

BIOBASED FAÇADE CLADDING FROM GREEN WASTE

MARKET CONSULTATION REPORT

EXECUTIVE SUMMARY

The challenge for DDS-Verko

DDS-Verko faces the challenge of converting green waste into usable raw materials for biobased façade cladding, aiming to promote circular construction techniques. This initiative is closely tied to DDS-Verko's core activity: processing organic household waste and pruning waste into compost. DDS-Verko's ambition extends beyond emphasizing green waste processing; it explores how locally collected green waste can be utilized for producing biobased building materials, aiming for sustainable and local material use. Hence, local resources and processes were initially mapped out.

Needs Analysis

Through a meticulous evaluation of the derived products from the 'processing organic waste and green waste into compost' process, digestate has emerged as the most suitable raw material for biobased façade cladding. With an impressive quantity of 33,000 tons onsite at DDS-Verko and its non-essential nature for compost production, digestate offers significant advantages. Furthermore, digestate processing utilizes valuable waste heat and contributes to addressing a broader challenge in Flanders, where digestate management across all digestion facilities is a shared concern. This underscores the substantial value of utilizing digestate as a primary raw material for biobased façade cladding production for buildings.

As digestate is a semi-liquid raw material, it is initially necessary to investigate which process is suitable for converting liquid digestate into a solid material. Two possible approaches have been identified: one without the addition of extra additives (aside from those from the own green waste processing process) and one with the addition of biobased additives sourced from external parties. Both approaches will be explored within a development trajectory, aiming to meet the product's technical characteristics and requirements. Market exploration focuses on these approaches as well as existing analogous processes for the development or market introduction of biobased building materials.

State of the Art

The current state of the art for utilizing digestate as a raw material for biobased façade cladding reveals challenges, both in the energy-intensive process of compost conversion and in the method of transforming digestate into a hard and usable

material. Innovative methods such as pressing, drying, and additive incorporation need to be explored to produce an attractive cladding material. Further developments and tests on mechanical strength and weather resistance are required to ensure a sustainable end product.

Market Consultation

Market consultation involved discussions with industry experts and potential stakeholders to evaluate the feasibility and potential applications of digestate as a building material. This process provided insight into the technical and market-driven requirements for a successful product, as well as the challenges that need to be overcome.

Outcome of the Market Consultation: Six Major Challenges

The market consultation identified six major challenges crucial to the development of biobased façade cladding from digestate:

1. Control or inhibition of anaerobic bacteria: It is essential to control the activity of anaerobic bacteria in digestate to prevent ongoing biological growth and material degradation.
2. Desired lifespan of façade panels: The material must have a long lifespan to be sustainable and economically viable.
3. Appropriate application for digestate: A market need must be identified where digestate can effectively be used as a building material.
4. Energy-saving processing methods: Developing energy-efficient processing methods is crucial to minimize costs and ecological footprint.
5. Compliance with technical and building regulations: The material must meet all relevant building regulations, including stability, fire resistance, and insulation properties.
6. Preconditions for waste streams and raw materials: Digestate must be processed as a recognized raw material to overcome logistical and regulatory challenges.

Conclusion

DDS-Verko's project 'Biobased Façade Cladding from Green Waste' shows promising prospects for developing sustainable building materials. By innovatively utilizing residual streams such as digestate, significant energy and emission savings can be achieved. Moreover, this project contributes to resource conservation and promotes circular processes. With a potential of 33,000 tons of digestate in Dendermonde and 180 million tons in the EU, there is a huge opportunity to contribute to a sustainable future for the construction sector. Collaboration with industry partners and addressing the six identified challenges will be crucial for the success of this innovative project.