



EuCiA
The European Voice of Composites

REFRESH
Project Live Talk:
Advancing Wind Turbine Blade
Circularity — LinkedIn® Live
Panel Discussion on 28/4/2026

IMBEO®

LinkedIn LIVE

28.04.26
11 am
(CET)

In Co-operation with

COMPOSITES LOUNGE
CREATING SUSTAINABLE VALUE

İlkay Özkisaoğlu
Composites Lounge Co-Founder
LinkedIn® Live Host

Raphaël Pleyne
Managing Director
EuCiA

Giorgio Betteto – Gees Recycling



Challenges

Wind blades : In practice the root and wing are two different products

Wind blade : presence of core material in % on volume –
Excluding shear blade or torsion box

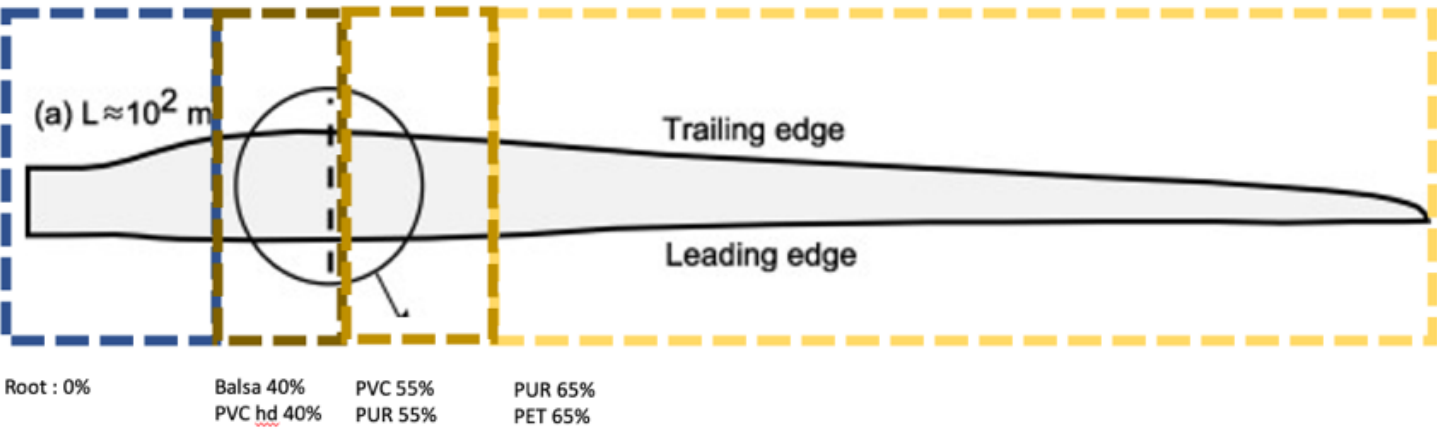
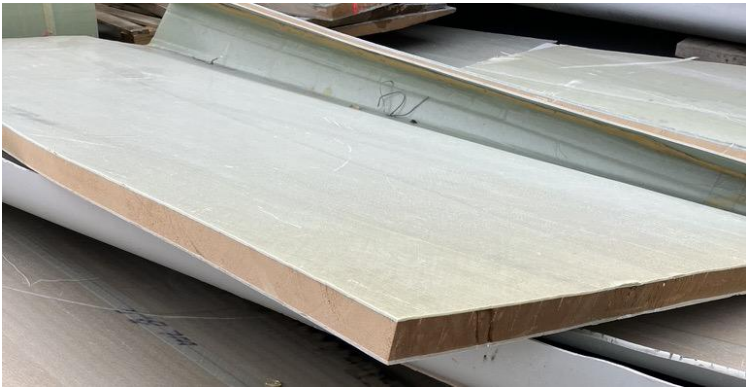


Figure 5 - Core material in blades - Giorgio Betteto

Figure 6 - Low density parts of blades - Giorgio Betteto

By volume , the core material presence in blades is significant , particularly after shredding:

Blades composition		Example Vestas V42 36 Meters					
				Specific weight after shredding			
				Fiberglass epoxy specific weight /S	Balsa Specific weight	Core Material specific weight	
weight of blade kg		1280		0,8	0,18	0,09	
Part	Material	Density	Lenght M	Weight Kg	Volume Shredded in Liters	% of volume	% of weight
Root (Blue)	Fiberglass Epoxy	1,5	5	510	637,50	23,35%	39,84%
Transition (brown)	Fiberglass epoxy	1,5	4	290	362,50	13,28%	22,66%
	Balsa / Core M	0,18	4	45	250,00	9,16%	3,52%
Wing connection (Light brown)	Fiberglass epoxy	1,5	27	340	425,00	15,56%	26,56%
	Core Material	0,09	27	95	1055,56	38,66%	7,42%
		Total		1280	2730,56	100,00%	100,00%



Core Material makes

- Much less interesting – if not forbidden - the use in cement kilns .
- Lower the production output by >70% in any thermochemical process like pyrolysis or solvolysis
 - Reactors have fixed volumetry , here the density is $\frac{1}{4}$
- Complicate (much) the process , with unwanted gases , byproducts and residues , that will change on type of CM.

Our proposal :

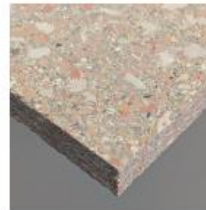
- Use the least interesting parts of blades , the less adapt to other recycling processes
- Transform in new materials using the RFM mechanical recycling – that was developed for composite waste regardless of resin , fiber or rigid foam type
- Exploit the low density as a value insted than a obstacle

REFRESH production line is making panels

- Better , Faster, more competitive
- Higher performances
- Future alternatives to MDF and Plywood



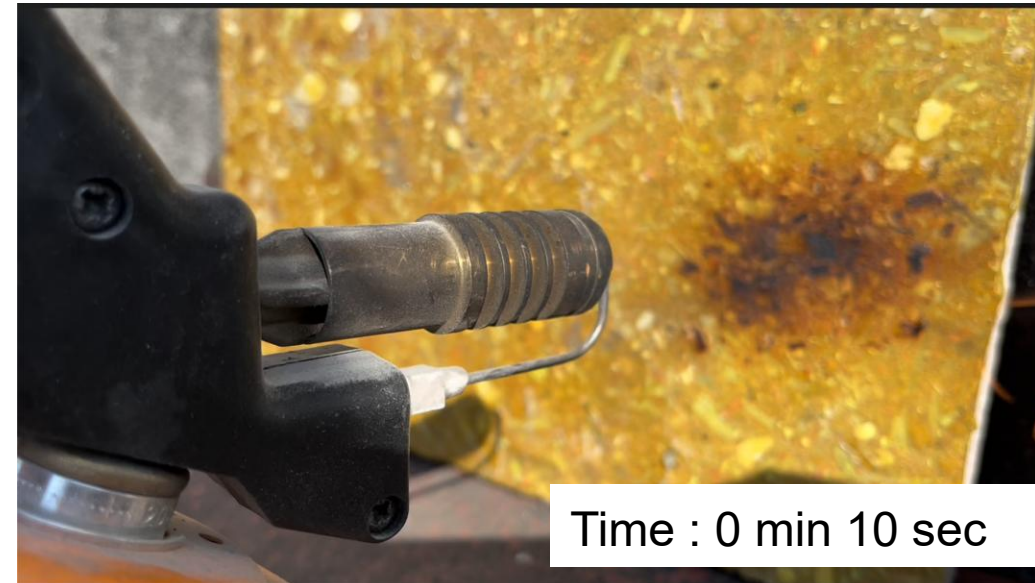
☐ Selected and tested **n. 4 types** of mechanically recycled panels as candidate for the proposed applications

Product	RFM Basic 850	RFM «wind blades»	D'ecò 1000	Replies
				
Nominal density (kg/m ³)	850	850	1000	FG sandwich
Nominal thickness (mm)	18	18	24	18

☐ Experimental results will be used as input data for **numerical model** and **product detailed design** aimed at matching the **application requirements**

Key issue in composites is the fire resistance , we are obtaining outstanding results from the panels made with wind blades with a phenolic resin coating

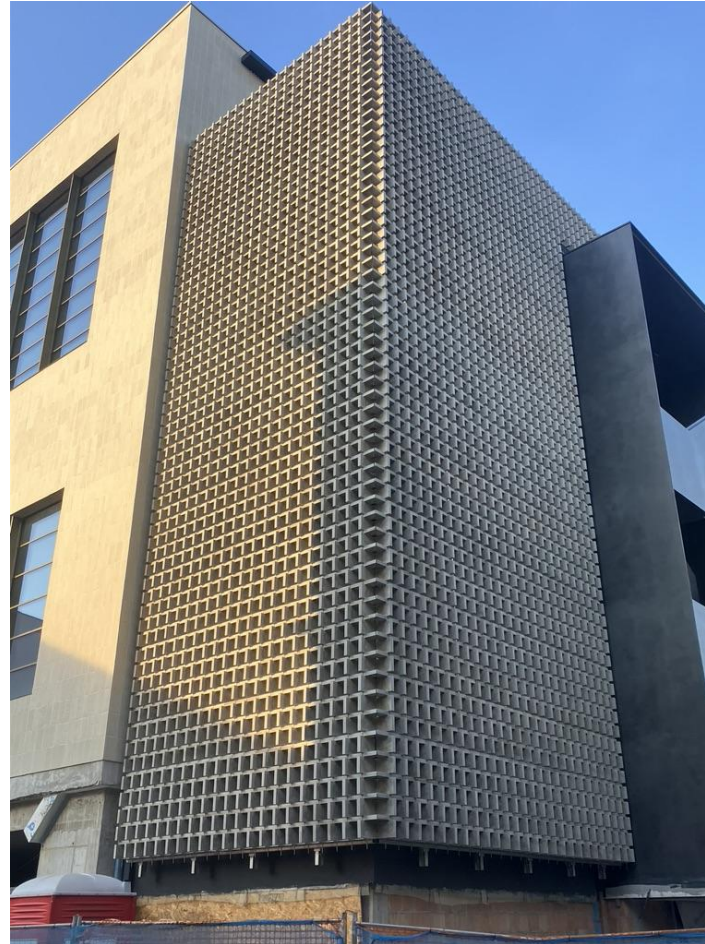
Propane flame at 5 cm
No propagation
No drops
Very small white smoke
Max penetration 1,4 mm on a 16 mm panel



REFRESH products results – what we obtain ? **Will be competitive?**

Circular economy - Building components

Recycled composites for shading
facades and architectural
components
40% lighter than ceramics
70% lighter than concrete
96% Recycled content



REFRESH products results – what we obtain ? **Will be competitive?**

Circular economy – cold chain / freezer components

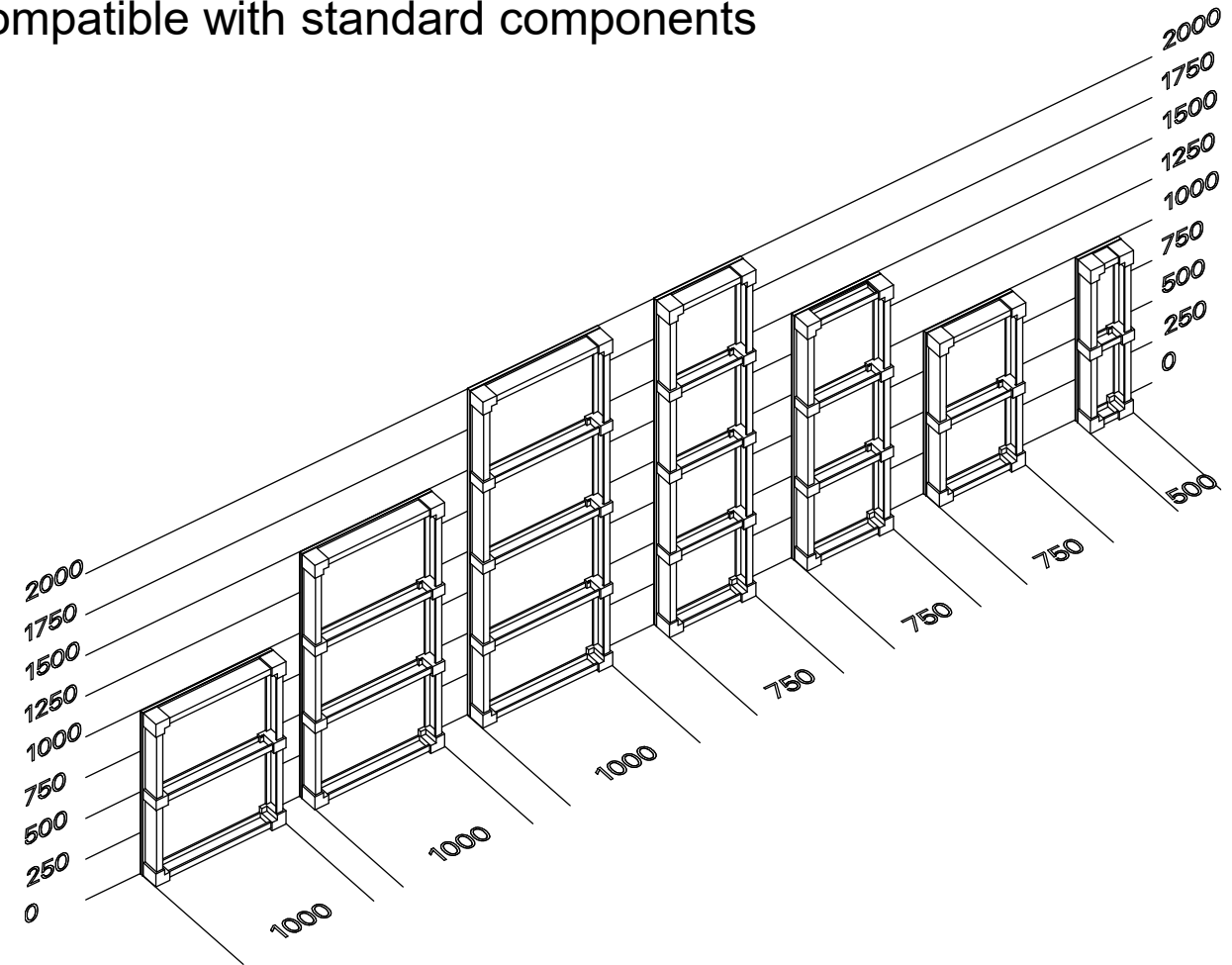
Recycled composites for Freezer /
cold chain components
96% Recycled content
Better insulation and no thermal
bridges
No rot, no rust
No need for reinforcing



REFRESH products results – what we obtain ? **Will be competitive?**

Formwork fully recycled – A complete system interchangeable and compatible with standard components

Recycled composites for Formwork
40% lighter than Alu ones
70% lighter than iron
90% Recycled content
No rust , no rot , EPD going on



REFRESH products results – what we obtain ? Will be competitive?



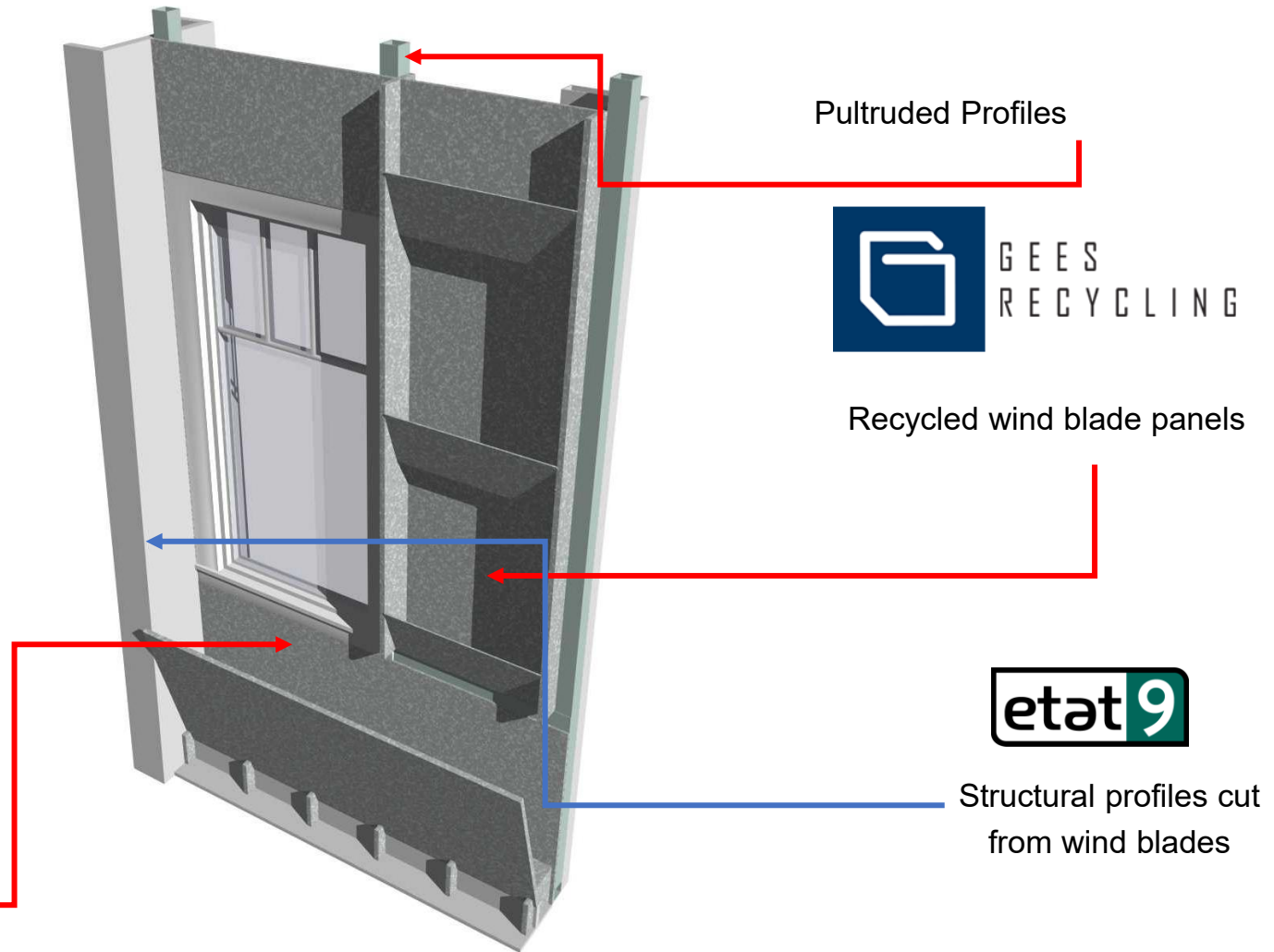
Horizon Europe
101096858



Recycled GF from pyrolysis



Glass fiber insulation





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



Thank you for your attention!

Giorgio Betteto

g.betteto@geesrecycling.com

geesretracking@gmail.com

Views and opinions expressed here are those of the authors(s) only and do not necessarily reflect those of the European Union. The European Union cannot be held responsible for them.



© Jason Bickley