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NATIONAL COUNCIL FOR AIR AND STREAM IMPROVEMENT, INC.
1010 Sherbrooke West, Montreal, Qc, H3A 2R7

Caroline Gaudreault, Ph.D.
Program Manager,
Sustainable Manufacturing & Climate
(514) 286-1182
cgaudreault@ncasi.org

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TO: Daniel Lemire and Bernard Lupien (Environment and Climate Change Canada)

FROM: Caroline Gaudreault (NCASI)

Cc : Kirsten Vice, Ilich Lama and Barry Malmberg (NCASI)

SUBJECT: ***NCASI Comments on ECCC "Proposed Design Elements of the Output-Based Pricing System (OBPS) for Sector Feedback - Pulp & Paper"***

1 INTRODUCTION

NCASI is a non-profit environmental research institute that seeks to create credible scientific information required to address the environmental information needs of the forest products industry in North America. NCASI undertakes primary research, conducts surveys, provides advice regarding technically appropriate methods of conducting environmental field measurements, undertakes technical studies such as scientific literature reviews and research compilations, and sponsors scientific research by universities and others to document the environmental performance of industry facility operations and forest management, and to gain insight into opportunities for further improvement in meeting sustainability goals. NCASI's Climate Change Research Program contains elements that address the complexity of the forest products industry's interactions with climate. This, along with nearly 75 years of experience in reviewing and treating environmental data, provides us with a unique lens on the development of metrics related to documenting the GHG performance of forest products industry operations, and we are pleased to contribute this perspective during the OBS development process.

Environment and Climate Change Canada (ECCC) has requested general comments the "Proposed Design Elements of the Output-Based Pricing System (OBPS) for Sector Feedback - Pulp & Paper". In specific, in this memorandum we provide comments on the requirement to use the "CGHGQR – Canada's Greenhouse Gas Quantification Requirements".

2 SPECIFIC COMMENTS

ECCC proposes requiring the use of the CGHGQR for quantifying combustion emissions in the context of the proposed OBPS. NCASI has two significant concerns with this proposal.

First, according to the 2017 Gazette for reporting GHG emissions (Government of Canada 2017) the CGHGQR is not applicable to the pulp and paper sector. These requirements are applicable only to CO_2 capture, CO_2 transport, CO_2 injection and CO_2 storage, along with facilities classified under North American Industry Classification System (NAICS) codes 327410, 327310, 331313, or 331110 that are engaged in lime manufacturing, cement manufacturing, aluminium manufacturing, or iron and steel manufacturing. In fact, at the time ECCC consulted on these requirements, ECCC communications made it clear to stakeholders that these quantification requirements were not going to apply to the forest products sector and that consultation related to the forest sector would take place at a later date; therefore, NCASI did not provide comment on the draft CGHGQR when they were released in 2017 for review.

Second, and more importantly, there are several technical and practical issues associated with the CGHGQR pertaining to how they would apply to the forest products sector that must be addressed before the CGHGQR could be applied in the Pulp & Paper OBPS, as described below:

1. The proposed quantification requirements are more onerous than those currently required for the forest products sector under the GHG reporting program. Canadian facilities currently do not have access to standardized tools that would enable compliance with the CGHGQR requirements.

2. Emission factors on mass and energy basis for spent liquor combustion can be found in Table 2-3 of the CGHGQR, with NCASI as the source of the information. It should be noted that the emission factor for spent pulping liquor emission is normalized to 50% moisture content and reported on a fuel basis (dry solids and moisture). The spent liquor CO_2 emission factor on an energy basis is taken from the NCASI GHG Calculation Tool (NCASI 2005)and erroneously converted to a mass basis by assuming the "same HHV vs. moisture content relationship used to convert wood waste." It is, however, incorrect to assume that spent pulping liquor has the same HHV vs. moisture content relationship as wood fuel/wood waste. There is extensive literature on the heating values for biomass (Chandrasekaran et al. 2012; Parr and Davidson 1922; White 1987; Baker 1983; and McBurney 1993, for example). Heating values are strongly positively correlated to the carbon content of the fuel. Hardwood species usually have a carbon content in the range of 47-50%, while softwood species have a carbon content in the range of 50-53% (Baker 1983). Because of the higher carbon content of softwood species, heating values of softwood are typically higher than hardwoods; a typical HHV for softwoods is 9,000 BTU/lb or 20.9 GJ/tonne and a typical HHV for hardwoods is 8,600 BTU/lb or 20.0 GJ/tonne (Baker 1983). Heating values vary (±5% from these

typical values) depending upon specific wood species (Baker 1983). The carbon content of spent liquor is lower than solid wood residuals because of the contribution of inorganic cooking chemicals (primarily sodium and sulphur) to the liquor. A typical carbon content of North American softwood spent liquor solids is 35% and may range from 32-37.5%, while a typical carbon content of North American hardwood spent liquor solids is 34% and may range from 31-36.5% (Gullichsen, J., Paulapuro, H. 1999). Because of the lower carbon content of spent liquor solids compared to solid biomass, a typical North American softwood spent liquor solids HHV is 6,100 BTU/lb (14.2 GJ/tonne) and ranges from 5700-6450 BTU/lb, and a typical North American hardwood spent liquor solids HHV is 5,975 BTU/lb (13.9 GJ/tonne) and ranges from 5500-6350 BTU/lb) (Gullichsen, J., Paulapuro, H. 1999).

3. Finally, the CGHGQR requires that emissions from biomass be estimated based on the amount of steam produced. This approach will be less accurate than an approach based on the mass quantity of biomass burned, and even less accurate than an approach based on the total fuel input (e.g., in MJ HHV) because additional conversion and assumptions are needed.

3 REFERENCES

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