HYPROGEO - Hybrid Propulsion Module for transfer to GEO orbit

Independent access to space is a key component of the European Space Policy. The competition is increasing in this area both for the full launching systems and the key subsystems. Cost-effectiveness becomes the main driving factor.
HYPROGEO ambition is to study a propulsion module based on Hybrid chemical propulsion. Hybrid propulsion is not a new technology but its application to a transfer module or to a re-ignitable upper stage is very innovative. It is an interesting alternative for the GEO transfer, between the chemical propulsion (bi-liquid) and the new trend of Electrical Propulsion (EP). There are very good synergies and complementarities with the other propulsion activities.
The proof of concept (specific impulse, thrust) has been demonstrated. The main technical challenge is the long duration firings. The future development of an operational system, already identified in the current roadmaps, requires advanced R&D work on 4 critical technologies:
- Combustion chamber.
- High endurance nozzle.
- Catalytic injector.
- Production, storage and use of high concentration hydrogen peroxide.

These R&D activities structure 4 main work packages. A system study ensures the global vision in coherence with an economic analysis, the identification of technical challenges and the consolidation of scientific results. A last work package performs the dissemination of results.
An innovative aspect is the fact that the R&D activities are directly driven by the evolution of market needs and system requirements.
Main expected benefits are:
- Green and simpler design (compared to bi-liquid).
- Shorter transfer time and reduced cost of operations (compared to EP)

A TRL 3-4 level is expected at the end of the project.
The impact of the project is secured by the composition of the consortium led by Astrium with the main European actors of the hybrid: it contributes to the consolidation of the European industrial supply chain for Hybrid propulsion.
Project duration is 36 months.

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Find out more: https://www.hyprogeo.eu/