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Sustainability assessment framework for the NFAT review

presentation for the
Manitoba Public Utilities Board hearings concerning the
Manitoba Hydro Preferred Development Plan and alternatives
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Report submitted to the PUB

Framework for Sustainability-based Assessment for the PUB's NFAT Assessment of Manitoba Hydro's Preferred Development Plan and Alternatives

submission centred on providing a comprehensive sustainability-based assessment framework

- framework presented as a set of criteria for evaluations and decisions in the NFAT case
- framework in the submission Table 6, beginning at page 28, also in handout

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Intent of submission and presentation

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- to provide PUB with an independently-developed, comprehensive analytical framework appropriate to the case and mandate
- to help ensure no key considerations are neglected in the PUB deliberations and broader decision making by others

K Thomas

Scope of submission and presentation

Submission

- focused on rationale for and substance of the framework
- have not applied the framework to review the preferred development plan or any of the alternatives in or beyond the MH NFAT submission
- have not taken a position on which presented or potential option would best satisfy the criteria we have presented in the submission

Presentation also offers:

- illustrative examples of the implications of the criteria set
- a broad comparison of the framework approach to the approach taken by MH, especially as presented in the MH submission chapter 13

Sustainability-based framework/criteria set

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- is comprehensive and integrated
  - incorporates the most advanced global understanding of what is required for progress towards sustainability (long as well as short term wellbeing)
  - is specified for the NFAT case and context
- builds on equivalents specified for other circumstances, including
  - CEC Keeyask review
  - other formal review processes (e.g. Mackenzie Gas Project joint review panel), and
  - other energy system planning (e.g. Integrated Power System Plan by the Ontario Power Authority)

Consistent with PUB mandate and NFAT Terms of Reference

- underlying PUB and Manitoba Hydro mandates to serve broad public interest
- comprehensive ToR scope including
  - "reasonableness, thoroughness and soundness of all critical inputs and assumptions" re NFAT
  - attention to risks and benefits, financial and economic factors, positive and adverse socio-economic effects, macro-environmental impact
  - expectations for alignment with the principles of sustainable development in *The Sustainable Development Act*
- need for integrated basis for comparative evaluation of conceptions of need, and nature of alternative responses to determine "the preferable long-term electricity development option for Manitoba when compared to alternatives" (ToR)

S Oikawa

Sustainability assessment: global practice

- means of implementing commitments to sustainability made by many jurisdictions and organizations
- rapidly expanding number and range of applications (not just in environmental assessment processes)
- many different approaches reflecting different ecologies, cultures, social and economic conditions, opportunities, etc.
- shared essentials based on common basic imperatives for progress towards sustainability and lessons from experience with sustainability assessment so far
- many applications in Canada including in environmental assessment reviews (e.g. five major joint review panels)

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Sustainability assessment: basic application considerations 1

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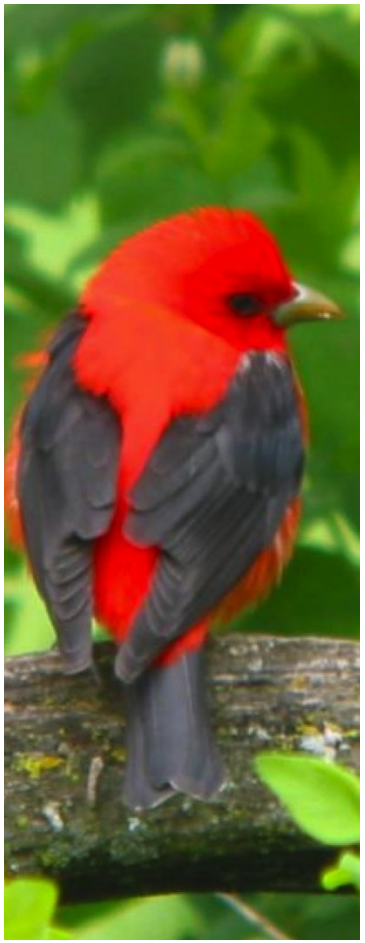
- use “positive contribution to sustainability” as the basic criterion for evaluations and decisions
- focus on identifying the best option and achieving multiple, mutually-reinforcing, fairly distributed, adaptive and lasting gains (compare alternatives vs trying to judge the acceptability of an individual project)
- give integrated attention to all core issues: all requirements for progress towards sustainability, and the interrelations among these requirements
- avoid lasting damage and identify/justify trade-offs explicitly

Sustainability assessment: basic application considerations 2



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apply explicit sustainability-based criteria to

- determination of purposes/needs
- identification and comparative evaluation of options/alternatives
- judgements about the significance of positive and adverse cumulative effects
- identification and evaluation of potential trade-offs
- identification of needs for mitigation and enhancement of effects of preferred alternative(s)
- decision making on approval and conditions
- determination of monitoring and other follow-up requirements

Sustainability criteria based on what is needed to move us towards sustainability

sustainability as (conditions for) lasting wellbeing:

- human sufficiency and opportunity
- ecological stewardship, resource maintenance and efficiency, and lasting socio-ecological system viability
- equity within and between generations
- democratic engagement, commitment and learning
- precaution and adaptation in a world where complexity and surprise are unavoidable
- all pursued together, seeking mutually supporting positive interactions
- avoidance of significant adverse effects and trade-offs

S Oikawa

Implications of sustainability objectives

- infinite growth of energy and material use is not potentially viable
  - current demands likely beyond sustainable capacity of biosphere
  - problem exacerbated by systems that deliver most benefits to the advantaged, and lots of people do not have enough
  - need to reverse trends towards deeper unsustainability
- no inherent conflict with growth
  - lives of many people are materially deficient and generally we need more opportunities, creative innovations, etc.
  - need appropriate kinds and measures of growth: with different material, energy and other ecological impact implications, different distribution of benefits and risks, different effects on opportunities for human expression and accomplishment

D Swayze


C Artuso

Specified sustainability criteria for the NFAT case and context

- criteria set combines attention to
  - all of the generic needs for progress towards sustainability
  - the key issues, opportunities, concerns, aspirations, capacities, limitations, understandings, priorities, etc. – peculiar to this case and context, including
    - particular context of Manitoba and the relevant export markets
    - particular context of energy systems, and the electrical power systems within broader energy systems
- specification done for Keeyask (CEC review); specification done more broadly for PUB NFAT review
- method:
  - generic criteria + key insights from previous energy and dam work + attention to evident issues and other key factors for the case drawn from MH NFAT submission, other Manitoba documents (e.g. Energy Strategy), … + peer review by a diversity of colleagues with related expertise

The criteria framework for sustainability assessment in the NFAT case

(Table 6, pp.28-32, and handout)

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- six major issues categories, each with a goal statement
- 31 more specific criteria issue areas, several in each category
- 90 particular questions under the criteria issue areas (integrating case and generic considerations)
- trade-offs addressed under “ensuring fairness”
- each question can be applied to each potentially reasonable portfolio option
  - can at least determine whether the likely sustainability effects are clearly positive, uncertain or mixed, or clearly negative

The six big issues categories

Six basic Table 6 categories of requirements for moving towards sustainability (gains needed and losses to be avoided)

- socio-ecological system integrity
- livelihood sufficiency and opportunity
- ensuring fairness
- resource maintenance and efficiency
- ensuring due process and an informed and engaged citizenry
- prudence, precaution and adaptation

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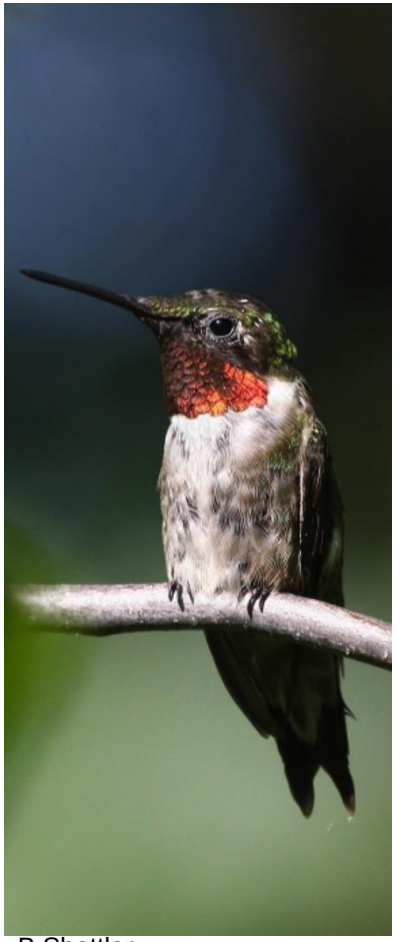
Imperfections of this sustainability criteria framework

- probably miss some important considerations
  - specification not the product of wide consultation with stakeholders and other experts
- inconveniently ill-suited to quantitative comparison of options: cannot simply assign numbers for whether/how each alternative meets each criterion and then add up the numbers
  - criteria areas overlap
  - no weighting
  - often no easy fit with quantitative (or even clear qualitative) indicators
- but suitable for ensuring attention to all key considerations; basis for reasoned argument approach



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Where our criteria set makes a difference: examples of need-related matters 1

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- base need on an understanding of the desired future and how to get there
  - rejects the assumption that we "need" to meet continuously increasing energy demand
  - must de-couple wellbeing growth from growth of energy and material demand
  - considers need in light of the full range of long term wellbeing considerations (sustainability imperatives)
- make values explicit and use open public process
- facilitates attention to wellbeing trade-offs:
  - what needs/goals may be compromised to meet other needs/goals?

Where our criteria set makes a difference: examples of need-related matters 2

- sees energy as a service
  - need is for service of energy, not for electrical energy itself (e.g. adequate light and comfortable ambient temperature in buildings)
- emphasizes importance of end use matching
  - selection of appropriate energy sources
  - advantages of efficiency initiatives

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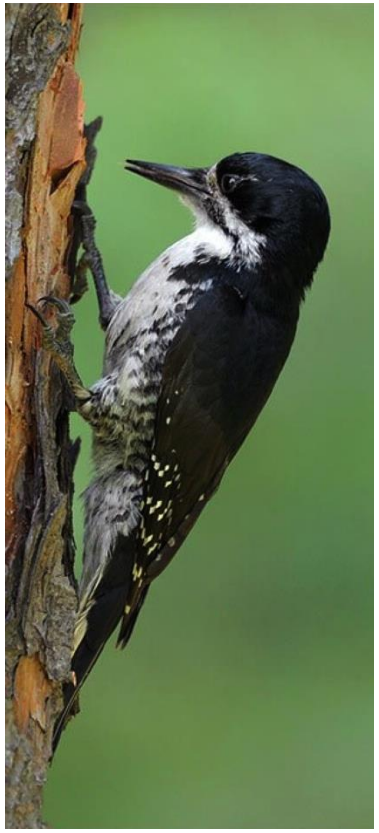
Support for end-use matching

[U]sing electricity – a high value energy form – to raise air or water temperatures by only a few degrees is considered a wasteful way to create heat. It is often termed, "using a chainsaw to cut butter." As a result, the conversion of buildings heated all-electrically (many of which are in rural areas) to use geothermal heat pumps, biomass or solar sources of renewable energy can produce multiple benefits (ex: lower energy costs, new local jobs, freeing up more electricity for Manitoba hydro exports).

– Manitoba Clean Energy Strategy (Manitoba 2012b, p. 30)



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Where our criteria set makes a difference: examples of need-related matters 3

backcasting (vs simple forecasting):

- uses participatory processes to define the characteristics of a desirable and viable future
- translates to a clear set of development objectives
- aims to foster and serve development towards those objectives
- contrasts with reliance on forecasting that takes increasing load growth as an inevitability and projects from past trends
- helps to avoid overstated demand
- makes value choices explicit

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Support for backcasting

Overstating future demand has led to a perceived need for a large incremental response to meet rapidly growing needs. In many circumstances this has militated against a gradual approach of adopting smaller, non-structural options and has pushed decision-makers into adopting large-scale dam projects because they seem to be the only adequate response to the large gap between existing supply and forecast demand.

– World Commission on Dams (2000), p.179

Where our criteria set makes a difference: framework use for assessing alternatives

S Oikawa

- alternatives identification and elaboration in light of a critical understanding of relations between needs and long term wellbeing objectives
- use of a portfolio approach that treats alternatives as part of a larger power system, rather than simply on their individual merits and limitations
  - allows for positive synergies
  - ensures viable alternatives are not screened out prematurely
- comparative evaluation of all alternative portfolios in light of specified sustainability assessment criteria in Table 6
  - may do initial broad round to adjust or eliminate portfolios with clearly unviable or unattractive components
- favours options offering multiple, mutually reinforcing and lasting benefits while avoiding adverse effects

Where our criteria set makes a difference: examples of alternatives-related matters 1

Nature Canada

- general preference for demand reduction and load growth avoidance and consequently for conservation and demand management (CDM) options
- favours substitution of less bad supply for clearly undesirable practices
  - e.g. solar, wind, biomass or hydro for coal
- emphasis on equitable redistribution effects
  - e.g. opportunities and other gains for Aboriginal people, women, rural/remote communities, and low income individuals and communities
- emphasis on cumulative effects on systems, especially already stressed systems
- focus on energy bridges to help ease transition from unsustainable approaches and practices to desired futures

Where our criteria set makes a difference: examples of alternatives-related matters 2

- recognition of uncertainty effects and advantages of flexibility
  - need to seek and anticipate positive innovation (e.g. in CDM, solar and wind) as well as unexpected stresses and opportunities
  - negative implications for locking-out options and locking-in particular strategies and behaviours
    - e.g. lock-in commitments to large fixed generation facilities and associated supply
    - also, and more deeply, lock-in to high consumption lifestyles
  - recognition of dynamic technology/economics
    - e.g. shifting relative advantages of solar/wind/CDM

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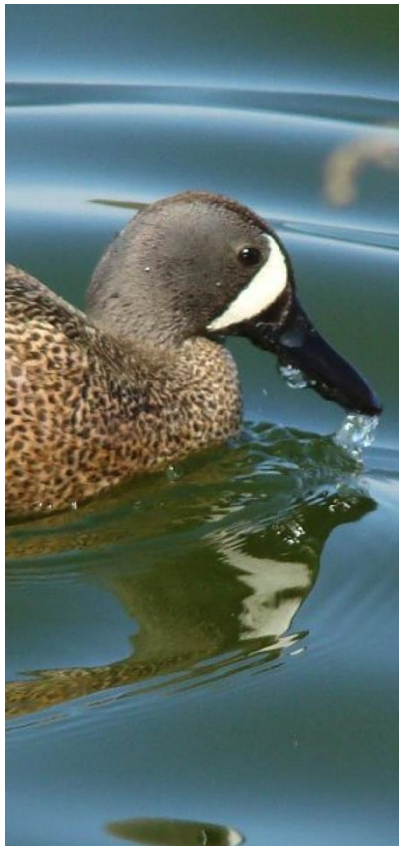
Where our criteria set makes a difference: overall implications for alternatives



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- likely to affect inclusion and design of portfolios
- likely to affect assessment of the relative strengths and limitations of components and their interactions
  - e.g. more ambitious CDM options, more dynamic and flexible supply options (e.g. solar, wind, biomass)
- in all cases, emphasis on applying the full suite of criteria, and avoiding a focus on only one factor
  - e.g. uncertainty and precaution favour flexibility vs lock-in, but some lock-in may be desirable for effects predictability
  - neither flexibility nor lock-in guarantees higher potential for benefits from less damaging supply, revenue gains for sufficiency and opportunity, fairer distribution of benefits and risks

Comparing approaches to assessing NFAT in light of the lasting public interest

MA-BCA	Sustainability assessment
Basis • willingness to pay • rational economic individuals making financial/consumer choices are the best available source of information for public interest choices *Analytic approach* • seeks quantification of costs and benefits to the extent possible	*Basis* • requirements for progress towards sustainability (collective long term interest) *Analytic approach* • multiple sources and forms of relevant information/understanding • not appropriate for quantitative use due to overlaps, no weightings, few simple indicators • basis for reasoned argument approach

Multiple accounts cost-benefit analysis (MA-BCA)

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advantages

- relies on available data (where they exist)
- extension from established economic practice
- allows quantified comparisons on some important considerations

disadvantages/challenges

- future generations not represented in current willingness to pay
- assumes collective long term interests covered by summed immediate individual interests expressed in financial/consumer choices
- relies on individual choices being well informed
- neglects, or has poor capacity to incorporate attention to, many important sustainability considerations
- tends to favour continuation along the current path
- quantifications vulnerable to challenge as false precision
- non-quantified components vulnerable to marginalization

Multiple accounts cost-benefit analysis (MA-BCA)

Chickadeephotoart

examples of evident limitations in MH submission:

- only 5 of 12 topics could be monetized
- simplistic accounting of social and ecological effects
  - Keeyask partner communities' willingness to participate in the partnership means no major residual biophysical or socio-economic effects
  - all significant costs internalized in project
- neglect of boom/bust dynamics
- questionable confidence about mitigation adequacy
  - e.g. sturgeon recovery plans
- questionable assumption that dams have only a positive bequest value
- covers only four options
  - no attention to enhanced demand management

Specified sustainability criteria framework

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advantages

- farsighted, focused on desirable and viable futures
- comprehensive of relevant interests, considerations, and interactive effects
- useful for identifying and ensuring attention to all key matters affecting lasting wellbeing
- recognizes needs for (gradual) transformation
- respects complexity and uncertainty
- more direct approach to long term public interest
- value choices more explicit

disadvantages/challenges

- is complex and does not pretend to avoid uncertainties
- limited potential for application through defensible quantification
- not (yet) the conventional way of looking at problems and opportunities and associated NFATs

Similarities and differences in coverage

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MA-BCA approach and specified sustainability criteria approach

- broadly similar scope of considerations: attention to sustainability issues in MH submission
  - some MH NFAT attention to many, maybe most of our criteria (though some big questions about adequacy of attention)
- contrasting in focus
  - much of MH submission focused on a few of our criteria bullets (e.g. **Livelihood sufficiency and opportunity**, section on *Providing reliable and economical electricity services*, bottom of p.28)

Complementary approaches?

S McGregor

MA-BCA approach and specified sustainability criteria approach are very different but at least potentially complementary

- specified sustainability criteria framework captures the key lasting issues more effectively
- MA-BCA captures key details on important financial/economic parameters
- contrasting approaches and assumptions valuable for questioning each other
- neither yet applied to all potentially reasonable options

Overall conclusions about the Manitoba Hydro approach

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- MH responds fully and directly to a limited number of our specified sustainability-based criteria
- at the same time, MH has recognized a broad range of sustainability assessment obligations and has paid attention at least to aspects of many of the criteria
  - from this perspective MH is not far from doing a sustainability-based assessment, though there are some significant limitations in how they did it
- while the differences between the MH approach and ours are significant, the step between them is not impossible
  - both approaches seek to establish what is in the long as well as short term public interest
- the approaches are complementary

Implications for long range power system planning

Craig&Rose

- farsighted power system planning with public review is difficult
  - major uncertainties related to various system dynamics affecting prices/costs, technological possibilities, etc.
  - multiple options and intersecting criteria
  - no adequate simple tools
- farsighted power system planning with public review is crucial
  - significantly different options
  - overall benefits and risks not evident from assessments of individual components
  - clear gains from public deliberation and review at the long term plan level

Overall conclusions re PUB adoption of the criteria set

- the PUB needs an explicit framework for analysis that
  - clearly covers all key public interest consideration
  - provides a rigorous basis for critical assessment of the needs and comparative evaluation of the alternatives
- there are justifiable grounds for taking such an approach
- adoption of an explicit set of sustainability-based criteria for the deliberations is easily possible
  - while the framework approach is complex and demanding, there's a big step between what would be ideal and what is far better than what's usually done and sufficient for the purposes
- a specified set of explicit criteria makes the job easier, and more defensible
  - covers the key generic requirements for service to the long as well as short term public interest
  - addresses the evident key issues of this case and context

D Swayze

Overall conclusions for PUB application of the criteria set


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- can take the criteria set and adjust as appropriate in light of the evidence presented to the board on the key issues in this case
- may group the criteria differently if it finds categories simpler or better suited to the case, so long as all the key issues are still considered
- might use Mackenzie Panel's red, yellow, green ratings per criterion and per category
- might complement sustainability criteria application with use of tools such as in MA-CBA
- must in any event give serious attention to all key considerations that affect the long as well as short term public interest

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Implications for the PUB and Manitoba beyond this case

- this case as first step towards general adoption of a sustainability-based approach to reviews and decision making concerning potentially significant undertakings
- future assessments should require proponents to adopt from the outset an integrated sustainability-based approach
- open processes for ensuring
  - a broad enough definition of the purposes to be served to cover options with maximum potential contributions to sustainability
  - explicit sustainability criteria specified for the case and context used for evaluations of purposes, alternatives, positive and adverse cumulative effects, mitigation and enhancement needs, trade-offs, implementation needs, etc.

Possible additional matters

- steps in evaluating alternatives using a sustainability-based criteria set
- illustrative generic trade-off questions

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Steps in evaluating alternatives using a sustainability-based criteria set

JE Ross

- for each alternative, prepare responses to each question (e.g. as strongly positive contribution, possibly positive but uncertain, possibly adverse but uncertain, strongly adverse) plus detailed comments
- assess overall positive or negative effects in the major issues categories
- include positive or negative interactions among effects
- identify and assess the acceptability of trade-offs
- identify the preferred alternative: likelihood of net positive sustainability effects (with multiple benefits and no significant long term damages or risks and no unacceptable trade-offs) in comparison with other options
- include notes on priorities, uncertainties, recommended approval conditions and other implications

Trade-off questions

S Oiawa

- what likelihood of significant adverse effects that cannot be avoided without accepting more adverse effects elsewhere?
- any trade-offs proposed where stronger mitigation efforts would be feasible?
- any proposed trade-off that would displace significant adverse effects from the present to the future?
- what public discussion and acceptance of proposed trade-offs?
- any alternative option that avoid significant adverse effects and deliver similar positive contributions to sustainability?