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Lessons from British Columbia's *"Carbon Neutral Government"* Mandate

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EXECUTIVE SUMMARY

In 2007, British Columbia (BC) became the first major jurisdiction in North America to commit to making government operations "carbon neutral" beginning in 2010. This paper takes a critical look at the coverage of BC's commitment, with respect to its stated objectives, international standards and declarations by similar jurisdictions.

The "carbon neutral government" mandate currently covers mainly scope 1 (direct) emissions and scope 2 (indirect) emissions from purchased energy that arise from the operations of all core provincial government and public sector organizations (PSOs). Although all non-energy services and materials used by the PSOs in their operations are potentially reportable as scope 3 (other indirect) emissions, only a small fraction of them are covered by the current mandate. The scope 3 emissions are not owned or controlled by the public sector, but they do exist because of government operations and make up a significant proportion of some PSOs' total emissions. In such cases, the PSOs may be able to exert considerable influence over these emissions through their policies and decisions. It may also be more cost-effective to reduce some of these scope 3 emissions, as compared to reducing PSOs' scope 1 or scope 2 emissions or purchasing offsets through the Pacific Carbon Trust (PCT).

While the initial coverage of the mandate is a good first step given the tight implementation schedule and scale of involvement, the government should consider widening the mandate's reporting coverage to encompass all relevant and significant emissions of PSOs, including outsourced services, cross-border trade and embodied energy/emissions. As such, in preparation for the next phase of implementation, this paper recommends that the government should (i) make it mandatory for PSOs to assess and report all relevant and significant scope 3 emissions; (ii) not require these additional scope 3 emissions to be reduced or offset, unlike scope 1 and scope 2 emissions currently are; and (iii) allow PSOs to use their scope 3 emission reductions as offsets, provided these meet the quality standards for offsets.

Expanding the scope of reporting would yield more opportunities for PSOs to reduce emissions at a lower cost for the province than through offset payments to the PCT. Doing so would encourage the devolution of greenhouse gas (GHG) mitigation to the PSOs' supply chains, thereby helping to green the BC economy from the demand side. Finally, it would eliminate opportunities for emission leakage from the public sector through the outsourcing of services. These significant improvements to the policy outcome can be achieved without increasing the burden of GHG reduction beyond the current mandate's scope.

1. INTRODUCTION

In 2007, the BC provincial government passed the *Greenhouse Gas Reduction Targets Act* (GGRTA) and became the first major jurisdiction in North America to commit to making government operations "carbon neutral" beginning in 2010. By virtue of its tight implementation schedule and scale of involvement, covering more than 150 core government and public sector organizations (PSOs) with a direct employment of close to 300,000 people (approximately seven percent of the population), this commitment is among the most aggressive climate action targets set so far by a major jurisdiction, and certainly one of the earliest where substantial impacts can be observed. This makes it a very interesting case study from which we can draw some early lessons for possible improvement or future application in other jurisdictions.

There are many aspects of this mandate that merit further examination, ranging from the magnitude of immediate and planned reduction in energy use and greenhouse gas (GHG) emissions by PSOs, assessment of the adequacy of support mechanisms and quality of offset projects undertaken, to the unintended impacts and trade-offs made by the organizations involved. This paper takes a critical look at the coverage of the mandate. This is important, because policy boundaries set the foundation and define the scope for the subsequent steps of measurement, emission reduction, offset and verification.

This paper first reviews the concept of carbon neutrality and explains the importance of establishing a clear definition and being transparent about the coverage. Next, the coverage of BC's "carbon neutral government" mandate is compared to prevailing international standards and declarations made by similar jurisdictions. The third section discusses some issues of coverage, first at a broad level and then focusing on three aspects that can be considered for the purpose of improving the coverage, maximizing impact within and beyond the public sector, and enhancing credibility of the mandate. The final section lists some recommendations that the BC government should consider in the next phase of implementation.

2. CARBON NEUTRALITY

The term "carbon neutral" was initially used by companies like the American electric power company AES Corp., which decided in 1989 to offset part of its carbon dioxide (CO_2) emissions by launching carbon sequestration projects in Guatemala. Such pronouncements received favorable media attention at the time. However, in most of these cases, the emissions calculation takes into account mainly the CO_2 and other GHG emissions linked to direct consumption of energy that arises from their own operations, but emissions from the rest of the supply chain—that exist because of these operations—are usually left out.

In recent years, with greater attention worldwide on climate change, "carbon neutral" has been increasingly used by governments, various organizations, communities and individuals, so much so, that it became the Oxford American Dictionary's 2006 Word of the Year. Both regulated and voluntary markets have also expanded to meet the growing demand for carbon offsets necessary for most organizations to achieve carbon neutrality in the short to medium term. Yet the general lack of clarity about the term has led to confusion and even cynicism, which can be counter-productive to genuine efforts to reduce emissions.

The UK's Department of Energy & Climate Change responded by issuing its *Guidance on Carbon Neutrality*[1], which provided this definition: "Carbon neutral means that – through a transparent process of calculating emissions, reducing those emissions and offsetting residual emissions – net carbon emissions equal zero." Among other steps, this document recommends

that, when communicating carbon neutrality, organizations should be clear about the emissions measured, always seek to reduce emissions where possible rather than purchase offsets, and verify their emissions reduction or quality of carbon offsets to make these claims transparent.

Several national and state/provincial governments have made announcements on carbon neutrality since 2007. Norway pledged to reduce global GHG emissions by the equivalent of 100% of its own emissions by 2050 at the latest. The government subsequently offered to advance this target to 2030, but only provided that "an ambitious global climate agreement is achieved, in which other developed countries also take on extensive obligations". The government report *Norwegian Climate Policy*[2] sets out a number of proposals for reducing GHG emissions and mentions that about half and up to two-thirds of the cuts in total emissions by 2020 would be made in Norway. To supplement its domestic efforts, the Norwegian government also set aside a budget of €500 million (CAD750 million) in 2008, positioning itself as one of the three largest buyers of carbon credits in the world.[3]

Notwithstanding the above, the Norwegian commitment has been criticized for relying too heavily on "sleight-of-hand" accounting and huge donations to environmental projects abroad, rather than meaningful emissions reduction at home. The government has so far provided few details on how it would be able to drastically reduce emissions in Norway, given the country's current fossil fuel-dependent consumption pattern and the important role of natural gas extraction in its economy. Critics therefore noted that "the Norwegian model may not be a path to the future of carbon neutrality and may not be sustainable, because it requires deep coffers and, anyway, there are not enough environmental projects in poor countries to cancel out all the emissions of the developed world".[4]

The minority government of New Zealand, led by the Labour Party, announced a plan for a carbon neutral public service in February 2007. The Prime Minister declared that the government would lead by example, with six departments being required to have carbon offsetting plans in place by early 2008, and to be carbon neutral by 2012. The other 28 public service departments were to develop their emissions reduction plans by early 2008 and be on a path to carbon neutrality by 2012. However, after the National Party formed a new minority government following the 2008 general election, the Carbon Neutral Public Service Program was discontinued in 2009. Environment Minister Nick Smith explained that the program "was just a feel good slogan cooked up by the previous government", which costs "millions of dollars". Discontinuation of the program would ensure that the government could afford to meet its priorities for the environment by other means.[5]

The New South Wales (NSW) state government in Australia announced in 2008 that government operations will become carbon neutral by 2020. The NSW government's commitment applies to the GHG emissions of all budget-dependent NSW government agencies, including state-run schools, hospitals and police stations. Other agencies are encouraged to reduce their GHG emissions. Offsetting of emissions will be considered in 2014 after all other means of reducing emissions have been put in place. If recommended and agreed, the actual offsetting will commence in 2020.[6]

Importantly, and despite efforts to clarify the meaning of carbon neutrality, many governments and organizations still choose to define the term in different ways to suit their own purposes. To overcome confusion while garnering full support and enhancing the credibility of their initiatives, government and organizations need to be transparent about the scope and coverage of their claims. They first must put in place an accurate, transparent and consistent process of

calculating GHG emissions. Generally speaking, without a clear definition of which emissions are being measured and reported, and which emissions are excluded, there is no firm foundation for reductions, so achieving "carbon neutrality" would not be very meaningful. Thus, the focus here is on clarifying and suggesting improvements to the policy boundaries of BC's "carbon neutral government" mandate, so that the mandate may best achieve its stated objectives.

3. BC'S OBJECTIVES AND COVERAGE

The BC Ministry of Environment estimates that provincial government emissions covered by the carbon neutrality mandate accounted for about 1.5% of total provincial GHG emissions in 2007, or about one million tonnes of carbon dioxide equivalent (CO_2e). Despite this being a small proportion of total emissions, the BC government is intending through this mandate for the core government and PSOs to lead by example, so as to contribute about 26% towards the 2012 provincial GHG emissions target of a six percent reduction from the 2007 base. The provincial government (including individual government ministries and agencies), school districts, colleges, universities, health authorities and Crown corporations are all included in this commitment.

The government wants climate action to be "seen and pursued as an economic opportunity as well as an environmental imperative".[7] Thus, the stated objectives of BC's "carbon neutral government" mandate, from the report *Getting to Carbon Neutral Government*[8], can be summarized as follows:

(a) Demonstrate leadership on climate action as it sets aggressive province-wide emissions reduction targets. The experience gained would be shared with other public institutions in BC;

(b) Foster the growth of innovative technology and practices and stimulate development of new products and services in a growing clean energy sector, thus ensuring economic growth through innovation, investment and job creation in new fields like carbon accounting, auditing, offsets, brokerage and trading;

(c) Strengthen the public sector's energy and asset management practices, thus reducing exposure to escalating costs while being better positioned to make informed decisions about capital assets;

(d) Build on community-based social marketing concepts and engage public sector staff in thinking creatively about how to tackle climate change, as well as reach out to all British Columbians to take action at home and in their communities.

The *GGRTA Carbon Neutral Government Regulation*[9] makes it clear that the mandate focuses on GHG emissions from the use of energy in the operations of PSOs, but not embodied GHG emissions in existing or new buildings, equipment, material or services used by PSOs in the course of their operations. Specifically, the regulation deems only the following to be included as PSO GHG emissions, for the purposes of BC's carbon neutrality policy:

(a) Direct emissions and indirect energy emissions from the heating, air-conditioning or lighting of a building or a portion of the building owned or leased by the PSO, other than the heating, air-conditioning or lighting of a building that is leased to another PSO;

(b) Direct emissions and indirect energy emissions from the operation of appliances, equipment or machinery, other than mobile combustion sources, owned or leased by the PSO;

(c) Direct emissions from the operation of a vehicle or mobile combustion source, other than a public transit or school bus owned or leased by the PSO;

(d) In relation to the provincial government, direct emissions and indirect energy emissions from the supply of travel or accommodation services to a public official, who is travelling on public business for which travel expenses and accommodation expenses are covered by the consolidated revenue fund;

(e) Direct emissions from the production of office paper purchased by the PSO for use in its business.

Here, "indirect energy emissions" in relation to a PSO or the supply of a good or service, means GHG emissions specifically associated with the production of electricity, steam, heating or cooling that is consumed or used by the organization or supplier of a good or service. In addition, a PSO must determine and report GHG emissions resulting from the operation of a public transit bus or school bus that is owned or leased by the PSO, but offsets need not be purchased for these emissions.

We compare below BC's coverage to that of prevailing international standards as well as declarations made by other similar governments that have declared carbon neutrality goals.

3.1. International Standards

The *Greenhouse Gas Protocol* (GHG Protocol) developed by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) is the most common and internationally accepted approach for the categorization and management of emissions. The *GHG Protocol Corporate Standard*[10] aims to provide standards and guidance for companies and other types of organizations preparing a GHG emissions inventory through the use of generally accepted GHG accounting principles. In addition, the *Greenhouse Gas Protocol for the U.S. Public Sector*[11] provides tailored guidance to interpret the content and structure of the *GHG Protocol Corporate Standard,* specifically for the public sector context, especially when coordinating GHG reporting requirements across multiple government organizations.

According to the *GHG Protocol*, an organization preparing a GHG inventory needs to establish first its organizational and operational boundaries. The GHG-emitting sources that fall under the organization's responsibility must be consolidated or grouped together; the grouping establishes the organizational boundary. The *GHG Protocol Corporate Standard* describes two distinct approaches that can be used to consolidate emissions for organizational reporting: control and equity share. The control approach can be further subdivided into financial control and operational control.

Once organizational boundaries are set, operational boundaries are defined. This involves identifying emissions associated with operations, categorizing them as direct and indirect, and choosing the scope of accounting and reporting for indirect emissions. The *GHG Protocol* lists three different 'scopes':

- Scope 1 (direct) GHG emissions from sources owned or controlled by the organization, for example, emissions from owned or controlled boilers, furnaces and vehicles;
- Scope 2 (electricity indirect) emissions from the generation of purchased electricity consumed by the organization;

- Scope 3 (other indirect) GHG emissions that are a consequence of the activities of the organization, but occur from sources not owned or controlled by it. Examples are business travel, waste disposal, and use of sold products or services.

The *GHG Protocol* recommends that an organization, at a minimum, should report scope 1 and scope 2 emissions. However, inclusion of scope 3 emissions is recommended where possible.

According to the *GGTRA Regulation* and other guidance documents issued by BC's Climate Action Secretariat (CAS), PSOs are to report emissions from subsidiaries, properties and assets under their financial control as per Generally Accepted Accounting Principles (GAAP) in proportion to their equity share. For example, a university or health authority would include a foundation or research institute under its financial control. Moreover, for properties or assets owned by a PSO, but leased to a non-PSO, such as a non-profit organization or private company, the emissions are to be included as emissions of the PSO. In terms of operational boundaries, emissions to be reported and offset under the *GGRTA* are mainly scope 1 and scope 2 emissions. The only scope 3 emissions included are those from business travel (for core government only) and office paper usage.

An interesting aspect of BC's coverage is that "direct emissions from the production of office paper purchased by the PSO for use in its business" is singled out as a category of emissions to be included. According to the CAS, this category is highly visible, and is something that public sector employees can easily relate to and act upon. The rationale for inclusion is similar to that of a case study of Cone Inc. highlighted in the *GHG Protocol*.[12] Cone Inc., a strategic marketing and communications agency, specifically included paper in its GHG inventory in order to make its employees aware of its climate strategy. By measuring its scope 3 paper emissions and reducing its use of paper, Cone Inc. is able to give its employees information about the company's effects and actions as well as tangible results.

3.2. Coverage in other similar jurisdictions

New Zealand and New South Wales, two jurisdictions with broadly similar population, land area, climate and stage of development as BC, have also declared carbon neutrality targets. Emissions that were to be included in inventories of the New Zealand public service (roughly equivalent to BC's core provincial government) are generally consistent with those counted by the *GHG Protocol*, including emissions associated with energy and electricity use, business travel and transport (including domestic and international air travel). Staff commuting or the embodied energy in products and buildings (i.e. emissions released in producing the materials used in construction) were not to be included. The environmental impacts of building construction, commuting and procurement were to be targeted instead through the Govt3 program and the sustainable government procurement initiative. Although emissions from waste to landfill are generally minimal and may be falling, New Zealand chose to include these emissions "to maintain credibility".[13]

The NSW government in Australia provides guidelines at this stage only to its departments, which are to set their own targets. In this case, the organizational boundary includes owned and tenanted buildings, car fleets, other facilities and owned land. If an organization is not the sole tenant of a building, then the percentage of occupancy needs to be calculated. For operational boundaries, scope 1 and scope 2 GHG emissions are to be included in accordance with the *GHG Protocol*. For scope 3, relevant emissions from other indirect

sources, such as employee use of taxis and airlines, emissions from waste or emissions from leased assets or outsourced activities, are to be considered.[14]

Within the State of NSW, the City of Sydney was among the first to declare that it had become carbon neutral in 2008. According to its statement, the city included scope 1 (nine percent), scope 2 (71%) and some scope 3 (20%) emissions. Scope 3 emissions are significant and included business travel by air and taxi, scope 1 emissions from major events and scope 1 emissions (eg. arising from fuel purchases) from 14 of its major contractors.[15]

It is also worth noting that the Canadian federal government's previous initiative, launched in 2001 to reduce total federal GHG emissions, – Federal House in Order (FHIO) – covers only direct and indirect emissions (scopes 1 and 2), mainly from buildings and transportation. The FHIO specifically excludes outsourced services and embodied emissions from purchased products, which are to be addressed by other policies, such as a green procurement policy.[16]

Table 1 summarizes some interesting aspects of the mandates in BC, New Zealand and New South Wales.

Table 1: A comparison of targets, scope and funding of carbon neutrality mandates in three similar jurisdictions

	British Columbia	New Zealand	New South Wales
Date of Announcement	November 2007	February 2007 – terminated by new government in 2009	May 2008
Carbon Neutral Target Dates	• Core government and PSOs to be carbon neutral by 2010 • Municipal and local governments to be carbon neutral by 2012	• Six departments to have offsetting plans by early 2008 and be carbon neutral by 2012 • Another 28 departments to be on the path to carbon neutrality by 2012	• All budget-dependent government agencies to be carbon neutral by 2020
Scope 1 (direct emissions)	• Heating, airconditioning or lighting of a building • Operation of appliances, equipment or machinery • Operation of vehicles or mobile combustion sources	Similar to BC	Similar to BC
Scope 2 (electricity indirect emissions)	• Heating, air-conditioning or lighting of a building • Operations of appliances, equipment or machinery	Similar to BC	Similar to BC
Scope 3 (other indirect emissions)	• Business travel (for core government only) • Production of office paper used in operations	• Business travel • Waste to landfill	• Business travel (eg. employee use of taxis and airlines) • Waste • Leased assets • Outsourced activities

	British Columbia	New Zealand	New South Wales
Notes	PSO operating budgets have not been augmented to pay for offsets. However, PSOs may apply for energy conservation project funding out of the $75 million set aside for 2008-2010 under the *Public Sector Energy Conservation Agreement*.	Funding for offset projects or purchases was to be sought from the government in 2010.	NSW has not budgeted for mitigation at agencies and has not specified offset purchases. However, agencies can access project funding from the Climate Change Fund and NSW Treasury Loan Fund.

Sources: British Columbia government[17]; Ministry of the Environment, New Zealand[18]; Department of Environment & Climate Change, NSW government[19]

As shown in this table, the organizational coverage of BC's carbon neutrality mandate is similar to NSW and wider than that in New Zealand, but the timeframe for implementation is much sooner in BC. In this sense, BC is leading the world in mandating carbon neutrality of its public sector. However, NSW's coverage of scope 3 emissions is broader, as emissions from business travel (for all agencies), waste and outsourced activities are also included.

4. DISCUSSION

4.1. Responsibility: Producer vs. Consumer

One of the debates in climate policy is whether responsibility should be placed on the actor who initiates a polluting process (the consumer) or the actor producing the pollution (the producer). In particular, the embodiment of GHGs in goods traded internationally raises the question of who is responsible for emitting GHGs to the atmosphere and which accounting principle is appropriate to use.[20] According to the "production accounting principle" adopted by most jurisdictions including BC, the producer is responsible for the GHG emissions from the production of energy, goods and services. In that way, GHG emissions are all located to the processes actually emitting GHGs to the atmosphere, i.e. industrial production, energy production and the use of fuels in households. The production accounting principle is presumed in the Kyoto agreement and the IPCC guidelines.

According to the "consumption accounting principle", the consumer is responsible for GHG emissions from the production of energy, goods and services. Using this principle, GHG emissions are related to the final use of goods and services, even if they are imported from foreign countries. A third approach is the "Carbon Emission Added" (CEA) approach, where the total GHG emission is assigned to countries or phases of a process (eg. from extraction of raw materials to the final use of a transformed good) in proportion to the embodied GHG emissions along the chain. This approach tries to solve the problem of distinguishing between the consumer and producer accounting principles, allowing for the sharing of responsibilities among all the interested parties in an efficacious and fair way.[21]

Studies have been undertaken to show the total impact of consumption on emissions. These studies support a shift towards measuring and accounting for emissions beyond that based purely on the production accounting principle. For example, more than 80% of the energy used and the CO_2 emitted in the US is a consequence of consumer demands and the direct and indirect associated economic activities.[22] Similarly, in assessing a local area or region,

one can distinguish between local and distant GHG emissions resulting from the activities required to support the local population. Indirect emissions and boundary issues become critical when comparisons are made between local areas or regions.[23]

Depending on the approach and system boundary used, the emissions allocated to each jurisdiction or actor may differ and, as a result, may have different options for reducing these emissions. As such, some argue that consumption-based GHG inventories have many advantages over production-based inventories. They help to address carbon leakage (because declaring all GHG emissions from consumption, including imports, means countries cannot reduce domestic emissions by simply increasing imports of the same products), increase options for mitigation, encourage environmental comparative advantage, and promote technology diffusion.[24]

However, while the theoretical framework of consumption-based inventories is sound, there are practical issues associated with data construction and availability, many of which may be resolved in the coming years, as ongoing projects undertaken by several countries will provide more data for analysis.[25] As such, the BC government should similarly consider pursuing a consumption-based model of accounting for emissions as methods improve and more data become available.

4.2. Influence: Organizational boundaries

The setting of organizational boundaries has significant implications for the extent of coverage. The requirement for reporting, under BC's carbon neutrality mandate, extends to subsidiaries, properties and assets that fall under PSOs' financial statements, constructed according to Generally Accepted Accounting Principles (GAAP). For these purposes, a subsidiary organization is an organization that, under GAAP, is included in the PSO's financial statement, either through full or proportional consolidation, or through consolidation on a modified equity basis.

Such a definition could create problems, especially for some PSOs that hold a portfolio of assets, some through subsidiaries that are several levels removed from the PSO's core operations. For example, a university is responsible for reporting and paying for offsets of emissions that occur on properties it owns, but that may be leased to private organizations for which it has no operational control. The university will likely face difficulty obtaining emissions data as well as influencing the reduction of these emissions.

An alternative is to set organizational boundaries based on operational rather than financial control, in line with the influence that the organizations would typically have. The *Greenhouse Gas Protocol for the U.S. Public Sector*[26] recommends the operational control approach as the most appropriate boundary for government organizations, as their primary activities most often consist of providing public services through specific operations, rather than to gain economic benefit from managing financial assets.

4.3. Relevance and completeness: Operational boundaries

A third area for discussion relates to two of the accounting and reporting principles of the *GHG Protocol*: Relevance (to ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users, both internal and external to the company) and completeness (to account for and report on all GHG emission sources and activities within the chosen inventory boundary, and disclose and justify any specific exclusions). These principles are further elaborated on in the *GHG Protocol*'s discussion of scope 3 emissions.

By definition, scope 3 emissions are not owned or controlled by the reporting company, but are the scope 1 and 2 emissions of other entities such as suppliers, customers, waste management and shipping companies. Although it is optional, including relevant scope 3 emissions in a GHG inventory ensures that the GHG inventory is complete and may provide companies with innovative opportunities to reduce emissions. IKEA, for example, included scope 3 emissions from its customers' trips to and from its stores, because it perceived this activity as important to its business. Its GHG inventory confirmed that this activity accounted for 56% of its total emissions. Moreover, IKEA found that it could have significant influence over its scope 3 emissions when selecting sites for new stores, by making them accessible by public transit.[27]

The *Corporate Value Chain* (*Scope 3) Accounting and Reporting Standard*[28,] points out that scope 3 emissions are actually a consequence of the activities of the reporting company, and that companies often have the ability to influence GHG reductions upstream and downstream of their operations. Companies are, therefore, advised to account for and report the largest scope 3 sources that collectively account for a significant proportion of their total anticipated scope 3 emissions.

In the *Greenhouse Gas Protocol for the U.S. Public Sector*, it is proposed that organizations should initially focus on accounting for and reporting activities that are relevant to their organizational mission and goals, and for which they have reliable information. In particular, organizations should consider reporting relevant scope 3 emissions that are large (or believed to be large) relative to its scope 1 and scope 2 emissions and where potential emissions reductions could be undertaken or influenced by the organization. Given the substantial impact public sector organizations can have on indirect GHG emissions through the use of contractors and procurement contracts, scope 3 emissions for the public sector may be quite significant.[29]

4.4. General assessment

In light of the above, the coverage of BC's carbon neutrality mandate can be considered a good first step. Taking into account the large variety of organizations with different structures and diverse nature of operations, it makes sense to start with mainly scope 1 and scope 2 emissions that are easier to measure and less controversial, since they can be directly linked to energy consumption.

However, although all non-energy services and materials used by the PSOs in their operations are potentially reportable under the scope 3 heading, only a small fraction of them are covered by the current mandate. Scope 3 emissions include everything from employees' commuting to work and outsourced activities, such as billing and insurance, to embodied energy/emissions in new buildings and appliances. These emissions exist because

of government operations, but are not owned or controlled by the public sector; yet they make up a significant proportion of the total emissions of some PSOs. In such cases, the PSOs may be able to exert considerable influence over these emissions through their policies and decisions regarding transportation subsidies, parking provision, contracting and procurement, etc. At the same time, it may also be more cost-effective to reduce some of these scope 3 emissions, as compared to reducing PSOs' scope 1 or scope 2 emissions or purchasing offsets through the Pacific Carbon Trust (PCT). For an illustration of this, please refer to the University of British Columbia (UBC) case in section 4.8.

Hence, given the ambitious objectives of the carbon neutrality mandate in BC, in particular to demonstrate leadership, it would make sense to include more scope 3 emissions within the mandate's reporting coverage. This would open up more opportunities to reduce emissions and broaden the scope for innovation both within and beyond the public sector. These will, in turn, stimulate green businesses and support lower-cost emission-reduction projects[30], thereby reinforcing BC's leadership role in climate action.

Inclusion of more scope 3 emissions should recognize the differences among PSOs and be subject to practical considerations of data availability and collection. The inclusion should be based on activities of the organizations that generate the most GHG and with reasonable scope for reduction. Accounting for these emissions need not involve a full-blown GHG life cycle analysis of all products and operations. Rather, a preliminary screening of these is easily accomplished through available life cycle assessment tools based on economic input-output data (e.g. www.eiolca.net).

A framework is needed to evaluate which scope 3 emissions should be targeted. This framework would take into account attributes such as:

- the scale of potential GHG reduction;
- the visibility of these reduction efforts (to facilitate engagement of stakeholders);
- ease of measurement and verification; and
- differences in the nature of PSOs' operations.

As pointed out earlier, BC included paper use as the only scope 3 GHG source for all PSOs because of its visibility, measurability and scope for action by employees. However, emissions from paper use are generally a very small proportion of total emissions in most organizations (e.g. about 0.7% in the case of UBC). There are other sources, such as employee commuting and business travel, that are also highly visible, although estimating the associated emissions might be more difficult. But actions to reduce emissions from employee commuting and business travel are likely to produce much more significant GHG reductions compared to paper use.

The following section of the paper focuses on three aspects that the government can consider in extending the coverage of the policy in future – outsourced services, cross-border trades and embodied emissions.

4.5. Outsourced services

Since the 2001 election, the BC government has undertaken a rigorous restructuring process that has included the implementation of e-government strategies, development of alternative service delivery models and outsourcing of some public service delivery. For example, Accenture and BC Hydro entered into a 10-year service contract valued at $1.45 billion, where Accenture acquired 1,540 staff previously employed by BC Hydro. A 10-year, $324 million contract was signed with Maximus BC to administer the Medical Services Plan and PharmaCare services effective April 1, 2005 and 230 full-time and part-time employees previously employed by the Ministry of Health were transferred to a call centre operated by Maximus in Victoria.[31]

Under BC's carbon neutrality mandate, existing contracts for services are excluded from the calculation of GHG emissions of PSOs. As a result of the outsourcing effort, government organizations now frequently contract provision of services to other organizations. These contracted services are provided using facilities, vehicles, etc. outside of the operational control of the government, and therefore significant quantities of GHG emissions are not included as scope 1 or 2 emission sources under the current policy. There is a case for including or closely monitoring such emissions from contracted services in order to prevent leakage of a significant proportion of emissions that the government should be responsible for, and to influence contractors' choice of processes, equipment, fuel or technologies.

One way that the government could try to overcome this is to ensure that, if a PSO has a contractual or partnership arrangement to deliver these services, the emissions from these same activities operated by the contractor/partner would also be included for new contracts or upon contract renewal. The phasing in of new contracts helps to provide an opportunity for PSOs to influence emissions during the next contract, and overcome current difficulties in data collection by integrating reporting requirements within the new contracts. Contract renewal, however, may still be subject to these difficulties. Moreover, inclusion of emissions from these contracts and the additional liability of purchasing offsets might result in an increase in the cost of such contracts. This may inadvertently discourage PSOs from going for open tender contract renewals or new contracts, preferring instead to extend or vary their existing contracts.

Inferring from the guidance provided to local governments, the types of contracts that would be included would be those that have reasonably identifiable energy consumption associated with the delivery of the service. For example, emissions related to consultant services, such as planning assistance, would not be included, but emissions from road maintenance contracts would. Similarly, if a partner organization were operating a recreation centre on behalf of a local government, the emissions from the recreation centre would be captured, but the corporate offices of the partner organization, and any vehicles used to travel to and from the corporate office to the recreation centre, would not be included.[32]

However, there is still some uncertainty regarding which services operated by contractors will be included in the emissions inventory of PSOs, and also which parts of outsourced contractors' emissions should be attributed to PSOs. This opens up the possibility for contractors to manipulate their emissions profile or shift emissions among operations to appear more favorable to government contracts, leading to an uneven playing field in contractor selection, without reducing overall emissions. Thus, if emissions from outsourced services are to be included in PSOs' reporting, more definitive guidance and a clearer rationale on what emissions are to be included should be provided.

4.6. Cross-border trade

The issue of emissions embodied in international trade was mentioned earlier in the discussion on whether producers or consumers should be held responsible for emissions. This is also relevant for cross-border trade between BC and other jurisdictions. Studies using input-output analysis have shown that embodied emissions of imports and exports are a significant portion of a country's total emissions.[33] With multi-region input-output models developed in recent years, it is possible to include feedback loops and capture direct, indirect and induced effects of trade between regions.[34]

Norway provides a good case study. The Norwegian way of life is heavily dependent on imported products. A study found that while Norway's domestic CO_2 emissions remain fairly stable at 55-57 Mt per year, Norway's carbon footprint abroad is growing fast.[35] The latter increased 33% to 39 Mt from 2001 to 2006, and will likely surpass domestic emissions in the near future. Thus future reductions of CO_2 emissions in Norway may be outweighed by increased emissions abroad through increased import activity.

Since BC has a relatively open economy with substantial inter-provincial and international trade, the continued exclusion of cross-border trades from GHG emissions would be a significant omission. In addition, like Norway, BC as a major producer of oil and gas, may benefit from a consumption-based GHG inventory that has greater flexibility towards jurisdictions with pollution-intensive resource endowments.[36] Because of these potential impacts, even if the decision is not to base GHG inventories in BC on a consumption model, it would be useful to begin a study on the impacts of cross-border trade or collect data for future research.

4.7. Embodied emissions

The embodied emissions of a product are the accumulated emissions arising directly and indirectly from the extraction of energy and raw materials in the manufacture and assembly of the product, trade and transportation across its global supply chain, and final disposal of the product or waste generated. Several studies have shown that embodied emissions are significant relative to operational emissions. Moreover, as operational emissions decrease (e.g. through efficiency improvements), embodied emissions become an even more important factor to consider.

In the context of a building, its life cycle energy consists of its initial embodied energy, its recurrent embodied energy (e.g. replacement of building systems or materials, reconfiguration or retrofitting arising from tenant turnover) and its operational energy over its lifetime. In some cases, new construction is not always the best solution, as renovation of an existing building may offer considerable embodied energy and financial savings. Life cycle energy analysis can also be a powerful decision-making tool at the design stage and can result in substantial net reductions in energy use over the projected life of the building.[37]

Similarly, although vehicle operation is the source of the majority of GHG emissions, accounting for 73% in one life cycle assessment[38], the other 27% are accounted for mainly by embodied emissions in the manufacture of the vehicle and production of fuel. The relative importance between operational emissions and embodied emissions also depends on the type of vehicle as well as the usage pattern over its lifetime.

A study of the environmental impact of service industries found that although colleges and universities in the US have relatively small direct impacts, their supply chain (indirect

impacts) accounts for 88% of their total energy input per dollar of output, and 88% of its GHG emissions.[39] Besides power generation and supply, which top the supply chain sectors in terms of indirect GHG emission (26%), real estate was a close second (at 20%), while waste management and remediation contributed five percent.

4.8. The case of the University of British Columbia

The GHG inventory of the University of British Columbia's Vancouver Campus (UBC-V) provides an interesting case study that demonstrates the significance of assessing scope 3 emissions relative to total emissions. In Table 2 below, note that BC's carbon neutrality mandate covers about 53% of UBC-V's total estimated emissions in 2008. The only scope 3 emissions covered under the mandate (i.e., from paper usage) account for 0.7%. A significant proportion of the remaining 47% of emissions come from commuting (25%), staff and faculty travel (12%) and embodied impacts of buildings and infrastructure (9%), which are not included in mandatory reporting or offsets.[40] Moreover, while UBC-V's emissions covered by the mandate decreased 0.8% from 2007 to 2009, emissions not covered increased by 2.4%.

Table 2: UBC Vancouver Campus GHG Emissions Inventory (2008)

Scope	Component	GHG emissions (tCO_2e/yr)	Covered by mandate?
1 & 2	Core buildings	46,400	Yes
	Other buildings	14,030	Yes
	Fleet	1,500	Yes
3	Paper	850	Yes
	Staff and faculty travel	13,600	No
	Solid waste	1,800	No
	Commuting	29,100	No
	Building lifecycle	10,200	No
Total estimated emissions		117,480	
Total emissions covered by the mandate		62,780 (53%)	

Source: UBC Vancouver Campus Climate Action Plan 2010-2015

Two major thrusts that UBC has undertaken and continues to pursue, illustrate the importance of exploring all options that can reduce not only scope 1 and 2 emissions, but scope 3 emissions as well. From 2003 to 2006, UBC undertook *ecotrek*, the largest energy retrofit project in Canada at that time, involving nearly 300 of UBC's core buildings. At a cost of $35 million, this project resulted in energy and water savings of $2.6 million annually and reduction of (scope 1 and scope 2) GHG emissions by 15,000 tonnes per year.[41]

UBC has also developed on-campus rental housing for students and employees, which substantially reduces the number and proportion of commuters. Under the current regulations, this action neither creates credit for UBC for reducing commuting emissions, nor credit for the smaller GHG footprint of more efficient housing on campus. Moreover, because the new housing is on campus, their scope 1 and 2 emissions are reportable and create emission liabilities at $25 per tonne of CO_2e emitted. Furthermore, a broad range of

services and shops are now available in and around the campus, reducing the need to travel for on-campus and neighbouring households. The average number of trips per person has decreased 14% from 1997 to 2009. On-campus housing, fewer parking spaces and greater use of the internet are all contributing factors to this change.[42] However, the current reporting boundaries discourage such initiatives.

UBC is planning to further expand student housing on campus by 8,000 beds. These will provide a host of benefits for students, but will also increase the "local" scope 1 and 2 emissions under UBC's current reporting mandate. Since all new residential construction at UBC must comply with the Residential Environmental Assessment Program (REAP) guidelines, housing at UBC will use approximately 15% less energy than Canada's Model National Energy Code for Buildings (MNECB), which in itself outperforms all provincial building codes.[43] As such, scope 1 and 2 emissions of the new on-campus housing will be much lower compared to existing off-campus housing that these students would otherwise rent. Moreover, commuting will be drastically reduced as a result of more students being accommodated on campus. An illustrative comparison of the impacts is given in Table 3:

Table 3: Comparison of Impacts from UBC Students Living Off-Campus and On-Campus

	Living Off Campus	Living On Campus	Remarks
Residential emissions per student (t/yr) [a]	0.96	0.72	See note (i).
Commuting emissions per student (t/yr) [b]	0.73	0	See note (ii).
Emission target under the government mandate (t/yr)	0	0	Our proposal is to keep targets the same – see section 5.
Emissions under current reporting (t/yr)	0	0.72	Only scope 1 and 2 emissions are currently included.
Actual emissions (t/yr) [a+b]	1.69	0.72	Accounting for all emissions within the province. Emissions are actually reduced by 0.97 t/yr for each student living on-campus vs. off-campus.
Current offset liability per student	0	$ 18.00	To be paid by UBC to PCT, at $25/t.
Proposed offset liability per student	0	- $ 24.18	Proposed credit for reduction of overall emissions by 0.97 t/yr.

Notes:

(i) Based on residential sector emissions from Table 4 of the *BC GHG Inventory Report 2008*, BC's population in 2010 (Statistics Canada), and assuming emissions from UBC on-campus housing are 75% of the emissions from average BC housing.

(ii) Based on emissions from commuting (29,100 tonnes) in UBC's GHG inventory from *UBC Vancouver Campus Climate Action Plan 2010-2015* and a commuting population of 40,000.

The decrease in commuting by having 8,000 more students live on campus will decrease scope 3 emissions by an estimated 5,820 tonnes of CO_2e per year or 20% of emissions from commuting. Overall, this initiative will cut BC's GHG emissions by over 7,700 tonnes per year (0.97 tonnes per student multiplied by 8,000 students). However, the current boundary setting changes what should be a net GHG reduction credit of 7,700 tonnes per year into a 5,760 tonnes per year penalty resulting in an additional offset liability of $145,000 per year due to the extra scope 1 and 2 emissions on-campus. The overall economic disincentive to UBC for housing these 8,000 people on campus (by summing up the additional offset liability and the foregone credit) would be more than $40 per head or $340,000 per year.

The cost of creating the more complete GHG audit at UBC is zero, as the current audit completed for $20,000 already reflects a wide range of scope 3 emissions. The cost of having other organizations expand their reporting from their current boundaries to include a wide range of scope 3 emissions is between one to five thousand dollars depending on the size and complexity of the organization.[44]

An alternative for such organizations is to market their innovative GHG reductions beyond the scope of the BC government mandate as GHG offsets. However, such an action not only requires the incremental cost of the audit, it would also incur validation and verification costs of at least $5,000 and transaction costs for the offset of five dollars per tonne or more. Thus, while the offset route is available to government organizations who have innovative GHG reduction strategies that cannot be captured under the BC mandate, the costs of realizing these initiatives are far higher, and prohibitively so, for all but the largest projects (greater than 1,000 tonnes per year).

5. RECOMMENDATIONS

In preparation for the next phase of implementation, we recommend that the government should (i) make it mandatory for PSOs to assess and report all relevant and significant scope 3 emissions; (ii) not require these additional scope 3 emissions to be reduced or offset, unlike scope 1 and scope 2 emissions currently are; and (iii) allow PSOs to use their scope 3 emission reductions as offsets, provided these meet the quality standards for offsets.

The government should make it mandatory for PSOs to assess and report the following categories of scope 3 emissions in their GHG inventory, based on activities that generate the most GHG and with reasonable scope for reduction:

a) Employee business travel (minimum inclusion of air travel);

b) Employee commuting (minimum inclusion of private transportation);

c) Building life cycle (minimum inclusion of new buildings);

d) Outsourced activities/contracts previously performed by the PSO; and

e) Other sources that contribute significantly to the PSO's total anticipated scope 3 emissions.

More comprehensive reporting of scope 3 emissions provides a more accurate picture of provincial emissions and may reveal opportunities for cost-effective reductions in overall emissions by shifting them across scopes 1, 2 and 3. The additional information on all relevant and significant emissions will enable PSOs to:

a) Learn more about the GHG impacts of all of their major activities and plans;

b) Devise much more effective capital projects and operational campaigns to reduce total GHG emissions, whether through changing their own plans and operations or influencing the actions of employees, customers, suppliers or contractors; and

c) Adopt measures with the maximum positive spillover effects, in furtherance of the broader provincial targets of the *GGRTA*.

This approach also guards against leakage of scope 1 and 2 emissions through PSOs' shifting activities and emissions from within the PSO to external contractors. By having to report scope 3 emissions, the PSO will be revealing the emission intensity of their contractors, thereby forcing them to not only report their emissions, but also to try to reduce them.

The expansion of opportunities for cost-effective emission reductions is well worth the incremental administrative cost of collecting and calculating scope 3 emissions, as illustrated by the UBC example. Moreover, the framework and methodology are well developed[45] and can be readily added to the existing framework for scope 1 and 2 emissions reporting – the SMARTTool. Smaller organizations with less internal capacity can then learn from the examples, so they can add the scope 3 reporting at very low incremental costs.

By not requiring that the additional scope 3 emissions (to be reported by PSOs) be included as emissions to be reduced or offset, this approach will not impose additional financial burdens on PSOs. With the possibility of converting their scope 3 reductions to offsets, there is also an added incentive for PSOs to look into all possibilities that they can influence to reduce overall emissions.

6. CONCLUSION

By setting an aggressive target for the entire public sector in BC to achieve carbon neutrality within a very short timeframe, the BC government is using this mandate as a way of communicating climate change issues and motivating organizations and individuals to act. Although the emissions of the public sector itself are relatively small, it is intended that the mandate will have a multiplier effect on behavioral change in its employees, as well as spill over to the general public and others who have close dealings with these organizations.

An important step in the government's path to carbon neutrality has been to define the policy coverage. For this mandate to achieve its desired outcome, it is critical that this policy is transparent and credible. This paper has raised some questions regarding the existing coverage and suggested several aspects that the government can consider in the next phase of implementation, once PSOs have gained some experience. Whether and to what extent the coverage can be expanded, depends on the structure and nature of operations of different PSOs, availability of data, financial impact on PSOs, scope for emission reduction, the influence PSOs have on third parties, etc.

The expanded scope of reporting identifies more opportunities for PSOs to reduce emissions at lower costs to the province as a whole than is possible through offset payments to the PCT. It encourages the devolution of GHG mitigation to the PSOs' supply chains, helping to green the BC economy from the demand side. Finally, it eliminates opportunities for emission leakage from the public sector through outsourcing of services. These significant improvements to the policy outcome can be achieved without increasing the burden of GHG reduction beyond the current mandate's scope.

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