REFRESH

Scaling up recycling technologies for wind turbine blades

Online workshop

Co-funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101096858.

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Workshop agenda

14:00 **Introduction to REFRESH**, Daniel Grisenti, RINA Consulting

14:10 **Smart blade cutting**, Jean-Baptiste Strehaiano, ETAT9

14:20 **Shredding and sorting technologies**, Guilhem Grimaud, MTB Group

14.30 **Mechanical recycling**, Giorgio Betteto, Gees Recycling

14:40 **Advanced thermal recycling**, Marcin Rusin, Gjenkraft

14.50 **MW-assisted pyrolysis**, Ignacio Julián, CIRCE Technology Centre

15:00 **Thermochemical treatment of dust and fines**, Jan Kašpar, Enecolab

15:10 **Blade circularity: the regulatory challenges**, Raphaël Pleynet, EuCIA

15:20 **Q&A session**

15:35 **Wrap up and close**

Please add your questions in the chat. We will answer these in the Q&A, or after the event.

Photo by Nicholas Doherty on Unsplash

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REFRESH: from end-of-use blades to new products

Daniel Grisenti
Project Coordinator

First stakeholder workshop
17 November, 2025, Online

Photo by Nicholas Doherty on Unsplash

The REFRESH consortium

Horizon Europe
101096858

11 partners from **5 countries:**

- Waste recycling and remanufacturing companies
- Engineering and consulting companies
- Research and development companies
- Access to stakeholders in the composites sector manufacturers

RINA is the project coordinator

EuCIA leads communication & dissemination activities

Methodology – The REFRESH concept

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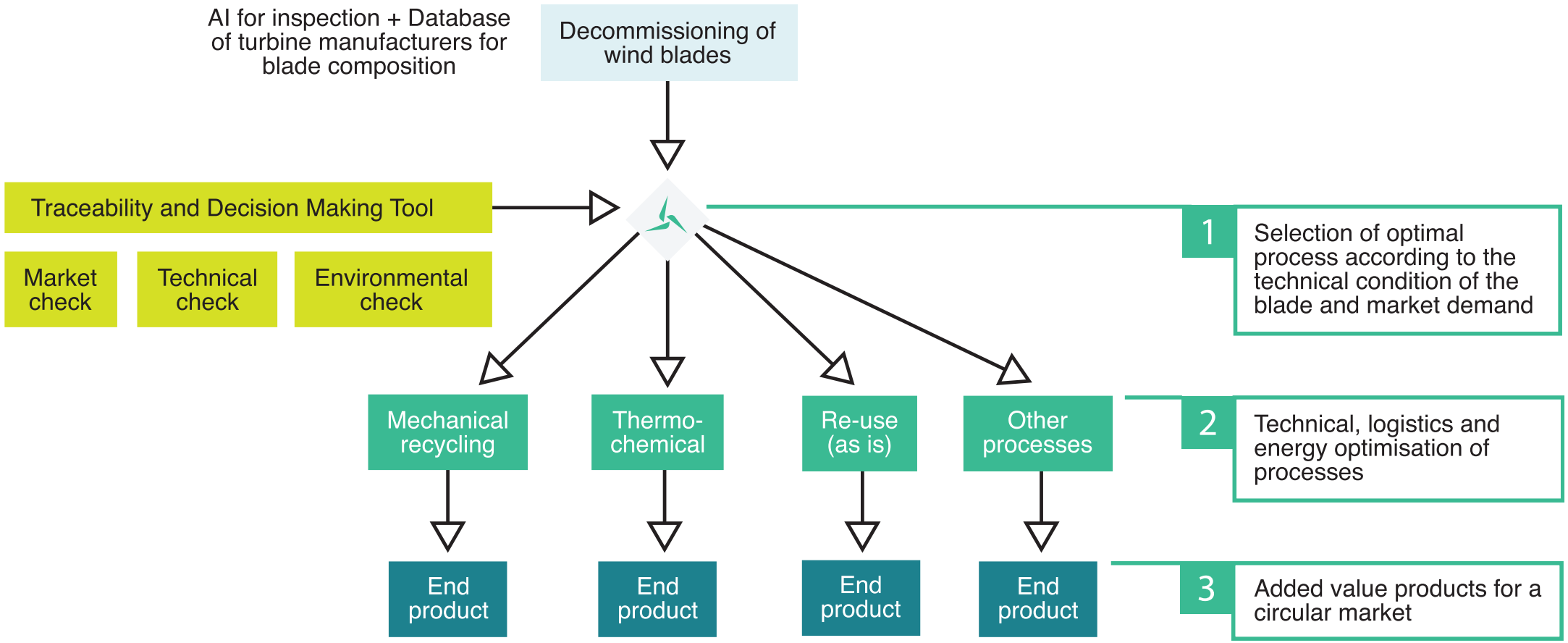

REFRESH smart tool for traceability (TECNALIA)

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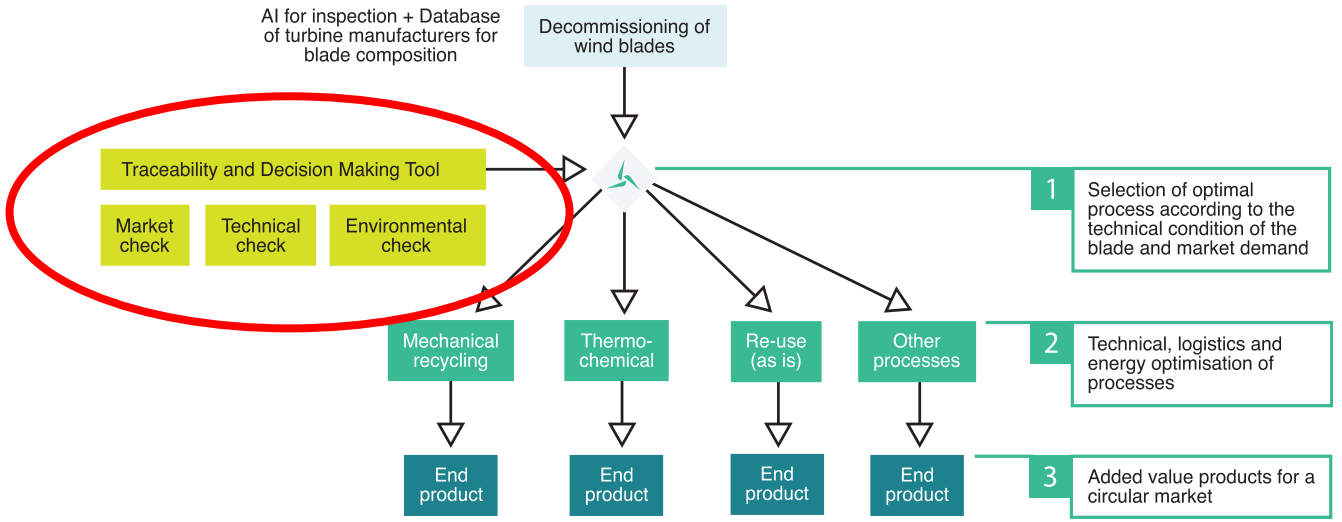
- ❖ Real-time tracking
- ❖ Transparent information sharing
- ❖ Secure data storage

Benefits:

- Enhanced quality control
- Improved efficiency
- Increased confidence and secondary materials acceptance
- Regulatory compliance

Data-driven decision-making tool



REFRESH smart tool for traceability (TECNALIA)

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Goal: to provide an **accurate and verifiable** set of information about the **products**

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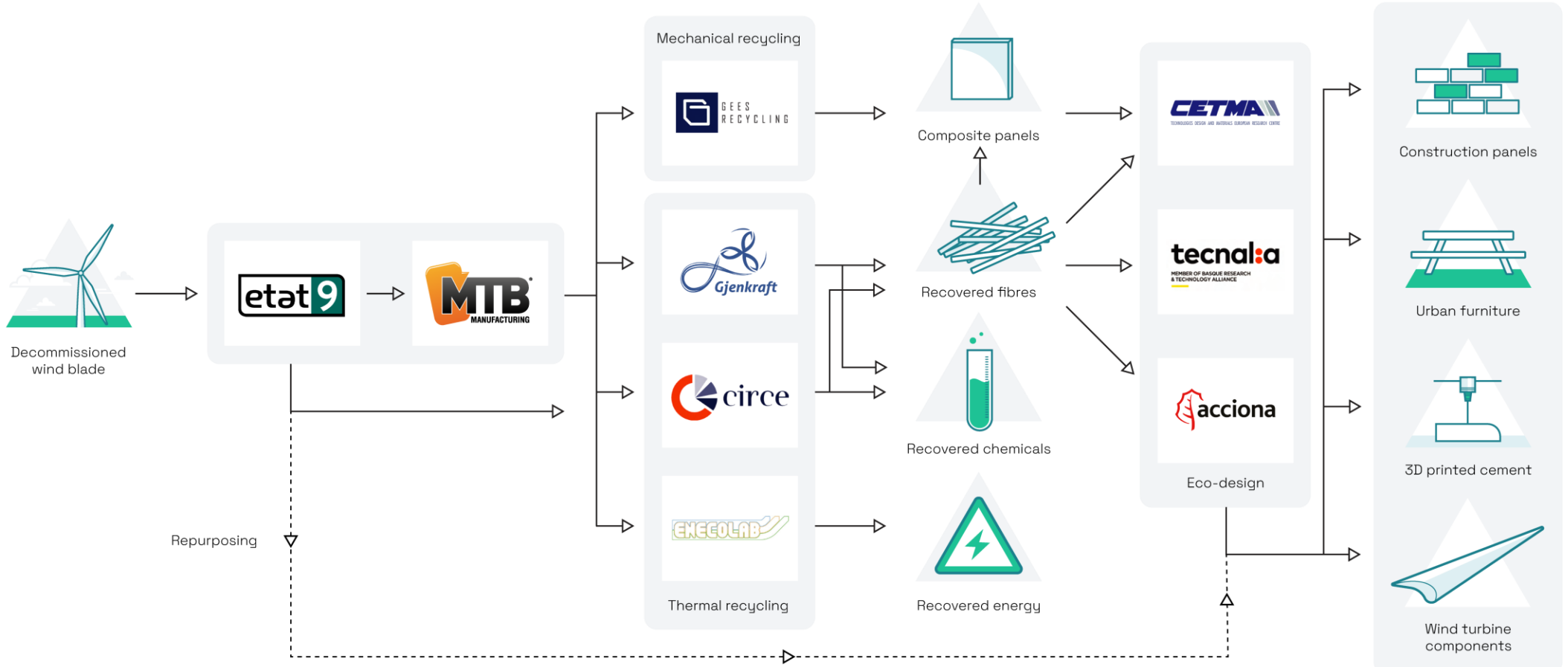
Methodology – The REFRESH value chain



REFRESH eco-design strategy (CETMA)

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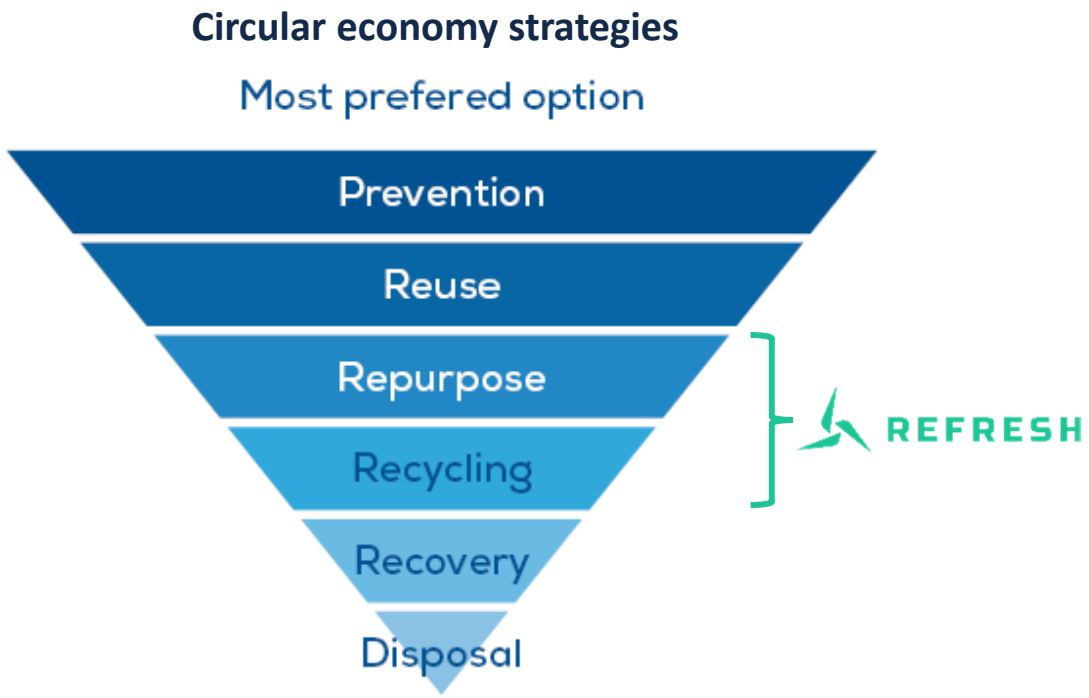

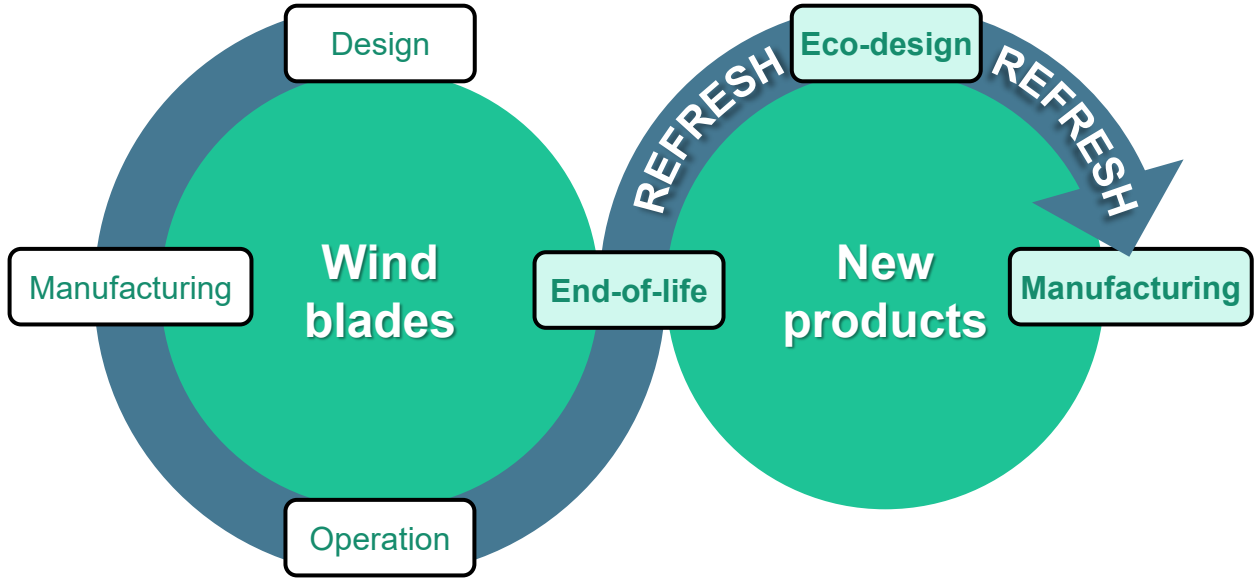

- Deployment of recycling technologies and repurposing strategies
- Development of recycled / repurposed products and markets

REFRESH eco-design strategy (CETMA)

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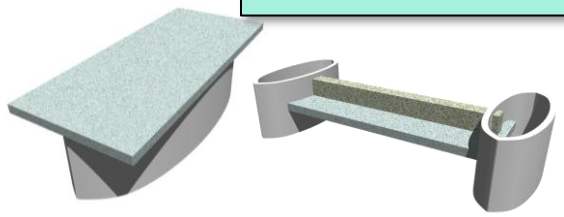
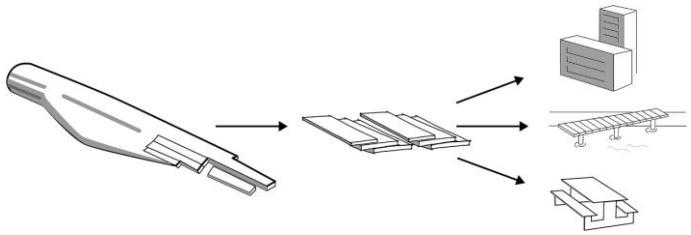
TRADITIONAL REPURPOSING APPROACH





ALTERNATIVE REPURPOSING APPROACH (JOUSTRA ET AL., 2021)

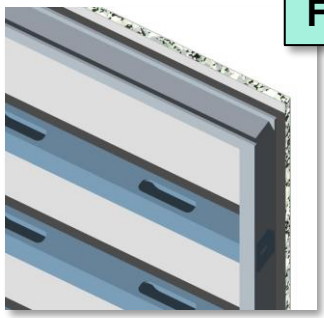
Repurposing of blade portions *with ETAT9*

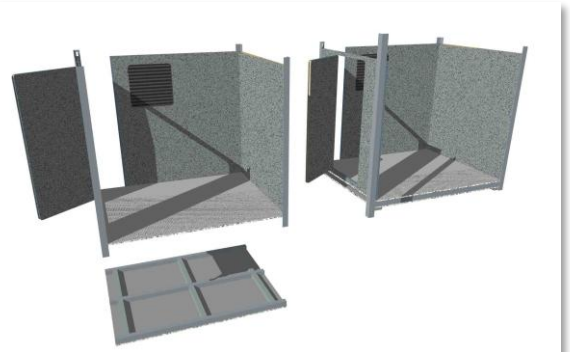
Mechanically recycled materials *with GEES*

Concrete structures *with TECNALIA*

Thermally recycled materials *with GJK*

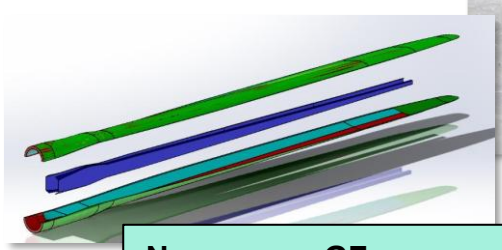
FORMWORK PANELS





EQUIPMENT SHELTER

NON-WOVEN GF INSULATION FOR BUILDING APPLICATIONS



NON-WOVEN GF MATT FOR WIND BLADE OUTER SKIN

ONSITE 3D PRINTED CONCRETE WIND TOWER

REFRESH preliminary LCA results (RINA-C)

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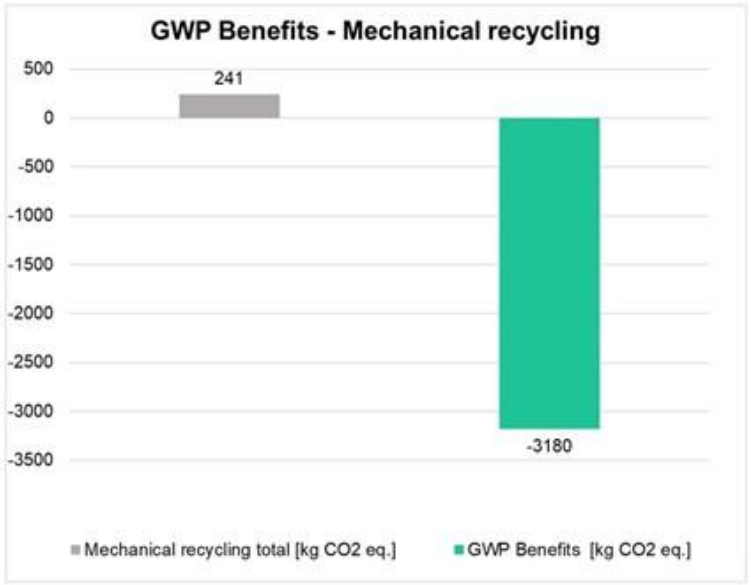

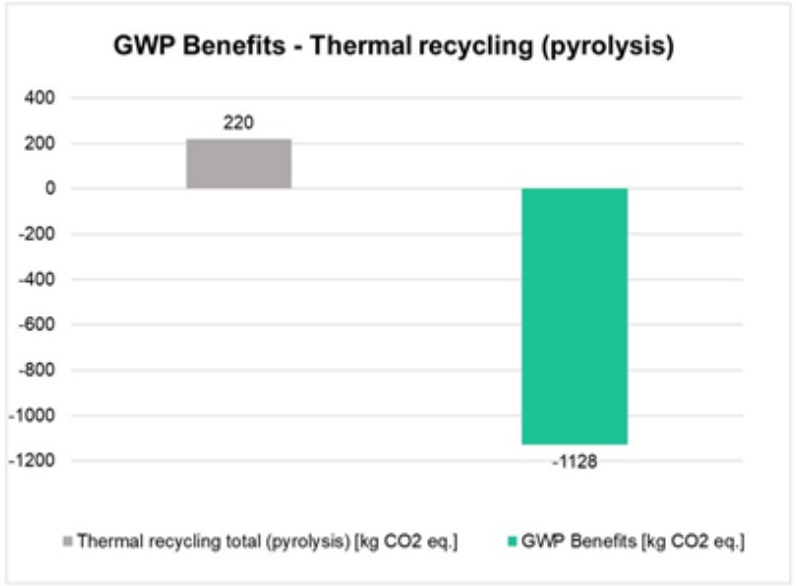

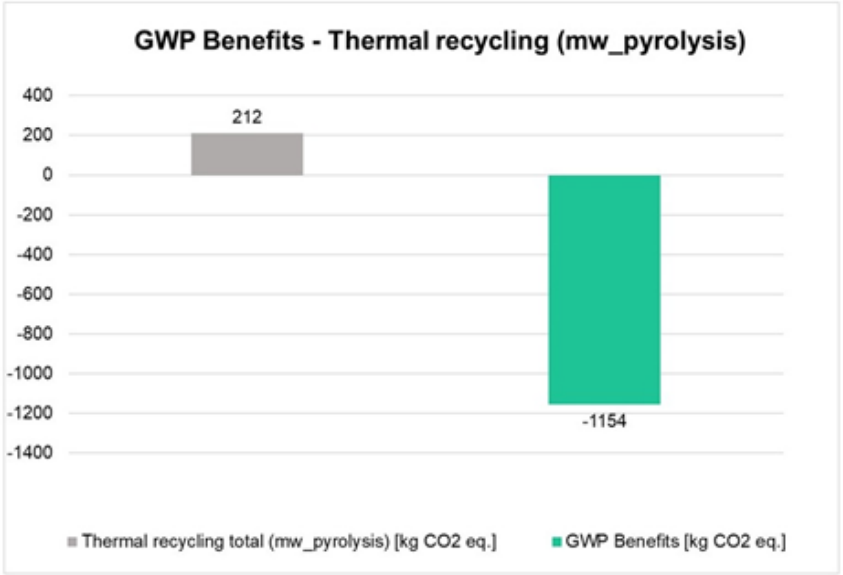

The REFRESH timeline

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M1-M18

Processes and plants design, Business plan, Preliminary LCA

M19-M48

Integration and testing
Demos
Experimental LCA
Traceability platform

We are here (M35)

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Thank you for your attention!

Daniel Grisenti, RINA-C

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