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To Whom it May Concern:

Per the Department of Environmental Protection's Extended Producer Responsibility (EPR) producer payments and reporting e-mail dated June 29, 2023, Origin Materials, Inc. (Origin) respectfully submits the following public comment.

Background on Origin:

Origin's mission is to enable the world's transition to sustainable materials. For over a decade, Origin has developed a platform for turning the carbon found in inexpensive, plentiful, non-food biomass, such as sustainable wood residues (which, generally, would otherwise be left to rot thereby releasing CO2 back into the atmosphere) into useful, renewable materials and chemicals while capturing carbon in the process. Origin's patented technology platform can help revolutionize the production of a wide range of end products, including 100% bio-based and recyclable packaging.

DEP Solicitation:

Subsection 13(A)(1)(c) states—

the payment schedule adopted under this subparagraph must delineate criteria to be used to adjust producer payments in a manner that incentivizes: the use of recycled content in and increased recyclability of packaging material, lower toxicity in packaging material, a reduction of the amount of packaging material used, a reduction of litter from packaging material, increased reuse of packaging material and labeling of packaging material to reduce consumer confusion and creates other incentives consistent with generally accepted industry standards.

Questions:

- *Should the payment schedule prioritize any of these incentives? Which incentives should be prioritized? Should priorities change if relevant program goals are not being met? How might the payment schedule reflect this?*

The payment schedule should prioritize the following incentives:

1) Recyclability.

Maine should actively seek to promote molecular solutions which enhance recyclability as part of its recycling initiatives.

When it comes to increasing recyclability, it's important to recognize that improving recycling goes beyond just enhancing physical tools and infrastructure. For instance, preliminary research suggests that incorporating specific chemical compounds such as Furandicarboxylic acid (FDCA) or polyethylene 2,5-furandicarboxylate (PEF) into the recycled plastic stream can significantly enhance the quality, stability, and durability of recycled polyethylene terephthalate (rPET).

Maine should require substantially lower fees for companies that implement these molecular solutions (half the fee charged to companies not implementing these solutions). These measures would help strengthen the supply of recycled materials and drive the transition towards a more sustainable and circular economy.

Overall, by acknowledging, in regulation, the importance of molecular solutions and actively supporting private industry by reducing EPR fees for those companies that implement these solutions, Maine can play a pivotal role in advancing recycling practices and driving meaningful change in the realm of sustainable materials.

2) Reduction in amount of packaging material used.

Polyethylene Furanoate (PEF) is a promising alternative to traditional packaging materials due to its ability to significantly reduce the amount of plastic required while maintaining excellent barrier properties. PEF is a bio-based polyester that can be derived from renewable sources such as wood residues and agricultural waste. Its unique molecular structure provides enhanced gas and moisture barrier properties, ensuring the preservation of packaged goods.

Compared to conventional packaging materials, PEF exhibits higher mechanical strength and thermal stability, allowing for the production of thinner, lighter packaging without compromising integrity. This reduction in material usage translates to lower production costs and environmental benefits, as less plastic waste is generated, energy consumption is decreased, and greenhouse gas emissions are mitigated. PEF's potential to lightweight packaging makes it a compelling solution for sustainable and eco-friendly packaging applications.

Companies that adopt materials such as PEF to minimize plastic usage should be eligible for a 50% reduction in fees compared to those not utilizing such materials.

3) Lower toxicity in packaging materials:

Hydrothermal carbon (HTC) can be employed to produce packaging materials with lower toxicity levels,

offering a more sustainable and environmentally friendly alternative. Origin's process converts biomass into HTC which then can be further processed and transformed into packaging materials.

One significant advantage of using HTC for packaging is its reduced toxicity compared to conventional materials. The HTC production process effectively removes or reduces harmful substances and impurities present in the biomass, resulting in a cleaner and less toxic end product. This is particularly important in packaging applications where the risk of chemical leaching into the packaged goods or the environment is a concern.

Companies that use materials such as HTC to reduce toxicity in packaging should be eligible for a 50% reduction in fees compared to those using higher toxicity materials.

- *Are there additional characteristics that should be incentivized in the payment schedule?*

Maine should implement incentives through this regulatory process to promote the adoption of non-petroleum biobased materials in the production of plastic packaging. Companies utilizing non-petroleum biobased materials should be eligible for a 50% reduction in fees compared to those using fossil-based materials.

By encouraging the use of non-petroleum biobased materials, Maine can spearhead the nationwide shift towards eco-friendly biobased products. Issues such as climate change, resource depletion, volatile fossil fuel markets, and rising energy costs highlight the need to transition towards sustainable practices supported by renewable resources that can be cultivated and maintained within the United States. Pollution related to plastics production originates from fossil fuel extraction and persists throughout the manufacturing process. According to the International Energy Agency, petrochemicals, which are currently employed to produce plastics, consume approximately 14% of oil and 8% of natural gas resources. In comparison, adopting non-petroleum materials, like those offered by Origin, can significantly reduce greenhouse gas emissions. For example, implementing six operating plants utilizing Origin's non-petroleum materials is projected to annually prevent approximately 8.3 million metric tons of CO₂ emissions, which is equivalent to the electricity consumption of around 960,000 homes for one year or the carbon emissions from approximately 1.8 million passenger vehicles driven for one year, and the avoidance of approximately 19 million barrels of oil consumption. Government support in transitioning from petroleum-based to non-petroleum-based materials is crucial to realizing these benefits.

Furthermore, non-petroleum biobased materials play a vital role in optimizing the effectiveness of rPET. Current data suggests that meeting minimum rPET content requirements may pose challenges for manufacturers and distributors due to various global factors. To ensure quality, aesthetics, and performance, such as structural stability and transparency, in recycled plastic, a consistent supply of virgin materials alongside rPET is necessary. Incorporating virgin non-petroleum materials into rPET can address technical obstacles associated with rPET, including discoloration. This blending process enhances the quality and appearance of recycled plastic, potentially preventing high-end manufacturers from disregarding minimum recycled content requirements. By incentivizing the production of carbon-negative, biobased materials, the state can complement rPET requirements and reduce the reliance on petroleum in plastics.

In summary, specifically incentivizing the use of non-petroleum biobased materials in plastic packaging will facilitate Maine's transition to a low-carbon future. These measures will contribute to sustainability goals, mitigate plastic pollution, and foster the adoption of eco-friendly alternatives.

Conclusion:

Thank you for allowing Origin the opportunity to submit comments on producer payments and reporting for EPR in Maine.

Sincerely,

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