASA's positive record in bringing stakeholders together and providing project management and stakeholder facilitation, there could be a role for the secretariat in also facilitating processes that are advisory in nature rather than consensus-seeking. Clearly articulating the areas where agreement could not be reached and describing the interests of all stakeholders will also yield useful and constructive input for government decision makers.

Potential Actions:

4.30 The CASA Board of Directors should conduct a survey to determine emerging air quality issues and stakeholders who are associated with these issues. This survey should also identify mechanisms to engage stakeholders not traditionally involved in CASA. The intent is to look at potential new areas of activity for CASA and to undertake outreach to new stakeholders.

4.31 The CASA Board of Directors should consider the idea of a parallel service stream to provide policy advice for projects not well-suited for consensus. These projects would have a defined time period, at the end of which the team's best advice would be forwarded to the decision maker. Criteria should be developed to determine when a project is suited for consensus and these should be applied to statements of opportunity. This idea is meant to capitalize on the strengths of the CASA secretariat and process and provide opportunities for the organization. It is not intended to replace CASA's consensus work.

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Goals and Potential Actions for Regional Planning Strategic Direction

GOAL 5: Air quality management plans that effectively address current and emerging air quality issues are in place for each of Alberta's seven land-use regions.

Air quality management plans may stand alone or they may be part of integrated regional plans (e.g., the air component of the Land-use Framework's regional plans). They should address the cumulative effects of air emissions by considering **both point and non-point sources** of air pollution. Air quality management should be done based on air movement, which does not necessarily align with administrative boundaries. This means that the Government of Alberta should take a leadership role in defining zones that are practical and efficient for managing air quality.

Regional air quality management plans would first require the development of provincial trigger levels for all air pollutants of concern, as has been done for particulate matter and ozone via the CASA PM and Ozone Management Framework. Ambient trigger levels would be a simple, proactive "green, yellow, red" system, described in more detail under Recommendation 5 in the body of this report.

Potential Actions:

5.1 The Government of Alberta should define zones that are practical and efficient for managing air quality.

5.2 The Government of Alberta should have in place a collaborative process for determining which air pollutants, in addition to particulate matter and ozone, require trigger levels, as well as a process for determining the "green", "yellow" and "red" trigger levels. Existing frameworks should be considered in developing trigger levels. This process should also define how triggers and trends would be measured.

5.3 As a starting point for developing regional air quality management plans, Alberta Environment, in collaboration with other stakeholders, should ensure that appropriate and timely actions are taken to prevent AAQO exceedances; this represents the existing provincial commitments to keeping clean areas clean and continuous improvement.

i. **The "red" level indicates that AAQOs are already being exceeded or are expected to be exceeded if emission reduction measures are not taken promptly. For regions at this level, regional emission limits should be set in the air quality management plan to ensure that ambient concentrations remain below the ambient air quality objective.** These limits reflect a specified maximum amount of emissions from all sources. The management plan should include all emission sources, and should apply appropriate policy tools to ensure that total air emissions stay below the threshold level. Various policy tools that could be used to reduce emissions are noted in Appendix D.

ii. **The "yellow" level indicates an upward ambient trend, demonstrating that AAQOs could be exceeded in the short to medium term. In these areas, a specific management plan should be prepared, describing measures that would arrest or reverse this trend.** The actions and measures will depend on the pollutant and its source(s).

iii. **The "green" level indicates areas where AAQOs are not in danger of being exceeded. In these areas, the current strategies for managing emissions are working but should be regularly assessed for continuous improvement opportunities.** The acknowledged intent is to keep clean areas clean and not to pollute up to the ambient air quality objectives. The focus at this level is on ensuring that the information needed to assess the region's air quality is available and that, where possible, steps are being taken to maintain or improve air quality.

5.4 The Government of Alberta in consultation with stakeholders should develop appropriate sub-regional air quality management plans required in response to the trigger levels. Regional plans may identify areas that require sub-regional plans to respond to

specific issues. See potential action 3.3 for details on coordinating decisions and actions between adjoining regions.

GOAL 6: Municipal planning and design incorporates sound air quality management principles.

The physical characteristics and patterns of land development in a region can affect air quality by influencing the behavior of the citizens who live there. Potential approaches for sustainability will differ for larger urban centers, smaller communities and rural areas due to their diverse needs and scales. In the context of our settlement patterns, "sustainable form" refers to a built human environment that is designed to minimize the environmental impact of its residents and maximize the efficient use of natural resources such as energy, land and water.

Potential Actions:

6.1 Every Alberta municipality with population of more than 20,000[12] should develop a sustainability plan that includes air quality and is supportive of and consistent with provincial policy. A number of municipalities are already working on sustainability plans, some aspects of which may rely on provincial and federal regulations. Many features that contribute to sustainable design and form will also contribute to better air quality, including but not limited to:

- Efficient transportation systems – Public transportation networks, which can include buses, rail, or other multi-passenger vehicles, that provide effective, affordable, hassle-free mobility.
- Efficient land use – Use of agricultural, urban, rural, natural, recreational and industrial lands with a focus on making more efficient and effective use of space to reduce the negative impacts of human activities on the land. Efficient land use is one of the strategies in the *Land-use Framework.*
- Human-scale development, mixed land use – Land use where employment, shopping and residential land uses are integrated in a compact urban form, at higher development intensities, and are pedestrian-oriented and highly accessible by public transit.
- Eco-industrial parks – Communities of manufacturing and services businesses that maximize their environmental and economic performance by collaboratively managing environmental issues and resources.
- District energy systems (combined heat and power) – District energy systems produce steam, hot water or chilled water at a central plant and then pipe that energy out to buildings in the district for space heating, domestic hot water heating and air conditioning.
- Distributed energy systems – The use of many, small-scale energy sources located near point-of-use.
- Local food production and security – Use of a variety of agriculture systems to reduce the distance food has to travel from point of production to point of consumption.
- Green buildings and green building codes – Policies that encourage or require new construction to be energy efficient.
- Vibrant communities – A sense of place and belonging, held among all residents, that instills stewardship of community and the desire to protect its qualities.

[12] A population of more than 20,000 is proposed because this corresponds to the size of community that the new Ambient Monitoring Strategic Plan recommends be considered for a permanent air monitoring station.

6.2 The provincial and municipal governments should convene an expert design symposium on the sustainable settlement features (see potential action 6.1) and on potential legal and fiscal mechanisms that can be used to achieve air quality outcomes and implement sustainability plans.

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Goals and Potential Actions for Pollution Prevention and Control Strategic Direction

GOAL 7: Provincial government legislation, regulation and policy promote and support pollution prevention and control measures across all sectors and activities that produce air emissions.

Policy tools define rules and incentives for action and enforcement, provide a "level playing field" for all players and make the costs of future pollution a significant factor in decision making. Legislation, regulation and regulatory policies need to be periodically reviewed and updated to promote pollution prevention and control measures. Various policy tools[13] can be used to achieve these ends, including:

- Incentives
- Supportive programming
- Voluntary stewardship and corporate responsibility
- Negotiated agreements
- Market based instruments and fiscal mechanisms
- Regulatory approaches

Potential Actions:

7.1 The Government of Alberta should eliminate legislative, regulatory and policy barriers to achieving pollution prevention, and identify legislative, regulatory and policy gaps that need to be filled to encourage pollution prevention and control. This includes barriers that prevent the use of renewable energy technologies and other approaches that reduce air emissions.

7.2 Where needed, the Government of Alberta should use appropriate and effective policy tools, including economic incentives and regulatory requirements, to encourage Albertans to make choices that reduce air emissions. In some cases, existing federal incentive programs could be matched to enhance the benefits. Such programs should be easy to understand and convenient to access. Regulatory and non-regulatory policy tools should be assessed and/or developed to support the goals recommended for a Clean Air Strategy, depending on the issue and who would best be suited to make the required change in behavior (the public, industry or government). An example of a possible policy tool could be a municipal bylaw to discourage vehicle idling.

7.3 The Government of Alberta should ensure that Alberta's environmentally-related legislation, regulations, and policies are aligned and congruent. For example, the provincial energy strategy, the climate change strategy, *Water for Life*, the *Land-use Framework*, and other policies should have goals, outcomes, and objectives that are consistent and supportive, and they should be underpinned by beliefs and values that are congruent.

[13] See Appendix D.

GOAL 8: Alberta leads in the research, development and adoption of clean, efficient technologies that prevent and control pollution.

Alberta has made significant strides in controlling emissions from existing activities, and recognizes the important role that continuous improvement can play in doing even better. But ongoing research and development hold the key to technology breakthroughs. Leadership in this area means that Alberta is as good as or better than any jurisdiction at promoting and implementing technology that will achieve outcomes for both pollution prevention and control. Alberta can do this by drawing upon existing best management practices globally; stimulating and supporting research into better, more efficient technologies that reduce impacts on air quality; and establishing conditions that promote investment in pollution prevention technology.

Potential Actions:

8.1 Alberta should implement cleaner and more efficient technologies to control and prevent emissions from new and existing sources, and improve energy efficiency and conservation. Clean, efficient technologies already exist in many areas and should be used as examples for other sectors to emulate. Appropriate policy tools may need to be developed and applied so large industries adopt and implement these technologies to improve existing facilities over time and ensure that desirable source performance standards are required for new developments.

8.2 Alberta should stimulate and support groundbreaking research on clean, efficient technologies. To strengthen and expand Alberta's economic base for the future and to continually improve Alberta's air quality, industry, with the support of provincial and municipal governments, needs to invest in and support research and development in technologies that lead to pollution prevention, long-term reductions in air emissions, and economic and competitiveness advantages for the implementer. "Support" includes financial assistance, regulation, and possible economic incentives for developing source performance standards and designing both industrial and non-industrial facilities to prevent pollution.

8.3 The Government of Alberta should establish and communicate expectations for continuous improvement in pollution control technology that is already in place.

GOAL 9: Specific strategies are in place, with consideration of leading practices in other jurisdictions, to prevent air pollution from all major sources and simultaneously produce other environmental, social and economic benefits.

Emissions from non-point, or area, sources are a particular challenge for the air quality management system because current management mechanisms do not effectively address these sources of pollution.

Potential Actions:

9.1 Design and implement targeted strategies in each of the following areas to prevent pollution and achieve other environmental, economic and social benefits:

i) **Transportation system design.** Approaches for dealing with transportation emissions need to consider the vehicles themselves and transportation systems as a whole. A strategy for transportation systems may include actions such as emissions control programs for vehicles, implementation of more convenient and efficient transportation systems in municipalities and incentives for accessing cleaner forms of transportation.

ii) **Alternative energy systems.** Alternative energy systems aimed at renewable and efficient energy, district and distributed energy, net zero building construction and industrial ecology.

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Goals and Potential Actions for Knowledge and Information Strategic Direction

GOAL 10: Alberta has a reliable, comprehensive and objective base of knowledge and information on emissions, ambient air quality, health and environmental impacts, and potential management and mitigation mechanisms.

A fundamental component of a new Clean Air Strategy should be a reliable and objective information base for making decisions about desired outcomes and appropriate policy and technology applications.

Potential Actions:

10.1 The Government of Alberta should implement an ambient monitoring strategic plan that is consistent with regional planning initiatives. Implementation of a new ambient monitoring strategic plan would provide the data and information to successfully manage air quality on a provincial and regional basis, and provide information that increases the understanding of natural emissions (such as forest fires) and transboundary sources. A new ambient monitoring strategic plan would fill gaps and facilitate the development of air policy to address both point and non-point sources of emissions.

10.2 The Government of Alberta should develop and thereafter maintain and continually improve current comprehensive air emissions inventories and emissions projections. Air emissions information exists from various sources, but it needs to be verified and consolidated into a comprehensive air emissions inventory that is open, transparent and easily accessible. Such an inventory should include all emissions sources – natural, manmade and transboundary. Area sources and point sources that are outside Alberta Environment's approvals process are the most important gaps to be filled. Emissions projections are also needed to enable anticipatory air policy development.

10.3 The Government of Alberta in consultation with stakeholders should commit to the ongoing application of air modeling systems that allow for reliable and transparent determination and projection of air emissions and ambient air quality in Alberta. Accurate information and scenario development are needed to inform policy development and actions and to verify that the desired outcomes have been achieved.

10.4 The Government of Alberta should develop a coordinating mechanism for sharing ambient and emission data and information. An administrative component of this action would be to establish a Government of Alberta forum for those who gather air-related data and information (see potential action 4.14).

10.5 The Government of Alberta should enhance and maintain one provincial, integrated repository for ambient air quality data and information that is consistent and comparable across all information sources. The intent is not to replace the numerous individual websites now operating (e.g., by airsheds), but to ensure that all information is

available in one place for easy access by anyone. This action should build on existing work such as the CASA Data Warehouse.

10.6 The Government of Alberta should undertake economic and other analysis on policy measures and the associated costs of action and inaction to reduce air emissions.

GOAL 11: Timely information on air quality and its management is generated and is easily accessible to all Albertans.

Having reliable, timely and accessible information about air quality is a critical first step in developing good understanding about the air monitoring and governance system; it also helps to create the awareness that can help individuals contribute to cleaner air.

Potential Actions:

11.1 The Government of Alberta should ensure that reliable and timely technical and general air-related information, including information on air quality in Alberta, is easily accessible to all Albertans. Examples of such information include**:**

- Air quality and air emissions. This includes current and historical information on provincial and regional air quality, emission sources, trends, and projections.
- Air emission targets and standards. Having information on source performance standards applied in Alberta would enable Albertans to better understand how air quality is being managed in the province.
- Ambient air quality objectives. Information on Alberta's air quality objectives, including how they were derived, would enable people to see how the data compare to the objectives.
- Impacts of air pollution. This includes information on both known impacts and emerging issues.
- Performance assessment information to tell Albertans about progress in achieving air quality goals and objectives.

11.2 The Government of Alberta should create a single repository of air-related information that is easily accessible by the public.

11.3 The Government of Alberta should report annually on the state of Alberta's air. This report should be verified by the Auditor General or another third party.

GOAL 12: Albertans understand their impacts on air quality, know what they can do to protect and improve it, and are motivated to make the necessary behavioral changes.

Because everyday actions can affect air quality, keeping the air clean is everyone's responsibility – industry, governments and individual citizens. With current, reliable information, it is much easier to make the right choices to maintain and protect air quality. Information enables people to gain knowledge and insight into an issue and is an important and necessary foundation for action.

Potential Actions:

12.1 The Government of Alberta should promote awareness of air quality and better inform consumer choices. The mechanism could be a center that would assemble and

disseminate information on air-related consumer choices. The material would also draw on "state of the air quality" information generated to fulfill Goal 11 and would clearly illustrate the impact that consumer choices can have on air quality. Such information and programs could be developed by government, industry and non-government organizations as an outcome of the air educators forum proposed in potential action 4.14. The first step is research and planning to identify the most effective tools, which could include but are not limited to:

- Social marketing
- Regular innovative advertising to targeted audiences to promote the programs
- Mitigation measures.

Individuals, industries and government departments and agencies are all consumers, and would benefit from this type of information. Access to reliable information can guide consumers' choices and help them decide which options are most suited to their situation. Emission reduction information would be supplemented with information that describes economic as well as environmental costs and benefits of feasible options, as an aid in making the appropriate choices.

12.2 **The Government of Alberta should develop and build on existing school programs to educate the next generation on air quality.** Examples include continued K-12 education on air quality and education on renewable energy.

GOAL 13: Albertans are informed of the impacts that air quality can have on them.

Potential Actions:

13.1 **The Government of Alberta should provide Albertans with timely information on air quality and potential human health effects so they can better manage their individual health outcomes related to air quality.** Some individuals are more sensitive than others to air pollution. By having current and accurate information about potential acute and long-term effects of air quality, they will be better able to make decisions about protecting their own health. Local governments can also use such information to advise their citizens in the event of a potentially harmful air quality event.

13.2 **The Government of Alberta should make information on air quality and potential human health effects available to Alberta health care providers.**

GOAL 14: Alberta has a comprehensive Air Research Strategy that is supported by a robust research infrastructure.

Identifying and establishing research priorities would help Alberta meet its present and future air quality management needs. A robust research infrastructure includes technical expertise to do basic research, the ability to move proven technology into the field, and the ability to innovate and respond to emerging issues.

Potential Actions:

The Government of Alberta should:

14.1 **Design a multi-stakeholder process to advise on research needs to address air policy priorities and knowledge and information gaps. This includes coordinating air**

research initiatives to avoid overlap and ensure that the province's air management is informed by the best knowledge and information available in Alberta and from other jurisdictions.

14.2 Collect and apply information on air monitoring, mitigation measures and best management practices that are used in other countries and could be effective in Alberta to protect air quality and health and reduce ecological risks.

14.3 Develop Alberta's air research infrastructure and partnerships to ensure that air research efforts are supported with appropriate technical expertise and adequate funding from the public and private sectors.

14.4 Establish a post-secondary research chair and associated multi-disciplinary research and training centre to strengthen Alberta's capacity in disciplines and areas related to air quality management.

Appendix B: Clean Air Strategy Project Team Members

Member	Stakeholder Organization
Al Mok (co-chair)	Suncor / CAPP
Al Schulz	CCPA
Alison Lewis	Greymont Western Canada
Allan Mumby	Alberta Airsheds Council
Anita Sartori	CNRL / CAPP
Bettina Mueller (co-chair)	Alberta Environment
Debra Gardiner	ENMAX
Don Bradshaw	Alberta Energy
Gerald Soroka	Alberta Association of Municipal Districts and Counties
Gerry Ertel	Shell / CPPI
Glynis Carling	Imperial Oil / CAPP
James Guthrie	TransAlta
Jennifer Allan	CASA
Krista Phillips	CAPP
Lawrence Cheng	Alberta Environment
Linda Osinchuk	Alberta Urban Municipalities Association
Long Fu	Alberta Environment
Merry Turtiak	Alberta Health and Wellness
Michael Brown	ERCB
Myles Kitagawa	Prairie Acid Rain Coalition
Nashina Shariff	Toxics Watch Society
Peter Dzikowski	Alberta Infrastructure and Transportation
Sandi Jones	Alberta Agriculture and Rural Development
Srikanth Venugopal	TransCanada
Steve Kennett (co-chair)	Pembina Institute
Tony Hudson	The Lung Association

Former Project Team Members and Alternates

Member	Stakeholder Organization
Alex MacKenzie	Alberta Health and Wellness
Angela Ball	TransAlta
Barb Shackel-Hardman	Alberta Agriculture and Food
Carolyn Kolebaba	Alberta Association of Municipal Districts and Counties
Christine Bryne	Imperial Oil / CAPP
David Lawlor	ENMAX
Jason Schultz	TransCanada
Ken Omotani	TransAlta
Kerra Chomlak	CASA
Len Bracko	Alberta Urban Municipalities Association
Martha Kostuch	Prairie Acid Rain Coalition
Mike Zemanek	Alberta Health and Wellness
Sharla Rauschning	Alberta Energy
Tim Goos	Environment Canada

Beliefs, Values and Principles Subgroup

Member	Stakeholder Organization
James Guthrie	TransAlta
Jennifer Allan	CASA
Mike Zemanek	Alberta Health and Wellness
Myles Kitagawa	Prairie Acid Rain Coalition

Consultation Subgroup

Member	Stakeholder Organization
Anita Sartori	CNRL / CAPP
Aynsley Toews	Alberta Environment, Education
Bettina Mueller	Alberta Environment
Jennifer Allan	CASA
Long Fu	Alberta Environment
Merry Turtiak	Alberta Health and Wellness
Renata Bothwell	Alberta Environment, Aboriginal Relations
Sharon Hawrelak	CASA
Tony Hudson	The Lung Association

Governance Subgroup

Member	Stakeholder Organization
Bettina Mueller	Alberta Environment
Don Bradshaw	Alberta Energy
Gerry Ertel	Shell Canada / CPPI
Jennifer Allan	CASA
Jillian Flett	Alberta Environment
Manuel Figueroa	Alberta Environment
Steve Kennett	Pembina Institute
Tricia Bell	Alberta Environment

Straw Dog Subgroup

Member	Stakeholder Organization
Debra Gardiner	ENMAX
Jennifer Allan	CASA
Lawrence Cheng	Alberta Environment
Merry Turtiak	Alberta Health and Wellness
Mike Zemanek	Alberta Health and Wellness
Myles Kitagawa	Prairie Acid Rain Coalition
Nashina Shariff	Toxics Watch Society
Randy Angle	Alberta Environment
Tony Hudson	The Lung Association

Appendix C: What We Heard in the Public Consultations

This appendix provides a brief summary of the results of the two phases of the 2008 public consultation conducted on behalf of CASA and the Clean Air Strategy project team. The full report and findings are available online as a companion document to this Clean Air Strategy report and recommendations; visit www.casahome.org.

Phase 1 – Initial Stakeholder Consultation (April 2008)

Fifteen CASA stakeholders, including non-governmental organizations, government and industry representatives, participated in a stakeholder telephone interview conducted to test their reaction to the team's initial priorities and solicit their input on other areas that may affect the team's recommendations.

The following key themes emerged during Phase 1:

- In general, all interviewees knew about CASA, its process and the clean air strategy.
- Many respondents believed that auto emissions and transportation use need to be addressed in the province, including testing emissions from old vehicles. Specifically, consumers need to be told of their impact on air quality. Consumers need to realize that the issue of air quality isn't just an industry problem – it could be the person mowing the lawn.
- Another common theme was that government – or someone – needs to take responsibility and be a leader on air quality issues in Alberta. Plus, there needs to be a specific strategy that government can follow and some form of accountability for non-compliance.
- Some respondents believed the Alberta government needs to think about a sustainable future for the province. This ranges from better urban planning by cities and energy efficiency to finding the sources of air quality problems, and dealing with them.
- A couple of interviewees thought even more airshed zones are needed in Alberta and questioned if the province had any control over federal jurisdictions like reserves and railways.

Phase 2 – Engaging Albertans and Aboriginal Groups (September – November 2008)

Phase 2 was an open and transparent public consultation program conducted between September 5 and November 30, 2008. Various tools were used to gather input from the public including town hall meetings and a dedicated website, telephone hotline, and written submissions. The *Clear the Air* discussion guide was used to focus discussion at seven town hall meetings. A proactive Aboriginal engagement process engaged First Nations, and a successful meeting with Treaty 6 Elders did occur.

The town hall meetings were held in Grande Prairie, Fort McMurray, Red Deer, Bonnyville, Lethbridge, Calgary and Edmonton. Public meeting representatives included private citizens and representatives from government, industry, the agriculture sector, health and environmental organizations, and others.

Most survey respondents identified themselves as private citizens (87%), 6% represented government, 3% represented a private company or industry association and 3% represented an environmental or health group. One academic researcher also completed the questionnaire. Survey respondents and town hall participants were not a representative sample of Albertans and, therefore, results cannot be generalized to the population.

What We Heard

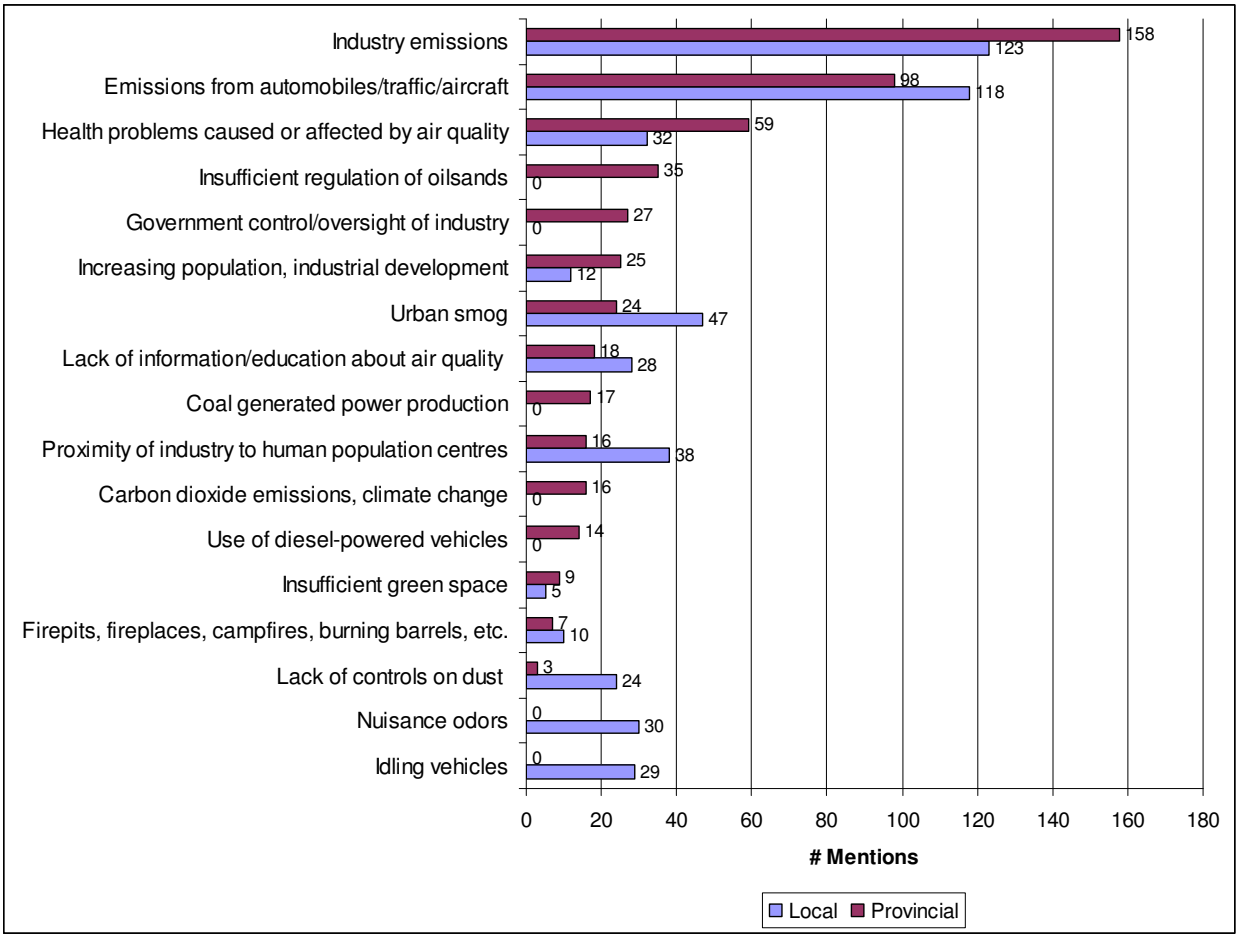
1. Perceptions of Air Quality

Most participants in the town hall meetings and respondents to the survey said that, overall, the air quality in Alberta is good, but could be better. Local air quality was generally rated lower than provincial air quality.

2. Air Quality Problems and Issues

In general, respondents identified similar air quality problems and issues at both the local and provincial levels, with some exceptions. The three issues most often identified were industry emissions, vehicle emissions and health problems related to poor air quality. Insufficient regulation of oilsands development and government oversight of industry were important provincial-only issues, while idling vehicles and nuisance odors were mentioned only as local problems.

Figure 7: When you think about air quality, what problems or issues are most important to you?



(n=328)

3. Key Areas for Provincial Government Action to Reduce Air Pollution

Participants and respondents were asked what specific actions government should take to reduce air pollution. The most common responses were:

- Review and strengthen legislation/regulations and adequately resource enforcement
- Adequately resource monitoring, inspection and enforcement of regulations
- Offer financial and other incentives to encourage innovation and adoption of best practices
- Use taxes and other financial disincentives to achieve compliance
- Conduct more substantive environmental impact assessments
- Coordinate air quality strategies with other jurisdictions
- Coordinate air quality strategies with those that address water and land use
- Create an independent scientific committee to review and oversee all ambient air quality monitoring data
- Invest in long-term research about the impact of pollutants on humans, animals, vegetation
- Invest in appropriate infrastructure for effective surveillance of air quality
- Enhance public transportation systems and community infrastructure
- Improve urban design and planning to promote alternative transportation
- Facilitate data sharing between CASA and other organizations
- Fund, sponsor and/or develop public education programs

Town hall participants said government must "take a wide angle view of the issue" including finding the right balance between economic development and protecting the environment. Issues were also raised at the public meetings about the amount and quality of monitoring and the low levels of public awareness of air quality issues.

4. Key Areas for Industry Action

Participants and respondents were asked what specific action industries should take to reduce air pollution. The most common responses were:

- Accept responsibility for emission reductions
- Commit to transparency in monitoring and access to information
- Invest in new technologies for pollution reduction
- Budget for pollution reduction activities, including staff to monitor and maintain these activities
- Share technology and "best management practices" within and across sectors
- Articulate the positives and gains made by industry
- Address air quality issues related to agriculture and livestock operations

At the town hall meetings, a number of participants said industry – or some industries – were doing a good job and should be recognized for their positive actions and best practices. Moreover, they would like to see greater sharing of these best practices through industry associations. Participants also encouraged companies to engage in "true collaboration" to improve performance across an industry sector. Transparency and good communication with the public were also identified as important responsibilities.

5. Key Areas to Promote Public/Individual Action

Participants and respondents were asked three questions related to current actions to reduce air pollution, future actions they would be willing to take and supports that would help them take action. A majority of survey respondents said they are practicing emission reduction behaviors or using specific products to reduce emissions. The following key areas were noted to help individual Albertans take action to reduce air pollution:

- Provide regular, accessible, understandable and meaningful information on air quality
- Develop a long-term public education campaign to promote personal responsibility
- Encourage and support reduced vehicle use through enhanced public transportation, urban infrastructure and workplace supports
- Encourage and support use of energy efficient appliances, vehicles and other "green" products through incentives, tax benefits and better products
- Offer incentives and supports to help people make changes

Town hall participants made the point that "we are all in this together" and we all have a role to play. Changing attitudes about consumption and changing behaviors related to energy use were mentioned most frequently as individual responsibilities. However, some participants expressed frustration at a lack of public interest in air quality.

6. Key Areas for Action Recommended by First Nations Participants

First Nations communities representing Treaty 6, Treaty 7 and Treaty 8 were invited to participate in the stakeholder consultation through local public meetings. The Treaty 7 and Treaty 8 meetings did not proceed due to lack of participation. A meeting with Treaty 6 representatives was held October 23. In addition, Treaty 8 Elders from Sturgeon Lake and Duncan's First Nation provided a summary of responses to the survey questions. Results from this engagement are summarized below.

- Develop a strategy that is flexible and nimble, and able to adapt to changing times and issues
- Address the health impacts of poor air quality
- Acknowledgement by the government that air quality issues can affect traditional and treaty rights
- Involve Aboriginal people in monitoring programs
- Invest a share of industrial profits in pollution prevention programs on reserve
- Facilitate greater cooperation and communication between government, industry and Aboriginal communities
- Promote emission-reducing behavior in Aboriginal communities

Appendix D: Sample Policy Tools

Management Category	Policy Tool Sub-Categories
Market Based Instruments and Fiscal Mechanisms	Emissions Trading
	Financial Incentives
	Charges, Taxes or tax credits
	Other Market Mechanisms
Regulatory Approaches	Prescriptive Standards
	Performance-based Standards
	Bans or Restrictions
	Regulatory Approvals and Permits
	Other Regulations
Negotiated Agreements	(no subcategories)
Voluntary Stewardship and Corporate Responsibility	House-in-Order
	Voluntary Agreements
Supportive Programming	Information Disclosure
	Promotion and Awareness
	Development of Codes of Practice and Tools
	Capacity Building

Source: Adapted from *Air Quality Management Policy Tools Leading Practice Research,* prepared by Marbek Resource Consultants, in association with Amec Earth & Environmental, for Alberta Environment; Revised December 2007.