

# CIRCULARSEAS

NEWSLETTER #2

***“Is COVID-19 good or bad for the ocean’s health?”***

***A Reflection***

***It is not possible to live in the present, or think about the future without taking this into account.***

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***“More CircularSeas workshops”***

The Leartiker Technology Center of Markina-Xemein and Azaro Fundazioa, both members of the Basque Science, Technology and Innovation Network, have held forward Workshops.

Representatives of the maritime industry sector and other companies around Circular Economy technologies and 3D printing participated in the workshop.

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***“First activities in the Vigo Node”***

An analysis of plastic waste has been carried out at the Vigo node through surveys in order to determine the viability of closing the loop by recycling the waste generated.

In addition, development is being carried out on a commercial 3D printer and a platform for testing unstable conditions.

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***Let’s do it!***

DIY Childrens Activities.

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## “ Is COVID-19 good or bad for the ocean's health?”



*It is necessary to adjust to a new normal, expecting that the global health systems can have things under control.*

*To answer the question: "is COVID-19 good or bad for the ocean's health?", Scuba Diver Life Association<sup>2</sup> editorial team suggests to go through the five following topics:*

### *1 - With less surveillance, illegal fishing will go uncontrolled.*

Fishing workers, like others, are facing increased pressure to protect their families in the event of a global recession. Some of them may need to follow not so good practices related to the ocean activity, creating bad news for the reduction of fish stocks.

#### *What can we do?*

To use our holidays to go to resorts that use the power of tourism for causes like nature protection, community education, and legitimate employment as the only way to fishing. There are some inspirational places to do so.

### *2 - If everyone accumulates food, the ocean would be under increased stress.*

Surprisingly, during the last pandemic times, people were more interested in acquiring toilet paper than in buying fish. Actually, the supply and demand for fresh fish has decreased since the COVID onset. Accordingly to the Food and Agriculture Organization (FAO)<sup>1</sup>, the measures to contain the spread of COVID-19 (e.g. closure of food services, cessation of tourism, reduction of transport services, trade restrictions, etc.) have caused disruption in both domestic and international supply chains. A similar fact occurred during the World War II and, eventually, led to a significant recovery in some fish species throughout the 1950's.

#### *What can we do?*

From now on, try to source fish in a responsible way and get informed by reading the right papers or works, in order to do the best to understand where our seafood is coming from.



### 3 – Scientific marine research was limited as a consequence of the virus.

The recent global lockdown gave rise to a significant reduction in science and research on ocean ecosystems. This fact affected areas related with ecosystem conservation and fish-stock management.

#### *What can we do?*

To support robust marine conservation organizations and help them with the resources they need to carry on with their work.

### 4 - Less human activity allows the ocean ecosystems a chance to recover.

After some postponements, activities like diving were impatient to get back in the water again. Meanwhile, the pandemic situation gave marine creatures a chance to recover and thrive.

#### *What can we do?*

To understand the negative consequences of irresponsible diving (and other ocean activities) practices. Now that we can get back in the water again, we need to try to get involved in conservation activities.

### 5 - The global break meant some "fresh air" for marine ecosystems.

There is no doubt that the human carbon footprint has fallen over the past few months. A depletion on CO2 concentration means a deceleration in climate changes and ocean acidification.

#### *What can we do?*

To think about which habits we want to bring back to our future life and what habits we want to leave behind. The future is in our hands.

As a concluding remark, let's just think that governments, businesses and normal people like us have now the opportunity to make blue economy sectors more "green" in the wake of the novel coronavirus crisis.

Short Communication by Margarida Franco CDRSP- PLeiria

#### References:

- 1 - FAO (Food and Agriculture Organization) <http://www.fao.org/2019-ncov/q-and-a/impact-on-fisheries-and-aquaculture/en/>
- 2 - COVID-19: Good or Bad for the Ocean? <https://scubadiverlife.com/covid-19-good-bad-ocean/>
- 3 - CSIS (Center for Strategic and International Studies), <https://www.csis.org/analysis/covid-19-sea-impacts-blue-economy-ocean-health-and-ocean-security>

## “Leartiker and Azaro Fundazioa have held more workshops”

Despite the fact that due to the current situation, the workshops had to be held online, the call has been a success.



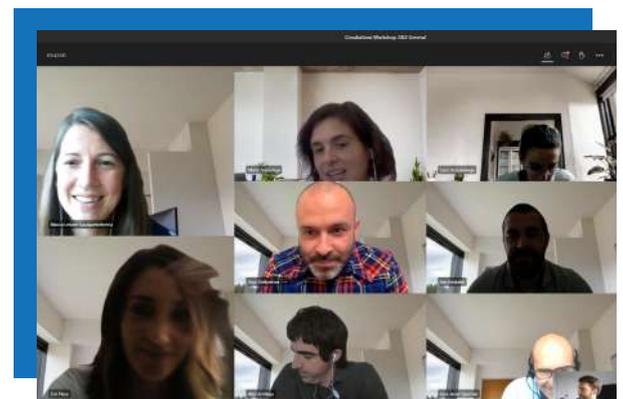
The Leartiker Technology Center of Markina-Xemein and Azaro Fundazioa, both members of the Basque Science, Technology and Innovation Network, have held further workshops of the European CIRCULARSEAS project (the first workshop was held in February on the project presentation day).

### The workshop program was led by Leartiker and was in three parts.

In the first part, they analyzed the Circular Economy and 3D printing of the Basque Country with the collaboration of BRTA (Basque Research and Technology Alliance) and Leartiker Polymer R&D. In the second and third parts, two creative sessions were held in which the participants, based on four success stories, have identified sustainable products from the maritime sector to later define the business model and finally to make a presentation of the model business developed.

Representatives of the maritime industry sector and other companies interested in innovating around Circular Economy technologies and 3D printing participated in the conference.

Rikardo Bueno, general director of the BRTA, has referred in his speech to the contribution made by the Basque technology centers to the Circular Economy. In this sense, he stressed that research and development are fundamental to the European "Green Deal" agreement and that the strategy of the Circular Economy in the Basque Country is to develop new material, technological and business models, as well as to transfer the acquired knowledge.



Printscreen of the session

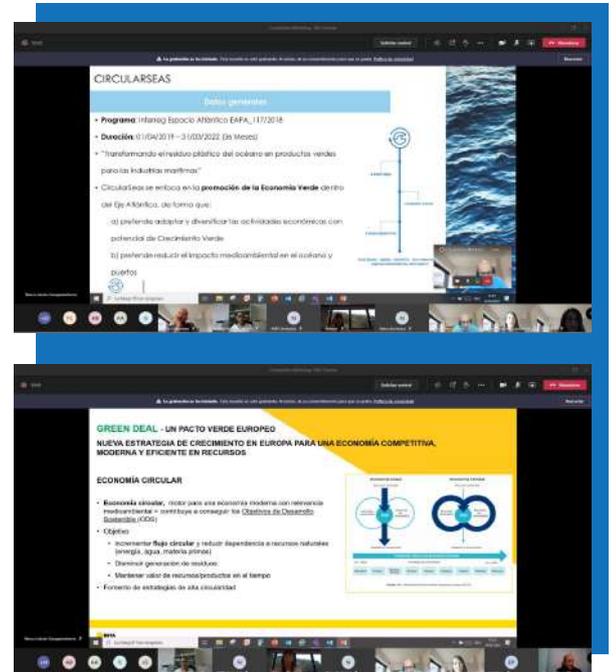
“Basque technology centers can contribute a lot but improving collaboration between them is essential to guarantee this transfer”

Rikardo Bueno, BRTA

**“ FDM technology was chosen for the CircularSeas project because it requires less investment and offers flexibility and agility ”**

Alex Arrillaga, coordinator of new materials at Leartiker, spoke about FDM technology for 3D printing. This technology was chosen for the CircularSeas project because it requires less investment and offers flexibility and agility: "It is easier to understand and more manageable for anyone". In addition, he stressed that the objective of this project is that the thermoplastic raw material that is used for printing is recycled and sustainable. So, you have to think about which polymeric material to use depending on the piece you want to manufacture.

The creative sessions have focused on the marine industries that appear in the CircularSeas project: the fishing sector, aquaculture, the auxiliary industry and the recreational sector.



Printscreen of the session

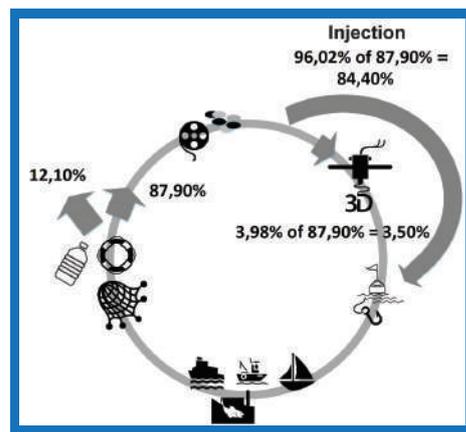
The participants were divided into four groups and they identified and defined sustainable products from the maritime sector, taking into account that they must be recycled, biodegradable or with improved characteristics. For this, they had the collaboration of the MATER Barco Museo Ecoactivo, Ternua, Indart3D and Eko-REC, who have shared their successful experiences in this area. Likewise, the characteristics of the different waste was identified to be able to specify new ideas; products that can be useful in the maritime sector; those that are more fragile or with certain characteristics; those that need to be personalized; and the inconveniences and risks that the generation of sustainable products can have among others.

Afterwards, each group has chosen one of the ideas that came out of the creative session and they have developed a business model around this product based on the Ecocanvas model. To do this, they specified what is the value of the product, its contribution to the market or to a need, the fundamental resources or what improvement the creation of this product would have with respect to the environment. Finally, the four groups have carried out a round table discussion of the chosen ideas.

The organizers were satisfied with the enthusiasm shown by the participants and the quality of the ideas developed. Moreover, they have stressed that "some of them may have a place in the CircularSeas project." Finally, the organizers are grateful for the support received from technology centers and universities related to knowledge and from government institutions that work for the economic development of our region.

### The University of Vigo has completed the diagnosis of plastic waste

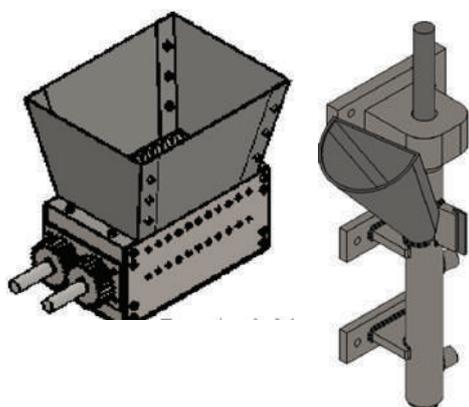
Surveys have provided empirical evidence on the economic, technical and environmental feasibility of 3DP technology in the manufacture of parts with green materials. From the results, it can be concluded that the amount of plastic that could be recycled through 3D printing, within an Circular Economy port, is much less than the total amount of plastic waste. Despite this, the amount of plastic to be recycled with this technology is significant. Furthermore, although the stakeholders are, already making an immense effort in terms of the volume of plastic waste destined for recycling, it is appreciated that there is still room to increase it. Regarding the technology for the recovery of these wastes, although injection is currently the most appropriate for mass production, 3D printing aimed primarily at more personalized pieces could absorb significant volumes of these recycled plastics.



### 3D printer and test platform

UVigo has started working to customize a commercial 3D printer (Ultimaker 2+) to be the basis for future integrated environment development and manufacturing testing under unstable conditions.

The development of an ocean motion test platform is currently beginning; Stewart platform. Despite being a well-known machine, available on the market, it has been decided to develop it in order to control all its parameters. This platform will be used in future tests of the influence of on-board conditions on possible on-board manufacturing.



### Disclosure: technologies for recycling

One of the illustrative and demonstrative activities of the Vigo node in the project is building a system for the generation of filaments (shredding + extruder).

This system will be used as support in future dissemination and awareness activities, as well as in student forums, where it is possible to easily illustrate the steps to follow when recycling plastic, this is the key to promoting recycling.

## Let's make a rainbow<sup>4</sup>

After an intense rain, the sun appears and with it comes the rainbow. But have you ever wondered how rainbows come about? What if, instead of drawing, we could also produce a rainbow?

The rainbow is one of the most beautiful natural phenomena, easily observable by everyone. It is an optical phenomenon caused by the refraction of sunlight in the water droplets present in the atmosphere, and it was explained by Isaac Newton, one of the most famous physicists of all time. Through a very simple experimental activity you will be able to reproduce the phenomenon at home, and thus understand it easily.

### You Will Need



Water container



Mirror



Flashlight



Paper

### Procedure:

- 1- Fill a container with water;
- 2- Place the mirror vertically inside the container leaving only half of the mirror submerged;
- 3- Turn on the flashlight and direct the light only on the part of the mirror that is submerged under water;
- 4- Place the paper sheet in order to intercept the light reflected by the mirror;
- 5- Observe the paper and you will be able to see your rainbow, through the different colours visible on the paper;

## Why can we observe the colours of the rainbow on the paper sheet?



- ✓ Sunlight is a mixture of several colours.
- ✓ The rainbow is caused by the scattering of sunlight that undergoes refraction when it hits the raindrops, causing the split of sunlight into the color spectrum: violet, indigo, blue, green, yellow, orange and red.
- ✓ The raindrops act as prisms separating and refracting the sunlight into its components. So the colours, that forms white light, are now separated and we can observe a beautiful rainbow.
- ✓ The same happens when the light from the flashlight (white light) , upon reaching the water is decomposed into the constituent colours, which are reflected by the mirror and observed on the white paper, like a rainbow.

## Curiosities

### Why does the rainbow have a curved shape?

The rainbow has a curved shape due to sunlight passing through raindrops.

The coloured light ray leaves the drop in the opposite direction making an angle of 42 degrees with incident radiation. So when we look at the rainbow it looks like it has a curved shape.



Reference:

4- from "Centro de Ciência Júnior": <https://www.centrocienciajunior.com/pt/>