

# MOTIVATION

Composite materials applied to aeronautical structural parts manufacturing have multiple advantages such as optimum mechanical properties, weight reduction and therefore fuel consumption. However, conventional composite materials such as thermosets are not environmentally efficient due to the recycling complexity which generates a large amount of waste at aircrafts end of life (EoL).

To meet this challenge, the aerospace industry is looking at recycling materials such as thermoplastic composites, which offer potential benefits, i.e: recyclable scrap and end of life products, welding and reforming capability and short processing cycles time in comparison with thermoset matrix.

In response to this necessity, the SPARTA project will focus on the development of a new recycling method for these thermoplastic composites (TPC) and obtaining high-quality parts for new applications within the aeronautic sector.

# MAIN GOAL



The **SPARTA** project is aligned with the Eco-Design objectives of the Clean Sky 2 programme. Solutions proposed in SPARTA project will allow to recover up to 80% of current waste thermoplastic composites.

Compared to other mechanical recycling methods, SPARTA methodology will reduce the waste recycling processing time by 50%, and CO2 emissions by up to 30% and the energy consumption by at least 15%. Additionally, the reuse of the scrapped TPC will reduce the demand of virgin material, and consequently, the energy embodied reduction in virgin composite materials will imply a significant CO2 reduction (by 30%).

As result of the SPARTA project, new high-quality products will be obtained made of recycled thermoplastic composites (rTPC) with a production cost by 15-20% lower than current mechanical recycling technology and material reprocessing.

# APPROACH

## REDUCING COST

- To turn worthless scrap material into valuable raw material
- To increase the demand of reused raw material
- No need of virgin material acquisition

## ECO-DESIGN

- To re-design thermoplastic composite parts to achieve similar properties to the virgin ones

## EFFICIENT MANUFACTURING

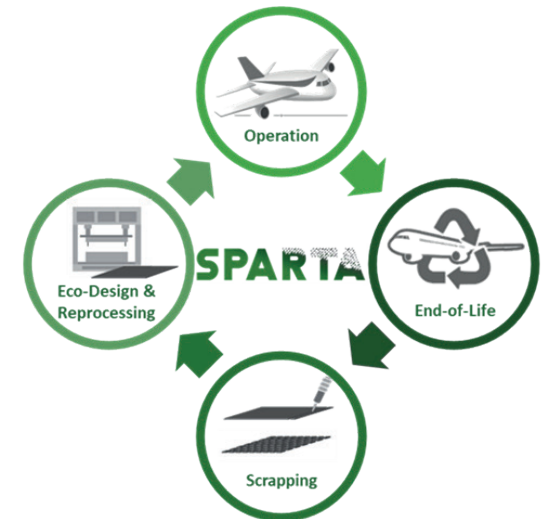
- To optimize the recycling techniques
- To optimize the unidirectional (UD) tapes deposition
- To optimize the compression moulding cycle
- To reduce energy consumption

## TIME TO MARKET

- To reduce the production time due to material availability at unchanged price

## QUALITY

- To obtain thermoplastic composites (TPC) parts with similar properties to virgin ones
- To improve EU Competitiveness



# SPARTA Project

aims at designing and manufacturing a novel and an eco-efficient scrapping methodology of thermoplastic reinforced fibre structures in order to approach the dimensions required for compression moulding manufacturing to produce high-quality parts. This methodology will have great environmental benefits and improvements of the life cycle assessment, where thermoplastic carbon fibre structures and components are used.

For further information, please contact us:  
<https://project-sparta.eu/contact.php>

The AIMPLAS (project coordinator) and TEKNIKER research centres are carrying out this project in collaboration with Topic Manager Royal Netherlands Aerospace Centre (NLR). The SPARTA Project is framed within the Airframe ITD of the CS2 Programme. Its results will contribute to Europe's strategic environmental and societal priorities while promoting the competitiveness and sustainable economic growth of the aeronautics industry.

## PARTNERS



**AIMPLAS**  
PLASTICS TECHNOLOGY  
CENTRE

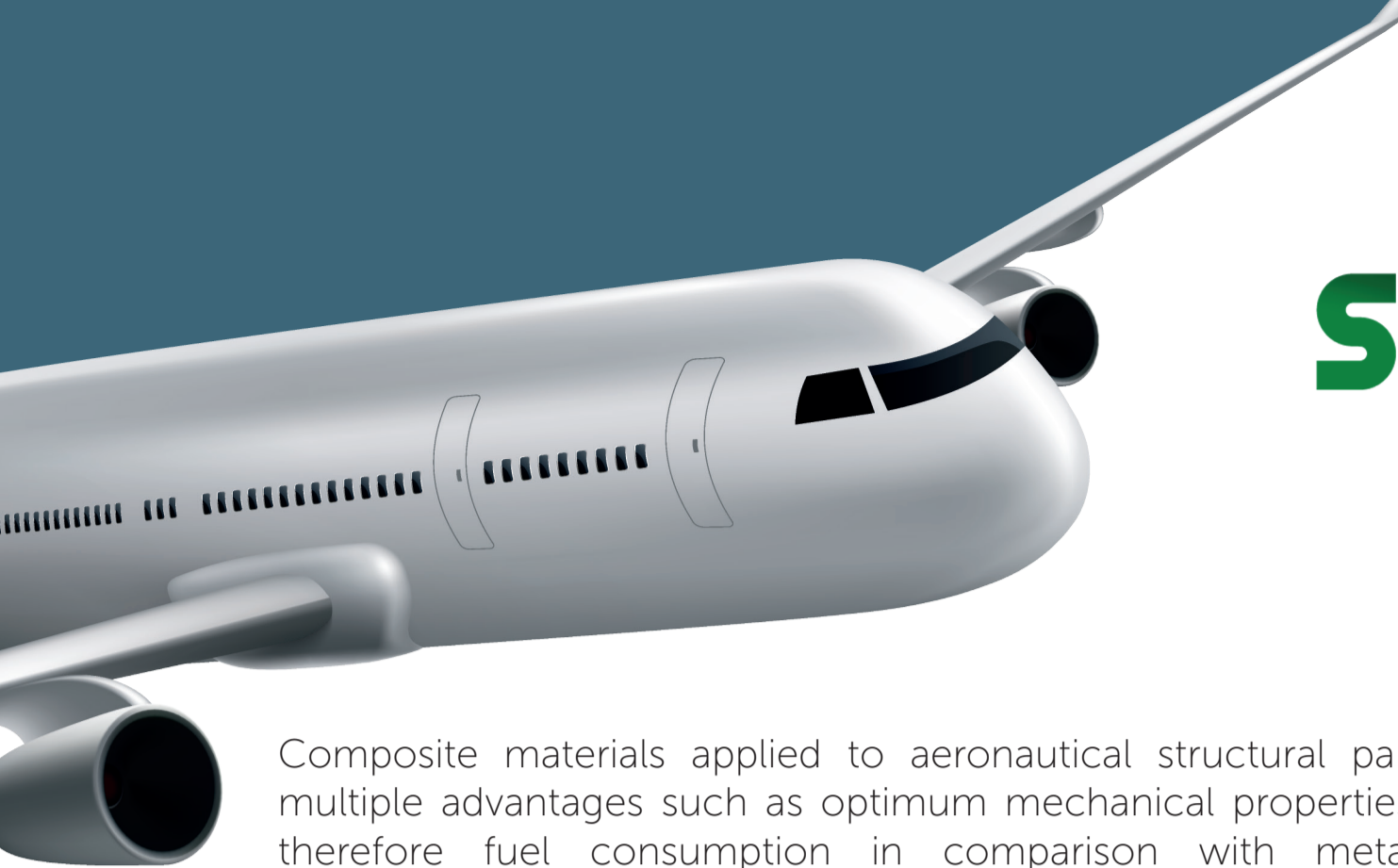


*The SPARTA project has received funding from the Clean Sky Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 887073.*



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the European Union





# SPARTA

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To meet this challenge, the aerospace industry is looking at recycling materials such as thermoplastic composites, which offer potential benefits, i.e: recyclable scrap and end of life products, welding and reforming capability and short processing cycles time in comparison with thermoset matrix.

In response to this necessity, the SPARTA project will focus on the development of a new recycling method for these thermoplastic composites (TPC) and obtaining high-quality parts for new applications within the aeronautic sector.

Compared to other mechanical recycling methods, SPARTA methodology will reduce the recycling processing time by 50%, and the energy consumption by at least 15%. Additionally, the reuse of the scrapped TPC will reduce the demand of virgin material, and consequently, the energy embodied reduction in virgin composite materials will imply a significant CO2 reduction (by 30%).

These key drivers are aligned with the Eco-Design objectives of the Clean Sky 2 programme.

As a result of the SPARTA project, new high-quality products will be obtained made of recycled thermoplastic composites (rTPC) with a production cost by 15-20% lower than current mechanical recycling technology and material reprocessing.

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