BRIEFING PAPER:

Co-Benefits Of Integrating Climate Change Adaptation And Mitigation In The Canadian Energy Sector

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Overview

Canada has committed to the rapid implementation of climate change commitments that will reduce carbon emissions (i.e. mitigation), reduce the nation's vulnerability to environmental impacts (i.e. adaptation), and build a new "green" economy. Mitigation and adaptation have traditionally been approached and implemented as separate processes; however, the cost, speed, and scale of needed climate solutions suggest that an integrated approach to climate change that combines the two - referred to here as low carbon resilience (LCR) - has advantages compared to approaches that separate them.

This briefing paper presents the results of a research project undertaken by Canadian researchers at the Government of the Yukon Department of Energy, Mines and Resources and the Ontario Centre for Climate Change Impacts and Adaptation Research (OCCIAR) that examined whether integration is occurring in Canada's energy sector, outlines co-benefits that can be achieved through integration that might not occur otherwise, and identifies conditions for success.[1] The results of the research suggest that integration is potentially an effective method to enable desired co-benefits for the energy sector while also addressing adaptation and mitigation.

Integrated Climate Action Co-Benefits in the Energy Sector agreed

- The Canadian energy sector faces a set of unique challenges:
  - Aging infrastructure;
  - Low per capita population separated by long distances;
  - Significant regulatory variability;
  - Significant geographic and ecosystem variability; and
  - Rising energy costs.
- Four co-benefits of low carbon resilience were identified at the outset of this research via a review of climate change action in the energy sector around the world, as follows:
  - **Reduced competition for resources,** whereby invested resources result in more than one service, or more is done with less to reduce demand pressures and provide a surplus.
  - **Reduced influence of scientific uncertainty,**[2] whereby mitigation objectives characterized by fewer variables and shorter timelines offset the uncertainty characteristic of adaptation objectives. Adaptation objectives tend to be complex, difficult to quantify and require lengthier periods to implement compared to mitigation objectives, which tend to be measurable, have fewer variables, and shorter timelines. Energy projects that combine mitigation objectives with adaptation objectives can assist in reducing the long-term uncertainty by contributing measurable metrics and demonstrable results over the short term, thereby increasing the rationale for immediate implementation.
  - **Harmonization of climate change implementation objectives**, whereby the likelihood of unanticipated impacts of adaptation or mitigation actions are reduced. Such unanticipated outcomes can result in "co-harms",[3] which result when uncoordinated climate actions have the opposite effect than what was intended; i.e., either increasing carbon emissions or decreasing resilience.
  - **Improved social license for energy projects,** whereby the social opposition to mitigation projects, which are perceived as providing global-level benefits, may be reduced through the promise of localized benefits attributed to adaptation projects. "Local" relevance typically increases social license compared to "global". For instance, the localized adaptation benefits of a wind project, such as energy self-sufficiency and increased energy security due to independence from

1 Hennessey, Ryan, Jeremy Pittman, Annette Morand, Allan Douglas, "Co-benefits of integrating climate change adaptation and mitigation in the Canadian energy sector". Energy Policy 111 (2017) 214-221. Elsevier Ltd. http://dx.doi.org/10.1016/j.enpol.2017.09.025

2 Scientific uncertainty is created by the assumptions and error that can arise when developing and interpreting climate projections. Uncertainty is inherent to adaptation actions, given the long horizon of such actions, and the limited data upon which to build assumptions. Uncertainty also affects the monitoring and evaluation of outcomes. Mitigation is typically simpler than adaptation on all fronts, and therefore the low carbon resilience approach is able to reduce the speculation associated with implementing adaptation activities.

3 Spencer, B. Lawler, J., Lowe, C., Thompson, L., Hinckley, T., Kim, S., Bolton, S., Meschke, S., Olden, J., and Voss, J., "Case studies in co-benefits approaches to climate change mitigation and adaptation". Journal of Environmental Planning and Management 60(4) (2017) 647-667.

a centralized grid, can result in more community support than the global carbon offsets it also offers because there are tangible benefits that compensate for what may be perceived as negative tradeoffs, such as aesthetic impact. This logic also holds for mitigation projects that provide local benefits – however examples of these were less obvious in the review of case studies.

> *'It may be difficult for community members to perceive the value of mitigation actions alone as the benefits of reducing greenhouse gas emissions are often seen and described in a global context. Adaptation, however, often focuses the benefits at the observable (local) context. As a result, community opposition to energy projects is likely to be less of a factor if both mitigation and adaptation benefits are clearly demonstrated as local as well as global in focus, enabling residents to "think globally and act locally." It is also important to acknowledge that adaptation and mitigation exist on a spectrum, as both have benefits that are local and global, despite mitigation often being characterized as a global benefit and adaptation as a local one.'*

Case Studies

This project featured eleven case studies designed to examine whether and how mitigation and adaptation are being integrated in the energy sector. The researchers examined six Canadian energy projects, three American projects, and two European projects to determine:

- Whether integration was occurring;
- What, if any, co-benefits were present; and
- What circumstances had led to integration where it was present.

Results showed that:

- Integration occurred in all the case studies, albeit for different reasons, and to achieve different outcomes.
- All four of the proposed co-benefits were evident, although which co-benefit was present differed between cases, and none of the case studies demonstrated all four.
- Integration occurred primarily under circumstances where a leader demonstrated sufficient intent to make it happen. Leadership and intent were clearly illustrated as important to integration given the lack of other reasons to integrate climate change.
- A combination of public-private partnerships and energy/climate change policy could also support a clear leader/champion and result in integration.
- The results suggest that integration occurs primarily where a single authority decides that climate change action is necessary. Public-private partnerships and energy/climate-policy can support leadership for climate action by reducing some of the risk of taking action and thereby fostering intent.

The case studies also suggest that:

- Integration was not the objective of the project in many cases. In most instances, project leaders were primarily seeking the identified co-benefits, and integration was the by-product of their actions.
- The co-benefits that were familiar to project leaders tended to be more evident than those related to climate action, which tended to be less well known. For example, conserving resources or harmonized project outcomes were more commonly cited as goals than improving the social license of the project or reducing scientific uncertainty.

The research therefore suggests that integration is a potentially effective method to enable co-benefits for the energy sector, and that purposeful integration would enable energy sector agents to accumulate more co-benefits per project while also taking action on climate change.[4]

Conclusion

In summary, the research shows that the best way for the energy sector to facilitate "purposeful integration" is by supporting leaders, both formal and informal. This support can be provided by reducing the risk leaders take in supporting implementation of innovative approaches such as integrative solutions, and by establishing a positive role for public private partnerships in energy projects that offsets some of the risk to other partners. Both forms of support can be provided through conventional energy policy, specifically:

- Leadership risk can be reduced through incentives, grants and funds that acknowledge the benefits of integrated solutions and provide the means to make them happen.
- Public-private partnerships can be facilitated through market development interventions, feed-in-tariffs, or innovation funds.

Through such policies, the energy sector can benefit from a coordinated approach to accumulating co-benefits through integrated climate action, or low carbon resilience, while the public can benefit from innovative energy projects that result in reduced greenhouse gas emissions, improved climate resilience, and innovative economic opportunities.

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4 The Canadian energy sector closely resembles that of Europe and the US and can therefore derive lessons from work not completed in Canada. International case studies were therefore added to the project to ensure adequate scope for analysis, identify whether Canadian cases were distinct from international ones, and document lessons from international experience applicable in the Canadian context. Full case studies are published in Morand et al. (2015). These case studies provide a robust cross section of energy sector activities at different scales, demonstrating a range of approaches to integration sufficient to enable coding and development of an analytical framework.