Mercer International Inc.

v.

Government of Canada

ICSID CASE NO. ARB(AF)/12/(3)

Second Expert Report

Preface

This report sets forth our expert opinion and conclusions concerning the NAFTA Chapter 11 claim submitted by Mercer International Inc. against the Government of Canada after review of Claimant's Reply and supporting documents made available by the Trade Law Bureau of the Department of Foreign Affairs, Trade and Development and the Department of Justice.

We have reviewed this information and believe it is appropriate for the purposes of this report. This report and our opinions are based upon industry knowledge and assumptions we have made with respect to the information provided and reviewed.

Contact

Pöyry Management Consulting Inc.
52 Vanderbilt Ave, Suite 1405
New York, NY 10017
USA
Tel. +1 646 651 1555
Fax +1 212 661 3830

Pöyry Management Consulting Inc.

FIGURES

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1 INTRODUCTION

1. In this second expert report, Pöyry provides further explanation of our opinions from the first expert report and responds to additional issues that the Claimant has in the context of this arbitration.

2. I have based my expert opinion on documents provided by counsel, my expertise and understanding of the pulp and paper industry, and Pöyry market and mill databases based on publicly available information.

2 EXECUTIVE SUMMARY

Celgar's Generation and Load Data Irregularities

3. I have identified small irregularities in the data Celgar provided to BC Hydro for 2007. The data Celgar provided to BC Hydro of 350 GWh of total generation for 2007 differs from the figures in its internal statistics which indicate that it generated [redacted] GWh of electricity. The internal statistics also indicate that Celgar's load was equivalent to[redacted] GWh.

Celgar's Normal Operations

4. Pulp mills frequently collect, review, and analyze data to assess their performance and to provide management information for decision-making and developing business objectives. Personnel responsible for these analyses will often review and revise them to exclude abnormal events that are not part of the normal course of business. These analyses are then used to determine baselines to evaluate performance on an ongoing basis.

5. Celgar appears to have engaged in these activities on a monthly, daily, and hourly basis based on the documents and spreadsheets I reviewed in preparing this report. The data and information in these documents indicates that these analyses were created to facilitate decision-making and to provide management with

information to develop business objectives. Based on my experience, these analyses were intended to improve Celgar's examination of data, communication of information and to provide a better understanding of the effect of their actions on the business.

6. Mr. Merwin has claimed that he did not understand what BC Hydro was referring to when it requested information on Celgar's normal operations. I am somewhat skeptical of this assertion. Mr. Merwin requested the advice from and was actively being supported by personnel at Celgar who were very familiar with operating conditions at the pulp mill. He would have had numerous opportunities to consult with and request additional information from these individuals before and after his discussions with BC Hydro. He also understood that BC Hydro was relying on the information provided in these discussions to set Celgar's GBL.

Celgar's Energy Generation in 2007

7. Celgar completed a series of investments in 2006, which increased pulp production and decreased the need for steam in their production process. Celgar's average annual pulp production climbed from ~1,279 ADmt/d in 2005 and 2006 to 1,350 ADmt/d in 2007. This increased pulp production resulted in a corresponding growth in black liquor production. This black liquor was burned in the recovery boiler to generate additional steam which offset the use of natural gas. This excess steam, in turn, was utilized for additional electricity generation.

8. Celgar relied on black liquor to produce approximately 94% of the total steam it generated in 2007. The power boiler in contrast was only responsible for [redacted] of total steam generation. Power boiler steam production was generally used to address any shortfalls in recovery boiler steam or increases in process demand.

9. Celgar also generated electricity at or above its 40 MW GBL approximately 79% of the time (i.e., 6627 hours) in 2007. This was a result of a more than 20 % increase in electricity production which was oftentimes used to offset imports of electricity. The pulp mill would still import electricity in the event of upset situations or mill shuts. The data I reviewed indicates that half of the time these imports were small (i.e., approximately [redacted] MW or less). The assessment I have

conducted also demonstrates that Celgar's hourly electricity generation in 2007 aligns closely with the mill's hourly load. This close interrelationship between hourly electricity generation and mill load confirms my conclusion in my first expert report that BC Hydro's decision to set Celgar's GBL at 40 MW (i.e., average mill load) was reasonable.

The Claimant's Allegation that it would have Operated Differently without the FortisBC and NorthPoint Sales Contracts

10. Canada requested that I assess Mr. Merwin's claims that Celgar would (1) not have [redacted] to generate electricity in the absence of the FortisBC and NorthPoint contracts, (2) not have incurred the costs of operating the [redacted] and (3) generate only the minimal amount of steam required to remain in thermal balance.

11. To analyze the first point, I first examined natural gas prices that were available to Celgar at the Station 2 hub where it normally purchases natural gas. I then reviewed the price and volume of electricity Celgar sold to both FortisBC [redacted] and NorthPoint [redacted] in 2007 under their respective agreements. Based on the price of natural gas and the amount Celgar required to produce electricity, I concluded that it would not have made economic sense to burn discretionary natural gas to make sales to FortisBC at any point in time in 2007.

12. NorthPoint sold electricity on behalf of Celgar into both the Alberta and U.S. Mid-Columbia market. I reviewed the prices and volumes of electricity NorthPoint sold on both the Alberta and Mid-Columbia markets. I concluded that none of the NorthPoint sales on the Mid-Columbia market were profitable enough to support the burning of discretionary natural gas. The NorthPoint sales into Alberta, on the other hand, were sometimes profitable enough to support the burning of discretionary natural gas. However, the availability of transmission access into Alberta was frequently a problem. This meant that NorthPoint was only able to sell Ceglar's electricity into Alberta for [redacted] hours when prices were high enough to justify the burning of discretionary natural gas. I determined that Celgar had supportive pricing and transmission access for only [redacted] MWh (or [redacted] GWh) which was equivalent to approximately [redacted] of its total sales in 2007.

13. I also reviewed the hours in which Celgar provided power to NorthPoint and compared them to my estimate of the daily fuel mix for the boilers at the pulp mill. I then calculated a weighted average fuel mix for these hours, which indicated that only [redacted] of the fuel used in both boilers would have been generated by firing natural gas. Accordingly, I conclude that Celgar was not firing discretionary natural gas to generate substantial additional electricity in 2007.

14. Another claim Mr. Merwin has made is that Celgar would not have incurred the expense of operating their [redacted] in the absence of the NorthPoint and FortisBC contracts. I disagree. There are, in fact, numerous operational benefits to running a power boiler that include:

- Providing support steam for pulp production, to minimize the use of natural gas in the recovery boiler, and to serve as a back-up for the incineration of concentrated non-condensable gases.

- Providing disposal for hog fuel generated onsite that would have to be disposed of in a landfill or otherwise removed.

- Disposal of sludge which would otherwise have to be landfilled if no other use was permitted.

- Providing support for increased winter steam demands and including startups.

15. Mr. Merwin's third claim is that Celgar would have only produced the minimal amount of steam required to remain in [redacted] without the FortisBC and NorthPoint sales contracts. Mr. Merwin has not provided a detailed mass and energy balance which would be necessary to substantiate the figures he provides for Ceglar's thermal balance.

16. Absent the documentation necessary to examine his claims, I would offer the following observations:

- Celgar substantially increased pulp and black liquor production, which resulted in a higher level of steam and power generation. It also reduced the amount of steam it required for its production process, which resulted in increasing amounts of steam being vented. It follows that Celgar's steam generation capability surpassed its process steam consumption.
- Celgar [redacted]
- Celgar's communications with third parties confirms that it considered the excess steam a "spin-off benefit".
- Celgar determined that the excess steam would likely be sufficient to support the installation of an additional turbine.
- if Celgar operated in thermal balance as Mr. Merwin suggests this would likely negate the energy savings realized through Blue Goose.

17. In conclusion, the information and documentation I have reviewed strongly suggests that Celgar would have continued to operate in a similar manner without these sales contracts.

The Skookumchuck Pulp Mill

18. The Skookumchuck operation has been configured and operated more akin [redacted] This stands in contrast to Celgar's operations which are more integrated in nature to its recovery boiler.

19. As a result of [redacted] In particular, the [redacted] under the terms of the 1997 EPA. Moreover, [redacted] would start to curtail their operations in early 2007. Delivered hog fuel prices for Skookumchuck would also [redacted]

20. Tembec subsequently concluded [redacted] the parties proceeded to replace the 1997 EPA with the 2009 EPA.

The Howe Sound Mill

21. BC Hydro has assessed Howe Sound's operations several times, including the determination for the sales threshold (2001 Enabling Agreement), and the setting of a GBL for the 2010 EPA. The original threshold for the 2001 Enabling Agreement, [redacted] MW, was set [redacted] This assessment is more conservative than BC Hydro's current GBL methodology.

22. Howe Sound had to [redacted] to produce electricity in excess of its [redacted] MW sales threshold. This bears no resemblance to Celgar's use of [redacted] when it generated electricity for sale to FortisBC and NorthPoint. Howe Sound, rationally, [redacted]

23. Finally, the Claimant now takes issue with BC Hydro's [redacted] This complaint is without merit. [redacted]

3 PÖYRY'S PREPARATION OF EXPERT REPORTS IN THIS PROCEEDING

24. The Claimant in its most recent submissions has raised questions concerning the scope of my review of materials and the preparation of my first expert report.[1] This section responds briefly to these allegations.

25. Not coincidentally, the majority of documents I requested and reviewed were provided by Canada. These documents encompassed material they had collected in the course of their document collection process as well as material filed by the Claimant as a part of its Memorial and subsequently its Reply. These documents contained a wide range of information, including governmental policy directives, contractual agreements, technical discussions, business and process data, and internal and external communications between BC Hydro and the owners of the facilities currently being reviewed, spanning more than 15 years in some instances. In addition to these materials, Canada also provided witness statements for me to review to understand some of the key individuals' actions supporting the GBL determination process for context. In preparing my reports, I have reviewed, conservatively speaking, more than 1500 documents.

26. I have also utilized Pöyry's internal database generated from publicly available information to review the general configuration of these facilities and to understand major design differences between the mills. As Pöyry has been operating in the Pulp and Paper sector since 1958[2], our business has continuously supported numerous design, operation review, and re-design engagements[3] for our clients to meet their business objectives. This experience gives us a unique perspective and understanding of not only the technical implications to an operation but also the economic impact to the business. To support our business objectives, Pöyry has collected various public domain excerpts from trade magazines, news periodicals, company reports, and other publications to aid in our business development efforts,

[1] *See* Claimant's Reply, ¶¶ 304, 305, 320, 375.

[2] Additional information about Pöyry, available online at www.poyry.com, **PÖYRY-70**; Pöyry Expert Report I, ¶ 3.

[3] Selected References of Kraft Mill Projects, Pöyry Expert Report I, Appendix 8.3.

and which have become part of the internal database I reviewed and relied on in preparing my first expert report.

27. Finally, I have relied on the knowledge and experience I developed providing consulting services to numerous pulp and paper mills, as well as my educational background in paper science and engineering, in forming my conclusions in my expert reports.

4 THE CELGAR PULP MILL

4.1 Celgar's Generation and Load Data Irregularities

28. In the course of preparing my second expert report, I carefully reviewed numerous analyses, spreadsheets, reports and other data that were produced by the Claimant in relation to operations at the Celgar pulp mill. These materials are generally consistent with the information the Claimant provided to BC Hydro and which it relies on in this arbitration. For example, the Claimant relies on the annual totals in Annex A (Revised) of the Reply, which is entitled "Celgar Mill Historic Data." I have found that the data in Annex A generally agreed with the monthly and daily generator output and pulp production data that I reviewed in Celgar's internal documents.[4] The data in this annex, however, does contain a few notable discrepancies.

29. The Claimant lists in Annex A of its Reply the "Turbine Generator #2[5] and Turbine Generator #3 Output" and the "Celgar Annual Mill Load" for the Celgar

[4] Zellstoff Celgar Limited, Monthly Statistical Summary, 2005.01 to 2013.01, MER00292666 **PÖYRY-71**. Pöyry Analysis of 2005 Selected Daily Operating Statistics, **PÖYRY-72**. Pöyry Analysis of 2006 Selected Daily Operating Statistics, **PÖYRY-73**. Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74**. Pöyry Analysis of 2008 Selected Daily Operating Statistics, **PÖYRY-75**. Pöyry Analysis of 2009 Selected Daily Operating Statistics, **PÖYRY-76**. Pöyry Analysis of 2010 Selected Daily Operating Statistics, **PÖYRY-77**. I have developed the Pöyry Analysis of Selected Daily Operating Statistics (**PÖYRY-72 - PÖYRY-77**) from internal spreadsheets that were maintained on a daily basis by Celgar personnel. The internal spreadsheets I used to create these analyses are listed in Appendix A. Due to the volume of documents that I relied on to create my analyses, I have not provided all of them as exhibits. I have provided only those documents that I refer to separately in my report. Should the Tribunal wish to see any of the other documents listed in Appendix A, I am happy to provide them.

[5] Turbine Generator #2 refers to the 52 MW turbine that was installed in 1993. Turbine Generator #3 refers to the turbine Ceglar acquired through the Pulp and Paper Green Transformation Program which commenced operations in 2010.

pulp mill. The "Turbine Generator #2 and Turbine Generator #3 Output" column provides the annual total generation for the Celgar pulp mill. The data in this column is consistent with the data in Celgar's internal Monthly Statistical Summary and the daily statistics for the calendar years 2005, 2006 and 2008. The data for annual total generation, however, is not consistent for calendar year 2007.[6]

30. The Claimant indicates in Annex A that the annual total generation was 350 GWh in 2007. This is not consistent with several other sources of data.[7] In particular, Celgar's internal Monthly Statistical Summary indicates that it generated [redacted] GWh in 2007.[8] I attempted to verify whether the figure in the Reply Annex was correct by comparing it to Celgar's daily reported values for generated electricity. The daily statistics, however, are consistent with the Monthly Statistical Summary.

31. The Claimant also indicates in Annex A that the "Celgar Annual Mill Load" is 349 GWh. The daily statistics and several other sources also indicate that Celgar's mill load in 2007 was [redacted] GWh.[9] I have provided a summary of some of the annual generation data I reviewed from Celgar's internal documents for the period from 2005 to 2010 in Table 1.

[6] There are also discrepancies in calendar year 2010 that could be attributable to the commissioning of the second turbine towards the end of that year. I did not discover a cause for this discrepancy in 2009.

[7] Zellstoff Celgar Limited, Monthly Statistical Summary, 2005.01 to 2013.01, MER00292666 **PÖYRY-71**. Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74**. Email from Susan Brenna-Smith to Jim McLaren, FW: Energy production for 2007, MER00227054, **PÖYRY-78**. Zellstoff Celgar Limited Partnership, Monthly Power Costs, 31 December 2007, MER00227055, **PÖYRY-79**.

[8] See Zellstoff Celgar Limited, Monthly Statistical Summary, 2005.01 to 2013.01, 2007 worksheet at row 81, MER00292666, **PÖYRY-71**.

[9] Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74**, Zellstoff Celgar Limited, Monthly Statistical Summary, 2005.01 to 2013.01, MER00292666 **PÖYRY-71**. Email from Susan Brenna-Smith to Jim McLaren, FW: Energy production for 2007, MER00227054 **PÖYRY-78**. Zellstoff Celgar Limited Partnership, Monthly Power Costs, 31 December 2007 at bates 227056 (listed in the column as "Net Celgar Use MWh"), MER00227056, **PÖYRY-79**.

Table 1: Summary of Total Generation Discrepancy

	Generation		
	Reply Annex A	Monthly Statistics	Daily Reports
2005	300,192	[redacted]	
2006	290,413		
2007	350,641		
2008	374,359		
2009	359,897		
2010	[redacted]		

32. The Claimant's accountant raised the discrepancy in the 2007 total generation figures with Mr. James McLaren[10] in the course of preparing data concerning the pulp mill.[11] None of the documents I have reviewed provides a response to the concerns raised by the accountant or a clear reason for this difference.

33. It is not unusual to have data discrepancies arise in internal analyses that are prepared by pulp and paper facilities given the various collection methods employed. I have raised this particular difference as the Claimant has noted data discrepancies in the mill operation data previously presented to the Tribunal[12] and because I understand that turbine output is a key parameter in the GBL determination.

4.2 Celgar's Normal Operations

4.2.1 BC Hydro's Concept of Normal Operations and its Relationship to Generator Baselines

34. From the documents, data, witness statements and other information I have reviewed, it is apparent that BC Hydro attempted to determine what "normal operations" were through an examination of the performance of the pulp and paper

[10] Mr. McLaren has held several positions at the mill, including Environmental Manager, Technical Services Manager, Utilities Manager, Strategic Projects Manager, and Energy Coordinator. James McLaren Statement I, ¶ 16.

[11] Email from Susan Brenna-Smith to Jim McLaren, FW: Energy production for 2007, 6 February 2009, at MER00227054 **PÖYRY-78**. Zellstoff Celgar Limited Partnership, Monthly Power Costs, 31 December 2007, MER00227055 **PÖYRY-79**.

[12] Brian Merwin Statement II, ¶ 38.

operations, the performance of the electrical generating assets, the electrical load required to support manufacturing, and the design and operating differences inherent to each of these pulp and paper facilities. BC Hydro considered a range of data from each of these facilities, including their generation and load data over a period of several years.[13]

35. BC Hydro also relied on its knowledge and understanding of the idiosyncrasies of these facilities (e.g., information concerning operations, historical consumption, normal mill load, etc.) that it had accumulated through its interactions with them. This, in turn, assisted them in their discussions with mill representatives when assessing the contracted GBL for "normal" operations, and in the case of Celgar, made BC Hydro more reliant on the information supplied to them when they made the GBL determination.[14]

36. BCUC Order G-38-01 set out a principle[15] that BC Hydro then developed further for the purposes of procuring electricity.[16] This allowed BC Hydro to adopt a flexible approach that was critical to setting GBLs, and that was fair for each of these facilities, as it reflected each facility's unique infrastructure and development. For example, I noted in my first expert report that the typical function of the power boiler in relation to the recovery boiler is to manage changing demands for steam for the production process.[17] Each mill makes its own decisions about how to operate these two types of boilers together.[18]

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[13] Lester Dyck Statement II, ¶ 15.

[14] As Mr. Dyck states, "… we started with a range of operational data – typically three to five years prior to the start of the negotiation of the EPA for which the GBL was being set – in order to determine through discussions with the proponent whether a recent one-year historical period represented normal operations at that time, or alternatively, which recent one-year period best represented normal operations at that time." Lester Dyck Statement II, ¶ 15.

[15] "…to make every effort to agree on a customer baseline, based either on the historical energy consumption of the customer or the historical output of the generator." BCUC, Order Number G-38-01, "British Columbia Hydro and Power Authority Obligation to Serve Rate Schedule 1821 Customers with Self-Generation Capability", 5 April 2001, p. 2, ¶ 1, **PÖYRY-80**.

[16] Lester Dyck Statement II, ¶ 3-6.

[17] Pöyry Expert Report I, ¶ 20 ("[P]ower boilers are not 'linked' to the pulping process in the same manner as Recovery Boilers. Rather, Power Boilers are used to contribute to overall steam generation and to manage changing demands for steam for the production process.")

[18] In my opinion, these decisions are affected by the decisions and investments of the past. For example, Celgar's operation changed from 1993 to 2007. As described in 1993, "The new mill will operate with three boilers. The new recovery boiler will generate approximately 410 t/hr of 6200 kPag/454 deg C steam while firing 75% solids black

37. Celgar's operation generates the majority of its steam from the high-pressure recovery boiler, with the support of a lower pressure, smaller volume power boiler that contributed about [redacted] of overall steam production in 2007.[19] Skookumchuck, in contrast, [redacted] when it was meeting its obligations under the 1997 EPA.[20] Mr. McLaren from Celgar[21] and Mr. Lague from Skookumchuck[22] both indicate how their operations differ utilizing their power boiler in concert with their recovery boiler. A GBL setting process that did not account for these types of differences would not be fair to the proponents.

4.2.2 The Celgar Pulp Mill's Normal Operations

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liquor….No. 1 power boiler will be retained on a standby basis for peak steam demand situations…No. 2 power boiler has now been fitted with an electrostatic precipitator and it will produce approximately 68 t/hr of 4200 kPag/399 deg C steam while firing hog fuel, natural gas and dewatered sludge from the effluent plant…" Turbogenerator Operations Manual – Revised – September 1, 1993, **PÖYRY-81**. As indicated to BC Hydro in 2008, this configuration had changed to include just the recovery boiler, No. 2 power boiler, and 52 MW turbogenerator. Letter from Brian Merwin to BC Hydro, Re: Zellstoff Celgar Limited Partnership ("Celgar") – Biomass Realization Project and Celgar Green Energy Project, 7 May 2008, at bates 019777, **PÖYRY-31**. Similarly, [redacted] Christian Lague Statement I, ¶¶ 9-17.

[19] Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74**. Pöyry Summary Tables Graphs, **PÖYRY-120.**

[20] For example, [redacted] Email from Chris Lague to Norman Wild, Subject: "Skookumchuck Steam Balances and expanded exhibit 4 of GBL document," **PÖYRY-56**.

[21] "…It currently averages about [redacted] hr on a combination of [redacted] moisture hog, wood chip fines and [redacted] moisture effluent treatment sludge. We anticipate upgrading this boiler back to at least its original name plate hog steaming rate of [redacted] t/hr. [redacted]" Email correspondence from Jim McLaren to Stephan Faucher of Siemens and Jack Smith, FW: Condensing turbine options for Zellstoff Celgar, 13 April 2007, MER00270263 **PÖYRY-83**.

[22] "…In addition [redacted] Christian Lague Statement I, ¶ 14.

38. Mr. Merwin claims that he did not have a clear understanding of what would be considered "normal" when he described Celgar's operations.[23] I have a considerable amount of experience reviewing business practices at pulp and paper facilities and assessing the efficiency of their operations. I have reviewed a large number of Celgar's documents, and it is clear to me that these same practices and assessments were occurring from 2006 onwards by Celgar personnel.

39. Pöyry is frequently engaged by clients to review or assess the capability of a specific process or, in certain instances, the entire manufacturing operation. I frequently review internal analyses or information that is collected at these pulp mills during these engagements. Although the form of these internal analyses is not consistent from one site to the next, the basic approach is the same in all of these facilities – personnel continually collect, review, and analyze data to assess the performance of their operation and to support business objectives for decision-making. These analyses are often critiqued and modified by personnel that are directly involved in the process or manufacturing operation to remove abnormal events that do not reflect normal operations (i.e., downtime associated with major investments or equipment failure due to defect or repeated reliability issues, production slow backs to enable equipment repairs "on the fly",[24] or acts of God, such as lightning strikes). After anomalous events are eliminated, these analyses become the starting point for determining a baseline, or conservative estimate, as to how, for example, a piece of equipment may operate so as to evaluate performance on a going forward basis.

40. Celgar engaged in the same type of analyses shortly after it assumed ownership of the pulp mill in 2005. Some of the operational data for the Celgar pulp mill I reviewed is reflected on a monthly, daily, and hourly basis in multiple Mercer

[23] Brian Merwin Statement II, ¶¶ 18-19.

[24] Manufacturing Kraft pulp is the combination of a number of individual processes. Affiliated with each of these processes are storage tanks to promote stability for the equipment. Depending on the location of the equipment failure and severity, an opportunity may be assessed to slow the production line down and fill underutilized tank storage while repairing the equipment rather than stopping all the processes. Put another way, it could be likened to taking a 300 km trip and planning to drive 60 km/hr. Along the way, a tire may lose some pressure, but the driver decides to slow to 50 km/h and keep driving, as they believe they will still arrive at the destination rather than stopping and taking the time to fix the tire.

documents.[25] Based on the information contained in the data series and the structure of the files, it is self-evident these analyses were created by Celgar personnel for their own business purposes.[26] Moreover, these analyses contained comments referring to new procedures[27] or operational reports to review[28] that I would view as their attempt at improving how they would examine the data, communicate across the organization, and understand the impact of their actions on the business.

41. Celgar also compiled these analyses and data into monthly and yearly summary statistics.[29] I have also reviewed and compared these figures to the data provided in the Reply. In these Excel spreadsheets, the data collected includes many areas of the facility, from the start of the process with the woodroom and chip receiving operations, to digester area, and through to end product generation and

[25] Multiple Excel files have been provided for my review covering monthly, daily, and hourly process statistics across multiple areas of the mill from January 2005 through December 2010. In brief, some of the 2007 documents would be: Zellstoff Celgar Limited, Daily Statistics, January 2007, MER00290022, **PÖYRY-84**; Zellstoff Celgar Limited, Daily Statistics, February 2007, MER00289976, **PÖYRY-85**; Zellstoff Celgar Limited, Daily Statistics, March 2007, MER00290151, **PÖYRY-86**; Zellstoff Celgar Limited, Daily Statistics, April 2007, MER00289852, **PÖYRY-87**; Zellstoff Celgar Limited, Daily Statistics, May 2007, MER00290196, **PÖYRY-88**; Zellstoff Celgar Limited, Daily Statistics, June 2007, MER00290109, **PÖYRY-89**; Zellstoff Celgar Limited, Daily Statistics, July 2007, MER00290068, **PÖYRY-90**; Zellstoff Celgar Limited, Daily Statistics, August 2007, MER00289897, **PÖYRY-91**; Zellstoff Celgar Limited, Daily Statistics, September 2007, MER00290320, **PÖYRY-92**; Zellstoff Celgar Limited, Daily Statistics, October 2007, MER00290279, **PÖYRY-93**; Zellstoff Celgar Limited, Daily Statistics, November 2007, MER00290239, **PÖYRY-94**; Zellstoff Celgar Limited, Daily Statistics, December 2007, MER00289936, **PÖYRY-95**.

[26] Examples of where this information can be used would be in preparing the 2007 Energy Budget, (*see* Energy Coordinator's January, 2007 Report to Al Hitzroth, 8 February 2007, at bates 089259, MER00089256, **PÖYRY-96**; Jim McLaren, Energy Coordinator's December, 2006 Report to Al Hitzroth, 15 January 2007, MER00091410, **PÖYRY-97)** or for strategic planning such as Mr. McLaren's report on, "Energy Cost Path to [redacted] /ADt then [redacted] ADt." Jim McLaren, Energy Cost Path to $[redacted]] /A Dt then [redacted]]/A Dt, 23 March 2007, MER00036311, **PÖYRY-98**; Email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review 23 March 2007, MER00036310, **PÖYRY-99** or internal benchmarking studies Zellstoff Celgar Limited, Benchmarking 2007, 1 January 2007, MER00265236, **PÖYRY-100**.

[27] *See* Zellstoff Celgar Limited, Daily Statistics, October 2007, MER00290279, **PÖYRY-93** (showing Utilities worksheet as, "Obsolete – Replaced by KPI Report").

[28] Zellstoff Celgar Limited, Energy Coordinator Key Performance Indicators, October 2007, MER00091086, **PÖYRY-101**.

[29] *See, e.g.* Zellstoff Celgar Limited, Daily Statistics, January 2007, MER00290022, **PÖYRY-84**; Zellstoff Celgar Limited, Daily Statistics, February 2007, MER00289976, **PÖYRY-85**; Zellstoff Celgar Limited, Daily Statistics, March 2007, MER00290151, **PÖYRY-86**; Zellstoff Celgar Limited, Daily Statistics, April 2007, MER00289852, **PÖYRY-87**; Zellstoff Celgar Limited, Daily Statistics, May 2007, MER00290196, **PÖYRY-88**; Zellstoff Celgar Limited, Daily Statistics, June 2007, MER00290109, **PÖYRY-89**; Zellstoff Celgar Limited, Daily Statistics, July 2007, MER00290068, **PÖYRY-90**; Zellstoff Celgar Limited, Daily Statistics, August 2007, MER00289897, **PÖYRY-91**; Zellstoff Celgar Limited, Daily Statistics, September 2007, MER00290320, **PÖYRY-92**; Zellstoff Celgar Limited, Daily Statistics, October 2007, MER00290279, **PÖYRY-93**; Zellstoff Celgar Limited, Daily Statistics, November 2007, MER00290239, **PÖYRY-94**; Zellstoff Celgar Limited, Daily Statistics, December 2007, MER00289936, **PÖYRY-95.** *See also* Zellstoff Celgar Limited, Monthly Statistical Summary, 2005.01 to 2013.01, MER00292666 **PÖYRY-71**.

quality analysis. These spreadsheets also provide operational information for supporting processes necessary for the manufacture of Celgar's pulp product. There are also references in these documents to electronic mill data systems and data historians[30] which were employed to provide information to employees and managers, and which would enable them to analyze the process in greater detail or to assess performance over longer periods of time.

42. Based on my experience, pulp mills typically seek to review these analyses and the underlying data on a weekly or monthly basis to enable management to address any changes in performance and, if necessary, to take corrective action. The review of these analyses is also frequently used to support other activities, such as production planning and financial planning for the pulp mill.[31] I reviewed several documents that indicate that these processes were occurring in the energy department for the Celgar pulp mill.[32]

43. Finally, these analyses would normally be used by internal and external engineers, scientists, and consultants to support many of the initiatives the Claimant undertook after it purchased the pulp mill from receivership, namely a continuous program of optimizing and implementing investment opportunities. In this context, performance baselines were determined in order to provide guidance for designing modifications to the site and identifying the financial benefit or loss to the business from undertaking these opportunities.[33]

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[30] Data historians collect measurements from a variety of mill systems to provide a picture of the whole mill environment rather than of one specific piece of equipment. These analytics can then be utilized to understand variability in operations and ways to reduce it to optimize production and reduce costs.

[31] *See, e.g.* Energy Cost Path to $[redacted] /ADt then [redacted] /ADt", Email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review 23 March 2007, MER00036310, **PÖYRY-99**.

[32] Multiple "Energy Coordinator" reports were provided to me for review. *See, e.g.* Energy Coordinator's December, 2006 Report to Al Hitzroth, 15 January 2007, MER00091410, **PÖYRY-97**; Energy Coordinator's January, 2007 Report to Al Hitzroth, 8 February 2007, MER00089256, **PÖYRY-96**; Energy Coordinator's February, 2007 Report to Al Hitzroth, 15 March 2007, MER00089261, **PÖYRY-102**; Energy Coordinator's July, 2007 Report to Al Hitzroth, 3 August 2007, MER00091267, **PÖYRY-103**; Energy Coordinator's August, 2007 Report to Al Hitzroth, 6 September 2007, MER00089252, **PÖYRY-104**; Energy Coordinator's September, 2007 Report to Al Hitzroth, 4 October 2007, MER00111541, **PÖYRY-105**.

[33] The management at the mill reviewed many of the capital projects undertaken at the site and reported to senior leadership in January 2012. This report discusses many of the major modifications that occurred at the mill, starting with Blue Goose and continuing past the installation of the new condensing turbine, and identifies the financial impact on the business. The appendix of this report also references other documentation developed around the time the original investments were completed. An example would be, "Blue Goose Post Evaluation BOD May 7-07." Zellstoff Celgar

44. For example, the Claimant, in a few documents, assesses the performance of the recovery boiler (and to a lesser extent the power boiler) over a six-month period in 2007 for the purposes of sizing the new condensing turbine and communicating performance of the operation.[34] It determined that the analyses it performed indicated that the recovery boiler steaming at a rate of [redacted] t/hr would be a "conservative" estimate and indicated that, with "continued investment in our mill to increase production rates, a steaming rate in the future of [redacted] t/hr was attainable.[35] It also indicated that the pulp mill's electrical load in 2007 was "approximately 42 MW" and projected that this load would increase to [redacted] MW in the future.[36] The Claimant also concluded that "[t]he recovery boiler at [redacted] t/hr can be considered average conditions at annual pulp production rate of [redacted] ADt/year – likely where the mill will be when the new condensing turbine is commissioned."[37]

45. The Claimant's knowledge of its own processes is also reflected in its communications with third parties. For example, the Claimant in its discussions with BC Hydro in April 2007[38] and FortisBC in May 2007[39] represented that the mill, "

Limited Partnership, Project Performance Analysis Capital Project Review, 24 January 2012, MER00148417, **PÖYRY-106**.

[34] Mr. McLaren provided support in reviewing the operation to aid in sizing TG3. Email from Jim McLaren to Stephan Faucher of Siemens and Jack Smith, FW: Condensing turbine options for Zellstoff Celgar, 13 April 2007, MER00270263, **PÖYRY-83**. As Mr. McLaren developed his viewpoint, he communicated it to senior leadership. Email from Jim McLaren to Brian Merwin, Sale of STG#2 and future STG#3 Electricity Output, 30 October 2007, MER00098456, **PÖYRY-107**.

[35] Email from Jim McLaren to Stephan Faucher of Siemens and Jack Smith, FW: Condensing turbine options for Zellstoff Celgar, 13 April 2007, MER00270263, **PÖYRY-83**.

[36] Email from Jim McLaren to Brian Merwin, Sale of STG#2 and future STG#3 Electricity Output, 30 October 2007, MER00098456, **PÖYRY-107**.

[37] It should be noted that the new turbine daily operating statistics were starting to be reported in September 2010 Zellstoff Celgar Limited, Monthly Statistics, 1 September 2010, MER00291507, **PÖYRY-108** with the mill achieving 502,107 ADmt/yr for 2010 as listed in Claimant's Reply Annex A (Revised) of Celgar Mill Historic Data. Based on my review of reported daily steam production for the recovery boiler in 2010, the recovery boiler operated on an average steaming rate of [redacted] excluding downtime associated with the annual mill shut. Pöyry Analysis of 2010 Selected Daily Operating Statistics, **PÖYRY-77**.

[38] Mercer International Group, BC Hydro RFEOI Meeting, April 2007, MER00277696, **PÖYRY-109**. From email communications between Mr. Merwin and Mr. McLaren prior to this meeting, it appears that Mr. Merwin supervised the content of the presentation and attended the meeting with BC Hydro while Mr. McLaren provided support on several topics. Email from Brian Merwin to Jim McLaren, RE: Tomorrows meeting, 26 April 2007, MER00098557, **PÖYRY-110**; Email from Jim McLaren to Brian Merwin, Material for Apr 29 BC Hydro meeting, MER00098522, **PÖYRY-111**; Email from Jim McLaren to Brian Merwin, 070423 BC Hydro Meeting.zip, MER00098715, **PÖYRY-112**.

[39] Mercer International Group, FortisBC Meeting, May 2007, MER00277673, **PÖYRY-113**.

[s]ells small volumes of excess electricity to Alberta and the U.S. on an hourly firm basis" and that it had excess steam that was generated as a "spin-off benefit" of its investment through Blue Goose. The Claimant also believed that it was appropriate to comment on abnormal events, such as its increase in electricity consumption from FortisBC in 2006, which it indicated was [redacted][40] Finally, the Claimant felt confident enough to represent to FortisBC at this time that, "[u]nder normal operating conditions Celgar's entire steam production will come from biomass." [41]

46. Celgar also prepared a Fuel Plan in response to the Bioenergy Call for Power that it was required to submit in June 2008 as part of their proposal for their condensing turbine (i.e., the Green Energy Project).[42] It indicated in this submission that Celgar's performance and operations in 2007, which included the benefits it was receiving from their investments, represented what I indicated in my first report as a "new normal," in relation to its historical performance in previous years.[43] Specifically, Celgar indicated that it " experienced significantly fewer process upsets compared to historical trends which allowed it to utilize less fossil fuel in its Power and Recovery boilers. As well, in 2007, Celgar chose to shut down its power boiler[44] and did not burn hog or bio-solids for several months minimizing the usage of supplemental gas as the steam production from the Power Boiler was not needed by the mill. "[45]

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[40] Mercer International Group, FortisBC Meeting, May 2007, MER00277673, **PÖYRY-113**.

[41] [Emphasis Added] Mercer representatives had developed the perspective by this time that, "Celgar's current pulp capacity project will be completed in Q2-2007. Celgar's reliability projects are ongoing and the mill is making good progress in achieving 92% reliability. In recent months, as a result of reliability projects, Celgar has been consistently venting significant quantities of steam. Once the capacity increase project is completed Celgar will have an even larger volume of vented steam." Mercer International Group, FortisBC Meeting, May 2007, at bates 277687, MER00277673, **PÖYRY-113.**

[42] Zellstoff Celgar Limited Partnership, Fuel Plan Requirements RFP Appendix # 5 BC Hydro Bioenergy Call for Power – Phase I, 10 June 2008, **PÖYRY-114**.

[43] Pöyry Expert Report I, ¶ 160.

[44] My analysis of 2007 operating data indicates that the power boiler [redacted] while the data for natural gas usage in the power boiler indicates that it was 'shut down' closer to [redacted] The power boiler restarted consuming hog later in the year as the pulp mill required more steam. Recovery Boiler Steam Production, **PÖYRY-115**. I discuss the potential causes for this action in section 4.4.2 of my report.

[45] Zellstoff Celgar Limited Partnership, Fuel Plan Requirements RFP Appendix # 5 BC Hydro Bioenergy Call for Power – Phase I, 10 June 2008, **PÖYRY-114**. Celgar continued to export electricity throughout this period using steam

47. The analyses and data I have reviewed and the examples I have provided above indicate that Celgar was continually collecting, reviewing, and analyzing data to assess the performance of their pulp mill operations and to support business objectives for decision-making. These different performance analyses reviewed how the operation was running at specific points in time and speak to an understanding of what personnel close to the operation would consider as "normal" at that time as well as "normal" or expected operating conditions in the future.

48. Mr. Dyck has testified he met with Mr. Merwin and had several phone calls to determine what "normal" operating conditions were at Celgar.[46] Mr. Merwin claims that as Director of Strategic and Business Initiatives he did not understand what BC Hydro was referring to when it requested information on normal operating conditions for Celgar.[47] I am somewhat skeptical of this assertion but I suppose that this could be true. However, I would observe that Mr. Merwin was soliciting the advice of[48], and being supported in these negotiations by, individuals such as Mr. McLaren who were very familiar with operating conditions at the mill and their implication to power generation and electrical consumption.[49] He had opportunities to form his understanding of normal operating conditions prior to these conversations

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from the recovery boiler. Pöyry Analysis of Recovery Boiler Steam Production, **PÖYRY-115**. Pöyry Analysis of NorthPoint Data, **PÖYRY-116**.

[46] Lester Dyck Statement II, ¶ 19-21.

[47] Brian Merwin Statement II, ¶ 19.

[48] As Mr. Merwin requested Mr. McLaren's review of his assessment, "It appears BC Hydro has formally come out against our arbitrage project. I think there is still an opportunity with them as they have a fair bit of arrogance that they are the option for us and it won't stop us. I have spent some time this weekend drafting a response letter as we need to get our GBL set in either case as we need it so that we can submit our bid. It still needs some editing. I would like you to take a quick look at it when you get a chance on Monday morning and offer comment if my analysis on the mill data seems plausible to you." Email from Jim McLaren to Brian Merwin, RE: Phase I Request for Proposals: Notice to Customers of GBL, 4 May 2008, MER00064460, **PÖYRY-117**.

[49] As Brian Merwin wrote to several Celgar personnel, " The BC Hydro submission deadline is fast approaching for Celgar's Energy Project. **This proposal needs to be treated with the highest priority from all involved at the mill, for if we are successful this contract will be worth several Hundred million dollars to Celgar.** Although the deadline is June 3rd we need to have Celgar's proposal complete by May 15 to have suitable time for the various legal and regulatory reviews before we make our submission. Jim, we are seeing a steady stream of material from you assisting me with putting the package together. Though we need to increase the speed that the material is sent to allow us to incorporate, tweak and edit it into our documents. As well there is more information that we will require from you. " Email from Brian Merwin to Alan Hitzroth, RE: Celgar's Proposal Submission for BC Hydro, 4 May 2008 at bates 72366, MER00072365, **PÖYRY-118**.

and meetings[50] with Mr. Dyck.[51] He could have requested the assistance of these individuals to follow-up on concerns he had after these conversations with Mr. Dyck.

49. Mr. Merwin must have also understood that these BC Hydro meetings and discussions were critical to the final determination of Celgar's GBL. BC Hydro relied on these discussions not only to determine what constituted "normal" operations but also to understand from the representatives' standpoint how the supplied data would or would not be reflective of normal operations during the term of the EPA[52] with the best available information at the time.

50. In conclusion, based on the information I have reviewed, it appears to me that BC Hydro appropriately sought to understand "normal" operating conditions at each of the proponent's mills and that Celgar had personnel with the expertise and the data and analyses to provide a detailed description of normal operating conditions at its facility and opportunity to provide background as to why the data would not be considered a "new normal" with the demonstrated achievements of 2007.

4.3 Celgar's Energy Generation in 2007

[50] As an example, Mr. McLaren advised Mr. Merwin, "If we can't break the BC Hydro position that the existing TG GBL portion is ineligible, then we must fight to establish our GBL to be as low as is credible – I support your logic of picking a GBL of 33 MW to reflect conditions prior to Mercer's energy investments." Email from Jim McLaren to Brian Merwin and Alan Hitzroth, RE: Phase I Request for Proposals: Notice to Customers of GBL, 4 May 2008, MER00064460, **PÖYRY-117**.

[51] *See, e.g.* Energy Coordinator's December, 2006 Report to Al Hitzroth, 15 January 2007, MER00091410, **PÖYRY-97**; Energy Coordinator's January, 2007 Report to Al Hitzroth, 8 February 2007, MER00089256, **PÖYRY-96**; Energy Coordinator's February, 2007 Report to Al Hitzroth, 15 March 2007, MER00089261, **PÖYRY-102**; Energy Coordinator's July, 2007 Report to Al Hitzroth, 3 August 2007, MER00091267, **PÖYRY-103**; Energy Coordinator's August, 2007 Report to Al Hitzroth, 6 September 2007, MER00089252, **PÖYRY-104**; Energy Coordinator's September, 2007 Report to Al Hitzroth, 4 October 2007MER00111541, **PÖYRY-105**.

[52] Mr. Dyck emphasized the importance of proponents securing this type of technical support in his first witness statement. "Additionally, I underlined the importance of proponent's submitting reasonable and defensible technical information in support of the GBL. As each customer generator and mill operation is unique, I explained that BC Hydro did not want to impose an overly prescriptive approach to setting GBLs that may fail to account for the unique circumstances of each proponent." Lester Dyck Statement I, ¶ 58. *See also* Email from David Keir to Lester Dyck re: Summary of GBL Discussion – 26 March 2008, dated March 27, 2008, **PÖYRY-119** (**"**The critical requirement is to supply reasonable, defensible, technical information in support of the GBL. Each customer generator and mill operation is unique and has unique operational attributes. … The bottom line is that you know your operations best. Help us to understand the unique operational conditions that are [*sic*] imbedded within your annual GBL, such that we can collectively review and understand any specific elements that may be open to refinement.")

51. Celgar completed its Blue Goose projects by the beginning of 2007, which improved both the reliability and productivity of the mill. Celgar's pulp production also increased, which resulted in additional black liquor and led to increased steam and power generation. This increase in pulp production and power generation is reflected in Table 2 below. The power generation levels in 2007 are substantially higher and more closely aligned with performance in 2008 and 2009.

Table 2: Historical Summary of Pulp Production and Steam Generation

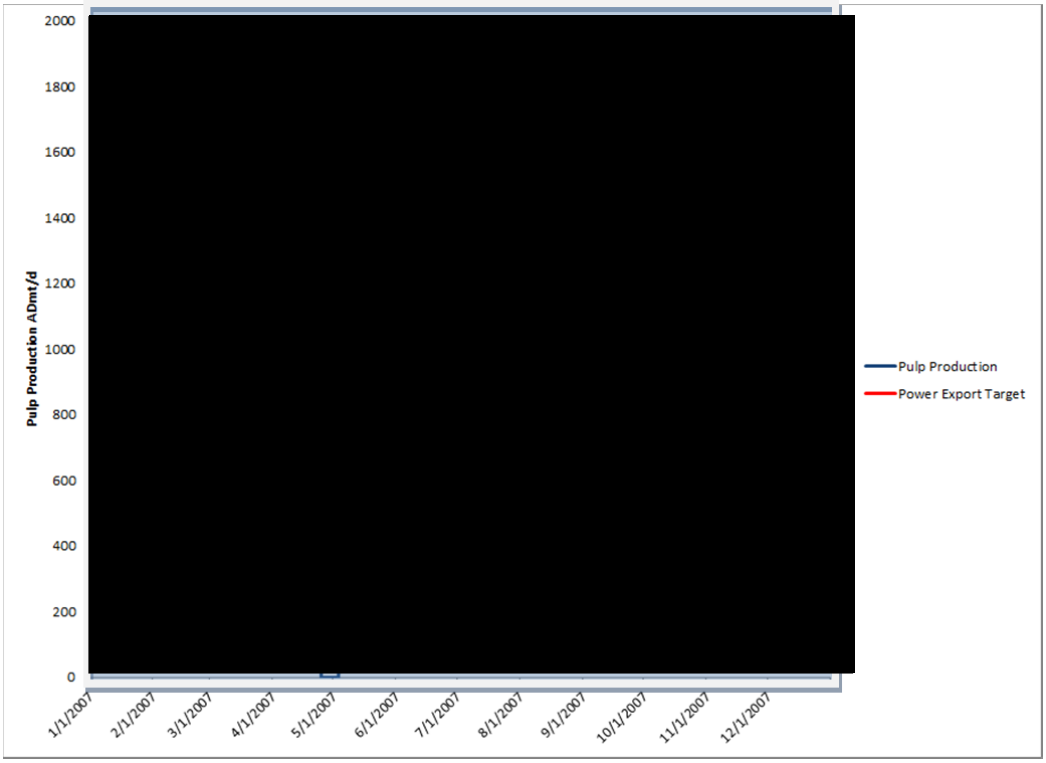
Production Year		2005	2006	2007	2008	2009	2010
Total Pulp Pdn	ADmt/a	444,723	438,885	476,468	486,034	466,863	502,097
Recovery Boiler Operating	Days	[redacted]					
Average Pulp/Day RB	ADmt/d	1,279	1,278	1,350	1,396	1,375	1,444
Steam Production							
Recovery	tonne/h	[redacted]					
#2 Power Boiler	tonne/h						

52. This table shows that Celgar's average annual pulp production increased to 1,350 ADmt/d[53] in 2007 from ~1,279 ADmt/d in 2005 and 2006. Celgar had determined that [redacted] is the pulp production level that would generate enough black liquor to enable the recovery boiler to produce sufficient steam for electricity exports.[54] Figure 1 shows the daily performance of the pulp mill in relation to the threshold of 1,300 Admt/d for power exports.

[53] The abbreviation ADmt/d refers to Air Dried metric tonnes per day.

[54] Mr. McLaren notes in his analysis in March 2007 on the inter-related importance of pulp production and power generation, "When the mill is running steady at target rates and No. 2 power boiler is generating sufficient 4200 kPa hog steam to at least satisfy the recovery soot blowing requirements [redacted] t/h), all the recovery boiler steam can be directed through the turbo generator for maximum electricity generation. Since the exhaust 500 kPa steam from the TG exceeds mill winter steam demand at these target rates, it is necessary to vent the surplus to atmosphere. Although, as expected, mill electrical consumption has increased from 39 to 42 MW with commissioning of the wash presses and the on-site oxygen plant, the TG still generates surplus electricity for export when daily pulp production stays consistently above [redacted] ADt/day." Jim McLaren, Energy Cost Path to [redacted] /A Dt then $[redacted] A Dt, 23 March 2007, at bates 36315, MER00036311, **PÖYRY-98**; Email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review, 23 March 2007, MER00036310, **PÖYRY-99**.

Figure 1: 2007 Daily Pulp Production and Identified Production Threshold for Power Export



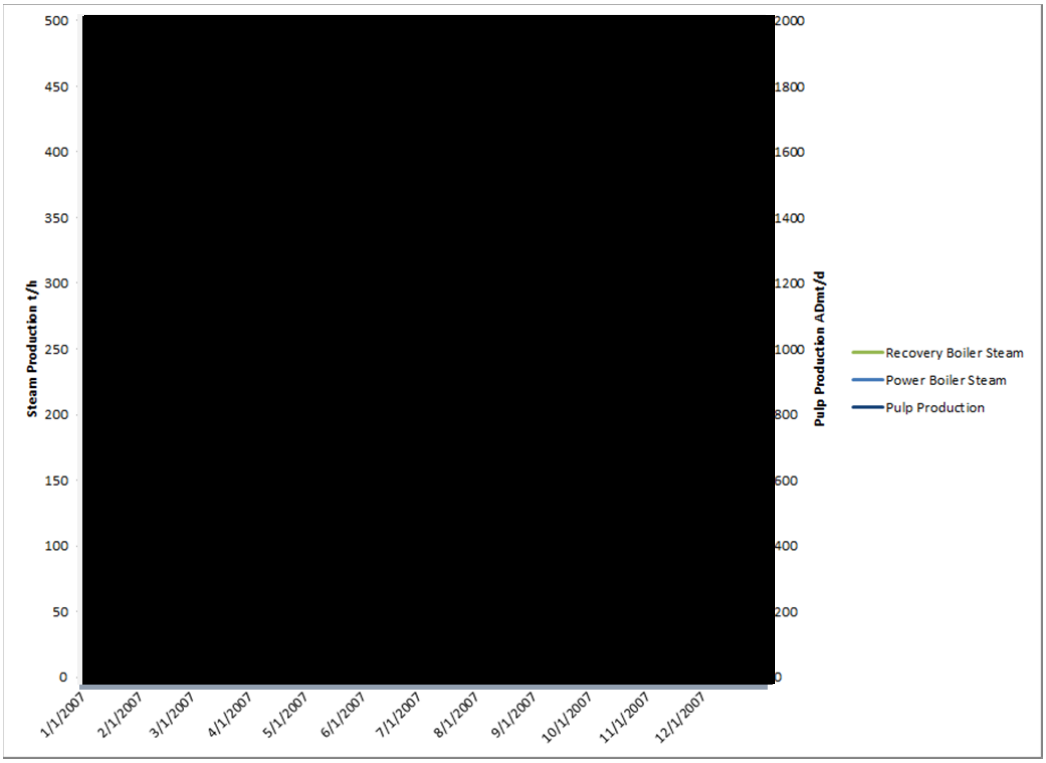
53. The recovery boiler was able to generate more steam throughout this period as increases in pulp production also increased the amount of black liquor that was available. Celgar commented on these improvements as a part of their RFP submission for the Bioenergy Call:

> In 2007, Celgar experienced significantly fewer [redacted] compared to historical trends which allowed it to utilize less fossil fuel in its Power and Recovery boilers. As well, in 2007, Celgar chose to [redacted] and did not [redacted]

54. This trend is also reflected in Figure 2 below.

[55] Zellstoff Celgar Limited Partnership, Fuel Plan Requirements RFP Appendix # 5 BC Hydro Bioenergy Call for Power – Phase I, 10 June 2008, pp. 4 and 11, **PÖYRY-114**.

Figure 2: 2007 Daily Pulp Production vs. Recovery Boiler and Power Boiler Steam Generation



55. Figure 2 demonstrates that a drop in pulp production (i.e,. the dark blue line) leads to a corresponding drop in Recovery Boiler steam (i.e., the green line) as less black liquor is available. These aspects of Kraft pulp production process are highly correlated. Celgar's pulp production in 2007, as shown in Figure 2, [redacted] Some volatility in pulp production is expected and normal, and in my experience, the data presented in Figure 2 falls within the range of acceptable operational stability for a pulp mill. The variability in Celgar's pulp production also resulted in similar variability in recovery boiler steam production, as well as in power generation. The variability of steam production from the recovery boiler, and power generation, would be mitigated to a certain extent by the ability of the mill to store black liquor.

56. The power boiler (i.e., the light blue line) was only responsible for a small amount of the steam generation at Celgar, accounting for approximately [redacted]

of total steam generation.[56] Steam from the power boiler would be used to address any shortfalls in recovery boiler steam production or increases in process demand.

57. It is also important to note that due to the capability of the power boiler in 2007, its function was typically to provide half of its steam generation (~15 t/hr) to servicing the recovery boiler, while the other half (~15 t/hr) fed the 1200 kPa (*i.e.* medium pressure) steam header consumers with extracted steam from TG2 (in comparison, ~120 t/hr of steam originated from the recovery boiler).[57] By my estimates, not operating the power boiler would require the diversion of steam otherwise available for power generation (approximately equivalent to [redacted] MW) to service the recovery boiler. In addition, it would reduce the amount of steam available for power generation by an amount roughly equivalent to [redacted] MW to meet process needs.[58]

58. Celgar primarily used black liquor to produce steam. The pulp mill also generated a much smaller amount of steam by burning hog fuel and natural gas. In Figure 3, I have estimated the daily fuel contribution to steam production by fuel type and location (e.g. steam from the recovery boiler or the power boiler). It can be seen that firing black liquor in the recovery boiler contributed to an average of 94% of steam generation in 2007.

[56] Based on my review of the annual figures, from 2006 to 2007, [redacted] Summary Table Graphs, **POYRY-120**.

[57] Letter from Brian Merwin to BC Hydro, Re: Zellstoff Celgar Limited Partnership ("Celgar") – Biomass Realization Project and Celgar Green Energy Project, 7 May 2008, at bates 019778 and 019779, **PÖYRY-31**.

[58] [redacted] Email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review, 23 March 2007, at bates 36320, MER00036310, **PÖYRY-99**; [redacted], Letter from Brian Merwin to BC Hydro, Re: Zellstoff Celgar Limited Partnership ("Celgar") – Biomass Realization Project and Celgar Green Energy Project, 7 May 2008, at bates 019777 - 019779, **PÖYRY-31**.

Figure 3: 2007 Fuel Contribution to Daily Steam Generation

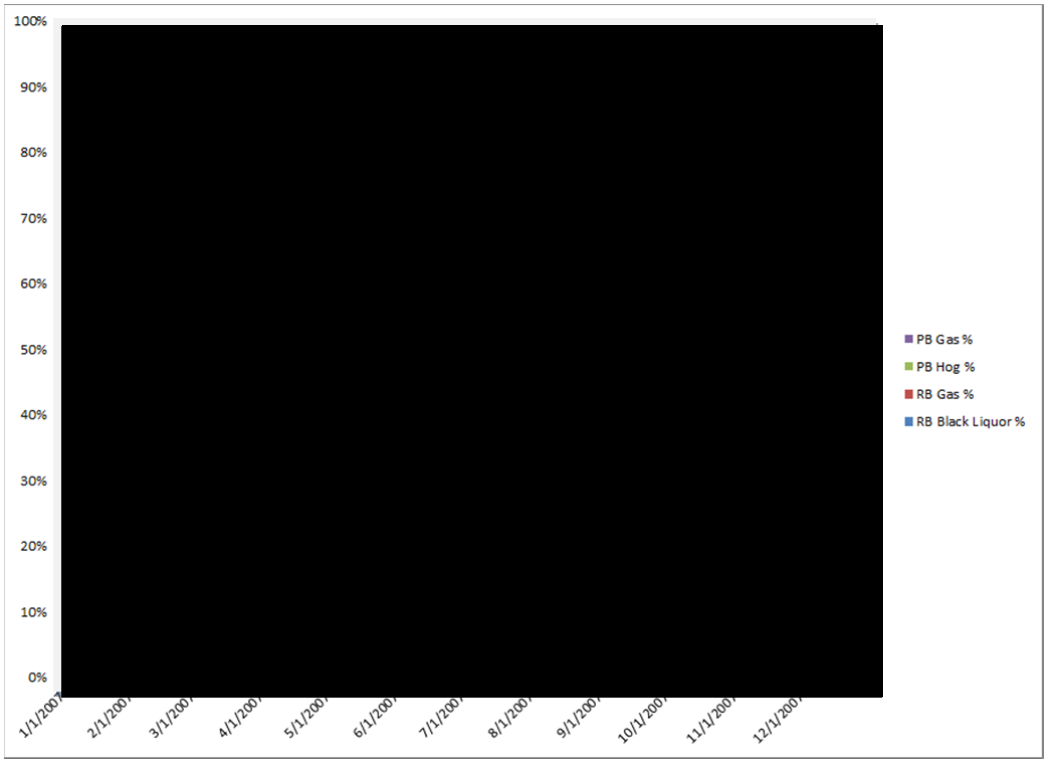
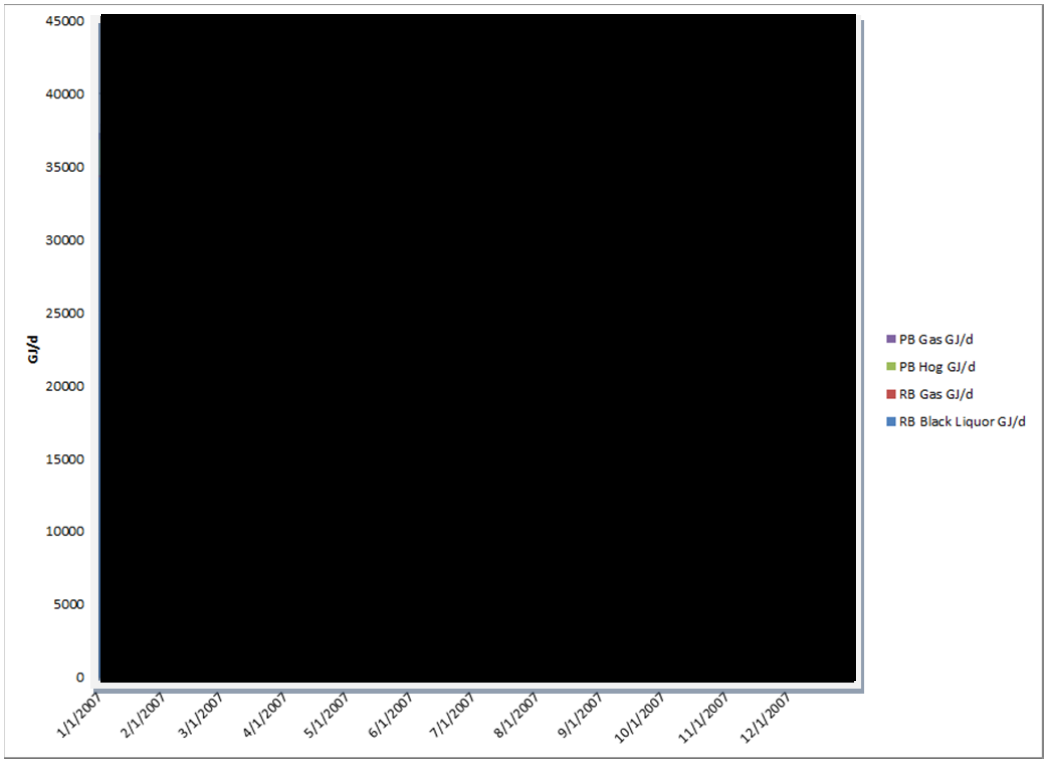


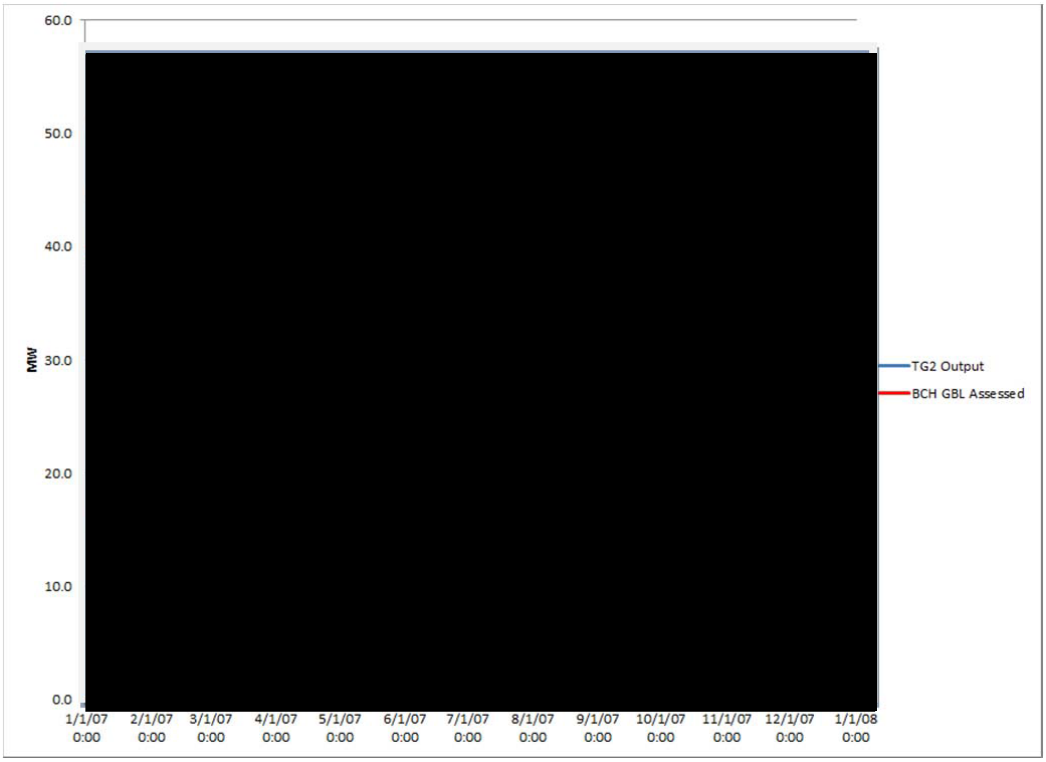
Figure 4: Estimated Daily Heat Generation by Boiler and Fuel Type



59. Comparing Figure 3 against Figure 4, I interpret some of the [redacted] Natural gas is frequently used as an auxiliary fuel to maintain steam generation if there are problems with black liquor quality. I also examined when natural gas was used in the recovery boiler and the power boiler (*i.e.* the red and purple lines), and compared it to steam shortfalls. I conclude on the basis of this comparison that [redacted]

60. I have observed above that steam production at the Celgar mill in 2007 was primarily the product of burning black liquor in the recovery boiler. The electricity generated by TG2 as a result of this steam production is shown on an hourly basis for 2007 in Figure 5 below.

Figure 5: 2007 Hourly TG2 Output vs. BC Hydro GBL Assessed



61. For 2007, TG2 operated for 6627 hours above the assessed 40 MW GBL.[59] Process upsets or TG downtime can be seen in the chart, and account for the valleys below the assessed 40 MW GBL. In these relative downtimes, Celgar's management often decided [redacted][60] In 2007, Celgar imported electricity in 2366 hours, approximately 288 hours of which were attributable to the mill's annual shut.[61] It is worth noting that, approximately 50% of the time the mill was importing power, the imports were for [redacted] MW or less. The mill exported power or remained power neutral 6394 hours in 2007, which means that the pulp mill was meeting its electrical needs 75 % of the time that it was in operation.[62] These observations are consistent with Mr. Merwin's representations to BC Hydro in 2008 that the mill was normally self-sufficient over the course of 2007, sold power when it generated in excess of its mill load, and purchased electricity only when the mill was experiencing upsets or downtime.[63]

62. A similar trend can be derived from the hourly information presented above and shown in Figure 6.

[59] Pöyry Analysis of 2007 TG Production and Power Export or Import – **PÖYRY-121**.

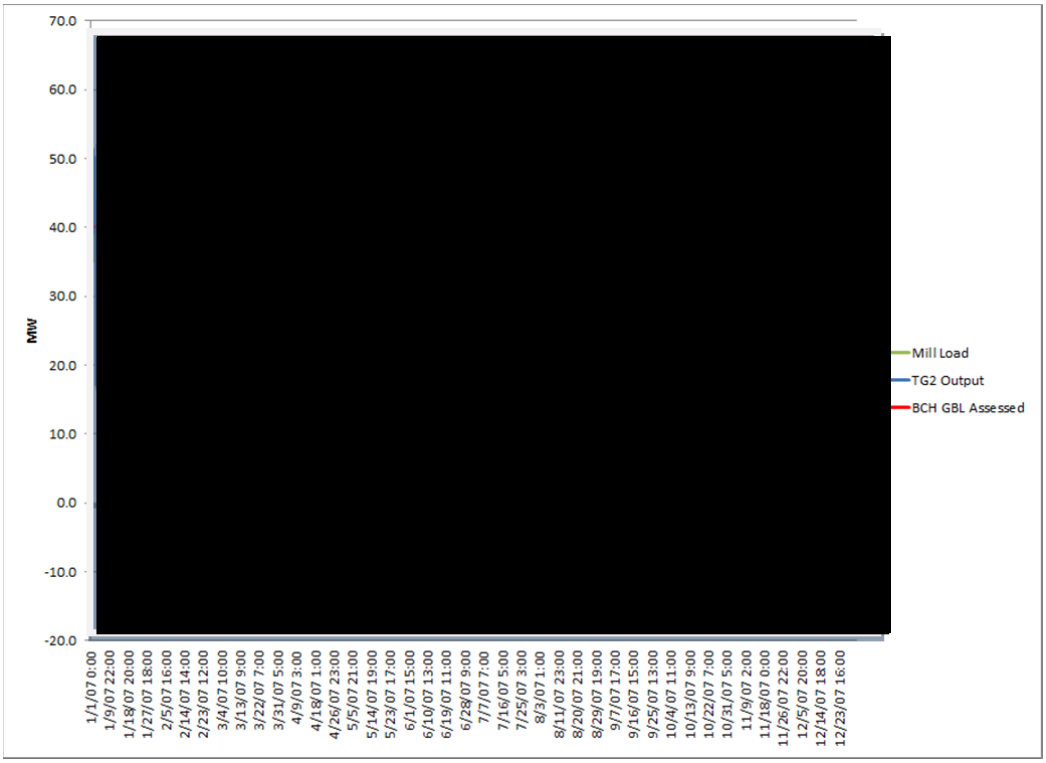
[60] *See* Energy Cost Path to $ [redacted] /A Dt then $ [redacted] A Dt,] 23 March 2007, at bates 36311, MER00036311, **PÖYRY-98** [redacted]. *See also* email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review 23 March 2007, MER00036310, **PÖYRY-99**

[61] Mr. Switlishoff has indicated 3,239 hours of imports based on his analysis; however, I could not locate his data series to compare the differences in conclusions. Elroy Switlishoff Expert Report II, ¶ 59.

[62] Pöyry Analysis of 2007 TG Production and Power Export or Import – **PÖYRY-121**.

[63] Lester Dyck Statement I, ¶ 82; Lester Dyck Statement II, ¶ 19.

Figure 6: 2007 TG2 Hourly Output vs. Mill Load and BCH GBL Assessed



63. Figure 6 compares Celgar's hourly TG2 output (*i.e.* the blue line) to its hourly mill load (*i.e.* the green line). This comparison shows that Celgar's hourly TG2 output in 2007 [redacted] with the mill's hourly load. This [redacted] supports the reasonableness of BC Hydro's decision to set Celgar's GBL at 40 MW, which was the mill's average load for 2007.

64. In conclusion, the Claimant's investments improved the pulp mill's operations and resulted in increased pulp production over 2005-2006 production levels. The increased pulp production led to increased black liquor and steam production, which in turn increased electricity generation. This confirms my conclusion in my first expert report that 2007 represented a new normal for the mill going forward.[64]

4.4 The Claimant's Allegation that it would have Operated Differently without the FortisBC and NorthPoint Sales Contracts

[64] Pöyry Expert Report I, ¶ 98.

65. Mr. Merwin states in his second witness statement that, "without the FortisBC and NorthPoint electricity sales contracts, Celgar's steam and electricity generation data would have been significantly different in 2007 and other years than actually occurred."[65] In particular, Mr. Merwin asserts that:

> There are costs (hog fuel costs and the operation and maintenance costs associated with running a power boiler at full capacity) associated with producing the discretionary, excess steam that generates electricity surplus to the Mill's own needs. Additionally, discretionary natural gas was burned to enhance power output at certain times when pricing in the market was high enough.

66. I have been asked to assess his claims that Celgar, in the absence of these sales contracts, would have made in 2007 the following operational decisions:

> Celgar would have [redacted] Thus, without the FortisBC and NorthPoint electricity sales contracts, Celgar would have [redacted] to generate electricity that would have simply flown onto the FortisBC transmission system with no compensation for Celgar.[66]

67. This section will therefore address: (1) whether Celgar was burning discretionary natural gas for the purposes of making sales; and (2) the costs associated with the power boiler, and what the consequences of shutting it down would be for Celgar's operations. I will then turn to Mr. Merwin's claim that the Claimant would have operated the mill in thermal balance in the absence of the FortisBC and NorthPoint contracts.

4.4.1 Discretionary Natural Gas

68. Mr. Merwin asserts that "discretionary natural gas was burned to enhance power output at certain times when pricing in the market was high enough", and that, without the FortisBC and NorthPoint contracts, the mill would have refrained from the [redacted][67] In order to assess how much natural

[65] Merwin Statement II, ¶ 28.

[66] Merwin Statement II, ¶ 28.

[67] Merwin Witness Statement I, ¶ 28.

gas the mill may have used to support these electricity sales in 2007, I first analyzed the fuel mix at the mill. Table 3 provides fuel mix detail for the site, by year, by asset, and by fuel type. [68]

Table 3: Fuel Consumption for Steam Summary

Production		2005	2006	2007	2008	2009	2010
Total Pulp Pdn	ADmt/a	444,723	438,885	476,468	486,034	466,863	502,097
Recovery Boiler Operating	Days	[redacted]					
Average Pulp/Day RB	ADmt/d						
Fuel Consumption for Steam							
Recovery Total	GJ/a						
Recovery Liquor	GJ/a						
Recovery Gas	GJ/a						
RB Nat. Gas	%						
PB Total Steam	GJ/a						
PB Gas	GJ/a						
PB Gas	%						
PB Hog	GJ/a						
PB Hog	%						
Plant Total							
Recovery Liquor	GJ/a						
PB Hog	GJ/a						
Recovery Gas	GJ/a						
PB Gas	GJ/a						
Recovery Liquor	%						
PB Hog	%						
Recovery Gas	%						
PB Gas	%						
Biomass	%						
Fossil Fuel	%						

69. I estimate that ~94% of the energy content of the steam generated in 2007 can be attributed to black liquor, the by-product generated in making pulp, while [redacted] would be from hog fuel, and a final [redacted] from natural gas. Burning black liquor is a necessary component of the Kraft pulping process, as it allows for the recovery of the pulping chemicals.[69]

[68] Pöyry Summary Table Graphs, **PÖYRY-120**.

[69] The recovery of chemicals is an important part of the Kraft Chemical Recovery Cycle, which I discussed in my first report: *See* Pöyry Expert Report I, ¶ 17-20. The kraft recovery system has three functions: (1) recovery and reuse of the inorganic pulping chemicals; (2) removal and sale of valuable organic by-product chemicals; and (3) destruction of the remaining organic material and recovery of its energy value as process steam and electrical power: Grace, Thomas M. "Overview of Kraft Recovery." Pulp and Paper Manufacture, Volume 5: Alkaline Pulping, Third Edition, 1983, p. 473, **PÖYRY-2 Revised**.

70. Celgar submitted evidence to the BCUC in 2008 that its "baseline use of natural gas for start-up and mill upset situations is approximately 400,000 GJ's."[70] However, in 2007, Celgar only fired 303,006 GJ of natural gas according to Annex A in the Claimant's Reply. This suggests that, generally speaking, if discretionary natural gas was being burned, it was not in large quantities.

71. In order to analyze whether Celgar in fact used discretionary natural gas in 2007, I examined natural gas prices at Station 2, which is the hub where Celgar buys its natural gas. Figure 7 shows Station 2 natural gas pricing for 2007,[71] without delivery charges.[72]

[70] Letter from Kim Moller, Sangra Moller LLP to Erica Hamilton, Commission Secretary, Re: British Columbia Utilities Commission (the "Commission"), British Columbia Hydro and Power Authority ("BC Hydro") Project No. 3698531/Order No. G-148-08 – Application to Amend Section 2.1 of Rate Schedule 3808 (the "Application") and Zellstoff Celgar Limited Partnership ("Zellstoff Celgar"), 15 December 2008, enclosing Zellstoff Celgar Evidence Submission, p. 11, **PÖYRY-122**.

[71] The chart can be found in **PÖYRY-116**. The original data can be found in Market Data Workbook (Confidential), Platts Spot Gas Prices (Jan 1, 2002 through to March 15, 2015), Monthly average daily spot prices, based on data provided by Platts, a division of McGraw Hill Financial, Inc., Exhibit **R-439**, an exhibit to the Witness Statement of Michael MacDougall.

[72] I requested that Canada search the documents produced by the Claimant for the contract prices for natural gas that Celgar had with Terasen and Spectra. Canada was not able to locate these documents in the Claimant's document production, nor was Canada able to locate data concerning the delivery charges from the Station 2 hub.

Figure 7: Station 2 Natural Gas Pricing

72. After examining the price of natural gas at Station 2, I then reviewed Celgar's sales of surplus electricity to FortisBC and NorthPoint. In 2007, Celgar sold [redacted] MWh to FortisBC and [redacted] MWh of power to NorthPoint.[73]

73. Celgar received [redacted] from FortisBC for its surplus power under their Brokerage Agreement.[74] Celgar's internal documents indicate that, in order to make 1 MWh of electricity, it needed to burn 21 GJ of natural gas.[75] Accordingly, it would only make sense to burn discretionary gas to make electricity for sales to

[73] Monthly Power Costs, December 31, 2007, at bates MER00042283, MER00042222, **PÖYRY-123**.

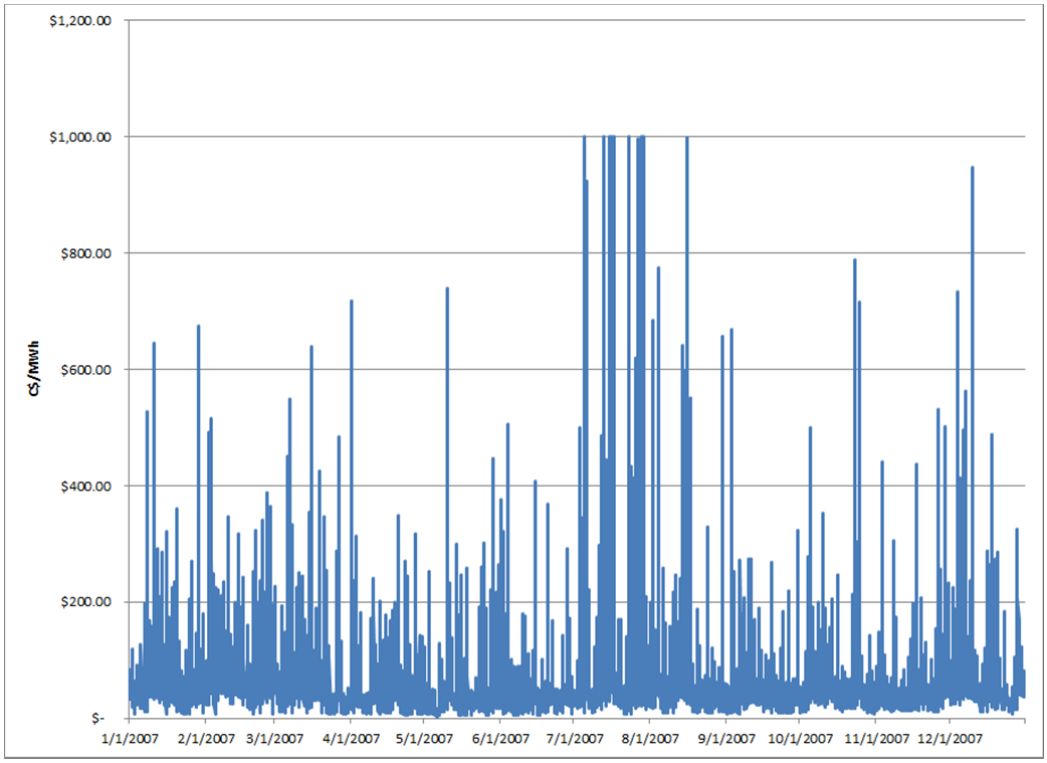
[74] General Service Power Contract between FortisBC and Zellstoff Celgar Limited Partnership, 1 Ocotober 2006 at s.10. **PÖYRY-212**. *See also* NorthPoint Sales Data for Celgar, January 2007, **PÖYRY-137**; NorthPoint Sales Data for Celgar, February 2007, **PÖYRY-138**; NorthPoint Sales Data for Celgar, March 2007, **PÖYRY-139**; NorthPoint Sales Data for Celgar, April 2007, **PÖYRY-140**; NorthPoint Sales Data for Celgar, May 2007, **PÖYRY-141**; NorthPoint Sales Data for Celgar, June 2007, **PÖYRY-142**; NorthPoint Sales Data for Celgar, July 2007, **PÖYRY-143**; NorthPoint Sales Data for Celgar, August 2007, **PÖYRY-144**; NorthPoint Sales Data for Celgar, September 2007, **PÖYRY-145**; NorthPoint Sales Data for Celgar, October 2007, **PÖYRY-146**; NorthPoint Sales Data for Celgar, November 2007, **PÖYRY-147**; NorthPoint Sales Data for Celgar, December 2007, **PÖYRY-148**.

[75] Letter from Brian Merwin to BC Hydro, Re: Zellstoff Celgar Limited Partnership ("Celgar") – Biomass Realization Project and Celgar Green Energy Project, 7 May 2008, at bates 019774, **PÖYRY-31**.

FortisBC if the price of natural gas was less than [redacted] The lowest price for natural gas at the Station 2 hub in 2007 was [redacted] It follows that it would not have made economic sense to [redacted] to make sales to FortisBC.

74. Celgar's NorthPoint contract established [redacted][76] When the opportunity presented itself with favorable pricing, transmission access was available, and with the assistance of NorthPoint, Celgar would sell power to the Alberta market. Power pricing for that market can be seen in Figure 8.[77]

Figure 8: 2007 AESO Hourly Pricing

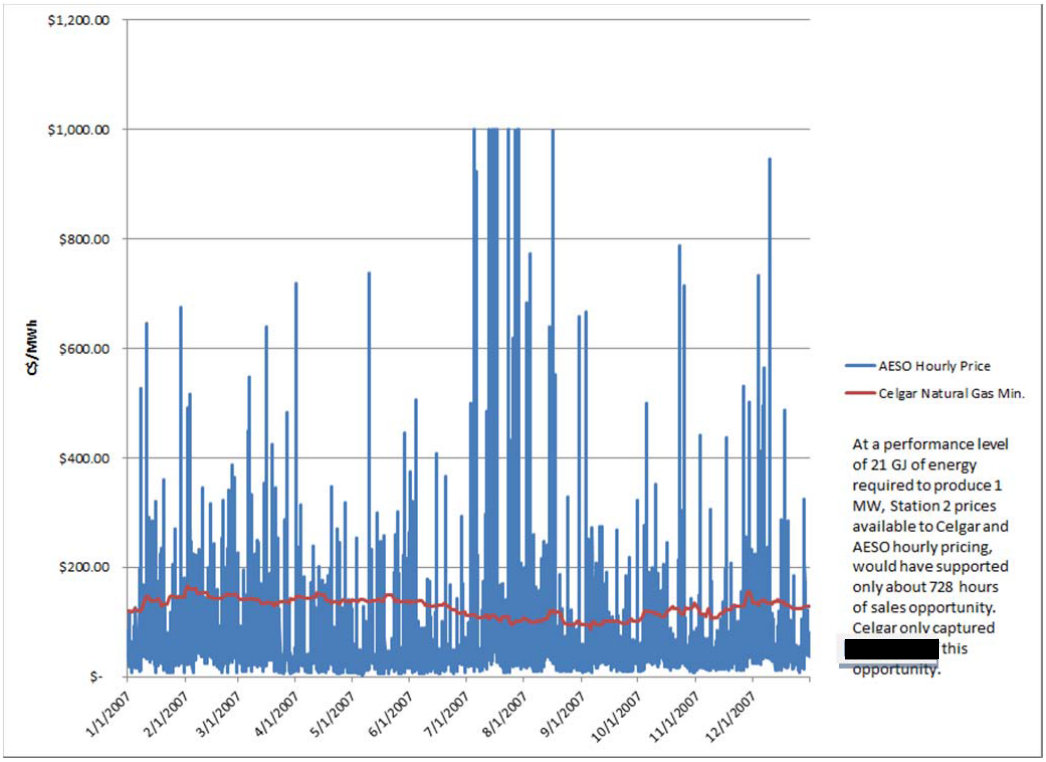


[76] Market Services Agreement between Zellstoff Celgar Limited Parternship and NorthPoint Energy Solutions Inc., dated July 12, 2006 C-213, **PÖYRY-124**.

[77] Pöyry Analysis of NorthPoint Data, **PÖYRY-116**.

75. Utilizing the Station 2 Natural Gas price in Figure 7, and assuming that 21 GJ of energy is required to generate 1 MWh,[78] I developed the red curve shown in Figure 9 below.

Figure 9: 2007 AESO Hourly Pricing vs. Celgar Natural Gas Based Power Cost



76. If AESO pricing (in blue) was above the red line, then an opportunity may have been available to Celgar to burn discretionary natural gas in order to make sales. This opportunity, however, was dependent on NorthPoint being aware of the opportunity, and the availability of transmission into Alberta, which I understand was frequently congested when prices were high.[79]

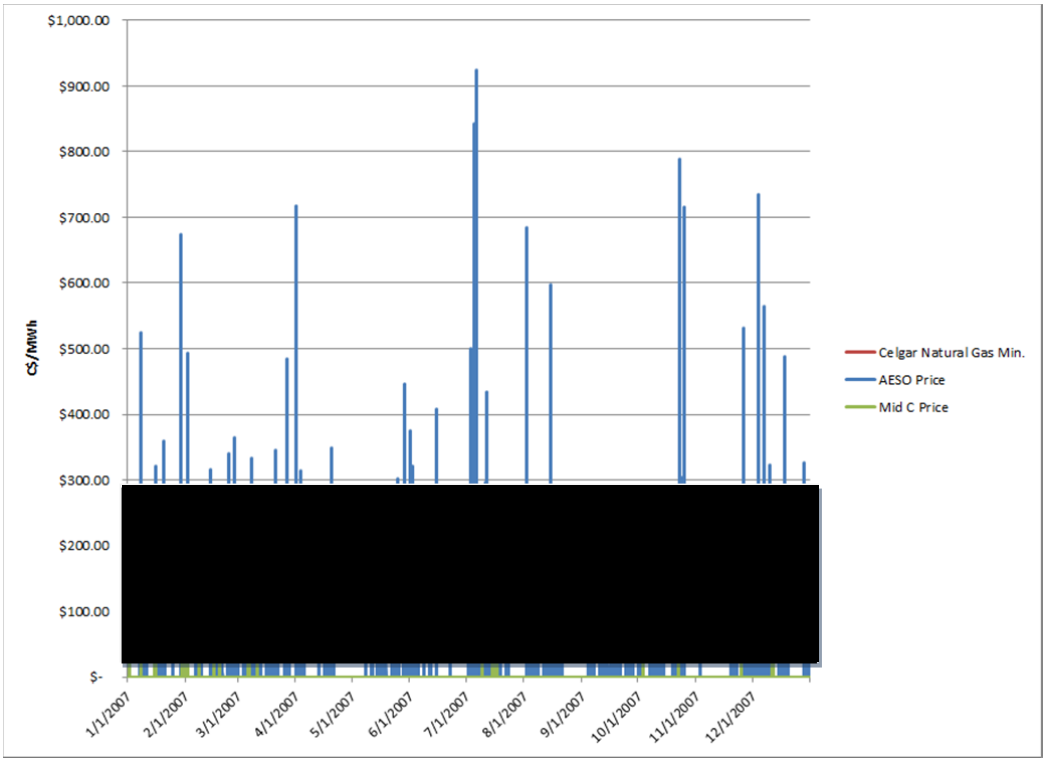
77. Figure 9 indicates that there were 728 hours in 2007 when AESO hourly pricing was higher than natural gas prices at Station 2. However, as I reviewed data

[78] Letter from Brian Merwin to BC Hydro, Re: Zellstoff Celgar Limited Partnership ("Celgar") – Biomass Realization Project and Celgar Green Energy Project, 7 May 2008, at bates 019774, **PÖYRY-31**.

[79] *See* Michael McDougall Witness I, ¶¶ 69-70; and Dean Krauss Statement I, ¶¶ 26 and 29. *See also* Energy Coordinator's July, 2007 Report to Al Hitzroth, 3 August 2007, at bates 91267, MER00091268, **PÖYRY-125** ("A total of [redacted] MWhr were exported to NorthPoint at an average price of [redacted]/MWhr. Maintaining transmission line access, when Alberta prices are most lucrative, continues to be a problem. ")

for when Celgar provided power to Alberta or to the US, I only identified [redacted] hours where this overlap occurred.[80] This can also be seen graphically in Figure 10.

Figure 10: Celgar Natural Gas Based Power Cost vs. Actual NorthPoint Sales



78. Figure 10 shows that there were many instances where AESO pricing was above Celgar's natural gas minimum,[81] but there are also many times when it was not. For sales into the U.S. (i.e., the green line), Mid-C market price levels were never above Celgar's natural gas minimum

4.4.2 Power Boiler Costs

79. Mr. Merwin also claims that without the sales contracts Celgar would not have incurred the costs associated with operating its power boiler.[82] I have

[80] Pöyry Analysis of NorthPoint Data, **PÖYRY-116**.

[81] As I indicated previously [redacted] hours occurred when pricing was above Celgar's Natural Gas Minimum in the Alberta market while Celgar provided power to Alberta for [redacted] hours. Conversely for the US, Celgar only provided power for [redacted] hours by my calculations. This is likely due to the more favorable pricing opportunities in Alberta.

[82] Brian Merwin Statement II, ¶ 28.

requested the documentation that Mr. Merwin provides in support of this assertion. There is none.

80. Mr. Merwin suggests that Celgar would not have operated its [redacted] without the sales contracts due to the expense of [redacted][83] I reviewed Celgar's internal documents to determine if this was true. These internal documents indicate that Celgar did not purchase any [redacted] from [redacted][84] The method of reporting costs on these documents changed in June 2007 such that the cost of purchasing hog fuel was no longer reported separately. Celgar, however, operated its power boiler [redacted][85] [redacted] It is therefore unlikely that it purchased any hog fuel or incurred any substantial costs associated with its operation in those months. Finally, Celgar maintains a wood room that is used to chip pulp logs and which produces hog as a by-product. This suggests that Celgar would have likely had an inventory of hog fuel from its woodroom operations to meet its need for November and December of that year.

81. Mr. Merwin's suggestion that Celgar would only use its [redacted] is unusual in light of the operational benefits that the [redacted] would have provided to Celgar.

82. First, and perhaps most importantly, Celgar indicated in numerous communications in 2007 that the power boiler was used that year to support steam demand for pulp production,[86] to address recovery boiler upsets so as not to affect

[83] Brian Merwin Statement II, ¶ 28.

[84] Zellstoff Celgar Limited Partnership, Monthly Report, January 2007, MER00274821, **PÖYRY-132**, Zellstoff Celgar Limited Partnership, Monthly Report, Feburary 2007, MER00274555, **PÖYRY-133**, Zellstoff Celgar Limited Partnership, Monthly Report, March 2007, MER00275477, **PÖYRY-134**, Zellstoff Celgar Limited Partnership, Monthly Report, April 2007, MER00041683, **PÖYRY-135**, and Zellstoff Celgar Limited Partnership, Monthly Report, May 2007, MER00026751, **PÖYRY-136**.

[85] I would clarify four modes for the power boiler in this context: "Operating", associated with consuming hog and/or natural gas and generating steam for process use. "Hot standby", associated with consuming natural gas to maintain boiler readiness and begin generating steam quickly. "Idle", associated with consuming no fuel of any type yet plans to continue expenditures to maintain equipment going forward. "Shut down", associated with consuming no fuel with no plans to maintain equipment going forward.

[86] "However, we require No. 2 power boiler to [redacted] Email from Jim McLaren to Brian Merwin, Draft Jan 2006 to March 2007 Energy Review, 23 March 2007, MER00036310, **PÖYRY-99**; Energy Cost Path to[[redacted] A Dt then [[redacted] /A Dt, 23 March 2007, at bates 036314, MER00036311,

pulp production,[87] to minimize firing of natural gas in the recovery boiler,[88] and to serve as a back-up for the incineration of concentrated non-condensable gases (required by environmental permits)[89] when other processes were down. In my experience, these are common uses for maintaining a power boiler in a pulp mill.

83. Second, Mr. Merwin asserts that the mill could have sold the [redacted][90] However, Mr. Merwin does not indicate whether there were purchasers of [redacted] that would be willing to pay satisfactory prices. I am also not aware of local facilities that would have purchased this [redacted] in the vicinity of Celgar at that time. If they could not locate a consumer that was willing to pay for the [redacted] then it would need to be disposed of in a landfill, which would impose an additional cost to the operation, or burned (if permitted).

84. Third, the power boiler was also a source for disposing of sludge, which consists of fibrous raw materials collected in the sewers and concentrated in the effluent treatment plant.[91] If sludge was not burned in the power boiler, then it would need to be disposed of in a landfill, which would pose additional costs to the operation, if another use was not found.[92]

PÖYRY-98. [redacted] Energy Coordinator's July, 2007 Report to Al Hitzroth, 3 August 2007, MER00091267, **POYRY-103**.

[87] [redacted] Energy Coordinator's August, 2007 Report to Al Hitzroth, 6 September 2007, MER00089252, **POYRY-104**.

[88] "When the mill is running steady at production rates over [redacted] and No. 2 power boiler is [redacted] the recovery boiler does not need to [redacted] to meet mill steam requirements." Energy Cost Path to $[redacted]/A Dt then $[redacted]/A Dt, 23 March 2007, at bates 036311, MER00036311, **PÖYRY-98**.

[89] [redacted] Energy Coordinator's August, 2007 Report to Al Hitzroth, 6 September 2007, MER00089252, **POYRY-104**.

[90] Merwin Witness Statement II, ¶ 28.

[91] "…It currently averages about [redacted] t/hr on a combination of [redacted]% moisture hog, wood chip fines and [redacted] moisture effluent treatment sludge. …[redacted] Email from Jim McLaren to Stephan Faucher of Siemens and Jack Smith, FW: Condensing turbine options for Zellstoff Celgar, 13 April 2007, MER00270263, **PÖYRY-83**.

[92] Celgar needed to burn natural gas in the power boiler in order to dispose of the sludge because of its moisture content , *see* January, 2007 Energy Coordinator Report to Al Hitzroth, at bates MER00089258, MER00089256, **PÖYRY-96** (

85. Finally, I do not believe that Celgar would operate in the manner suggested by Mr. Merwin, particularly because, for a cold climate mill, an auxiliary boiler is often needed to warm mill equipment during the winter months. Mill process steam demand would also increase in the winter months, which would require Celgar to operate the power boiler.

86. These considerations lead to the conclusion that Celgar would have operated its Power Boiler in the absence of sales contracts with FortisBC and NorthPoint. There is a considerable amount of evidence on the record concerning Celgar's operations. Mr. Merwin has not substantiated his claims with any of this evidence.

4.4.3 Mr. Merwin's Thermal Balance Claim

87. Mr. Merwin asserts that, without the FortisBC and NorthPoint sales contracts, Celgar would have produced only the minimal amount of steam required to remain in thermal balance and meet the mill's process needs.[93] Mr. Merwin then provides figures in a table for how the mill would allegedly operate in thermal balance. In my experience, to demonstrate a pulp mill's thermal balance, I would expect to see a detailed mass and energy balance.[94] Mr. Merwin provides none of this information. As I have not been able to locate daily or hourly statistics relating to process steam consumption or mill steam venting activities, I cannot assess the accuracy of Mr. Merwin's figures in his second witness statement.

88. I have, however, thoroughly reviewed Celgar's pulp and steam production and energy generation in 2007 above in Section 4.3. I would therefore offer the following observations concerning Mr. Merwin's assertions:

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report of diversion of "wet bio-solids" from the power boiler having a "positive impact on gas usage"). *See also* Email from Jim McLaren to Stephan Faucher of Siemens and Jack Smith, FW: Condensing turbine options for Zellstoff Celgar, 13 April 2007, MER00270263, **PÖYRY-83** (the power boiler to continue consuming "a combination of [redacted] moisture hog, wood chip fines and [redacted] moisture effluent treatment sludge" in April of that same year.)

[93] Merwin Witness Statement II, ¶ 29.

[94] *See, e.g.*, Thermal Energy Balances attached to Email from Chris Lague to Norman Wild, Re: Skookumchuck Steam Balances and expanded Exhibit 4 GBL document, **PÖYRY-56**.

- Following the completion of Project Blue Goose, Celgar substantially improved pulp production in 2007, which increased the amount of black liquor generated in 2007. Celgar disposed of its black liquor by burning it in the recovery boiler, resulting in a higher level of steam generation based on black liquor. The steam generation data I reviewed, which is set out in Table 2, confirms this trend.
- Blue Goose also led to a reduction of Celgar's process steam demand, which resulted in increasing amounts of steam being vented by the pulp mill. Put simply, Celgar's steam generation capability surpassed its process steam consumption.
- Celgar did not have [redacted]
- The Claimant's contemporaneous communications with third parties confirm that excess steam was a "spin-off benefit" of its Blue Goose improvements.
- Celgar's excess steam led it to consider whether the mill could better utilize the steam's energy potential by making additional investments in steam generation and installing an additional turbine (e.g., the Green Energy Project of 2010).
- In addition, Celgar's improved performance in 2007 as a result of Blue Goose led to energy cost savings of $[ ]/ADMT at the mill.[95] Higher electricity generation was the natural result of more stable recovery boiler operations and higher steam generation. Therefore, to operate the mill in thermal balance would require Celgar to incur the costs of purchasing more electricity from FortisBC, thereby negating some of the Blue Goose benefits.

89. I am therefore skeptical of Mr. Merwin's unsubstantiated claim that Celgar would have only produced the "minimal" amount of steam necessary to operate in thermal balance. Rather, the information I have reviewed strongly suggests that Celgar would have continued to operate in the same manner as described in

[95] Zellstoff Celgar Limited Partnership, Project Performance Analysis Capital Project Review, 24 January 2012, MER00148417, **PÖYRY-106**.

Section 4.3 above, regardless of whether it had the FortisBC and NorthPoint sales contracts.

5 THE SKOOKUMCHUCK PULP MILL

5.1 Skookumchuck's "Normal Operations" in the Absence of the 1997 EPA

90. As I explained in my first expert report, BC Hydro adopted a modeling approach for the Tembec Skookumchuck pulp mill as this was the first time it set a GBL for a pulp mill with a pre-existing EPA.[96] Mr. Switlishoff takes issue with what he calls BC Hydro's [redacted][97] His criticism ignores the nature of the 1997 EPA [redacted] The nature of the 1997 EPA was central to BC Hydro and Tembec's consideration of Skookumchuck's normal operations in the absence of this EPA.

91. Mr. Switlishoff indicated in his original report:

> "[i]n an environment where the cost of wood processing residues makes it uneconomical for a power boiler based IPP to generate electricity, an NBSK pulp mill that has made the appropriate investments would usually continue generating electricity by virtue of the black liquor co-product of the NBSK process."[98]

92. His acknowledgement of the different factors affecting the generation of electricity by a NBSK pulp mill and by an IPP operation [redacted] The 1997 EPA was originally established based on an IPP model, [redacted]

[96] Purcell Power Corp. and BC Hydro, Electricity Purchase Agreement, 5 September 1997, **PÖYRY-52** ("Purcell EPA"). *See also* Lester Dyck Statement I, ¶ 106.

[97] Elroy Switlishoff Expert Report II, ¶ 79.

[98] Elroy Switlishoff Expert Report I, ¶ 42.

[redacted]>[99] The contract structure reflected this reality, [redacted]

[redacted]>[100] [redacted]

[redacted][101]

93. In 2009, [redacted]

[redacted]>[102] As Mr. Lague explains, in 2006, [redacted]

[redacted]>[103]

94. Moreover, B.C. sawmill curtailments in the East Kootenays region intensified following the collapse in the U.S. housing market in 2008. I have found references for 5 of the 7 closest supply sources to the Skookumchuck operation, [redacted]>[104] starting to curtail their operations as early as 2007.[105] As Mr. Lague recalls, "In 2009, [redacted]

[99] *See* Christian Lague Statement, ¶ 20 ("Tembec understood that [redacted]> BC Hydro Inter-Office Memo of Tembec Skookumchuck Pulp Operations – CBL / GBL / EPA Analysis, 8 April 2009, at bates 037396, **PÖYRY-8** [redacted]> In fact, the 1997 EPA was a contract [redacted] Chris Lague Statement I, ¶ 21.

[100] Purcell Power Corp. and BC Hydro, Electricity Purchase Agreement, 5 September 1997 at bates 016986, **PÖYRY-52** ("Purcell EPA).

[101] [redacted]> attached to Email from Chris Lague to Norman Wild, Re: Skookumchuck Steam Balances and expanded Exhibit 4 GBL document, bates 157660, **PÖYRY-56**.

[102] Christian Lague Statement I, ¶¶ 33-41.

[103] Christian Lague Statement I, ¶ 33.

[104] [redacted] Purcell Power Corp. and BC Hydro, Electricity Purchase Agreement, 5 September 1997, Section 15.1 at bates 016986 and Figure 1 at bates 017007, **PÖYRY-52** ("Purcell EPA").

[105] From **PÖYRY-53**, the Canal Flats, Elko, and Cranbrook operation were announced to idle for eight weeks in February 2009. This uncertain situation persisted through the year with Canal Flats and Elko re-starting and idling again. As reported by Reuters in June 2009, "The company (Tembec) also said employees at its sawmills in Elko and Canal Flats, British Columbia, have been advised that those sites would be idled effective June 15 for a minimum of three weeks for similar reasons." Dennis Rounsville, the head of Tembec's Forest Products Group indicated, "These

[redacted][106] This had a direct impact on the cost of power generation at the mill. As Mr. Lague notes, [redacted][107]

95. Mr. Switlishoff speculates that Tembec's Skookumchuck mill [redacted]>[108] These sawmills, however, were in the business of providing lumber products and generated residual chips and hog fuel that Tembec could sell to any interested party so as to maximize revenue to the business. These sawmills were not in the business of supporting the pulp mill and, in my opinion, were operated in that manner. It would follow that changes to the residual chip and hog fuel supply to the Skookumchuck mill would cause disruptions to its operations, as it would need to locate and to source these materials elsewhere.

96. In light of the [redacted]>[109] [redacted][110] [redacted]

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shutdowns are a consequence to the rapid and significant appreciation in the value of the Canadian dollar, continued weak markets for lumber, and the related need to manage inventories and working capital." "Update 1-Tembec to temporarily idle sawmills in Ontario, BC." Euan Rocha. Reuters. June 12, 2009, **PÖYRY-126**. Based on a 2011 report discussing changes in 2010, "…the Galloway Lumber Ltd. mill also reopened after being shuttered for two years;" *2011 BC Check-Up – Kootenay Development Region*, Institute of Chartered Accountants of British Columbia, 2011, **PÖYRY-127**. As reported, "The mill has been out of production since it was moth-balled back in the spring of 2009." *Canfor's Radium mill gearing up for fall restart*, Keith Powell, Kootenay Business, October 2012, **PÖYRY-128**.

[106] Christian Lague Statement, ¶ 34.

[107] This is a distinction between the Skookumchuck and Celgar operations as, [redacted] Celgar does have this equipment and uses this capability in their fiber basket to balance the pricing of residual chips with those processed onsite at its woodroom so as to mitigate supply risks in manufacturing pulp.

[108] *See* Elroy Switlishoff Expert Report II, ¶ 75; *See also* Peter Fox-Penner Expert Report, ¶ 61.

[109] During BC Hydro review of Skookumchuck's operation, [redacted] BC Hydro Inter-Office Memo of Tembec Skookumchuck Pulp Operations – CBL / GBL / EPA Analysis, 8 April 2009, at bates 037397, **PÖYRY-8**.

[110] Christian Lague Statement, ¶ 40.

[redacted]>[111] BC Hydro agreed that, without the delivery obligations of the 1997 EPA, and without the prospect of the new EPA, [redacted]

97. BC Hydro also recognized that, [redacted]>[112] BC Hydro therefore agreed to negotiate a new agreement with Tembec on the same terms as the Bioenergy Call for Power Phase I contracts, including a GBL.

98. Mr. Switlishoff also cites to Tembec's generating data following the mill's shutdown in February 2009 to support his assertion that BC Hydro's approach to Tembec's GBL used a [redacted]>[113] I note only that Tembec was operating the plant, [redacted]>[114] [redacted] the reality of Skookumchuck's operations would necessarily change.

5.2 Clarifications on the Model

99. The Claimant alleges in its Reply and accompanying expert reports that BC Hydro did not conduct an independent analysis of Tembec's model and that I only used a model to confirm the setting of the GBL.[115] The April 2009 Inter-office memo of BC Hydro indicates clearly the perspectives held by BC Hydro and Tembec of both sides' initial GBL proposal.[116] The discussion and review of the communications held

[111] Letter from C. Lague, Tembec to Matt Steele, BC Hydro, Re: Tembec Skookumchuck site GBL, dated March 10, 2009, **PÖYRY-54**; Christian Lague Statement, ¶¶ 39, 43.

[112] *See* BC Hydro Inter-Office Memo of Tembec Skookumchuck Pulp Operations – CBL / GBL / EPA Analysis, 8 April 2009, **PÖYRY-8**.

[113] Second Expert Statement of Elroy Switlishoff, ¶ 81.

[114] Christian Lague Statement, ¶ 52.

[115] Elroy Switlishoff Expert Report II, ¶¶ 42 (and fn 23), 69, 71; Claimant's Reply, ¶ 444, fn 500. Pöyry Expert Report I, ¶¶ 133-136.

[116] [redacted]

and process data shared between BC Hydro and Tembec is discussed in my original report.[117] Mr. Dyck also confirms that BC Hydro's engineers ran an equivalent model to that run by Mr. Lague.[118]

100. In addition, the Claimant may have misinterpreted my original report when I indicated that: "Examining the [redacted] Diagram … and using the historical operation data (following tables)."[119] The diagram I referred to merely show the expected power output of the turbine [redacted] These diagrams have no reference points to draw conclusions; however, I applied the operating data submitted, as referenced in my original report, to address the claims Tembec made concerning [redacted][120] [redacted] [121]

101. My review utilized [redacted] [122] This information, applied to the diagrams mentioned above, would result in [redacted]

[redacted] BC Hydro Inter-Office Memo of Tembec Skookumchuck Pulp Operations – CBL / GBL / EPA Analysis, 8 April 2009, at bates 037398, **PÖYRY-8**.

[117] Pöyry Expert Report I, ¶¶ 132 – 135.

[118] Lester Dyck Statement II, ¶ 43. I note that the engineer who ran the models, Mr. Norman Wild, lost his models in a file transfer.

[119] Pöyry Expert Report I, ¶ 134.

[120] Pöyry Expert Report I, ¶ 135

[121] Letter from C. Lague, Tembec to Matt Steele, BC Hydro, Re: Tembec Skookumchuck site GBL, dated March 10, 2009, **PÖYRY-54**; Christian Lague Statement I, ¶¶ 42-45.

[122] In my first report, I also concluded that [redacted] Tembec Skookumchuck CBL Calculations F10 & F11, **POYRY-129**.)

[redacted]>[123]. [redacted] BC Hydro ran a model that confirmed [redacted]>[124] and subsequently proposed a GBL of 14 MW, which Tembec accepted.

102. In clarifying this process, I hope it is understood now that I did not utilize a model, but process data used to develop the model utilized by Tembec in GBL discussions. This data is from [redacted] and would be, in my view, in agreement with reviewing process data for the GBL determination.

103. The Claimant also critiques the model for [redacted]>[125] Its critique, however, assumes that Tembec's negotiating position [redacted]>> As I described in my initial report, Tembec's position was that, [redacted][126] However, BC Hydro [redacted]>[127] [redacted][128]

[123] As Tembec indicated to BC Hydro, [redacted] Letter from C. Lague, Tembec to Matt Steele, BC Hydro, Re: Tembec Skookumchuck site GBL, dated March 10, 2009 bates 020996, **PÖYRY-54**.

[124] Lester Dyck Statement II, ¶ 43.

[125] *See, e.g.* Switlishoff II, ¶¶ 40-41, 68.

[126] Pöyry Expert Report I, ¶ 132; *see also* Letter from C. Lague, Tembec to Matt Steele, BC Hydro, Re: Tembec Skookumchuck site GBL, dated March 10, 2009, **PÖYRY-54**.

[127] Lester Dyck Statement II, ¶ 46.

[128] Lester Dyck Statement II, ¶ 45.

104. Given that the mill would operate [redacted] without an EPA, I conclude Mr. Switlishoff's concerns are misplaced. I have already described that a hog boiler will typically play a support role to a recovery boiler in producing steam for process needs, [redacted]

6 THE HOWE SOUND MILL

105. As I explained in my first expert report, Howe Sound and BC Hydro negotiated the conditions under which Howe Sound could sell idle generation in 2001 through a Consent and Enabling Agreement.[129] Mr. Pierre Lamarche has testified that Howe Sound had idle generation [redacted] Mr. Lamarche has also explained that Howe Sound's < [redacted] MW threshold for sales was established [redacted] >[130]

106. Mr. Lamarche indicates that Howe Sound's sales under the 2001 Consent Agreement were made by [redacted] >[131] This stands in stark contrast to Celgar's power sales in 2007. My analysis above indicates that it was unlikely that the power Celgar sold to FortisBC and NorthPoint was solely generated by [redacted] >[132] Rather, Celgar appears to have used [redacted] almost exclusively for [redacted]

[129] Consent and Enabling Agreement between British Columbia Hydro and Power Authority, Howe Sound Pulp and Paper Limited and Powerex Corp., 12 April, 2001., **PÖYRY-130**.

[130] Pierre Lamarche Statement II, ¶¶ 4-6.

[131] Pierre Lamarche Statement I, ¶¶ 39-40.

[132] Market Data Workbook (Confidential), Platts Spot Gas Prices (Jan 1, 2002 through to March 15, 2015), Monthly average daily spot prices, based on data provided by Platts, a division of McGraw Hill Financial, Inc., Exhibit **R-439**, an exhibit to the Witness Statement of Michael MacDougall

107. BC Hydro and Howe Sound [redacted] the Consent and Enabling Agreement as the price of natural gas for the pulp mill remained high. Howe Sound, however, [redacted]

108. The Claimant also continues to complain that BC Hydro should [redacted] As I indicated in my first report, I reviewed the process and considerations that resulted in Howe Sound's operation [redacted] This was brought to the attention of BC Hydro's negotiation team as these events impacted the site's power generation capability.[133] I also noted in my original report that the negotiation team did not consider data prior to this timeframe as its operations had changed significantly.[134]

109. Mr. Switlishoff contends that [redacted]>[135] This makes little sense. Howe Sound [redacted] The information provided to the negotiating team indicated that [redacted]>[136] It is my understanding that Mr. Dyck in his first witness statement was simply explaining why he [redacted]

[133] Pöyry Expert Report, ¶¶ 111-117.

[134] I would liken this change similar to how I described Celgar's operations after Blue Goose as a "new normal." Pöyry Expert Report, ¶ 160. Also, for the reasons [redacted]

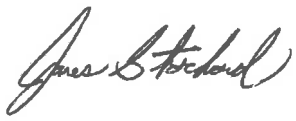
[135] Elroy Switlishoff Expert Report II, ¶ 81-86.

[136] Pöyry Expert Report, ¶ 112.

7 CONCLUSIONS

111. In conclusion, I am of the view that BC Hydro set GBLs in an objective manner that took into account the unique situation and circumstances at each of these pulp mills. I therefore can confirm my conclusion in my first expert report that these GBLs appear to be reasonable.

112. I would welcome any questions the Tribunal might have concerning my conclusions.



James Stockard
Pöyry Management Consulting USA, Inc.

APPENDIX A

Pöyry Analysis	**Source Documents Produced by the Claimant**
Pöyry Analysis of 2005 Selected Daily Operating Statistics, **PÖYRY-72**	Zellstoff Celgar Limited, Daily Statistics, January 2005, MER00288969**;** Zellstoff Celgar Limited, Daily Statistics, February 2005, MER00288929**;** Zellstoff Celgar Limited, Daily Statistics, March 2005, MER00289095**;** Zellstoff Celgar Limited, Daily Statistics, April 2005, MER00288800**;** Zellstoff Celgar Limited, Daily Statistics, May 2005, MER00289135**;** Zellstoff Celgar Limited, Daily Statistics, June 2005, MER00289054**;** Zellstoff Celgar Limited, Daily Statistics, July 2005, MER00289009**;** Zellstoff Celgar Limited, Daily Statistics, August 2005, MER00288839**;** Zellstoff Celgar Limited, Daily Statistics, September 2005, MER00289262**;** Zellstoff Celgar Limited, Daily Statistics, October 2005, MER00289218**;** Zellstoff Celgar Limited, Daily Statistics, November 2005, MER00289174**;** Zellstoff Celgar Limited, Daily Statistics, December 2005, MER00288884**.**
Pöyry Analysis of 2006 Selected Daily Operating Statistics, **PÖYRY-73**	Zellstoff Celgar Limited, Daily Statistics, January 2006, MER00289488; Zellstoff Celgar Limited, Daily Statistics, February 2006, MER00289444; Zellstoff Celgar Limited, Daily Statistics, March 2006, MER00289626; Zellstoff Celgar Limited, Daily Statistics, April 2006, MER00289308; Zellstoff Celgar Limited, Daily Statistics, May 2006, MER00289670; Zellstoff Celgar Limited, Daily Statistics, June 2006, MER00289581; Zellstoff Celgar Limited, Daily Statistics, July 2006, MER00289536; Zellstoff Celgar Limited, Daily Statistics, August 2006, MER00289353; Zellstoff Celgar Limited, Daily Statistics, September 2006, MER00289807; Zellstoff Celgar Limited, Daily Statistics, October 2006, MER00289761; Zellstoff Celgar Limited, Daily Statistics, November 2006, MER00289715; Zellstoff Celgar Limited, Daily Statistics, December 2006, MER00288398.
Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74**	Zellstoff Celgar Limited, Daily Statistics, January 2007, MER00290022, **PÖYRY-84**; Zellstoff Celgar Limited, Daily Statistics,

	February 2007, MER00289976, **PÖYRY-85**; Zellstoff Celgar Limited, Daily Statistics, March 2007, MER00290151, **PÖYRY-86**; Zellstoff Celgar Limited, Daily Statistics, April 2007, MER00289852, **PÖYRY-87**; Zellstoff Celgar Limited, Daily Statistics, May 2007, MER00290196, **PÖYRY-88**; Zellstoff Celgar Limited, Daily Statistics, June 2007, MER00290109, **PÖYRY-89**; Zellstoff Celgar Limited, Daily Statistics, July 2007, MER00290068, **PÖYRY-90**; Zellstoff Celgar Limited, Daily Statistics, August 2007, MER00289897, **PÖYRY-91**; Zellstoff Celgar Limited, Daily Statistics, September 2007, MER00290320, **PÖYRY-92**; Zellstoff Celgar Limited, Daily Statistics, October 2007, MER00290279, **PÖYRY-93**; Zellstoff Celgar Limited, Daily Statistics, November 2007, MER00290239, **PÖYRY-94**; Zellstoff Celgar Limited, Daily Statistics, December 2007, MER00289936, **PÖYRY-95.**
Pöyry Analysis of 2008 Selected Daily Operating Statistics, **PÖYRY-75**	Zellstoff Celgar Limited, Daily Statistics, January 2008, MER00290507; Zellstoff Celgar Limited, Daily Statistics, February 2008, MER00290468; Zellstoff Celgar Limited, Daily Statistics, March 2008, MER00290626; Zellstoff Celgar Limited, Daily Statistics, April 2008, MER00290360; Zellstoff Celgar Limited, Daily Statistics, May 2008, MER00290666; Zellstoff Celgar Limited, Daily Statistics, June 2008, MER00290587; Zellstoff Celgar Limited, Daily Statistics, July 2008, MER00290547; Zellstoff Celgar Limited, Daily Statistics, August 2008, MER00290400; Zellstoff Celgar Limited, Daily Statistics, September 2008, MER00290759; Zellstoff Celgar Limited, Daily Statistics, October 2008, MER00290732; Zellstoff Celgar Limited, Daily Statistics, November 2008, MER00290705; Zellstoff Celgar Limited, Daily Statistics, December 2008, MER00290441.
Pöyry Analysis of 2009 Selected Daily Operating Statistics, **PÖYRY-76**	Zellstoff Celgar Limited, Daily Statistics, January 2009, MER00290910; Zellstoff Celgar Limited, Daily Statistics, February 2009, MER00290883; Zellstoff Celgar Limited, Daily Statistics, March 2009, MER00290994; Zellstoff Celgar Limited, Daily Statistics, April 2009, MER00290802; Zellstoff Celgar Limited, Daily Statistics, May 2009, MER00291021;

	Zellstoff Celgar Limited, Daily Statistics, June 2009, MER00290967; Zellstoff Celgar Limited, Daily Statistics, July 2009, MER00290940; Zellstoff Celgar Limited, Daily Statistics, August 2009, MER00290829; Zellstoff Celgar Limited, Daily Statistics, September 2009, MER00291102; Zellstoff Celgar Limited, Daily Statistics, October 2009, MER00291075; Zellstoff Celgar Limited, Daily Statistics, November 2009, MER00291048; Zellstoff Celgar Limited, Daily Statistics, December 2009, MER00290856.
Pöyry Analysis of 2010 Selected Daily Operating Statistics, **PÖYRY-77**	Zellstoff Celgar Limited, Daily Statistics, January 2010, MER00291267; Zellstoff Celgar Limited, Daily Statistics, February 2010, MER00291233; Zellstoff Celgar Limited, Daily Statistics, March 2010, MER00291366; Zellstoff Celgar Limited, Daily Statistics, April 2010, MER00291130; Zellstoff Celgar Limited, Daily Statistics, May 2010, MER00291400; Zellstoff Celgar Limited, Daily Statistics, June 2010, MER00291332; Zellstoff Celgar Limited, Daily Statistics, July 2010, MER00291303; Zellstoff Celgar Limited, Daily Statistics, August 2010, MER00291164; Zellstoff Celgar Limited, Daily Statistics, September 2010, MER00291507; Zellstoff Celgar Limited, Daily Statistics, October 2010, MER00291475; Zellstoff Celgar Limited, Daily Statistics, November 2010, MER00291430; Zellstoff Celgar Limited, Daily Statistics, December 2010, MER00291191.
Pöyry Analysis of Recovery Boiler Steam Production, **PÖYRY-115**	Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74.**
Pöyry Analysis of NorthPoint Data, **PÖYRY-116**	Station 2 Natural Gas Pricing, AESO Prices, and Mid-C Prices for 2007, **R-439;** Pöyry Analysis of Recovery Boiler Steam Production, **PÖYRY-115;** NorthPoint Sales Data for Celgar, January 2007, **PÖYRY-137** NorthPoint Sales Data for Celgar, February 2007, **PÖYRY-138;** NorthPoint Sales Data for Celgar, March 2007, **PÖYRY-139;** NorthPoint Sales Data for Celgar, April 2007, **PÖYRY-140;** NorthPoint Sales Data for Celgar, May 2007, **PÖYRY-141;** NorthPoint Sales Data for Celgar, June 2007,

	PÖYRY-142; NorthPoint Sales Data for Celgar, July 2007, **PÖYRY-143;** NorthPoint Sales Data for Celgar, August 2007, **PÖYRY-144**; NorthPoint Sales Data for Celgar, September 2007, **PÖYRY-145;** NorthPoint Sales Data for Celgar, October 2007, **PÖYRY-146;** NorthPoint Sales Data for Celgar, November 2007, **PÖYRY-147;** NorthPoint Sales Data for Celgar, December 2007. **PÖYRY-148;**
Pöyry Summary Table Graphs, **PÖYRY-120**	Zellstoff Celgar Limited, Monthly Statistical Summary, January 2005 to January 2013, MER00292666, **PÖYRY-71;** Pöyry Analysis of 2005 Selected Daily Operating Statistics, **PÖYRY-72;** Pöyry Analysis of 2006 Selected Daily Operating Statistics, **PÖYRY-73;** Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74;** Pöyry Analysis of 2008 Selected Daily Operating Statistics, **PÖYRY-75;** Pöyry Analysis of 2009 Selected Daily Operating Statistics, **PÖYRY-76;** Pöyry Analysis of 2010 Selected Daily Operating Statistics, **PÖYRY-77.**
Pöyry Analysis of 2007 TG Production and Power Export or Import, **PÖYRY-121**	Hours when Celgar Imported Exported Power 2007, MER00286704; TG2 Output daily and hourly 2004-2009, MER00287799.
Pöyry Review of Reported Generation Discrepancy, **PÖYRY-193**	Reply Annex A; Zellstoff Celgar Limited, Monthly Statistical Summary, January 2005 to January 2013, MER00292666, **PÖYRY-71;** Pöyry Analysis of 2005 Selected Daily Operating Statistics, **PÖYRY-72;** Pöyry Analysis of 2006 Selected Daily Operating Statistics, **PÖYRY-73;** Pöyry Analysis of 2007 Selected Daily Operating Statistics, **PÖYRY-74;** Pöyry Analysis of 2008 Selected Daily Operating Statistics, **PÖYRY-75;** Pöyry Analysis of 2009 Selected Daily Operating Statistics, **PÖYRY-76;** Pöyry Analysis of 2010 Selected Daily Operating Statistics, **PÖYRY-77.**