

CRITICAL REVIEW OF THE REGIONAL CUMULATIVE EFFECTS ASSESSMENT (RCEA) FOR HYDROELECTRIC DEVELOPMENTS ON THE CHURCHILL, BURNTWOOD AND NELSON RIVER SYSTEMS

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ABOUT THE AUTHORS

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- Doctoral research - regional and strategic approaches to cumulative effects assessment (CEA)
- Canadian Council of Ministers of Environment (CCME), Alberta Environment, Fisheries and Oceans Canada & others – Regional Strategic Environmental Assessment guidance, cumulative effects definitions
- Building Common Ground – Regional Impact Assessment based on CCME guidance
- BC Hydro – transmission vegetation & wildlife habitat management strategies
- Bipole III, Keeyask, NFAT CEA methodology reviews



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Dr. Ayodele Olagunju, PhD, PMP

- Doctoral research - integration of environmental assessment, planning, and policy-making on a regional scale
- NFAT Review of the Keeyask and Conawapa Generating Stations
- Review of the Application of Cumulative Effects Assessment in the Context of Project Environmental Assessments: The James Bay Territory (Quebec)
- International peer-reviewed works on environmental governance, strategic environmental assessment, and cumulative effects assessment



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AGENDA

- **Context and purpose of the review**
- **Overview of regional cumulative effects assessment**
- **Our approach to the review and review criteria**
- **Synthesis of key findings and observations**
 - *What was done reasonably well?*
 - *Where are improvements needed?*
 - *Recommendations*
- **Next steps**



1.

Context and Purpose of the Review



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CONTEXT

In September **2004**, as part of the Wuskwatim Generation and Transmission Project public hearings, the Manitoba Clean Environment Commission (CEC) recommended that¹:

The Government of Manitoba should undertake a regional planning initiative in northern Manitoba and on the east side of Lake Winnipeg, to address existing and future hydroelectric and other developments...A cooperative regional planning approach would be more appropriate to assess the cumulative effects of past, present and future developments in northern Manitoba. The Commission further notes that there is potential for a strategic environmental assessment approach to future planning and development in northern Manitoba that includes hydroelectric development along with future mining, transportation, infrastructure and related projects (Recommendation 7.4.4)



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CONTEXT

In November **2012**, Gunn and Noble reviewed the cumulative effects assessment prepared for the Bipole III transmission project and recommended that²:

...the Government of Manitoba undertake immediately a regional-strategic environmental assessment of the cumulative effects of current and future land uses, particularly in the northern portion of the Bipole III study area.



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CONTEXT

Shortly thereafter, in its **2013** report on the Bipole III Project public hearing process, the CEC again recommended that:

Manitoba Hydro, in cooperation with the Manitoba Government, conduct a Regional Cumulative Effects Assessment [RCEA] for all Manitoba Hydro projects and associated infrastructure in the Nelson River sub-watershed; and that this be undertaken prior to the licensing of any additional projects in the Nelson River sub-watershed after the Bipole III project (Recommendation 13.2).



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PURPOSE

To assess the Manitoba and Manitoba Hydro RCEA on behalf of the Manitoba Public Interest Law Center, acting on behalf of the Consumers Association of Canada (CAC) (Manitoba) Inc.

Objectives:

- establish the strengths and weaknesses of the RCEA from a cumulative effects perspective, focusing on conceptual approach and assessment methodology
- provide recommendations about ways the initiative could be improved

Scope:

- does not assess the scientific accuracy or disciplinary appropriateness in presenting past and current effects
- does not assess the accuracy in presenting community perspectives and concerns



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2.

Overview of Regional Cumulative Effects Assessment



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WHAT IS REGIONAL CUMULATIVE EFFECTS ASSESSMENT?

Cumulative effect:

...changes to the environment that are caused by an action in combination with other past, present and future human actions³

...a change in the environment caused by multiple interactions among human activities and natural processes that accumulate across space and time⁴

The high cost of incremental decisions is at the heart of cumulative effects

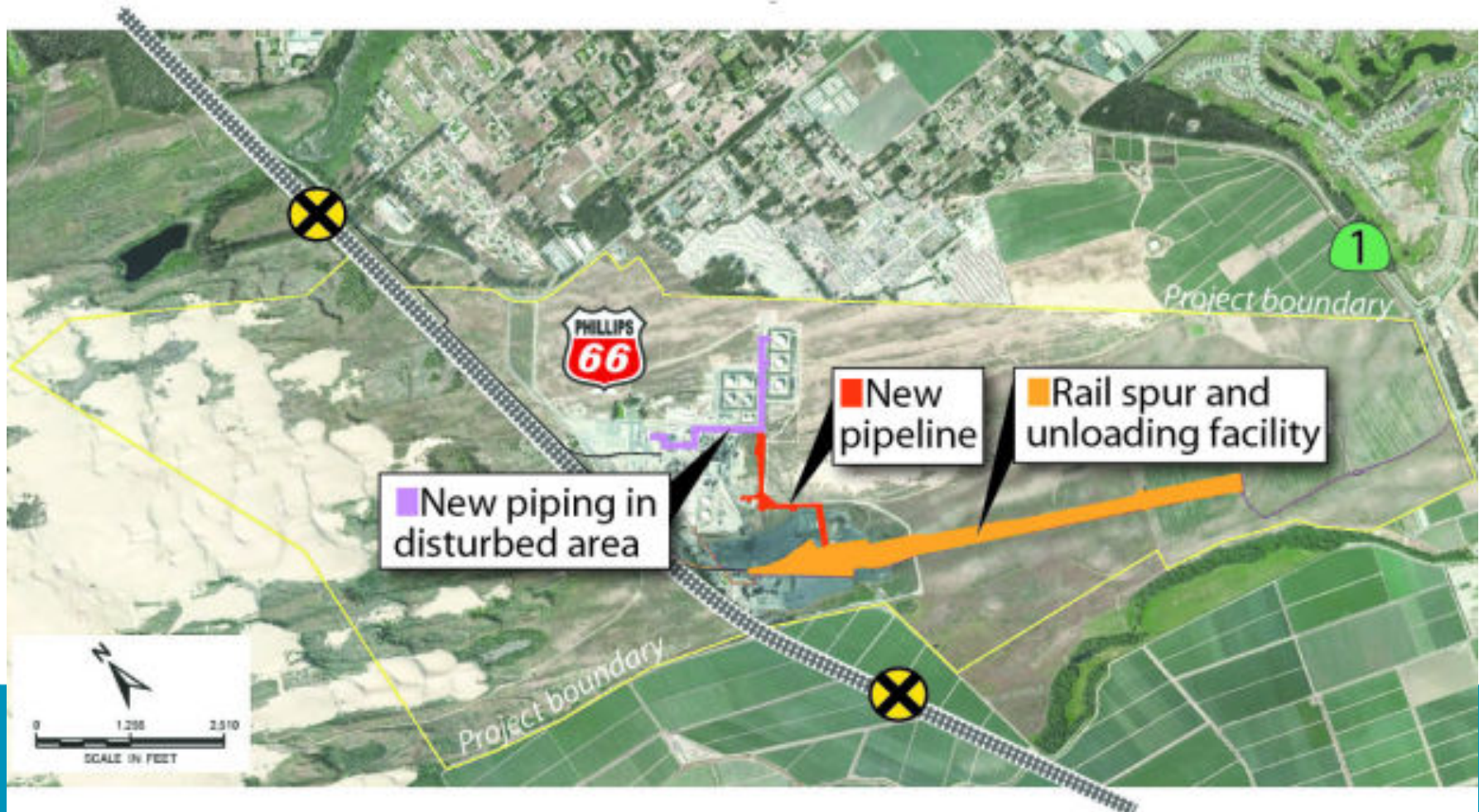


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WHAT IS REGIONAL CUMULATIVE EFFECTS ASSESSMENT?

Regional scale of analysis:

...important to capture impacts that will occur beyond the project footprint



WHAT IS REGIONAL CUMULATIVE EFFECTS ASSESSMENT?

Regional cumulative effects assessment (RCEA):

...important to predict the total impact of all initiatives on valued components' sustainability, and the contribution of individual projects to that total

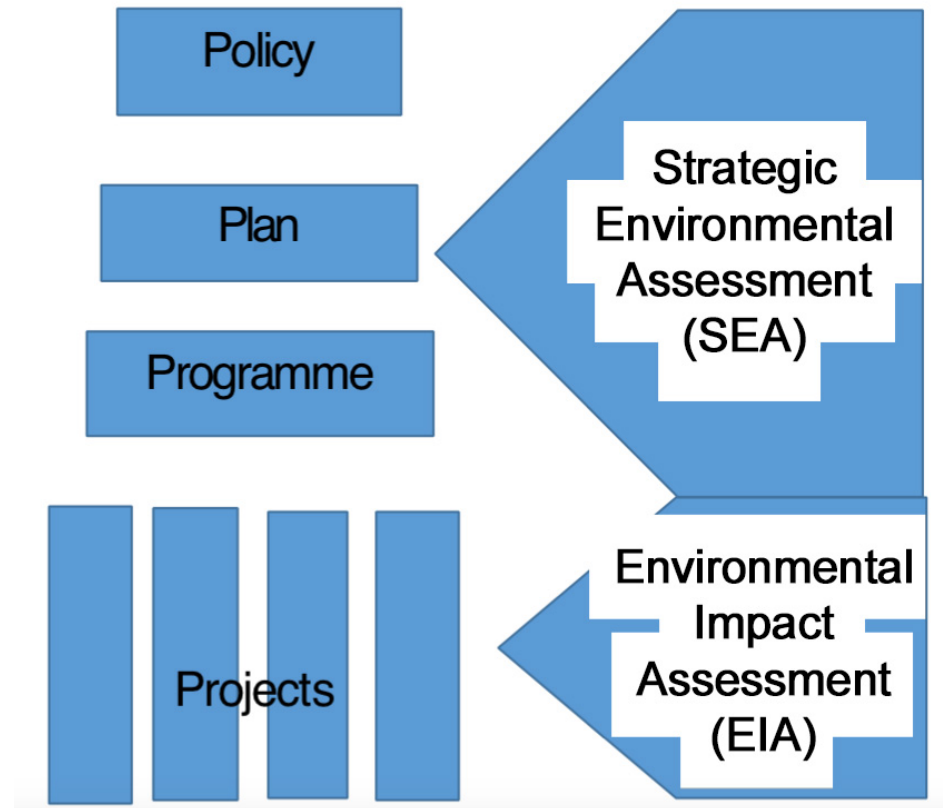




WHAT IS REGIONAL CUMULATIVE EFFECTS ASSESSMENT?

Strategic approach:

...whereas project EA only explores project alternatives, **strategic** EA explores alternatives to the project or (program of projects) in the context of desired future states





WHAT IS REGIONAL CUMULATIVE EFFECTS ASSESSMENT?

RCEA matters:

...it's a unique avenue to capture and debate the significance of past, present, and future impacts to a region – as this cannot be achieved in any single project impact assessment

...Canadians believe it may play a major role in addressing cumulative impacts on Indigenous and northern communities⁵

RCEA matters to Manitoba:

...unprecedented opportunity for leadership and collaboration with regard to the fate of northern Manitoba; to collectively influence the future of hydroelectric and other developments; to inform all subsequent project assessments and decisions



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1 Burntwood River -
 Wuskwatim - 200 MW
 First Rapids - 210 MW
 Manasan - 270 MW
 Early Morning - 80 MW

2 Laurie River -
 Laurie River 1 - 5 MW
 Laurie River 2 - 5 MW

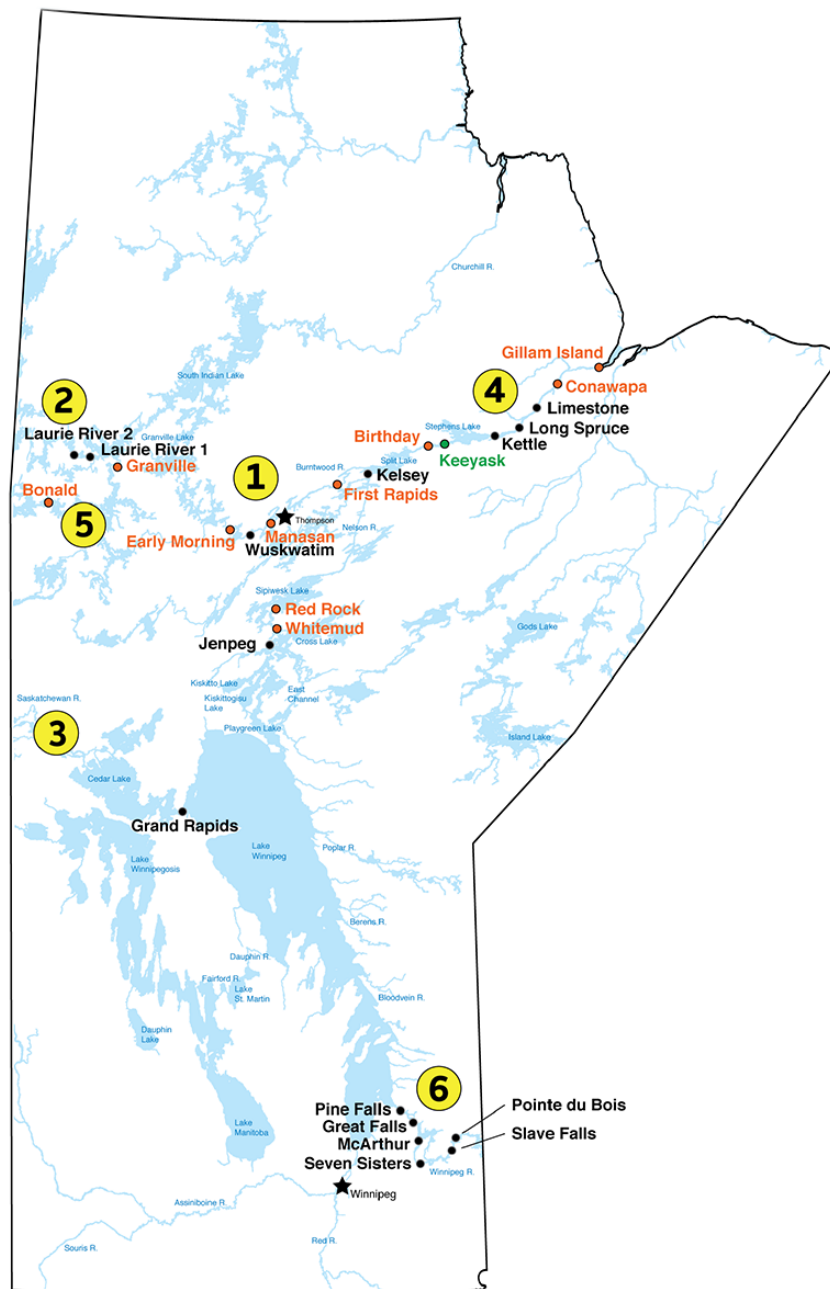
3 Saskatchewan River -
 Grand Rapids - 480 MW

4 Nelson River -
 Jenpeg - 129 MW
 Kelsey - 250 MW
 Kettle - 1,220 MW
 Long Spruce - 1,010 MW
 Limestone - 1,340 MW
 Keeyask - 695 MW
 Conawapa - 1,485 MW
 Gillam Island - 1,080 MW
 Birthday - 380 MW
 Redrock - 250 MW
 Whitemud - 310 MW

5 Upper Churchill River -
 Granville - 120 MW
 Bonald - 110 MW

6 Winnipeg River -
 Pine Falls - 89 MW
 Great Falls - 136 MW
 McArthur - 55 MW
 Seven Sisters - 165 MW
 Pointe du Bois - 77 MW
 Slave Falls - 67 MW

• **Current sites-** 5,228 MW
 • **Under development-** 695 MW
 • **Potential sites-** 4,295 MW



Burntwood River
 200 MW current (1 reservoir)
 560 MW future (3 reservoirs)

Nelson River
 3949 MW current (5 reservoirs)
 4200 MW future (6 reservoirs)

Upper Churchill River
 0 MW current (0 reservoirs)
 230 MW future (2 reservoirs)

3.

Our Approach to the Review and Review Criteria



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APPROACH TO REVIEW

Four basic stages of a typical CEA methodology guided our review:

- **Scoping** of participants, boundaries, regional study components and indicators
- **Retrospective analysis** of baseline conditions and cumulative effects
- **Prospective analysis** of potential cumulative effects of additional projects
- **Management** measures, including significance determination, mitigation, monitoring



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APPROACH TO REVIEW

Although the CEC's Bipole III recommendation does not call specifically for a strategic regional cumulative effects assessment in northern Manitoba, and the Terms of Reference for the RCEA reflect this,

- the CEC previously recommended a **strategic** approach in the Wuskwatim hearing
- Noble and Gunn also recommended a **strategic** approach in their review of the Bipole III filing
- the Public Interest Law Centre and the Consumers' Association of Canada (Manitoba chapter) have asked to learn more about a **strategic** approach to regional cumulative effects assessment and how the Manitoba and Manitoba Hydro RCEA compares



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APPROACH TO REVIEW

CCME's Core and Methodological Principles for Regional Strategic Environmental Assessment

10 Core principles:

Cumulative effects focused

Multi-scaled

Early commencement

Strategic

Futures-oriented

Multi-tiered

Multi-sectoral

Participatory

Opportunistic

Adaptive

5 Methodological principles:

Regional VEC-based

Structured and Systematic

Integrated

Focused on alternatives

Interdisciplinary

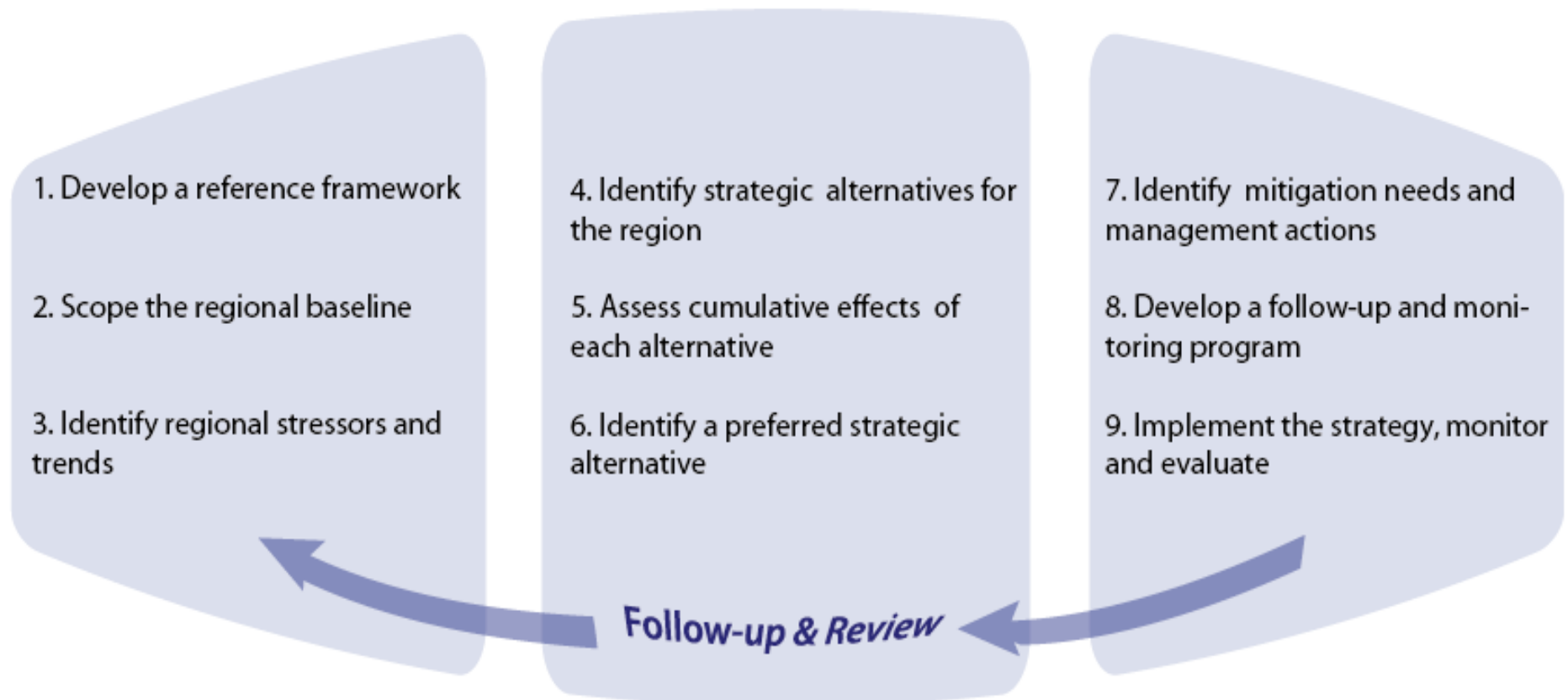


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APPROACH TO REVIEW

Basic Process for Regional Strategic Environmental Assessment



4. Synthesis of Key Findings and Observations



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SCOPING

“What is included in the assessment and what is not”

- Participants
- Regional study components* (RSCs) of interest, their indicators and metrics
- Spatial scale – physical boundaries
- Temporal scale – how far back and how far forward

*Defined as “Topics that have been selected to focus the assessment, represent the overall effects of hydroelectric developments within the Region of Interest and reflect key ecological and social concerns, or are of key importance to the people living in the area”

(Phase 2, Part 1, p. XXV)



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SCOPING

- ✓ The spatial scope of analysis is adjusted to suit each Regional study components (RSC). Typically, a sub-regional (sometimes location specific) approach to assessing effects is utilized, and at times the boundary of analysis is extended beyond the Region of Interest (ROI)* (e.g. to capture the extent of migratory habitat)

*Region of Interest (ROI) includes “the main areas directly affected by Manitoba Hydro developments associated with the Lake Winnipeg Regulation (LWR), Churchill River Diversion (CRD) and associated transmission projects”

(Phase 2, Part 1, p. XXV)



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SCOPING

- X** Scoping the RCEA as a retrospective exercise rather than a strategic exercise represents a missed opportunity in light of the CEC's past statements identifying the need for a strategic assessment of cumulative effects in the region
- X** Regional stakeholders were not engaged in the RCEA, including scoping, except indirectly through review of historical transcripts and reports





SCOPING

- X** RSCs list is fairly limited, with many wildlife species affected by hydroelectric development not included
- X** A significant portion of the Bipole III transmission line is omitted, thereby limiting the attention given to the effects of transmission line construction, clearing, and vegetation maintenance en masse in the ROI





RETROSPECTIVE ANALYSIS

“Determining baseline conditions, how developments have changed conditions over time, whether that change is significant to the sustainability of RSCs”

- Threshold determination, identifying acceptable limits
- Identify associations and trends that can be used to predict RSC responses to future developments and cumulative change





RETROSPECTIVE ANALYSIS

- ✓ The RCEA addresses both environmental and socio-economic effects
- ✓ The RCEA consistently reports changes and trends over time for the RSCs examined, providing both quantitative and qualitative descriptions, compares pre- and post-development conditions, and generally attempts to assess the overall health of the selected RSCs within the regional ecosystem for Part V Water and Part VI Land



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RETROSPECTIVE ANALYSIS

- ✓ The RCEA compares on-site/on-system conditions with off-site/off-system conditions in many instances where data is available for Part V Water and Part VI Land
- ✓ The RCEA consistently provides a high-level overview of predominant pathways of effects in the form of network diagrams that illustrate drivers, pathways, and effects for each selected RSC for Physical Environment, Land, and Water





RETROSPECTIVE ANALYSIS

- ✓ The RCEA consistently uses indicators, metrics, and benchmarks to assess impacts to Part V Water and Part VI Land RSCs. However, this is not evident in Part III People or Part IV Physical Environment
- ✓ The RCEA identifies driver and response indicators to facilitate a clearer picture of the overall health of each RSC in Part IV Physical Environment, Part V Water and Part VI Land. In our view this is a useful, innovative practice





RETROSPECTIVE ANALYSIS

X Keeyask is included in scope of RCEA, which has yet to be completed. But the RCEA does no prospective analysis. How can future impacts to the Nelson River system and estuary have been adequately captured in a retrospective analysis?

X Almost exclusively, the RCEA focuses on the direct, additive effects of hydroelectric development on each environmental component—a synergistic approach linking multiple stressors to each component is either avoided, or perhaps overlooked.





RETROSPECTIVE ANALYSIS

- X** Inconsistency in the approach taken to the retrospective analysis when comparing Parts III and IV (People and Physical Environment) to Parts V and VI (Water and Land) – focus on information-provision rather than quantifying or qualifying the magnitude and pathways of combined perturbations
- X** In general, save for a few instances, the use of environmental thresholds that could help assess the significance of historical impacts on RSCs is avoided in the RCEA, often due to unavailability





RETROSPECTIVE ANALYSIS

- X** At times in Part VI Land, the cumulative impact of hydro development on an RSC is qualified relative to the impact attributable to other developments, and deemed proportionately less—an error also flagged in Bipole III and Keeyask CEA reviews
- X** The RCEA does not attempt to qualify the total, cumulative stress placed on any given sub-region, even though it is apparent that the total stress on certain sub-regions is much greater than others (e.g. “Area 2” – the Nelson River and estuary – being the most stressed)





RETROSPECTIVE ANALYSIS

X The RCEA avoids the issue of significance of regional impacts. Scientific benchmarks are consistently used to gauge the seriousness of noted cumulative effects to RSCs in Part V Water and Part VI Land, but the societal significance of the cumulative effects throughout the RCEA is not addressed

*If a threshold has been crossed,
any future impact on an RSC
must be considered significant*



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PROSPECTIVE ANALYSIS

“Assess potential responses of RSCs to disturbances in the future, including those directly attributable to the projects in question and to other future projects and actions within the regional environment”

- Typically centered on quantitative modelling using a scenario-based approach
- Predict how RSC indicators/metrics will change
- Where data are not available, lessons from the outcomes of similar developments and expert judgment are used to explore possible future conditions





PROSPECTIVE ANALYSIS

X The RCEA does not include prospective analysis, as per the Terms of Reference⁶ - in spite of the fact that a major question regarding the future welfare of the environment and communities northern Manitoba is the potential for more dams

It is “retrospective in nature” (p.1) and “describes environmental change over time as a result of previous hydro development, including impacts, mitigation measures, community issues, compensation and the current quality of the environment” (p.3)

The RCEA is “based on a review and synthesis of past and ongoing studies and monitoring programs” (p.3)



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MANAGEMENT

“Identify appropriate mitigation and monitoring actions for RSCs subject to cumulative effects”

- Understanding how much more change in an affected VEC is tolerable or acceptable is key to significance determination or sustainability test, as the case may be in a regional assessment. This requires knowledge of other development actions in the region – past, present, and future
- In cases where an RSC is already unhealthy or regional conditions are already unsustainable, the management efforts should focus on rectifying or restoring conditions and delivering net positive contributions to regional sustainability





MANAGEMENT

X The RCEA does provide comprehensive overview of mitigation and compensation initiatives in Part III People, but of course does not revisit those strategies based on the results of prospective analysis or significance determination. Ideally, those would inform and influence a coordinated regional mitigation and monitoring plan going forward

Where applicable, the assessment includes a discussion of mitigation and remedial works that have been put in place to reduce effects and compensation provides for effects that could not be mitigated” (Phase II, Part I, pg. 1.2-6)





RECOMMENDATIONS SPECIFIC TO THE RCEA REPORT

1. Clearly state the intended purpose of the RCEA. *Without a clear statement of the tactical purpose of the RCEA, it is difficult to conceptualize the influence of this work, its value as a resource, and to whom.*
2. Allow the RSC list to be publicly and independently vetted.
3. Include prospective analysis, to highlight potential cumulative effects that would be induced in the Nelson River system and estuary by Keeyask and Conawapa generation projects.
4. Include all of the Bipole III transmission line in ROI. Conduct further analysis of the cumulative effects of transmission line construction, clearing, and vegetation maintenance *en masse* in the ROI (with special focus on wildlife habitat and riparian zone degradation).





RECOMMENDATIONS SPECIFIC TO THE RCEA REPORT

5. Facilitate independent scientific review of the use of thresholds in the RCEA to determine whether their near absence is justified; develop scientific environmental thresholds appropriate to assist in future assessments in northern Manitoba.
6. Further attempt to describe synergistic effects in the ROI affecting RSCs, as well as the total cumulative effects on RSCs on an area-by-area basis, particularly for the Nelson River system and estuary and other highly stressed sub-regions.
7. Regarding linkage diagrams to illustrate drivers and pathways of effects, provide a more explicit depiction of the other developments taken into account in the RCEA analysis, when possible.





RECOMMENDATIONS SPECIFIC TO THE RCEA REPORT

8. Implement stakeholder engagement to assist in scoping RSCs and determining impact significance. Reinstate the public hearing on the RCEA, as originally planned.
9. Include a complete list of past and current monitoring and remediation programs and initiatives to facilitate a gap analysis; should inform the development of an all-inclusive comprehensive regional monitoring program that involves public, industry, and Indigenous partnerships as appropriate, and is based on clear articulation of actions for achieving or maintaining sustainability of each RSC.
10. Develop Part III People and Part IV Physical Environment beyond an information-provision approach to also include retrospective and prospective analysis of change trends and their significance.





RECOMMENDATIONS

FOR A STRATEGIC RCEA IN NORTHERN MANITOBA

1. Revisit the initiative as a strategic exercise that is objectives-led and includes evaluation of alternative development scenarios, and results in the selection of a preferred alternative that details the desired nature and pace of development in northern Manitoba in the future.
2. Use the results of a strategic RCEA to inform future hydroelectric development project approvals in northern Manitoba, including the Conawapa Generating Station and associated infrastructure, as well as related regional policy and planning processes (e.g. GROW, Provincial Clean Energy Strategy).



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RECOMMENDATIONS

FOR A STRATEGIC RCEA IN NORTHERN MANITOBA

3. Explore the opportunity to designate the RCEA ROI as one of the identifiable pilot projects for regional impact assessment in Canada as described in Building Common Ground: A New Vision for Impact Assessment in Canada.

Transforming the RCEA from non-strategic to strategic is essential in order to reach its fullest potential in strengthening Manitoba's environment, economy, and people.



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5. Next Steps



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NEXT STEPS

Toward the CCME's Core and Methodological Principles for Regional Strategic Environmental Assessment

10 Core principles:



Cumulative effects focused
Multi-scaled

Early commencement

TO DO

Strategic
Futures-oriented
Multi-tiered
Multi-sectoral
Participatory
Opportunistic
Adaptive

5 Methodological principles:

Regional VEC-based
Structured and Systematic



Integrated
Focused on alternatives
Interdisciplinary

TO DO

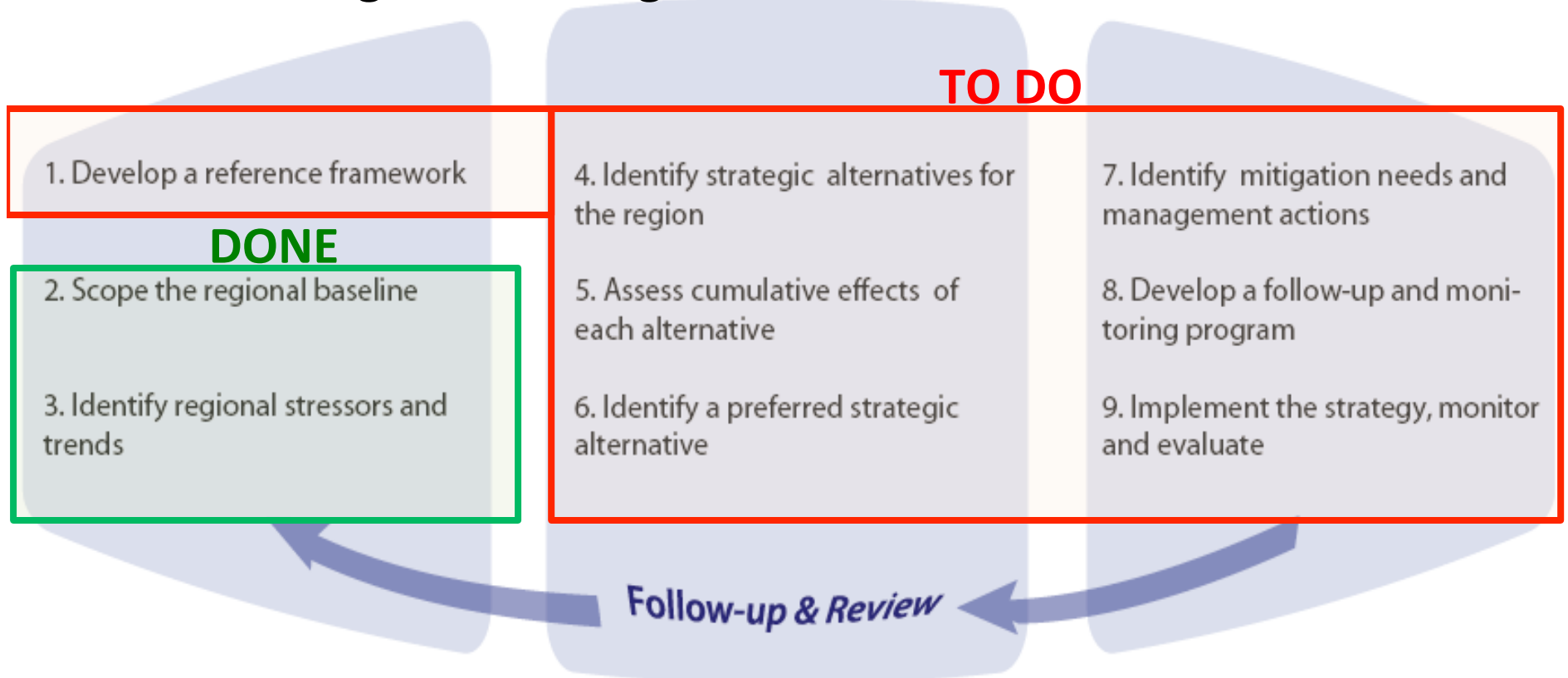


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NEXT STEPS

Toward a Step-Wise Process for Regional Strategic Environmental Assessment






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