

**Site C Submission on Biomass Energy Purchase Agreements  
A Critical Component of BC's Integrated Forest Industry  
Submitted by BC Pulp & Paper Coalition (PPC)<sup>1</sup>**

**Executive Summary**

Biomass cogeneration, as opposed to standalone greenfield biomass generation, is the only resource option available to BC Hydro that provides reliability with the following attributes:

- Dependable generation with the capacity for firming, shaping and storage;
- Cost effective and connected to the grid near major users; and,
- Renewable as defined by being GHG neutral.

Biomass energy sales is an outcome of the government strategy of increasing forest utilization and is critically integrated into the forest sector supply chain. The PPC asserts that, as a minimum, 100% of the existing biomass cogeneration Electricity Purchase Agreements (EPAs) need to be renewed to preserve the value of the integration of the forest industry and mitigate the load attrition risk of major forest products customers whose EPAs may not be renewed.

The fuel risk associated with biomass energy sales by forest companies is manageable and is already being taken on by the proponents, and there is likely opportunity for some growth. BC Hydro has 730 MW and 2,600 GWh of generation of biomass cogeneration under EPAs.<sup>2</sup>

Termination of these EPAs removes the only option for use or disposition of forest waste in most regions of the province, with potentially far reaching impacts. The PPC is open to transitioning to a new EPA model for biomass that meets BC Hydro's changing operating context as evidenced by recent records for peak demand in winter and summer. Finally, given the far-reaching policy impacts of biomass cogeneration there may need to be some consideration of whether the BC Hydro rate payer should bear all the cost of this resource.

**Comments on the Interim Report**

The PPC would first like to acknowledge the Commission's interim findings with respect to Bioenergy, specifically:

*"31. The Panel finds that geothermal, biomass, solar and battery storage may be viable alternatives and requests that BC Hydro rerun its portfolio analysis with these alternatives included.*

*34. Based on BC Hydro's submission, the Panel finds that biomass is eligible for inclusion in an alternate portfolio. It is firm, dispatchable and has a relatively low UEC.<sup>3</sup>"*

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<sup>1</sup> Submission on behalf of the Industry members of the BC Pulp & Paper Coalition

<sup>2</sup> <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/independent-power-producers-calls-for-power/independent-power-producers/ipp-supply-list-in-operation.pdf>

<sup>3</sup> *British Columbia Hydro and Power Authority – British Columbia Utilities Commission Inquiry Respecting Site C – Project No. 1598922 – Preliminary Report 6.0 Appendix F – Summary of preliminary findings*

### **Responses to the Commission's Questions**

The PPC would like to offer its perspective on two questions posed by the Panel in the Interim Report.

***Question 66. Based on BC Hydro's submission, the Panel finds that biomass is eligible for inclusion in an alternate portfolio. It is firm, dispatchable and has a relatively low UEC. However, BC Hydro also states that the availability of source fibre is limited and its long-term availability is uncertain. BC Hydro is requested to confirm this conclusion is current and up to date.<sup>4</sup>***

The PPC believes that biomass fuel supply dynamics, which are a key component of the forest industry integrated supply chain, are not well understood outside of the sector and that the issue of fuel availability can be readily managed by the forest companies. BC Hydro has stated in their 2013 Integrated Resource Plan (IRP) that only 50% of the Biomass EPAs should be renewed – this is not an acceptable outcome based on the BC Forest Industry's capability regarding biomass supply. In fact, this would be damaging to the BC Forest Industry.

1. **Fuel Risk is to the Proponent's Account:** EPA's have been structured so the proponent takes the fuel risk in the form of Liquidated Damages for delivery shortfall – not BC Hydro. In fact, the reason that many EPAs are up for renewal soon is that some proponents wanted to manage their exposure to potential Liquidated Damages due to the assumption of the fuel risk. Shorter EPA terms provided proponents an opportunity to "right size" their firm energy obligation in the near term based on their internal projections. Therefore, we argue that the fuel supply risk should remain with the groups that have been working through those challenges since the first pulp mills were started up in the early 1900's. It is PPC's position that BC Hydro should plan to include renewal of 100% of the existing biomass generator fleet capacity while allowing for an opportunity to reshape generation profiles based on biomass supply situation and flexibility for each generator.
2. **Increased Forest Utilization will increase Fuel Supply:** The recent government policy announcement to apply a carbon tax to slash pile burning effective April 1, 2018 appears to be a clear signal that the government wants more biomass to come out of the forest. The impact of this change remains to be seen but it is reasonable to assume that this will result in an increase in available fuel for bioenergy. This is consistent with the previous BC Government whose Forest Minister also had the mandate to increase forest utilization by extracting more residuals from the forests. BC Forest Ministry reports of avoidable timber waste at logging sites confirm the opportunity for additional volume.
3. **Efficiency Improvements Reduce Biomass Requirements:** Equating fuel supply to generating capacity is an oversimplification of future bioenergy potential. Conversion efficiency, the amount of electricity output per mass of biomass fuel input, of mills across the province varies widely and all mills have varying opportunities to improve their conversion efficiency. In short, not only is there sufficient fuel available, there is also the ability to extract more energy from every tonne collected from our forests which can increase output or lower generation costs.
4. **Regional Fuel Availability is Variable:** The BC Forest Industry is diverse with supply and demand balances that vary across its unique regions and commercial environments. Excess fuel supply is a greater issue in the foreseeable future with many suppliers being forced to stockpile or landfill

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<sup>4</sup> 3.0 Appendix C – List of questions for BC Hydro

biomass due an imbalance in demand from biomass boilers. For instance, the BC Coast region has an oversupply of biomass fuel (hog fuel) that continues to create disposal problems. Producing more bioenergy would be an effective solution.

5. **Fibre Availability is not the same as Fuel Availability:** The PPC would also like to make a distinction between “fibre” and biomass “fuel”. As an integrated system, our industry is designed to ensure that every piece of wood harvested is directed to its highest value and best use. However, much of the fuel that enters our boilers is unsuitable for alternative conversion due to various reasons (e.g., moisture, size, contamination with bark, dirt and salt). Power generation via incineration is the most robust of all the conversion technologies and is an effective option for value recovery. The PPC represents biomass generators whose fuel supply is integrated with its fibre feedstock for conversion into value added products. Moreover, access to fibre is often contingent on taking the associated wood waste associated with that fibre under contractual arrangements with other forest companies.

***67. Parties are invited to provide updated costing data (capital, O&M, capacity factor) and long-term availability estimates for biomass.<sup>5</sup>***

It appears that the portfolio analysis was based on the Phase 2 Bioenergy Call, which only considered greenfield biomass IPP's. These plants are inherently more expensive than cogeneration facilities due to the economy of scale and the higher thermal efficiency of an integrated facility with an on-site steam host for the steam and heat extracted from the turbine. The Phase 1 Bioenergy Call was a competitive process that was open to all potential proponents, and this call provides a good benchmark for the price of bioenergy in the province at that point in time and would be an indicator of the high end of the potential price range presently.

A breakdown of the detailed costing data for an integrated facility is not a practicable since each facility is unique in terms of the characteristics of its steam demand, boiler design, fuel quality and turbine design. The key challenge in these estimates is how to allocate the total site costs for capital and O&M between power generation and market production. A costing estimate for a proxy greenfield site, although higher, is much more straightforward.

The estimate of capacity factor is similarly complicated since the capacity of an integrated site is a function of the generator capacity, boiler capacity and steam load at the site – all of which can have seasonal factors of various magnitudes. Many of the present EPA's are supplied on a “Seasonally Firm” basis which obligates the proponent to supply a volume of firm energy over a 3-month period as opposed to a specific volume of firm energy in each hour, usually at a higher price. The seasonal firm product will generally result in a lower capacity factor since the proponent does not have the financial incentive to maximize the capacity factor once the contract is set. Moreover, bioenergy EPAs are unique in that BC Hydro retains the right to exercise Buyer Turndown rights so it is not forced to purchase firm energy under the EPA during periods of excess supply, typically the Freshet Season.

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<sup>5</sup> 3.0 Appendix C – List of questions for BC Hydro

In summary, the cost of an integrated facility is a function of many site-specific factors and therefore an open call process provides the best reference point. However, it is fair to assume that the Unit Energy Cost of biomass cogeneration would be significantly lower than a standalone plant as contemplated in the Phase 2 Bioenergy Call. This reference point may be modified based on how BC Hydro values various components of the delivered energy product (e.g., energy, capacity, ancillary services, dispatchability, generator control, etc.). The bioenergy EPA generators would welcome detailed negotiations with BC Hydro on how to maximize the value proposition for the ratepayer based on the delivered energy product attributes noted above.

### **Concluding Comments**

Biomass is unique in energy supply options in that proceeding with this generation solves an environmental issue instead of creating one. Leaving the material at the harvest site is considered wasteful and poses challenges for reforestation and increases the risk of wildfire. Options such as landfilling, which are not generally permitted under the Ministry of Environment requires vast areas and creates a GHG management issue.

The replacement of particulate emitting beehive burners with modern boilers and world class emission reduction technology was a great step forward for air quality and resource utilization in BC. However, biomass boilers have significantly higher fixed costs for maintenance and labor relative to a beehive burner or a natural gas boiler. The introduction of bioenergy EPA's over 10 years ago helped to offset these additional costs while achieving the province's energy, environmental and GHG policy goals. Over time proponents have modified their facilities and operating practices to optimize a combined manufacturing and energy facility. This has resulted in a situation where the success of almost every pulp and paper mill in BC is closely tied to its energy sales performance, irreversibly linking EPA's with the consumption of wood waste and the entire forest sector supply chain.

There is presently a surplus of fuel in many parts of the province, even with the EPA's. Terminating Biomass EPA's would force biomass boiler operators to reducing fuel consumption to minimize costs. BC Hydro admits that the industrial sector is the most difficult load to predict given the complexity of commodity market cycles and the lumpy nature of the load. Biomass generation is the only supply source directly linked to customer load since it consumes the waste generated by other sectors in the forest industry.

A portfolio scenario employing greenfield facilities is not the most cost-effective expansion scenario. Expansion of biomass generation to existing sites and to other industrial facilities that presently do not have EPAs with BC Hydro (four in the pulp and paper sector alone and more in the solid wood sector) should be considered. This will provide the lowest cost expansion model from the perspective of proponent cost, fuel supply chains and, transmission infrastructure.

The Biomass EPA generators would welcome the opportunity to renew the existing EPAs, look for potential expansions based on a company's fuel supply situation and to investigate the many value-added features for the benefit of the ratepayer and the biomass proponent. With the widespread benefit to the forest sector, the PPC has communicated the need to BC Hydro and Government to develop an appropriate framework which reflects the total value to BC. This is a model that has been implemented by other jurisdictions.