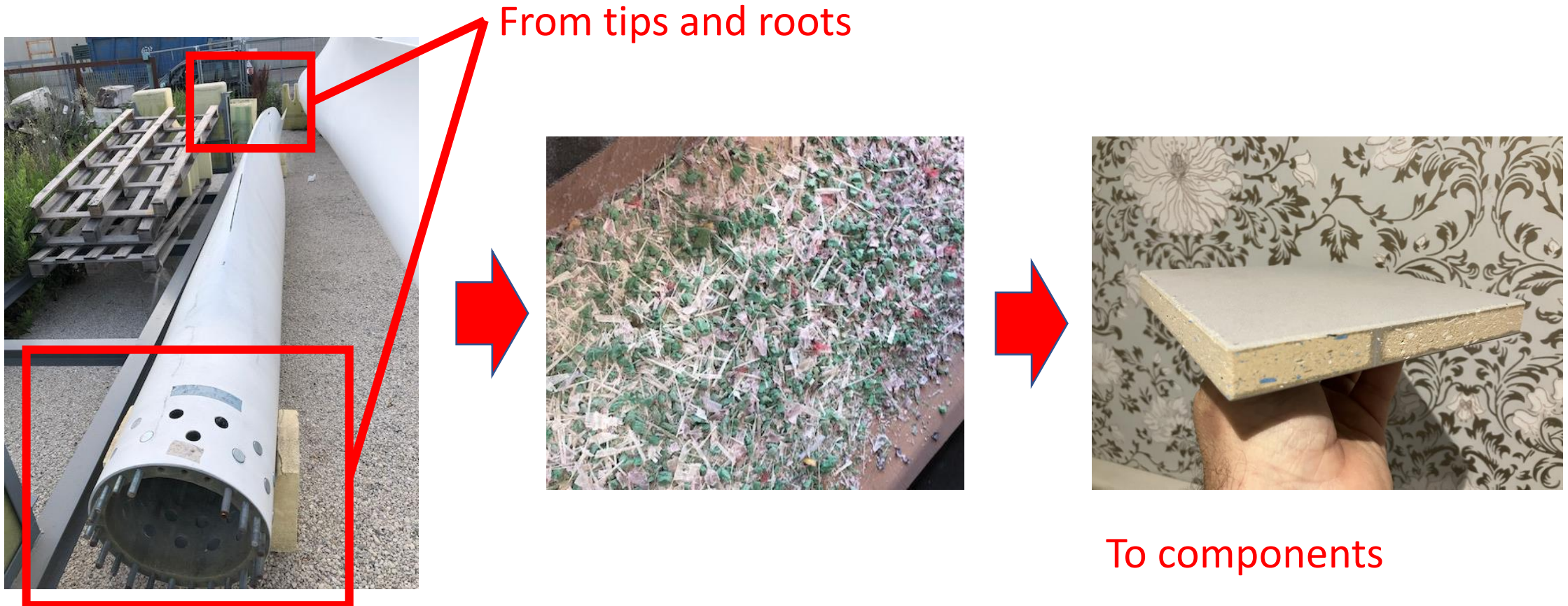


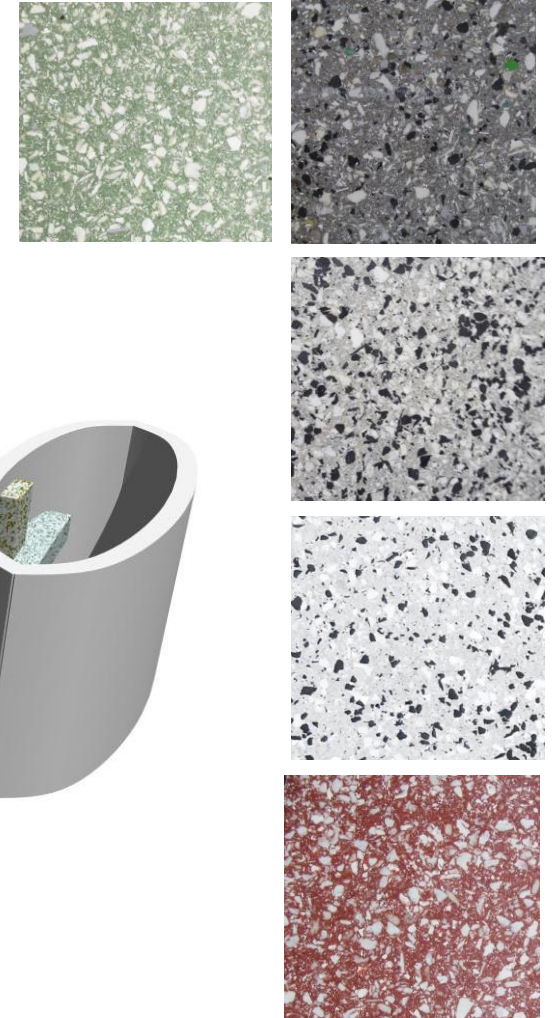
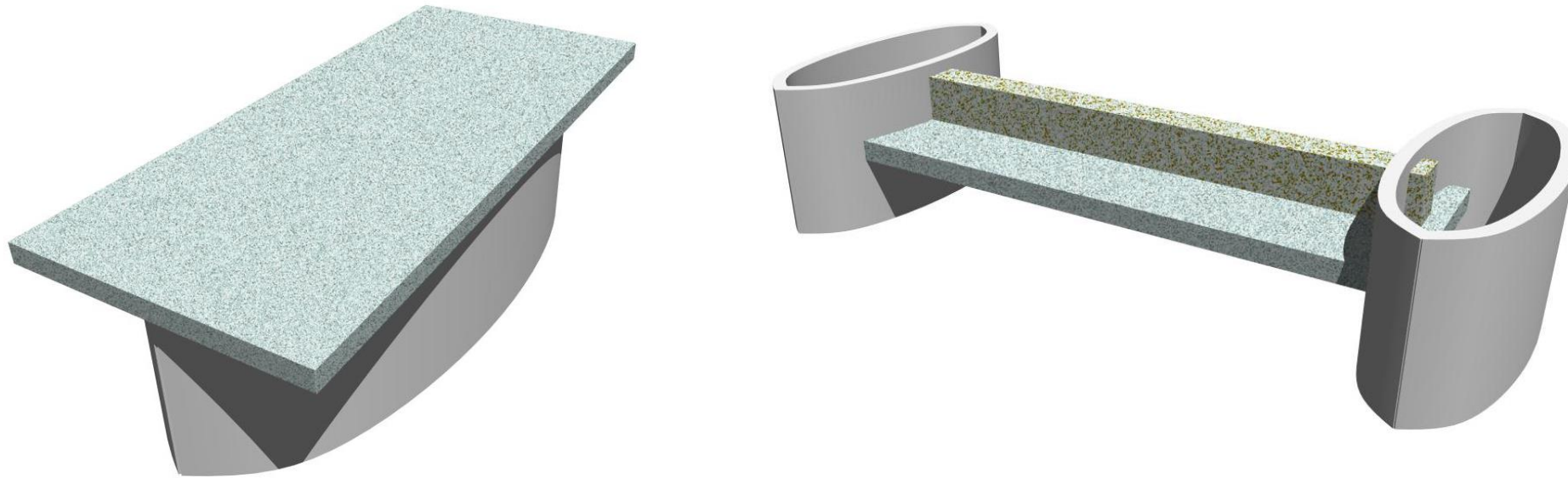
Synergies and Cooperation

From REFRESH Project

Gees Recycling , building on its working experience in mechanical recycling of composites have interesting solutions and products , synergic for wind blade circular economy



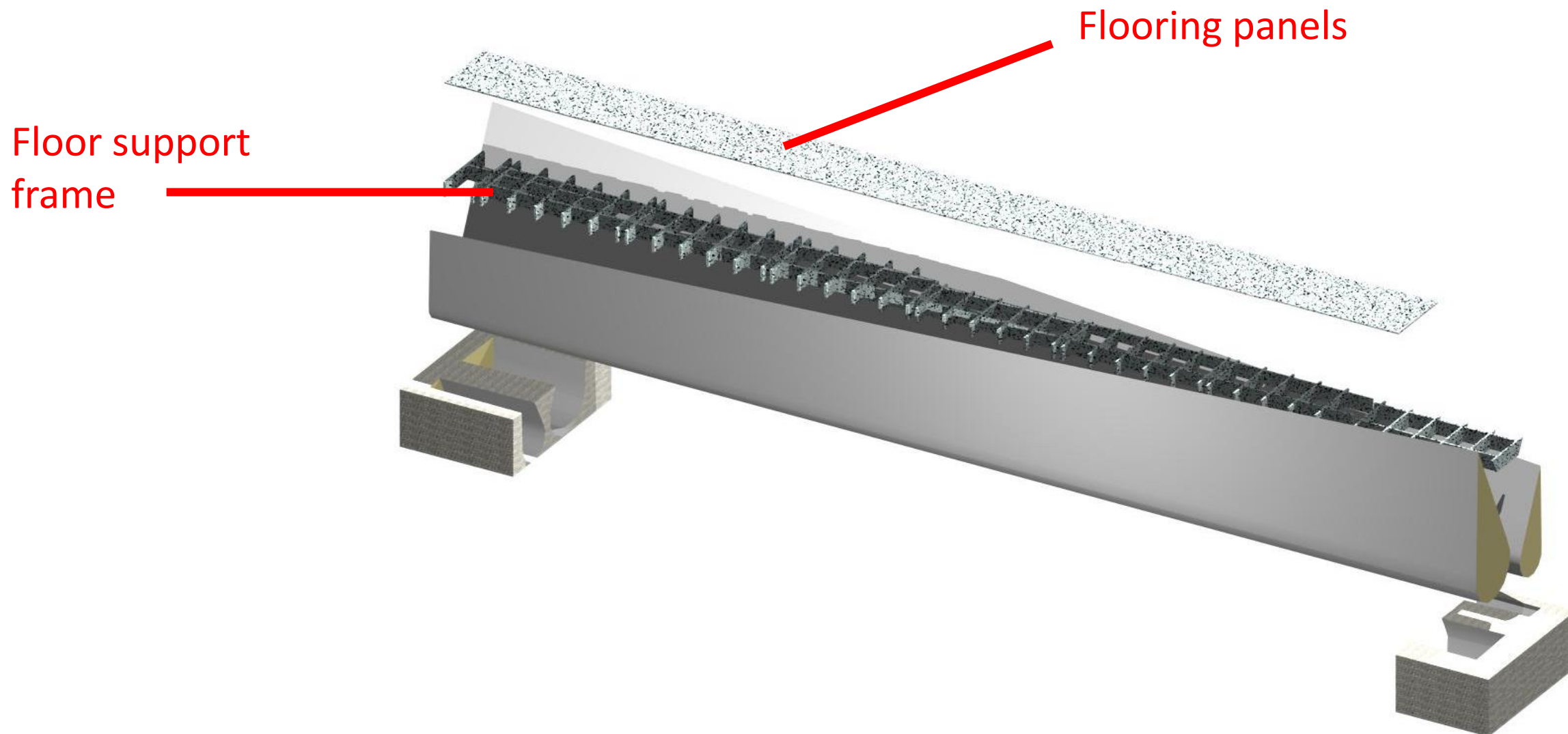
Components for outside furniture from repurposing



Tabletops , parts for benches , lots of possibilities also for aspects

Totally sourced from wind blades – same resistance

Components for blade bridges

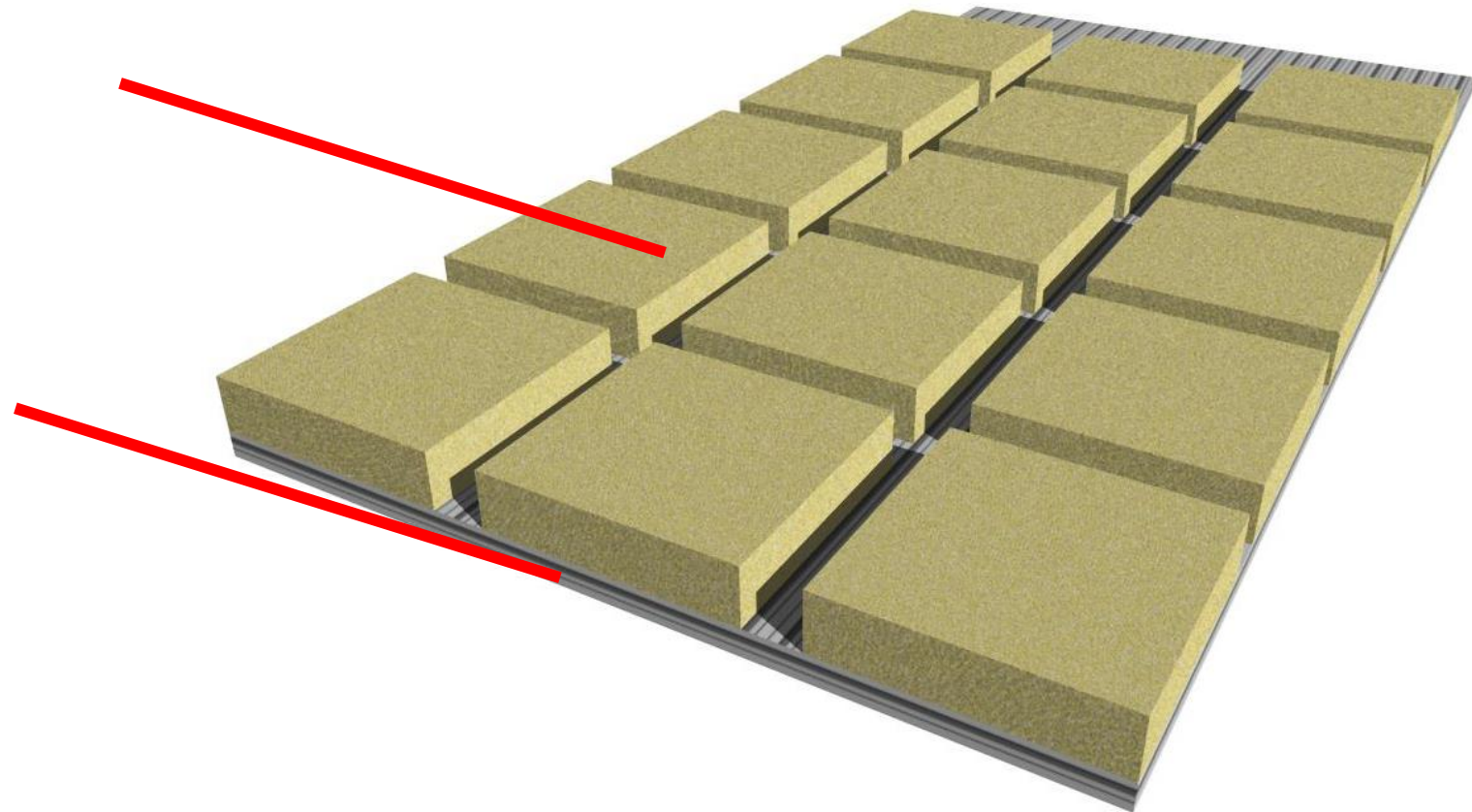


New structural products from REPLYES Technology

Step 1

Recycled mid-density
Core material

FRP Laminate



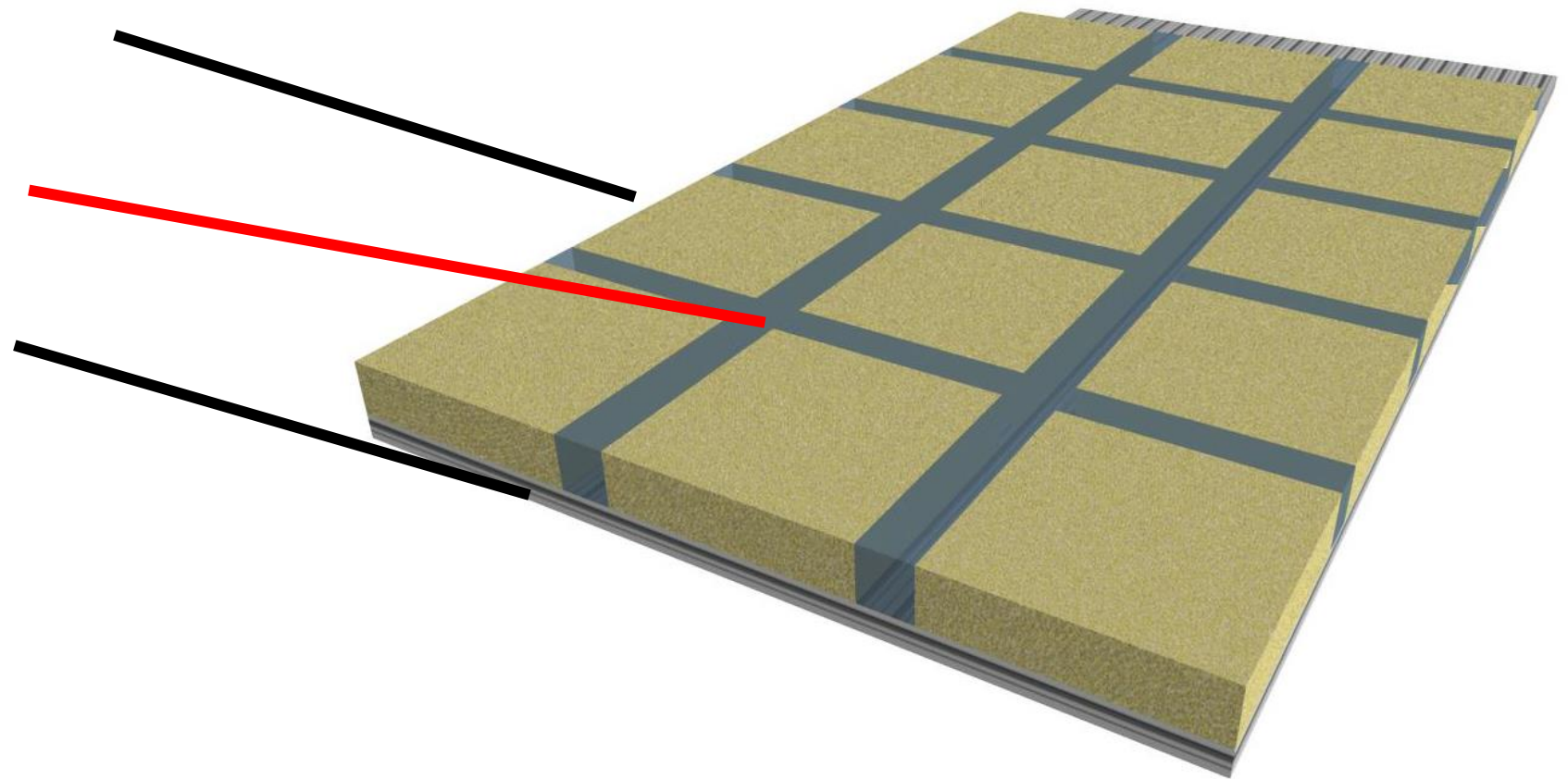
New structural products from REPLYES Technology

Step 2

Recycled mid-density
Core material

Resin Infusion (Epoxy,
Vinylester, PUR)

FRP Laminate



New structural products from REPLYES Technology

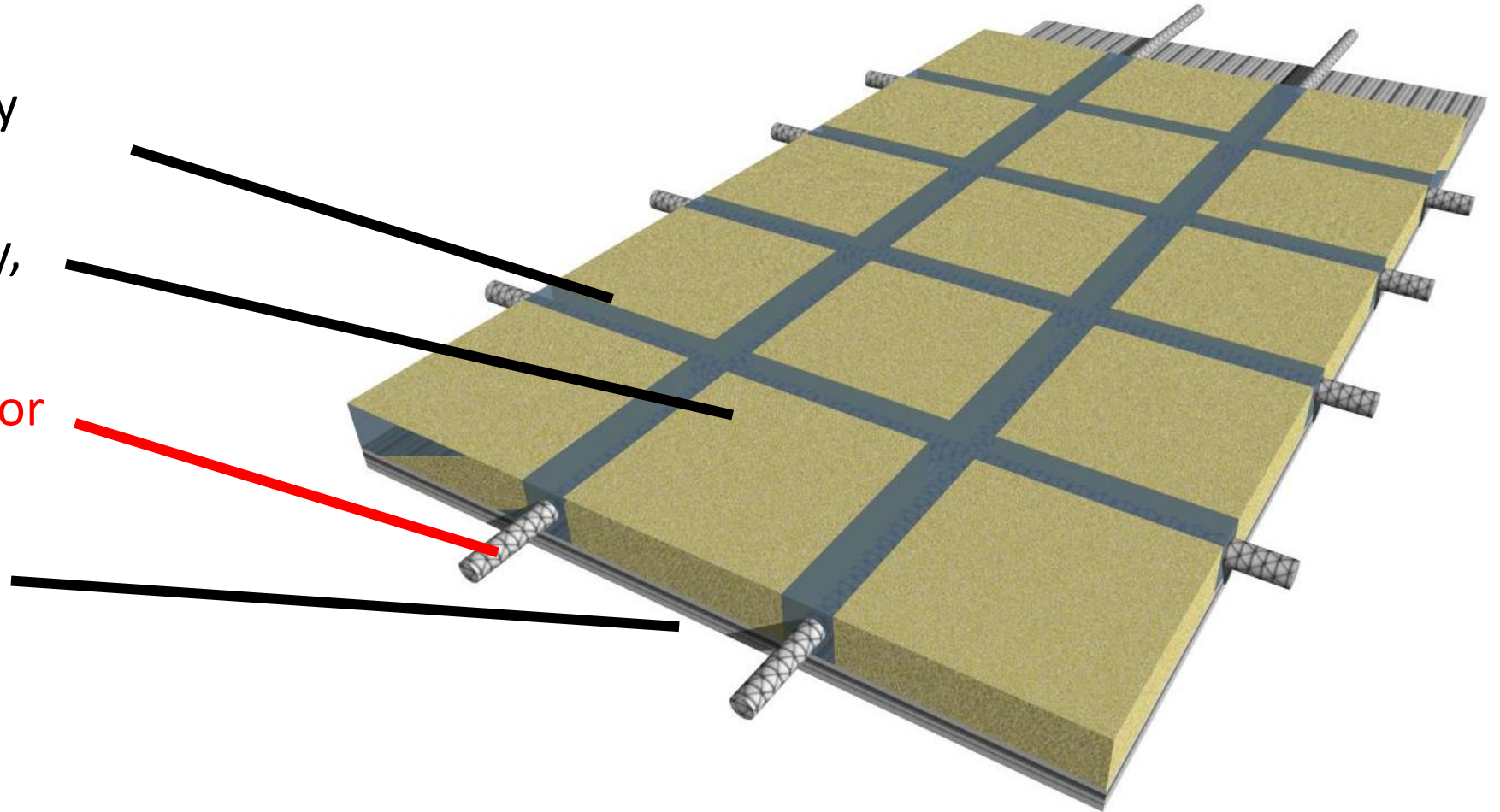
Step 3

Recycled mid-density
Core material

Resin Infusion (Epoxy,
Vinylester, PUR)

Reinforcing FRP grid or
strands

FRP Laminate



New structural products from REPLYES Technology

Step 4

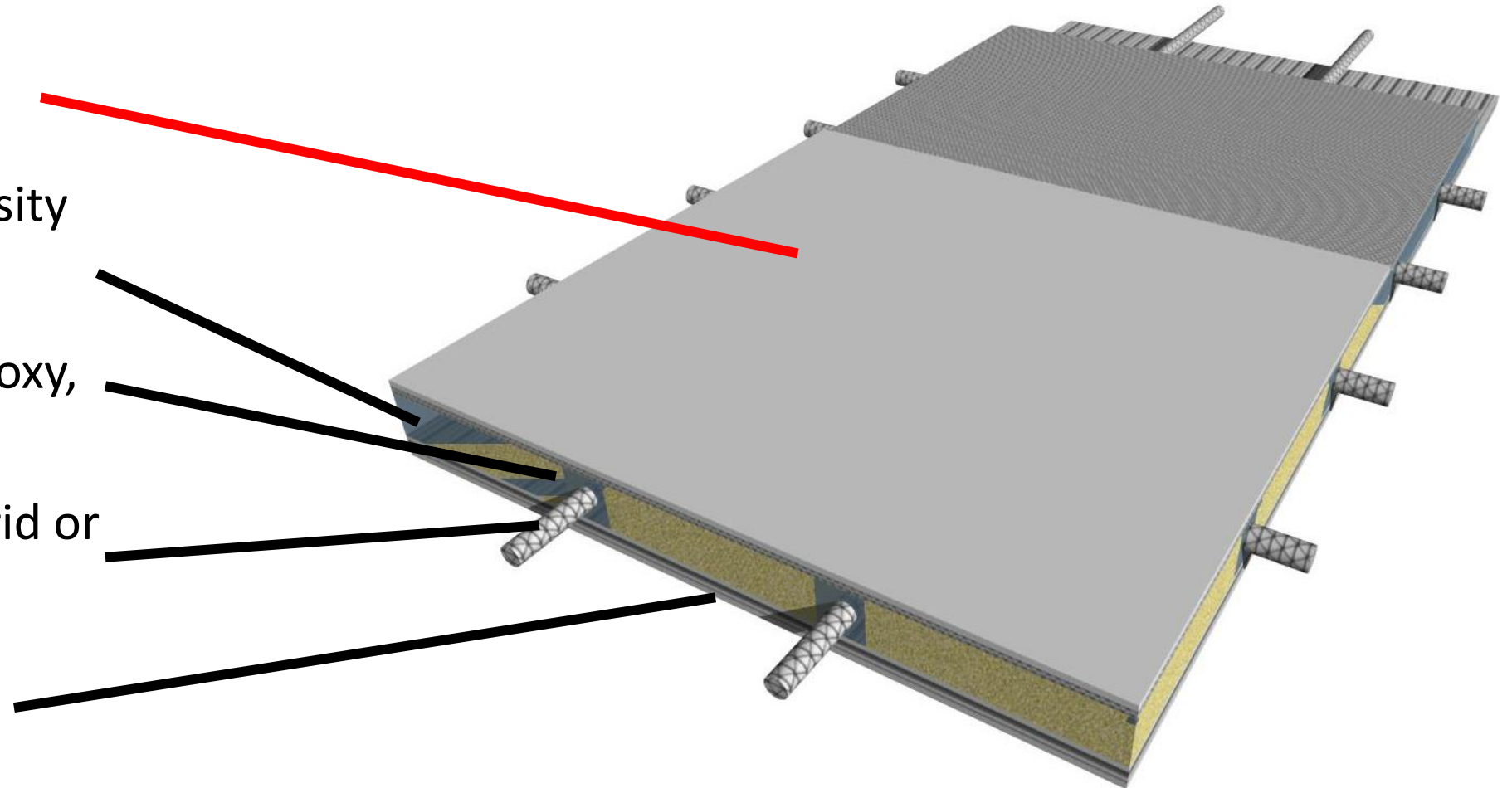
FRP Laminate

Recycled mid-density
Core material

Resin Infusion (Epoxy,
Vinylester, PUR)

Reinforcing FRP grid or
strands

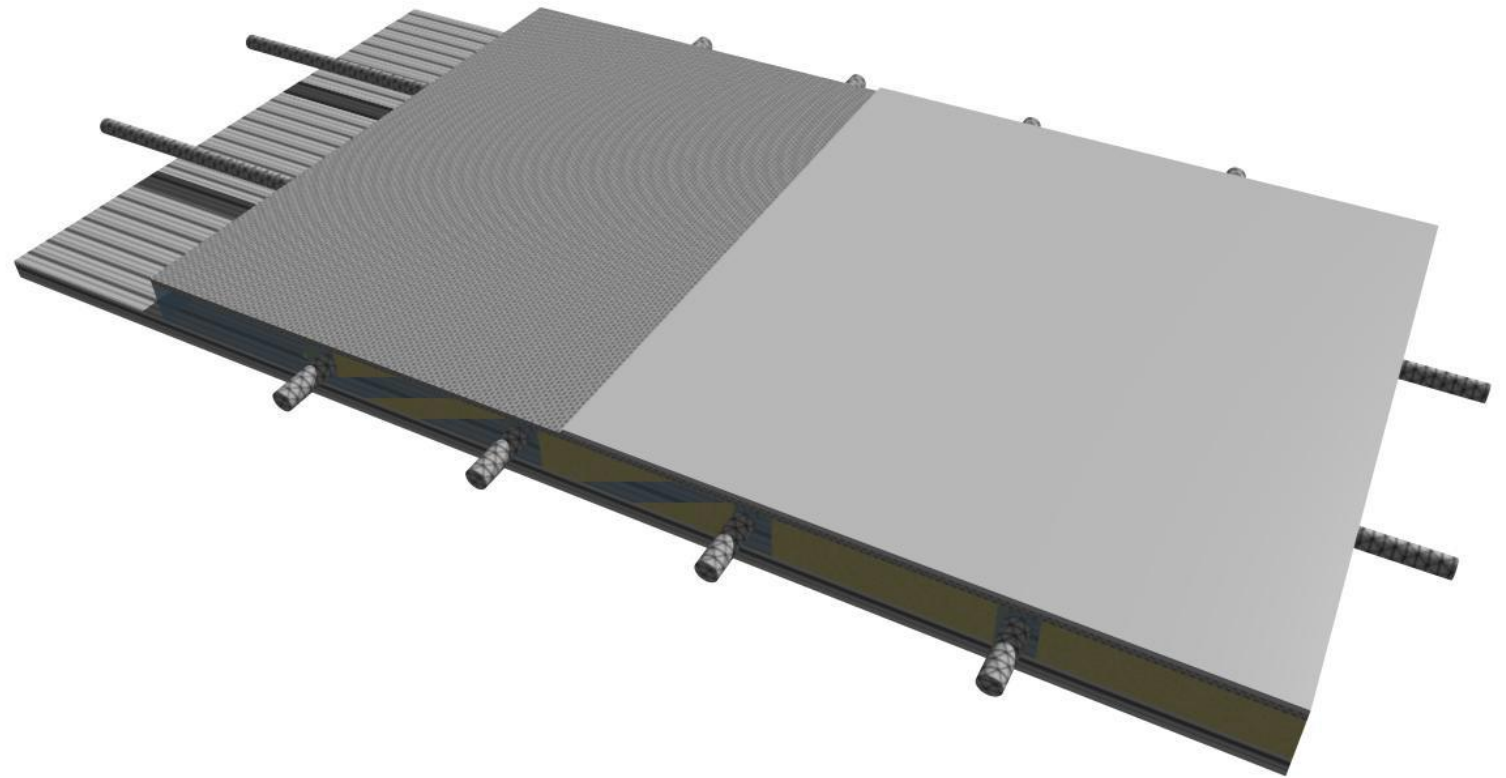
FRP Laminate



New structural products from REPLYES Technology

Advantages : wide array of choices

- Large sizes up to 14 x 3 metres
- Thickness from 10 to 60 mm
- Reinforcements in strands, grid or pultruded profiles
- FRP laminate faces from 1 to 6 mm
- Many fibres types , including natural
- Many resin types
- Industrialized production
- Still fully recyclable



Enclosures and containers for wind farm equipment

20' Container fully
Composite
Recycled content >85%

Light , no corrosion, better
soundproofing
Competitive price and
Total end-of-life recyclable

In picture container for TGBB NL
For MAELSTROM-h2020.eu project



Synergies and Cooperation

From REFRESH Project – ENECOLAB GEOW[®] process

Material

Preliminary tests:

Milled wind blades (fiberglass + epoxy resin)

Source: VESTAS ITALY

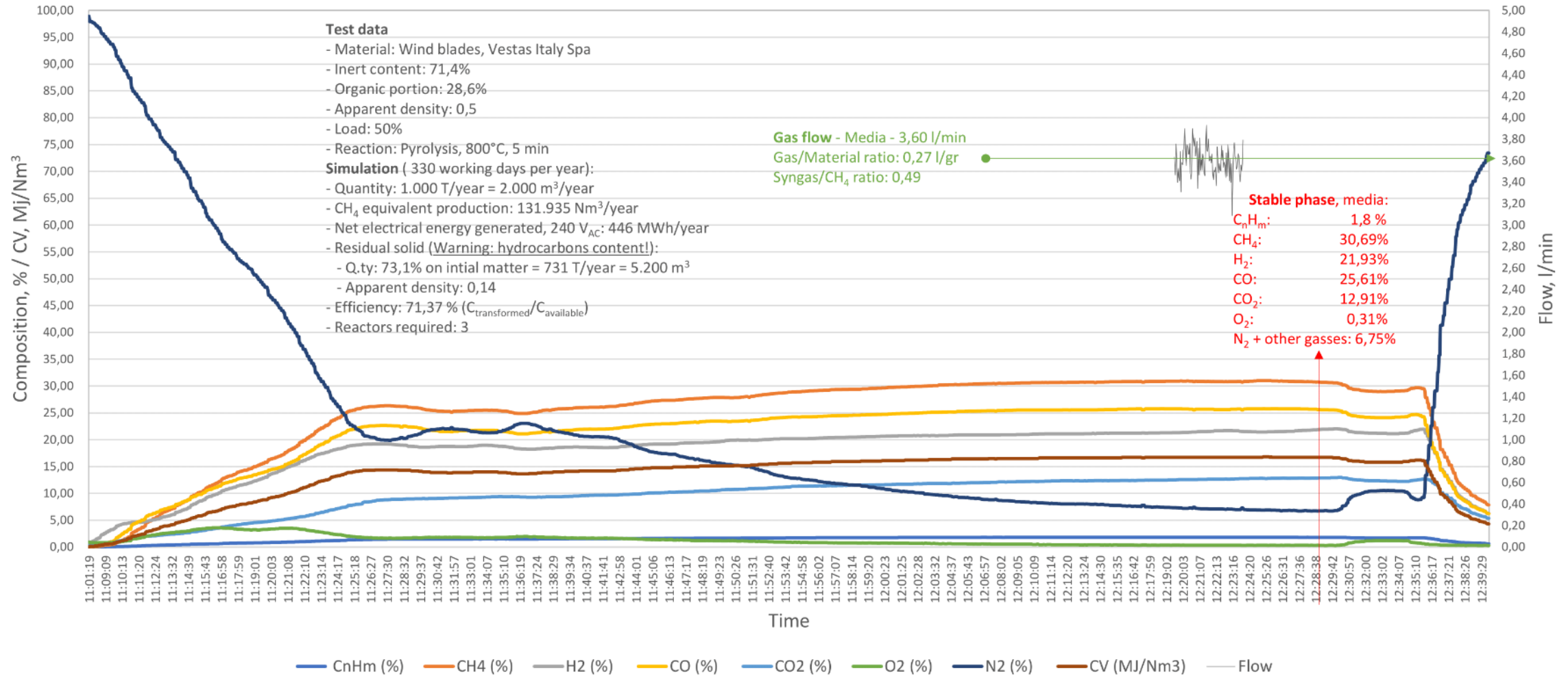
Supplier: Gees Recycling



The material as received

Process, Anaerobic Pyrolysis

REFRESH PROJECT - 20230614 Muggia 204 - PC Data - Graph

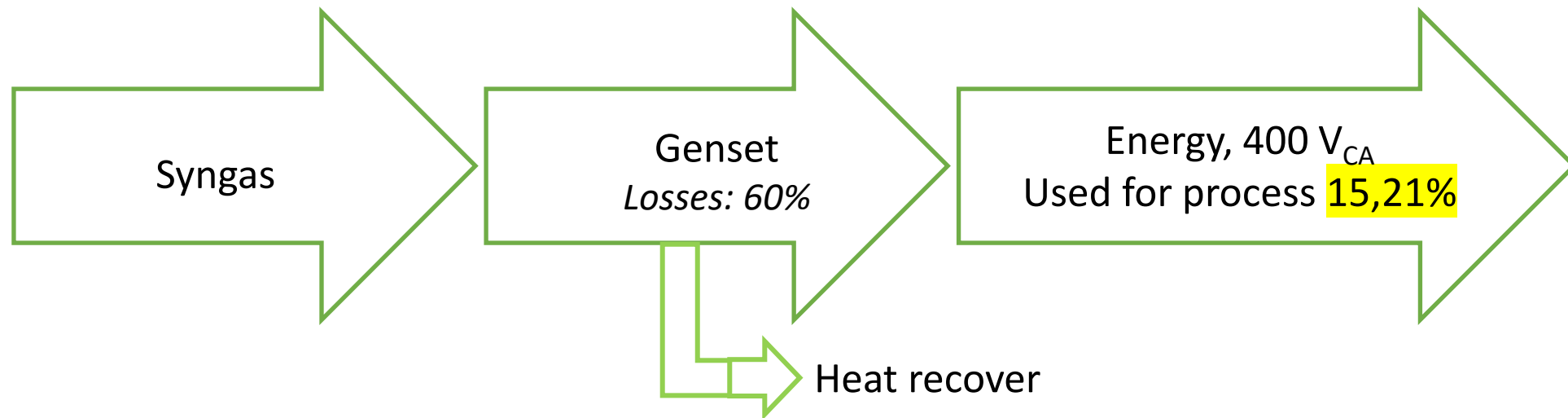


3rd: GEOW[®] thermochemical process, anaerobical pyrolysis

Process, Anaerobic Pyrolysis

Results, **positive**:

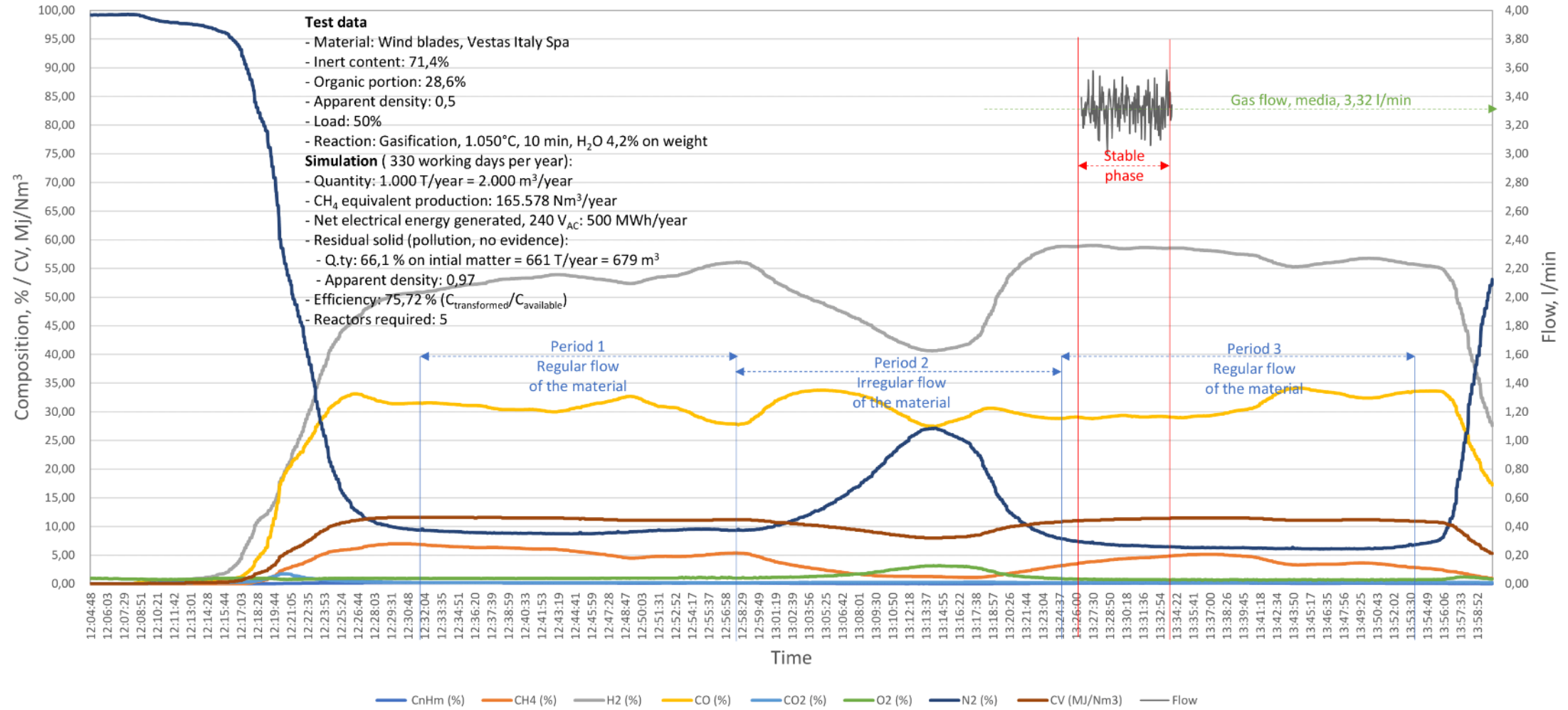
- 1) Even if the initial content of available carbon is not so interesting, the syngas produced contain **more energy** than the energy used by the process



- 2) Process efficiency: 71,37% ($C_{\text{TRANSFORMED}} / C_{\text{INITIAL CONTENT}}$)

Process, Gasification

REFRESH PROJECT - 20230620 Muggia 208 - PC Data - Graph



4th: GEOW[®] thermochemical process, Gasification

Process, Gasification

Results, **positive**:



Granulometry, residual solid after
gasification #208

Ø mm	gr	%
2,5 < 5,0:	60,9	20,74
1,2 < 2,5:	68,6	23,36
0,6 < 1,2:	67,6	23,02
0,0 < 0,6:	36,8	12,53
Losses:	59,8	20,36
Total:	293,7	100,00

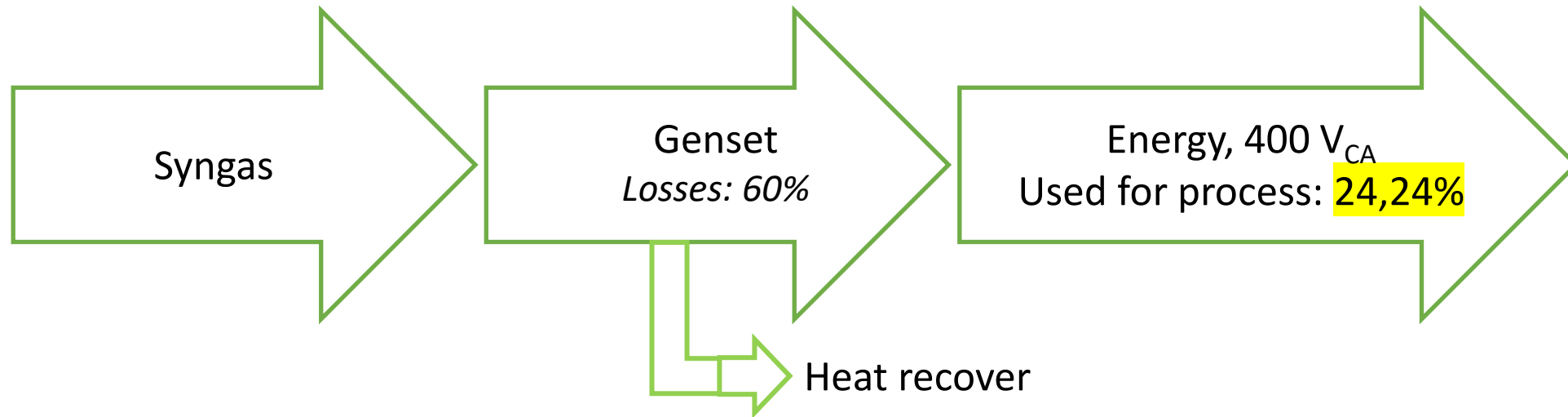
1. No evidence of pollution in the residual solids

**This may be applied also to different tar and byproducts of other
low-mid temperature Pyrolysis and Solvolysis processes**

Process, Gasification

Results, **positive**:

2. Even if the initial content of available carbon is not so interesting, the syngas produced contain more energy than the energy used by the process



3. Process efficiency: 75,72 % ($C_{\text{TRANSFORMED}} / C_{\text{INITIAL CONTENT}}$)