REVOLUTION: Building skills for sustainable lightweight materials and digitalization techniques development in the automotive industry

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**Dissemination Team** 

















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## **REVOLUTION** project



REVOLUTION is proposing a disruptive innovation that will bring open-loop recycling to the forefront of automotive injection moulding. REVOLUTION will use machine learning and artificial intelligence to OPTIMISE the input of recycled materials and injection moulding process to deliver high-quality parts.

- ✓ 14 Partners
- ✓ 10 Countries



- ✓ From 01.01.2021 to 31.12.2023
- ✓ H2020, Innovation Action
- ✓ 4 Use cases

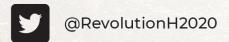


#### **USE CASES**

Back seat B-Pillar panel cover Lower rear Crash Box



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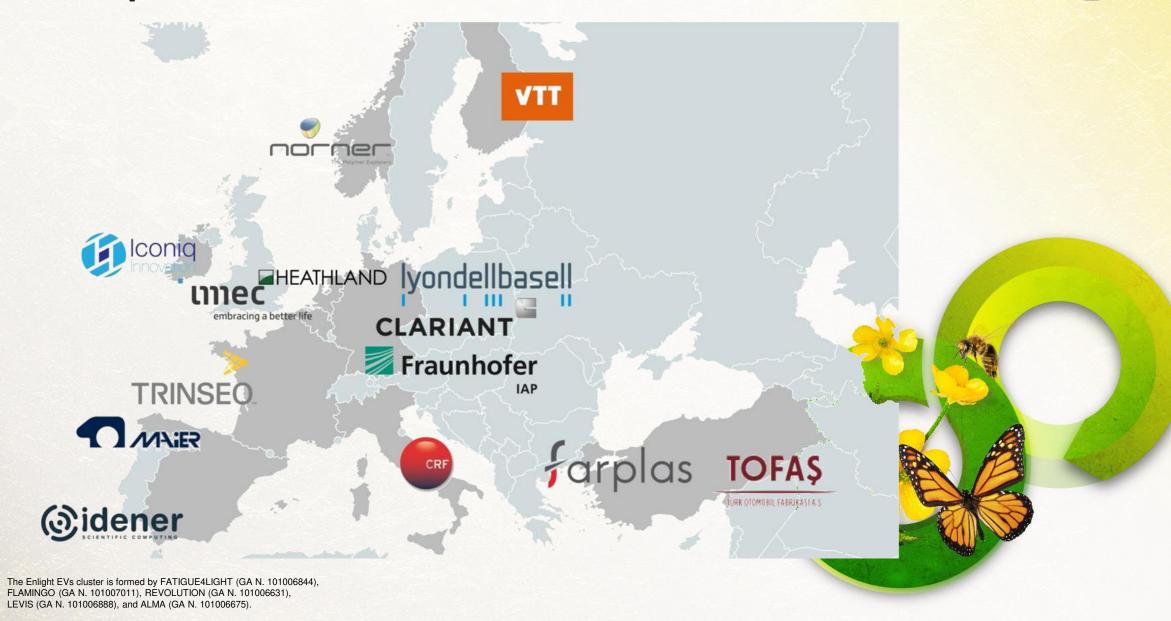


**REVOLUTION Project** 



## **Partnership**





## **Project Overview**



# REVOLUTION is proposing a disruptive innovation that will bring open-loop recycling to the forefront of automotive injection moulding.

➤ The project will develop this platform, and a range of recycled formulations, including self-reinforced materials to deliver innovative components that offer:



SUPERIOR PERFORMANCE

- ➤ REVOLUTION will use machine learning and artificial intelligence to optimise the input of recycled materials and injection moulding process to deliver high-quality parts.
- > The Al-Platform will use data from three areas of the production process to predict part quality when using recycled materials.

END-OF-LIFE ADVANTAGES

### Goals



Reduce the weight of the components between 10% and 40% compared to the current alternatives



Demonstrate that at least 80% of the components of the selected use cases can be recovered for recycling and/or reuse



## **Implementation**



Optimisation of advanced light material

Development of advanced process control

Modelling and design

Demonstration and validation

✓ The feedback of these activities will give inputs for environmental and social assessments



- ✓ An exploitation plan for the results of the project will be performed
- ✓ Communication and dissemination activities will be running through the project implementation







#### Back seat panel

This component is currently made of a formed steel sheet that is welded to a metallic frame. REVOLUTION will build on CRF's previous efforts to convert this component to a SRPO, with a weight saving of -55%.











#### **B-Pillar cover**

During the REVOLUTION project, the manufacturing of a 2k dual-part will be transformed into a *mono-material injection moulded component* using post-industrially recycled PMMA.







#### Crash Box

Nowadays, most crash boxes are commercially produced using steel. The rear crash box demonstrated in REVOLUTION will be a 100% polymer solution.





#### **Lower Rear Bumper**

It is a coloured aesthetical part. Many times, it is difficult to attain the appropriate colour and gloss using postconsumer recycled materials and, at the same time, keep mechanical and physical properties. REVOLUTION project will optimise the use of PCR PP, aiming to achieve a 20% weight reduction.



## **Environmental assessment highlights**



- Raw material production is the principal source for the Global warming impact in the four-case studied.
- Transport of materials start to be relevant in the impacts when transport distance is high (around 5000 km).

• In the metal pieces, welding is an important source of impacts, due to the electricity mix of the country and the production of fume welding (gases mixtures made of metals).







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