Novel hybrid engine solutions are bringing about a new technological breakthrough in the world of helicopter propulsion. What are the challenges facing Turbomeca? Olivier Andries, Chairman & CEO of Turbomeca (Safran), provides some answers.

Turbomeca is currently studying hybrid engine concepts. What is the background to this?
Turbomeca has been a major player on the helicopter engine stage for many years. To keep one step ahead, we need to prepare for the future. This means that we have to provide solutions that push the innovation and performance envelope, such as the hybrid engine.

Why are hybrid technologies in the limelight right now?
The power-to-weight ratio of "conventional" engines has doubled in fifty years, while cutting fuel consumption by 40%. However, current estimates show that for conventional engine architecture, further improvements would reduce fuel consumption by around 15% by 2020. Hybridization, on the other hand, would take us beyond this with an expected 25% gain in specific consumption. Hybrid engines would also have a positive impact on the environment and helicopter safety.

What does engine hybridization involve?
It consists in combining a number of sources of energy adapted to the various phases of helicopter flight. The idea is to optimize the "conventional" engine for a given power rating, namely cruise flight. For critical phases such as takeoff or hovering, or emergency situations, the additional energy required to power the helicopter is supplied by other sources such as the APU (auxiliary power unit) or electric generators. Engines would therefore no longer need to be sized for these specific ratings and fuel consumption would fall as a result. Hybridization also challenges us to consider the helicopter propulsion system as a whole and this is one that we are preparing to meet.

What is the business outlook for these hybrid engines?
We expect to begin demonstrating hybridization for the 2000-3000 horsepower range around 2014-2015 ahead of the introduction of a new 10-to-12-ton helicopter class which will require high-performance propulsion systems in this power range. We are therefore currently working on the technological solutions to meet this demand. It is clear, however, that progress on hybrid propulsion will also depend on the gradual improvement in the power-to-weight ratio of electric storage systems.

www.turbomeca.com