New England Governors and Eastern Canadian Premiers (NEG/ECP)
Regional Climate Change Action Plan Development
In response to NEG/ECP Resolution 39-1 Concerning Climate Change

Regional Strategies, Policies and Measures
Potential Options for Consideration

Overview

This document contains the full set of potential actions for the eleven jurisdictions of the NEG/ECP region to consider for inclusion in a 2017 *Regional Climate Action Plan*.

The items included were identified during 2016 by staff from the NEG/ECP region[1] and are intended to be vetted through a more an inclusive, collaborative process in the first half of 2017. This process will take advantage of recent and concurrent climate and energy planning within Canada and the US as well as by individual states and provinces.

As part of this process subcommittees will review sections of this document identify those environmental, transportation and energy strategies, policies and measures [2] whose implementation at the regional level will make possible the economy-wide GHG reductions needed for the NEG/ECP region to achieve the 2030 GHG emissions reduction marker range of 35–45 percent below 1990 levels as well as the 2050 target.

The discussions among the sector specific subcommittees will be monitored in order to assure coordination among interrelated recommendations occurring cross-sector.

Background

During 2016, the NEG/ECP committees formed a temporary "Staff Working Group" (SWG) to address the collaborative, cross-sector directives of *Resolution 39-1*. The SWG worked during the first half of 2016 to consider current commitments and initiatives within the region, existing external plans and agreements, as well as additional regional opportunities to accomplish this directive. The SWG, with the review and approval of the standing NEG/ECP committees, identified six broad categories to advance regional GHG emissions reduction actions.

1. **Cross-Cutting:** Options that affect multiple sectors
2. **Government Leadership by Example:** Options that reduce GHG emissions from government facilities, fleets and operations
3. **Energy Supply and Transmission:** Options that deal with centralized electricity generation, the transmission of electricity and natural gas, and delivered heating fuels
4. **End-Use and Distributed Energy:** Options that focus on increasing energy efficiency and conservation, and distributed energy resources in buildings and industry (thermal and electric)

[1] Each item was included: within the 2016 Interim Work Plan or the 2016 Strategic Framework, which were both shared with the Governors and Premiers; or an "Expanded Framework," which contained a laundry list of more specific items that were tabled until this phase.

[2] Such efforts would complement efforts at the state, provincial and federal levels.

5. **Transportation:** Options that address transportation choices and accessibility, vehicle technology and fuels
6. **Natural Resources:** Options that enhance the amount of carbon being captured and stored in agricultural and forested lands and other natural systems, and that encourage sustainable materials management

Within each of these categories, the SWG identified a series of high-level options that describe opportunities for the states and provinces to consider implementing, as a region, in order to make progress towards achieving the regional GHG emissions reductions targets. The options were used to develop two documents that demonstrate progress towards meeting the directives contained in *Resolution 39-1*: 1) an *Interim Climate Change Work Plan* (Appendix 1), which describes projects and initiatives the NEG/ECP committees will pursue over the coming year; and 2) a *Strategic Framework* (Appendix 2), which will serve as the foundation for the development of a *Regional Climate Change Action Plan* to be submitted to the NEG/ECP at its 41st conference in 2017. The regional climate change plan will be developed following more robust qualitative and quantitative assessment of options by the SWG, working under the COE, in coordination with the NICE, TAQC and CCSC, and relying on available technical resources.

Next Steps

During 2017, the majority of the planning work will fall to a temporary ad-hoc Staff Working Group (SWG) and five topic-based subcommittees (Topics 2-6 below). These ad-hoc teams will be tasked with developing a list of potential actions that will, when implemented at the regional level, make possible the GHG emissions reductions needed for the NEG/ECP region to achieve its near and long-term GHG emissions reductions goals (*e.g.*, 35-45% reduction by 2030).

The SWG will monitor the subcommittee discussions and the stakeholder input and coordinate among interrelated discussions and recommendations as needed.

Overarching Sector-Based Options

The six GHG emissions reduction categories were selected by the SWG not only to organize the overarching options and more specific potential actions that were discussed over the past several months, but also to ensure that the effort was taking a holistic view and considering the full range of opportunities available across the region. The categories, therefore, allowed the SWG to organize the potential options in order to accurately compare the options to one another and to identify additional emissions reduction strategies that were not yet represented. The following category descriptions are intended to provide clarity as to the nature of the issues they address.

1. **Cross-Cutting:** Options that affect multiple sectors

Existing Target:
Reduce overall energy use by at least 20 percent below "business as usual scenarios" by 2020 by targeting all sectors of the economy including the residential, commercial, institutional, industrial and transportation sectors.[3]

The resolution directed that the *Regional Climate Change Initiative* identify strategies, policies and measures across the energy, transportation and natural resource sectors. While each sector has many unique attributes, the sectors are interconnected to one another in a number of ways. There are options that have been identified for the work plan and for future evaluation that affect multiple sectors simultaneously and, therefore, were best placed in a broad category.

Regional Option Example – Showcase and enhance research and innovation in low- and zero-carbon technologies and processes and take advantage of economic opportunities offered by the emerging low-carbon economy.

2. **Government Leadership by Example:** Options that reduce GHG emissions from government facilities, fleets and operations

Existing Target:
Reduce end-use GHG emissions due to state and provincial government activities and operations by 25 percent below the 2001 level by 2012.[4]

The options within this category include not only the actions that the state and provincial government may take to manage their operations, but also the opportunity to tell the region's story. The NEG/ECP jurisdictions, in collaboration, have an opportunity to demonstrate the benefits of climate action in general and coordinated action at all scales. Due to the size of its collective economy, as well as its diverse range of intranational and international cross-border relationships, the jurisdictions can set an example for their own residents, businesses and corporations, as well as for other states and provinces, and for other nations.

[3] NEG/ECP Resolution 34-3, 2010.

[4] NEG/ECP (2001). Climate Change Action Plan 2001, New England Governors/Eastern Canadian Premiers, https://www.novascotia.ca/nse/climate.change/docs/NEG-ECP.pdf.

Regional Option Example – Coordinate efforts to reduce GHG emissions associated with government operations through fleet management, building energy use management and low-carbon energy supply.

3. **Energy Supply and Transmission:** Options that deal with centralized electricity generation, the transmission of electricity and natural gas, and delivered heating fuels

Existing Target:
Pursue an increase in the region's renewable energy generation capacity by 10 percent over 2006 levels by 2020.[5]

This category looks broadly at the opportunities related to energy supply that may best be viewed at the regional level. This includes a focus on decarbonizing the electricity generation sector through the management of large, centralized electricity generation facilities as well as on efficiency improvements that may be possible with respect to transmission and distribution of electricity and energy in general. The category further reflects opportunities that may exist to expand the availability of low- and zero-carbon heating options across the region.

Regional Option Example – Enable the integration of an expanding range of energy sources and technologies (*e.g.*, energy storage, renewable generation) in order to decarbonize the electricity sector.

4. **End-Use and Distributed Energy:** Options that focus on increasing energy efficiency and conservation, and distributed energy resources in buildings and industry (thermal and electric)

Existing Target:
Reduce overall energy use by 20 percent in homes, buildings and industry compared to "Business As Usual" by 2020.[6]

This category focuses on opportunities to reduce energy demand and consumption at the regional level through energy efficiency and conservation and through distributed generation at the site level. Included are opportunities to: reduce overall energy use in homes and businesses and by industry through improved building envelope, efficient appliances and building operations; and increase the amount of smaller-scale distributed energy resources, such as combined heat and power and renewable energy.

Regional Option Example – Coordinate adoption of standards and energy codes, to the extent feasible, to increase the efficiency of new construction (and major refurbishment) in residential and commercial buildings.

5. **Transportation:** Options that address transportation choices and accessibility**,** vehicle technology and fuels

[5] NEG/ECP (2006). *Resolution 30-2*: Resolution Concerning Energy, 30th Annual Conference of the New England Governors and Eastern Canadian Premiers, Newport, RI, May 11-12, 2006, http://www.cap-cpma.ca/images/CAP/30-2%20Energy%20E.pdf.

[6] NEG/ECP (2006). *Resolution 34-3*: Resolution Concerning Energy Efficiency, 34th Annual Conference of the New England Governors and Eastern Canadian Premiers, Lenox, MA, July 11-13, 2010, http://www.cap-cpma.ca/images/CAP/Resolution%2034-3%20Energy%20Efficiency.pdf.

Existing Target:

Work toward achieving throughout the region a five percent regional fleet-market-share penetration of alternative fuel vehicles by 2020 and facilitate the availability of refueling stations to support those vehicles.[7]

The transportation category includes all aspects of the transportation sector, including on-road and non-road vehicles, freight and passenger rail, and marine and aviation equipment. Strategies include both a transition to new technologies and improvements to the efficiency of existing transportation systems. Due to the increased interest in vehicle electrification and in the reduction in the carbon intensity of transportation fuels, there is a growing connection between this category and the Energy Supply and Transmission category above.

Regional Option Example – Promote the transition to low-carbon fuels, zero emissions and low-carbon emission vehicles and charging corridors and networks.

6. **Natural Resources:** Options that enhance the amount of carbon being captured and stored in agricultural and forested lands and other natural systems, and that encourage sustainable materials management

The category reflects the growing understanding that the region's natural ecosystems, such as forests, wetlands salt marshes, and sea grass beds, contain vast reservoirs of carbon and may have the potential to store even more. Human managed landscapes such as working agricultural and forest lands also serve as carbon reservoirs, and often have additional storage potential. These same wilderness and managed lands make communities more resilient to expected climate impacts such as sea level rise and inland flooding, and support local economies centered on agricultural and forest products, tourism and recreation. By protecting and appropriately managing these areas, the region may be able to maintain and enhance the carbon they store, complementing other efforts to reduce GHG emissions from fossil fuel combustion and industry. In addition, this category also reflects opportunities to reduce the life-cycle GHG emissions associated with the manufacture, use and disposal of products and food by residents, businesses and industry.

Regional Option Example – Encourage adoption of forestry practices that maintain and increase forest carbon storage as part of the development and promotion of sustainable forest programs.

[7] NEG/ECP (2013). *Resolution 37-3*: Resolution Concerning Transportation, 37th Annual Conference of the New England Governors and Eastern Canadian Premiers, La Malbaie, Quebec, September 8-9, 2013, http://www.cap-cpma.ca/images/ECP%20Documents/NEG-ECP%20Resolution%2037-3%20Transportation%20EN.PDF.

Sector Specific Options

1. Cross-Cutting: Options that affect multiple sectors

Existing Target:

Reduce overall energy use by at least 20 percent below "business as usual scenarios" by 2020 by targeting all sectors of the economy including the residential, commercial, institutional, industrial and transportation sectors.[8]

1.1. Maintain a regional economy-wide GHG emissions inventory using consistent and accepted methods and report annually on progress towards achieving the regional GHG markers and targets.

1.1.1. Continue to update the regional GHG inventory annually, including transportation GHG information and performance indicators gathered at a state, provincial and national level.[9]

1.1.2. Include GHG emission projections in the regional GHG inventory and report on regular basis on the forecasts in order to guide and orient regional emission reduction options to meet or exceed the NEG/ECP GHG markers and targets.

1.1.3. Identify and report on a series of metrics and performance indicators, beyond GHG emissions, which can be consistently tracked and reported on and which will allow the broader impact of GHG-emission reductions to be understood and communicated.

1.2. Showcase and enhance research and innovation in low-carbon technologies and processes and take advantage of economic opportunities offered by the emerging low-carbon economy.

1.2.1. Inventory existing green financing mechanisms (GFM) and examine the feasibility of creating a regional or intranational green innovation fund, including options for financing tools to bring green innovation to scale.

1.2.2. Conduct a Green (low-carbon) Innovation "connector event", which brings businesses, researchers and venture capitalists together to develop early insight, build partnerships and foster access to potential investment.

1.2.3. Collaborate with academic institutions and business associations to synchronize research with business needs.

1.3. Work collaboratively toward compatible policies, standards and targets (to the extent possible) among the individual jurisdictions.

1.3.1. Work with federal governments to seek additional national solutions, including, but not limited to, emission standards, market-based instruments, funding and cooperative agreements.

1.3.2. Collectively incorporate the social and environmental cost of carbon into all governmental calculations of energy cost, including those in strategic planning for energy, jurisdictional decisions on energy procurement, and energy program development.

[8] NEG/ECP Resolution 34-3, 2010.

[9] Potential performance indicators: Total GHG, GHG by sector, energy usage, and fuel consumption.

1.4. Maintain a leadership role in North America in the development of market-based programs designed to create clean growth economic opportunities for the region and enhance its overall competitiveness nationally and internationally.

1.4.1. Track, understand, and help coordinate efforts, where practical, to link to emissions trading programs planned and underway within the region (*e.g.*, RGGI, TCI, WCI)and among other jurisdictions.

1.4.2. Estimate cumulative GHG reduction benefits for 2030 from existing trading programs.

1.4.3. Work with both RGGI and the WCI to identify and assess issues and opportunities associated with linking existing carbon markets.

1.4.4. Initiate a regional economic analysis on the benefits and opportunities related to the carbon pricing mechanisms and how it can help the region meet or exceed the regional GHG reduction markers and targets.

1.5. Promote a dialogue among environmental organizations, electric utilities, major energy users, and non-governmental organizations to foster a shared understanding of the impacts of energy use on climate change and enable more consistent messaging and communication regarding solutions.

1.5.1. Identify a list of NGOs, energy users and others, with whom to collaborate in the future on this.[10]

1.5.2. Begin to examine and seek to align marketing, education and outreach best practices that most effectively convey the importance of this issue to citizens in each province and state.[11]

1.5.3. Compile and share communication materials about GHG emissions labeling in different economic sectors (*e.g.*, vehicles and mobility choice, appliances, building performance).

1.5.4. Harmonize GHG emissions labeling, where possible, to allow citizens, businesses, counties, and municipalities to develop their own awareness and educational initiatives.

[10] Modified from: NEG/ECP (2013). 2013 Regional Climate Change Action Plan Blueprint, 37th Annual Conference of New England Governors and Eastern Canadian Premiers, Charlevoix, Québec, http://coneg.org/data/documents/2013%20Blueprint%20Final.pdf.

[11] Modified from: NEG/ECP (2013). 2013 Regional Climate Change Action Plan Blueprint, 37th Annual Conference of New England Governors and Eastern Canadian Premiers, Charlevoix, Québec, http://coneg.org/data/documents/2013%20Blueprint%20Final.pdf.

2. Government Leadership by Example: Options that reduce GHG emissions from government facilities, fleets and operations

Existing Target:
Reduce end-use GHG emissions due to state and provincial government activities and operations by 25 percent below the 2001 level by 2012.[12]

2.1. Work collaboratively, where practical, to reduce GHG emissions associated with government operations through fleet management, building energy use management and low-carbon energy supply.

2.1.1. Develop a consistent methodology and protocol that can be used to produce a GHG emissions inventory for government operations (*i.e.*, emissions from state and provincial fleets and owned and occupied buildings) that will measure progress and showcase the results of actions taken over time.

2.1.2. Evaluate and report on the 2012 public sector GHG emissions goal in preparation for proposing 2020 and 2030 goals/targets in the future.

2.1.3. Set new 2020 and 2030 goals for reducing end-use emissions from this sector.

2.1.4. Establish regional alignment of high-energy performance benchmarking for all publicly funded new construction and major renovations.

2.1.5. Implement energy assessment as a consideration in project assessments for public buildings.

2.1.6. Align and/or upgrade jurisdictional policies on sustainable building design to be applied to all government construction and renovation projects.

2.1.7. Coordinate minimum emission standards and fuel economy requirements for state/province light duty vehicle fleets.

2.2. Highlight the region's leadership through collaborative reporting and communication.

2.2.1. Develop and maintain an inventory of climate change-related activities and plans within the region.[13]

2.2.2. Develop a report on a series of metrics that showcase the achievements of the individual states and provinces and of the region as a whole in addressing climate change.[14]

2.2.3. Develop a consistent means to use the ECP and CONEG websites to showcase the progress and plans of the region and individual jurisdictions related to climate change mitigation and adaptation.[15]

2.2.4. Produce a regular report showcasing the achievements of the NEG/ECP region in order to highlight the leadership role of the states and provinces in tackling climate change.

[12] NEG/ECP (2001). Climate Change Action Plan 2001, New England Governors/Eastern Canadian Premiers, https://www.novascotia.ca/nse/climate.change/docs/NEG-ECP.pdf.

[13] NEG/ECP (2013). 2013 Regional Climate Change Action Plan Blueprint, 37th Annual Conference of New England Governors and Eastern Canadian Premiers, Charlevoix, Québec, http://coneg.org/data/documents/2013%20Blueprint%20Final.pdf.

[14] NEG/ECP (2013). 2013 Regional Climate Change Action Plan Blueprint, 37th Annual Conference of New England Governors and Eastern Canadian Premiers, Charlevoix, Québec, http://coneg.org/data/documents/2013%20Blueprint%20Final.pdf.

[15] NEG/ECP (2013). 2013 Regional Climate Change Action Plan Blueprint, 37th Annual Conference of New England Governors and Eastern Canadian Premiers, Charlevoix, Québec, http://coneg.org/data/documents/2013%20Blueprint%20Final.pdf.

2.2.5. Update the ECP and CONEG web platforms in order to highlight actions taken in the region as well as showcase regional and individual mitigation and adaptation measures and action plans.

2.2.6. Highlight the region's activities and achievements in climate change mitigation in forums in North America and worldwide in order to raise awareness and increase economic and political opportunities and benefits throughout the region.

2.2.7. Align efforts and targets across region to convert public buildings to cleaner energy and to phase out the use of heavy fuel oil in public buildings and replace it with cleaner-burning fuels.

3. Energy Supply & Transmission: Options that deal with centralized electricity generation, the transmission of electricity and natural gas, and delivered heating fuels

Existing Target:

Pursue an increase in the region's renewable energy generation capacity by 10 percent over 2006 levels by 2020.[16]

3.1. Expand the regional supply of utility-scale renewable energy in order to reduce the carbon intensity of the region's average electricity generation.

3.1.1. Evaluate and report on the progress towards the 2020 renewable generation goal in preparation for proposing a 2030 goal/target for increasing the generation of renewable energy.

3.1.2. Develop an inventory of NEG/ECP jurisdictions' existing utility-scale renewable energy programs and goals for electricity.

3.1.3. Establish a 2030 regional targets for utility-scale (?) renewable energy. Establish goal for increased renewable energy generation capacity.[17]

3.1.4. Coordinate and harmonize RPS programs; estimate regional GHG reductions.

3.1.5. Estimate collective benefits of state, provincial, and regional (*e.g.*, multi-state) renewable energy policies and programs, including any resulting transmission benefits.[18]

3.2. Enable the integration of an expanding range of energy supply sources and technologies (*e.g.*, energy storage, renewable generation, smart appliances) in order to further decarbonize the electricity sector.

3.2.1. Pursue smart grid technology within the region and work towards a coordinated regional implementation approach.[19]

3.3. Track and support regional efforts to expand the use of low- and no-carbon fuels.

3.3.1. Develop an inventory of NEG/ECP jurisdictions' existing data sources and regulations regarding heating fuel in general and the renewable content in heating fuels.

3.3.2. Begin to identify the metrics, methodologies and benchmark years to evaluate the use of low- and no-carbon fuels and identify a host entity to collect the data.

3.3.3. Track and Report progress to utilize lower-carbon heating fuels.

3.3.4. Evaluate the potential to influence the carbon content of fuels in the regional liquid fuels market.

[16] NEG/ECP (2006). *Resolution 30-2*: Resolution Concerning Energy, 30th Annual Conference of the New England Governors and Eastern Canadian Premiers, Newport, RI, May 11-12, 2006, http://www.cap-cpma.ca/images/CAP/30-2%20Energy%20E.pdf.

[17] NEG/ECP (2006). Resolution 30-2: Resolution Concerning Energy, 30th Annual Conference of the New England Governors and Eastern Canadian Premiers, Newport, RI, May 11-12, 2006, http://www.cap-cpma.ca/images/CAP/30-2%20Energy%20E.pdf.

[18] Note: As this section addresses central generation, the RE policies and programs referenced here should be only those that result in transmission.

[19] NEG/ECP (2009). Resolution 33-4: Resolution Concerning Energy Efficiency, 33rd Annual Conference of the New England Governors and Eastern Canadian Premiers, Saint John, NB, September 14-15, 2009, http://www.cap-cpma.ca/images/CAP/Resolution%2033-4%20Energy%20Efficiency%20E.pdf.

3.3.5. Consider an initiative to boost state and provincial policies to measure and promote the availability of high-renewable-content heating fuels, liquid fuels (*e.g.*, bioheat), and biomass.

3.3.6. Coordinate efforts, where practical, to expand the regional supply of low- and zero-carbon fuels.

3.4. Coordinate efforts to reduce GHG emissions associated with transmission of electricity (*e.g.*, line losses) and the transmission and distribution of natural gas (*e.g.*, methane leakage).[20]

3.4.1. Initiate a coordinated effort to estimate leaks from natural gas pipelines and the emission reduction potential of mitigation measures within the region.

3.4.2. Launch a coordinated effort to estimate sulfur hexafluoride (SF_6) emissions from gas-insulated switch gears and the emission reduction potential of mitigation measures within the region.

3.4.3. Work within the region to reduce sulfur hexafluoride (SF_6) emissions from gas-insulated switch gear.

3.4.4. Work within the region to reduce methane emissions associated with natural gas transmission and distribution.

3.5. Establish a set of key regional metrics and adopt common measurement and verification protocols to monitor the results of actions and policies on energy supply and transmission, and share information on their effectiveness.

3.5.1. Share methodologies on estimating electric sector emissions accounting for renewable energy certificates, imports, and exports.

3.5.2. Develop & maintain a regional database on electricity production by sources and report regularly on how electricity generation is changing and contributing to regional goals.

3.5.3. Include energy demand and supply mix of electricity production as a key regional metric.

3.5.4. Harmonize calculations regarding the impact of renewable energy.

[20] https://georgetown.app.box.com/s/fewtksbnhspvlg2dtkqtjtwofmroep6w

4. **End-Use and Distributed Energy:** Options that focus on increasing energy efficiency and conservation, and distributed energy resources in buildings and industry (thermal and electric)

Existing Target:
Reduce overall energy use by 20 percent in homes, buildings and industry compared to "Business As Usual" by 2020.[21]

4.1. Track and enhance the region's energy efficiency and conservation targets to support the reduction in energy consumption among buildings and industry.

4.1.1. Establish regional energy efficiency standards for heating systems, appliances and electronic devices.[22]

4.1.2. Tracking energy use to understand impact of EE

4.1.3. Report progress to reduce end-use energy consumption regionally

4.1.4. Complete an avoided energy supply cost study.[23]

4.1.5. Harmonize calculations of energy efficiency.

4.2. Track and support regional efforts to reduce end-use energy consumption through energy efficiency and conservation.

4.2.1. Evaluate and report on the progress towards the 2020 energy-use reduction goal by 20 percent below BAU levels in preparation for proposing a 2030 goal/target in the future.

4.2.2. Develop an inventory of NEG/ECP jurisdictions' existing energy efficiency programs and goals.

4.3. Coordinate, where practical, adoption of advanced standards and energy codes to increase the efficiency of new construction (and major refurbishment) in residential and commercial buildings.

4.3.1. Coordinate with early adopter states and provinces to share best practices and smooth the introduction of new codes and standards.

4.3.2. Adoption of a "race to the top" to catch the best amongst the NEG-ECP is warranted.[24]

4.4. Coordinate, where practical, energy efficiency and conservation programs for existing buildings and new construction to increase the participation of firms and households in conservation programs for all fuels.

[21] NEG/ECP (2006). *Resolution 34-3*: Resolution Concerning Energy Efficiency, 34th Annual Conference of the New England Governors and Eastern Canadian Premiers, Lenox, MA, July 11-13, 2010, http://www.cap-cpma.ca/images/CAP/Resolution%2034-3%20Energy%20Efficiency.pdf.

[22] NEG/ECP (2006). Resolution 34-3: Resolution Concerning Energy Efficiency, 34th Annual Conference of the New England Governors and Eastern Canadian Premiers, Lenox, MA, July 11-13, 2010, http://www.cap-cpma.ca/images/CAP/Resolution%2034-3%20Energy%20Efficiency.pdf.

[23] Sources: https://georgetown.app.box.com/s/n0giaaueq51xgd7yykpde0nvy669cyb2; https://georgetown.app.box.com/s/pfqhdc20mm3c2e63ouz74196q856dltu; https://georgetown.app.box.com/s/9o5114nh3mbwg8v4cg8hx0s0tchcb1ba.

[24] Could propose to highlight the yearly best achievements at the annual meetings at the state dinner to keep it more friendly – even though competitive.

4.4.1. Develop an inventory of NEG/ECP jurisdictions' existing energy efficiency programs and goals.

4.4.2. Align energy efficiency (potential savings) targets across the region and track progress at achieving targets.

4.4.3. Coordinate and harmonize energy efficiency programs; estimate regional GHG reductions.

4.4.4. Share best practices for the determination of energy costs avoided by energy efficiency and conservation.

4.4.5. Coordinate and align demand-side management programs to promote energy savings in homes and businesses.

4.4.6. Evaluate GHG reporting thresholds and align improvements in GHG management (energy efficiency and fuel switching) by the industrial sector, where feasible.

4.4.7. Coordination and alignment of programs seems unlikely because of the different approaches taken by each government. However, an iterative biyearly or on a three year revision cycle, where the CCSC could identify best standards on the Canadian and on the US sides, and every government stating that they intend to catch up in the best available time, would be warranted.

4.5. Coordinate efforts, where practical, to expand the regional supply of distributed power sources (*e.g.*, combined heat and power, customer sited renewable generation).

4.5.1. Track and support regional efforts to expand the use of lower-carbon fuels.

4.5.2. Begin to identify the metrics, methodologies and benchmark years for evaluation and host entity to collect the data.

4.5.3. Track and Report progress to utilize lower-carbon heating fuels.

4.5.4. Evaluate impacts of increasing distributed energy resources on regional GHG emissions, including impacts from line loss reductions and changing load shapes.[25]

4.5.5. Harmonize calculations of impacts of fuel switching.

[25] Considerations to pursue: removal of entities from grid could cause surge in transmission line; micro-grid/"islands" increase resilience to climate hazards; and ex. of success, solar installed on municipal building for use as back-up supply in storm. Create an agreement with utilities for use in emergency. Metering for credits otherwise.

5. Transportation: Options that address transportation choices and accessibility, vehicle technology and fuels

Existing Target:
Work toward achieving throughout the region a five percent regional fleet-market-share penetration of alternative fuel vehicles by 2020 and facilitate the availability of refueling stations to support those vehicles.[26]

5.1. Improve the efficiency and intermodality of all modes of the transportation system.[27]

5.1.1. Identify modal bottlenecks on all modes within the region.

5.1.2. Conduct a freight commodity flow analysis for the NEG/ECP region, including projections, by mode (*i.e.*, Truck, Rail, Maritime and conduct a scenario planning exercise).

5.2. Promote the transition to low-carbon fuels, zero emissions and low-carbon emission vehicles and charging corridors and networks.

5.2.1. Develop a regional profile of the fleet fuel efficiency and greenhouse gas emissions of light duty vehicles as well as the number of Plug-in Hybrid Electric Vehicles, Battery Electric Vehicles and Natural Gas Vehicles in the states and provinces.[28]

5.2.2. Inventory existing and proposed EV charging infrastructure and identify gaps in the emerging network.

5.2.3. Utilize available funding to electrify major transportation corridors in the NEG/ECP region to better enable travel by EVs throughout the region.[29]

5.3. Support continual improvements, within jurisdictional authorities, in the energy efficiency of passenger vehicles and heavy duty trucks as well as in the marine, railroad and aviation sectors.

5.3.1. Support adoption of stringent fuel economy and GHG-emission standards for all class of vehicles.

5.3.2. Electrification of rail passenger commuter services.

5.3.3. Facilitate replacement of diesel-locomotive fleet with cleaner fleets.

5.3.4. Begin replacing bus fleet(s) with low, or zero emission buses.

[26] NEG/ECP (2013). *Resolution 37-3*: Resolution Concerning Transportation, 37th Annual Conference of the New England Governors and Eastern Canadian Premiers, La Malbaie, Quebec, September 8-9, 2013, http://www.cap-cpma.ca/images/ECP%20Documents/NEG-ECP%20Resolution%2037-3%20Transportation%20EN.PDF.

[27] The adoption of the U.S. Agreement on Land, Rail, Marine, and Air Transport Preclearance will further enhance mutual security and facilitate low-risk cross-border movement in all modes of travel including at the Jean Lesage International Airport in Québec city, as well as for rail service in Montreal. It will ensure the return of the Amtrak «Vermonter» train between Montréal, Vermont and New-England destinations. https://www.dhs.gov/news/2015/03/16/united-states-and-canada-sign-preclearance-agreement

[28] NEG/ECP (2013). Resolution 37-3: Resolution Concerning Transportation, 37th Annual Conference of the New England Governors and Eastern Canadian Premiers, La Malbaie, Quebec, September 8-9, 2013, http://www.cap-cpma.ca/images/ECP%20Documents/NEG-ECP%20Resolution%2037-3%20Transportation%20EN.PDF.

[29] Support development of FAST charging station network. Includes the: Multi-State ZEV Action Plan; Québec-Vermont Electric Charging Road Corridor; and Québec - Maine Corridor Electrification.

5.4. Support improvements to passenger and freight transportation, including intermodal options, vehicle technologies, fuel economy, and mode shifting.

5.4.1. (Initiate an effort to) Assess the feasibility of pricing strategies to encourage efficiency in the fleet, reduce single occupancy vehicle trips.

5.4.2. Collaborate to promote SmartWay program across the region.

6. **Natural Resources:** Options that enhance the amount of carbon being captured and stored in agricultural and forested lands and other natural systems, and that encourage sustainable materials management

   6.1. Encourage opportunities for maintaining forest carbon storage and increasing forest carbon sinks as part of the development and promotion of sustainable forest programs.

      6.1.1. Promote coordinated management of the region's forests to discourage conversion of forest land to other uses that would result in reduced carbon stocks or sequestration.

      6.1.2. Support opportunities to link conservation corridors across jurisdictions that enhance carbon sinks.

   6.2. (Seek to) Ensure that the utilization of woody biomass fuels, to the extent that they are relied on, results in GHG emissions reductions.

      6.2.1. Coordinate silvicultural practices to maintain net forest carbon storage through balanced and appropriate harvesting of wood for both non-energy and energy uses, as well as through designation of forest lands to remain unharvested.

      6.2.2. Promote the use of advanced-technology biomass combustion units having the highest efficiencies and lowest air pollution emissions.

   6.3. Encourage the conservation of existing agricultural carbon sinks and reservoirs, an increase in carbon sequestration, and the reduction of agriculture-based GHG emissions through the development and promotion of improved management practices.

      6.3.1. Support opportunities for agricultural equipment efficiency improvements (*e.g.*, farm lighting, dairy equipment, maple sugaring equipment, etc).[30]

      6.3.2. Explore regional opportunities to promote effective hierarchical management of agricultural organics.[31]

      6.3.3. Agricultural carbon – TBD

   6.4. Manage blue carbon resources to preserve and enhance their existing carbon reservoirs.[32]

      6.4.1. Promote conservation partnerships to prevent degradation of existing wetlands and riparian buffer areas, which both mitigate GHG emissions by storing large quantities of carbon and methane, and make the landscape more resilient to climate impacts such as increased flooding.[33]

      6.4.2. Coordinate the quantification of carbon that is stored and sequestered in freshwater aquatic and upland wetland areas and assess their vulnerability.

      6.4.3. Coordinate the restoration and protection of freshwater aquatic and upland wetland areas to secure carbon storage and sequestration capacity.

[30] See: https://www.efficiencyvermont.com/products-technologies/agricultural-equipment

[31] See: http://legislature.vermont.gov/assets/Legislative-Reports/SWIAC-Report-FINAL.PDF, pg. 8.

[32] Blue carbon refers to carbon that is captured by living organisms in fresh and marine environments (e.g., oceans, estuary, wetlands) and is stored in the form of biomass and sediments.

[33] See: http://climatechange.vermont.gov/our-climate-work/nature-based-solutions/floodplains-wetlands

6.4.4. Coordinate the quantification of carbon that is stored and sequestered in coastal wetland areas and marine systems and assess vulnerability to destruction.

6.4.5. Coordinate the restoration and protection of coastal wetland areas and marine systems to secure carbon storage and sequestration capacity.

6.5. Pursue practices that reduce methane production and emission associated with waste and wastewater.

6.5.1. Pursue practices that reduce methane losses from landfills, through leakages at closed facilities, and via landfill-to-energy facilities.