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En route to sustainable aviation: from climate science to mitigation policies

Abstract

Jérôme BONINI, Hervé MORVAN

Sustainability, Future Power & Propulsion

The aviation sector has been very proactive in considering options and scenarios to take the sector to net zero by 2050, as evidenced across a range of roadmaps being published.
A consensus has emerged from those on the importance of acting early and at scale, which has led to a focus onto efficiency & fleet replacement as well as SAF & its scalability; this constitutes a first and immediate time horizon, and therefore a key area of focus, as the sector looks to grow over the next 20 years and see the introduction of the next generation of technologies and products.
There's a second, parallel timeline, however, this one bolder, but also more uncertain, and set in the context of the opportunity of a disruption to the sector, on a longer time horizon, as embodied by the recent interest in cryogenic fuels & technologies for example (in Europe first but now increasingly on China and North America).
The paper will consider both outlooks, verbalise the challenges, threats and opportunities of each in tomorrow's market, energy, geopolitical and competitive contexts.
Central to both timelines, and at the heart of the power & propulsion system, lies a gas turbine whose potential can be stretched significantly further, mechanically but also thermodynamically and electrically. Central to all is also the challenge of preparing the sector well, notably in Europe, for future readiness and competitiveness, in light of greater uncertainty and the increasing power of other nations, all in the face of what is a huge economic opportunity in the narrowbody sector specifically.