

Biocarbon based Polymers for Sustainable Material Development

Timeline | 03/2023 to 02/2027

Overall Budget | 3.168.331,20 €
ICIQ's Budget | 503.942,40 €

ICIQ People | [Arjan Kleij Research Group](#)

<https://dcarbonizeproject.eu/>

Call | HORIZON-MSCA-2021-DN-01

SUMMARY

D-Carbonize's approach targets biocarbon recycling into valuable starting materials for the chemical/polymer industries and will primarily provide innovative low-carb catalysis solutions. The use of biocarbon is advantageous in many respects as it is renewable, generally abundant and non-toxic, and it represents easy-to-handle carbon reagents even on larger scale. Despite the lack of universal (catalytic) strategies available for biocarbon valorization into monomers and polymers, recent advances in catalysis science have demonstrated the engineering and use of new promising metal- and organo-catalysts with high potential to overcome these limitations, thereby creating the necessary feasibility to transform biocarbon into (1) fine chemicals such as carbonates, carbamates, carboxylic acids, and esters, (2) pharmaceutical synthons, and (3) biomass/CO₂-based polymers. Thus, catalysis has already been shown to be a useful technology for biocarbon valorization but has been rarely used in the wider context of new and functional biocarbon based monomer/polymer development. The use of the latter helps to shape the future of functionalized poly-esters/carbonates/amides and their subsequent utilization in novel tailor-made and commercially relevant materials. Furthermore, this project will also explore depolymerization pathways to recycle the synthesized polymers obtaining new monomers and/or other added-value molecules that could re-enter the loop and be used in new polymers and materials. The network will recruit 12 doctoral candidates, who will be awarded double doctoral degrees by two universities in two different countries at the end of the training program.

D-Carbonize brings together leading high-education institutions, research centers and companies to form an innovation community able to offer excellent research and training both in R&D and entrepreneurship.

WORK PLAN

Doctoral Candidates	Year 1	Year 2	Year 3
DC1	ICIQ	ICIQ, Corning	UHEI
DC2	ICIQ	ICIQ, CNRS	CELABOR
DC3	ULIEGE	ULIEGE, ICIQ	POLIKEY
DC4	ULIEGE	ULIEGE, RUG	Corning
DC5	RUG	RUG, CELABOR	ICIQ
DC6	RUG	RUG, AIMPLAS	POLIKEY
DC7	CNRS	CNRS, TOTAL	ULIEGE
DC8	CNRS	CNRS, TOTAL	UHEI
DC9	UHEI	UHEI, AIMPLAS	BASF
DC10	UHEI	UHEI, BASF	RUG
DC11	AIMPLAS	AIMPLAS, CNRS	TOTAL
DC12	AIMPLAS	AIMPLAS, POLIKEY	ULIEGE

CONSORTIA

Project coordinator

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