

**EOI # E100299**

**Weyerhaeuser Grande Prairie Evaporator  
Project**

**Final Technical & Financial Report**

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**Abstract & Keywords** (for the CCEMC website – can be up to 500 words)

Weyerhaeuser Company Limited, at its Grande Prairie Alberta pulpmill, replaced its 5-effect evaporator plant with a new state-of-the-art, high efficiency 7-effect evaporator plant. The new evaporator plant will significantly reduce greenhouse gas emissions by utilizing less steam and generating additional green power for export to the Alberta power grid. The project has many other environmental and operational benefits, such as a decrease in water usage for the mill and an increase in high quality NBSK pulp production.

The new evaporator plant started up in November, 2012 and the benefits were realized quickly. The project was the last phase in a series of three large projects aimed at replacing the Chemical Recovery & Utilities section of the mill with new start-of-the art, high efficiency assets. The mill is now a net energy exporter for the north-west region of the province.

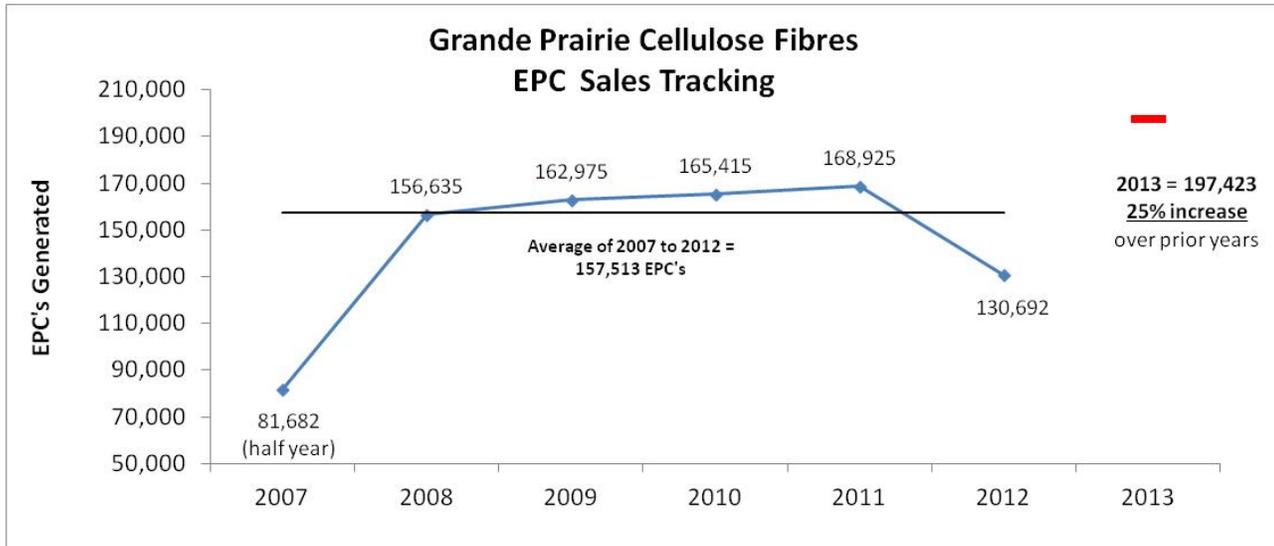
**Original Project Goals & Project Final Outcomes**

	<b>Original Project Goals</b>	<b>Project Final Outcomes</b>
<b>Cost</b>	<ul style="list-style-type: none"><li>The estimated project costs during the planning stage of the project was \$72,550,528</li></ul>	<ul style="list-style-type: none"><li>Final project costs came in at \$81,791,227.</li><li>This was 12.7% over the original estimate and driven by the primary vessel delivery delays and significant competition for trades labour in the region.</li><li>The CCEMC contribution of \$5 million was ~6% of the final project costs</li></ul>
<b>Schedule</b>	<ul style="list-style-type: none"><li>The estimated project startup date during the planning stage of the project was June, 2012</li></ul>	<ul style="list-style-type: none"><li>The new Evaporator plant started up successfully on November 18, 2012.</li><li>This ~5 month start up delay was due to the primary vessels being delivered later than planned. There were delays leaving the port in Asia and then delays on delivery from the U.S. where the vessels landed in North America.</li><li>There were minor delays towards the end of the project due to a skilled labour shortage.</li></ul>

<p><b>Outputs</b></p>	<ul style="list-style-type: none"> <li>• The key deliverables for the Evaporator project were: <ul style="list-style-type: none"> <li>○ Improved steam economy of 5.9 lbs of water evaporated per lb of steam used.</li> <li>○ 80% solids delivered to the recovery boiler.</li>   <li>○ Throughput capacity of 2,554 gpm (gallons per minute).</li>   <li>○ Generate 23 MW's of additional power.</li>   <li>○ 8% water consumption reduction.</li>   <li>○ 6% pulp production improvement.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Since the start up of the new Evaporator plant the mill immediately realized some of the benefits and has consistently been progressing towards others: <ul style="list-style-type: none"> <li>○ The steam economy target was realized right away.</li>   <li>○ For the full year 2013 &amp; 2014 the mill achieved 78% solids delivered to the recovery boiler. The primary issue in reaching 80% has been the need to complete water washes, introducing moisture into the system. Work continues to get to the final target of 80% solids.</li> <li>○ The mill averaged 1900 gpm after start up and has consistently moved towards the design of 2,554 gpm. Currently running in the 2,250 gpm range.</li> <li>○ As of January, 2014 the mill is currently generating ~18 MW's of additional power. As we progress to the throughput &amp; solids targets we will get to the 23 MW target.</li> <li>○ For the full year 2013 the mill saw a 10% reduction in water consumption, beating the project target.</li> <li>○ The mill has exceeded the 6% pulp production improvement, meeting the project targets &amp; setting numerous production records in 2013.</li> </ul> </li> </ul>
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**Preliminary GHG Impact Assessment**

	<b>Original Project Goals</b>	<b>Preliminary GHG Impact Assessment</b>
<b>GHG Impact Assessment</b>	<ul style="list-style-type: none"> <li>In the planning phase of the project it was estimated that GHG emissions would be reduced by 112,160 CO2e per year. The key drivers to the estimate were the additional 23 MW's of green power &amp; the additional 22,200 tonnes of pulp production.</li> </ul>	<ul style="list-style-type: none"> <li>Based on the results achieved by the project in January 2014:               <ul style="list-style-type: none"> <li>The pulp production target has been met.</li> <li>The mill is approximately 5 MW's short on the power target.</li> </ul> </li> <li>The 5 year target GHG emissions reduction which was based on achieving the full 23 MW's of additional green power is still valid. The mill expects to reach this level in the future as we continue to optimize the project.</li> </ul>
	<ul style="list-style-type: none"> <li>The graph below is a summary of the number of EPC's our mill has been generating each year under the SGER regulation. As shown, from the first year in 2007 through 2012 (the Evaporator project started up in mid-November 2012) we generated on average around 157,513 EPC's each year. 2013 was our first full year of operation with the new Evaporator plant and we saw an increase of 25% in our EPC's for that calendar year. 2013 was characterized by start up and optimization of the new Evaporator plant throughout the year. A 25% increase in the first full year of operation is a significant improvement over where we were prior to the project. We expect to see more improvement going forward.</li> <li>Our 2013 EPC's were chosen for random audit in November, 2014 under the SGER legislation. We received the final audit report from SAI Global in January, 2015. We also have the 3rd party verification by CRA that was completed in Q1/2014 for our 2013 compliance year. Both reports have been attached as verification of the GHG assessment.</li> </ul>	



## Overall Conclusions

The implementation of the new Evaporator project at the Weyerhaeuser, Grande Prairie Pulpmill has been a success. Not only has the project taken the mill to a new level in terms of energy self sufficiency and net export capability to the Alberta grid, it has also resulted in other significant environmental benefits like a 10% reduction in water consumption & a 40% reduction in SO2 emissions. Another significant outcome of the project has been the re-mapping of water temperature streams in our facility. Hot, warm & cold water streams have been segregated with the start up of the Evaporator plant and we are just now starting to see the significant opportunities in isolating these streams and optimizing energy usage within each of them. We believe this will lead to even more green energy & environmental improvement in the years to come.

The new technology is state-of-the-art for a KRAFT Pulpmill in North America and serves as a benchmark in the industry for other mills to follow.