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AGILE REGULATION FOR CLEAN ENERGY INNOVATION:

Examining the Early Experience of Two Canadian Institutions

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Agile Regulation for Clean Energy Innovation: Examining the Early Experience of Two Canadian Institutions

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I. INTRODUCTION

Canadian energy regulators operate in an increasingly complex environment, marked by rapid technological change, high uncertainty, and confronted with unprecedented challenges, most notably, the need to drastically reduce national emissions both to meet emission reduction targets and keep pace with a greening global economy. However, Canada's current regulatory system is increasingly understood as a significant obstacle to innovation and the transition to a low carbon economy. Comparatively, Canada ranks 14th on the World Economic Forum's (WEF) 2018 Global Competitiveness Index, but ranks 38th on the burden of government regulations.[1] Similarly, Canada ranks 22nd overall on the 2019 World Bank's Ease of Doing Business Index and 34th out of 35 OECD countries with respect to the time required to obtain a construction permit.[2] At the same time, Canada ranks relatively low (22nd of 35 OECD countries) on the Global Environmental Performance Index.[3] In order to accelerate the transition to a low carbon economy and capture a larger portion of the clean growth market — which represents a US$26 trillion opportunity over the next 12 years — Canada's energy regulators must become more agile in nature.

The COVID 19 global pandemic has made reducing regulatory barriers to cleantech an even more urgent task. Stimulus spending and related recovery measures provide an ideal window to accelerate low carbon innovation and growth in Canada. The 'build back better' agenda strongly emphasizes accelerating clean growth in Canada to align a post-COVID-19 recovery with recent policy commitments to net-zero emissions in 2050 in order to position Canada as a leader in this rapidly growing market.[4] Achieving the Government of Canada's ambitious emission reduction strategy will require an unprecedented scale and pace of innovation. Against this backdrop, shifting to a more agile regulatory system has never been more pressing to ensure that Canada's growing investments in recovery and innovation, and burgeoning climate policies, achieve the combined objective of maximizing economic recovery while reducing national emissions.

Shifting towards a more agile regulatory system has two dimensions. It involves changing policy *instruments* and the regulatory *institutions* that implement them. Agile regulatory instruments are stringent, flexible, and dynamically predictable. They avoid prescriptive, command and control approaches favouring performance-based standards, which are inherently more flexible. They also place greater reliance on non-state actors, especially for informing the ideal level of stringency. Agile regulations are also predictable – to support long-term investment – without remaining static. Operationalizing such regulations requires regulators that are well-informed, collaborative, and have both the ability and capacity to experiment, approaching policy-making and implementation as an iterative rather than static process. By doing so, integrating regulatory agility via improved stringency, flexibility and predictability in both instrument and institutional design can help drive innovation and foster improved performance towards Canada's economic and environmental goals.

Despite this potential, the implementation of previous strategies to increase regulatory agility has, at times, faltered due to concerns that increases in flexibility and efficiency come at the expense of stringency and the protection of public goods. However, if optimally designed and implemented (with continual evaluation and adjustment), agile regulatory practices should drive innovation in environmental performance. The issue lies in a lack of understanding of what this means in practice. Currently, the state of knowledge has been formalized only slightly beyond the notion that 'agile regulation is what agile regulators do'.[5] This lack of knowledge is especially true for agile regulatory institutions (vs. instruments) and for the Canadian jurisdiction, where there has been little research generated compared to the United States and Europe.

This article aims to start filling this knowledge gap by examining the early experience of two leading examples of agile regulatory institutions in Canada: the Ontario Energy Board Innovation Sandbox (est. 2019) and the Vancouver Zero Emission Building Exchange (est. 2018). This article provides an in-depth account of the development of these current initiatives over their first years in operation to draw out preliminary insights into how the design and functions of these institutions are enabling (or are intended to enable) more agile regulatory practice. In presenting our preliminary analysis, we attempt to provide nuanced descriptions of the early experience of these two case studies of agile regulatory institutions by drawing from interviews with senior staff, along with a comprehensive review of the secondary literature on agile regulatory institutions (and instrument) design.

II. BACKGROUND

Agile Regulatory Approaches in Context - A Brief History of Regulatory Reform:

There have been multiple waves of regulatory reform approaches over the past 50 years that, in many ways, follow broader shifts in modes of governance. Globally, governance and public administration narratives and coordination models have evolved from bureaucracy/hierarchy, to new public management/market-oriented models, to new governance/networked-centred models.[6] This shift has by no means been linear, nor anything close to uniform across regions or timescales, but these models do capture the general transition from government to governance represented by 'more diffuse' methods of societal steering.[7] As a critical aspect of governance, it is not surprising that dominant regulatory models have followed a similar evolution. The evolution between these models of governance, and the associated shifts in approaches to environmental regulation, are described below in chronological order. Although different terms are used to describe these phases of dominant regulatory models, we refer to them as Command-and-Control, New Public Management, and New Governance.

Throughout Canada and the United States, initial approaches to environmental regulation generally reflected a command-and-control approach, where prescriptive regulations are primarily enforced by government with heavy reliance on technical experts. This model was a classic expression of 'bureaucratic rationality' (as defined by Max Weber[8]); the underlying assumption of this approach was a zero-sum game, where firms were considered 'amoral actors', which required blunt legalistic and deterrence-based rules to change behaviour effectively.[9] Over time this more adversarial model, based on centralized bureaucratic control through substantive law, was heavily critiqued for being too costly in comparison to the benefits delivered.[10]

Beginning in the late-1980s/early-1990s, following the broader shift towards market-oriented, New Public Management (NPM) governance models, governments, industry, and environmental non-governmental organizations (ENGOs) began to look for regulatory instruments that could maintain or improve environmental performance at lower costs and with more flexibility.[11] This shift reflected the core features of NPM approaches, which are associated with privatization and out-sourcing of government activities and the prominent use of markets (vs. hierarchies), reflecting the school's adherence to 'efficiency first'.[12] Economic and risk analysis and more selective regulatory interventions in the economy were stressed.[13] Broadly, this shift in environmental policy and regulation was associated with the rise of neoliberal ideas about government.

This move away from prescriptive command and control regulation also reflected a second stream of criticism for environmental regulations in the 1990s – that command-and-control regulation was no longer capable of dealing with the increasingly complex environmental problems that regulators were trying to manage.[14] For example, so-called first-generation pollution problems like toxins emitted from a smokestack were less complicated to manage than multi-dimensional, second-generation pollution issues like acid rain.[1] These management and performance-based regulatory models also differentiated from the previous model in their involvement of non-state actors (including industry) in their implementation.

In Canada, this shifting regulatory landscape coalesced into an initiative on 'Smart Regulations', and the Federal government struck an External Advisory Committee on Smart Regulations in 2003. The Smart Regulations initiative represented a broad agenda that was supposed to be embraced across departments and sectors.[15] The approach aimed to "forge a middle path between the extremes of command regulation and de-regulation".[16] The Committee described a vision wherein "Governments, citizens and businesses will work together to build a national regulatory system that maximizes the benefits of regulation for all Canadians, enables them to take advantage of new knowledge and supports Canada's participation in an international economy".[17] The Committee made 73 recommendations, including sector-specific recommendations (*e.g.* for manufacturing, biotechnology, and environmental assessment). Many of the themes of these recommendations are also reflected in agile regulation, including the need for cultural change, enhanced intergovernmental coordination, increased responsiveness and developing improved performance measurement and evaluation methods.[18]

The results of the Smart Regulation agenda in Canada have been mixed (Olszynski 2015, Winfield 2016.[19] There is a lingering opinion that much of this effort devolved into simple de-regulation and that reform efforts were only about improving competitiveness – without achieving other public benefits related to health, safety, and the environment. This critique has been made more broadly for New Public Management governance models, where the focus of the model shifted to management, performance appraisal and efficiency as opposed to policy, public order and accountability.[20] These criticisms also echo the broader stated deficiencies of the neo-liberal turn in government (especially in the U.S. and Britain) and associated aggressive de-regulation agendas (e.g., increased inequality).[21]

[1] 1st and 2nd generation pollution problems can also be called point-source or non-point-source pollution problems, which highlights the difference in complexity in addressing the problem through policy and regulation.

The most recent shift in governance and regulatory models, known as 'new governance' approaches, attempts to address these critiques by focusing on effectiveness, transparency and upholding public trust while still utilizing market-oriented measures and a reliance on non-state actors to ensure flexibility, efficiency, and to enable innovation. In this way, the ideas and strategies for reform embodied in new governance or networked governance approaches attempts to strike a middle ground between the two prior models. In Canada, this new governance approach has come to be known as agile regulation or regulatory excellence.

The Canadian federal government accordingly re-engaged with regulatory reform in 2018, motivated by the understanding that the current system was inadequate for dealing with highly complex challenges (like climate change mitigation) and the rapid pace and scale of innovation in an increasingly interconnected world. As a part of the Federal Government's implementation framework for the Pan Canadian Framework on Climate Change[22], Economic Strategy Tables, made up of primarily industry representatives, were established to ensure the challenges of maintaining a competitive economy were addressed in the context of pursuing a low carbon transition. The Federal Government's 2018 Economic Strategy Tables concluded "Canada's regulatory system is not conducive to innovation", and recommended a shift towards more agile regulations as a critical priority for Canada's future competitiveness.[23] The report of the Resources Table described such regulations as "outcomes-driven, flexible, stringent, timely and predictable in order to attract investment and stimulate innovation while continuing to achieve world-class safety, health and environmental performance".[24]

Following the recommendations of the Economic Strategy Tables, the External Advisory Committee on Regulatory Competitiveness was formed to help improve Canada's regulatory frameworks to enable investment and innovation while upholding its public good protection function (i.e. safeguarding health, safety, security and the environment).[25] Targeted regulatory reviews were also announced in 2018 to bolster government efforts at modernizing the regulatory system. These ongoing reviews are overseen by the Treasury Board Secretariat in coordination with relevant government departments and agencies. The sectors targeted are chosen based on advice provided by the External Advisory Committee. The Committee has delivered four recommendation letters to the Treasury Board Secretariat since it was formed. In their most recent letter (March 2021), the External Advisory Committee on Regulatory Competitiveness highlighted the need for what they are now calling 'regulatory excellence' as its "most important and urgent recommendation".[26] The Committee's definition of regulatory excellence clearly reflects a new governance approach to regulation:

> We define regulatory excellence as a regulatory system that is rigorous, agile, and efficient, giving consumers confidence in their protections and businesses confidence to invest. It is a system where decisions are made in a timely way that recognizes the interconnectedness of a modern economy. Improving the lives of Canadians means taking an ecosystem approach and working collaboratively with those inside and outside of government. When departments work in silos, valuable opportunities are lost, and time is wasted. Regulatory excellence means using the best available evidence and being transparent and inclusive. It means regulations that are flexible and predictable, so investors and households can make long-term

> investments with confidence in regulatory direction. It favours simplicity, recognizing that additional rules and complexity do not always lead to better outcomes. It puts a high premium on ensuring that regulations and the processes to implement them (reporting, verification, and enforcement) minimize compliance burden and avoid unintended consequences. Regulatory excellence builds trust between government and the citizens it serves.[27]

Globally, there are many names for this latest regulatory reform movement, geared towards building regulatory regimes capable of managing 21st Century challenges — or what is sometimes called 'the Fourth Industrial Revolution'.[28] In the United Kingdom, the birthplace of some of the most innovative regulatory mechanisms like regulatory sandboxes, the regulatory reform agenda is often called 'anticipatory regulation'. Similarly, The Australian Government speaks about 'innovative and agile government', including the need for more agile regulation. The World Economic Forum's Global Future Council on Agile Governance also refers to this kind of sophisticated regulation as agile regulation.[29] Although the OECD once outlined principles for good regulation, it now refers to this line of work as 'better regulation'.[30] The European Commission also uses this phrase and has established a 'better regulation agenda' for its member states. Regardless of the exact phrasing, the underlying notion of these regulatory reform agendas are very similar: to reform regulatory systems so that they can deal with highly complex novel challenges in an increasingly interconnected and uncertain world, characterized by rapid technological change at unprecedented scales.

Although governments and organizations have begun to describe what this kind of regulatory system might look like at a very high level (e.g., agile, rigorous, efficient, transparent, inclusive, evidence-based, flexible, predictable), the widely varying terminology makes it more difficult to compare and contrast emerging approaches and to understand what these different understandings mean for regulatory reform in practice.

Achieving Agile Regulation: Instruments and Institutions

We argue that increasing regulatory agility, in practice, relies heavily on the regulatory *institutions*, which implement regulations and define the practice of regulatory management. To date, there has been much more research on agile regulatory *instruments* (e.g., flexible regulations) as opposed to regulatory *institutions*. This is especially true in the Canadian context, where the handful of existing efforts to describe agile regulatory institutions have been high-level and primarily descriptive[31].

There are multiple characteristics of regulatory institutions that enable regulators to operate in a more agile manner (e.g., being transparent, dynamically predictable, anticipatory, experimental, connected, adaptive). Examples of innovative institutions aimed at enhancing these elements include innovation offices, regulatory sandboxes, in-house research and innovation programs, novel technology/data applications, and various protocols for assisting proponents on cases made to regulatory boards and for ensuring meaningful public consultation. These regulatory institutions that enable agile regulatory management share multiple inter-related characteristics and linkages. For example, more anticipatory approaches to regulation will require regulators to undertake direct research activities, like the production of periodic 'foresight reports' to understand

the drawbacks and opportunities of emerging technologies and business models, in addition to foreseeing disruption with existing regulatory regimes. This kind of work, by definition, means regulators will have to be more inclusionary, working with policymakers, innovators, and experts.

To better understand some of these institutions and provide reflections on their implementation experience, the remainder of this paper will look in more detail at two specific case studies of agile regulatory institutions: the Ontario Energy Board Innovation Sandbox and the Vancouver Zero Emission Building Exchange. These two case studies represent three types of agile regulatory institutions: innovation offices, regulatory sandboxes, and capacity-building institutions. Before moving on to the case studies, these three types of agile regulatory institutions are briefly described below.

Innovation Offices

The concept of an innovation office is relatively simple. Their primary function is to facilitate information exchange between proponents and regulators to help proponents navigate the regulatory system. This, in turn, improves regulators' understanding of innovative products and developments in the field to serve as evidence for amending regulations and dismantling barriers. As a permanent mechanism, innovation offices provide a consistent and standardized way for proponents and regulators to connect outside of more formal mechanisms like regulatory hearings. This provides benefits in terms of more informal (and therefore less time-consuming) information exchange and increased reciprocity since innovation offices allow for increased engagement between stakeholders who would not normally communicate outside formal channels. The exact design of innovation offices can vary, for example, by implementing different rules or practices required for proponents using the service. This can include different levels of reporting by proponents on all information gathered while using the service in order to reduce any risk of certain proponents gaining an unfair advantage over others.[32]

Regulatory Sandboxes

Recent years have witnessed a growing interest in "regulatory sandboxes" as a tool to address regulatory barriers. Regulatory Sandboxes are commonly understood as "a regulatory approach…that allows live, time-bound testing of innovations under a regulator's oversight".[33] In particular, the financial technology (FinTech) industry that pioneered the concept has embraced it, with sandboxes in place or proposed around the globe. By identifying barriers and piloting projects with alternative compliance arrangements to mitigate risk, regulatory sandboxes can help reduce regulatory burdens to innovation. Regulatory sandboxes should not be confused with technology pilots. Technology pilots can take place under a regulatory sandbox, but the scope of a sandbox is broader than testing technologies under alternative arrangements. For example, novel business models can also be tested under sandboxes to provide insights into how they interact with an existing regulatory regime. Early evidence from the United Kingdom's Financial Conduct Authority suggests that sandbox participation supported companies in reducing time to market, facilitating investor funding, testing products and markets, and building consumer safeguards.[34]

Capacity Building Institutions

Unlike innovation offices or regulatory sandboxes, there is no set definition for capacity-building institutions within regulatory theory, although there is no shortage of discussions in the literature on the need for capacity building to enable better regulation.[35] However, a related body of literature on polycentric climate governance provides a basis for the beginnings of a definition, which we develop here. Within polycentric governance theory, networks and institutions facilitating connection and coordination can be understood as 'trans-local collaborations'.[36] When the role of trans-local collaborations was explicitly tested in research, they were found to provide sites critical for collective action that helped engage conditional cooperators and provide political causal mechanisms for unlocking low-carbon transition pathways, specifically capacity and coalition building.[37] Broadly defined, capacity-building institutions in the context of agile regulation provide a site for knowledge generation and exchange. However, they function as more than just a knowledge exchange platform in their intention to build coalitions towards a normative goal or objective. They may also have additional functions that stem from these primary ones. For example, the ZEBx's arm's length and politically neutral design enabled the organization to act as a neutral arbiter or intermediary in its provision of information between industry and regulators around what building standards were and were not achievable.

III. INTRODUCTION TO THE CASES

Ontario Energy Board (OEB) Innovation Sandbox

The OEB's Innovation Sandbox is a prime example of a Canadian effort to increase regulatory agility, in particular via increased flexibility, (dynamic) predictability and capacity building via information provision and two-way engagement/learning. Because the Innovation Sandbox encompasses a combination of innovation office and sandbox functions, in theory, it should enable learning and capacity building from both experimentation and knowledge exchange. Formal opportunities for engagement and two-way learning provide opportunities for capacity building and enhanced predictability through a set and transparent engagement and decision-making process. Flexibility in the form of regulatory relief is provided by the experimental element of the innovation sandbox, where specific projects are provided with assistance.

Overview of the Sandbox

In January 2019, the Ontario Energy Board (OEB) launched its energy Innovation Sandbox. The stated objective of the OEB Innovation Sandbox is to promote the development of "energy-related projects that show clear potential for benefit to consumers – whether in the form of long-term economic efficiencies, cost performance improvement, service enhancements or other ways".[38]

The Sandbox offers two streams of support: Stream 1 is a regulatory sandbox, further discussed below as a tool for addressing barriers in existing regulatory regimes. Stream 2 is an example of an innovation office function where 'customized guidance' is offered to proponents. This stream applies to projects that are not facing regulatory barriers but would nevertheless benefit from assistance in navigating regulatory compliance. For example, OEB staff may help firms identify which regulations apply to them or provide written assurances that the project does

not raise specific compliance concerns. In practice, these regulators could also refer innovators to the sandbox for regulatory experimentation.

Proponents can approach the Innovation Sandbox at any time – there are no set deadlines or parameters of any kind around when information can be requested. Also, the process for requesting a meeting is straightforward – proponents simply send an email to the listed address for a meeting request or to discuss specific questions. There are no intake or application forms required. Critically, regulatory staff require themselves to meet with a proponent within 20 days of the request. [39]

Projects much demonstrate the following five conditions to qualify for the OEB's innovation sandbox:

1. Consumer benefit and protection: e.g., long-term economic efficiencies, improvement in cost performance, enhancements to service or other forms.
2. Relevance: Must relate to gas or electricity.
3. Innovation: The project must involve testing a new product, service or business model for gas or electricity that is not widely in use in Ontario and can be scaled.
4. Readiness: Project must be ready to be trialed.
5. True regulatory barrier (Stream 1): There must be a clear regulatory barrier.

According to the Innovation Sandbox website, the primary concerns that would disqualify a project or idea from the Sandbox are if there is no prospect for a benefit to customers (and certainly no chance of harm), no cost-shifting, and that if relief is being sought, it is relief that the OEB has the ability to provide (i.e., not relief from legislation). The idea should also be innovative — although OEB staff acknowledge defining what this means in practice can be 'tricky'. The OEB's Innovation Sandbox also does not support:

1. Technical demonstration or feasibility trials.
2. Projects that would lead to cost-shifting among consumers.
3. Requests to change utility revenue requirements.
4. Requests to permanently change regulation.

The streamlined criteria for considering an idea or the project was done purposefully so the Sandbox process did not start to resemble the formal application process at the OEB and was further justified by the lower risk profile posed by projects which would receive only temporary exemptions.

Origins of the Sandbox

In 2018, the Advisory Committee on Innovation (ACI) delivered a report to the Chair of the OEB on actions the Board could take to promote innovation in Ontario's energy sector, including implementing a regulatory sandbox.[40] OEB staff had also heard anecdotally from stakeholders about the need to examining ways to reduce regulatory barriers to innovation. OEB staff then began to strategize how to address this issue at large versus focusing on potential reforms for a particular aspect of the existing regulatory framework. OEB staff began researching what

other leading regulators were doing to promote innovation and quickly identified regulatory sandboxes. OEB staff developed the OEB Innovation Sandbox, modelled in part on leading examples like the United Kingdom Ofgem's sandbox[41], and formally launched it in January of 2019.

Early Experience of the Sandbox (January 2019 – June 2021)

The Innovation Sandbox operated primarily as an innovation office for the first year and a half, where "open, frank conversations with OEB staff" were the most popular way proponents engaged with the institution.[42] The most common topic of conversations between OEB staff and proponents using the innovation office was whether a project or idea was possible under the current regulatory framework.[43] Between January 2019 and June 2020, the Innovation Sandbox was approached by 33 proponents, 8 of which submitted written proposals. Of the eight written submissions, one submission by a rate-regulated electricity distributor resulted in customized guidance in the form of a regulatory Bulletin, which was issued in August of 2020. [44] Other proponents who submitted written proposals to the Innovation Sandbox requested support for which the OEB did not have the authority to provide relief. For example, 4 of the 8 written requests were for exemptions that are not within the OEB's power to give[2] and one submission did not require regulatory exemption.[45] Other proponents were looking for business development support for a new product or proposed suggestions for permanent, long-term modifications to OEB policy and regulation — both of which are outside the scope of the Innovation Sandbox.[46]

In contrast to the first year and a half, OEB staff report that in the past 12 months (roughly Summer 2020-2021), more written proposals (as a share of total engagement) have been received. In this way, the Innovation Sandbox is starting to operate more equally as both an innovation office and a regulatory sandbox. The experimental element of the Innovation Sandbox, the regulatory sandbox, enables the much-needed flexibility for proponents to test innovative ideas in a manner that contains risk. The use of the regulatory sandbox, as a permanent institution where time-bound pilots can be undertaken and the results assessed, allows the OEB to leverage the innovative capacities of non-state actors to help meet the stated policy objectives of the regulatory system. To further increase the utility of the experimental element of the Innovation Sandbox, it would be beneficial if the OEB required some kind of reporting by Sandbox proponents, which would ideally be made public. This would ensure that the experience and insights from a given experiment were documented for the sake of co-learning and capacity building, but also, this process of sharing insights publicly ensures a given proponent will not have a competitive advantage over others in the sector.

As the institution has matured, OEB staff initiated a 'sandbox renewal' consultation to solicit feedback from stakeholders on the experience to date and on future items to consider in relation to the Innovation Sandbox design and function. The fact that the OEB is conducting iterative consultations based on reflections on the experience to date illustrates OEB staff are cognizant of the need for iteration in continually shaping the institution for learning – two hallmarks of agile regulatory practice. One area where feedback should ideally be solicited is in

[2] The OEB may grant exemptions from its own regulatory requirements, such as OEB electricity codes, OEB natural gas rules and OEB licences. However, subject to certain exceptions, the OEB cannot grant exemptions to requirements that are found in statutes or regulations.

regards to policy clarity, which has recently been recognized as an important variable in the context of regulator's efforts to increase agility.[47]

Canadian energy regulators, like the OEB, are increasingly being directed by government to become more innovative. Indeed, the OEB's mandate was recently updated to include the objective of facilitating innovation.[48] A critical aspect of achieving this objective in practice is for regulators to understand to what end they are encouraging innovation (i.e., advance policy clarity), so that they can better evaluate where to increase flexibility (around the 'purposeful dimension where innovation is sought), while retaining (or tightening) regulatory stringency in other dimensions. Similar to other provincial energy regulators, the OEB's mandate around innovation does not explicitly address any decarbonization goals. Ideally, further conversations under the auspices of the sandbox renewal consultations will flush out the objectives embedded in purposeful innovation, which in theory should improve the OEB's ability to adjust the Innovation Sandbox's design and function in order to better meet the clarified objectives. This clarity is particularly important where decisions entail a consideration of tradeoffs between potentially conflicting objectives like decarbonization goals and maintaining the lowest possible costs for customers.

The Vancouver Zero Emission Building Exchange (ZEBx)

The Building Bylaws and the Rezoning Policy for Green Buildings, under the Vancouver Zero Emission Building Plan (ZEBP), exemplifies an agile approach to reducing emissions from buildings through regulation. Both the regulations themselves (i.e., instrument) and Vancouver Zero Emission Building Exchange (i.e., institution) developed to support the implementation of these stringent regulations can be considered agile. Firstly, the new regulations are stringent, with increasing stringency built-in, and are performance-focused, providing flexibility in compliance. The regulations provide predictability for builders by establishing set timelines for stringency increases and reviews. In addition, criteria and expectations regarding zero emissions buildings are set to remain fairly consistent from year to year to enable industry to focus on the desired outcomes and optimize their solutions by learning from prior projects. Periodic evaluation of the regulations ensures an iterative approach to regulatory review and improvement. The Zero Emission Building Plan squarely provides for capacity building via a novel institution, the ZEBx, which forms the focus of this analysis.

Overview of the ZEBx and Regulations under the Vancouver Zero-Emission Building Plan

The City of Vancouver's Zero Emission Building Plan[49] (ZEBP) is a flexible, phased approach to combat and reduce carbon pollution in Vancouver. This Plan lays out four action strategies to require the majority of new buildings in Vancouver to use 100% renewable energy and have no operational greenhouse gas emissions by 2025 and for all new buildings to achieve these outcomes by 2030.[50] These four strategies are:

1. Limits: establish GHG and thermal energy limits by building type and step these down over time to zero
2. Leadership: require City-owned and City managed building projects to demonstrate zero emission building approaches where viable

3. Catalyse: develop tools to catalyse leading private builders and developers to demonstrate effective approaches to zero emission new buildings; and
4. Capacity Building: establish a Centre of Excellence for Zero Emission Buildings to facilitate the removal of barriers, the sharing of knowledge, and the development of the skills required to successfully achieve this goal

In May of 2017, new regulations under the Green Building Policy for Rezoning[51] were introduced as a part of the Vancouver ZEBP. The regulations require new large buildings to meet specified standards based on GHG intensity targets (GHG emissions per unit area per year) by building type. The performance of both energy efficiency and carbon are regulated under this scheme. Targets are based on a stepped reduction timeline starting in 2016 (in approximately 5-year intervals) until all buildings achieve zero emissions by 2030, and for many building types, by 2025.[52] The regulations will be updated to reflect these targets as hard limits for the set milestone years.[53] In order to provide consistency to the building industry in British Columbia, these rules were designed to be closely aligned with B.C. Energy Step Code, which was also released in 2017.[54] Under these rules, developers have significant flexibility in choosing their approach to develop more energy-efficient buildings (e.g., building practices, technologies and energy sources, including electricity and natural gas).[55]

In order to aid in the achievement of these more stringent regulations, the ZEBx was established in 2018. The primary function of the ZEBx is capacity building via knowledge gathering and exchange with the goal of establishing a community of practice for the high-performance building industry. The ZEBx website describes the organization as "a collaborative platform [and]…an industry hub that facilitates knowledge exchange to accelerate market transformation".[56] It's mission is "to rapidly accelerate the knowledge, capacity and passion for zero-emissions building in Vancouver and British Columbia".[57]

Origins of the ZEBx

Specialized skills and knowledge are required to develop zero-emission buildings, as is requires more of a systems approach to development.[58] In Vancouver, the City Government realized that the local building industry was lacking in these skills and sought to mitigate for this, in part, by recommending for an institution to carry out pro-active capacity building aimed at knowledge generation and sharing, in addition to engaging the public on the benefits of zero-emission buildings.[59] According to ZEBx staff, when it came time to establish a capacity-building institution, one of the main inspirations for the City of Vancouver Green Building Team was the model of New York City's Building Energy Exchange. Drawing partly on this model, the ZEBx was established in 2018 as an arm's length government agency hosted by hosted by the Vancouver Regional Construction Association in partnership with the City of Vancouver, Passive House Canada and the Open Green Building Society.[60]

Early Experience of the ZEBx

In reflecting on the early experience of the ZEBx, staff report the capacity building model is working; however, while the ZEBx has been successful in growing a community of practice in Vancouver, they acknowledge they still have work to do in terms of reaching some groups in the

building sector. In particular, the ZEBx has not had much engagement with large traditional developers in either the small-building or large-building sub-sectors. To date, the primary groups that make up this growing community of practice are the architecture community and smaller builder-developers that were already early adopters in the green building sector. Individual homeowners do not really interact with the ZEBx, but are likely influenced by the architects and builders that do interact with the institution. Given the engagement experience so far, the strategy being employed by ZEBx is to showcase the building successes of smaller developers and builders engaged with the institution as a proof of concept to those developers and builders, often traditional larger developers, who are not yet involved in the community of practice. The main way this 'showcasing' is done is through the host of programs the ZEBx runs, which makes up the bulk of the day-to-day work for ZEBx staff.

According to ZEBx staff, the core means of capacity-building occurs through the programming developed and run by Exchange staff. There are many different kinds of programs that are structured differently, employing various engagement styles, and targeting various audiences and knowledge needs. One of the critical mechanisms initially developed to meet the institutions capacity building objectives was the Standardized Case Studies To Catalyze Implementation Of ZEBs. [61] This series of case studies provided a means for systematically undertaking direct research and dissemination activities. Like the model for the entire organization, this direct research approach to capacity building was also inspired by an existing effort – the British Columbia Energy Step Code Study Series.[62] A key design element of this series is its standardized format, which is meant to enable "industry to effectively access the information, compare results across various projects, building systems, products and designs, and integrate the knowledge into their projects".[63] The case study series is also structured by its focus on addressing four core objectives of high-energy performance buildings. Another more recent program, the ZEBx Decarb Lunch webinar series, which was developed during the COVID 19 period, has now become their most popular program.[64]

According to ZEBx staff, one early lesson learned in designing programming for capacity building is striking a balance in providing information that is accessible and understandable while still providing enough substance and detail to ensure the information exchange truly results in capacity being built. Arguably, it is the keen focus on information provision as a means to an end (i.e., building capacity) and correlating attention to the design of information exchange that has made this capacity-building strategy successful in increasing regulatory agility in practice.

The showcasing of successful ZEB projects through ZEBx programming not only increases regulatory agility by capacity-building geared at industry, but also by providing evidence to regulators that zero-emission building regulations can be met in a cost-efficient manner. According to ZEBx staff, the fact that the organization is impartial in its orientation and capacity builds towards the goal of decarbonizing the building sector, as opposed to advocating for any kind of specific solution, has been critical for building the institution's credibility as a neutral intermediary between industry and government. Given regulators often struggle to know where the leading edge of technology lies, and therefore how far they can 'ratchet up' stringency levels[65], having an active, informed and impartial institution to substantiate appropriate stringency levels based on agnostic assessments of existing industry capacity enables regulators to 1) push back against industry attempts to downgrade stringency levels based on exaggerated or false claims of unfeasibility and 2) justify increase stringency levels when appropriate. In a sense, the role of the ZEBx as a neutral

intermediary in assessing industry capacity can be viewed as indirect capacity building for the regulators themselves, which has helped them uphold the implementation of the City's agile approach to building regulations.

IV. SUMMARY DISCUSSION AND FUTURE RESEARCH

Regulatory models have evolved over time, largely following the generalized pattern of shifting modes in governance systems. The latest iteration of regulatory reform in Canada, known as regulatory excellence or agile regulation, has emphasized the need for flexible, stringent and predictable regulations to be operationalized by regulatory management that is agile, rigorous, efficient, transparent and inclusive. This paper describes and examines the early experience of two examples of agile regulatory institutions to both understand the complexities of development and implementation and to begin to link their design and function to increasing regulatory agility. Specifically, this research highlights the critical role of knowledge gathering and exchange as a means of capacity building through co-learning processes.

The two examples of agile regulatory institutions examined in this research were able to increase regulatory agility, in practice, due to the unique functions these institutions provided, especially their shared capacity-building functions related to information gathering, dissemination and co-learning. Given these two cases represent two different kinds of agile regulatory institutions, there are, of course, differences in their function and structure that impacted how co-learning and capacity building translated into increased agility in practice.

In the case of the ZEBx, the organization's structure as an independent non-profit knowledge platform meant capacity building and co-learning (and increased agility) occurred through direct knowledge gathering and dissemination and neutral intermediary functions. Information gathering and exchange happened through ZEBx programming, which included direct research, analysis and dissemination activities like regular case study analysis and training webinars. In comparison, the OEB's Innovation Sandbox was able to enable capacity building and co-learning by providing opportunities for informal and timely conversations between regulatory staff and proponents, in addition to opportunities for experimentation. In the OEB case, information-gathering activities did not take the form of direct research, analysis and dissemination but was more of a two-way learning process between proponents who approached the Innovation Sandbox and OEB staff.

In these cases, capacity-building through co-learning represents the core crossover element that enabled increased regulatory agility. These co-learning processes between relevant stakeholders resulted in increased capacity for regulated entities to understand and navigate the respective regulatory frameworks in a way that enhanced the potential for innovative approaches for compliance. This increased capacity is especially critical for operationalizing agile regulation, given capacity limitations are a common barrier to increasing regulatory agility, especially in sectors like building and energy where technologies are rapidly evolving. These experiences also reflect the theoretical proposition of agile regulation, that increasing regulatory agility requires the inclusion of a larger number of increasingly diverse stakeholders.

This research represents an initial effort to make these linkages; however, additional research is required to develop a context-sensitive theory of agile regulatory institutions. Specifically, the characteristics of agile regulatory institutions and the elements that support them need to be further explored and categorized, and our understanding improved for how these elements 1) improve agility and 2) what new authorities and capacities are required to operationalize them. This kind of future research is vital given the wide variety of terminology used to describe similar elements of agile regulatory institutions and almost no understanding of the causal relationships between individual elements and increased regulatory agility. Filling this gap in the literature will provide other would-be agile regulators with important context-specific lessons and best practices, which are urgently needed to drive clean innovation and accelerate emission reductions.

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