FORTISBC

Proposal

2005 UPDATE
Energy Efficiency
Potential Assessment

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Table of Contents

1. Introduction

Willis Energy Services Ltd. (Willis) is pleased to present this proposal to FortisBC to prepare a 2005 Update to the Efficiency Savings Potential Assessment. Previously, Willis Energy Services performed a Residential Potential Energy Use Efficiency Review for FortisBC in 1999 and worked with FortisBC in the development of their Demand Side Management 2000 – 2004 Business Plan.

2. Approach

The purpose of the update to the Efficiency Savings Potential is to determine the energy savings resource that is available to FortisBC's PowerSense program for Energy Efficiency (EE) planning purposes. To determine the efficiency savings potential for the years 2005 to 2014, Willis proposes to prepare an energy end use breakdown for each customer sector, and based on typical energy use indices, reconcile the derived total end use consumption with actual sales for the base year, 2004. Using FortisBC gross load and demand forecast, a Reference case showing consumption by end use for the study period, will be prepared for each customer sector.

During recent years much work has been completed in other jurisdictions to build rigorous databases of energy savings measure (ESM) information, including energy savings, marginal costs, equipment costs, and electric system impacts. Several such databases have been submitted to, or requested by, the utility regulator. Much work in this area has been completed in the Pacific Northwest, in particular by the Northwest Energy Efficiency Alliance, the Northwest Power and Conservation Council, Bonneville Power Administration, and the Oregon Office of Energy. Also, Natural Resources Canada (NRCan) has implemented its own deemed savings program by bringing Energy Star™ to Canada. The credibility of these databases has grown and Willis proposes to use the deemed savings and cost data for those energy savings measures that are identified by this study, are included in approved deemed savings databases, and have a unit cost less than FortisBC's avoided cost of new supply.

An Economic case will be prepared by applying the energy savings measures to the end uses and energy using processes, by sector, as captured in the Reference Case and calculating the economic efficiency savings potential by the difference between the Reference case consumption and the Economic case consumption. The energy savings measures replace 100 percent of the annual turnover, based on typical stock life, of the entire stock of existing fixtures and installed equipment for the Economic case.

Recognizing that the Economic case does not provide a sound basis for resource acquisition planning, the study will prepare an Achievable Efficiency Savings estimate. Willis, working with FortisBC, will develop achievable annual savings targets based on selected savings measures and customer participation estimates.

3. Energy Efficiency Potential Definitions

For the purpose of this Study the following definitions will apply:

Term for Efficiency Savings Potential

The Efficiency Savings Potential Assessment is for the years 2005 to 2014.

2004 Base Year Consumption

The base year consumption is defined as the annual consumption per FortisBC billing data for the fiscal year 2004.

Residential

The Residential sector consumption will be categorized as follows:

- Housing type: Single family dwelling, Row/townhouses, and Apartments/mobiles
- Space Heating: Electric Heat and Non-electric Heat
- End Uses: Space Cooling, Water Heating, Lighting, and Appliances

General Service

The General Service sector consumption will be categorized as follows:

- Building type: Offices, Retail, Hospitality, Hospitals, Schools, and Other
- End Uses: Lighting, Heating Ventilation and Cooling, Water Heating, Refrigeration, Space Heating and Cooling, Plug Loads and Miscellaneous

Industrial

The Industrial sector consumption will be categorized as follows:

- Sub-sector: Wood Products and Other
- End Uses: Process Equipment, Pumping Systems, Air Displacement Systems, Compression Systems, Conveyance, and Other

Reference Case for Energy Efficiency Potential

The Reference Case is FortisBC's 2005 gross load forecast for electricity consumption for the years 2009 and 2014 for the Residential, General Service and Industrial Sectors. The gross load forecast is exclusive of any planned utility Energy Efficiency activities, but does include natural improvements in efficiency from January 1, 2005 until March 31, 2014.

Deemed Savings Measure and Unit Cost

Deemed savings for commercial efficiency measures available for the identified end uses and energy systems by housing, building and process system are based on the Regional Technical Review findings of the Northwest Power and Conservation Council in 2000 and updates in 2004.

Economic Energy Efficiency Measures

These measures are defined as those that deliver the same or more energy service than the typically installed product or equipment and whose expected life cycle cost is less than or equal to FortisBC's avoided cost of new electricity supply.

Achievable Energy Efficiency Potential

This potential is defined as that portion of the Economic potential that is achievable through government and utility interventions and programs that would result in the implementation of technological and operating changes.

4. Proposal Study Methodology

The study would be performed per the following tasks:

4.1 Base Case – Billing Data Analysis

RESIDENTIAL

For the Base Year Willis will work with FortisBC to prepare an analysis of 2004 residential billing data to update the 1998 residential end-use breakdown model. Population, electric heat, new housing by type, demolitions, vintages by type, and energy use indices will be reviewed and updated with the 2004 statistics. There will be a bottom up analysis, including wholesale customer residential load, and the resulting total annual sales calculation will be reconciled with actual residential sales for 2004.

GENERAL SERVICE

Using BC Hydro's 2002 Conservation Potential Review Update for the Commercial Sector breakdown for the Interior of the province by commercial building types, general service billing data will be allocated to building types and reconciled to general service class rates by customer size. Building types under consideration are:

Offices – Large, Small;
Retail – Large, Small;
Hospitality;
Hospitals;

Schools; and
Other

INDUSTRIAL

Wood Products: Based on end uses, equipment and processes identified by BC Hydro's 2002 Conservation Potential Review Update for the Industrial Sector and FortisBC wood products customers and their 2004 consumption, the average use per end use, system and processes will be estimated.

Other: The actual sales of the individual customers, grouped by industrial activity, will be allocated to typical end uses and secondary uses for the relevant industrial category.

4.2 Base Year Analysis – Municipal Wholesale End Use Forecast

For the municipal wholesale customers Willis, in consultation with FortisBC and its municipal wholesale customers, will update the residential end use breakdown by housing type and heating equipment for 2004. Willis will prepare the end use breakdowns for the Commercial and Industrial sectors by the categories in 4.1 above.

4.3 Reference Case

With references to BC Hydro's 2002 Conservation Potential Review Update and the FortisBC Energy Efficiency Five-Year Business Plan (1999-2004), prepared by Gilbert, Veerman and Parent, the base year end use analysis will be extended to 2014 based on FortisBC 2005 Gross Load Forecast, corporate discount rate, corporate planning inflation rate, and long-term electricity price forecast to create the base case.

4.4 Energy Saving Measures Identification

The following will be source of energy saving measures that will be taken into consideration in developing the efficiency potential.

- Canadian Federal Government, Natural Resources Canada Office of Energy Efficiency
- BC Provincial Government, Ministry of Energy and Mines, the 2004 CBIP and ASHRAE studies that provide an overview of a number of options to increase energy performance in commercial, institutional, multi-unit residential and industrial buildings.
- BC Hydro, 2002 Conservation Potential Review Update
- FortisBC in-house information;
- US Department of Energy's Energy Information Administration reports
- Oregon State Public Utilities Commission Orders
- California Public Utilities Commission Deemed Savings

4.5 Estimated Energy Savings and Costs

The identified measures from deemed savings databases will have associated savings and costs estimates. The estimates will be cross-referenced with those of other recent work, such as BC Hydro's 2002 Conservation Potential Review Update and the Ministry of Energy and Mines CBIP and ASHRAE studies.

4.6 Economic Energy Efficiency Savings Case

The Economic Efficiency Potential will be calculated as the identified savings measures by customer sector are applied to the end use breakdowns in the Reference Case, assuming that existing technologies will be replaced over the study period with the identified ESMs that have a cost of less than or equal to FortisBC's avoided cost of new electricity supply.

4.7 Determination of Achievable Energy Efficiency Savings Potential

The difference between the Reference Case and the Economic Efficiency Savings Case is the Economic Potential for Efficiency Savings and is the basis for determining the Achievable Potential. Taking into account FortisBCs resources for program delivery, along with the utility's forecast revenue, identified market barriers, product barriers, and rate impacts, the Achievable Potential will necessarily be a subset of the Economic Potential.

4.8 Report Preparation

The final report will summarize the methodology and findings of the study, and present the Economic and Achievable Efficiency Cases and Efficiency Savings Potential and Cost. The appendices will contain the detailed calculations and pertinent reference material.

5. Milestones

Initiation of Project	February 7, 2005
Base Year Analysis and Planning Session with FortisBC	February 11, 2005
Reference Case (Residential)	March 1, 2005
Reference Case (General Service and Industrial)	March 14, 2005
Deemed Savings and Costs	March 20, 2005
Economic Efficiency Case	April 12, 2005
Achievable Potential	April 25, 2005
Final Report	May 15, 2005