

AEROSPACE ENGINEERING

DIMEAS - New parametric models for life cycle cost and life cycle assessment estimation

Funded By	Dipartimento DIMEAS
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Context of the research activity	<p>New parametric models are required to estimate the LCC (Life Cycle Cost) and LCA (Life Cycle Assessment) of new aircraft categories such as hybrid electric regional aircraft, advanced multi-role utility aircraft and urban mobility. To correctly assess those innovative aircraft, all the necessary support systems (e.g. maintenance, logistics, ground support equipment, energy supply etc.) should be also assessed.</p>
Objectives	<p>The state of the art of LCC and LCA models are mainly driven by conventional aircraft (i.e. liner aircraft with conventional propulsion system and conventional on-board systems). The aim of the present research is to develop models for the emerging new aircraft. In particular, the activities will be carried out within the HERA (Hybrid Electric Regional Aircraft - Clean Aviation) and Colossus (Horizon Europe) 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 deeply analyze the new aircraft systems and equipment to define new models to evaluate their economic and environmental impact. Therefore, the electrified on-board systems, fuel cells, electric motors, integrated thermal management system and other new aircraft parts will be identified and evaluated. Moreover, the activity will include the analysis of all the necessary support systems (e.g. maintenance, logistics, ground support equipment) and the new energy sources. Commercial software and database may be used to define part of the necessary information. With a bottom-up approach, the new models will be incorporated with those already developed within the DIMEAS to define new LCC and LCA models sensible to the new technologies.</p> <p>Finally, the new models will be used to provide:</p> <ul style="list-style-type: none"> - life cycle assessment and cost of conventional reference aircraft - life cycle assessment and cost of innovative aircraft <p>The results will be validated by the industrial partners collaborating in the</p>

Skills and competencies for the development of the activity

The candidate should be familiar with the following subjects:

- aircraft life cycle cost estimation
- aircraft life cycle assessment
- aircraft systems design
- aircraft electrification

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