

FUTURE SPACE TRANSPORTATION FLPP SPRING SESSION 2026



ESA FIRST! AVIONICS & GNC

COMPANY INFORMATION



Company: ArianeGroup

Location: Bremen (Germany)

Founded: 2015

Employees: >8000

Mission: ArianeGroup is a key industrial player in European space transportation. Together with our subsidiaries and partners, we develop, build and operate reliable, high-performance civil and military launchers, as well as cutting-edge equipment and services for the benefit of many branches of industry.

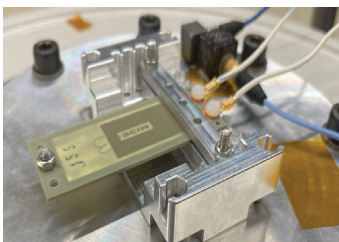
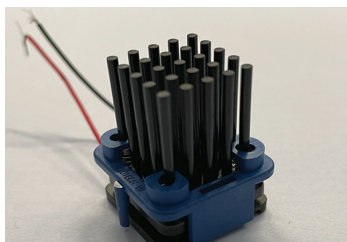
ACTIVITY

Project name: NeGePow – Power Harvesting and Wireless Charging for Launcher Applications

Objective:

1. To verify the suitability of commercial off-the-shelf (COTS) components in the main functional domain of thermoelectric and piezoelectric for the design of energy harvesting.
2. To verify the COTS components for wireless power charging through the spacecraft sidewall for the recharge of energy buffer of wireless sensor nodes.

Applications: For space vehicles: provides a fully wireless power source to wireless sensors networks, improving flexibility and reducing the impacts of mission customisation with respect to the flight instrumentation (functional and not functional sensors).



TECHNOLOGY AND INNOVATION

What we developed: Thermoelectric energy harvester: Several COTS thermoelectric modules were tested at the low temperature gradients typical of a heavy launcher cryogenic upper stage to assess power output.

Piezoelectric energy harvester: Several COTS piezoelectric generators were tested under representative vibration conditions of a heavy launcher cryogenic upper stage to assess power output.

Wireless power transfer: Several wireless transfer technologies were tested for power transmission through representative spacecraft structural materials to determine functionality and performance.

Unique features: The project allows a full and unique energy source for the deployment of a wireless sensor network. The harvesters are able to satisfy the energy needs of a representative wireless kit to be flown on the SALTO project.

The energy harvester demonstrators confirmed the suitability of COTS components in the main operational domains, thus allowing a sensible cost reduction.

KEY RESULTS

- Confirmed the thermoelectric suitability in the established thermal environment boundaries (hot and cold faces) in terms of generated electrical energy
- Confirmed the piezoelectric suitability in the established environment boundaries in terms of generated electrical energy
- Confirmed the possibility to perform a wireless energy transfer between several representative samples of Carbon Fiber Reinforced Plastic (various thickness and technologies).

NEXT STEPS AND MARKET READINESS

Roadmap:

- Characterise the COTS in the complete thermomechanical, vacuum and EMC environment
- Design and qualify the flight versions of the harvesters
- Qualify the charger end of the wireless power transfer devices (to withstand the flight environment while not active)

Opportunities: Launcher and in-space logistic vehicles qualification instrumentation (to be embarked on the first flights).

Launchers and in-space logistic vehicles customisation (flight dependant sensor suite)

Inter-stage and umbilical power transfer

Target Launch: ~2028

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