

**STS-01**

**The Combined Role of Modelling, Simulation, Optimization, Control  
and Digitalization for Solving New Computational Challenges of  
Aviation, Transport and Renewable Energy (Part 1 + 2)**

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The global warming and past two pandemic years have the potential to change the face of aviation, transport and renewable energy. However, with the new European Programme of Research & Innovation *Horizon Europe* and its activities in aviation, transport and renewable energy, the vision of decreasing emissions in air and surface transport has its utmost priority.

This STS addresses prospective scientific and technological activities as single or coupled in modelling, simulation, optimization, control and digitalization using innovative computational methods for green aviation, transport and renewable energy.

A roadmap towards a climate-neutral transport includes innovative digitalized technologies in all transport areas. In addition, for advanced transport concepts, disruptive solutions introduced in aviation and other transport modes will play a central role. A successful introduction of such concepts will require a combined trans-disciplinary research and technology development including operational and economic factors.

The central objective of this STS is to present technologies contributing to minimize the climate impact of aviation and other transport modes and its consequences for people and the environment. The interactions of all above factors are considered for a better understanding towards carbon neutral climate, which will help to provide industry with a basis for decision-making of numerical tools and software.

Among the topics and areas presented in this STS, which addresses technologies relevant to aviation, transport and renewable energy such as disruptive aviation design, optimizations, simulations, software developments, digital twins, Artificial Intelligence, traffic management; extreme environment events surveillance and even health care.

This STS has invited experts in the above fields in two different sections: Part 1 focused on aviation and Part 2 addresses transport and renewable energy issues. Both integrate papers from contributing experts in the above topics and areas, which are of interest also to young scientists and technologists, who are or will be involved in the challenges of the next generation of greener aviation, transport and renewable energy.