SUBJECT: Experience and qualifications

QUESTION:
Please identify any judicial or administrative proceedings in which Dr Simpson has been qualified as an expert witness or testified regarding risk analysis assessments of resource alternatives in the energy sector

RESPONSE:

Manitoba Hydro has inadvertently mistated my area of expertise.

My professional expertise in applied microeconomics and applied econometrics provides a foundation for the analysis of issues related to the management of risks by firms and to the assessment of risk using modern economic and statistical techniques.

I have given evidence relating to good practice modern risk analysis on three separate occasions before the Manitoba Public Utilities Board.[1]

The expert evidence was related to modern risk analysis and the Manitoba Public Insurance Rate Stabilization Reserve. On the first two occasions, my evidence was prepared in collaboration with Professor Derek Hum. On the third occasion, I was solely responsible for the evidence. Please refer to PUB Orders 157/12, 157/08 and 156/06.

In the proceeding leading up to PUB Order 5/12, I served as an expert consultant on issues relating to risk with particular reference to the evidence of the Independent Experts retained by the Public Utilities Board. I did not provide expert evidence in that proceeding but the cross examination of CAC MB was instrumental in convincing the Independent Experts to redo their calculations of drought risk. For more information on the recommendations of CAC MB based upon my advice, please see PUB Order 5/12, p. 201.

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[1]
     Hum and Simpson, *On determining an Appropriate Rate Stabilization Reserve for MPI: Critique of Methodology and Related issues (September 2006).* Hum and Simpson, *On determining the Target RSR for MPI and Corporate Risk Management Tools, (September 2009), Simpson, Manitoba Public Insurance Rate Risk Management and the Rate Stabilization Reserve,* (September 2012)

SUBJECT:

Experience and qualifications

QUESTION:

Please provide details of the experience of Dr. Simpson with respect to: conducting risk analysis assessments of energy utilities and specifically utilities that predominantly rely on hydro–electric based generation.

RESPONSE:

Manitoba Hydro has inadvertently misstated my area of expertise.

My professional expertise in applied microeconomics and applied econometrics provides a foundation for the analysis of issues related to the management of risks by firms and to the assessment of risk using modern economic and statistical techniques.

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SUBJECT:

Experience and qualifications

QUESTION:

Please provide details of the experience of Dr. Simpson with respect to: risk analysis assessments of resource alternatives in the energy sector.

RESPONSE:

Manitoba Hydro has inadvertently misstated my area of expertise.

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SUBJECT: Uncertainty Analysis

REFERENCE: Page 2

PREAMBLE: **Dr. Simpson said on Page 2 – "Manitoba Hydro….restricts its risk analysis to what it determines to be the three most important risk factors—energy prices, the discount rate, and capital costs—out of a group of ten risk factors. Their approach thereby ignores some potentially important risk factors, such as load and its determinants, some of which are then considered separately in a "sensitivity analysis" in chapter 10."**

QUESTION:
Assuming it is not feasible to include all potential risk factors in the probabilistic analysis, what process does Dr. Simpson suggest for selecting those factors to examine in detail? Please explain.

RESPONSE:

I do not assume that it is not feasible, given modern risk assessment practices and computing technology, to limit risk factors to three.

REFERENCE: Page 2

PREAMBLE: **Dr. Simpson said on Page 2 – "Manitoba Hydro….restricts its risk analysis to what it determines to be the three most important risk factors—energy prices, the discount rate, and capital costs—out of a group of ten risk factors. Their approach thereby ignores some potentially important risk factors, such as load and its determinants, some of which are then considered separately in a "sensitivity analysis" in chapter 10."**

QUESTION:
Please identify which additional risk factors Dr. Simpson suggests be included in the probabilistic analysis and why?

RESPONSE:
There appear to be a number of additional factors that are important to the outcomes, such as load, and their integration into the risk analysis would improve our understanding of their impact on plan selection.

SUBJECT: Uncertainty Analysis

REFERENCE: Page 2

PREAMBLE: **Dr. Simpson said on Page 2 – "Second, the "probability distributions"
describing the range of possible outcomes for each of the remaining three risk
factors are limited to three points, representing low, reference (expected) and high
outcomes or scenarios. The NFAT refers the reader to Appendix 9.3 for details of the
formation of these scenarios and their associated probabilities, but the details are
sketchy."**

QUESTION:
Assuming the logic behind the probability assignments is sound, does Dr. Simpson
believe that the use of a three-point distribution methodology is inherently inadequate or
is he simply indicating preference for greater granularity? Please explain.

RESPONSE:
Inadequate is a strong word but it is very difficult to capture the range of risks associated
with any factor with only three points.

SUBJECT: Uncertainty Analysis

REFERENCE: Page 3

PREAMBLE: **Dr. Simpson said on Page 3 – "At this point measures of risk (the variance or other measures of spread of the NPV outcomes) could also be calculated to assess the riskiness of the plan in a more conventional way, but Hydro now uses what I would consider to be a less conventional S-curve methodology of risk assessment instead." Manitoba Hydro considered a variety of ways of representing and displaying the risk of the alternative plans. We believe S-curves are a very powerful tool and have a variety of advantages over other measures such as standard deviation."**

QUESTION:
Other than being less conventional (as Dr. Simpson indicated), does Dr. Simpson see any significant drawbacks to the use of S-curves for representing and displaying risk?

RESPONSE:
The limitations of the analysis seem to be primarily the limited number of outcomes assessed (3) for a limited number of risk factors (3).

SUBJECT: Uncertainty Analysis

REFERENCE: Page 5

PREAMBLE: **Dr. Simpson said on Page 5 – "Risk is measured here as the gap (divided by 2) between the P90 and P10 outcomes, or the interdecile range, which constitutes one conventional measure of risk that incorporates both upside potential (reward) and downside risk (risk) in the terminology of the NFAT….An alternative two-way comparison can be made between downside risk (difference between P10 and expected value in Table 14.2) and return (expected value)…"**

QUESTION:
Both the interdecile and the 10th percentile-mean ranges referenced by Dr. Simpson have limitations in this context. Does Dr. Simpson see any significant drawbacks to the use of the 10th percentile value as a measure of downside risk? Please explain.

RESPONSE:
The conventional measure of risk is the second moment of the distribution of outcomes, i.e. the variance or standard deviation. For downside risk, I would think that this would be the (one-sided) variance of outcomes below the mean. The value of this measure is that it considers all points of the distribution, not just P50 and P10. I used the P10, P50 and P90 outcomes because they were provided by the NFAT Report.