



EXPRESSION OF INTEREST

1. Contact details

Country	TURKEY
Name of the organisation	ASPİLSAN ENERJİ
Name of the contact	Rasiha Nefise MUTLU
Phone	05068029360
Email	rasihanefise.mutlu@aspilsan.com

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.

History

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 quality 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 laboratory 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

1) Advanced sustainable and safe pre-processing technologies for End-of-Life (EoL) battery recycling (Batt4EU Partnership)

HORIZON-CL5-2024-D2-01-01

2) Non-Li Sustainable Batteries with European Supply Chains for Stationary Storage (Batt4EU Partnership)

HORIZON-CL5-2024-D2-01-02

A company possessing the skills outlined above is well-equipped for engaging in lithium-ion battery production and characterization processes, particularly in the realm of energy storage and battery technologies. The mastery of 18650 Cylindrical Cell Preparations encompasses a broad spectrum of lab-scale cylindrical battery preparation processes, including material mixing, coating, calendaring, slitting, tab welding, winding, grooving, and crimping.

New Material Synthesis by Co-Precipitation is crucial for the production of cathode or anode materials, with a company gaining experience in material synthesis using medium-sized reactors and calcination furnaces. The ability to Characterize Materials using techniques such as surface area analysis (BET), X-ray diffraction (XRD), and particle size analysis (PSA) is essential for understanding the properties of the synthesized materials and evaluating their quality. The company may also excel in Cell Design for Full Cell, involving the integration of cathode, anode, separator, and electrolyte materials for a complete battery cell. Additionally, proficiency in Cell Test Analysis includes planning, implementing, and analyzing electrochemical half-cell tests and full battery tests to assess the performance of the



manufactured batteries. Overall, these skills enable the company to play an effective role in the development, optimization, and testing processes within the field of battery technology.

Design, and Mechanical Design. In the realm of Battery Pack Design, we excel in crafting efficient and innovative solutions tailored to specific requirements. Our proficiency extends to the intricate design and optimization of Battery Management Systems, ensuring the seamless coordination of individual battery cells. The electrical and electronic components of the battery pack receive meticulous attention, with a focus on precision and performance. Our capabilities also extend to the design of cooling systems, critical for maintaining optimal operating temperatures and enhancing the overall efficiency and safety of the battery pack. Mechanical design considerations cover the structural integrity and form factor, ensuring the robustness and seamless integration of the battery pack into various applications. The final stage involves rigorous integration and testing, where our skilled team ensures that the battery pack functions cohesively and meets stringent performance standards. In essence, our proficiency spans all facets of battery pack development, making us a comprehensive and reliable partner for diverse energy storage solutions.

4. Proposed activities for the project

Indicate which activities you would like to implement during the project

Our company is committed to improving battery cell preparation, focusing on efficiency and precision, exploring innovative applications for batteries, and enhancing processes for 18650 cylindrical cells. We are dedicated to innovating cathode and anode materials through advanced synthesis techniques and deepening our understanding through comprehensive materials characterization. Our holistic approach to cell design prioritizes integration efficiency, and we aim to optimize testing protocols for consistent performance assessments. Sustainability is a key focus, with research into advanced recycling processes aligned with a zero-waste concept. We also plan to implement a vertical integration strategy and contribute to reducing dependencies on critical raw materials in line with European economic goals. Additionally, our efforts extend to post-lithium cell chemistry development, cost-effective storage solutions, and establishing a European-based supply chain. We are committed to demonstrating our developed system, ensuring safety across various conditions, and presenting a defined concept for sustainable manufacturing. Overall, our activities aim to drive innovation and competitiveness in the European energy storage market.

5. References

Previous research projects:

ASPILSANenerji :

Project acronym / starting date	Main objectives	Main activities	Role in the project
<i>Eurogia 2030- Design of 18650 Sodium Energy Battery for Household Energy Storage</i>	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-Emission Vehicles for Urban Passenger Challenge)	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)	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)	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	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 collaboration (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.