

AEROSPACE ENGINEERING

DIMEAS - LCC and LCA models for System of Systems

Funded By	Dipartimento DIMEAS
Supervisor	FIORITI MARCO - marco.fioriti@polito.it
Contact	
Context of the research activity	To correctly estimate the cost and the environmental impact of an air transportation system, all part of the transport system should be taken into account. Therefore, new models have to be developed to consider all the other systems that support the aircraft especially for new kind of aerial transportation (e.g., Urban Air Mobility)
Objectives	<p>The aim of the present research is to develop parametric models to separately estimate the cost and the environmental impact of new transportation systems. The transportation system is represented by the aircraft fleet and all needed support systems which are usually defined as System of Systems (SoS) concept. The activities will be carried out within Colossus (Horizon Europe) and the HERA (Hybrid Electric Regional Aircraft – Clean Aviation) researches focusing on hybrid electric regional aircraft, hybrid electric utility aircraft and full electric urban mobility. The candidate will interact with the main partners of the above mentioned researches (LEONARDO Aircraft Division, Airbus D.S., German research center - DLR, University of Naples - UNINA, Technical University of Delft - Tu-Delft and others).</p> <p>The candidate will contribute to the development of parametric models capable of estimating the cost and the environmental impact (e.g., Green House Gas, CO₂ etc) of developing, producing, operating and dismantling/recycling the air transport SoS of hybrid-electric and full electric aircraft. The candidate will focus on the life cycle of different kind of vertiports, air traffic control infrastructures and support systems. Moreover, particular attention will be given to the hydrogen production, liquification, storage and refueling. The LCC (Life Cycle Cost) and LCA (Life Cycle Assessment) models will be flexible enough to allow trad-off studies changing SoS configuration, support strategy, aircraft architecture and implemented technologies.</p> <p>The activity will be carried out starting from the models already developed in DIMEAS with proprietary and commercial software.</p>
Skills and competencies for the development of	<p>The candidate should be familiar with the following subjects:</p> <ul style="list-style-type: none"> - aircraft on-board system design - aircraft on-board system modelling - aircraft design - aircraft electrification

development of the activity

- System of Systems concept

Moreover, the candidate should be able to interact and collaboratively work with other researchers