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CUMULATIVE AND REGIONAL ASSESSMENT: A PERSPECTIVE

HIGHLIGHTS

- All development activities, large and small, have cumulative effects. With 7 billion people on the earth and still growing, there is enormous continuous strain on the natural environment, which supplies all the raw materials needed to meet all our needs and wants. In some cases, we can see the increased environmental pressures. In other cases, we perceive or have a mental impression of negative impacts, perhaps driven in part by a variety of interactive cognitive biases.
- Cumulative effects assessment (CEA) has increased in importance over the past 20 years. It is now an accepted sub-discipline within project-specific environmental assessment processes and is gradually making its way into permitting/licensing regulatory decision-making for smaller projects and activities.
- B.C. has some of the best CEA practitioners and they deploy a robust form of assessment compared to many other places.
- CEA is conceptually simple but difficult to implement in practice. CEA is valuable for improving the environmental and social sustainability of a project and assisting government agencies with their project decision-making but there is an unrealistic expectation it will deliver definitive conclusions on the combined effects of past, present, and foreseeable human activities. CEA, and environmental assessment in general, is not the proper place for broader conversations about policy issues since many of these are far beyond the scope of any one project.
- Given these limitations, regional effects assessment (REA) may be better for looking at the hypothetical futures of a place and building understanding about "what's important".
- But REA is land use planning (LUP) and British Columbia's experience with LUP is mixed. Perhaps a smaller scale more focused look at a place can help increase certainty and contain project development costs.
- A must have pre-requisite for REA in B.C. is a clear understanding of how the results of such a process(es) will be integrated into regulatory decision-making. Both CEA and REA are tools. Neither are panaceas.

INTRODUCTION

All human activities have effects on the natural environment and on the human environment (i.e., the social and economic aspects of society). As the population and economy grow, the environment is always changing. Many are familiar with the term cumulative impact or cumulative effects assessment (CEA) as part of the review processes for large projects — mines, transportation infrastructure, energy projects, other major industrial facilities, and sometimes even tourism facilities such as ski resorts. All development activities large and small have cumulative effects of some kind. Some B.C. policy-makers are talking about the use of regional effects assessment (REA) and strategic effects assessments (SEA) to manage development-related effects at a broader level. CEA is usually part of a project-specific assessment. SEA normally targets the review of policies, plans, and programs while REA is a form of land-use planning, albeit targeted to an activity and region.

This article is a practitioner's perspective on the generally accepted closest-to-project form of CEA and REA and their use in evaluating major projects under both the *Canadian Environmental Assessment Act* (1995, 2012) and some version of this under the yet-to-be-passed Bill C-69

Impact Assessment Act, along with British Columbia's *Environmental Assessment Act* (1995, 2002, 2018). It provides a brief history of cumulative assessments in Canada and British Columbia, discusses methods for assessments, identifies challenges, and identifies a few specific issues aimed at improvement. We also offer some perspectives on regional impact assessment.

CONTEXT

Today there are more than 7 billion people in the world with over half of us added in the last 50 years.[1] Although recent population statistics suggest the global rate of growth is slowing, the world population is still expected to reach 9 billion by 2040. Clearly this rising population will put enormous strain on the natural environment, which supplies all of the raw materials and foodstuffs needed to meet all our needs and wants. The majority of people aspire, regardless of where they live, to achieve a higher economic standing for themselves and their children and, as western societies, we support efforts to raise the standard of living in the developing world. Once acquired, however, the comforts and conveniences of modern economies become necessities, creating new obligations and expectations. This population and economic growth dynamic will inescapably lead to increased pressure on the natural environment through cumulative effects.

CEA increased in importance over the past 20 years. The proposal and development of major projects across British Columbia and Canada in recent years has fostered substantial public attention on cumulative effects issues. The main reason is quite simple, the demands on the natural environment for the raw materials and infrastructure necessary for our day-to-day lifestyle are increasing. In some cases, we can see the increased environmental pressures. In other cases, we perceive or have a mental impression of negative impacts, perhaps driven in part by a variety of interactive cognitive biases.[2] Regardless, accounting for and predicting the cumulative effects of industrial and other human activity is now an accepted sub-discipline within project-specific environmental assessment processes and is gradually making its way into permitting/licensing regulatory decision-making for smaller projects and activities. By examining the interactions of past, present, and planned projects across the landscape, we can find opportunities to minimize the negative implications of development while realizing the positive outcomes from economic growth. At the same time there are many challenges.

Strategic Assessment (SEA):
Originated in 1981 by the U.S Department of Housing and Urban Development aimed at "avoiding approval delays, reducing expenses in the preparation of project-specific assessments, and addressing the long-term comprehensive and cumulative effects of individual actions." The approach focused on "consideration of the effects of urban development/redevelopment on an area as opposed to a specific site … [with a focus on] overall development pattern[s], including housing, shopping, employment centers, community facilities, services, and key infrastructure elements … [aimed at] 'understanding of the cumulative impacts of various development patterns." Today the meaning of SEA is broader and oriented towards the review of existing and proposed policies, plans and programs.

Regional Assessment (REA):
This is a smaller version of land-use planning. Environment Canada's definition of a region is "any area in which it is suspected or known that effects due to the action under review may interact with effects from other actions. This area typically extends beyond the local study area; however, as to how far will vary greatly depending on the nature of the cause-effect relationships involved." For all intents and purposes, CEA is a regional assessment because "cumulative effects should be assessed relative to a goal in which the effects are managed on a regional basis."

Sources: Area-Wide Environmental Assessment Guidebook, Cumulative Effects Assessment Practitioners' Guide.

HISTORY OF CEA AND REA

In Canada and B.C., beginning in the latter case with the War in the Woods (1993),[3] the level of public attention on regulatory processes for land-based activities has increased significantly. One result is amped-up political pressure to add considerably more weight and focus on CEA, as well as REA and SEA, within project-specific review processes. Today, and "despite a growing body of literature addressing [the] science

[1] For perspective, at the beginning of the 19th century (i.e., 1800), pre-industrial revolution, there were less than one billion people in the world. At that time Beijing was the biggest city with just one million people — less than half the size of the Metro Vancouver today. New York had about 65,000. California's population stood at ~850,000 and Los Angeles had a grand total of ~11,000. Compared to today when these metro areas are home to 8.4 million, 39 million, and 4.2 million, respectively. B.C doesn't even have census data until 1871. At that point the count was ~36,000. By the end of 2018 B.C had approximately 4.9 million people.

[2] **Bandwagon effect**: the probability of one person adopting a belief based on several other people who hold the same belief, often referred to as groupthink. **Confirmation bias**: We tend to listen to and accept information that confirms our misperceptions. **Availability heuristic**: People overestimate the importance of information that is available to them. **Clustering illusion**: A tendency to see patterns in random events. **Conservatism bias**: Where people favour prior evidence over new evidence or information that has emerged. **Zero-risk bias**: Humans love certainty even if it is counterproductive and inconsistent with evidence.

[3] The War in the Woods" took place in Clayoquot Sound on Vancouver Island in the 1980s through to the mid-1990s over logging practices and tenure allocation for old growth timber.

requirements of impact assessment, the CEA practice remains contested."[4]

For decades, Canadian environmental assessments have enabled the review of cumulative effects for major capital projects. Before 1995[5], there was no such legal requirement.[6] CEA, if done, was implemented via policy guidance. The 1995 *Canadian Environmental Assessment Act* (CEAA) used the words "shall include a consideration." To CEAA 2012 was added a purpose statement — "to encourage the study of the cumulative effects of physical activities in a region and the consideration of those study results in environmental assessments," and the word "shall"[7] was changed to "must" in section 19(1)(a). Despite the obvious conflict of words in the purpose — "encourage" versus "must" in the body of the Act – as a matter of course a practitioner completes studies and data collection for CEA analysis. The proposed federal *Impact Assessment Act* (Bill C-69) continues CEA as a "must" factor (section 22(1)(ii)) and expands it to include a host of social and economic considerations. The new Act, if passed in its present form, would also enable REA (section 92) and SEA (section 95). Neither is required, however, and may be pursued at the discretion of the Minister.

B.C. has had a legislated process for reviewing energy projects since 1980 and mines since 1991. Neither had requirements for cumulative effects assessment. In 1995, with the implementation of the *B.C. Environmental Assessment Act* (BCEAA), section 22(j)[8] required project proponents to gather "data necessary or useful to enable the assessment of the probable cumulative effects of the project." While a formal assessment of cumulative effects was not mandatory, most Terms of Reference for the proponent's application under the regime established by the 1995 Act included requirements for some level of cumulative impact analysis. These were completed under policy direction and largely mirrored the federal methodology, which itself followed early concepts and ideas developed and adopted in the United States beginning in the 1970s. These ideas were incorporated, in part, into early federal Environmental Review Office polices. Even under the 2002 version of B.C.'s Act (which is still in force), CEA is still discretionary but in practice is usually completed. Section 11(1) says "if the executive director [decides] set out in section 10 (1) (c) for a reviewable project, the executive director must also determine by order .... (b) the potential effects to be considered in the assessment, including potential cumulative environmental effects."

In 2015, the B.C. Auditor General issued a report[9] critical of the province's approach to managing the cumulative effects of natural resource development. The response for large projects was new guidance[10] (2017) based on a provincial interim framework.[11] This framework expanded the reach of CEA. It is now used to some extent by the Ministry of Forest, Lands, Natural Resource Operations and Rural Development in decision-making for permits/licenses on provincial Crown lands. The Oil and Gas Commission uses Area Based Analysis,[12] which in many respects is a form of regional impact assessment. Later this year, a re-write of BCEAA will make explicit a "must" requirement for cumulative effects assessment — section 25(2). It carries forward the powers for SEA (Section 49, Bill 51, section 73), and adds powers to enable REA (section 35).

Careful Use of Terms

"Expectations of what should be accomplished in CEA often exceed what is reasonably possible given our knowledge of natural ecosystems, available information, level of effort required to obtain more information, and the limits of analytical techniques in predicting the effects of actions on the environment. These terms should not be used in a CEA unless they are carefully defined; otherwise, the uncertainty associated with their meaning will later bring into question the usefulness of the CEA during its interpretation by regulatory reviewers."

Sources: Cumulative Effects Assessment Practitioners' Guide, Canadian Environmental Assessment Agency.

[4] Duinker, Peter N. Burbidge, Erin L. Boardly, Samantha R. Greig, Lorne A. Scientific dimensions of cumulative effects assessment: toward improvements in guidance for practice. Environmental Reviews. October 2013.
[5] CEAA assented in 1992 but not in force until January 1995.
[6] The first guidance document on the "how to" of CIA for the federal process was published in 1994. https://www.canada.ca/content/dam/ceaa-acee/documents/policy-guidance/reference-guide-addressing-cumulative-environmental-effects/Addressing_Cumulative_Environmental_Effects.pdf. Guidance is updated regularly with the most recent version being 2014. Recently Canada has provided additional advice on how to incorporate climate change related considerations. https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance.html#ceaa.
[7] Section 16(1). "Shall" can be interpreted to mean "may."
[8] http://www.bclaws.ca/civix/document/id/rs/rs/96119_01#section022.
[9] https://www.bcauditor.com/pubs/2015/managing-cumulative-effects-natural-resource-development-bc.
[10] https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/environmental-assessments/news-and-annoucements/eao-cumulative-effects-and-bc-environmental-assessments.pdf.
[11] https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/cumulative-effects-framework/policy.
[12] https://www.bcogc.ca/public-zone/area-based-analysis-aba.

CEA IN PRACTICE

CEA is conceptually simple but difficult to implement in practice. As a method, there are expectations it will deliver definitive conclusions on the totality and combined effects of past, present, and foreseeable human activities on the environment, economy and society in a given place. This is an unrealistic expectation. No project-specific CEA process can capture ecosystem dynamics in management approaches or predictive models,[13] in part because of incomplete knowledge, low predictive ability of ecosystem behavior, natural variability, measurement error, and constantly changing policies. The latter is a particularly true for British Columbia.

In addition, much of the dissatisfaction among stakeholders and Indigenous communities with project assessment is driven by desire to address broad policy-related issues, many of which are outside the scope of any one project and arguably should not be part of project-specific reviews. CEA cannot solve this dilemma; proponents do not have the resources or authority to manage environmental issues at a landscape level.

At best, the current approach to CEA increases the level of effort a proponent invests in environmental protection for its project, and provides government with additional information about a project's contribution to the sum of activities that already exist. This is valuable for improving the environmental and social sustainability of a project and assists government agencies with their decision-making processes. However, it may not meet public or Indigenous expectations, because CEA often only offers a perspective on the magnitude and significance of environmental changes through the lens of the project in question. The reality is that many want CEA to be undertaken at a scale larger than what is possible with an individual project.

From this perspective, project-specific CEA is a form of risk assessment[14,15] for real projects (i.e., projects that are in an environmental assessment or permitting process), in combination with a guess on a collection of potential/hypothetical projects (Note: in B.C. less than 40% of major projects that are in the environmental assessment processes proceed to construction). It is an educated conclusion by practitioners about the positive and negative changes stemming from a project on the values (often referred to as Valued Components) considered important by stakeholders, writ large. Practitioners use science, expert judgement, a deep understanding of data and pattern recognition, along with experience in the field to make informed conclusions about possible future consequences specific to the development of one project. But as demonstrated by British Columbia's "LNG boom," where 13 projects were proposed between 2010 and 2016 and only one (LNG Canada) has made a financial investment decision to date, these kinds of predictions are uncertain and proposed projects often do not come to fruition. As such, the main value of CEA is primarily in the consideration of past and present projects and activities, acting in relationship to an actual proposed project.

Of note, British Columbia has some of the best CEA practitioners and they deploy a robust form of assessment compared to many other places.[16] This is good news. But in the end, we can only "know" the actual effects of a set of activities over time and at a point in the future, facilitated by evidence collected through monitoring. Project-specific CEA has limitations.

The four basic steps of CEA /Risk Assessment

(1) The context: document the condition of the existing environment, which reflects past and present activities, and residual effects of the project on the aspects of the natural and human environment sensitive to effects (i.e., valued components).

(2) The possibilities: Gather additional information on projects that are in a regulatory process or have been publicly announced, and estimate the additional contributions these projects are likely to have on the predicted adverse effects on the valued components.

(3) Additional protections: Propose mitigations that the proponent and the responsible government agencies can technically and economically implement to reduce or avoid cumulative effects.

(4) The analysis: Assess the likelihood and significance of the residual cumulative effects, after consideration of the mitigation measures.

[13] Groffman, Peter, M. Ecological Thresholds: the Key to Successful Environmental Management or an Important Concept with No Practical Application? Ecosystems. Springer. 2006.
[14] "Cumulative Impact Assessment: Is It Just a Fancy Way of Identifying and Managing Risk"? Environment and Energy Bulletin, Business Council of B.C., Volume 4, Issue 6, November 2012.
[15] **Risk Assessment Defined**: The identification, evaluation, and estimation of the levels of risks involved in a situation, their comparison against benchmarks or standards, and determination of an acceptable level of risk. **Environmental Risk Assessment**: a process for estimating the likelihood or probability of an adverse outcome or event due to pressures or changes in environmental conditions resulting from human activities.
[16] Foley, Melissa, M., et al. "The challenges and opportunities in cumulative effects assessment." Environmental Impact Assessment Review. June 2016.

REGIONAL EFFECTS ASSESSMENT

REA is better for looking at the potential hypothetical futures based on a shared understanding of "what's important" and how to identify both apportionment of burdens from and among land and resource users, as well as realization of the opportunities and benefits from development. But let's be clear, REA basically amounts to land-use planning (LUP), albeit on a smaller scale than British Columbia's history with LUP from the 1990s — a long and expensive process, yielding mixed results. Perhaps REA, which is intended to be undertaken in a focused manner and on a smaller scale, can lead to a conversation that yields faster, more specific results than historic LUP processes, thus resulting in greater certainty and more manageable project development costs. But it is still troublesome that the power and authority for a land use planning exercise is embedded in a project specific review process. The potential for misuse is clear.

Regardless, it is hard to disagree with most of the best-case scenario items described on page 16 and the outcomes on page 19 of West Coast Environmental Law's recent paper, "Regional Strategic Environmental Assessment for Northern British Columbia: The Case and Opportunity."[17] For example, the staging of development to help smooth out boom and bust cycles, and increasing the availability and accessibility of high-quality data: both are sound ideas. These suggestions and other ideas advanced in the WCEL paper merit further discussion to see if it is possible to scope REAs to a level that is useful for decision-making, and not just another tool for those opposed to development to say "no."

The challenges in developing a robust REA structure are many and known. They include:

- Identifying the regulatory agencies, Indigenous nations and stakeholders (including industries) that will be invited to participate in the REA process. Location matters.
- Establishing appropriate spatial and temporal scope for REA. Boundaries matter.
- Obtaining appropriate baseline data for use in the analysis. Data and information matter.
- Defining a manageable set of potential impacts to evaluate. Scope matters.
- Deriving a meaningful set of indicators that can capture the scale and significance of potential impacts and relating these impacts to environmental or socio-economic effects. Precision matters.
- Defining defensible thresholds against which the outcomes of the REA will be assessed. Perspective matters.
- Establishing responsibilities for mitigation and management of identified cumulative impacts. Accountability and deciding who is responsible matter.

Finally, to make the process and conclusions defensible and useable, one of the most critical outcomes is having a clear understanding of how the results of the REA will be integrated into regulatory decision-making. This is a must have pre-requisite. Tools have a purpose. Tools must be right sized and specific. REA is a tool, not a panacea.

CONCLUSION

The documenting and evaluation of cumulative effects by project proponents is an undisputed requirement in environmental assessment processes. In B.C., it is becoming an important part of permitting and licensing in certain areas as well. One positive result is that the requirements have increased the environmental and social sustainability of projects. But the costs and time for reviews have also increased, and the angst and social friction among many stakeholders about land and resource use has not decreased. CEA cannot solve this dilemma; it has limitations. REA cannot solve this either, but it may yield benefits in areas with higher concentrations of development and, in combination with CEA, increase certainty for proponents entering an environmental assessment process. The task at the outset is to clearly articulate what these tools can and cannot do. This is fundamental and critical as expectations, which are just beliefs and conjecture about what the future might hold, are harder to manage than reality.

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[17] https://www.wcel.org/sites/default/files/publications/WCEL_NBCenviroAssess_report_FINAL_0.pdf.