EXPRESSION OF INTEREST

1. Contact details

Country	TURKEY
Name of the organisation	ASPİLSAN ENERJİ
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2. Short description of the organisation

ASPİLSAN Enerji Industry and Trade Inc. was established on April 2, 1981, in the Kayseri Organized Industrial Zone.

The main areas of activity for ASPİLSAN Energy include:

Radios, thermal systems, robotics, medical devices, and UAV batteries, battery blocks,
Aircraft and helicopter batteries,
Electric vehicle batteries,
Maritime vehicles,
Rail system batteries,
Energy storage systems,
Charging devices,
Battery protection and management (BMS) circuits,
Electronic card production,
Testing, laboratory, and engineering services.

With 42 years of experience, being the first and only company in Turkey producing aircraft/helicopter batteries in the Nickel-Cadmium chemistry, our company is also the largest battery manufacturer in the country. After Ni-Cd chemistry, ASPİLSAN Energy initiated the mass production of the ASPİLSAN INR18650A28 Lithium-Ion Rechargeable Cylindrical Cell, becoming the first company in Europe to mass-produce lithium-ion 18650 cells. The design, development, and production of the cell are made in factory. ASPİLSAN has many qualty certificates and fits standards taken from Europe and International Organization for Standardization.

The Battery R&D Center established by Aspilsan Energy in the Mimar Sinan Organized Industrial Zone conducts electronic, software, and mechanical design studies. Battery management systems, battery packs in various chemicals, charging devices, and power electronics-based system designs are developed. The batteries designed by ASPİLSAN Energy are used in various fields such as communication systems, tracking, maritime vehicles, reconnaissance, satellite systems, launch, night, and thermal vision systems, and unmanned vehicles.

Cell R&D laboratuary started with the goal of gaining the capability to develop cell prototypes ready for use in batteries using Chemistry, Materials, Metallurgy, and Electrochemistry technologies, the

Design, Product Development. Electrochemistry and material studies are at the core of energy technologies.

Our Istanbul R&D center work on the development of fuel cells and electrolyzers. The unit's goal is to develop products suitable for commercialization. Another important goal of the unit is to increase the localization rate in these products as much as possible. In this context, there are collaborations with various research institutions and universities. The unit has capabilities in the development of platinum and iridium-based catalysts used in fuel cells and electrolyzers, the production of membrane electrode assemblies (MEA), and the design and integration of fuel cell and electrolyzer stacks.

In Ankara R&D center, Electric vehicle batteries and aviation batteries development studies have been added to the work carried out. In this way, the knowledge of the center has been increased, and the ability to develop and produce lithium-ion batteries at the system level has been ensured. Battery management system and software development, test, and verification activities for electric vehicle and aviation systems are carried out by our teams.

3. Specific skills related to the project

Indicate the specific skills and competence in relation with

Clean and competitive solutions for all transport modes (HORIZON-CL5-2024-D5-01)

1) **Advanced battery system integration for next generation vehicles (2ZERO Partnership)**
   HORIZON-CL5-2024-D5-01-03
2) **Impact monitoring of EU Aviation R&I**
   HORIZON-CL5-2024-D5-01-09
3) **Assessment of air pollutant emissions from low-carbon fuels in the heavy-duty, aviation, and maritime sectors**
   HORIZON-CL5-2024-D5-01-18

Aspilsan has expertise in the field of aviation battery applications and our interest in horizon ; e-mobility, with a particular focus on electric vertical take-off and landing (e-VTOL) vehicles, air taxis etc.The emphasis on safe critical system design expertise is evident, with a commitment to adhering to aviation standards such as ARP-4754 and ARP-4761. The project aims to design and certified aviation batteries and Battery Management Systems (BMS) in accordance with industry standards, including DO-254 for hardware, DO-178 for software, and DO-311A for aviation batteries. The scope encompasses the entire lifecycle, from battery pack design, including electrical and electronic components, mechanical considerations, and cooling and heating system design, to integration and testing processes. This multifaceted approach underscores the project's commitment to ensuring safety, compliance, and optimal performance in the development of cutting-edge aviation battery solutions. It aligns with the broader goals of advancing e-mobility in aviation while addressing critical aspects of design, certification, and integration, positioning the project at the forefront of innovation in the industry.

4. Proposed activities for the project

Indicate which activities you would like to implement during the project

Our proficiency in battery pack design, battery management system design, electrical electronic design, mechanical design, and integration/testing aligns seamlessly with the outlined project activities. Specifically, we can spearhead the structural battery pack design and integration, considering trade-offs in energy density,quality, safety, and overall production cost. By focusing on these activities, we are well-equipped to play a central role in advancing the project's goals of modularity, scalability, improved efficiency, decarbonization, and reduced costs in the realm of e-mobility technology.

Our proficiencies are :

- Mobility(e-VTOL, air taxi etc..)
- Aviation Batteries , Emergency Batteries
- Safe Critical System Design Expertise(ARP-4754,ARP-4761)
- Aviation Battery and BMS design with certification baseline (DO-254,DO-178C, DO-311A)
- *Battery Pack Design*
- *Battery management system design*
- *Battery pack electrical electronic design*
- *Battery pack cooing system design*
- *Battery pack Mechanical design*
- *Battery pack integration and test*

5. References

Previous research projects:

ASPİLSANEnerji :

Project acronym / starting date	**Main objectives**	**Main activities**	**Role in the project**
Eurogia 2030- *Design of 18650 Sodium Energy Battery for Household Energy Storage (new)*	Design 18650 Sodium Ion Battery for Household Energy Storage	- Develop 18650 Sodium Ion Battery Cell - Acquire roll-to-roll coating machine (60%) - Enhance Aspilsan's sodium-ion battery design and electrolyte development capabilities	Lead the project, coordinate stakeholders, design and develop sodium-ion battery cell, acquire roll-to-roll coating machine, enhance capabilities in battery design.
Eurogia 2030-Call20 Green Ammonia Production with 4D HYDROGEN (June 2023 - May 2026)	Produce 10 kW PEM Electrolyzer with 4D HYDROGEN	Lead the project, design and produce 10 kW PEM electrolyzer, collaborate with SOCAR R&D, contribute to international recognition in the EUROGIA program.	Develop 10 kW PEM Type Electrolyzer
Horizon Europe Project (HORIZON-CL5-2023-D5-01) (ZEV-UP Frugal Zero-Emmision Vehicles for Urban Passenger Challenge) (June 2023 - May 2026)	Produce L7 Class Light Electric Vehicle Batteries	- Develop and produce interchangeable vehicle battery's mechanical and electronic system - Collaborate with international partners including Ford, Akka, Coskunoz, and others	Lead the project, design and produce L7 class light electric vehicle batteries, collaborate with international partners.

Battery Development R&D Center: TÜBİTAK 1004 Project (Project Code: 22AG016) (*Neurotechnological Solutions Platform Against Challenges Threatening Human Function)(15.05.2023-15.5.2027)*	Develop Neurotechnological Solutions Platform	- Develop high-tech products in biomedical equipment technologies - Develop electrolytes for solid-state batteries with high energy storage capacity	Lead the project, establish Neurotechnological Solutions Platform, develop high-tech products, enhance capabilities in biomedicine batteries and solid-state battery technologies.
HORIZON EUROPE PROJECT (BASE: Battery Passport for Resilient Supply Chain and Implementation of Circular Economy)(new)	Develop Digital Battery Passport Concept	- Develop and implement digital battery passport (DBP) concept	Contribute to the project, focus on the development, production, testing, integration, and analysis of aging tests of the battery pack for the DBP concept.
HORIZON EUROPE PROJECT Name: *SAFELOOP(new)*	Enhance Safety and Performance of Lithium-ion Battery Cells	- Lead work package on cell integration, performance, and safety tests	Lead the work package, conduct cell integration, performance, and safety tests, contribute to enhancing safety and performance of lithium-ion battery cells.
TÜBİTAK Priority Area R&D (18.08.2017)	Develop Battery and Energy Management Systems Sensitive to Vehicle Performance Parameters for Electric and Hybrid Vehicles	- Conduct research and development for vehicle performance-sensitive battery and energy management systems	Lead the project, research and develop systems sensitive to vehicle performance parameters for electric and hybrid vehicles.
TÜBİTAK INDUSTRIAL AR-GE (30.06.2017)	Electrode Production for Ni-Cd Cells Used in Aircraft Batteries	- Produce electrodes for Ni-Cd cells used in aircraft batteries	Lead the project, oversee electrode production for Ni-Cd cells, contribute to aircraft battery technology.
University- Industry colloboration (14.03.2016)	Design Smart Battery-Cabinet Compatible for Charge and Maintenance	- Design smart battery-cabinet - Develop charging and maintenance capabilities	Lead the project, design smart battery-cabinet, collaborate with university for industry partnership.