TARMAKBİR

Türk Tarım Alet ve Makineleri İmalatçıları Birliği

The 11th Member Meeting of the Regional Council of Agricultural Machinery Associations in Asia and the Pacific (ReCAMA)

The Agricultural Machinery Industry in Turkiye At a Glance

Wuhan, 25 October 2025

TARMAKBİR, Turkish Association of Agricultural Machinery & Equipment Manufacturers, is an initiative of Turkish private sector that found in 1978. Being the representative of the Turkish ag. machinery industry, currently it has more than 200 member companies those are senior manufacturers of tractors and other ag. machinery.

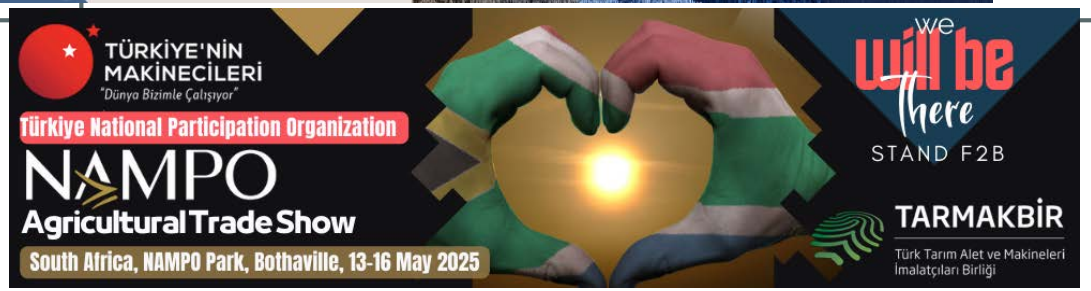
TARMAKBİR has been entitled to use the word “Turkish” at the beginning of its title by a former decision of the Turkish Council of Ministers.

Global Membership List

AGRIEVOLUTION Global Association for Agricultural Machinery Manufacturers' Associations (Founding Member, Ex-Chairman, Board Member)

CEMA European Agricultural Machinery Association (Member)

ReCAMA Asia-Pacific Countries Agricultural Machinery Associations Regional Council (Ex-Chairman, Member)



We're everywhere (2025)

Insights & Key Figures
on the Turkish agricultural machinery

Turkish agricultural machinery industry key indicators (2024)

Number of Enterprises
1.123
(TOBB, 2024)

Total Employment
38.077
(TOBB, 2024)

Production Value*
6,6 billion $
(2024)

Economic Value-Added*
1,3 billion $
(2024)

Total Exports
1,5 billion $

Total Imports
1,2 billion $

Net Sales*
5,5 billion $
(2024)

Home Market Value**
5,5 billion $
(2024)

*The information is sourced from calculations made by TARMAKBİR.
**Analysis reflects the sales value based on production is reduced by the amount of exports, and the projected domestic wholesale value of imports is incorporated into the resulting total.

Following the production of the first agricultural implement — a basic plough — in 1861, and the launch of the first tractor from an assembly line in 1955, the national industry has since developed the capability to **manufacture almost any type of agricultural machinery required for the sector's mechanization. However, there are still a few exceptions to this capability. Such mechanisation tools are manufactured at a very low level and the needs are generally met through imports.**
In the sector in general, the ratio of manufacturing to the domestic market is quite high, e.g. the ratio of imports to the domestic market in 2024 is 29.5 per cent, half the ratio of the overall machinery industry.

In particular, some products that would not be rational to produce in terms of sales volumes (economy of scale, brand recognition)

High-capacity machines for wide areas, particularly for bigger businesses and large agricultural lands (especially self-propelled harvesters)

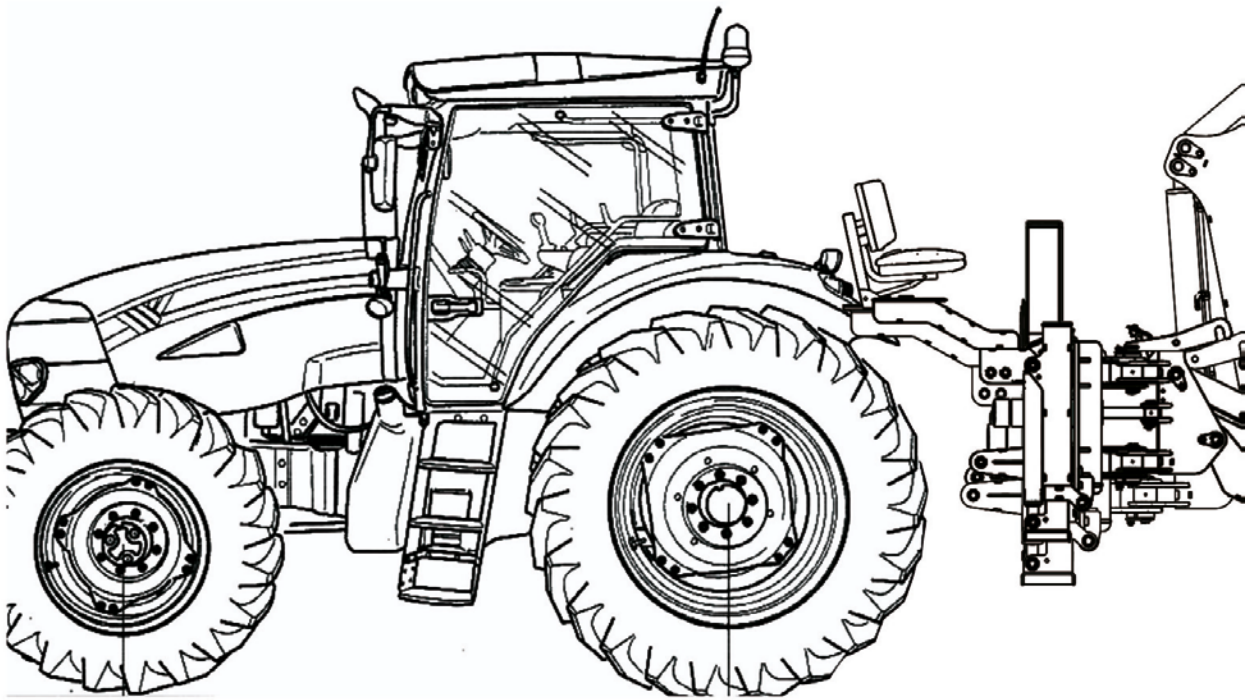
Top-notch engineered products, especially smart agricultural equipment (which requires high-engineering knowledge, technology and infrastructure)

Key challenges and constraints faced with the R&D and application of **cutting-edge technologies**

R&D in the Agricultural Machinery Sector

Key Insight: The share of R&D expenditures in the agricultural machinery sector (7.9%) is higher than the overall average of the machinery industry (4.5%).

Interpretation: While this demonstrates that R&D is valued in the sector, most efforts are directed toward product development rather than fundamental innovation.



Barriers to R&D Advancement:

- Limited scale and cost constraints
- Short-term profit expectations
- Delayed implementation of industrial property legislation
- Heavy workload of intellectual property courts
- Low purchasing power of farmers
- Low profit margins in the sector

Institutional and Policy Context

Compared to their weight in the general machinery industry, agricultural machinery manufacturers **benefit less from government incentives** such as R&D and design center supports.

As of **2024**, Turkey has **1,323 R&D centers** and **327 design centers**; however, only **4.8%** of R&D centers and **2.7%** of design centers operate within the **agricultural machinery field**.

Conclusion

Cutting-edge technology (CET) in agriculture represents a growing value, yet it continues to face several constraints. In Turkey, while large and high-value farms are increasingly adopting digital farming practices, small and medium-sized farms remain behind due to cost barriers and limited access.

Investment and Financing Needs:
To accelerate the adoption of CET, investment incentives and dedicated financing mechanisms are vital for both manufacturers and farmers.

Education and Trust:
Comprehensive training and quality assurance programs are essential to build confidence in digital technologies and encourage their widespread use.

Inclusive Policies:
Tailored initiatives for small-scale farms should be developed to ensure broader adoption, equitable access, and sustainable growth across the sector.

Cases or good practices of cutting-edge technologies **in agricultural mechanization**

Innovative Agricultural Technologies Developed in Turkiye

From TAGEM (Agricultural Ministry, General Directorate of Agricultural Research and Policies) conducts joint projects with universities, TÜBİTAK, and the private sector, operating through 47 research institutes.

Some of the recent works developed within the scope of the project:

Domestic & Innovative Machinery

- Legume, Lavender, and Safflower Harvesters
- Compost Spreader & Strip-Tillage Machine
- Automatic Drum Irrigation & Mobile Silage Baler
- Fertilizer Machine with Subsurface Injection System

Renewable Energy in Agriculture

- Solar Drying & Hybrid Energy Systems
- Zero-Waste Greenhouse Model using Biomass Energy

Soil & Water Conservation

- Conservation tillage methods for various crops and terrains

Input Optimization Technologies

- Variable-Rate Liquid Fertilizer Kit
- Smart Spraying System with Time-of-Flight Sensors

Data & AI-Driven Agriculture

- Deep Learning–based Pest/Disease Detection in Orchards & Vineyards
- AI-based Yield Prediction Models for Strategic Crops

Autonomous Farming Systems

- Autonomous Vineyard Robot
- Fertilizer Scraping Robots

Doktar

2017
Founded in

500k
Farmers Registered in Our Database

103
Total Employees

250K
More than 250k hectares covered.

50K
Farmer questions answered annually

117
Plants covered

Innovative AgTech Pioneer:
Founded in 2012, Doktar develops local, end-to-end digital farming solutions using IoT, AI, and data analytics technologies.

Comprehensive Product Ecosystem:
Offers integrated tools such as Orbit (farm monitoring), PestTrap (pest tracking), SoilScanner (soil analysis), and FlowMeter (water management), enabling fully digitalized farm operations.

Data & AI-Driven Decision Support:
Uses satellite imagery, sensors, and machine learning to provide real-time insights and smart recommendations for irrigation, fertilization, and crop health.

Strong Partnerships & Global Reach:
Collaborates with universities, agribusinesses, and EU projects, expanding its impact across Europe, the Middle East, and Africa.

Sustainability Focus:
Helps reduce water, fertilizer, and pesticide use, contributing to climate-smart and resource-efficient agriculture.

MOVE ON®

MOVE ON is best known for developing autonomous tractor kits and AI-powered agricultural technologies.
Their key products include the TAS kit (camera-based automatic steering) and the advanced TASAI kit (full autonomy, cloud-connected control). ***These kits can be retrofitted to virtually any tractor model, turning traditional tractors into smart, autonomous machines.***
MOVE ON develops the MAC (MOVE ON AgTech Cloud) platform, which integrates data analytics, farm and fleet management, yield forecasting, and remote monitoring.

MCP - MOVE ON AgTech Cloud Platform

MOVE ON - MCP is a data-driven cloud computing solution developed with a focus on digitalisation solutions for sustainable and traceable agriculture with agricultural artificial intelligence and autonomy softwares.

Fleet Management
Field Analysis via Drones
Field Analysis via Satellite
Variable Rate Applications
Section Control Applications

TAS - Vision Guidance Based Tractor Automatic Steering Kit

MOVE ON - TAS Kit works with millimeter precision by adding eye to the tractors and making analysis in less than blink of an eye, thanks to the camera and artificial intelligence technology.

ROW - Camera-Guided, Side-Shift Enabled, Section-Controlled, Cloud-Integrated Smart Weeding Machine Kit

MOVE ON - ROW Kit works with millimeter precision by adding eye to the weeders and making analysis in less than blink of an eye, thanks to the camera and artificial intelligence technology.

TASAI - Autonomous Tractor Kit

MOVE ON - TASAI Kit integrates into tractors and agricultural equipment in a cloud-supported manner, providing 360-degree field and plant vision and autonomy.

Row Vision Guidance Weeder (Kit)
The smart weeding unit analyzes plants and weeds with MOVE ON's cameras and controls the weeding machine with Agricultural AI Technology.
Cameras attached to the ends of the device enable positioning by seeing the plants instantly. According to the position of the plants, the equipment gets closer to the plant and operates from the lowest point.

ÖNALLAR

Fully Autonomous Spraying System

One-Touch Autonomy: Enables complete spraying operations with a single command.

Advanced Technology & Adaptation: Equipped with sensors that automatically detect row spacing and plant height, allowing compatibility with various crop types and enhancing efficiency.

Optimized Spraying: Maintains constant pressure for ideal droplet size and uniform coverage.

Smart Nozzle Control: 48 independent PWM nozzles automatically adjust flow rate during turns and speed changes.

Overlap Prevention: Eliminates spray overlap to prevent chemical waste and reduce costs.

Self propelled sprayer/ mineral fertiliser spreading machine

They offer wide coverage, low soil compaction, and high maneuverability.

With GPS-based precision spraying and fuel-efficient engines, they reduce costs and environmental impact.

Operating independently without a tractor, they save both time and labor for farmers.

With some apart modifications on the machine, it can also be used as a self-propelled precision mineral fertiliser spreading machine.

BRIDGESOFT

Bridgesoft's smart agricultural solutions are designed as modular retrofit kits that can be easily installed on existing spraying and fertilizing machines. This allows farmers to upgrade their current equipment with AI-powered precision technology without needing to buy new machinery. The systems integrate seamlessly with various boom sprayers and implements, maintaining full compatibility and ease of use. This approach makes advanced smart farming accessible and cost-effective for every grower.

Farmers can smarten the X-arm hanging type sprayers in their inventory. These machines are capable of spraying, liquid fertilisation or both.

•**Spraying**: Targets weeds in the field (our AI can recognize over 600 types of weeds) and can apply different types of pesticides, reducing spraying costs by up to 90%.

•**Fertilizing**: Identifies the gaps between plants on the rows and avoids applying fertilizer to non-plant areas, reducing fertilization costs by up to 30%.

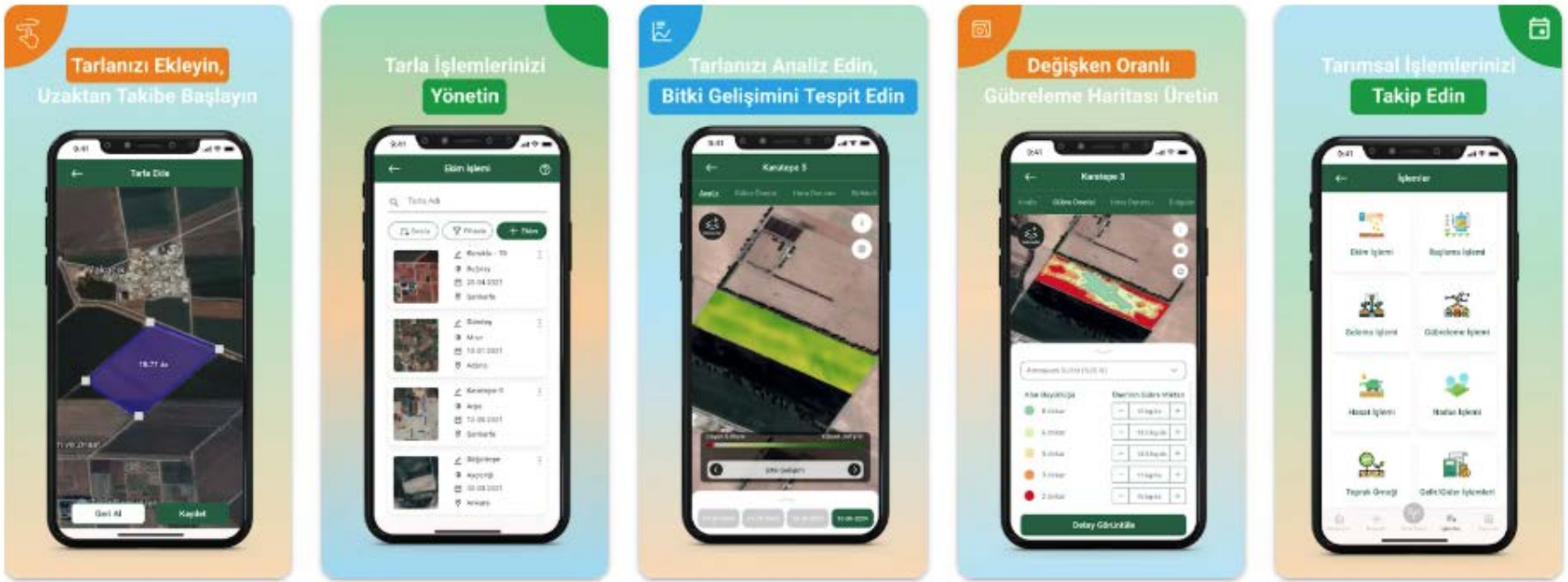
This technology is highly efficient for spraying and liquid fertilization applications in crops planted with row spacing (such as potatoes, tomatoes, corn, sunflower, cotton, sugar beet, soy bean and lettuce).

HASSAS

GAPHASSAS is Turkey’s first national precision agriculture application software, developed by various government institutions.
Using satellite imagery, sensor data, and artificial intelligence (AI) algorithms), it analyzes variables such as plant growth and soil moisture levels across different areas of farmland, providing early warnings based on anomaly detection. Within this scope, user data and satellite images are processed through AI algorithms to generate recommendations for farmers.

Farmers can record agricultural operations such as planting, irrigation, fertilization, and spraying through the application and compare them with historical data.

The software primarily serves nine provinces within the GAP Region of Turkey.



Existing policies promoting R&D and applications of cutting-edge technologies **in agricultural mechanization**

Public R&D Incentives and Supports

Ministry of Industry and Technology of the Republic of Türkiye

R&D and Design Center Incentives: Supports the establishment of R&D and design centers by capital companies in Türkiye. Incentives include:

- Corporate tax reduction
- Income tax withholding reduction
- Employer's share of social security premium support
- Exemption from stamp and customs duties
- Basic sciences employment support

Small and Medium Enterprises Development Organization of Türkiye (KOSGEB)

- **1507 – TÜBİTAK SME R&D Startup Support Program:** Supports small and medium-sized enterprises starting R&D projects.
- **1501 – TÜBİTAK Industrial R&D Projects Support Program:** Encourages industrial companies to develop innovative products and technologies.
- **Technology Center Support Program:** Supports the establishment and operation of technology development centers for startups and SMEs.
- **Strategic Product Support Program:** Aims to increase the domestic production of high-technology and critical products.1

Ministry of Trade – Design and Product Development Supports

• Under Communiqué No. 2008/2, expenses of design companies and offices are supported, including:
promotion, employment, patent and design registration, consultancy, and overseas office expenses.
• The overseas education and living expenses of 60 designers who achieve top rankings in design competitions are covered.
• Additionally, within design and product development projects,
engineer and designer salaries, as well as equipment and software costs, are supported.

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Ministry of Agriculture and Forestry & TAGEM Supports

The duty to support agricultural research is defined under Article 8 of the Agriculture Law.

TAGEM (General Directorate of Agricultural Research and Policies) conducts joint projects with universities, TÜBİTAK, and the private sector, operating through 47 research institutes.

Although there is no dedicated institute for agricultural machinery, several institutes have relevant departments.

In 2021, the Agricultural Machinery and Technologies R&D and Innovation Center was established within the Tekirdağ Viticulture Research Institute.

TAMTEST (Agricultural Equipment and Machinery Test Center Directorate) also carries out sectoral R&D activities.

The Scientific and Technological Research Council of Türkiye (TÜBİTAK)
National Support Programs

1501 - Industrial R&D Projects Grant Programme
1503 - R&D Project Brokerage Events Grant Program
1505 - University – Industry Collaboration Support Program
1507 - TUBITAK SME R&D Start-up Support Program
1511 - Research Technology Development and Innovation Projects in Priority Areas G. P. (Technology Focused Industrial Movement Program)
1512 - Entrepreneurship Support Program
1513 - Technology Transfer Office Support Program
1514 - Venture Capital Funding Program (Tech-InvesTR)
1515 - Frontier R&D Laboratory Support Programme
1601 - Capacity Building for I&E Grant Program
1601- Teknoloji Transferi Profesyoneli Çağrısı
1602 - TUBITAK Patent Support Program
1607- BIGG+ SME Mentorship Interface
1612 - BiGG – 1st Phase Implementing Agencies Call
1701-R&D Project Evaluation and Monitoring Call
1702 - Patent Based Technology Transfer Support Call
1704 - SAYEM- Industrial Innovation Networks
1707 - SME Support Call for Order-Based R&D Projects
1711 - Artificial Intelligence Ecosystem Call
1812 - Investment Based Entrepreneurship Support Program (BiGG Investment)
1831 Climate-informed and Green Innovation Technology Extension Program
1832 Call for Green Transformation in Industry
1833 - SAYEM Green Transformation Call

Regional R&D and Innovation Centers

AKİTEK, Smart Technogies Center
•Established through cooperation between **TARMAKBİR**, **Karatay University**, and regional institutions.
•Aims to develop **Agriculture 4.0–compatible smart agricultural machinery**.
•Funded with approximately **€5 million** under the **EU IPA program**, operations began at the **end of 2021**.

İZMİR – Agricultural Technology Center (İTTM)
•Founded under the leadership of the **İzmir Commodity Exchange**.
•Provides an **open innovation environment** for testing **smart agriculture applications**.
•Located in **Menemen**, includes a **TEKMER unit**.
•Facilitates **international partnerships** and **access to venture capital**.
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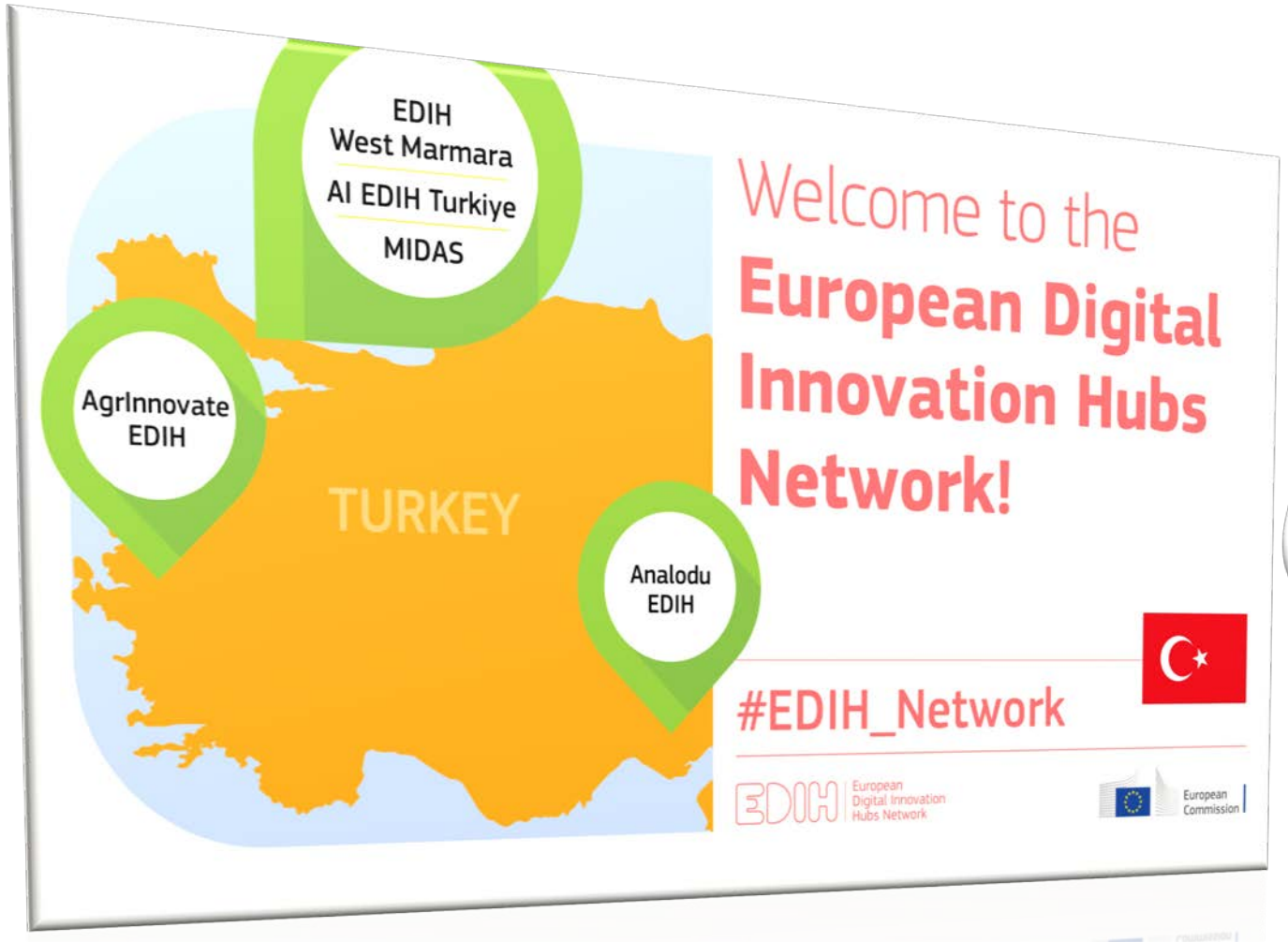
AgrInnovate EDIH

The consortium (AgrInnovate EDIH), of which ITTM is the leader and TARMAKBİR is a member, has started its activities as a European Digital Innovation Centre since January 2025.

AgrInnovate EDIH is one of the 5 consortia accepted from our country to the European Digital Innovation Centres (EDIH Network) network.



Teşekkürler!

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