



UNDERSTANDING THE IMPACT OF SUSTAINABLE FINANCE ON ONTARIO'S ENERGY SECTOR

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(2020-2030)

PROJECT OVERVIEW

I. Defining Sustainable Finance

For the purposes of this project, we are working with the definition of sustainable finance provided by Canada’s Expert Panel on Sustainable Finance:

“Capital flows (as reflected in lending and investment), risks management activities (such as insurance and risk assessment), and financial processes (including disclosures, valuations, and oversight) that assimilate environmental and social factors as a means of promoting sustainable economic growth and the long-term stability of the financial system.” [1]

Some examples of sustainable finance tools include:

FIXED INCOME	COMMODITY-BASED	IMPACT-LINKED	RISK MANAGEMENT	OTHER
<ul style="list-style-type: none"> • Green Bonds • Sustainability Bonds 	<ul style="list-style-type: none"> • Renewable Energy Credits • ESG ETFs • Cap and Trade 	<ul style="list-style-type: none"> • Social Success Notes • Environmental Impact Bonds • Impact-Linked Finance 	<ul style="list-style-type: none"> • Weather Derivatives • Catastrophe Bonds • Smart Beta • Increasing availability to ESG data 	<ul style="list-style-type: none"> • Green Deposit Accounts • Eco Credit Systems • Taxation Structures • Blended finance

* Sustainable finance tools may belong to one or more categories.

II. Project Scope

This report assesses the impact of sustainable finance developments on Ontario’s energy sector over a 5-year time horizon, between 2020-2025. Using scenario analyses that explore alternative trajectories for sustainable finance in Canada, the analysis considers possible implications for the Ontario Ministry of Energy, Northern Development and Mines (ENDM) and Ontario’s energy sector. Based on secondary research and informational interviews with experts and stakeholders, we have identified that the degree to which the Transition Taxonomy (to be released in 2020) is adopted by stakeholders will determine the rate of change at which Ontario’s energy sector will experience the impact of sustainable finance. Assessment of downstream political, economic, and social ramifications of sustainable finance in Ontario’s energy sector are also discussed. The intended audience of this brief is the ENDM, with an aim to raise awareness of the challenges and opportunities associated with existing and emerging sustainable finance tools (e.g. green bonds). Stakeholders include the ENDM, the Independent Energy System Operator (IESO), the Ontario Energy Board (OEB), the provincial government, financial institutions, utilities such as Ontario Power Generation (OPG) and Hydro One, sustainably driven companies, and energy consumers (e.g. commercial and industrial, residential).

METHODOLOGY

Our research draws from government and industry reporting, academic analysis, comparative jurisdictional scans, and primary research through contact with Ontario's energy stakeholders and experts. The results of our research are elaborated in two scenario analyses and their ensuing recommendations. The scenarios take place in 2025, five years after the release of the National Standard of Canada for Green and In Transition Taxonomy, and the report also features issues for the ENDM to consider over the upcoming decade (2020-2030) regardless of overall adherence to the taxonomy.

INTERVIEWS

We undertook seven interviews with experts from academic research centres, energy operators, non-profit organizations, and financial institutions. By speaking with professionals from across sectors we were able to build our scenario analyses with a comprehensive perspective, taking into account variations in outlook due to area of expertise. With some minor adjustments to properly leverage each expert's unique knowledge base, our research questions included (but were not limited to):

- *Would you be able to speak to the anticipated impact of a Canada-wide sustainable finance taxonomy? And what would that look like in Ontario's energy sector?*
- *What is the role of the government in preparing to capture opportunities and manage risks for the energy sector?*
- *How can sustainable finance be used to provide financial protection (i.e. insure utilities)?*
- *What are the potential impacts on energy customers?*
- *In your view, what are the biggest uncertainties that sustainable finance presents to the Ontario energy sector?*

Over the course of our interviews, a recurring theme emerged: interviewees from a diverse range of backgrounds expressed concern about the lack of a cohesive overarching framework within which sustainable finance could operate. This feedback led us to focus our attention on the plausible futures based on the adoption levels of a sustainable finance taxonomy for Canada.

JURISDICTIONAL SCANS

Our preliminary jurisdictional scans looked at Denmark and Germany, two countries that (until very recently) had near opposite reputations for sustainability and the availability of sustainable finance tools. Denmark, considered a global leader in green initiatives, has a number of sustainable finance tools available to corporations and private citizens. Germany, on the other hand, was considered an international laggert in the realm of sustainable finance and now aims to become “a leading location” for the sector.[2] These efforts are very recent, and have yet to develop enough to be analyzed and applied to Ontario’s circumstances, but the ENDM should nevertheless observe developments in Germany’s economic environment and governance structures. In the end, these jurisdictional scans were not as applicable as we had initially hoped. They were, however, useful in framing our own expectations for collaborative effort between the private sector and government when building our recommendations.

SCENARIO OVERVIEW

This section draws insight from government and industry reporting, academic analysis, comparative jurisdictional scans, and primary research through contact with energy stakeholders and experts to present two hypothetical scenarios. Drivers are first examined to contextualize the scenarios presented. The relationship between sustainable finance and the ENDM is described through a risk pathway. Opportunities and risks are then examined for both scenarios.

Drivers

The following are current and emerging drivers of change that represent the most relevant shifts in political, economic, social, technological, and environmental trends that will affect the ENDM and its stakeholders within 5 years:

- I. Energy Emissions
- II. Demographics
- III. Electrification of Public Transportation Networks
- IV. Innovation
- V. Changing Perception of Climate-Related Risks
- VI. Sustainable Finance Taxonomy

I. Energy Emissions

In line with Canada's commitments under the 2015 Paris Agreement, the Government of Ontario has committed to reduce the province's GHG emissions to 30 percent below 2005 levels by the year 2030.[3] Approximately 75 percent of Ontario's GHG emissions come from the energy sector.[4] The electricity sub-sector is low-emitting as Ontario generates 60 percent of its electricity through nuclear power, however, the province is set to undergo a shift in energy sourcing. With Pickering Nuclear Generating Station set to shut down operations by 2025, and both Darlington and Bruce nuclear plants to undergo future refurbishments until approximately 2030, natural gas is positioned to be the default energy source to compensate for the province's impending decrease in nuclear power capacity. Reporting from the IESO's 2020 Annual Planning Outlook notes that GHG emissions are "expected to increase in the 2020s as a result of increased production from gas-fired generation during the nuclear refurbishment period and the retirement of the Pickering Nuclear Generating Station. Electricity sector emissions are forecast to increase to 11 megatonnes CO₂e by 2030, still remaining well below 2005 levels." [5] Taking into account emissions beyond electricity, the province's auditor general has reported that Ontario is not on track to reach its emissions reduction target for 2030.[6]

II. Demographics

Ontario's population is projected to reach roughly 16 million by 2025 and the province will likely experience a rise in overall energy consumption stemming from this population growth.[7] There will be greater demand for housing and office space, which will require large amounts of resources for both the construction process and for the supply of utilities after they are built. More people will also mean more vehicles on the road and will feature a mix of traditional GHG emitting vehicles and electric vehicles (EVs). The lack of EVs on the road today can be explained by a variety of factors, including a lack of affordable options and a lack of charging infrastructure. Efforts are currently underway to address these barriers over the next five years, with over 350 new EV models to be made available by 2025, as well as through the expansion of both public and personal charging stations. [8] Another consequence of a growing population is increased internet usage, which is already a major consumer of energy. Electricity demand to support the internet's infrastructure is expected to continuously rise on account of its "never-ending creation of data." [9] The fact that structural changes are also taking place as the economy shifts towards more service-intensive industries will further exert greater pressure on computer servers and lead to an expansion of data centers, all of which rely on electricity to function.

III. Electrification of Public Transportation Networks

Ontario's energy landscape will also be affected by increased electrification over the next five years as the transportation sector continues to undergo a 'green shift.' The provincial government has already issued several green bonds, some of which have gone to fund clean transportation projects. The province intends to issue more green bonds sometime in the near future, pending market conditions.[10] A number of Ontario's major cities are implementing their own 'green' transit initiatives, with the goal of retrofitting existing vehicles or developing more sustainable modes of public transportation. For example, Toronto's TTC is in the process of adding three different types of eco-friendly buses to their fleet – clean diesel, hybrid electric and battery electric – in their quest to halve emissions between 2028-2032 and to ultimately possess an emissions-free fleet by 2040.[11] Mississauga's MiWay is adding their own hybrid-electric buses that can be converted to full battery power to help them reduce emissions by 80 per cent by 2050.[12] While Ottawa's OC Transpo has put the brakes on new green-fleet initiatives, this may change as they monitor the efficiency of electric buses in cities like Calgary and Toronto.[13] Other cities in Ontario have developed their own sustainable transportation plans, and they must all be accompanied by investments in charging infrastructure to support these initiatives.[14] This 'green shift' is not exclusive to bus systems, as several rail networks have also announced efforts to further reduce their carbon footprints. Stage 2 of Ottawa's planned expansion of its Light Rail Transit (LRT) system is currently underway, and by 2025 will have added 47km of rail network and 29 new or redeveloped stations.[15] Across the Greater Toronto Hamilton Area, Metrolinx is working with both provincial and municipal actors to electrify the GO rail corridors, with the goal of adding electrified trains in the next few years.[16]

IV. Innovation

Innovation continues to have a major impact on the energy sector in Ontario. Advances in technology are making sustainable energy sources such as solar panels and battery storage available for personal consumption which could lead to an increased rate of grid defection. As these alternative energy service options become cheaper and more efficient, a greater number of individuals are given greater incentive to install them in their homes or businesses and disconnect from the centralized grid. In this event, the price of electricity will subsequently increase, which will then motivate more people to disconnect, resulting in an even further increase in electricity prices. This cycle could lead to a large number of Ontario's energy assets becoming stranded. As such, technological and business model innovation are key determinants of future success for Ontario-based energy stakeholders.

V. Changing Perception of Climate-Related Risks

Risk analysis and perception is a deeply cerebral process that uses a complex collection of factors to evaluate perceived risk from a threat, including trust, values, experience, emotions, as well as cultural and ideological factors such as worldviews.[17] In addition, perception varies across individuals, groups, and organizations based on a perceived exposure to the risks and adverse outcomes. For instance, utilities, reinsurance companies, and governments are more likely to react differently to the climate-related risks, compared to an average citizen who may be more concerned with weather, rather than regional climate. As such, public perception of climate change and its risks are extremely varied and complex. However, with the increasing frequency and severity of climate-related events, it is likely that climate risk perception will continue to rapidly change in similar ways across society in the near-term.

Evaluation of climate change is a complicated process where experimentation and repeated observation is challenging. The resultant uncertainty forces the public to rely on simplifying heuristics (i.e. rules of thumb) and readily accessible mental frameworks that inform their judgements and evaluations.[18]

For instance, the availability heuristic, whereby people make judgements about the likelihood of an event based on how easily an instance or case comes to mind, demonstrates an ability of human cognition to evaluate events and derive conclusions without immediate attention. This is particularly pertinent, as there are increasingly numerous examples of events that may affect the public's perception of climate risks and risk exposure. For instance, California's Pacific Gas and Electric Company's (PG&E) bankruptcy, triggered by over \$7.7 billion dollars in losses resulting from wildfires, has been dubbed the first "climate change bankruptcy" and has attracted attention on a global scale.[19] Another example are the bushfires in Australia, which have killed more than 400 people and forced Australian citizens to be exposed to poor, hazardous air quality for 81 days in 2019.[20] Both events have undoubtedly swayed the public's risk perception by developing, fostering, and affirming emotions of fear and anxiety.



VI. Sustainable Finance Taxonomy

Quick Facts: National Standard of Canada for Green and In Transition Taxonomy

Initiators:

- Canadian financial sector (banks, pensions, insurance companies)
- Canadian Standards Association (CSA)

What it is:

- Part 1: *Transition Definition, Framework and Taxonomy (Express Document)*
 - A voluntary classification tool
 - Applicable to transition-based financial instruments
 - Singularly focused on GHG emissions reduction
 - A work in progress (definitions and guidance within are subject to change)
- Part 2: *National Standard of Canada for Green and In Transition Taxonomy*
 - An expansion on the Express Document that will define “green” taxonomy

Timeline:

- Express Document for release in June 2020
- *National Standard* for release in late 2020

The Canadian financial sector has partnered with the Canadian Standards Association (CSA) to develop a National Standard of Canada for Green and In Transition Taxonomy which is scheduled for release by the end of 2020.[21] In advance of this release, the project’s oversight group, the Transition Finance Technical Committee, plans to publish an express standard, titled Transition Definition, Framework and Taxonomy, which will clearly define the “in transition” activities that will fit into the final standard. This express standard is expected to be released in late June 2020.[22] The express standard will include guidelines for the following sectors: agriculture; forestry; primary manufacturing (cement, steel, and glass); mineral mining; oil and gas (upstream, midstream, downstream); transportation (heavy duty vehicles, railway, aviation, trucking, shipping); and utilities (electricity generation, transmission, distribution). These sectors were prioritized due to their heavy carbon footprint; however, the list will be expanded as the final standard is developed. As the express document’s title conveys, the exact definition of “transition” and the timeline within which transitions will operate has not yet been solidified.[23]

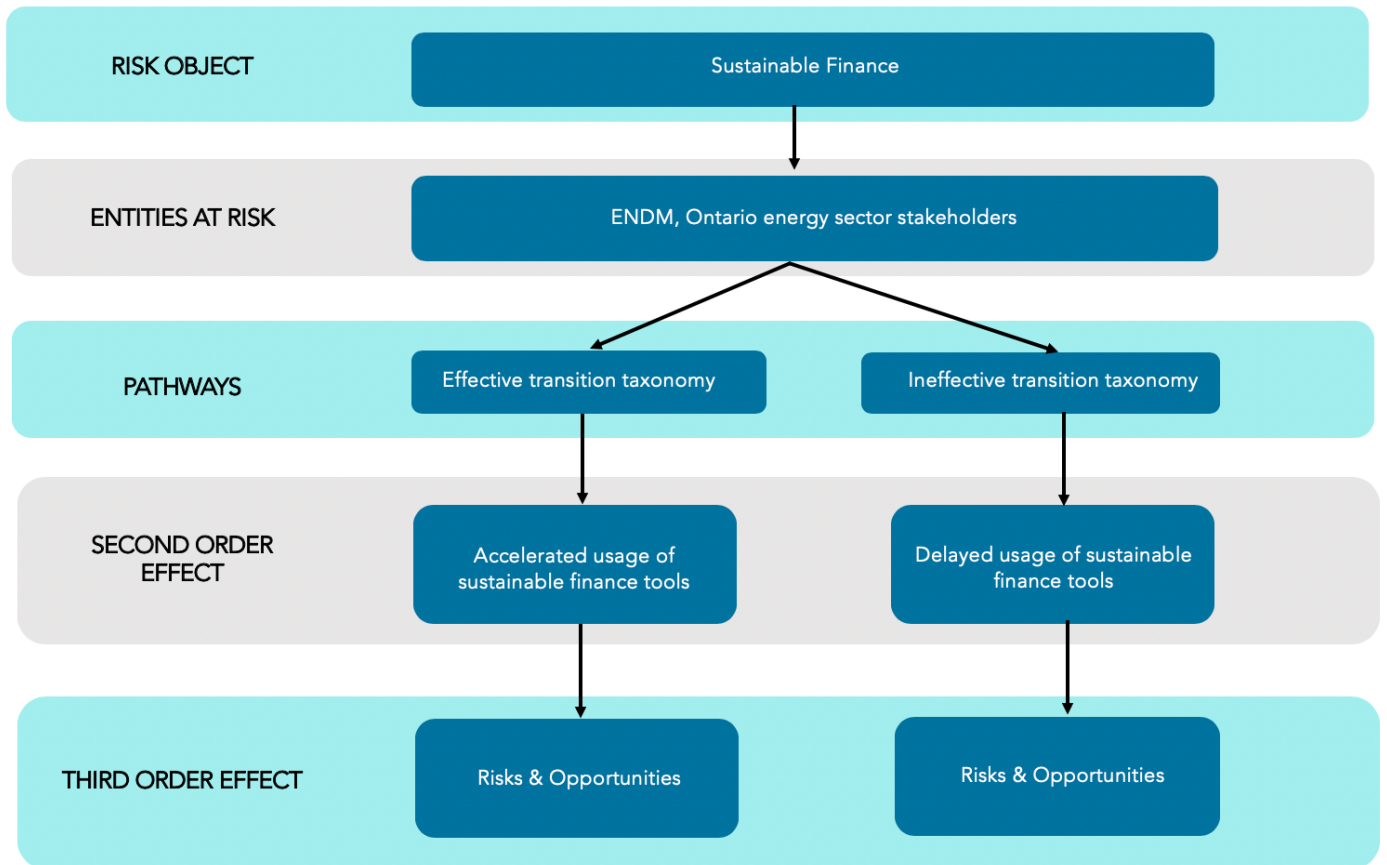
The catalyzing factors for this development include both domestic Canadian reporting and an international trend towards the standardization of sustainable finance. In 2018, the Government of Canada established the “Expert Panel on Sustainable Finance” to identify ways in which the financial sector can help channel funding towards green initiatives in Canada.[24] The Panel provided 15 recommendations which outlined (cont’d)

(cont'd) opportunities for sustainable growth, with the ninth recommendation urging Canada to “set a global standard for transition-oriented financing,” among other goals.[25] Internationally, the European Union is set to operationalize its new sustainable finance taxonomy regulation in phases to be completed by 2022.[26] However, there are crucial distinctions between the EU and Canadian taxonomies. First, as the CSA notes, “most green taxonomies developed around the world do not recognize several Canadian natural-resource sectors as being Green or In Transition.”[27] For instance, nuclear and non-solid fuels (including natural gas) can only be included in certain circumstances where they meet technical screening criteria. Second, the EU taxonomy encompasses environmental, social, and governance (ESG) considerations in its outlook on sustainability, whereas the upcoming Canadian taxonomy (in its current form) will be solely focused on the reduction of GHG emissions. Additionally, the EU taxonomy provides a regulatory framework to be enforced through the national laws of member states – in contrast, Canada’s proposed taxonomy is a classification system that will rely on voluntary adherence. There is a possibility that the configuration and focus of the standard will change over time, as the Transition Finance Technical Committee has stated that the Transition Taxonomy will be continually “reviewed and improved.”[28] The Technical Committee has expressed that the Canadian taxonomy will not develop in complete isolation from international developments, and moving forward the standard may be shaped by Canada’s participation in the International Organization for Standardization’s technical committee on sustainable finance (ISO TC 322), with activities ongoing until September 2022.[29] There is potential for the final National Standard of Canada for Green and In Transition Taxonomy to encompass a broader scope of sustainability activities, however the terms of the standard’s “green” taxonomy have not yet been outlined.

Given the potential for exclusion from international taxonomies, the development of a Canadian standard is a possible solution to help fill this gap, in addition to allowing Canada to play a more prominent role in the global shift towards a low-carbon future. However, the true impact of the upcoming industry-led Transition Taxonomy remains unclear.

RISK PATHWAYS

The figure below is a graphical representation of the pathways of risk that are being investigated in this assessment. Sustainable finance, as defined above, is the risk object (i.e. disruptor). The objects-at-risk (i.e. entities at risk) are the ENDM and its stakeholders. The pathway through which the risk object and objects-at-risk are related represents the mechanism(s) that sustainable finance affects the ENDM and its stakeholders. In this assessment, a low versus high level of adoption of the Transition Taxonomy diverges the analysis into two separate plausible futures, also referred to as scenarios. The second and third order effects are downstream outcomes of the divergent event, each equipped with respective risks and opportunities that are analyzed in detail below.



SCENARIO ANALYSIS

I. Scenario A: Low Adoption of Taxonomy

i. Description

The CSA’s National Standard of Canada for Green and In Transition Taxonomy was released in 2020. Five years later, due to its voluntary participation, the Transition Taxonomy has fallen short in catalyzing sustainable finance in Canada. Upon its release, it was hoped that the Transition Taxonomy would be the factor that accelerated the development and implementation of comprehensive ESG guidelines and standards, thereby increasing investor confidence and encouraging capital flows. However, given that there has been minimal adherence to or utilization of the taxonomy, uncertainty regarding what constitutes “green” investments remains a significant barrier to private capital mobilization. As such, investors await clear signposts and signals from regulators or the government that will drive sustainable finance in the country. Further, there is increasing awareness of the decision to increase natural gas use within the province in order to compensate for decreased nuclear capacity. Together with an increasing concern for climate-related events that threaten the reliability of energy provision, Ontarians have begun to protest for the past four months. There is growing concern on increased reputational risk due to perceived inaction, as well as exacerbated social unrest.

Opportunities

- Demonstrate proactivity and leadership
- Delayed rate of change

Challenges

- Limited capital available
- Social risk and unrest
- Limited asset protection

ii. Opportunities***Demonstrate proactivity and leadership:***

The delayed uptake of the Transition Taxonomy gives the government the opportunity to demonstrate leadership and catalyze stricter adherence to more sustainable models of business, thereby providing an opportunity to calm possible dissatisfaction and push for greater accountability for businesses. By playing an active role in providing assistance to and incentives for companies that have been slow to adhere to the taxonomy, particularly heavy-emitting industries, the government could protect itself and these businesses from associated reputational risks both domestically and abroad. At the same time, spearheading this push also helps ensure greater government involvement in the process moving forward, demonstrating competency and proactivity. If unprecedented levels of interprovincial cooperation could be suggested and driven by Ontario, the outcomes may be of significant reputational gain that could offset the reputational damage from increased natural gas use in the province.

Delayed rate of change:

A widely adopted sustainable finance taxonomy will accelerate the demand changes to multi-organizational culture, data gathering and analysis, and government accounting standards. While the initial release of the Transition Taxonomy may leave the government and energy stakeholders like OPG scrambling to adjust accordingly, a delayed rate of change would offer a number of benefits. Actors would be afforded an extended buffer period to adjust accounting practices, upskill/retrain employees, and redefine workplace values, principles, and culture, as well as the chance to stay ahead of operational disruptions. The value of an adjustment period and its associated benefits was demonstrated by the Sarbanes-Oxley Act of 2002, which served as a legislative response to increase the accountability and transparency of American corporations.[30] For U.S.-based companies in 2002, those who were first to adjust operations had the potential to reduce compliance costs relative to those who waited and were later forced to rapidly adjust and comply with the new regulations. As such, in the case of Ontario and the ENDM, there is a tangible benefit to considering SASB-aligned accounting standards early on. Doing so will also provide them with greater influence over how the standards are implemented for other actors.

Furthermore, a delay in private capital mobilization could also stall investments into high-potential ventures. As a result, the public sector, as well as other competitors and stakeholders in Ontario's energy sector, could gain an extended opportunity to adapt to the new and emerging business models and economic environments from the outset. By placing high value on creating an option to exercise operational agility, the ENDM preserves the opportunity for itself to exercise such options once sustainable finance takes off and significant disruption financial and operational disruptions accelerates.

iii. Challenges

Limited capital mobilization:

In addition to low adherence to the Transition Taxonomy, there has been little discussion about the expansion of scope to cover the entirety of ESG, ultimately resulting in limited private capital mobilization via sustainable finance. Usage of tools across the sustainable finance spectrum has increased, however, at a much slower pace. As a result, high-impact, creative applications of sustainable finance tools in Ontario's energy sector, such as for research and development, scaling and partnering with ventures that offer energy-as-a-service (EaaS), asset insurance, and alternative forms of public-private partnerships could be massively underutilized due to the low levels of adherence.

Social risk and unrest:

Ontarians are aware of the government's decision to increase reliance on natural gas, and in recent years, the general public has begun to perceive any and all fossil fuel-derived energy as antagonistic. Perception of climate risks has shifted towards fear due to increasing instances of climate-related disasters, such as the Pacific Gas and Electric Company (PG&E) fire and bankruptcy. As a result, the public could perceive that Ontario's energy sector has regressed from its traditionally clean (post-coal), green energy supply, despite natural gas being a relatively low-carbon fossil fuel. The possibility of increasing public outcry could lead to further dissatisfaction, significant and adverse economic impact, and reputational damage to the ENDM.

Limited asset protection:

A changing risk perception of climate-related events has affected the ability for organizations that own Ontario's energy infrastructure (e.g. transmission lines) to hedge against financial loss. Resultantly, insurance providers could prove unwilling to offer financial protection to such assets. Absent innovative methods to hedge against climate-related financial loss, such as catastrophe bonds and weather derivatives, the provincial government may remain exposed to significant financial risk. With an increasing public concern for damage to Ontario's periphery energy infrastructure, whose damage may disproportionately affect remote communities, as well as First Nations and Metis communities, limited asset protection is another factor that could feed social and reputational risk, and public unrest.

II. Scenario B: High Adoption of Taxonomy

i. Description

Five years after the release of the National Standard of Canada for Green and In Transition Taxonomy, the taxonomy has been adopted across relevant sectors, including Ontario's energy sector. The stability and predictability offered by the standard has helped transform Ontario's investment landscape as it has accelerated the implementation of comprehensive ESG guidelines and standards which has led to increased investor confidence, thereby making it easier to mobilize sustainable finance resources. The readily available capital has been used to fund projects that help contribute to an overall reduction of Ontario's GHG emissions, which were noted by Ontario's auditor general in 2019 as being off-track in meeting the province's 2030 emissions goals.[31] While citizens are glad that Ontario is contributing to a zero-emissions future, the province's reliance on natural gas remains a source of contention.

Opportunities

- Increased investor confidence
- Greater resilience and opportunities for innovation
- Improved energy access for remote communities

Challenges

- Voluntary adherence
- Transition Taxonomy accommodates heavy GHG emitting sectors
- Unequipped for change

ii. Opportunities

Increased investor confidence:

The wide-scale recognition and adoption of the Canadian taxonomy could add stability and predictability to the investment landscape and help spur the mobilization of private capital. With a clear and consistent standard to draw from, investors could mobilize their capital with more confidence using sustainable finance tools. As such, investors have the luxury of choosing investment vehicles in various sectors across Canada due to decreased levels of uncertainty. This represents an opportunity for Ontario to be a recipient of such capital flows. However, capitalizing on this opportunity requires the ENDM to be proactive to ensure that Ontario's energy sector is primed to receive these cash injections and make the investments profitable. This includes factors such as abundant high-quality data, adjusted disclosure practices, and standardized assurance mechanisms and processes.

Another consequence of the high adoption of the taxonomy could be a greater capacity to address 'greenwashing.' 'Greenwashing' has traditionally served as a barrier to the securitization of sustainable finance activities through green bonds in areas where there is uncertainty regarding the real environmental benefit of the asset in question.[32] This is less of a concern with the development and adoption of the taxonomy, which has the ability to reduce uncertainty, increase transparency, and lead to the establishment of more robust disclosure practices given that it outlines various thresholds that must be met by a company for its products to qualify as sustainable. Not only could these outcomes strengthen private investor confidence, but also that of the ENDM, both of whom may be less hesitant to finance projects.

Greater resilience and opportunities for innovation:

The nature of the energy sector has meant that public and private sector actors involved in Ontario's energy landscape, including the ENDM, have made considerable investments in long-term assets and extensive generation, transmission and distribution networks. These assets and networks are vulnerable to climate-related disasters, and it is imperative for organizations to implement effective adaptive strategies to mitigate the physical and transitional risks associated with these events, as well as take advantage of opportunities. [33] The widespread adoption of the Transition Taxonomy could make Ontario's energy sector, and by extension, the ENDM, more resilient to climate-related challenges, with capital more readily available than ever before to fund smart grid research and development, as well as other programs.

Currently, there are numerous opportunities to increase the resiliency of Ontario's electricity transmission and distribution (T&D). As per the Climate Risk Matrix created by the Intact Centre on Climate Adaptation, capital mobilized via sustainable finance can enable mitigation measures against risks of flood, fire, windstorm, ice and snow loading, and thawing permafrost. For instance, in response to risks of fire, the Climate Risk Matrix prompts T&D stakeholders to "clear vegetation along transmission corridors", and additionally provides pragmatic evaluation criteria to determine fire risk exposure.[34] By taking action based on the recommended mitigation measures, Ontario's energy sector can effectively manage physical climate risk exposure.

Improved energy access for remote communities:

Making electricity available and affordable for remote communities, including First Nations and Métis communities, is an important part of the ENDM's mandate. One of the challenges associated with connecting these communities to the province's electricity grid is the lack of infrastructure to support these operations. The increased availability of capital brought on by the widespread adoption of the taxonomy could open the door to fund projects that improve the availability of reliable and cleaner energy to remote communities. If the ENDM were to spearhead efforts to implement these projects, it could enable utility costs and GHG emissions to decline as individuals switch away from the diesel energy sources they previously relied upon.

iii. Challenges***Voluntary Adherence:***

Despite the widespread adoption of the standard, the fact that it is voluntary could mean that some organizations in the energy sector may elect not to endorse and apply the taxonomy. These organizations may simply be uninterested in qualifying for green bonds or other sustainable finance tools and will carry on with their operations. However, in light of the aforementioned benefits of the taxonomy, it would be in the best interest of the ENDM to encourage widespread adoption. The absence of a universal uptake could potentially jeopardize participation rates in the future and further impede efforts to meet the 2030 emissions reductions target.

Transition Taxonomy accommodates heavy GHG emitting sectors:

The made-in-Canada taxonomy was developed while taking into consideration the needs of the country's resource-based economy. As a result, the Transition Taxonomy has accommodated relatively heavy GHG emitting sectors such as oil and natural gas, complicating Ontario's efforts to reduce its GHG emissions output. Ontarians have seen the EU's sustainable finance taxonomy, which is more stringent on heavy-emitting industries, and will question why the province has not adopted similar measures. While the ENDM was not involved in the initial development of the Transition Taxonomy, they may nevertheless incur reputational risks due to a perceived lack of effort in reducing natural gas usage.

Unequipped for change:

The rapid development and adoption of the taxonomy would force the government to react quickly in order to accommodate the plurality of stakeholders who have adopted the Transition Taxonomy, including the adjustment of accounting practices, employee upskilling/reskilling, and multi-organizational culture shift. It takes time to implement these changes, and so the government may find itself initially unable to support the mobilization of capital in the energy sector as effectively as it would like, potentially missing out on important opportunities.

RECOMMENDATIONS

I. Scenario A: Low Adoption of Taxonomy

Demonstrate Leadership:

As mentioned by Peter Johnson, Chair of the Transition Taxonomy Committee, the purpose of fast-tracking the development and release of the Transition Taxonomy was to present parameters of a sustainable transition that are applicable to Canada's resource-reliant economy. Given that the Transition Taxonomy has failed to gain traction, this gap remains. This presents a unique opportunity for the ENDM, alongside other provincial ministries, to develop the actual precedents and standards rather than be reactive to them. Demonstrating leadership in this instance may also offset the reputational damage that was incurred because of increased natural gas usage in the province.

Stay ahead of disruption and change:

As mentioned above, a sustainable taxonomy enables organizations and businesses across Canada to mobilize, receive, and utilize sustainable finance tools and practices. However, sustainable finance may accelerate the rate of organizational change to a pace that may be detrimental to the ENDM. Given the delay, there is an opportunity for the ENDM to take advantage of a more gradual transition period. Considering the factors below could therefore position the ENDM to stay agile and adaptive to emerging changes, and will signal proactivity, credibility, and reliability to other jurisdictions.

- *Workplace culture shift:* Sustainable finance presents new opportunities that may also require a shift in workplace values, principles, and culture. However, garnering buy-in and facilitating cultural change within Ontario's energy sector workforce and workspace will undoubtedly be a long, challenging, and drawn-out process. It is a process that demands new behaviours from leaders and employees that may be contradictory to previously efficiency-and excellence-driven work styles.[35] By engaging in this process of change before sustainable finance rapidly takes off, the ENDM can begin redefining culture to prime the workforce for sustainability-driven change.
- *Innovation:* Innovation is a double-edged sword, whose medium and long-term impact on the ENDM and its stakeholders depends on the rate at which business model change is driven. Ventures offering EaaS products already exist today in good numbers. With an expectation that capital flows accelerated by sustainable finance will rapidly increase the rate of innovation, the ENDM is exposed to significant operational and financial risk. For instance, accelerated clean tech innovation may exacerbate the possibility of grid defection, wherein increasing proportions of Ontario energy consumers cut themselves from the grid. Accelerated innovation may also result in accelerated business model innovation that puts traditional business models at a disadvantage. Therefore, it is recommended that the ENDM create more opportunities for public-private partnerships and business model innovation. For instance, (cont'd)

- (cont'd) new and innovative tech developed by ventures are purchased and utilized by the ENDM and its stakeholders. The value would also be bidirectional, as the ENDM would be providing access to partnerships and markets for the growing venture. Through this process, actors that would otherwise be considered competitors can be leveraged as an asset to enhance service to Ontario's energy customers.
- *Financial disclosure practices:* Even now, investors are demanding more transparency and insight to climate-related risk exposure of assets and organizations, and demand for said information will only increase with the widespread adoption of the taxonomy. Adequate readjustment of financial disclosure practices to accommodate new disclosure practices may require new talent, process adjustment, or employee upskilling/retraining. By shifting and updating this process before a large influx of demand, the ENDM can capitalize on emerging opportunities. In other words, by updating financial disclosure practices within the ENDM and its stakeholder organizations, such as Hydro One and OPG, Ontario's energy sector may position itself to receive private capital flows once investors seek opportunities to invest. Showing proactivity in this area can also signal a positive outlook for energy-related investments in Ontario and may stimulate investor confidence even without the broad adoption of a Canada-wide Transition Taxonomy.
- *Data collection and analysis:* There remains a concern that adjustment may be difficult to achieve due to a lack of data. The provision and analysis of decision-useful data underpins the ability of the ENDM to respond to changes driven by climate-related taxonomies and sustainable finance at large. It is therefore integral that stakeholder organizations operating within Ontario's energy sector begin the process of updating data collection and analysis processes immediately. While this may be done internally through reskilling or upskilling existing talent, public-private partnerships may be another method through which decision-useful data can be provided. By decreasing financial and regulatory barriers, Ontario may position itself to be the prime recipient of private capital flows once sustainable finance tools and developments take off in Canada. Even more so, the ENDM has the opportunity to set precedent in involvement in such processes, which will further signal to investors that Ontario's energy sector has a stable, profitable investment climate.

RECOMMENDATIONS

II. Scenario B: High Adoption of Taxonomy

Develop initiatives parallel to the taxonomy:

Even though there has been widespread uptake of the taxonomy, its voluntary nature will likely mean that adoption will not be universal. To address this issue, the ENDM could collaborate with other provincial ministries and departments in the federal government to develop parallel initiatives that support and further legitimize the Canadian taxonomy. These initiatives could include public outreach campaigns and programs for the development of related human resourcing (for example, work programs to train individuals in recognizing and applying the standards).

Supporting public-private partnerships to provide cleaner electricity to remote communities:

As noted above, one of the challenges associated with connecting remote communities, including First Nations and Métis communities, to the electricity grid, is that there is currently a lack of critical infrastructure in these areas. Many of these communities are forced to rely on diesel energy, which can be more expensive and GHG intensive than electricity provided by hydro, nuclear, and natural gas sources.[36] The ENDM could play an important role and work with the IESO, utility companies, and other private organizations to finance the construction of transmission and distribution lines and other infrastructure through public-private partnerships. If that is not feasible, public-private partnerships could be used to fund the installation of solar panels in remote communities. Ontario currently has one of the lowest installation costs and highest access to solar panel installers in Canada, and while it would likely be more expensive to support these projects in remote areas, over time, the costs would decrease as the projects increase in frequency. [37] Providing solar energy would ultimately serve as a cost-efficient and clean energy source for these communities.

Increase support to clean tech funds:

In keeping with its mandate to “support the growth of clean technology and innovation in the electricity sector” the ENDM could increase its support to clean tech funds in Ontario for the development of energy sector-relevant clean technology. Since the Canadian taxonomy in its current form largely accommodates heavy GHG emitting activities, the value of clean tech innovation is apparent, and providing assistance to these types of funds could help fill the gap. For example, the IESO has contributed to the “Grid Innovation Fund” which largely finances specific projects that help save electricity costs or improve energy consumption.[38] The proposed clean tech funds that the ENDM would support would be expanded to target energy consumption in general (such as natural gas heating or gas-powered appliances) and could also be leveraged to aid clean tech companies, not just on an individual project level.

With more capital availing itself under the taxonomy, the ENDM could play a role in organizing this capital and ensuring funds for sustainable innovations through clean tech research and enterprises are prevalent, which would also help with issues related to growth and scalability. However, this support would not be limited to funding. The ENDM could use its expertise and offer technical assistance to both emerging and existing companies, even exporting their knowledge through these funds to projects, companies, and jurisdictions that need help with transitioning to a more sustainable finance-oriented future. As such, increasing contributions to cleantech funds is also a tactic that may offset potential reputational damage from increased natural gas reliance.

One example of an increasingly popular clean tech advancement in the transportation sector is the proliferation of hydrogen fuel cell-powered electric vehicles. Whistler, British Columbia implemented a hydrogen bus fleet in 2010 prior to the Vancouver Olympics that year – five years later, the fleet ceased operations due to high cost,[39] yet hydrogen buses are on the rise internationally (for example, Japan is building its own fleet of hydrogen buses in advance of the 2021 Tokyo Olympics.[40] In 2018, Metrolinx published the Hydrail Feasibility Study Report, which explored the applicability of using hydrogen to power the GO train network (as compared to conventional electrification). The report concluded that “it is technically and economically feasible to build and operate the GO network using HFC-powered rail vehicles” although there were “aspects of the Hydrail System that warrant further investigation to support the RER procurement process.”[41] Study is still underway, and if hydrogen is determined to be an advantageous source of electricity, the ENDM could use a clean tech fund to provide the resources to drive technological advancement and explore measures to address the issue of prohibitive cost.

CONSIDERATIONS (2020-2030)

The transitional taxonomy was created to provide Canada its own path to a more sustainable future. In the coming years government and industry stakeholders will need to contend with what comes further down that path. While natural gas has been deemed as “in transition” for now, perceptions are likely to change in the near future. Changes in the public’s perception of natural gas (and possibly nuclear energy) will need to be addressed before the tides turn against an energy source that powers much of the province. Moving forward, there are a few things the ENDM can consider to help with this transition:

- *Establish an Ontario Sustainable Finance Committee (SFC):* Ontario’s SFC would be modeled after Germany’s SFC, which brings together “experts from the financial sector, business, science and civil society” to develop a coherent, sustainability-oriented investment strategy.[42] Unlike in Germany, however, energy stakeholders in Ontario, including the ENDM, would be incorporated into the SFC. Doing so would ensure that the sector’s needs would be more effectively considered, given the substantial role it plays in contributing to a more sustainable future.
- *Power-charging innovation:* Ontario’s clean tech sector consists of over 5,000 organizations, with 55 per cent of these organizations having less than 10 employees.[43] With such potential for growth, boosting contributions to Ontario-based clean tech funds in the form of financial and technical support are a means of driving social, economic, and environmental impact within the province. As mentioned above, strengthening support for clean tech innovation and companies in Ontario may further reduce energy consumption and offset the reputational risks associated with natural gas usage.
- *Proactively embrace change:* As of 2019, over USD \$30 trillion had been invested in sustainable finance, a 30 per cent increase from just three years before.[44] These figures suggest that sustainable finance will continue to grow regardless of the adoption levels of Canada’s taxonomy. Capital flows leveraging sustainable finance, particularly towards more sustainable investments, are likely to be hastened due to decreased oil prices triggered by COVID-19. A 24 per cent decrease in the price of Brent crude to \$34/per barrel on March 9 has international oil producers scrambling to maintain market share, signalling to global investors that the risk of stranded assets may be on the horizon.[45] Institutional investors, particularly pension funds, are given all the more incentive to increase the rate of divestment of oil and other heavy-emitting resources, as stranded asset risk increases. Rapid divestment and reallocation of capital heightens the opportunity costs mentioned above. As such, it is vital that the province is positioned to receive capital flows by embracing change early on. Adequate workplace culture and operational shifts will undoubtedly be a key determinant of the capacity for the province to capture the opportunities presented by additional capital flows.

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