

**SCOPE OF WORK FOR LA CAPRA ASSOCIATES
NFAT REVIEW
LAST UPDATED: SEPTEMBER 20, 2013**

LA CAPRA ASSOCIATES

Power Resource Planning and Economic Evaluation

1. From a supply perspective, assess the extent to which the Plan addresses the reliability and security requirements of Manitoba's electricity supply.
2. Assess whether Manitoba Hydro's approach to comparing generation sequences follows sound industry practice.
3. Review reservoir operations of Lake Winnipeg for optimal value.
4. Review Manitoba Hydro's NFAT filings with respect to the Lake Winnipeg and Upper Nelson River Water Regime change and the potential mitigation costs to the NFAT projects.
5. Review the potential global warming impacts on water supply/river flows/lake and reservoir evaporation.
6. Develop power resource plans and alternatives, including identifying other scenarios that could potentially compete on an economic basis with Manitoba Hydro's Preferred Development Plan.
7. Incorporate exports (bilateral contracts and opportunity market pricing) into power resource planning.
8. Evaluate the accuracy and completeness of Manitoba Hydro's export assumptions into MISO and other jurisdictions.
9. Comment on the practical role of merchant trading and energy imports.
10. Examine the No New Generation scenario and the potential for extended use of imports to meet Manitoba Hydro's domestic load requirements.
11. For all scenarios addressed, define the lower quartile, median and upper quartile impacts of natural gas supply pricing, coal pricing and wind pricing.
12. Address the relative generation and integration costs of hydro, wind, natural gas turbines (single-cycle and combined-cycle) and Demand-Side Management.
13. Assess the maximum deferral prospects for Keeyask G.S. and/or Conawapa G.S.
14. Comment on climate change impacts on energy supply and demand.
15. Test Manitoba Hydro's alternative scenarios and any new scenarios created for drought impacts.
16. Review and assess the reasonableness and completeness of Manitoba Hydro's sensitivity analysis of alternative development plans. Perform additional sensitivity analysis as required.

17. Analyse the In-service cost and rate impact on domestic customers of the Preferred Development Plan and alternatives.
18. Analyse the net and gross marginal cost of the Preferred Plan and Alternatives;
19. Analyse the net present value of hydro power and natural gas generation;
20. Assess the reasonableness of the Weighted Average Cost of Capital (WACC) approach, including consideration of different capital structures.
21. Analyse the Internal Rate of Return (IRR), including an evaluation against hurdle rates.
22. Review Manitoba Hydros IRRs against prior IRR values presented in public filings.
23. Upon prior approval by the NFAT Panel, address any other issues that may be identified in reviewing Manitoba Hydro's evidence or are requested by the NFAT Panel.

Business Case and Risk Assessment

1. Analyse the financial and economic risks of the Preferred Development Plan and export contracts and export opportunity revenues in relationship to alternative development strategies.
2. Assess whether the high-level summaries filed by Manitoba Hydro of net present value and internal rates of return reflect sound assumptions and calculations.
3. Enumerate any special consideration with respect to Crown-owned utility operations.
4. Address estimate uncertainties involving large complex hydro projects.
5. Examine and evaluate the treatment of risk in Manitoba Hydro's development of Power Resource Plans and resource scenario models. Incorporate expert opinions on flood and drought risks and optimal strategy.
6. Analyse the market value of clean energy from hydro power during various seasonal and peak or off-peak periods.
7. Address the future U.S. versus Canadian export opportunities.
8. Review Manitoba Hydro's filings and assess the accuracy, reasonableness and completeness of the relative values that Manitoba Hydro places on capital costs/energy supply.
9. Review the accuracy, reasonableness and completeness of presented alternative scenarios including an assessment of key variables such as:
 - (a) Time Frames [80 years];
 - (b) Alternative Time Frames of 20/40 years;
 - (c) Interest rates;

- (d) Inflation;
 - (e) Discount rates;
 - (f) Present value calculations; and
 - (g) Internal rate of return calculations.
10. Review and compare the discount rate applied in the current analysis with prior discount rates used by Manitoba Hydro to assess consistency and reasonableness of the approach.
 11. Review all significant scenarios employing other methodologies, including:
 - (a) in-service rate impacts; and
 - (b) the net present value of costs.
 12. Within each scenario look for a clear business and value proposition for Manitoba ratepayers as well as Manitoba Hydro.
 13. Test each scenario for potential risks, including:
 - (a) Lower export market prices;
 - (b) Higher interest rates;
 - (c) Lower or higher domestic load growth;
 - (d) Droughts;
 - (e) Competing technologies;
 - (f) Fuel price changes;
 - (g) Carbon pricing;
 - (h) Government and regulatory policy change;
 - (i) Construction cost escalator;
 - (j) Economic conditions;
 - (k) Infrastructure failure; and
 - (l) Any other major risks identified.
 14. Upon prior approval by the NFAT Panel, address any other issues that may be identified in reviewing Manitoba Hydro's evidence or are requested by the NFAT Panel.

Transmission Economics

1. Review and assess the impact of Manitoba Hydro's transmission positions on Manitoba Hydro's assumptions as to export revenue.
2. Review and assess Manitoba Hydro's contemplated plan to partially fund U.S. transmission infrastructure and the financial benefits to be derived from such plan.
3. Upon prior approval by the NFAT Panel, address any other issues that may be identified in reviewing Manitoba Hydro's evidence or are requested by the NFAT Panel.

Review of Manitoba Hydro's Export Contracts

1. Review and assess Manitoba Hydro's export contracts with U.S. counterparties for:
 - (a) Firm energy commitments;
 - (b) Firm energy pricing;
 - (c) Peak demand opportunity market sales;
 - (d) Off-peak period opportunity market sales;
 - (e) Adverse water clauses;
 - (f) Drought relief;
 - (g) Clean energy guarantees;
 - (h) Treatment of environmental attributes; and
 - (i) Any other commercial obligations in the contracts and the implications on Manitoba Hydro and its counterparties; and
2. Upon prior approval by the NFAT Panel, address any other issues that may be identified in reviewing Manitoba Hydro's evidence or are requested by the NFAT Panel.

Financial Modelling

1. Development a financial model that would have the flexibility to change basic assumptions on factors affecting costs to Manitoba Hydro and MISO utility competitive market alternatives. The model should be able to quickly determine the metrics evaluating the timing and type of resources that could be in the Manitoba Hydro Development Plan, and should meet the following requirements:
 - (a) The model is expected to be set up within excel spreadsheets.
 - (b) The model will not require detailed market simulation software to be used with each alternative business cases.

- (c) The model is expected to be used by La Capra Associates staff to support its independent analysis and report as well as examine cases desired by the NFAT and Interveners.
 - (d) Model documentation will be prepared.
2. Upon prior approval by the NFAT Panel, address any other issues that may be identified in reviewing Manitoba Hydro's evidence or are requested by the NFAT Panel.

ENERNEX

1. Review Manitoba Hydro's screening of resource alternatives and assess the adequacy of the screening as it pertains to the examination of wind and the integration of wind/gas/hydro into the Manitoba generation asset mix.
2. Review and assess the technical issues associated with integration of up to 1000 MW of wind in Manitoba and the potential to integrate such wind assets with hydro and additional gas-fired generation.
3. Review and assess the economics of wind and wind/gas/hydro integration alternatives in light of the projected demands for domestic energy and the expected export requirements.
4. Review and assess the costs of wind/gas/hydro integration and the resulting costs for a wind/gas/hydro "dispatchable" product for various gas prices. Compare this alternative with generation costs in the proposed "preferred development plan".
5. Review and assess possible risks of a wind/gas/hydro alternative and comment on how such risks may be managed.
6. Examine the merits of a wind/gas/hydro integration alternative during drought and during high hydraulic flow years. Provide comments on how this alternative might impact Hydro's overall capacity and energy delivery capability.
7. Review and assess the costs of integrating wind in other jurisdictions and compare those costs with integrating wind in Manitoba.
8. Prepare first round and second round information requests and information requests to interveners on evidence.
9. Prepare expert evidence with La Capra Associates in compliance with the Terms of Reference for the Needs for and Alternatives to review of Hydro's preferred development plan.
10. Provide expert testimony during public hearings.