



# FiberEUse

Dena Arabsolgar



Large scale demonstration of  
new circular economy value-  
chains based on the reuse of  
end-of-life fiber reinforced  
composites

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# Holonix FiberEUse IT platform

a circular IT platform to manage innovative design  
and Circular Entities

*Sustainable Places 2020*

*Virtual, 27<sup>th</sup> October 2020*

Dena Arabsolgar





- Data about FiberEUse project
- FiberEUse Use Cases overview
- FiberEUse Example in Construction
- Stakeholders needs overview
- The new Circular Information Management
- A Matrioska approach: Circular Platform
- Multi-Actor involvement: co-create Circular Products
- Challenges
- Solutions: Idea Manager, Eco-System Management Platform



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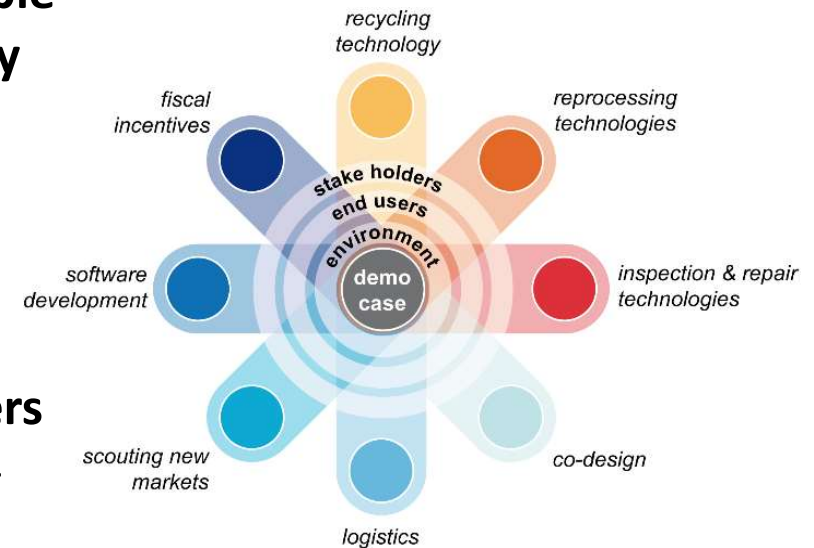


- Funding body: **EU Horizon 2020** (Grant Agreement No. H2020-730323-1)
- Grant: **€9.8 million**
- Duration: **4 years** started on June 2017
- Consortium: **20 partners**, from **7 EU countries**.
- Aim: **Integrating different innovation actions through a holistic approach to enhance the profitability of composite recycling and reuse in value-added products.**



FiberEUse aims to develop and demonstrate a large scale reuse of end-of-life (EoL) composites materials via:

- **Integration of innovative remanufacturing technologies addressed to develop profitable reuse options for mechanically or thermally recycled EoL GFRP and CFRP composites** - enabling ease of operation, significant cost reduction, compliance with EU Directives
- **Development of an innovation strategy for mobilization and networking of stakeholders from all the sectors related to composites** - from original equipment manufacturers (OEMs) to tier 1 suppliers, logistical operators, technology providers and exploiters, designers, and end-user associations



*FiberEUse Concept*

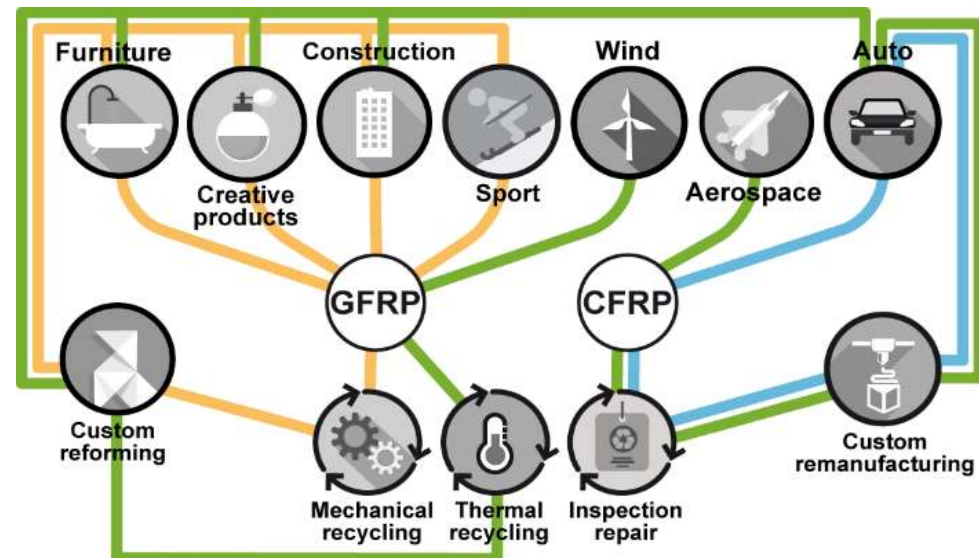


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FiberEUse is based on the realization of three macro use-cases, further detailed in eight demonstrators:

- **Use-case 1: Mechanical** recycling of short GFRP and re-use in added-value customized applications, including furniture, construction, sport and creative products
- **Use-case 2: Thermal** recycling of long fibers (glass and carbon) and re-use in high-tech, high-resistance applications
- **Use-case 3: Inspection, repair and remanufacturing** for EoL CFRP products in high-tech applications

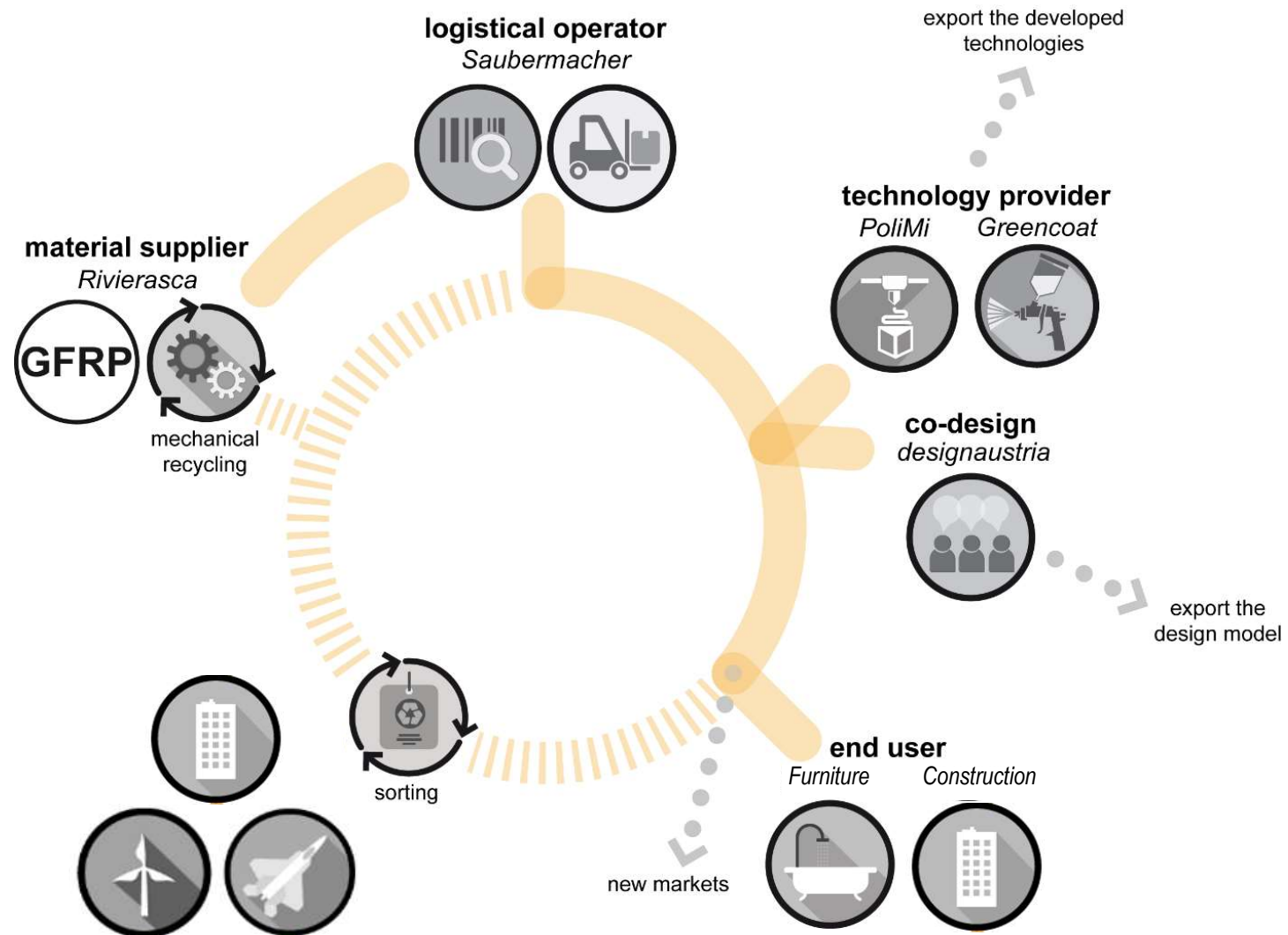


*FiberEUse Use-Cases and involved industrial sectors*



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# FiberEUse project – a circular value chain example





### Construction: how we can improve future

GFRP manufacturers need to be encouraged and stimulated to

**take back** their products at the end of their useful lives,

and shown how to make **profit** from this.

New business opportunities can be realized by careful evaluation  
and minimization of logistical costs.

**New product concepts** based on **recyclates**

need to be developed for a wider market and social acceptance,

making possible the realization of new circular economy business cases

making profit

and at the same time saving raw materials,

energy and reducing emissions.



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«I am a Waste provider»

«I am a ByProduct provider»:

- I need to dispose my end of life products
  - I want to reduce costs
  - I cannot send them to landfill anymore...
  - I want to do that in a sustainable way
- BUT...
  - I do not know who to offer them
  - Should I pre-process my waste? How?



## Stakeholders needs



«I am a Producer»:

- I am interested in new materials that
  - Are less expensive than traditional ones
  - Offer the same/similar properties than traditional ones
  - Whose availability meets my production needs
- BUT...
  - I cannot compare traditional and new materials
  - I do not know how to purchase them...who can provide me the material?



«I am a process provider»:

- I can process end-of-life products
- I can create new materials
- I can offer technologies to use new materials (i.e.: additive manufacturing,...)
- BUT...
  - I do not know who can provide me waste
  - I do not know who is interested in the new materials/technologies



«I am a logistic operator»:

- I can pre-process end of life products
- I can organise national/international transport
- BUT...
  - Who needs my services?
  - Which are the regulations that are applied to waste and new materials in each country?





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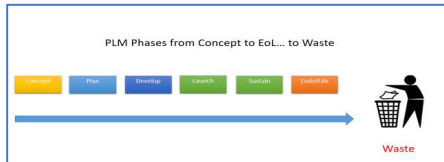


### PLM Phases from Concept to EoL... to Waste

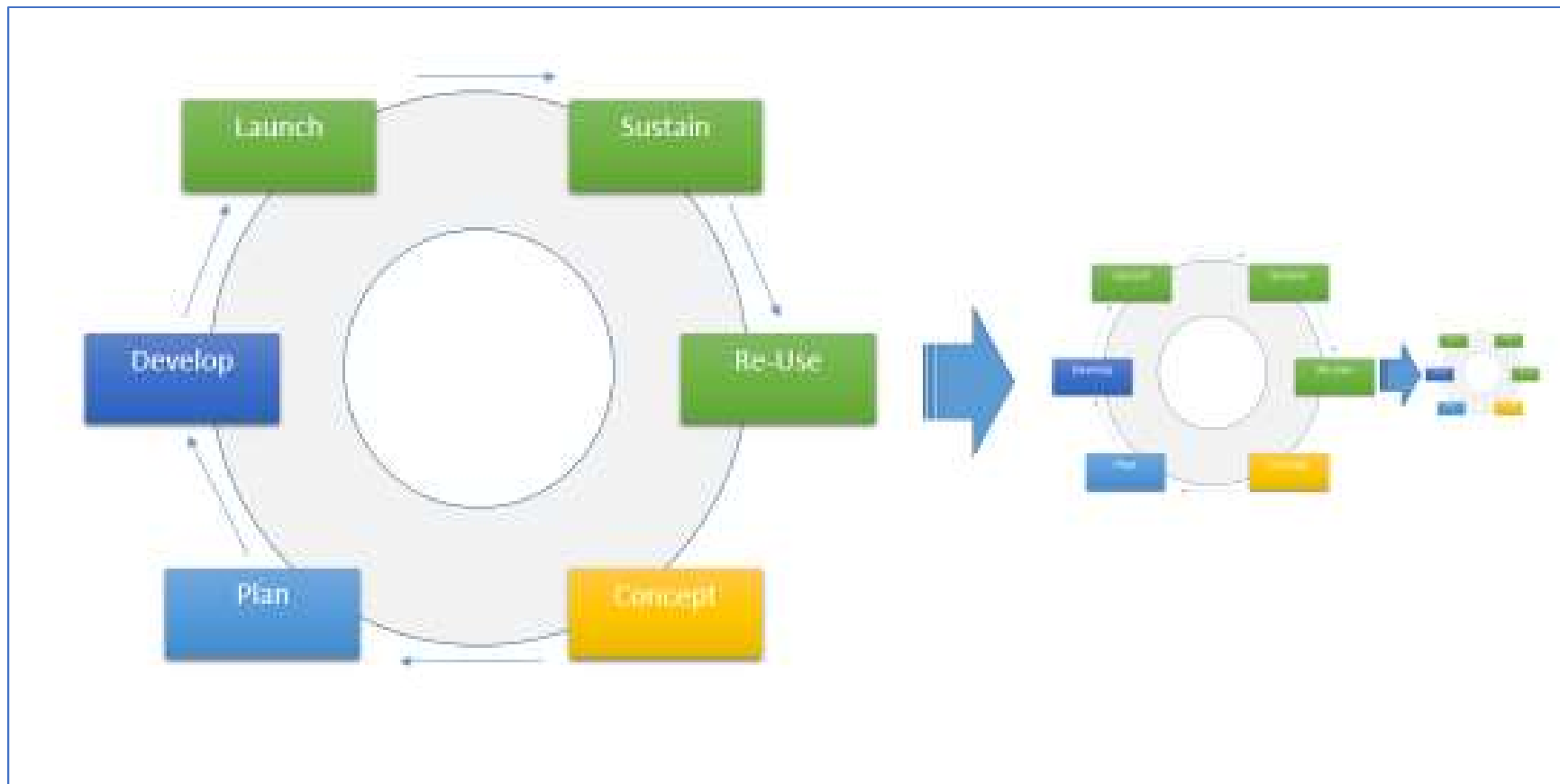


Linear economy  
From extraction to waste

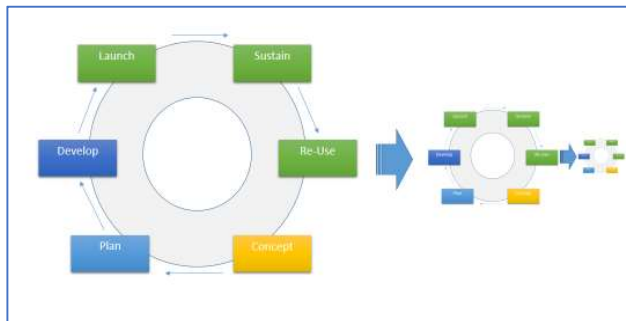
# The new Circular Information Management



Circular economy  
From object to object



## Matrioska approach



## Multi-Actor involvement



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### *Re-use, Re-cycle, and Re-something again*

We need to  
**create knowledge and match needs**  
to know IF, HOW, WHAT, WHEN  
I can use, reuse, recycle, remanufacture

How?  
Let people know  
Search  
Enter in touch  
Match  
Suggest  
Visualize  
Keep history tracked

#circularentity  
#eco-system





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## A Multi-Actor involvement: co-creation



***Share and collaborate** is the new mantra*

We need to involve actors  
And to introduce  
**the social approach**  
across the Value Chain

How?

Propose ideas

Tag

Like

Comment

Score

Poll

Search

Match

#circularITplatform

#cocreation

#openinnovation





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### 1. How to go from one Entity to the next Circular Entity?



New collaborations

New ideas

New processes

New materials



**Solution:**

Idea Manager tool  
#openinnovation  
#cocreation

### 2. How to actively involve users?



New collaborations

New deals

New connections

New ecosystem

**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion



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### Solution:

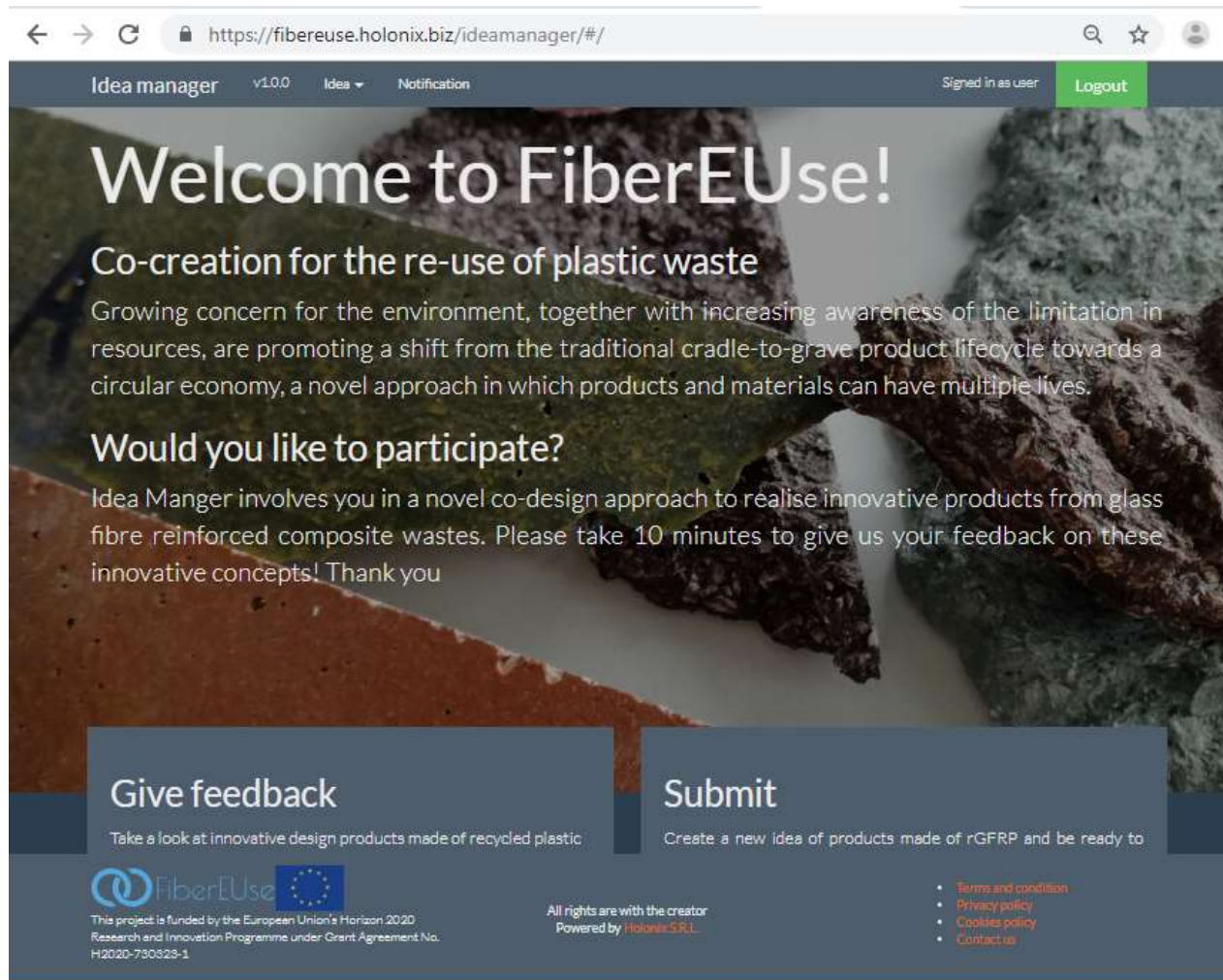
Idea Manager tool  
#openinnovation  
#cocreation

**Idea Manager** is a web-based software-tool designed to provide and support activities along the idea generation process, which is part of the **open innovation** approach.

not solely firm-centric

multi-actor (employee, designers, customers, providers, ...community)

## Solutions: The Idea Manager tool



**Solution:**

Idea Manager tool  
#openinnovation  
#cocreation

## Solutions: The Idea Manager tool



← → ↻ <https://fibereuse.holonix.biz/ideamanager/#/newidea> 🔑 🔍 ☆ 👤 ⋮

Idea manager v1.0.0 Idea Notification Signed in as user Logout

Innovate with us!

### New Idea

#### Main data

Title

File input:  Nessun file selezionato

Description

Insert new tag

Tags: acoustic,artificial marble,bioreisin,bodyshaker,building system,cellulosefibers,cold tub,criticaldesign,double-sided-bench,e-charger,electric product,electronic,environmentalpollution,fiber reinforcement for concrete,FiberEUse,Fibrewall,furniture,gogreen,grass,greening,healthcare,hot tub,let'sgrowgrass,letthadustsattleonit,medical treatment,mobility,Outdoor,outdoorbench,para,Parametric Layering,Plants,plasticpollution,public space,public use,recycled pho,recycling,recycling phoneboxes,relaxing,safe,safe space,safezone,ski,smartphone,sound,spa,sports&leisure,stores,transport,tub,urba,urban gardening,Urban greening,Vertical greening,wasteforwaste

#### Additional data

Submit



**Solution:**  
Idea Manager tool  
#openinnovation  
#cocreation



### MODUL X^3

#### Description

THE DESIGN CONCEPT IMPLIES A DEVELOPMENT OF A MULTIFUNCTIONAL, TEMPORARY MODULAR VOLUME WITH AN EXTE...[read more](#)



#### Author

MikSmol

#### Attachments

SMOLSKI\_Mikhail\_SS18\_Final\_Presentation.pdf

👍 Unlike it 22

💬 comments 5

Feedback survey

### FIBREBENCH

#### Description

You choose which direction you would like to look at or how close you would like to sit to another p...[read more](#)



#### Author

alicia.wa

#### Attachments

Guschlbauer,Stangl,Wackenheim - Bank.pdf

👍 Unlike it 23

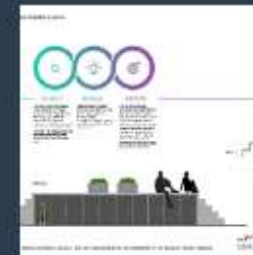
💬 comments 6

Feedback survey

### BICYCLE RACK

#### Description

The aim is to develop a functional, safe and attractive place where bicycles can be stored and locke...[read more](#)



#### Author

saracramer

#### Attachments

Cramer\_Bicyclerack.pdf

👍 Unlike it 39

💬 comments 8

Feedback survey

# Solutions: The Idea Manager tool



Idea manager

v1.0.0

Idea ▾

Concept ▾

Survey ▾

Signed in as moderator

Logout

Find innovative idea!

Search idea

Autodose,Connectivity,Easy to Use,Eco-Friendly,Efficacy,Efficiency,Energy Saving,Ergonomic Machine,High Performance,Home wellness,IoT,Light Noise,Monitoring,Reliability,Resource Efficiency,Safe,Smart Device,Smart Home,Smart Maintenance,Sustainability,Touch,Water Saving

Add a tag

Name	Status	Description	Usefull for	Like	Comment	Author
<a href="#">Energy Awareness Service</a>	Pending	Service that allows costumer to control and optimize the energy consumption during each cycle in the day, making him/her more aware about his/her usage.	Not usefull	Like it 1	comments 0	user
<a href="#">Predictive Assistance Service</a>	Evaluating (Public)	Analysis of machine current status, recognition of dangerous situations, efficient management of the maintenance process.	1 concept	Like it 1	comments 3	user
<a href="#">Perfect Dosing Technology</a>	Reject	Allows customer to understand what and how many detergent should be used according to dirty clothes to wash.	Not usefull	Like it 0	comments 0	user
<a href="#">Professional washing</a>	To Clarify	This ability allows costumer to wash and dryer in total safety the clothes that request drywash	Not usefull	Like it 0	comments 0	user
<a href="#">Touch Experience</a>	Evaluating (Public)	This idea provides the re-design of dashboard where the costumer has a touch screen to choose the cycles, identify the timing, and set	1 concept	Like it 2	comments 3	user



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### Solution:

the Eco-System Management platform  
#matchmake  
#Re-cursion

**The Holonix Circular IT platform is** a cloud based multi-sided platform where multiple potential users can be enabled to manage and access relevant information.

It connects two or more interdependent user groups, by playing an intermediation or a matchmaking role.

This solution minimize transactions costs between market sides.

The platform must achieve a network effect, involving many users and stakeholders.



### Solution:

the Eco-System Management platform

#matchmake

#Re-cursion

FiberEUse

RIVIERASCA\_ADMIN

FiberEUse LAND\_c8ee984691.svg

# Eco-System management platform


## Glass and carbon fiber ecosystem

An innovative tool that enable new value chains in the circular economy of the glass and carbon fiber.

This project is funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. H2020-730323-1



**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion



- Home
- Project
- Company
- Circular entity**
- Process
- Logistic
- Service
- Enter in touch
- Open Innovation
- Search

FiberEUseRIVIERASCA\_ADMIN

List Circular entity

+ NEW CIRCULAR ENTITY


MINESHOW OTHER

name	location	description
Construction 75% UP, 25% GF	Bottanuco - BG - Italy	Glass Fiber construction waste in unsaturated polyester various colours
Uncured glass fiber prepreg pieces	Bregenz Austria	
Blade	Spain	Glass Fiber Blade entire to be cutted or chopped
Piece of Blade	Spain	Glass Fiber Blade cutted and ready for common truck transport
Recycled fibers	Romanore-Borgo Virgilio (MN)	raw recycled material

Records per page: 51-5 of 6



**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion



Home

Project

Company

Circular entity

Process

Logistic

Service

Enter in touch

Open Innovation

Search

FiberEUse

RIVIERASCA\_ADMIN

## Circular entity detail

ATTRIBUTES

ATTACHMENTS

SUGGESTIONS

name

Construction 75% UP, 25% GF

location

Bottanuco - BG - Italy

category

Glass fiber

description

Glass Fiber construction waste in unsaturated polyester various colours

External resource

Circular entity(EXT)

Process(EXT)


SAVE

Active

VALUE CHAIN



**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion

  
FiberEUse

- Home
- Project
- Company
- Circular entity
- Process
- Logistic
- Service
- Enter in touch
- Open Innovation
- Search

FiberEUse

RIVIERASCA\_ADMIN

ACTIVEVALUE CHAIN

## Circular entity detail

ATTRIBUTES

ATTACHMENTS

SUGGESTIONS

Internal resource

Circular entity(IN)

Process(IN)

Logistic(IN)

LCA - LCC results

Dismantlable

Custom attributes

Type of resin

Unsaturated polyester - Orthoftalic

GF content (%)

242526


Fiber Length (mm)

ADD ATTRIBUTE

SAVE



**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion

  
FiberEUse

- Home
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FiberEUse

RIVIERASCA\_ADMIN

Enter in touch

INBOX OUTBOX

Sender	Receiver	Object	message	reply	Deal
#####	RIVIERASCA	[circularEntity] Construction 75% UP, 25% GF	TEST ATTACHMENT		<div>REPLY</div> <div>YES NO</div>

Records per page: 5 1-1 of 1



**Solution:**  
the Eco-System Management platform  
#matchmake  
#Re-cursion

FiberEUse

Home

Project

Company

Circular entity

Process

Logistic

Service

Enter in touch

Open Innovation

Search

FiberEUse

Search

Key chopping

CIRCULAR ENTITY

PROCESS

LOGISTIC

Filters

rangeVal 2

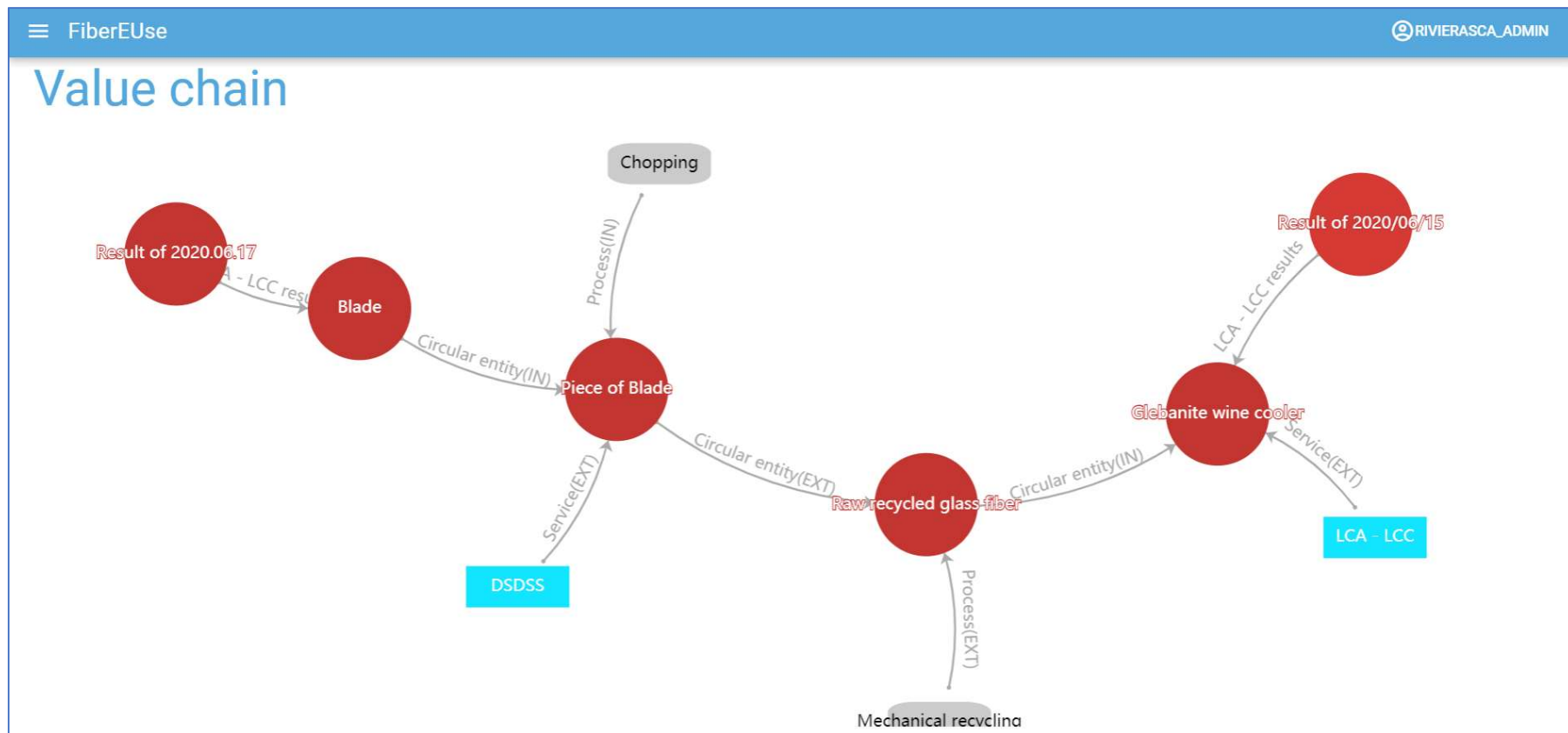
ADD FILTER

SAVE RUN

RIVIERASCA\_ADMIN



**Solution:**  
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