

Natural Resources, Energy & Environment

35. A Resource Sector Driven Recovery

DESCRIPTION

The resource sector can play a significant role in driving Canada's economy recovery and with the right policy commitments from the federal government is positioned to provide the leadership and innovation to help Canada and the world transition to a low carbon economy. This resolution provides several key recommendations to ensure Canadians prosper in the post-covid economy and that our natural assets are used to their full potential.

BACKGROUND

COVID-19 has shaken Canada's economy to its core. Social distancing measures and lockdowns have put many Canadians out of work, have closed businesses, and have created significant demand destruction, including the resource sector, which is the cornerstone of the Canadian economy. The repercussions and cumulative effects of this market shock will define the decade ahead of us. Most concerning, the federal deficit could range between \$256 billion and \$1 trillion dollars, and heavily indebted Canadian households will struggle to drive growth.

Under these conditions, policymakers at all levels of government will face significant pressure to address public debt. Without a clear direction on how to stimulate the economy to grow revenue bases, there will be significant temptations to impose austerity measures or markedly increase personal and corporate tax rates. These potential measures pose a risk to the recovery speed and the economy's competitiveness. It is imperative that the federal governments works to stimulate economic growth. Success will require that Canada's bountiful resource sector is positioned to lead our economic recovery.

However, positioning our resource sector to be a significant driver of prosperity is no small task. COVID-19 has impacted the resource sector particularly hard with nearly 30% of resource companies noting a decline of revenue greater than 50% in March of 2020. A global recession may create long-term pressure on raw materials, especially those related to the construction industry. These new pressures have compounded longstanding concerns related to regulatory uncertainty and political risk, which have deterred investment in major resource projects, added high cumulative costs stemming from inefficiencies in Canada's climate policies, and persistent challenges in reaching global markets.

While these challenges are significant, they pale against the opportunities that would become accessible if public -policy was developed in service of a coherent strategy for the sector. As other nations dedicate funds to 'a green recovery,' Canadian mineral and metals producers have a chance to meet significant demand for precious metals essential to the energy transition and, through key mineral inputs, support global food security. A recent report by the World Bank noted that keeping warming below a 2 degree scenario would produce 1000% increase in demand for rare earth metals, and a significant increase in precious metals as well. This presents a significant opportunity for Canada's mineral sector, to attract investment and create jobs.

Similarly, in the aftermath of COVID-19 related demand destruction, Canadian oil and gas producers have an opportunity to displace higher emitting fuels and meet the demands of consumers who are seeking socially and environmentally responsibly produced energy products. Domestically, a strong energy sector will ensure Canada's advanced manufacturing sector and other sectors that are critical to Canada's recovery remain supported. In addition, to becoming a supplier of superior oil and gas products and supporting Canadian industry, our energy sector has an opportunity to leverage its innovations here to gain share in global clean technology markets, forecasted to be worth \$2.5 trillion in 2022.

With the right public-policy supports, we can realize these opportunities while creating the revenues that will be crucial to reduce the deficit without sacrificing the social services that Canadians expect of their governments.

RECOMMENDATIONS

That the Government of Canada:

1. Align Output-Based Pricing System (OBPS) and Clean Fuel Standard (CFS) for greater efficiencies lower costs, economic impact and ensure EITE (Emissions Intensive Trade Exposed) protection is appropriately implemented in both policies and covers all sectors of the economy.
2. Continued commitment from the federal government to work with industry to provide regulatory clarity and certainty to capital markets to restore investor confidence in Canada's resource sector.
3. Broaden the definition of clean technology to include energy systems that mitigate emissions, scrub emissions and displace higher emissions and include these in carbon pricing frameworks.
4. In consultation with the provinces develop a systems approach to energy that connects the dots between exports and enhanced rail and port infrastructure, support for energy intensive industries, and the modernization of Canadian power grids.
5. Government must seek to rebalance domestic policy provisions and signal how they intend to support Canada's role in providing key energy, technology, and mineral inputs to world markets that can reduce global emissions.
6. The federal government should seek ways to support and encourage Canada's energy sector as a key stakeholder in its net-zero target while ensuring feasibility and competitiveness to business and taxpayers.

NOTES

¹¹⁹, ¹²⁰, ¹²¹, ¹²²

¹¹⁹ Report from Canada's Economic Strategy Tables: Clean Technology, Government of Canada, 2018. <https://www.ic.gc.ca/eic/site/098.nsf/eng/00023.html>

¹²⁰ The Growing Role for Minerals and Metals for a Low-Carbon Future, World Bank, 2017; <https://www.worldbank.org/en/news/press-release/2017/07/18/clean-energy-transition-will-increase-demand-for-minerals-says-new-world-bank-report>

¹²¹ Statistics Canada, Business Conditions Survey, Business revenue from January 1 to March 31, 2019, compared with January 1 to March 31, 2020, by business characteristics, <https://www150.statcan.gc.ca/t1/tb1/en/tv.action?pid=3310023401>

¹²² Scenario Analysis Update: COVID-19 Pandemic and Oil Shocks, Parliamentary Budget Officer, April 24, 2020

36. Funding For Climate Change Adaptation – Severe Weather Disaster Mitigation through Flood Protection

DESCRIPTION

Flood protection works are deficient in many communities across Canada, which are - due to climate change - at an increasing risk of flooding due to long-term sea level rise and severe weather events such as wind and snowstorms, and more intense rainfalls, which will increase urban flood risks.

Current disaster mitigation funding programs provide limited funds to address long term disaster mitigation projects, with significant financial responsibility falling to local governments, which do not have the financial capacity to assume such significant costs. Senior levels of government should work with local governments and First Nations to fund and assist in implementing a streamlined approvals process for long term flood protection as a part of their disaster mitigation and adaptation programs and should develop and implement a national action plan on flooding as per the Prime Minister's *Mandate Letter to the Minister of Public Safety and Emergency Preparedness*.

BACKGROUND

Global warming poses a serious threat to several thousand kilometres of coastline communities due to sea level rise and waterfront communities across the country which are vulnerable to inland seasonal flooding due to seasonal climate change. Floods from rivers and oceans could destroy or affect residential, commercial, industrial and agricultural properties as well as affect transportation means (roads, highways, bridges) and cause widespread disruption to day-to-day living requiring significant expenditure to restore areas back to pre-flood conditions. Inland, the spring flooding that took place in late April and May 2019 across Ontario, Quebec and New Brunswick caused close to \$208 million in insured damage, according to Catastrophe Indices and Quantification (CatIQ) Inc. The most common cause of damage was overflowing rivers, which led to road and basement flooding, submerged vehicles and shifted home foundations. Heavy rain also caused roof leaks and sewer backups.

The damage to the economy and businesses due to floods are significant, in the billions of dollars. The Federation of Canadian Municipalities (FCM) and Insurance Bureau of Canada (IBC) released a report in early 2020 entitled "Investing in Canada's Future: The Cost of Climate Adaptation at the Local Level" which included the fact that "floods accounted for the largest percentage of the projected annual losses of \$2.43 billion."¹²³

¹²³ Insurance Bureau of Canada: The Cost of Climate Adaptation Report (February 2020, pg 11, Table 2, Column 2) <http://assets.ibc.ca/Documents/Disaster/The-Cost-of-Climate-Adaptation-Report-EN.pdf>

The Insurance Bureau of Canada explains that “it is not only insurers that foot the bill for severe weather damage, but also taxpayers. That’s why all stakeholders should come together to reduce the financial strain caused by flood events. For every dollar paid out in insurance claims for damaged homes and businesses, Canadian governments and their taxpayers pay out much more to repair public infrastructure damaged by severe weather.”¹²⁴

Flood protection structures; measures such as dikes and associated infrastructure (pump stations, flood boxes, rip rap and relief wells) throughout Canada’s coastal and waterfront communities need to be upgraded to combat the threat of sea level rise of up to 1m by 2100. Significant timebound expenditure is needed to upgrade flood protection infrastructure across the country.¹²⁵

In British Columbia, municipalities are facing an aging dike infrastructure. In 2015, BC’s inspector of dikes hired Northwest Hydraulic Consultants to assess 500 kilometres across the highly populated Lower Mainland of B.C. and they concluded that none of the dikes fully met provincial standards. Even more concerning, 71% were vulnerable to failure during flooding.¹²⁶ In 2012 in Truro, Nova Scotia, flood waters breached a dike, causing millions of dollars in damage. This type of climate change related coastal flooding poses a threat not only to valuable businesses, homes, and farmland, but it can also disrupt access to critical essential services like sewage treatment, clean drinking water, power, and access to safe transportation routes.¹²⁷

Mitigating these risks will reduce vulnerability for the short term; however, long term adaption strategies are needed to cope with environmental change. Local governments, however, have limited economic resources and many do not have the financial capacity to fund large scale adaption projects. For many communities, these types of adaption projects will involve dike/seawall upgrades, improvements to foreshore protection, flood plains mapping and land use zoning controls. “A recent study commissioned by the Union of Quebec Municipalities found that the cost of adapting to climate change for Quebec municipalities could hit \$4 billion over the next five years”¹²⁸ alone. The federal government’s current Disaster Mitigation and Mitigation Fund (DMAF) is currently \$2 billion in total for all municipalities and projects across Canada.

¹²⁴ Insurance Bureau of Canada: Halloween Storm Across Eastern Canada Caused Over \$250 Million in Insured Damage (December 9, 2019) <http://www.ibc.ca/on/resources/media-centre/media-releases/halloween-storm-across-eastern-canada-caused-over-250-million-in-insured-damage>

¹²⁵ 2019, Surrey Coastal Flood Adaptation Strategy – Presentation to the Surrey Board of Trade Environment Team by the City of Surrey Environment and Drainage Manager <https://businessinsurrey.com/wp-content/uploads/2019/02/CFAS-Surrey-BOT-Feb-14-2019-compressed.pdf>

¹²⁶ Globe & Mail: Will Sackville’s dikes finally fall? Rising seas could ruin land Acadians turned from marshes to farms <https://www.theglobeandmail.com/canada/article-will-sackvilles-dikes-finally-fall-how-rising-seas-could-ruin-land/>

¹²⁷ Chronicle Herald: Province, Ottawa spending \$114m to reinforce Bay of Fundy dikes against rising seas <https://www.thechronicleherald.ca/news/local/province-ottawa-spending-114m-to-reinforce-bay-of-fundy-dykes-against-rising-seas-302999/>

¹²⁸ FCM Policy Resolution: Federal Climate Change Adaptation Funding and Support for Regional Disaster Mitigation and Flood Planning (adopted June 2019) <https://data.fcm.ca/home/fcm-resolutions.htm?lang=en-CA&resolution=203b9e90-df86-e911-baa5-005056bc2614&srch=%flood%&iss=&filt=false>

This amount is insufficient to meet current needs for disaster mitigation projects, much less for investment in future projects. As noted in the 2019 Canadian Chamber of Commerce 2019 policy ENABLE MUNICIPAL INFRASTRUCTURE TO WITHSTAND THE CHALLENGES OF CLIMATE CHANGE, there is a need for additional federal funding and resources to be devoted to “develop and retrofit municipal infrastructure to anticipate and mitigate the economic impacts of climate change.”¹²⁹ Building on the recommendations of this policy, a defined national plan to address the specific issues of flood prevention and adaptation – the largest percentage of projected annual DFAA costs amongst severe weather disaster events in Canada – is necessary.

Collaboration between multiple stakeholders, including federal, provincial and municipal governments, private landowners, residents, First Nations, and businesses is necessary in order to develop a strategic plan for funding and approval of flood prevention infrastructure investments over time, which will both increase adaptive capacity and reduce vulnerability to climate change.

RECOMMENDATIONS

That the Government of Canada:

1. Develop and implement a national action plan on flooding as per the Prime Minister’s *Mandate Letter to the Minister of Public Safety and Emergency Preparedness*; and
2. Partner with provincial and local governments to provide guaranteed, predictable, flexible federal funding and a stream-lined approval process, through a strategic plan over time, to ensure needed adaption strategies that will both increase adaptive capacity and reduce vulnerability to climate change.

¹²⁹ Canadian Chamber of Commerce Policy Book 2019: 54. ENABLE MUNICIPAL INFRASTRUCTURE TO WITHSTAND THE CHALLENGES OF CLIMATE CHANGE

37. Federal Backing For Small Modular Reactors

DESCRIPTION

Increased financial backing from the federal government for research and implementation of Small Modular Reactor (SMR) technology will contribute to decreased carbon emissions, more jobs in research, lowered costs for energy consumers along with the potential for international exportation.

BACKGROUND

SMRs are nuclear fission reactors that are built to be small in both physical size and power output and modular in that they are portable and scalable.¹³⁰

Successful SMR deployment will likely require a ‘fleet’ based approach to operations in order to benefit from standardization and economies of scale, meaning that capital costs decrease as more units are produced. Due to the small size and modularity, SMRs can be completely built in a controlled factory setting by installing one module at a time, increasing the level of construction quality and efficiency.¹³¹

The driver behind the promotion of SMR technology is that the reactors could be used to provide affordable energy for homes, offices, businesses, and industrial processes, especially in remote communities, like those in Canada’s far North. SMRs are a promising technology that will help not only residents of the far north but companies such as mining operations transition away from diesel.¹³²

Coal is in finite resource and is deemed to be a less environmentally friendly energy generation option. The western provinces in particular are still reliant on coal, with approximately 40% of Saskatchewan’s energy coming from coal.¹³³ Many of these provinces have either declared plans for the phasing out of this resource or in Saskatchewan’s case, a retrofit of existing coal plants to include carbon capture and storage. In the goal of a transition to a low-carbon economy SMR technology could provide hybrid energy systems to provide load-following power to enable higher penetration of intermittent renewables.

¹³⁰ World Nuclear Association. (2020, May). Small Nuclear Power Reactors. Retrieved from: <https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/small-nuclear-power-reactors.aspx>

¹³¹ Canadian Small Modular Reactor Roadmap Steering Committee. (2018). A Call to Action: A Canadian Roadmap for Small Modular Reactors. Retrieved from: https://smrroadmap.ca/wp-content/uploads/2018/11/SMRroadmap_EN_nov6_Web-1.pdf

¹³² Atomic Energy of Canada Limited . (2018). Small Modular Reactors . Retrieved from: <https://www.aec.ca/science-technology/small-modular-reactors/>

¹³³ Government of Canada . (2020). Provincial and Territorial Energy Profiles - Saskatchewan. Retrieved from: <https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/sk-eng.html>

Although chances of malfunction are minuet, SMR technology is designed for a high level of passive or inherent safety in the event of malfunction. In addition to fear of malfunction, many units are being designed to be placed below ground to avoid terrorist threats.¹³⁴ Large reactor safety zones cover a larger surface area which must include heat removal zones, which are not necessary for SMRs. Since small reactors are envisaged as replacing fossil fuel plants in many situations, the emergency planning zone required is designed to be no more than a 300-meter radius.¹³⁵

RECOMMENDATIONS

That the Government of Canada:

1. Unlock tools such as the Canada Infrastructure Bank or Green Recovery Fund to allow to invest in existing infrastructure that will help allow for new technologies like SMRs.
2. Ensure the licensing process for unite is not duplicative so that approvals can be expedited through all levels of government agencies.
3. Create partnership with utilities and industry to support capacity building initiatives. This would include engagement with the public, business leaders and Indigenous stakeholders to develop a robust knowledge base.
4. Ensure that its policies, such as environmental regulations and construction red tape do not unintentionally interfere or create disincentives for SMR technology.

¹³⁴ World Nuclear Association. (2020, May). Small Nuclear Power Reactors. Retrieved from: <https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/small-nuclear-power-reactors.aspx>

¹³⁵ Ibid

38. Hydrogen & Hydrail: A Real Advancement in the Transportation Sector

DESCRIPTION

Across Canada, interest in hydrogen power, both for commuting and heavy industry is growing exponentially. Province after province is adopting zero emission standards, as is the federal government. In western Canada hydrogen-generating projects are moving beyond R&D to pilot and retail stage. In Ontario & Quebec, hydrogen R&D is proceeding rapidly, and consumer hydrogen sales for vehicles are underway.

BACKGROUND

This is a bold vision. To achieve such substantial changes to Canada's transportation sector, business and industry must be engaged in discussions so that challenges and opportunities for both are identified and addressed. This engagement could focus on ensuring the efficient movement of products to market as well as providing labour force mobility so that employees can live in an affordable location of their choosing and still easily access their place of employment no matter where they live within a region.

Zero- and low-emission vehicles do currently exist, but the technology is still developing. In the case of industrial vehicles – diesel engines on trains, earthmovers, heavy equipment – the “pulling” power is missing. Passenger vehicles have been quickly adopted by consumers and continue to evolve.

The significant costs related to various types of alternative-powered vehicles make it challenging for individual commuters to switch from petroleum-powered vehicles. This reality is magnified in remote and rural communities where fast-charging stations or access to electric vehicles is patchy. There is also the practical reality that the greenhouse gases released in the production of electric or fuel-celled zero emission vehicles can also be significant (life-cycle costs).

In light of these barriers, transit options remain the most efficient way to move people over larger distances, although these systems are challenged by volume. Critical mass, i.e., frequency of use, is needed to ensure an efficient and cost-effective transit system. As a result of market realities, this complex issue of reducing transportation related GHGs while not negatively impacting the economy will require significant attention. It also presents an opportunity for Canada to be a leader in research and development in the area of alternative fuels and alternatively powered mass transit systems.

Urban and Inter-urban transit: As an example in BC, respondents to a recent City of Kelowna Quality of Life survey rated public transit between ‘poor’ and ‘fair’ while opportunities to cycle and walk were rated slightly above ‘fair’.

While intra-city transit continues to be identified by users and local government leaders as poor, studies have also shown that there is increased demand for inter-city transit. In the North Okanagan for example, the annual number of trips taken on the Vernon Regional Transit system increased from approximately 488,000 in 2010 to approximately 566,000 in 2015. A key route between Vernon and the University of British Columbia's Okanagan (UBCO) campus in Kelowna was introduced in July 2008 and it has proven to be a vital and valued service with buses often running at full capacity between the two cities.

In central Alberta, a large pilot has begun utilizing hydrogen technology and light rail to connect Calgary with Red Deer, and an eventual plan to connect to Edmonton in the north. Alberta's reliance on petroleum technology can be ameliorated with the successful introduction of such technologies.

Businesses are also concerned about mobility when it comes to the labour force. Having an efficient transportation system that allows employees to be able to get to and from their employment is essential for both the business community and the employees themselves. Greater mobility means greater housing options and increased affordability particularly for those who work in the service sector.

Increased urban density may make sense to a city that is looking to keep its infrastructure costs down, but it can create a challenge if employees, particularly those in the service sector, can't afford to live in the core areas in which those businesses are located. An efficient passenger rail service like that developed in Vancouver (TransLink) and other major metropolitan regions around the world addresses wider mobility options for tomorrow's labour force and addresses the need to move towards low emission transportation options. The latter is a fundamental focus of Bill 28 as introduced by the province of BC (CleanBc) earlier this year.

Recent research led by the School of Engineering at UBC Okanagan (UBCO), Dr. Gord Lovegrove has brought together a number of proponents of hydrogen powered fuel cells for three key businesses: (1) rail passenger service (Hydrail); (2) Retrofit kits for diesel locomotives (which would be used to power Hydrail) and heavy equipment; (3) urban and rural based hydrogen gas generating "gas stations" which would manufacture hydrogen gas onsite through the use of solar power and water for a 100% clean, zero GHG emission process for retail sales. The proponents include the University of British Columbia Okanagan and the Penticton Indian Band.

Hydrail presents a cost-effective mass transit opportunity for the Okanagan Valley with applications across Canada, North America and Europe - many of its innovations are based on existing hydrogen transit technology developed in Europe. Its advocates promote the new advances in the technology as a much more affordable option compared to an electrified system. Hydrail capital costs have been listed at \$5 million/mile vs. \$150 million/mile SkyTrain (part of TransLink, SkyTrain is the oldest and one of the longest automated driverless light rapid transit systems in the world). This estimate has been verified by the lead contractor for CN/CP in Western Canada, with headquarters in Kelowna, which is already supporting UBCO's School of Engineering in related teaching and research activities.

The advocates envision a 250 passenger (Hydrail) electric train running at city speeds in cities, at highway speeds between cities, in the median or beside Highway 97 (embedded rails in cities for barrier-free crossings). With zero emissions and no engine noise to operate, it is believed such a commuter option would have a significant impact in achieving reduced regional greenhouse gas emissions and enhancing tourism access and thus the tourism economy of the Okanagan valley.

Compared to highway capital costs of over \$50 million/mile to twin Highway 97, OVER-PR (Okanagan Valley Electric Regional Passenger Rail) is both safer and more cost effective for commuters. Compared to the proposed OVER-PR, the highway produces more noise, GHGs, air pollution, and crashes. In Kelowna alone, 4,200 crashes in five years cost BC over \$1.5 Billion. Each train will take 250 cars off the road and provide access for youth, seniors and visitors to connect between Okanagan Valley cities.

Given the future legislative requirements for ZEV – in fact, 10% of all light duty vehicles must be ZEV by 2025; 50% by 2030 and 100% by 2040 - and in consideration of the current state of technology and the business case for reducing GHGs generated by transportation – a comprehensive strategy is required. The strategy should accelerate research and development around alternate fuels; fuel-cell technology; and fast-charging stations across the province. Such an acceleration would engender new start-up businesses, and expansion of existing businesses, boosting various sectors of the economy. There is also a promising business case for green hydrogen production in BC due to the province's extensive clean hydropower resources. Hydrogen can be produced from diverse, domestic resources including fossil fuels, biomass, and water electrolysis with electricity. The environmental impact and energy efficiency of hydrogen depends on how it is produced. BC's emphasis through CleanBC and Canada's growing country-wide initiatives around fossil fuel replacement bode well for the commercial growth in the hydrogen fuel industry.

In June of 2020, a BC company based in North Vancouver, BC, confirmed that their 2020/early 2021 initiatives include (1) building a hydrogen fuel storage facility and pump in Kelowna, BC (making five in BC); (2) working with the Penticton Indian Band on a pilot hydrogen fueling project with NRC funding, and a mirror project in California; (3) expanding work with Hydra Energy supplying diesel conversion to hydrogen vehicles for the lower mainland of BC; (4) participating in a pilot project in Alberta on a full fuel cell demonstration facility; (5) expanding their hydrogen station footprint in Quebec to 10 facilities. This expanded commercial activity proves out the interest in and commercial viability of, hydrogen as a green fuel in Canada.

Through deeper engagement with the government of Canada, the multiple research projects both at university level and in private industry across the country will help realize the key deliverables of the government's recently announced Hydrogen strategy. This strategy envisions building a \$5-billion industry that would create 100,000 jobs and include a nationwide network of hydrogen-vehicle fueling stations by 2050 - once it has overcome the challenges of high costs and a lack of cohesive industry standards.

Hydrogen, according to the government's strategy, could be of major benefit as a source of heat for industry and buildings, in power generation, and fueling trucks, trains and ships where electric batteries are not feasible. Hydrogen development will allow Canada and other countries to reach their climate targets. The European Union and Australia both have aggressive hydrogen project funds launching.

The main challenge in Canada is cost: compared to conventional fuel options, hydrogen is not yet viable. And doing away with fossil fuel is not realistic; blue hydrogen is currently the most cost-effective hydrogen available.

Moving to large-scale use of hydrogen is decades away and is a long-term vision; but Canada must start now.

RECOMMENDATIONS

That the Government of Canada:

1. Provide additional research funding to Canada's post-secondary institutions to accelerate examination of emerging technology on hydrogen fuel cells to enable light rail or hydrail as has been introduced in Europe as a means to serve growing regions of the country.
2. Invest and create hydrogen funded pilots to help achieve the 2050 fueling goals using hydrogen.
3. Engage provincial elected officials, business, community and academic leaders in a discussion on the creation of a centre of transportation excellence focused on applied research in the area of hydrogen as an alternative fuel source to serve the transportation sector (road, rail & aerospace) in alignment with the various provinces' visions of mandating the requirement for zero emission vehicles (In BC, by 2040, Bill 28).

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136, 137, 138, 139, 140, 141

¹³⁶ OVER PR (Okanagan Valley Electric Regional Passenger Rail) <https://engineering.ok.ubc.ca/about/contact/gordon-lovegrove/> Research Summary

¹³⁷ <https://www.alstom.com/coradia-iliint-worlds-1st-hydrogen-powered-train>

¹³⁸ The Penticton Indian Band's K'uL Group defines itself as being formed to foster the development of a sustainable economy for the Penticton Indian Band. It is the "for profit" business investment and development division of the PIB and is the umbrella organization that holds the corporate business investments.

¹³⁹ Principal Investigator Dr Gord Lovegrove, PEng, MBA, PhD, Fellow of the Institute of Transportation Engineers, UBCO Sustainable Transport Safety Research Lab Associate Professor, Faculty of Applied Science, School of Engineering Chair, Sustainable Development Committee, Cdn Society of Civil Engineering

¹⁴⁰ <https://www.kelowna.ca/our-community/news-events/news/2018-citizen-survey-results>

¹⁴¹ <https://www.leg.bc.ca/parliamentary-business/legislation-debates-proceedings/41st-parliament/4th-session/bills/first-reading/gov28-1>

39. Reuse of Greywater to Help Address Unsustainable Water Resource Demand

DESCRIPTION

Of the overall available water resources on earth, approximately 97% is in the oceans with the remaining 3% available for direct use; however, out of this 3% the water available for use by humans is estimated at one one-hundredth. Survival remains one of the key factors of water use along with food production, industry, and domestic needs.

Global demand for water has or will soon reach or exceed natural capacity of watersheds. Much of the world is affected by acute water shortage and over-exploitation of water resources resulting in the destruction of these resources and high levels of freshwater pollution resulting from anthropogenic factors. Urbanization, industrialization, and population growth have resulted in unsustainable water demand which affects cost to business, ability to operate and quality of life. Canada is not immune to these problems.

As growth and demand continues where will the water come from to sustain industry, food production, ecological and human activities? The widespread reuse of grey water is a viable option that should be explored to meet some of this demand for water.

BACKGROUND

Greywater refers to wastewater drained from sinks, showers, machines, and other domestic, agricultural, commercial, and industrial sources. Greywater differs from black water in that it does not contain human waste. The average person in a developing country consumes approximately 20 to 30 litres of water per day; however, Canadians are one of the highest global users of water, generating >300 litres of wastewater each day. Canada has yet to realize the realities of a global water crisis to the degree that much of the world has already felt. In order to address the water crisis, UNESCO International Hydrological Programme promotes the collection and recycling of grey water to preserve global water supply.

With global warming, increasing domestic and global populations and concomitant increases in industrialization and urbanization, there is tremendous need for freshwater resources worldwide with sources becoming increasingly scarce. To achieve effective greywater treatment and reuse, extensive contributions from technical and non-technical experts is required.

Greywater treatment and reuse if embraced and enforced can lead to a substantial decline in over-reliance on freshwater resources for non-potable uses (e.g., industrial and commercial processes, agriculture, domestic use, etc.). Current research is endeavoring to address dwindling water resources by reducing demand, increasing efficiency, and developing alternative sources previously considered unusable. Of these, "greywater" is a viable potential source. The increased use of reclaimed water presents one of the greatest untapped opportunities to better use and manage existing water supplies. Greywater might also provide a supplementary source to existing water sources in areas where there is acute water crisis, regionally, nationally, and

internationally. Recycled greywater can be used for different water-demanding commercial, industrial, agricultural and domestic activities, including potable and non-potable uses.

Reuse of greywater is an old practice but requires innovation and largescale application to assist in the reduction and over-reliance on freshwater, potable resources and to reduce the overall growing pollution caused by the discharge of untreated greywater into freshwater resources. The development of innovative technologies used to recycle greywater provides a world-leading opportunity to provide innovative technologies and solutions to address a national and international crisis. Although some technologies have been developed to treat or remove specific pollutants, quality criteria differ for each type and greywater composition and generation rates vary greatly from one system or region to another. To be universally effective, systems must be designed to be efficient and effective on a large scale and take into consideration regional variability and complexities such that effluent from treatment systems can meet water quality criteria.

With the spread of the novel coronavirus COVID-19, and related health and economic implications, concerns could arise with respect to the safe reuse of recycled water. The principal transmission route of COVID-19 is close contact with infected persons (e.g., respiratory droplets). Human coronaviruses are more fragile than other viruses and although research is still ongoing, scientific data suggest that coronaviruses die off rapidly in wastewater, with a 99.9% reduction in 2–4 days. The design and operation of processes used to disinfect water and wastewater are based on the most resistant and more transmissible viruses as such existing conventional disinfection methods would be expected to readily inactivate COVID-19. The WHO stated, there is “no current evidence that they are present in surface or groundwater sources or transmitted through contaminated drinking water”. Greywater usually undergoes a 3- to 4-stage treatment (multi-barrier system) including disinfection, before the recycled (grey)water is safely used for non-potable applications.

Business Case for this Policy

Industry, and business in general, is becoming subject to high water costs and being challenged to do more with less water. Businesses are often in conflict with local domestic uses, other industries, agriculture, tourism, and ecosystem needs and protection bylaws. This restriction on water use and resources has direct implications to business and the Canadian economy. Lack of water often means curtailment of production and certain activities, intermittent shutdowns and production limitations, limitations on land development, and unsustainable practices. Modern and developed jurisdictions must lead the development of water reuse management practices.

In Canada, BC is a leader in developing policy and legislation to safely manage the recovery and reuse of municipal wastewater. Recovery and reuse of municipal wastewater (reclaimed water) for non-contact commercial and institutional, household and landscape purposes could increase the amount of net water available without effecting current consumption patterns, volumes, or lifestyles. More than ever, building codes and reclaimed water standards need to be updated to reflect current economic and environmental requirements.

Currently, as per the Canadian Guidelines for Domestic Reclaimed Water for Use in Toilet and Urinal Flushing, Canada bases its plumbing requirements for non-potable water systems are addressed by CSA Standard B128.1-06/B128.2-06, Design and installation of non-potable water systems/ and Maintenance and field testing of non-potable water systems (CSA, 2006). These standards and guidelines are now outdated and need to be re-examined.

Reusing grey water for industrial use, irrigation and other non-potable water applications will help in reconnection of urban habitats to the natural water cycle, which will contribute significantly to sustainable urban development and the economy. Industrial facilities have an important role to play, and, therefore, should be consulted when developing new guidelines and regulations. Reuse of greywater can help in substituting precious drinking water in applications which do not need drinking water quality such as industrial, agricultural, and domestic applications. The major benefits of greywater recycling can be summarized as reduced freshwater extraction from rivers and aquifers, less impact from wastewater treatment plant infrastructure, nitrification of the topsoil, reduced energy use and chemical pollution from treatment, replenishment of groundwater aquifers, increased agricultural productivity, reclamation of nutrients and improved quality of surface and groundwater.

Protection of public health is of paramount importance while devising any greywater reuse program. As solutions are investigated, proper treatment, operation and maintenance of greywater recycling systems are essential to maintain public protection and confidence. Were Canada to become a global leader in greywater reuse, it would benefit both the environmental and public as well as industry, economy and place Canada on the leading edge of innovation and technological advancement on a topic of global importance and economic benefit.

RECOMMENDATIONS

That the Government of Canada:

1. Adopt national guidelines for reclaimed water standards that can be applied to both residential and non-residential applications in terms of use and requirements, and
2. Provide incentives in the form of infrastructure support to ensure Canadian business makes strides in the development and implementation of water reuse management practices.

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¹⁴², ¹⁴³

¹⁴² <https://en.unesco.org/themes/water-security/hydrology>

¹⁴³ http://www.ecosanres.org/pdf_files/ESR_Publications_2004/ESR4web.pdf

40. A Circular Economy from Plastics

DESCRIPTION

Plastics provide value through the use of thousands of products that add comfort, convenience and safety to our everyday lives. However, because of our linear economy behaviour of “make, use, dispose”, nearly 80% of all post-consumer plastics in Canada end up in our landfills. This poses a threat to our environment and a loss to an economic opportunity. The potential lies in replacing linear behaviours with a more sustainable, circular economy where plastics are recovered and re-purposed to capture the value-add potential for new, innovative products derived from a plastics “commodity”.

BACKGROUND

Currently, in Canada, over 3 million tonnes of plastic waste is generated every year with an estimated 9% being recycled while the remainder ends up in landfills, being incinerated, or simply dumped in the environment. This unsustainable practice has an adverse effect on the economy and threatens the health of the environment.

Environment and Climate Change Canada (ECCC) commissioned a study to better understand the current state of our plastics industry. Their findings show that our plastics manufacturing industry is a significant economic driver with sales being reported at \$35 billion in 2017 and supporting over 90,000 jobs across more than 1,900 companies. In comparison, Canada’s recycling industry has less than a dozen companies employing about 500 people and generating \$350 million.

Because our infrastructure does not keep pace with our plastics consumption, a significant amount of plastics end up being disposed of rather than being recycled and re-purposed into higher valued products for consumer use. The ECCC study finds that by diverting this “waste” product to recycling facilities requires an investment between \$4 - \$8 billion for new infrastructure plus government regulation to encourage responsible use and disposal of plastics. Revenues from the investment could increase to \$3 billion and create over 40,000 new direct and indirect jobs nationally.

At the G7 Environment Ministers meeting in late 2018, Canada announced the Circular Economy Leadership Coalition that is “accelerating sustainable, profitable, zero-waste solutions to ensure Canadian leadership in the global Circular Economy”. Soon after the federal, provincial, and territorial governments agreed to a Canada-wide strategy on Zero Plastic Waste. Under this umbrella, and in support of the G7 Innovation Challenge to Address Marine Plastic Litter, Canada is “investing in innovative Canadian technologies to help small businesses across the country find new ways to reduce plastic waste and turn it into valuable resources that support a circular economy.”

In 2019, the federal government made a commitment to ban “unnecessary single use plastics” such as straws, plastics bags, cotton swabs, etc. In early 2020, to achieve this goal, the Federal government signaled its intent to list plastics as “toxic” under Schedule 1 of the Canadian Environmental Protection Act (CEPA).

There is significant concern in industry that the regulatory framework proposed would impair efforts to invest in recycling infrastructure and technology, limit investment in new resin facilities that may use recycled content as feedstock and set precedent for barriers to international trade.

In July 2020, Alberta, one of Canada's largest plastic manufacturing locations, announced the creation of The Plastics Alliance of Alberta, a special partnership between government, industry, and academia. The group will "collaborate on actions needed to encourage and support a plastics circular economy in Alberta", and will be chaired by the Industry Solutions area of the Northern Alberta Institute of Technology.

Today, we are seeing some industries re-thinking their systems and processes to align with a circular model to be more productive and create new market opportunities. However, addressing the plastic waste issue and changing the way we think about plastics requires a long-term commitment by all consumers, manufacturers, technology providers, government and society as a whole. Investments and clear regulations will be required by government to achieve a larger commitment to developing the infrastructure and encouraging the behaviours required for a sustainable, healthy future for our communities.

RECOMMENDATIONS

That the Government of Canada:

1. Establish a task force that includes government, industry, and research institutions to identify global best practices for plastics management and to advise on policies and programs to encourage a circular economy,
2. Implement policies and programs that support the investment in infrastructure and services that would further encourage value-add manufacturing investments thereby creating new employment and economic potential across Canada,
3. Not list plastics as toxic under Schedule 1 of CEPA,
4. Support and promote industries and attract investments that support a circular economy, adding value to our natural resources and continuing economic diversification,
5. Consider implementing a "green credit" for advanced recycling products to offset the significant costs of building out recycled content feedstock.

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¹⁴⁴ http://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf

41. A Path Forward for Canadian Energy

DESCRIPTION

The world has entered unprecedented economic challenges and Canada has not been spared. With May 2020 hitting record-high unemployment at 13.7%¹⁴⁵ and an expanding national debt, Canada must chart a viable recovery path, and energy holds a vital place on that path. Canada's oil and gas sector has seen deep struggles in the last two decades, and the recent impacts of COVID-19 and global oil price instability are causing deeper wounds than ever. In June 2020, the Federal Minister of Natural Resources stated; "the bottom line is the country is not going to recover unless the oil and gas sector recovers."¹⁴⁶ Oil and gas, and energy as a whole, is vital to Canada's economy, and we must chart a collaborative path forward.

BACKGROUND

Currently, Canada has divided views and important interests as well as concerns around resource development. While a large number of families in Canada rely on their energy sector work to put food on the table, there other Canadians with legitimate concerns around the inherent rights of Indigenous peoples and environmental risks.

Canadians recognize that the environment is important and we must do our part to lead in building a greener society. However, this must be properly balanced with the economic and technological realities we also live in. The demand for Canadian energy, including fossil fuels, remains high for the foreseeable future. The Canada Energy Regulator suggests that while coal and oil will decline in use while natural gas and renewable use rises, crude oil production still has the potential to see a 49% increase from 2018 levels to 2040.¹⁴⁷ On environmental concerns, it is important to keep the numbers in context and celebrate the hard work that is being done to reduce emissions. According to NRCAN, while the oil sands account for 11% of Canada's, they only make up 0.1% of global emissions. As well, "From 2000 to 2017 the emission intensity of oil sands operations dropped by approximately 28% as a result of technological and efficiency improvements, fewer venting emissions and reductions in the percentage of crude bitumen being upgraded to synthetic crude oil."¹⁴⁸

Canada needs to focus on its values of collaboration, civic pride, and its leadership in human rights. One of the top countries that Canada imported oil from in 2019 was Saudi Arabia.¹⁴⁹ Canada currently produces enough oil to more than meet its own energy consumption needs.

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¹⁴⁵ <https://www150.statcan.gc.ca/n1/daily-quotidien/200605/dq200605a-eng.htm>

¹⁴⁶ <https://edmontonjournal.com/opinion/columnists/varcoe-oregan-says-the-country-is-not-going-to-recover-unless-the-oil-and-gas-sector-recovers/wcm/f8eb9b6d-3c67-4734-8f86-33f784f7c391/>

¹⁴⁷ <https://www.cer-rec.gc.ca/nrg/ntgrtd/fr/2019/rsits/index-eng.html>

¹⁴⁸ <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/crude-oil-facts/20064>

¹⁴⁹ [https://www5.statcan.gc.ca/cimt-cicm/topNCountries-pays?lang=eng&getSectionId\(\)=0&dataTransformation=0&refYr=2019&refMonth=12&freq=9&countryId=0&getUsaState\(\)=0&provid=1&retrieve=Retrieve&country=null&tradeType=3&topNDefault=10&monthStr=null&chapterId=27&arrayId=0§ionLabel=&scaleValue=0&scaleQuantity=0&commodityId=270900](https://www5.statcan.gc.ca/cimt-cicm/topNCountries-pays?lang=eng&getSectionId()=0&dataTransformation=0&refYr=2019&refMonth=12&freq=9&countryId=0&getUsaState()=0&provid=1&retrieve=Retrieve&country=null&tradeType=3&topNDefault=10&monthStr=null&chapterId=27&arrayId=0§ionLabel=&scaleValue=0&scaleQuantity=0&commodityId=270900)

¹⁵⁰ <https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/clean-fossil-fuels/crude-oil/oil-supply-demand/18086>

When viewing the human rights track record of Saudi Arabia, we believe that Canadians would prefer our own domestic supply to continue our leadership in promoting global human rights, as well as to secure our supply price shocks from OPEC+ nations.

We appreciate the Federal Government's continued commitment to the Trans Mountain Expansion, Enbridge Line 3, and Keystone XL. Pipelines are safer than transporting oil via rail and provide the opportunity for Indigenous partnership/ownership.

The Canadian Chamber of Commerce requests that the Federal Government develop and implement a cohesive energy strategy that recognizes regional and provincial differences, and charts a collaborative path forward with industry, stakeholders, and provincial governments, to work together to use our own energy to meet our own needs, by removing interprovincial trade barriers, and continue our global leadership in clean energy innovation. The Canadian Chamber of Commerce recognizes that the energy sector can be part of a net-zero strategy and can play a vital role in building the Canada of tomorrow.

RECOMMENDATIONS

That the Government of Canada:

Work with industry, stakeholders, and provincial governments to create and implement a cohesive energy strategy that:

1. Considers the resource-rich opportunities we have across the nation and how to work with each other, including Indigenous partners, from coast to coast to coast to ensure sustainable development and national security of resources, with a focus on using our own energy to meet our own needs,
2. Works with the provinces to remove interprovincial trade barriers to allow free flow access for energy and goods,
3. Recognizes the clean energy we already produce, recognizes that the energy sector can be a partner in a net-zero strategy, and sets goals to lead the world in the cleanest technologies, including in innovation around the continued use of fossil fuels, and;
4. Educates and builds knowledge to Canadians and international audiences on the investments and actions our energy industry has taken to be leaders in environmentally responsible developers of our national resources.

42. Reform Scope of Federal Environmental Assessments to Accelerate National Infrastructure Development

DESCRIPTION

Projects critical to the national economy face months or years of delay due to the over-sized scope of federal Environmental Assessment (EA) regimes. Instead of genuinely assessing environmental risk, today's federal Environmental Assessments are empty shells. They create hurdles for project development and provide a platform for opponents to object. Without an objective set of rules and standards, EAs often become politicized. The outcome seems mostly determined by the priorities of the government in power, while critical infrastructure projects languish in red tape.

BACKGROUND

Investment in Canada's economy is hampered due to the uncertainty that is created around the delays and increased costs of prolonged environmental assessments. Investment in natural resource, transportation and city-building infrastructure is increasingly inadequate. Cost overruns and schedule delays on infrastructure projects are a common occurrence. Balancing environmental protection with infrastructure development is an economic necessity. Project assessments should be rules-based as opposed to the current discretionary case-by-case reviews.

The economic prosperity resulting from Canadian natural resource development – estimated at nearly one-fifth of the nation's GDP and 1.7 million jobs -- is dependent on industry's ability to pursue new projects; for decades, these have been subject to environmental assessments (EAs) at the provincial/territorial level as well as at the federal level through the Impact Assessment Act (IAA). Coordination of assessments required at both levels has been problematic for most of this period, with the need for two separate and often duplicative processes resulting in considerable regulatory overlap, delays and uncertainty that have, in many cases, led to weakened project economics, fragmented consultations, and reduced business competitiveness.

IAA 2019 reforms

On June 21, 2019, the federal government of Canada (Canada) passed Bill C-69, new legislation that would materially reform the federal environmental assessment regime in Canada. The reforms will see the National Energy Board (NEB) replaced by the Canadian Energy Regulator (CER) and the Canadian Environmental Assessment Act, 2012 (CEAA 2012) replaced by a new Impact Assessment Act (IAA). This was an attempt to address these challenges aimed at attempting to harmonize the provincial-federal regulatory overlap and shorten the duration of the overall process through the introduction of specific timelines. However, some elements of these reforms have instead had the opposite effect: since its implementation, the mining industry has seen a duplication of provincial processes, federal intrusion into provincial jurisdiction, and a deterioration in federal and provincial coordination and among federal government

departments and agencies. Combined, these have resulted in "inefficient and costly impacts to project economics."

The 2019 legislative amendments also exacerbated the growing delays associated with EAs.

While the process introduced specific timelines, it also added various means to stop and extend timelines within the process itself, which have further complicated the federal processes' ability to align with provincial processes; in practice, this – along with a significant decline in federal scientific support for EAs – has in fact lengthened the overall duration of federal EA processes.

Related federal reforms

It is also important to consider the impact of additional reviews the federal government is also conducting on other legislation directly tied to EA projects in Canada: the Fisheries Act, the Navigation Protection Act, and the National Energy Board. Each set of reforms is being handled as a separate process with disparate sets of recommendations. Given the considerable overlap in the mandates of these panels and the potential impact that each could have on the EA process, it is crucial that the federal government ensures that any efforts to introduce changes to any and all of these elements does not result in duplicative or contradictory regulation, and does not complicate industry's ability to navigate the federal EA process.

RECOMMENDATIONS

That the Government of Canada:

1. Develop a framework fully supporting a "one project, one assessment" approach, that recognizes equivalency when appropriate, for projects that trigger environmental assessment requirements at both the federal and provincial/territorial levels by:
 - a. Moving from a discretionary case-by-case review system to a rules-based system;
 - b. Publishing substantive EA requirements listing pre-determined criteria, with full transparency, before projects are proposed;
 - c. Allowing regional EAs to avoid delays and duplication;
 - d. Ensuring assessments prioritize the economic benefits of a project.
2. Respect provincial/territorial jurisdiction by maintaining the current scope of effects considered within federal environmental assessments, and preventing new federal environmental assessment requirements from being created for categories of projects already captured by provincial/territorial assessment requirements.
3. Improve timelines and reduce duplication for environmental assessments by:
 - a. enhancing coordination with provincial/territorial governments,
 - b. working with industry to identify potential efficiencies, and
 - c. adequately resourcing federal scientific support for provincial/territorial governments and federal departments as required throughout the process.
4. Make all information generated during environmental assessments accessible to the public through an online library or registry, which should also provide information about post-assessment monitoring and enforcement.
5. Ensure Indigenous peoples have the capacity to participate in the environmental assessment project review process by enhancing funding for participation and by developing strategies to build longer-term capacity within communities.
6. Engage potentially impacted Indigenous communities as early in the process as possible and jointly determine desired outcomes for consultation and participation.
7. Retain the Canadian Environmental Assessment Act 2012 definition of "interested parties" of public hearing participants as being those directly affected by a given project or those with relevant information or expertise.

NOTES

¹⁵¹, ¹⁵², ¹⁵³, ¹⁵⁴, ¹⁵⁵

¹⁵¹ Ibid.

¹⁵² Ibid.

¹⁵³ <https://www.osler.com/en/resources/regulations/2019/government-of-canada-enacts-changes-to-environmental-assessment-processes>

¹⁵⁴ Mining Association of Canada, "Facts and Figures of the Canadian Mining Industry", 2016

¹⁵⁵ Natural Resources Canada, "10 Key Facts on Canada's Natural Resources", October 2016