

## **APPENDIX B**

### **807L Capacity Increase**

#### **2016 Long-term Outlook (2016 LTO) LOAD and GENERATION FORECASTS**

### 1 Introduction

1.1 Load and generation forecasts are an essential input to the AESO's transmission planning process. This document describes the forecast used in the 807L Capacity Increase planning studies ("Planning Studies") discussed in the *807L Capacity Increase Planning Study Report*.

1.2 The forecasts in this document are a subset of the corporate forecasts published separately by the AESO.<sup>1</sup>

1.3 The Planning Studies are focused on the Beamer Area only, which consists of Beamer 233S, Redwater 171S, Weasel Creek 947S, and Abee 993S substations and the 138 kV transmission lines connected to these substations. Therefore, the information and data presented in this document focuses on the load growth forecasts in the Beamer Area, and related generation forecasts over the 20-year planning horizon. For additional reference, however, data and information are also presented on the AESO's broader Fort Saskatchewan Planning Area ("Area 33") and on total provincial load, or Alberta Internal Load ("AIL").

1.4 Load and generation data for the Beamer Area are from the 2016 LTO Reference Case. The 2016 LTO's Reference Case represents the AESO's current expectation for future long-term load growth and generation development, and serves as the corporate forecast information decisions on several areas of the AESO's business, including transmission system planning.

Details and clarifications around the use of the forecast, for the purpose of assessing transmission system adequacy and planning for respective transmission system development in this area, are included within this document.

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<sup>1</sup> The AESO updates its corporate load and generation forecast annually. The AESO's latest corporate load forecast and associated forecast scenario's released May 2016, are found in the 2016 Long-term Outlook, also referred to as the 2016 LTO. This forecast is available online on the AESO forecasting page found at: <https://www.aeso.ca/grid/forecasting/>

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A brief description of the associated generation forecast information and data is also discussed.

### 2 Historical Load

2.1 Table 2-1 summarizes historic summer load levels for the Beamer Area, the Fort Saskatchewan Planning Area and AIL at their respective peak demands.

**Table 2-1: Historical Summer Peak Loads (MW)**

Year	Beamer Area (233S, 171S, 947S, 993S)	Fort Saskatchewan (Area 33)	Alberta Internal Load (AIL)
2010	85	533	9,338
2011	88	600	9,376
2012	89	641	9,885
2013	91	582	10,063
2014	91	600	10,419
2015	93	621	10,520
2016 YTD	93	630	10,244

\* Two new substations Weasel Creek 947S and Abee 993S energized in 2013

\* 2016 Year To Date (YTD) as of August 17, 2016.

**Table 2-2: Historical Winter Peak Loads (MW)**

Year	Beamer Area (233S, 171S, 947S, 993S)	Fort Saskatchewan (Area 33)	Alberta Internal Load (AIL)
2010	91	586	10,226
2011	90	603	10,609
2012	90	602	10,599
2013	98	639	11,139
2014	94	641	11,229
2015	99	667	10,982

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2.2 While both the Beamer Area and the Fort Saskatchewan Planning Area are winter peaking, this report is only focusing on the summer peak loads as transmission line 807L is more stressed under summer conditions based on the AESO's planning assessment. The compound average annual summer peak load growth rates for the Beamer Area and the Fort Saskatchewan Planning Area over the past 6 years (2010 to 2015) are 1.4 percent and 2.6 percent respectively.

2.3 The majority of the load in the Fort Saskatchewan Planning Area is industrial, comprised of oil and gas, pipelines, heavy oil upgrading, refineries, and hydrocarbon processing. Most of the load growth in the Beamer Area within the past 5 years has been associated with the energization of Abee (993S) and Weasel Creek (947S) substations. These substations were energized in 2013, and serve mainly pipeline load.

### 3 Load Forecast

3.1 Table 3-1 below summarizes the 2016 LTO Reference Case forecast summer peak loads for the Beamer Area, the Fort Saskatchewan Planning Area, and AIL at their respective peak demands. Load in the Beamer Area is forecast to grow at a compound average annual growth rate of about 1% percent (2015 to 2035) consistent with the historical growth in this area.

**Table 3-1: 2016 LTO  
Summer Load at Peak (MW)**

Year	Beamer Area (233S, 171S, 947S, 993S)	Fort Saskatchewan (Area 33)	Alberta Internal Load (AIL)
2017	109	659	12,253
2020	110	737	13,177
2025	112	756	14,319
2035	115	785	16,132

3.2 While developing the load forecast for the Beamer Area, the AESO has considered historical load growth and reviewed the latest load forecast information including recently revised FortisAlberta’s Distribution Facility Owner (DFO) substation-level forecasts.

3.3 Load growth in the Beamer Area is expected to increase in the near-term as there are two new carbon capture and storage developments, which are anticipated to become operational in the 2017 timeframe. Otherwise, load growth is expected to remain relatively flat over the 20 year planning horizon. These developments will be supplied through FortisAlberta and have received public funding as part of the Alberta Carbon Trunk Line (ACTL), which is a carbon capture and storage project being developed by Enhance Energy Inc.

## **4 Existing Generation**

4.1 In the development of credible stressed study cases for the purposes of the Planning Studies, the following existing generating units in the Fort Saskatchewan Planning Area were identified and are shown in Table 4-1 including their generation capacity.

**Table 4-1: Existing Local Generation**

<b>Existing Local Generation</b>	
<b>Unit</b>	<b>Size (MW)</b>
Air Liquide	96
Scotford	195
DOW	326
Redwater	46
Total Fort Saskatchewan Generation	663

## **5 Generation Forecast**

5.1 For the purpose of the Planning Studies, generation capacity assumptions were provided for the preparation of the study cases in the near-term (2017 and 2020), mid-term (2025), and long-term (2035) timeframes. Table 5-1 presents the maximum capacity of existing and future generation in the Fort Saskatchewan Planning Area. In addition to the generators listed in the table, the AESO does consider the possibility that more combined cycle may be added to this area in the future, but beyond the 2025 timeframe.

**Table 5-1: 2016 LTO Reference Case Forecast Generation**

Local Forecast Generation Capacity (MW)							
Year	Air Liquide	Scotford	Dow	Redwater	P1289* Deerland	P1421* Heartland	P1647 Williams* Strathcona
2017	96	195	326	46	0	0	0
2020	96	195	326	46	95	0	90
2025	96	195	326	46	190	510	90
2035	96	195	326	46	190	510	90

\* Associated project numbers for each generation connection project.

5.2 The forecast generation capacity was dispatched in the study scenarios based on a combination of capturing reasonable stressed conditions and anticipated in-merit energy. The details of study scenarios are listed in section 3.1 of the *807L Capacity Increase Planning Study Report*.

5.3 Table 5-1 lists the three potential generation projects in the Fort Saskatchewan Planning Area that were considered in the study (Deerland Peaking Power Plant, Heartland Generating Station, and Williams Strathcona). None of these specific projects are under development at this time, and current market conditions are contributing to uncertainty with respect to gas generation developments in general. As such, these specific projects may be subject to change in the next several years as the individual business decisions of the generation proponents respond to market signals. This could result in changes to size, timing, or cancellation of one or more of the above projects. As a result, the earliest in-service date expected for any of the above developments is 2020, and could be later considering construction lead-times for such facilities and the current state of the project's development. Due to the uncertainty around these projects various combinations of these generators are considered in the 2020 to 2025 timeframe.