MANITOBA HYDRO

2012/13 & 2013/14 ELECTRIC GENERAL RATE APPLICATION

MANITOBA HYDRO'S INFORMATION REQUESTS WITH RESPECT TO THE PRE-FILED EVIDENCE OF PHILIPPE DUNSKY, DUNSKY ENERGY CONSULTING

ON BEHALF OF THE CONSUMERS' ASSOCIATION OF CANADA AND GREEN ACTION CENTRE ("CAC/GAC")

MH/CAC/GAC (Dunsky)-1

Reference: Written Testimony of Philippe U. Dunsky

Question:

a) Please provide a copy of Mr. Dunsky's curriculum vitae.

Please see attachment.

MH/CAC/GAC (Dunsky)-2

Question: Once an energy efficient opportunity is identified and considered to be economic under either TRC, a modified TRC or a Societal Test, a utility will determine the most economic approach to transforming that market. One approach that a utility may undertake to move an energy efficient opportunity forward within a market, is to offer an incentive over a period with the objective of increasing market penetration. At this point the level of free ridership going forward may be such that the more aggressive market intervention approach is now no longer cost-effective and that the utility may adjust its intervention strategy to a customer-information based approach for that specific technology.

a) Please confirm that this is a reasonable and generally accepted market approach that may be undertaken by a utility or agency pursuing energy efficiency opportunities.

It is difficult to answer a hypothetical. The extent to which this would be an effective course of action would depend entirely on market data and dynamics. For example, if the market were fully transformed, then it would be important to remove the incentives, as suggested. On the other hand, the high free ridership could also be the result of a situation in which a *subset* of the market has been transformed (e.g. general A-frame bulbs), but another subset has very low market penetration (e.g. specialty bulbs). In that case, the appropriate course of action may involve modifying the program structure, which may involve mid- or down-

stream incentives limited to products within the subset (it could involve other strategies as well). There are myriad possible market contexts, each of which could justify a different market response. Certainly the response described in the question might be one of them.

MH/CAC/GAC (Dunsky)-3

Reference: Written Testimony of Philippe U. Dunsky, page 36, second paragraph.

> "A preliminary analysis conducted by my firm, and based on the measured performance results for commercially-available DHP models, suggest that a typical Manitoban home could save upwards of 35% of its total heating load by installing DHPs."

Question:

a) Please provide the detailed analysis referenced above for ductless heat pumps and how Mr. Dunsky determined this technology to be an economic opportunity in Manitoba.

For the details of our analysis of heating load savings, please refer to PUB/CAC/GAC (Dunsky)-18.

For purposes of determining the B/C opportunity, we used Manitoba Hydro's stated avoided costs and discount rate, and find that benefits (avoided costs) outweigh costs (assuming reasonable incentives and free ridership) by 50% (i.e. a 1.5 B/C ratio).

This estimate is based on the following analyses and assumptions:

- Savings of 6,068 kWh (net of added cooling loads) from Hot2000 simulation using a single-family detached house located in Winnipeg with an annual heating load of 60 GJ
- DHP system characteristics: 36,000 BTU/hr. (3 tons) capacity, 2 compressors (1.5 tons each) and four heads, heating and cooling uses, COP of 2.7 at 0 °C, SEER of 21, unrestricted use (no cut-off temperature).
- DHP costs ($7,080): based on RS Means Residential Cost Data 2012, cost for additional heads estimated at $900 each, includes frost control, wiring kit, contractor's overhead and profit, Manitoba sales taxes (GST and RST) and an adjustment factor of 1.03 to convert general costs to Manitoba specific costs in Canadian dollars (provided by RS Means)
- Incentive equal to 40% of total costs
- Free ridership of 20%
- Discount rate of 6.1%
- Levelized marginal value of savings : 8.52 cents per kWh (at meter)
- Estimated useful life of 15 years