



GREENNOVA
FOUNDATION

2022 Annual Report



A year with results

Year 2022 has been positive for Greennova Foundation. We have continued to enjoy the support of our donors and sponsors and our projects have continued their progress with positive results.

But 2022 will be remembered as a dark year, in which a war with effects that are difficult to foresee broke out in the heart of the European continent. For now it has already caused a redefinition of energy flows between producing and consuming countries, price increases aggravated by the effects of the pandemic, a relaunch of renewable energy expansion plans and a positioning to ensure the supply of the necessary materials to carry out the transition to cleaner energies.

The world has realized that energy security is not entirely guaranteed. The countries that can afford it will install many photovoltaic panels, but the rest will continue to rely on fossil fuels because without energy, society stops.

The speed at which the energy transition takes place will determine how long it takes to leave fossil fuels behind. The longer it takes, the more carbon dioxide will have to be removed from the atmosphere.

Sebastià Carrión
Director

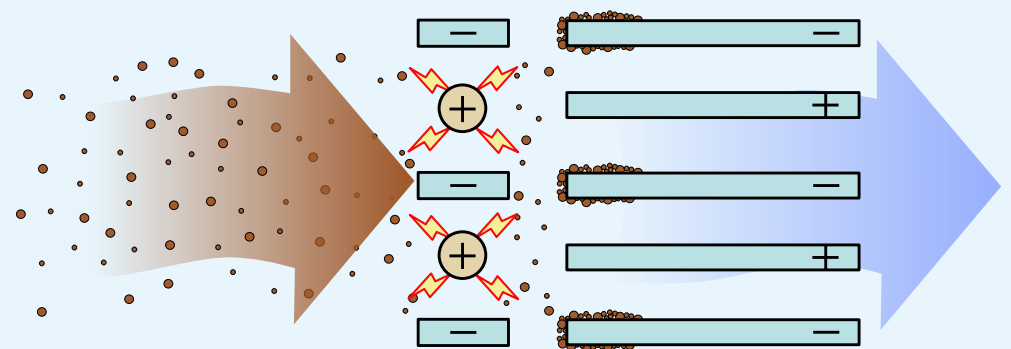
POLUSTOP Project

2022 has also brought good news to the POLUSTOP project, committed to the fight against pollution and climate change by capturing particles from the air.

The project has been recently sponsored with a public Climate Change Coupon, which despite being a modest contribution will make possible to buy some special equipment and continue with the research in collaboration with Eurecat.

Therefore the project will change how particles are captured. While in the early phases of the project, particle capture was tried to accomplish using regenerated filters, now the research will try to do it by creating electrostatic and magnetic fields.

We hope to get good results with this new strategy so that a test device can soon be installed in a big (and polluted) city.



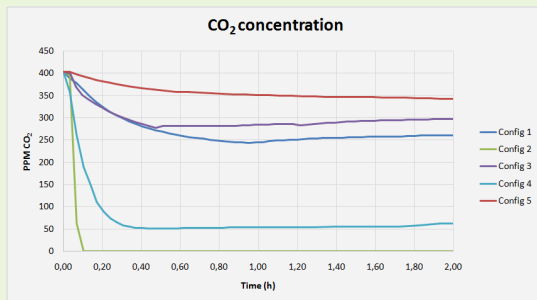
CAPTACO2 project, which is developing an atmospheric CO₂ desktop capturing device, has continued with the work of Anna Mas at the University of Tarragona.

During 2022 Anna has been working on the composition of the membranes that separate the capturing liquid from the air. Many different types of membrane have been characterized based on their composition, thickness, and manufacturing process.

Anna has also perfected the experimental setup. The initial test module has allowed to extract interesting results like those shown in the graph below, but it is limited because it has a small volume and thus a little amount of available CO₂.

The new experimental arrangement uses a climatic chamber in which the module, uncovered, is located. The chamber is airtight, and much larger than the module, therefore the volume of carbon dioxide that can be captured is much greater.

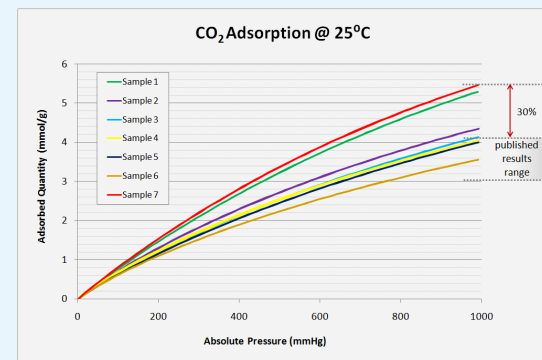
Using a climate chamber allows to have conditions much closer to the real ones. The chamber, at the beginning of the experiment, contains atmospheric air. On the contrary, the previous assembly required the use of a cylinder of synthetic air.



GRAFECO2 project has continued studying different MOF + graphene oxide structures to capture atmospheric CO₂, with the work of PhD student Elizabeth Martínez at the University of Barcelona.

After many tests Elizabeth has been able to synthesize a sample that improves CO₂ adsorption by up to 30%, comparing it with previously published data. It is an excellent result.

In parallel, Elizabeth has worked on the synthesis method. Following the principles of Green Chemistry, she has set aside the use of toxic solvents, such as DMF, to use the ball mill technique which is much more respectful with the environment.



Whether it is done with the ball mill technique or using DMF, the consistency of the synthesized samples is not suitable for an industrial device. That's why Elizabeth is also looking for ways to amalgamate the samples.

She has tried with 3D printing, airbrushing, and pressing.

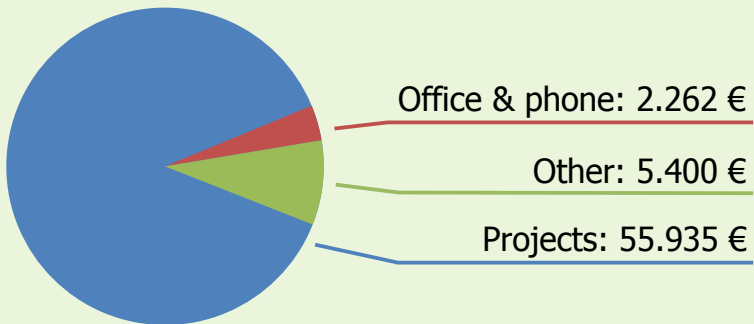
Elizabeth's Industrial PhD concludes in October; the task of the Foundation will be to obtain more resources to be able to continue the project with a new PhD student.

Transparent accounts

Greennova Foundation accounting inflows and outflows during 2022

| | |
|----------------------|-----------|
| Patrimony start 2022 | 66.517 € |
| Received donations | 51.000 € |
| Expenditures | -63.597 € |
| Patrimony start 2023 | 53.920 € |

Expenditures per type



GREENNOVA
FOUNDATION

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