LINKING MITIGATION AND ADAPTATION GOALS IN THE ENERGY SECTOR

Demonstrating the Near to Long-Term Benefits of Harmonized Policy Development for Building Climate Change Resilience in the Canadian Energy Sector

Adaptation Canada 2016
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Presentation Outline

• Project rationale

• Characteristics of solutions that integrate adaptation and mitigation in the energy sector

• Identified co-benefits

• Identified case studies

• Demonstrated tools utilized to access co-benefits

• A case for linking mitigation and adaptation

• Synthesized mechanisms and outputs

• Observed Patterns

• Next Steps
Project Rationale

Investigate the synergies between mitigation and adaptation in the Canadian energy sector.

• Define and deliberate characteristics of adaptation/mitigation solutions in the energy sector.
• Determine potential benefits and barriers to implementing such solutions.
Characteristics of ADMI solutions

Identified characteristics of solutions:
- Small scale projects or programs that contribute to resilience.
- Large scale projects or programs that contribute to capacity.
- Solutions will share characteristics based on mitigative and adaptive capacity.

Scale and characteristics supported by theory.
Co-benefits of Integration

Four co-benefits synthesized from academic literature:

1. Reduced competition for resources between end uses.
2. A reduced influence of scientific uncertainty on policy development and implementation.
3. The harmonization of climate change responses with implementation objectives.
4. Increase in the social license of energy projects.
## Canadian Case Studies

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>Lower Churchill Hydroelectric Generation Project</td>
<td>Newfoundland and Labrador</td>
<td>Development of a hydroelectric power generation facility at Muskrat Falls in Labrador will enhance the amount of clean, renewable electricity in the province.</td>
</tr>
<tr>
<td>Hydrogen Assisted Renewable Power (HARP)</td>
<td>British Columbia</td>
<td>The HARP system is a demonstration project that determined the feasibility of storing excess renewable energy in remote communities isolated from the provincial electricity grid.</td>
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<tr>
<td>Climate Change and Emissions Management Fund (CCEMF)</td>
<td>Alberta</td>
<td>Large GHG emitters in Alberta who cannot meet provincial targets contribute to the CCEMF which supports investment in innovation and clean technologies aimed at reducing Alberta’s GHG emissions and improving adaptive capacity.</td>
</tr>
<tr>
<td>First Nations Power Authority (FNPA)</td>
<td>Saskatchewan</td>
<td>FNPA is a not-for-profit corporation that helps build capacity of Saskatchewan First Nations to participate in the province’s power sector.</td>
</tr>
<tr>
<td>Markham District Energy (MDE)</td>
<td>Ontario</td>
<td>MDE is a thermal energy utility owned by the City of Markham and currently operates a number of Combined Heat and Power (CHP) thermal energy plants.</td>
</tr>
<tr>
<td>Independent Power Production (IPP) and Micro-generation Policies</td>
<td>Yukon</td>
<td>The Yukon government’s IPP and Microgeneration Policies outline how electricity will be purchased from independent power producers and how individuals will be allowed to connect renewable energy sources to the grid (micro-generation).</td>
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For full report & case study summaries: [www.climateontario.ca/reports.php](http://www.climateontario.ca/reports.php)
# International Case Studies

<table>
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<tr>
<th><strong>Sustainable Energy Production</strong></th>
<th>Borough of Woking, UK</th>
<th>Woking is one of the most energy efficient local authorities in the UK, spending the last few decades successfully implementing small- and large-scale renewable and sustainable energy projects, including Combined Heat and Power (CHP).</th>
</tr>
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<tbody>
<tr>
<td><strong>Geothermal Power Plant Project</strong></td>
<td>Chena Hot Springs Resort, Alaska</td>
<td>The Chena Hot Springs Resort became the first business in Alaska to install a geothermal power plant in 2006.</td>
</tr>
<tr>
<td><strong>Smart Grid Project</strong></td>
<td>Washington DC, USA</td>
<td>The Smart Grid Project in Washington, D.C. modernizes the electrical grid using new infrastructure such as smart meters, monitors, wires and switches.</td>
</tr>
<tr>
<td><strong>Green Roof Incentives</strong></td>
<td>Basel, Switzerland</td>
<td>A combination of financial incentives and building regulations has helped the City of Basel achieve the highest percentage of green roof area per capita in the world.</td>
</tr>
<tr>
<td><strong>Green Infrastructure Plan</strong></td>
<td>New York, New York</td>
<td>NYC’s Green Infrastructure Plan helps to manage storm-water within the city and meet two overarching goals: better water quality in NYC Harbour and creating a liveable and sustainable NYC.</td>
</tr>
</tbody>
</table>

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Demonstrated Tools that support Integration – Preliminary Conclusions

• **Policy** is important for achieving integrated responses to climate change in the energy sector.

• Strong **leadership** can play an important part in contributing to both adaptation and mitigation.

• Assembling effective **partnerships** is critical for financing technology projects that yield adaptation and mitigation benefits.

• Previous or current energy/cost saving projects can **use funds** to re-cycle back into adaptation and mitigation projects.

• **Investment options** will create opportunities for adaptation and mitigation.

• A strong **business case** helps incent both adaptation and mitigation goals into energy sector projects and policies.
A Case for Linking Adaptation and Mitigation

- Results from the case studies suggest that the energy sector is currently accumulating co-benefits from the interfaces suggested by the literature.
- Some observations:
  - In most cases, co-benefits of linking adaptation and mitigation were not well understood in advance of project implementation.
  - While some co-benefits were derived from projects, the potential benefits were not necessarily optimized to the extent possible.
  - Adaptation was less emphasized in the case studies than mitigation.
Synthesized Mechanisms and Outputs

• Integration is occurring but a clear rationale is not evident.

• To investigate this relationship further the various tools were synthesized into four input variables: policy, public-private partnerships, leadership; and intent.

• Five output variables were proposed based on research: harmonization of objectives, increased social license, strength of integration, reduced competition for resources, and reduced influence of uncertainty.

• Further research is investigating these pathways using the Qualitative Comparative Analysis Methodology.
Observed Patterns

Preliminary results suggest:

• Integration is occurring under conditions of weak governance defined by a lack of policy.

• Policy is important but other factors (PPP, intent, or leadership) have compensated for weak policy where outcomes are observed.

• These factors are strongly associated with outcomes that are relatively well understood (harmonization of objectives and social license).

• The influence of inputs becomes weaker where outcomes are less immediate or tangible (reduced competition for resources and reduced influence of uncertainty).

• The influence of inputs breaks down entirely where benefits are theoretical (strength of integration).
Next Steps

Over the next few months we will work to:

• Confirm observed patterns of integration under conditions of weak governance via QCA analysis.

• Discuss the consistency and empirical significance of the patterns and provide enhanced rationale and role for integration in the energy sector.

• Provide recommendations (communication, informed policy/planning, and incentives) to support the energy sector in taking action on climate change. Integration should improve the effectiveness of actions.

• Work with other sectors to evaluate the empirical relationships proposed. Scale of projects, programs, and benefits increase if applied in other sectors such as agriculture, infrastructure development, and forestry.
Thank you and Questions

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