Horizon Europe Expression of Interest
MESS Technology Center (MEXT)

Founded in 1959, the **Türkiye Metal Sanayicileri Sendikası (MESS)** stands as Turkey's **largest** employers' association, representing over **260 member companies** across key industries such as automotive, white goods, and steel. Collectively, these sectors employ **more than 210,000** individuals directly and over 1 million indirectly, contributing to **40% of the country's exports** and generating an annual economic impact exceeding **$60 billion**. Beyond its traditional industrial relations mandate, MESS has also adopted a vision to focus on **innovation, sustainability, digital transformation and AI** to empower its members and the broader industrial ecosystem.

To drive this mission, MESS established the **MESS Technology Center (MEXT)** in 2019. Its mission is to support the **digital and green transformation** of the manufacturing industry.

MEXT has also been designated as a European Digital Innovation Hub (EDIH) to assist digital and green transformation of manufacturing SMEs in Türkiye focusing on **Artificial Intelligence (AI)** and **High-Performance Computing (HPC).** Through its state-of-the-art Digital Factory and ecosystem-building initiatives, MEXT provides a "**Test Before Invest**" service model, advanced technical consultancy, training programs, and networking opportunities. Leveraging its infrastructure and expertise, MEXT connects SMEs with innovation ecosystems, enabling them to adopt cutting-edge technologies and enhance competitiveness, aligning with the goals of the **Digital Europe Programme.**

MEXT AI CENTER

AI Center is a dedicated innovation hub focused on driving artificial intelligence research, development, and deployment across industries. Our mission is to accelerate AI adoption through strategic partnerships, competency-building initiatives, and cutting-edge technology solutions. The center specializes in Generative AI, machine learning, data analytics, and AI-powered automation, enabling businesses to enhance efficiency, innovation, and scalability. Key activities include AI maturity assessments, tailored training programs, AI prototyping and productization, ecosystem collaboration with global technology partners, and participation in EU-and local R&D projects.

MEXT serves as a comprehensive platform supporting enterprises in their **digital and green** (Twin) and AI transition journeys, structured around four pillars: Digital Factory, Digital Maturity Assessment, Ecosystem Development, and Competency Building.

1. Digital Factory

MEXT Digital Factory is **a real production environment** comprising two production lines and **integrating more than 200 Industrial transition use cases** to demonstrate their added value in manufacturing (First and only in the world). **At thephysically set-up discrete line**, a shaft-mounted speed reducer (gearbox) is produced in The style of an automotive fabrication cell and showcased on an assembly line inspired by the processes of the relevant stakeholders. **The virtual continuous line**, being the first application in the world, demonstrates a continuous production line of a steel galvanization plant integrated with the control systems used in real-life production. The objectives are to **convey the benefits of Twin transition applications** such as AI and Industrial IoT to manufacturing sectors and to use **the real production environment** for hands-on training sessions and as a testbed for new Twin transition technologies. MEXT Digital Factory is equipped with a comprehensive range of **state-of-the-art infrastructure**, tools, and machinery such as a 5G Mobile Private Network, Automated Storage and Retrieval System (ASRS), 3D bin-picking-enabled robotic kitting station, an assembly line with 8 stations including robots and cobots, 5- axis CNC, laser engraving machine, plastic injection molding machine, plastic 3D printer, and multi-material, multi-layer electronics 3D printer. Additionally, 5 Autonomous Mobile Robots (AMRs) are used for intralogistics and machine loading/unloading processes. The Digital Factory features a reference IoT architecture. The end-to-end-integrated industrial IoT stack includes:

- Enterprise Resource Planning System (ERP)
- Warehouse Management System (WMS)
- Manufacturing Execution System (MES)
- Product Lifecycle Management System (PLM)
- Industrial IoT platform
- Middleware platforms for OT/IT convergence

The IT infrastructure also includes powerful computational resources, such as 2.6 GHz 96 core CPUs, 160GB VRAM, and 2 NVIDIA Tesla A100 GPUs for AI tasks. **The virtual continuous line, being the first application in the world**, demonstrates a continuous production line of a steel galvanization plant integrated with the control systems used **in real-life production**. The objectives are to convey the benefits of Industrial Transition applications such as AI and Industrial IoT to manufacturing sectors and to use the real production environment for hands-on training sessions and as a testbed for new Industrial Trasnition technologies.

2. Digital, Sustainability, AI and Automation Maturity Assessments

MEXT conducts the world's most comprehensive assessments of industrial digital and green maturity, serving over 650 (Half of which SMEs companies across 15 manufacturing sectors in Turkey, alongside evaluations conducted in Germany, Saudi Arabia, Azerbaijan, and Romania. These assessments identify industry needs, develop transformation roadmaps, and provide technical consulting to implement actionable projects. MEXT's globally accredited team ensures enterprises meet international standards in their digital and sustainability efforts. MEXT provides an array of technical consultancy and deep-dive services, including maturity assessments (Digital Maturity Assessment (SIRI), Sustainability Maturity Assessment (COSIRI), AI Assessment, Automation Feasibility Analysis (AFA) Assessment), technical consultancy services for digital transformation, AI-enabled twin transition, and end-to-end AI use case identification and implementation. Technology

Center's team includes more than 20 certified assessors and over 30 technical experts to deliver these services.

3. CompetencyBuilding

MEXT has created world's most comprehensive "digital transformation in manufacturing" curriculum. MEXT has trained more than 30.000 participants from over 700 companies, offering the most extensive digital and green transformation training programs in Turkey. Having both theoretical and practical - hands-on components, these initiatives aim to cultivate transformation leaders - from shop floor operators to senior executives—who drive sustainable, high- tech production, enhancing Turkey's global competitiveness

4. Ecosystem Development

MEXT collaborates with a robust network of over 70 partners, including local technology providers, global firms, startups, and universities. Through open innovation processes, MEXT fosters collaboration between industrial companies and startups, advancing cutting edge solutions in areas such as energy management, AI, additive manufacturing, and sustainability. Initiatives like the Turcorn 100 acceleration program support promising startups on their journey to becoming "Turcorns" (Turkish unicorns). See page 6

MEXT CAPACITY

1. DIGIAL FACTORY DEMONSTRATION

Capability	Description	Project Support Area
Real-World Testing Environment	MEXT's Digital Factory replicates real production lines (discrete and continuous) and integrates over 200 digital, green and AI use cases.	Serves as a sandbox for testing and validating new manufacturing technologies, AI algorithms, and IoT solutions under real-world conditions.
Cutting-Edge Infrastructure	Equipped with advanced tools such as 5G Mobile Private Networks, autonomous mobile robots (AMRs), 5-axis CNC machines, IoT architecture, and high-performance computational resources (e.g., NVIDIA Tesla A100 GPUs)	Provides facilities for prototyping, simulating, and evaluating the impact of digital manufacturing solutions, enabling researchers to refine their innovations.
Industry 4.0 Integration	Full-stack integration of ERP, MES, WMS, and IoT systems with middleware for OT/IT convergence.	Acts as a model for designing interoperable systems and testing their scalability and compatibility with existing industry setups.
AI-Driven Manufacturing Solutions	Advanced computational resources for running AI models and testing their effectiveness in optimizing manufacturing processes.	Contributes to AI model validation, such as predictive maintenance, quality control, and process optimization

2. DIGITAL AND GREEN MATURITY ASSESSMENT

Capability	Description	Project Support Area
Globally Accredited Assessment Tools	MEXT utilizes internationally recognized frameworks such as SIRI (Smart Industry Readiness Index) and COSIRI (Circular and Sustainable Industry Readiness Index).	Provides a standardized approach to assessing SMEs' digital and green maturity levels, ensuring alignment with Horizon Europe's objectives for twin transitions. an
Comprehensive Evaluation Expertise	Experience conducting over 400 assessments across 12 manufacturing sectors in Turkey and internationally (e.g., Germany, Saudi Arabia, Azerbaijan, and Romania).	Offers insights into diverse industrial needs, making MEXT a valuable resource for **mapping industry readiness** across Horizon Europe's multi-national projects.
Roadmap Development for Transformation	Capability to develop customized transformation roadmaps based on assessment results, focusing on actionable, sector-specific recommendations.	Supports consortium partners in planning and implementing digital and green transformation strategies and business plans tailored to Horizon Europe project goals.
Sustainability Metrics and Reporting	Experience in tracking and reporting sustainability impacts using data-driven methodologies.	Enables Horizon Europe projects to measure progress toward sustainability goals, providing evidence-based recommendations for continuous improvement.

3. COMPETENCY DEVELOPMENT

Capability	Description	Project Support Area
Extensive Workforce Training Experience	MEXT has trained nearly 30,000 participants from over 700 companies, covering shop floor operators to senior executives.	Designs and deliver customized training programs focused on advanced digital and green skills
Industry Specific Training Programs	Expertise in providing training for diverse sectors like automotive, white goods, and steel manufacturing etc.	Develops sector-specific upskilling programs for Horizon Europe projects to ensure targeted impact in relevant industries.
Integration with Real-world Applications	Training programs are backed by MEXT's Digital Factory, offering hands-on learning with over 200 Industry 4.0 use cases, including robotics, IoT, and AI applications.	Provides experiential learning opportunities that align with HE's emphasis on real-world application and innovation

4. ECOSYSEM DEVELOPMENT

Capability	Description	Project Support Area
Extensive Partner Network	Collaborates with over 100 ecosystem partners, including leading international and local technology providers.	Facilitatess connections between consortium members and a diverse range of technology providers, fostering collaborative development of innovative solutions in areas such as energy, additive manufacturing,

		AI, sustainability, digitalization, etc.
Industrial Testbed Facilities	MEXT supports startups through initiatives like the Turcorn 100 acceleration program, aiming to nurture promising startups into "Turcorns" (Turkish unicorns).	Provides a real-world environment for consortium partners to test and validate innovative solutions, accelerating the development and deployment of new technologies
Access to Technology Providers	MEXT offers access to a broad network of technology providers to enhance Industry 4.0 knowledge.	Connects consortium members with relevant technology providers, facilitating the adoption of cutting- edge solutions. Amazon Web Services, Cisco, Microsoft, IBM, Rexroth, Siemens, Bosh, B/S/H, Mercedes, MAN, Groupe Renault, Ford, Koç, ABB, ISUZU, Schneider are some of them.

5. COLLABORATIVE NETWORKS

MEXT collaborates with over 60 partners, including:

- Universities: İstanbul Technical University, Bilkent, Boğaziçi University, Koç University etc.
- Technology Companies: Amazon Web Services, Cisco, Microsoft, IBM etc.
- Industry Organizations: İstanbul Chamber of Commerce, Turkish Textile Industry Employers Association (TTSIS), İstanbul Apparel Exporters' Association (IHKIB), and White Goods Suppliers Association (BEYSAD) etc.
- Global Entities: Confederation of Danish Industry, European Digital Innovation Hubs (EDIH) network, EIT
- Policy and Development Partners: UNDP, TİSK, World Economic Forum (WEF), Turkish Ministries.

SUMMARY of ALIGNMENT with HORIZON EUROPE and EU PRIORITIES

MEXT Expertise	Relevant Horizon Europe Areas
Digital Transformation in Manufacturing	Digital, Industry, and Space; AI, Big Data, and Advanced Computing; Industry 4.0 and IoT for Manufacturing.
Green and Sustainability Transformation	Green Deal, Circular Economy, Climate Action, and Resource Efficiency; Life Cycle Assessment; Sustainable Industries.
Digital and Green Maturity Assessments	Enabling SMEs for Twin Transitions; Industrial Competitiveness and Sustainability.
Competency Building and Workforce Training	Skills Agenda and Workforce Development; Upskilling for Digital and Green Transitions; Education and Culture.
Open Innovation and Ecosystem Development	European Innovation Ecosystems; Start-up Support and Scale-up; Industry-Academia Collaboration.
AI and High-Performance Computing (HPC)	Artificial Intelligence, Big Data, and High-Performance Computing for Sustainable Manufacturing.
5G-Enabled Digital Factory	Next-Generation Communication; Advanced Networks and IoT; Digital Infrastructure for Industry 4.0.
Nature-Based Solutions for Industry	Climate Adaptation; Urban Resilience; Sustainable Practices in Industrial Areas.

CONTACT DETAILS

Country	TURKEY - TÜRKİYE
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AREAS of INTEREST

Horizon Europe, Work Programme 2025 – 2026

Call	Heading	Submission	Budget (€)

SPECIFIC SKILLS about the HORIZON EUROPE PROJECTS

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MEXT CAN TAKE ACTIVE PART IN FOLLOWING TASKS IN RELEVANT HORIZON EUROPE PROJECTS

MEXT can serve as a technical partner in Horizon Europe projects by providing expertise in digital transformation, such as implementing AI-driven manufacturing systems, conducting digital maturity assessments, and scaling Industry Twin Transition. It can also act as a pilot site for testing and validating innovative technologies, including green manufacturing processes and energy-efficient systems. Additionally, MEXT can contribute as an education and training provider, developing tailored programs to upskill the workforce in digital and sustainable practices, while fostering collaboration between industry, academia, and policymakers.

The 70 use cases developed at MEXT can be utilized as proof-of-concept models to demonstrate the tangible benefits of digital transformation across various industries, accelerating technology adoption in Horizon Europe projects. They can also serve as replicable frameworks for scaling twin transition, providing practical blueprints for other regions and sectors involved in the program

1. **Research and Data Analysis:**

   - Conduct **digital and sustainability maturity assessments** for industries, providing tailored transformation roadmaps.
   - Utilize **AI-driven data analytics** to gather and process insights from manufacturing ecosystems, focusing on resource efficiency, emissions reduction, and productivity improvements.
   - Benchmark industrial practices and identify gaps in adopting digital and green technologies.

2. **R&D and Technology Validation:**

   - Develop and test **AI-driven solutions** for manufacturing optimization, including predictive maintenance, digital twins, and energy-efficient processes.
   - Validate **Twin Transition use cases** in MEXT's **Digital Factory**, demonstrating their applicability in real-world scenarios.
   - Lead pilot projects integrating advanced technologies such as **IoT, robotics, and 5G-enabled systems** into industrial processes.

3. **Green Transition and Sustainability Support:**

   - Provide expertise in **Life Cycle Assessment (LCA)** and **Circular Economy practices**, ensuring alignment with sustainability goals.
   - Develop methodologies for **resource-efficient manufacturing**, including waste reduction, circularity, and energy optimization.
   - Support the implementation of **green manufacturing strategies** aligned with the EU's Net Zero Industry Act and Critical Raw Materials Act.

4. **Training and Capacity Building:**

   - Design and deliver customized training programs for SMEs, focusing on Twin Transition technologies, AI, and sustainability
   - Train workers and managers to adapt to advanced manufacturing environments and human- centric Industry 5.0 models.
   - Support skills development for implementing and scaling digital twins, AI applications, and sustainable production methods.

5. **Ecosystem Building and Collaboration:**

   - Foster collaboration among industrial stakeholders, startups, technology providers, and policymakers through MEXT's extensive partner network.
   - Support open innovation initiatives, accelerating SMEs and startups.
   - Facilitate cross-sectoral synergies in EU-funded projects by acting as a connector between diverse stakeholders.

6. **Communication and Dissemination:**

- Develop comprehensive dissemination plans, including digital campaigns, multilingual publications, and stakeholder engagement strategies.
- Organize workshops, conferences, and knowledge-sharing events to maximize the reach and impact of project results.
- Contribute to European platforms and initiatives, such as AI-on-Demand, to share best practices and project outcomes.

7. **Policy Advisory and Standardization:**

- Provide policy recommendations on digital transformation, sustainability, and circular economy in line with EU regulations.
- Contribute to the development of industry standards for AI integration, digital twins, and green manufacturing technologies.

8. **Technical Implementation and Support:**

- Act as a technical hub for testing and validating cutting-edge manufacturing technologies.
- Support the integration of AI, IoT, and advanced automation into existing manufacturing ecosystems, ensuring interoperability and scalability.
- Provide technical consultancy for implementing low-emission, energy-efficient solutions across industries

9. **Synthetic Data and Digital Twins:**

- Generate and validate synthetic data for training AI models and improving decision-making in manufacturing.
- Develop digital twin solutions to simulate and optimize manufacturing processes, reducing time-to-market and resource use.

10. **Monitoring and Evaluation:**

- Develop tools for real-time monitoring of project KPIs, including energy consumption, emissions, and productivity metrics.
- Provide post-project evaluations to measure the scalability and impact of implemented technologies.

11. **International Collaboration:**

- Facilitate knowledge transfer and capacity building in emerging markets through its partnerships.
- Collaborate with European institutions (EDIH Network, EIT Network etc.) and global initiatives to promote best practices and align with international standards.

Project Name	Programme	Role	Budget	Status
GreenSync Ecosystem: Connecting the Manufacturing Ecosystem for a Sustainable Future	EU Instrument for Pre-Accession (IPA III)	Coordinator	656.181EUR	Ongoing
From Design to Production: Digital Transformation of Apparel Sector in Turkey	EU Instrument for Pre-Accession (IPA II)	Consortium Partner	4.500.000 EUR	Ongoing
Digital Transformation of SMEs in Turkey through Establishment of the Industry 4.0 Competence Center	EU Instrument for Pre-Accession (IPA II)	Consortium Partner	3.600.000 EUR	Ongoing
AI EDIH Türkiye: AI-Enabled Manufacturing for Twin Transition	EU Digital Europe	Coordinator	2.000.000 EUR	Ongoing
Black Sea Smart Marine Environmental Outcome System	INTERREG NEXT Black Sea	Coordinator	1.291.447 EUR	Ongoing
Green Transformation Program for Turkish Industrial Companies	Danish Innovation Programme	Coordinator	271.000 EUR	Ongoing
Developing Women Empowerment Models in Manufacturing Industry (WE)	EU Instrument for Pre-Accession (IPA II)	Consortium Partner	8.000.000 EUR	Ongoing
IQVETIII: Design Academy	EU Instrument for Pre-Accession (IPA II)	Coordinator	661.566 EUR	Completed
IQVETIII: A Multi-Layered Solution for VET: Change Agents	EU Instrument for Pre-Accession (IPA II)	Coordinator	547.278 EUR	Completed
5GAMMEX	UK Tactical Fund	Coordinator	100.000 GBP	Completed
Establishment of AI Laboratory for Research and Applied Consultancy	Istanbul Development Agency	Coordinator	6.559.159 TRY	Ongoing
MESS Digital Transformation and Competence Development Center: Our Direction is Tomorrow	Istanbul Development Agency	Coordinator	15.485.502 TRY	Ongoing

REPORTs

Date(s) of Report	Name of The Report
January 2025	*United for Net Zero: Public-Private Collaboration to Accelerate Industry Decarbonization*
December 2023	*Türkiye Manufacturing Transformation Insights Report 2022-2023*
December 2022	*Unlocking Value from Artificial Intelligence in Manufacturing*
February 2022	*The Global Smart Industry Readiness Index Initiative: Manufacturing Transformation Insights Report 2022*
January 2022	*Empowering AI Leadership: AI C-Suite Toolkit*