Challenges of developing and applying integrated strategies at various scales

Les enjeux du développement et de la mise en œuvre de stratégies intégrées aux différentes échelles

R MINJARES*, A LLOYD*, J CLARK*,
K HICKS*, J KUYLENSTIERNA*, R MILLS*

Background paper for the Global Atmospheric Pollution Forum Stockholm Conference on "Air Pollution and Climate Change: Developing a Framework for Integrated Co-benefits Strategies".

Document préparatoire à la conférence du GAPF à Stockholm sur « Pollution Atmosphérique et changement climatique : développer un cadre pour des stratégies intégrées visant des co-bénéfices ».

Introduction

An integrated co-benefits strategy is a mechanism for grouping climate change goals with non-climate goals to produce policies that are more likely to achieve both. Leveraging these synergies through a single policy action can bring additional resources and political support to the climate change issue that a narrowly focused climate policy would otherwise fail to receive.

There are many significant barriers to enacting concrete, simultaneous, and global reductions of climate forcing emissions. Integrated strategies offer a plan of action for policy makers at all scales of government to overcome these barriers and achieve more rapid greenhouse emission reductions than would otherwise be possible. This background paper outlines a series of themes and questions that arise when considering the challenges to developing and applying these types of strategies. It has been drafted to supplement the panel discussion, "Challenges to developing and applying integrated approaches at different scales", which took place on September 18, 2008 at the meeting of the Global Atmospheric Pollution Forum in Stockholm, Sweden.

1. Integrated strategies: an overview

An integrated strategy is a plan of action with the overall aim of achieving simultaneous climate, health, economic, and other goals (like mobility and equity). It recognizes that single actions can produce multiple benefits, and that these multiple benefits are necessary to engage a broader set of stakeholders in reducing their respective greenhouse emissions. Integrated strategies recognize that the strong need for climate mitigation can raise awareness and shift resources to non-climate-related issues that might otherwise receive less attention. At the same time, for developing countries, co-benefit strategies provide a way in which their priority air quality concerns can be met in a way that can help them achieve greenhouse gas emission reductions, as well. In this way integrated co-benefit strategies can engage a broader set of stakeholders for mutual benefit.

The intended outcome of integrated strategies is policies enacted into law, which are the vehicle for reducing greenhouse emissions and for capturing other benefits. A regulation to control transportation-related sources of PM_{10} is an example of such a policy, since it would produce both health and climate benefits. While the policy is the vehicle for capturing multiple benefits, the strategy sets forth the structures, mandates and tools that enable co-benefit policies to be developed.

The need for integrated co-benefit strategies is clear: human-induced warming of the planet is producing changes to the environment that may threaten human health and welfare. Rapid reductions in emissions of greenhouse gases and other climate forcing agents are necessary to mitigate and hopefully

* *wkh1@york.ac.uk*

forestall these dangerous changes to the environment. At the present moment a window of opportunity exists to take action to successfully mitigate climate change.

The global challenge of mitigating climate change is to enforce reductions in emissions produced by independent stakeholders within a narrow window of time. But policy change is made by governments and their officials who express widely varying interests. In Asian metropolitan regions, only a handful of local governments have developed a climate action plan, and yet these urban regions are the largest sources of greenhouse emissions compared to their rural counterparts. This points to the low priority for action to mitigate climate change compared to other issues, and it may also indicate the absence of appropriate knowledge and resources. Even more important, these regions are significant sources of future greenhouse emissions estimated to result from projected economic growth, so action here is critical. They and others are open to creative ways to reduce greenhouse emissions, but not to slow economic growth, so policies that satisfy both interests are more likely to be enacted. Specific actions may be synergistic with climate goals, such as the dieselization of vehicle fleets, but if these are too narrowly written, they may produce unnecessary tradeoffs, such as an increase in PM emissions. The urgency of the need to mitigate dangerous climate change motivates the search for integrated strategies that will bring new resources and greater initiative to achieve climate change goals.

There is an important distinction to be made between two approaches to leveraging these synergies. One is through an atmospheric chemistry lens where the interactions of individual climate forcing agents also interact with the human body and are the target of public health goals. For example, tropospheric ozone is a target for public health and other objectives to reduce the incidence of asthma and other unwanted health outcomes, and it is also a significant non-CO_2 climate forcing agent. At the level of atmospheric chemistry, this example shows how integrated strategies can target synergies to capture benefits for climate and health.

The other consideration is what the multiple benefits are of controlling a specific emission source, as opposed to an individual gas or particle. A source-based emission control policy makes available a potentially broader set of co-benefits. For example an economic development plan in a rapidly growing country that switches to natural gas-powered electrical generation from coal-fired generation.

The desire for rapid action is not limited to advocates for controls on greenhouse gas emissions. Advocates for stronger economic development and improvements in public health are just as interested in these synergies. In various regions of the world, the relative importance of the benefits of emission controls will vary, and the motivation for policy action will have different sources.

There is a pattern in the type of non-climate benefits that are attractive to national governments. In developed nations and regions, public health and climate are commonly grouped together while economic development is discussed in passing. In other regions, particularly rapidly developing ones in Asia, public health resonates as a co-benefit, but economic development is a stronger motivator for action. The state of economic development of a country appears to influence the types of co-benefit policies that are attractive and viable.

The primary challenge for policy makers is to develop, analyze and implement an integrated strategy that captures all of these benefits in a way that moves policy forward.

2. Elements of an integrated strategy

Broadly speaking there can be two components to an integrated strategy. The first is the framework or structure that sets the boundaries for policymaking and that guides policy development down a specific path. This can be in the form of legal mandates, executive orders, regulatory structures and other mechanisms that focus the development of policy. The second are the tools necessary to analyze new and potential policy. These include but are not limited to the scientific knowledge base for identifying opportunities and the integrated assessment tools for evaluating policy scenarios. We draw from different examples taken from the experience of governments around the world to suggest what some of these frameworks and tools might be.

2.1. Need for high level political support

The Indian Prime Minister Manmohan Singh announced to the public on June 30, 2008 the National Climate Action Plan for India which outlines eight national missions intended to redirect economic development down a more sustainable path. It specifically outlines a co-benefits approach designed to achieve development goals and climate goals simultaneously. This type of high-level document provides the political support necessary to focus on policies that capture multiple benefits. It signals the potential access to additional resources for such an approach, encourages (and may mandate) unmotivated officials to adopt this approach and it coordinates action among jurisdictions that may not be coordinated otherwise.

Political support can come not just from the executive, but also the legislative branch of government. An example of this is the Global Warming Solutions Act of 2006 passed by the State of California, which sets forth a timeline for bringing statewide emissions into compliance with goals set forth by a previous order of the state governor. This legislation requires that analysis of climate issues also take into account health and economic issues, and *vice versa.* The requirement reflects the prominent place that environ-

mental justice concerns have in the state. As a mandate it ensures proper accounting of co-benefits and prompts decision-makers to adopt policies to capture these.

2.2 Criteria for project selection

An integrated strategy can include specific criteria for project selection just as much as it can contain broad mandates and aspirational goals. The Asia-Pacific Gateway for Climate and Development invests in mitigation strategies in Asian countries that achieve climate and economic benefits. This co-benefits approach to climate change mitigation requires that projects receiving its economic development funds achieve some type of GHG reductions below the business-as-usual projection. As a simple criterion, this sets down limits for the types of projects selected and focuses the initiative on producing multiple beneficial outcomes.

2.3. Structural integration to improve communication

The framework for developing integrated policies can take the form of a structural change within an organization. An example of this exists in the UK at the Department of Environment, Food and Rural Affairs (DEFRA). Dr. Martin Williams, who heads the air quality division, has successfully integrated the climate and air quality divisions so that conversations and interactions take place formally and informally. This structural approach facilitates a level of communication that captures synergies in the work of the two offices. Therefore, an element of an integrated strategy can be this structural integration of mutually reinforcing activities to capture co-benefits in policy making.

2.4. Developing principles to define an integrated strategy

It is possible to structure the work of a legislative official or a regulatory agency based on a set of principles that define an integrated strategy. One example is the Bellagio Memorandum on Motor Vehicle Policy, which structures the best practices approach to regulatory policy of the International Council on Clean Transportation. This was agreed upon at a meeting of transportation experts and regulatory officials representing each of the major motorized nations. There are 43 principles divided into five broad categories. The following is a selection of 5 overarching principles which could set the framework for an integrated strategy on transportation policy:

1. Design programs and policies that reduce conventional, toxic and noise pollution and greenhouse gas emissions in parallel...

2. Base policies solely on performance compared to societal objectives, and deny special consideration to specific fuels, technologies, or vehicle types.

3. In both industrialized and developing countries, expect and require the best technologies and fuels available worldwide...

4. Use combinations of economic instruments and regulatory requirements; make related policies complimentary.

5. Treat vehicles and fuels as a system, and move toward standards based on life-cycle emissions in policies.

2.5. Tools for developing, evaluating and comparing integrated strategies

Finally an integrated strategy should contain the necessary tools to develop, evaluate and compare integrated policies. Here are some examples of tools that an integrated strategy may contain.

2.5.1. Time horizons

From an air quality perspective, it is typical for a regulatory standard to set goals for improvement on the order of three to five years. However, climate goals operate on much longer time frames, on the order of 50 to 100 years due to the lifetime of gases and the time necessary to observe climate changes. One tool for designing policy is the alignment of time frames for regulating short and long-lived gases. The Kyoto Protocol uses time frames on the order of centuries to compare climate forcing gases. Conventional pollutants regulated for their health impacts could be evaluated based on their progress toward a 100-year goal as well. At the same time, certain short-lived climate forcing gases produce immediate impacts, like black carbon and ozone. These are better evaluated on 20-year time horizons, so this shorter time frame could be useful for comparing both short and long-lived greenhouse emissions to conventional air pollutants.

2.5.2. Assessment tools

Integrated assessments are necessary to identify and to evaluate potential policies. An integrated strategy should facilitate these types of assessments with the use of tools developed to perform them. Examples of integrated assessment tools are the Greenhouse Gases and Air Pollution Interactions and Synergies (GAINS) Model and the US EPA Integrated Environmental Strategies (IES) framework for analyzing co-benefits. These provide technical and model-based processes for evaluation that are useful for comparing and evaluating potential co-benefits policies. Analysis and control of emission sources focuses on tailpipe or end of pipe measures, these do not characterize the full emissions of a project or activity. Life-cycle analysis captures the full spectrum of emissions produced by such an activity and is a more useful, albeit more complex, tool for evaluating a specific project or policy.

2.5.3. Metrics (i.e., GWP, GTP)

A tool for evaluating the climate forcing impacts of two or more greenhouse gases is the Global Warming Potential, a metric developed and used under the Kyoto Protocol to facilitate analysis and comparison of mitigation projects. The tool is limited in its applicability to non-Kyoto climate forcing agents because of its singular application to long-lived and well-mixed greenhouse gases, which does not characterize short-lived climate forcers like tropospheric ozone. A metric that can compare short-lived and long-lived climate forcers would better facilitate analysis and comparison of mitigation measures addressing Kyoto and non-Kyoto gases. An integrated assessment should also include metrics that can compare economic and health impacts as well as climate impacts. The absence of such metrics leaves out these important co-benefits from the analysis.

3. Challenges to developing and applying integrated strategies

3.1. Conflicts between climate and air pollution goals

In the process of developing integrated strategies, there will be situations when climate and non-climate goals (like air pollution) will conflict. One example from the transportation sector is the application of strategies to reduce diesel emissions from heavy-duty vehicles. These vehicles are a substantial source of particulate matter emissions linked to premature death, cardiovascular disease and other negative outcomes. A very effective technological strategy, the use of diesel particulate filters (DPFs), can eliminate these emissions almost entirely and save potentially hundreds of thousands of lives if used appropriately. From a public health perspective DPFs are an essential tool for reducing transportation emissions, but some have raised the concern that these will reduce fuel efficiency, increasing emissions of carbon dioxide. Not all are convinced that such a CO_2 penalty exists, but regardless of the outcome of the debate, **how should a decision maker navigate between climate and non-climate goals when confronted with a potential tradeoff?**

There are two examples of ways to deal with a conflict like this. In the UK, where climate and air quality are regulated under the Department for Environment, Food and Rural Affairs (DEFRA), these tradeoffs are negotiated. For example when a policy choice requires a tradeoff between climate and non-climate goals, a choice in favor of one is made and at the next opportunity, the other goal is favored. As each conflict arises, climate and air quality officers negotiate a solution that achieves their respective goals in the long term.

In the State of California, the Air Resources Board which historically has been responsible solely for regulating emissions to protect public health, now finds itself responsible for planning and implementing the state's climate change mitigation plan. The agency finds itself pursuing two objectives simultaneously, but its historic role in regulating emissions for air quality remains its defining characteristic. Some in the organization have taken the position that its air quality mission will always supersede its climate change goals. The culture and history of the organization frame its focus on public health in a way that prioritizes this over other goals.

3.2. Limited scientific or technical information

The development of appropriate policies begins with a scientific basis for action. This knowledge defines how individual gases and particles are associated with climate and non-climate outcomes and how they should be controlled. But in the absence of this knowledge, or if this is not fully developed, a barrier exists to policy development. **Which of the climate forcing gases and particles lack sufficient scientific basis to develop policy? Which have a sufficient basis to support policy development?**

Even when there is a strong scientific basis for policy development, there may be difficulty developing and applying appropriate policies. For example there is a strong scientific basis for action to mitigate the climate forcing of tropospheric ozone, but given its many precursor gases, the sources of these gases, and the complex nature of its chemistry, policies must coordinate reductions of emissions across time and space. Metropolitan areas have had some success by targeting the ozone precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), so ozone is not immune to policy intervention. However background tropospheric ozone poses a more challenging problem. **What are some of the challenges to developing and applying integrated strategies to control tropospheric ozone and other gases?**

3.3. Poor communication or mis-perception of knowledge

The perception or misperception of knowledge can obstruct policy development. This is an important barrier where certain stakeholders must be involved in the process. When the issue relates to scientific knowledge, there may be instances where poor communication of the synergies and interactions between climate and non-climate goals are so complex that they are difficult to communicate. For example, despite the co-benefits of controlling non-Kyoto greenhouse emissions, there were and continue to be some stakeholders who challenge the idea that this policy goal will achieve much climate benefit. **How are scientific knowledge and policy opportunities best communicated to stakeholders?**

3.4. Absence of analytical tools

Sophisticated policies require tools to evaluate different technological and policy scenarios and their

climate effects. Some may be fully developed and tested, but it is not clear whether these are all that are needed to tackle all greenhouse emissions. For various reasons these tools may not be available, and this is a challenge to policymakers interested in large-scale policy evaluations. If a tool is available, but disagreement exists about its methodology, data, etc., this conflict can stall the evaluation. And if a tool exists and is available, but resources to perform the analysis are scarce, then the tool is of no use. Various scenarios around the application of an integrated assessment tool may play themselves out among those pursuing an integrated strategy. The availability of a proper tool, the resources to apply it, and agreement about its function are just a few of these challenges. **Do we have all of the analytical tools we need for developing integrated strategies? What are the limitations of such tools?**

3.5. Weak or non-existent political strategy

Public support is essential to the success of any policy, so a political strategy is necessary to communicate the need for action and gain this support. Integrated strategies that have multiple goals can broaden the base for support, but pose a challenge to communication efforts. Integrating multiple strategies around a single focused theme or goal can be an effective communication tool for mobilizing public support around climate mitigation strategies. The keys to a strong political strategy are finding a central emphasis for the integrated effort and communicating this to the public at the appropriate time. **How should a strong political strategy on co-benefits be structured?**

3.6. Poor communication between departments

Not only is it important to communicate policy goals to the public, but also the communication between departments or regulatory entities that have jurisdiction over climate goals requires structuring. One element of integrated strategies discussed above is the structure of communication between climate and health divisions within a government department or regulatory agency. Certainly the absence of an integrated structure does not imply the absence of integrated communications, but to the extent the structure facilitates communication, the absence of structure can be a challenge to integrated strategies. In the U.S. State of California, the Governor established a Climate Action Team (CAT) to minimize mis-communication between departments. The CAT contained representatives of major regulatory bodies to coordinate their actions to achieve stated climate goals. This facilitated, for example, an interface between air quality and waste management agencies around the goal of controlling VOCs from composting. These are important conversations that this type of interaction can facilitate. Without appropriate integration and communication, opportunities for integrated policy action are lost. Over the long term, the holistic approach that this type of integrated structure offers is needed more and more. **What are ways to avoid mis-communication between stakeholders?**

3.7. Absence of resources and political support

There can be political challenges to integrated strategies that stem from poor communication to policy makers. Their support is necessary to gain access to resources necessary for policy development, and to gain some early support for implementing policies that are ultimately developed. Some times this support takes the form of a legislative action or executive order, but this is not necessary in all instances. Whatever the form, the absence of political support can stifle policy development oriented toward integrated strategies. **How do we build strategies to solicit and maintain this support?**

4. Conclusions and questions to guide discussions

There are many significant barriers to enacting concrete, simultaneous, and global reductions of climate forcing emissions. Strategies that integrate climate with air pollution controls can offer a plan of action for policy makers at all scales of government – local, regional, national and international – to overcome these barriers and achieve more rapid greenhouse emission reductions than might otherwise be possible.

To date, there have been mostly limited efforts at the various scales to integrate climate and air pollution policy. Current policy frameworks for air pollution and climate change are often not well suited to co-operation and integrated approaches. For example, air pollution control strategies are often undertaken at local levels and do not include the 50-year planning horizons in which strategic options for climate mitigation are regularly addressed. Also, it can be difficult to compare strategies without metrics that can compare short-lived and long-lived climate forcers addressing Kyoto and non-Kyoto gases.

There are also a variety of other institutional, cultural and technical challenges to successfully integrating climate and air pollution policies at various scales. These include potential conflicts between climate and air pollution goals in certain cases; organizational/bureaucratic constraints; lack of political support and poor communication.

Following is a set of possible questions that could be discussed during the session on how integrated co-benefit strategies can be developed and applied. These strategies are an important mechanism for grouping climate and non-climate goals, and they may permit more rapid policy action to mitigate climate change, but there may be some challenges to implementing these types of strategies effectively.

Implementation

- Where have integrated assessment strategies been successfully implemented to date? What has led to their successful development?
- What kinds of strategies (e.g. ozone, methane, demand side management) are known to successfully promote climate and air pollution co-benefits?
- What information is needed in developing countries to promote the cost savings associated with co-benefits approaches?
- How are scientific knowledge and opportunities best communicated to policy makers and various stakeholders?
- What are some successful ways of soliciting and maintaining political support for co-benefits strategies?

Challenges

- What are ways to help decision makers navigate between climate and non-climate goals when confronted with a potential tradeoff (e.g. PM health effects and climate)?
- What are some of the challenges to developing and applying integrated strategies to control tropospheric ozone and other gases?
- How can we promote the results of integrated assessments to policy makers at all levels?