

## ASPİLSAN ENERJİ IS INTRODUCING NEW DOMESTIC SOLUTIONS FOR UNINTERRUPTED ENERGY

ASPİLSAN Enerji aims to strengthen its success with new products, relying on its accomplishments in the export market with domestic battery cells, batteries, and batteries.

Ahmet Turan Özdemir, the General Manager of ASPİLSAN Enerji, stated in his announcement that 2023 started with an earthquake and continued as an economically challenging year. Despite this, he mentioned that the company had diversified its production and ended the year with new product exports.

Referring to the experiences gained from the earthquake disaster which led to the development of new products, Özdemir stated that they aim to enter the market with these products in 2024.

Highlighting their success in exporting lithium-ion battery cells to the Middle East and Europe, Özdemir emphasized that they have made a pioneering move in battery production and export in Türkiye. He also mentioned that they have completed transportation certification processes to export battery cells to the American market, which indicates that their export routes will now be focused on America.

Özdemir pointed out that energy is an area that attracts the attention of investors and has a lot of needs, stating that there is a demand for portable or fixed energy storage solutions ranging from cells used in electronic circuit designs to megawatt-level systems.

Explaining that ASPİLSAN Enerji has products and designs for some fixed solutions such as portable energy storage systems and telecommunication batteries, Özdemir said:

"We will continue to design in this direction. The earthquake showed us that people can postpone their needs such as shelter and nutrition for a while, but they cannot tolerate the interruption of communication with the authorities and their relatives during the coordination phase of the earthquake. Emergency situations require the network to function properly, communication devices to function properly, and devices to function in hospitals and health clinics. When you count these, we're discussing storage units, both large and small, with distinct energy requirements and capacities. We closely monitor the needs of both our country and the world in this field. The cell we produce is a preferred product to meet the needs of portable energy systems because its energy density is high. In addition, systems that are relatively low in energy density but slightly heavier are suitable for fixed storage systems."

### National products entered new sectors

According to Ahmet Turan Özdemir, there are variations in the types, capacities, and characteristics of batteries that are utilized in wind and solar energy systems, land platforms, air and space batteries, submarine batteries, and soldier-carried batteries on vehicles.

Aside from the products they make—from raw materials to battery cells, battery cells to batteries, batteries to systems, and packages—Özdemir said that they also design batteries using various cells they buy from the market, keeping in mind consumer needs for budget, safety, and usage.

Özdemir stated that their batteries are designed to operate in a range of environments and conditions, from submarines to airplanes.

Özdemir stated that they developed batteries that were tailored to fit specific budgets with different chemicals and conducted the following evaluations:

"Our primary objective is to meet the needs of our heroic army. We are also focused on expanding our presence in the civilian market. The telecommunication battery project we were involved in with Turkcell and Türk Telekom in 2023 was a success. We once again crowned this battery with export. Backup batteries are necessary to prevent the network from going silent and survive natural disasters, fires, and war situations. We need these solutions if we want to create systems that can meet their own energy needs, independent of the grid, in remote locations for both military and civilian purposes. ASPİLSAN is among the providers of these solutions, and we will diversify this process, which started with telecommunications, by adding independent energy storage systems."

Özdemir stated that an R&D team of seventy-five is working on charging these systems with alternative sources, and that energy needs should be met in tents and containers in the earthquake zone, as well as in camping and outdoor activities. Here, we create designs in consultation with our clients, taking into account their needs as well as the industry dynamics. You will see our products in the previously mentioned framework in 2024. We're putting some effort into these. I'm hoping that 2024 will bring us and our nation even greater success. We firmly think this to be true. He assessed that I assess that we will prioritize customer satisfaction in the field as we implement our diversified portfolio."

### Preparation for the "Battery Manufacturer of the Region" mission

Pointing out that the European Union wants to establish a self-sufficient structure in battery and battery technologies, ASPİLSAN Enerji General Manager Ahmet Turan Özdemir said that they are carrying out certification and production quality studies to ensure the necessary standards to take part here.

"When the regulations of Europe and the USA are implemented, we will be ready to export our products, but there are some sensitivities in Europe related to the cell-to-system interface. Our company is putting in great effort with our team to prepare for this process."

Emphasizing that their biggest goal is to add new export successes, Özdemir said:

"We have a mission to become a battery manufacturer in its region. We are engaged in this mission. In developing this ecosystem in our country, ASPİLSAN does not only produce battery cells. Meetings are also held with raw material producers, machinery manufacturers, universities and researchers. It acts as an active player, regardless of commercial concerns, on how we can serve our country, from raw materials to recycling and recovery, and how we can support this chain."

"If there will be a battery manufacturer in our country, which is something I believe in, it will be us. We will extract our raw material, process it and turn it into active material, produce electrodes and batteries from it, close the battery and turn it into a battery with its electronic circuits and software. After considering our end-of-life batteries in secondary uses, we must establish a chain management system to reuse them through recycling and recovery processes. At this point, we are working actively with all our efforts."

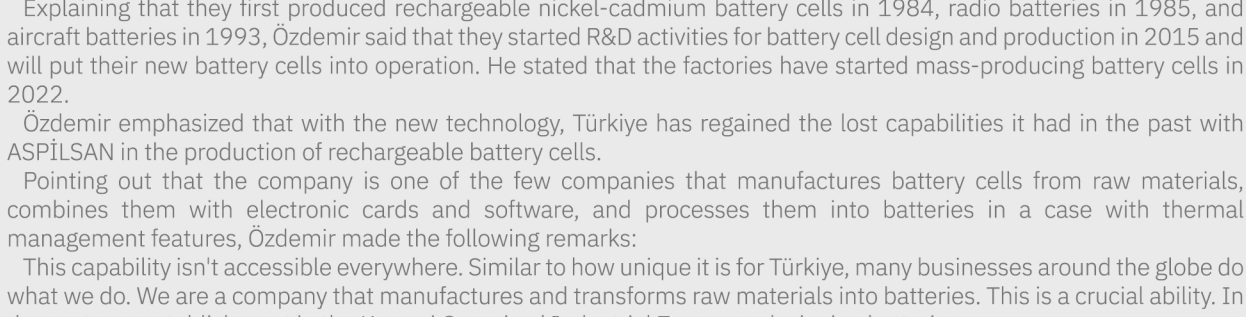
## KAAN, THE PROUD OF TURKISH ENGINEERS

We are proud to contribute to our nation's survival projects by producing batteries for our 5th generation multi-role fighter aircraft, KAAN. ⚡



## TÜRKİYE INTRODUCED NEW PROFESSIONS WITH DOMESTIC BATTERY PRODUCTION

The investments made by the Turkish defense industry in domestic battery cells and battery production enabled the emergence of the first examples of certain professions in Türkiye.



ASPİLSAN Enerji General Manager Ahmet Turan Özdemir, in his statement to the AA correspondent, said that the company was established in 1981 due to the lessons learned from the Cyprus Peace Operation to meet the energy needs of the army.

Explaining that they first produced rechargeable nickel-cadmium battery cells in 1984, radio batteries in 1985, and will put their new battery cells into operation. He stated that the factories have started mass-producing battery cells in 2022.

Özdemir emphasized that with the new technology, Türkiye has regained the lost capabilities it had in the past with ASPİLSAN in the production of rechargeable battery cells.

"Pointing out that the company is one of the few companies that manufactures battery cells from raw materials, combines them with electronic cards and software, and processes them into batteries in a case with thermal management features, Özdemir made the following remarks:

"This capability isn't accessible everywhere. Similar to how unique it is for Türkiye, many businesses around the globe do what we do. We are a company that manufactures and transforms raw materials into batteries. This is a crucial ability. In the past, our establishment in the Kayseri Organized Industrial Zone was designing batteries."

"We also had a manufacturing team that produced nickel-cadmium aviation and marine batteries, as well as rail systems. There, this factory still operates. But eventually, we scattered to Turkey. In Istanbul, we operate a fuel cell and hydrogen plant. We possess an R&D group. Our R&D team in Kayseri, along with another R&D team in Ankara are working on aviation batteries, researching electric vehicle batteries, and batteries for radio and portable energy systems. They all create batteries that run at comparatively lower voltages and currents. Moreover, two of our factories are located in Kayseri."

### Newborn Jobs

Noting that their investments in battery technologies and facilities have allowed them to achieve several firsts in the field of employment in Türkiye, Özdemir stated:

"Our company employs the first electrode technician in Türkiye, as well as the first operators of the mixer section, where we take the raw material and mix it, and the technicians who wrap the electrode and insert the battery cell into the case in the assembly section. The first individuals in Türkiye to work in these fields and perform these tasks were our technicians and formation engineers in the formation line."

"Within the ecosystem, we have nurtured our friends, defined professions, and created the first jobs in our nation. As a result, our contribution to employment is significant by both creating new professions in Türkiye and employing 330 qualified staff, including 150 new-hires in addition to the 180 who were employed in this factory and other locations prior to 2021. We view it as significant not only in terms of quantity but also in terms of quality, the jobs we have designated for them, and the new professions we have brought to our nation."

Özdemir noted the growing global demand for portable energy, pointing to this upward trend. He predicted that interest in these professional groups will only increase within the sector. Özdemir stated that there is a need for people with expertise in contract management, project management, legal consulting, and technical domains like mechanical, electrical, and software engineering, as well as battery design and software development, especially in the energy and defense industries. He stressed how in-demand these professionals will be from the start and will only get more so over time. "As time goes on, these people will have more and more opportunities for employment. Consequently, it is clear that there will be a growing demand for energy-related professions in the future, as well as for those who collaborate with them, and that the market will pay more attention to these positions."

### University-Industry Cooperation in Human Resources Training

Ahmet Turan Özdemir made the observation that university or national education curricula might not always adequately train the required professional groups in the defense industry, particularly in specialized fields like ammunition production, aviation, and space. He said that when necessary, the industry occasionally turns to employee training.

According to Özdemir, in order to meet the various needs of the industry, the Ministry of Science, Industry, and Technology launched a program named "Sector on Campus." He stated that ASPİLSAN is one of the 22 stakeholders in the program, which includes 11 universities and 11 industrial organizations.

Özdemir highlighted their support for the program by saying that they work with their engineers to define new courses, develop new curricula, and provide engineering education in areas where the industry needs it. He added, "To meet the needs for human resources, our Defense Industry Presidency also supports these processes with various structures through the KOK program and other programs. In this sense, we each support these kinds of initiatives in accordance with our Defense Industry Presidency. With the industry's help, our nation is, in one way or another, producing the human capital required by the industry. Without hesitation, we offer all the help we can in this regard."

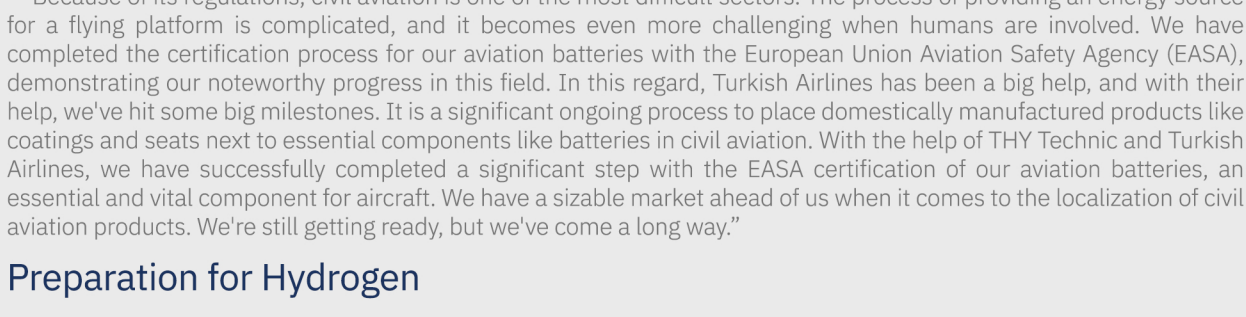
## ASPİLSAN ENERJİ COOPERATION AND COORDINATION WORKSHOP WAS HELD



The directors of the Turkish Armed Forces Foundation, ASELSAN, ROKETSAN, TAI, HAVELSAN, and İŞBİR Electricity companies participated in our ASPİLSAN Enerji Cooperation and Coordination Workshop, which aims to strengthen cooperation and increase coordination by bringing together our stakeholders in the ecosystem.



## ASPİLSAN ENERJİ BRINGS ITS CAPABILITIES TO THE CIVIL AVIATION SECTOR



As part of their engagements with civilian sectors, ASPİLSAN Enerji General Manager Ahmet Turan Özdemir announced that they have implemented an agreement with Turkcell. He underlined how much Türkiye has advanced since the invention of telecommunication batteries, pointing out that they are used extensively throughout the network.

Apart from partnerships with the electric home appliance industry, Özdemir also mentioned continuous endeavors in this domain.

He said they are forming alliances with various businesses to integrate new battery cells into continuous devices and expressed optimism about reaping the benefits of these alliances soon.

Özdemir emphasized how important portable energy storage devices are for both military and non-military uses. Within this framework, he discussed their intentions to implement the products they have created in the near future.

Providing information about their work on civil aviation, Özdemir said:

"Because of its regulations, civil aviation is one of the most difficult sectors. The process of providing an energy source for a flying platform is complicated, and it becomes even more challenging when humans are involved. We have completed the certification process for our aviation batteries with the European Union Aviation Safety Agency (EASA), demonstrating our noteworthy progress in this field. In this regard, Turkish Airlines has been a big help, and with their help, we've hit some big milestones. It is a significant ongoing process to place domestically manufactured products like coatings and seats next to essential components like batteries in civil aviation. With the help of THY Technic and Turkish Airlines, we have successfully completed a significant step with the EASA certification of our aviation batteries, an essential and vital component for aircraft. We have a sizable market ahead of us when it comes to the localization of civil aviation products. We're still getting ready, but we've come a long way."

### Preparation for Hydrogen

According to Ahmet Turan Özdemir, they have been working with doctorate researchers at Technopark Istanbul for the past five years on research and development (R&D) projects related to hydrogen and fuel cell technologies, in addition to other initiatives.

Özdemir also emphasized the importance of hydrogen as an energy source while pointing out that obstacles still need to be addressed in the areas of cost-effective hydrogen production, storage, and transportation.

Explaining that by enhancing these circumstances, a more effective service can be rendered and that regulations might necessitate the use of hydrogen, Mr. Özdemir added:

"No resource on Earth is infinite. After a certain period, the lithium batteries we use will start to have problems. In the future, we will require alternative energy sources. The field of hydrogen is also significant. We see and are aware of the significant investments that certain European investors are making in this space, particularly in the African continent. We keep up our R&D efforts to be prepared for that day. In this area, we also assess funds from the European Union. Our teams are working on hydrogen-related projects funded by the European Union. Important studies on this topic are supported in our nation by TENMAK and TUBİTAK. With these institutions, we continue our work on hydrogen and fuel cells."

### Electric Vehicle Batteries

According to Özdemir, who disclosed that their factories in the organized industrial zone of Kayseri produce nickel-cadmium batteries as assemblies made from electrodes, these products are widely used in rail, air, and marine transportation because of their electrical characteristics and safety. He said they offer solutions for various vehicle groups.

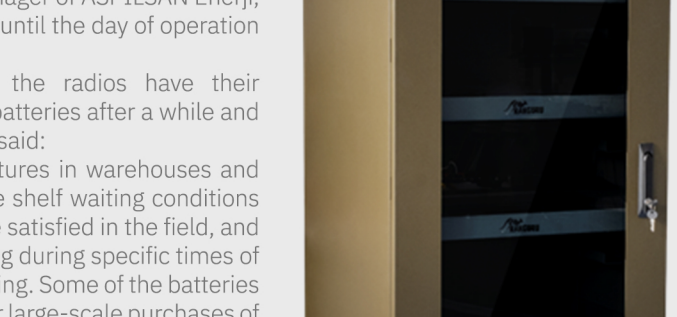
"Pointing out that R&D teams are operating in Ankara regarding electric vehicles, Özdemir said:

"We produce battery packs for everything from minibuses to light-electric cars here. We have made significant progress in this area. We have done extensive research in this area and have produced items such as cells, leak-proof and thermally managed products, and circuits for battery production. We have achieved substantial progress in this direction. These products were created, designed, and provided per the demands of our clients. Our products function in real-world situations. We continue to design and produce certain products. The European Union places a high value on this industry."

## THE OFFICIAL KICK-OFF MEETING OF THE ZEV-UP PROJECT TOOK PLACE

"The largest civilian research and innovation initiative in the world, #HorizonEurope, also referred to as the "Horizon Europe Programme," aims to support science and innovation-related endeavors. It is the European Union's ninth framework program. ZEV-UP (Fuzul Zero-Emission Vehicles concepts for the Urban Passenger challenge) is one of the components of the Horizon Europe Programme Cluster 5: Climate, Energy, Mobility, component "Target 5 - Clean and competitive solutions for all modes of transportation." The project has been selected for support by the European Commission and involves 17 stakeholders from 11 different countries.

All parties involved attended the project's official kick-off meeting, which was held in Brussels on February 8, 2024. The goal of the ZEV-UP project, in which we are involved, is to provide a modular, compact, zero-emission light electric vehicle appropriate for passenger and freight transportation in order to promote cleaner, greener, and smarter cities. We are happy to share that, over the course of the project's 42 months, ASPİLSAN Enerji will be involved in the development and production of the battery for the reasonably priced and user-focused L7 class electric vehicle.



## KANGURU, THE NEW ASSISTANT OF THE SECURITY FORCES

A smart battery storage and charging cabinet named "KANGURU" was developed by ASPİLSAN Enerji for security forces. Frequent use of these cabinets, which are always fully charged and ready for use, even in the most adverse of circumstances.

With its products, ASPİLSAN Enerji, a company that develops solutions for batteries, cells, and their charging needs, helps to lessen reliance on foreign suppliers for energy storage.

A Utility Model Certificate was granted to ASPİLSAN Enerji for their newly developed KANGURU smart battery storage and charging cabinet.

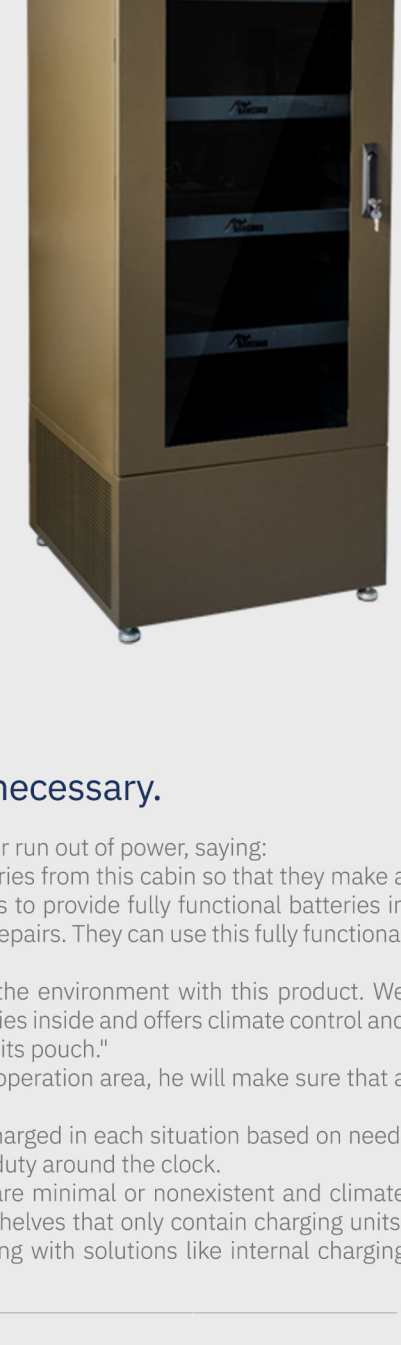
In his statement, Ahmet Turan Özdemir, General Manager of ASPİLSAN Enerji, stated that radio batteries are typically stored in safes until the day of operation after being supplied.

Pointing out that the electronic circuits inside the radios have their own consumption, Özdemir stated that they can drain the batteries after a while and that they need to be maintained periodically. Özdemir said:

"Certain batteries can reach extremely low temperatures in warehouses and high temperatures under sheet metal roofs. There are shelf waiting conditions for these too. These requirements might not always be satisfied in the field, and they usually can't be. Additionally, they require charging during specific times of the day. Preserving and maintaining this calls for planning. Some of the batteries may become unusable if they are not maintained for your large-scale purchases of products because necessary closer to the end of the year and you made your supply ready."

"You can get batteries that are guaranteed for their quality, charge, and operation when the operation button is pressed from this cabinet. Much has charging circuits and smart maintenance algorithms. There are slots inside these cabinets where we can insert various kinds of batteries. The shelves holding these batteries can be arranged to suit the needs of each individual. We store our radios in the cabin, where they are kept in a climate-controlled by heating, air conditioning, and ventilation, regardless of the type of radio we use or the batteries we have. We can see on the screen which batteries are on which shelves and what condition they are in."

Özdemir clarified that while it is possible to monitor and set off an alarm for broken or discharged batteries.



### You will hear a sound as the latch is pressed when necessary.

Özdemir emphasized that the cabin's batteries are maintained and will not fall or run out of power, saying:

"When I need it in the field, I take healthy, well-charged, well-maintained batteries out of this cabin, so that they make a sound when I press the latch." Our intention when designing these cabinets was to provide fully functional batteries in locations with challenging storage conditions and no access to technical staff for repairs. They can use this fully functional operation to fulfill the requirements of our security forces."

We manufacture charging stations as well as batteries, and we also provide the environment with this product. We created a ready-to-use product in the shape of a cabinet that maintains the batteries inside and offers climate control and charging units, even in outdoor settings, much like KANGURU protects its baby in its pouch."

Ahmet Turan Özdemir emphasized that when a security personnel goes to the operation area, he will make sure that a battery he takes from the shelf in the cabin is healthy, fully charged and reliable.

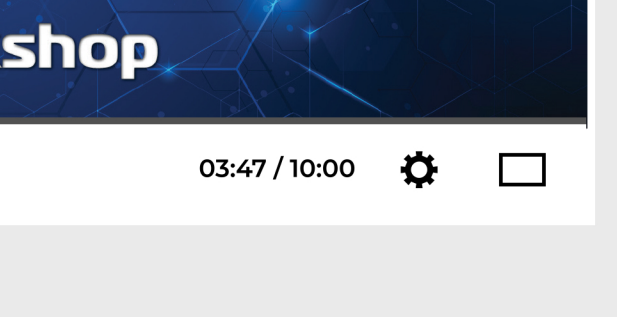
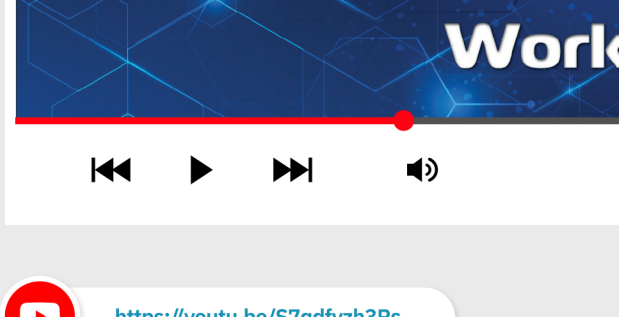
Özdemir said that the cabin is scalable and that various battery types can be charged in each situation based on need, adding that it is a solution to meet the energy needs to keep the forces ready for duty around the clock.

Özdemir added that for settings like headquarters, where outside influences are minimal or nonexistent and climate control is not required, they have designed wall-mounted units in the shape of shelves that only contain charging units. According to him, they provide consumers with continuous energy services along with solutions like internal charging units for indoor environments and cabinets for difficult conditions.

## OUR ENERGY TO A SUSTAINABLE FUTURE

Aligned with our sustainability objectives, we initiated meetings with youth, the guarantors of our future, through our project "Our Energy for a Sustainable Future." In this particular context, our goal is to encourage energy conservation for a more livable world and to raise awareness by engaging with youth about the need to dispose of spent batteries in battery waste bins rather than the trash.

OUR ENERGY TO A SUSTAINABLE FUTURE



## FOLLOW THE ENERGY

We extend our thanks to all participants for their valuable contributions to the ASPİLSAN Enerji Collaboration and Coordination Workshop.



<https://youtu.be/57d0dvh38s>