



# European Project Semester

## PROJECT OUTLINE

**Project dates:** March – June 2020

**Title:**

*Implementation of circular economy solutions for marine plastic waste up-cycling*

**Project activity areas:**

*Plastic up-cycling, circular economy, business project funding, material science, biochemistry, Research & Developments, Environment protection*

**Keywords:**

*Plastic marine waste, up-cycling, funding, circular economy, polymer science, material engineering, environment, protection, societal approach*

**Tutor's name and coordinates**

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**Project origin**

*Research, Innovation, Up-cycling, Circular Economy, Environment protection*

**Project technical background:**

This project aims to create a new circular economical channel to up-cycle marine plastic wastes. It is lead by the organisation [www.ReSEAclons.org](http://www.ReSEAclons.org) located in southern France. This association has organised a plastic marine waste collect channel in partnership with fisheries, local communities, governmental organisations, citizens. They also have started a up-cycling project with a French polymer science university cluster that lead to the manufacturing of a plastic “ecocup” thanks to



compression moulding of marine plastic waste powder. Now this “ecocup” project needs a new kick to put it to the next level. Indeed, we actually don't know the technical properties of such mix of plastic which limits its application domains. We wish to give it a second life and give it a real economic value.

Thus, the project shall investigate several aspects of the problem:

1. **Project funding:** This project implies the seek for funds (governmental, regional, other). This component of the project will consist in analysing all the funding possibilities available, select the best option and implement it. It also implies to able to defend the project in front of funders or public institutions. A great experience for those who have in mind a future business development.
2. **Material science characterisation:** As already explained, the “ecocup” material is not understood yet and not characterised yet. The aim of this part of the project is to set up a polymer analysis plan that includes physic and chemistry characterisation, mechanical and thermal testing and also durability testing such as ageing. Ageing shall be standard laboratory accelerated testings but also natural environment

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testings using the “pic du midi” ageing platform at 2877m in the Pyrenees. Due to the great heterogeneity of the said up-cycled material, the characterisation project shall be apprehended on a statistical point of view using a big data approach. The final goal of this characterisation is to end-up with a specification document of the up-cycled material that allows a reflexion about the market potential of the same.

3. Product development: the aim of this part of the project is to imagine a potential economic future for the up-cycled material. It implies an engineering approach to define potential applications for the up-cycled material beyond the “ecocup” solution.

4. Circular economy: this project is deeply anchored in values such as respect. Respect of the environment but also respect for the people. We have to think the future development of this project with respect with local economies by restoring the scale of values through the different actors of the cycle. As a consequence, a whole part of the project shall be dedicated to integrating all the stakeholders of this newborn economical ecosystem. Our goal is to heal the society as we want to heal the marine life.

5. Up-cycling solution innovation: the up-cycling project is only the first step of the project. We would like to develop other innovative or even revolutionary approaches of up-cycling plastics. This part of the project is to set up an ambitious project to provide with perennial solution to deal with the use of oil-based plastic base on our experience of the “ecocup” material.

**Studied topics:**

- Innovative project funding
- Polymer science applied to marine plastic waste up-cycled characterisation
- Circular economy study and development
- Product development works in order to open up the application field of the up-cycled material
- Research for innovative up-cycling solution for oil-based plastics