

# USAIRE STUDENT AWARD 2008

**Gaël LE BRIS**

**ECOLE NATIONALE DE L'AVIATION CIVILE**



While twenty years ago the UN founded the IPCC and the oil industry observed the validity of the Hubbert depletion theory, we are now standing at a crossroads. If the aeronautics industry has made efforts to make aviation greener, the last decade was marked by a true awareness of the unprecedented energetic and environmental challenges for 2030. Indeed, 2008 has known a record number of breakthroughs which have marked the worlds of aeronautics and defense, including the first flights of synjets and on-board fuel cells.

By 2030, the progressive disappearance of fossil oilfields will force us to find new methods to produce hydrocarbons. Only one of those, the Fischer-Tropsch XTL process developed by German chemists between the two world wars, can provide an immediate and credible solution. The primary source of acceptable jet fuel will first be gas (GTL), then coal (CTL) and finally a renewable biomass, most likely derived from seaweeds.

Post-Kyoto environmental measures, the pressures of airport neighbours, and the increase of jet fuel prices require non-stop innovation in aircraft design, ATM, aircraft operations and airport management. Innovative solutions are just around the corner – advanced composite materials, more sophisticated airborne electronics, more efficient winglets, direct approaches and so on. The battle for a greener and cleaner aviation continues. The French TGV model (where trains compete with airlines for interurban connections) or the floatport of Float Inc. (US) are two examples of this new drive for innovation.

Therefore, 2030 will prove to be a turning point for disruptive technologies: new aerodynamic configurations, flying wings, and open-rotors, to cite just a few. It will be necessary to change the very concept of the airplane, because the A350 and B787 will mark the apogee of the airliner as we have known it. In 2030, aircraft manufacturers and airlines will be ready to cross the line. And possibly, the final revolution may be a second energetic transition, with the advent of hydrogen power at the heart of civilisation in 2030-2050. If we succeed in finding a solution for storing LH<sub>2</sub> easily and safely, hydrogen will then be the perfect fuel for truly eco-efficient and durable aviation.

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[gael.le-bris@laposte.net](mailto:gael.le-bris@laposte.net)