EFFRA – European Factories of the Future Research Association

Stakeholder Webinar
MiE Work Programme 2025-27

23 May 2023 -
Excellence in manufacturing
Environmental Sustainability in Manufacturing
Agenda 23 May 2023

12h45 – 13h15
Welcome by EFFRA and the European Commission
Made in Europe Work Programme(s) 25-27 - where we stand

13h15 – 15h00
- The overall set of proposed priorities (consultation document)
- Proposed priorities from the perspective of excellence in manufacturing
- Proposed priorities from the perspective of environmental sustainability in manufacturing
- Examples of past and ongoing projects
- Introduction to the modalities of the consultation
- Q & A
European Commission & Member States

European Factories of the Future Research Association

Factories of the Future Public Private Partnership
2010-2020

MADE IN EUROPE
2021-2027
European manufacturing industry vision

• “Ensuring competitiveness & sustainability and supporting resilient and adaptive manufacturing ecosystems, able to cope with external disturbances and rising environmental and social requirements”

• “Europe to be the leading ‘solution provider’ in production technology, digitalisation, resource efficiency and circular economy implementation.”

• “Europe to be the most attractive region for producing sustainable high-added value goods and services”

Political Focus:
• Resilience of European Industry
• Strategic autonomy of European Industry
• Environmental sustainability of Europe Industry
Made in Europe Partnership story line

- **2009/2010**: FP7
- **2013**: FOF 2020
- **2014**: Factories 4.0 and Beyond
- **2016**: 2020
- **2020**: Present

...
**MiE General objectives**

**Manufacturing competitiveness**  
Leadership & manufacturing excellence, generating new products and new markets

**European Green Deal**  
Circular and climate-neutral manufacturing

**An Economy that Works for People and SMEs**  
Attractive value added manufacturing jobs

**A Europe Fit for the Digital Age**  
Digital transformation of manufacturing industry, trusted and robust

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**MiE Specific Objectives**

- **Excellent, responsive and smart factories & supply chains**
- **Circular products & Climate-neutral manufacturing**
- **New integrated business, product-service and production approaches; new use models**
- **Human-centered and human-driven manufacturing innovation**

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**MiE Key Technologies and Enablers**

- Advanced smart material and product processing technologies, and process chains
- Smart mechatronic systems, devices and components
- Intelligent and autonomous handling, robotics, assembly and logistic technologies
- De-manufacturing, recycling technologies, and life-cycle analysis approaches
- Simulation and modelling (digital twins) covering the material processing level up to manufacturing system, and factory and value network level from design until recycling.
- Robust and secure industrial real-time communication technologies, and distributed control architectures and standardized equipment protocols
- Data analytics, artificial intelligence, machine learning and deployment of digital platforms for data management and sharing
- New business and new organisational approaches, including links with regulatory aspects such as safety, data ownership, and liability
- Skilled workforce
- Standards
Call 2021

CL4-2021-TT-01-01: AI enhanced robotics system for smart manufacturing (IA)

CL4-2021-TT-01-02: Zero-defect manufacturing towards zero-waste (IA)

CL4-2021-TT-01-03: Laser-based technologies for green manufacturing (RIA)

CL4-2021-TT-01-05: Manufacturing technologies for bio-based materials (RIA)

CL4-2021-TT-01-07: Artificial Intelligence for sustainable, agile manufacturing (IA)

CL4-2021-TT-01-08: Data-driven Distributed Industrial Environments (IA)

Call 2022

CL4-2022-TT-01-01: Rapid reconfigurable production process chains (IA)

CL4-2022-TT-01-02: Products with complex functional surfaces (RIA)

CL4-2022-TT-01-03: Excellence in distributed control and modular manufacturing (RIA)

CL4-2022-TT-01-04: Intelligent work piece handling in a full production line (RIA)

CL4-2022-TT-01-06: ICT Innovation for Manufacturing Sustainability in SMEs (I4MS2) (IA)

CL4-2022-TT-01-07: Digital tools to support the engineering of a Circular Economy (RIA)
Call 2023

CL4-2023-TT-01-02: High-precision OR complex product manufacturing – potentially including the use of photonics

CL4-2023-TT-01-04: Factory-level and value chain approaches for remanufacturing

CL4-2023-TT-01-07: Achieving resiliency in value networks through modelling and Manufacturing as a Service

CL4-2023-TT-01-08: Foresight and technology transfer for Manufacturing As A Service

Call 2024

CL4-2024-TT-01-01: Bio-intelligent manufacturing industries

CL4-2024-TT-01-03: Manufacturing as a Service: Technologies for customised, flexible, and decentralised production on demand

CL4-2024-TT-01-05: Technologies/solutions to support circularity for manufacturing
Portfolio analysis - allocation of MiE call topics to SRIA R&I Objectives

Specific Objective 1: Excellent, responsive and smart factories & supply chains
- R&I Objective 1.1: Data 'highways' and data spaces in support of smart factories in dynamic value networks
- R&I Objective 1.2: Scalable, reconfigurable and flexible first-time right manufacturing
- R&I Objective 1.3: Zero-defect and zero-downtime high-precision manufacturing, including predictive quality and non-destructive inspection methods
- R&I Objective 1.4: Artificial intelligence for productive, excellent, robust and agile manufacturing chains - Predictive manufacturing capabilities & logistics of the future
- R&I Objective 1.5: Advanced Manufacturing processes for smart and complex products
- R&I Objective 1.6: Manufacturing for miniaturization and functional integration

Specific Objective 2: Circular products & Climate-neutral manufacturing
- R&I Objective 2.1: Ultra-efficient, low energy and carbon-neutral manufacturing
- R&I Objective 2.2: De-manufacturing, re-manufacturing and recycling technologies for circular economy
- R&I Objective 2.3: Manufacturing with new and substitute materials
- R&I Objective 2.4: Virtual end-to-end lifecycle engineering and manufacturing from product to production lines, factories, and networks
- R&I Objective 2.5: Digital platforms and data management for circular product and production-systems life-cycles

Specific Objective 3: New integrated business, product-service and production approaches; new use models
- R&I Objective 3.1: Collaborative product-service engineering for customer driven manufacturing value networks
- R&I Objective 3.2: Manufacturing processes and approaches near to customers or consumers (including urban manufacturing)
- R&I Objective 3.3: Transparency, trust and data & IP integrity, open systems and cyber security along the product and manufacturing lifecycle

Specific Objective 4: Human-centered and human-driven manufacturing innovation
- R&I Objective 4.1: Digital platforms and engineering tools supporting creativity and productivity of manufacturing development
- R&I Objective 4.2: Improving human device interaction using augmented and virtual reality and digital twins
- R&I Objective 4.3: Human & technology complementarity and excellence in manufacturing
- R&I Objective 4.4: Manufacturing Innovation and change management
- R&I Objective 4.5: Technology validation and migration paths towards industrial deployment of advanced manufacturing technologies by SMEs
Made in Europe and inclusive productivity: doing better (creating more added value) with less

- Excellent productive and flexible Manufacturing automation for open strategic autonomy
- Sustainable value network resilience and competitiveness through robust and flexible production technologies
- Recovering and preserving the European leadership in strategic and high value-added products
- Circular, connected manufacturing ecosystems
- The next level of circular economy through scalable, highly productive and zero-defect remanufacturing technologies
- Manufacturing with new/ limited raw materials availability
- Solutions for energy-efficiency for realising net-zero discrete manufacturing processes and value chains
- Quick response service deployment for maintaining optimal manufacturing operations using trusted AI and digital twins
- Life-cycle management of manufacturing solutions and associated services for flexible, productive and sustainable manufacturing industry
- Data spaces and cloud/edge solutions for responsive and robust manufacturing
- Digitally enabled compliance and integration of innovative manufacturing solutions
- Understanding the transformation of the factory work and organisation
- Physical and cognitive augmentation of human capabilities for inclusive and socially sustainable manufacturing
- Digitally enabled upskilling, qualification and job transformation
- Bio-intelligent Manufacturing
Made in Europe and inclusive productivity: doing better (creating more added value) with less

- **Excellent productive and flexible** Manufacturing automation for open strategic autonomy
- **Sustainable value network resilience and competitiveness** through robust and flexible production technologies
- Recovering and preserving the European leadership in strategic and high value-added products
- **Circular, connected** manufacturing ecosystems
- The next level of circular economy through scalable, highly productive and zero-defect re-manufacturing technologies
- Manufacturing with new/ limited raw materials availability
- Solutions for **energy-efficiency** for realising net-zero discrete manufacturing processes and value chains
- Quick response service deployment for maintaining optimal manufacturing operations using trusted AI and digital twins
- Life-cycle solution of products, production technologies and industry
- Data space and response to reduce energy consumption
- Digitally enabled devices of innovation
- Understanding the transformation of the factory work and organisation
- Physical and cognitive augmentation of human capabilities for inclusive and socially sustainable manufacturing
- Digitally enabled upskilling, qualification and job transformation

**MiE Specific Objectives**

- Excellent, responsive and smart factories & supply chains
- Circular products & Climate-neutral manufacturing
- New integrated business, product-service and production approaches; new use models
- Human-centered and human-driven manufacturing innovation
Made in Europe and inclusive productivity: doing better (creating more added value) with less

- Excellent productive and flexible Manufacturing automation for open strategic autonomy
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- Solutions for energy-efficiency for realising net-zero discrete manufacturing processes and value chains
- Bio-intelligent Manufacturing

- Quick response service deployment for maintaining optimal manufacturing operations using trusted AI and digital twins
- Life-cycle solutions for product and industry resilience through robust and flexible production technologies
- Recovering and preserving the European leadership in strategic and high value-added products
- Circular, connected manufacturing ecosystems
- The next level of circular economy through scalable, highly productive and zero-defect re-manufacturing technologies
- Manufacturing with new/ limited raw materials availability
- Solutions for energy-efficiency for realising net-zero discrete manufacturing processes and value chains

**MiE Specific Objectives**

- **Excellent, responsive and smart factories & supply chains**
- **Circular products & Climate-neutral manufacturing**
- **New integrated business, product-service and production approaches; new use models**
- **Human-centered and human-driven manufacturing innovation**
- **Digitally enabled upskilling, qualification and job transformation**
Questions?
Examples of relevant past/ongoing projects

**HORIZON-CL4-2021-TWIN-TRANSITION-01-08: Data-driven Distributed Industrial Environments (IA)**
### Examples of relevant past/ongoing projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Title</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I4Q</strong></td>
<td>Industrial Data Services for Quality Control in Smart Manufacturing</td>
<td>01-01-2021</td>
<td>31-12-2023</td>
</tr>
<tr>
<td><strong>InterQ</strong></td>
<td>Interlinked Process, Product and Data Quality framework for Zero-Defects Manufacturing</td>
<td>01-11-2020</td>
<td>31-10-2023</td>
</tr>
<tr>
<td><strong>DATA.ZERO</strong></td>
<td>Data Reliability and Digitally-enhanced Quality Management for Zero Defect Manufacturing in Smart Factories and Ecosystems</td>
<td>01-10-2020</td>
<td>31-03-2024</td>
</tr>
<tr>
<td><strong>OPTIMAI</strong></td>
<td>Optimizing Manufacturing Processes through Artificial Intelligence and Virtualization</td>
<td>01-01-2021</td>
<td>31-12-2023</td>
</tr>
</tbody>
</table>

**DT-FOF-11-2020 Quality control in smart manufacturing (IA)**
Examples of relevant past/ongoing projects

**DT-ICT-07-2018-2019**

**Digital Manufacturing Platforms for Connected Smart Factories**

- **EFFP** (European Factory Platform) | European Connected Factory Platform for Agile Manufacturing
  - Date: 01-01-2019 - 31-12-2022
  - Comments: 39 | Views: 5

- **QUALITY** | Digital Reality in Zero Defect Manufacturing
  - Date: 01-01-2019 - 31-07-2022
  - Comments: 77 | Views: 15

- **ZDMP** | Zero Defect Manufacturing Platform
  - Date: 01-01-2019 - 30-06-2023
  - Comments: 89 | Views: 10

- **KYKLOS 4.0** | An Advanced Circular and Agile Manufacturing Ecosystem based on rapid reconfigurable manufacturing process and individualized consumer preferences
  - Date: 01-01-2020 - 31-12-2023
  - Comments: 33 | Views: 7

- **DigiPrime** | Digital Platform for Circular Economy in Cross-sectorial Sustainable Value Networks
  - Date: 01-01-2020 - 31-12-2023
  - Comments: 20 | Views: 3

- **SHOP4CF** | Smart Human Oriented Platform for Connected Factories
  - Date: 01-01-2020 - 31-12-2023
  - Comments: 32 | Views: 4

- **ConnectedFactories 2** | Global-leading smart manufacturing through digital platforms, cross-cutting factors and skilled workforce
  - Date: 01-12-2019 - 30-11-2022
  - Comments: 23

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**MADE IN EUROPE**

**EFFR**

EUROPEAN FUND FOR RESEARCH AND INNOVATION
<table>
<thead>
<tr>
<th>Project Title</th>
<th>Description</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIAA</td>
<td>Lean Intelligent Assembly Automation</td>
<td></td>
<td>02-09-2013</td>
</tr>
<tr>
<td>AMBLUE</td>
<td>Adaptive Automation in Assembly For BLUE collar workers satisfaction in Evolvable context</td>
<td></td>
<td>01-09-2016</td>
</tr>
<tr>
<td>A4BLUE</td>
<td>Wireless Autonomous, Reliable and Resilient Production Operation Architecture for Cognitive Manufacturing</td>
<td></td>
<td>01-10-2016</td>
</tr>
<tr>
<td>SatisFactory</td>
<td>A collaborative and augmented-enabled ecosystem for increasing SATISfaction and working experience in smart FACTORY environments</td>
<td></td>
<td>01-01-2015</td>
</tr>
<tr>
<td>INCLUSIVE</td>
<td>Smart and adaptive interfaces for INCLUSIVE work environment</td>
<td></td>
<td>01-10-2016</td>
</tr>
<tr>
<td>COMPOSITION</td>
<td>Ecosystem for Collaborative Manufacturing Processes, Intra- and Interfactory Integration and Automation</td>
<td></td>
<td>01-09-2016</td>
</tr>
<tr>
<td>Daedalus</td>
<td>Distributed control and simulation platform to support an Ecosystem of Digital Automation developers</td>
<td></td>
<td>01-10-2016</td>
</tr>
<tr>
<td>AREUS</td>
<td>Automation and Robotics for European Sustainable manufacturing</td>
<td></td>
<td>01-09-2013</td>
</tr>
<tr>
<td>FACTORY-ECOMATION</td>
<td>Factory ECO-friendly and energy efficient technologies and adaptive autoMATION solutions</td>
<td></td>
<td>01-10-2012</td>
</tr>
<tr>
<td>Factory2Fit</td>
<td>Empowering and participatory adaptation of factory automation to fit for workers</td>
<td></td>
<td>01-10-2016</td>
</tr>
<tr>
<td>SCALABLE4.0</td>
<td>Scalable automation for flexible production systems</td>
<td></td>
<td>01-01-2017</td>
</tr>
<tr>
<td>HUMAN</td>
<td>HUMAN MANufacturing</td>
<td></td>
<td>01-10-2016</td>
</tr>
<tr>
<td>MANUWORK</td>
<td>Balancing Human and Automation Levels for the Manufacturing Workplaces of the Future</td>
<td></td>
<td>01-10-2016</td>
</tr>
</tbody>
</table>
### Examples of relevant past/ongoing projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
<th>Duration</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circular TwAIn</td>
<td>AI Platform for Integrated Sustainable and Circular Manufacturing</td>
<td>01-07-2022 - 30-06-2025</td>
<td>3</td>
</tr>
<tr>
<td>AIDEAS</td>
<td>AI Driven Industrial Equipment product life cycle boosting Agility, Sustainability and resilience</td>
<td>01-10-2022 - 30-09-2025</td>
<td></td>
</tr>
</tbody>
</table>

**HORIZON-CL4-2021-TWIN-TRANSITION-01-07: Artificial Intelligence for sustainable, agile manufacturing (IA)**
Examples of relevant past/ongoing projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Start Date - End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALICIA</td>
<td>Assembly Lines in C irculAtion – smart digital tools for the sustainable, human-centric and resilient use of production resources</td>
<td>01-01-2023 - 31-12-2025</td>
</tr>
<tr>
<td>DiCiM</td>
<td>Digitalised Value Management for Unlocking the potential of the Circular Manufacturing Systems with integrated digital solutions</td>
<td>01-01-2023 - 31-12-2026</td>
</tr>
<tr>
<td>AUTO-TWIN</td>
<td>Data-driven method based on a process mining approach for Automated Digital Twin generation, operations, and maintenance in circular value chains</td>
<td>01-12-2022 - 30-11-2025</td>
</tr>
<tr>
<td>CIRC-UTS</td>
<td>Circular Integration of independent Reverse supply Chains for the smart reUse of Industrially relevant Semiconductors</td>
<td>01-01-2023 - 31-12-2025</td>
</tr>
<tr>
<td>DaCapo</td>
<td>Digital assets and tools for Circular value chains and manufacturing products</td>
<td>01-01-2023 - 30-06-2026</td>
</tr>
</tbody>
</table>

**HORIZON-CL4-2022-TWIN-TRANSITION-01-07**: Digital tools to support the engineering of a Circular Economy (RIA)
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMBIANCE</td>
<td>Advanced Manufacturing of Bio-Based Products for Urban outdoor applications through innovative characterization, digital technologies and circular approach</td>
<td>01-06-2022</td>
<td>31-05-2026</td>
</tr>
<tr>
<td>NewWave</td>
<td>Building a sustainable &amp; circular economy through innovative, bio-based manufacturing lines</td>
<td>01-04-2022</td>
<td>31-03-2026</td>
</tr>
<tr>
<td>BIO-UPTAKE</td>
<td>BIOcomposites in smart plastic transformation processes to pave the way for the large-scale UPTAKE of sustainable bio-based products</td>
<td>01-12-2022</td>
<td>31-05-2026</td>
</tr>
<tr>
<td>VITAL</td>
<td>InnoVative processing Technologies for bio-based foAmed thermopLastics</td>
<td>01-06-2022</td>
<td>31-05-2025</td>
</tr>
<tr>
<td>GREEN-LOOP</td>
<td>Sustainable manufacture systems towards novel bio-based materials</td>
<td>01-09-2022</td>
<td>31-08-2025</td>
</tr>
</tbody>
</table>

**HORIZON-CL4-2021-TWIN-TRANSITION-01-05: Manufacturing technologies for bio-based materials (RIA)**
Have a look at the Data Space Pathway Introduction Video here below!

(We recommend viewing in HD. Click on YouTube or click here to view on YouTube)

Also check out the Digital Platforms Use Cases Video, showcasing the step stones to implementing Data Spaces in Manufacturing.

www.connectedfactories.eu
https://portal.effra.eu
For DENiM it is about defining the pathway for energy efficiency using digital technologies
For DENiM it is about defining the pathway for energy efficiency using digital technologies

[Diagram showing the pathway for energy efficiency through digitisation]
https://denim-fof.eu/2023/03/15/pathways-to-energy-efficient-manufacturing-through-digitisation/
A Smart Predictive Maintenance Toolbox for drawing lines of car body elements - SPMTcar

CWA 17492:2020 - Predictive control and maintenance of data intensive industrial processes (MONSOON)

Predictive Maintenance demonstrator in lot-size-1 manufacturing furniture domain

ForeSee Cluster - Predictive maintenance technologies for production systems. A roadmap to development and implementation.

Next Generation IoT and Digital Twin Based Fault Diagnosis and Predictive Maintenance

How to contribute to the consultation

The Made in Europe partnership is now operating in full swing. Two calls have been launched and the project proposals associated with them have been evaluated. The development of calls for proposals is now halfway published and three calls remaining.

While this in mind, EFFRA is organizing two online stakeholder webinars to discuss the state of play of the Made in Europe Partnership and present possible focus areas for the next Work Programme 2025-27. These webinars will mark the opening of a consultation, generating an inclusive knowledge sharing approach with stakeholders and the public.

The webinars are:
- Made in Europe Work Programme 2025-27 (Expert/Stakeholder perspective)
- Made in Europe Consultation Work Programme 2025-27 (Project perspective)

The webinars will be held on [date], at [time].

Watch the webinars live on [URL] or subscribe for updates.
Consultation Made in Europe WP 25-27 - Expert/stakeholder perspective

This page concerns the consultation on the Work Programme 25-27 of the Horizon Europe Programme with respect to manufacturing research & innovation, in particular with regard to the Made in Europe Partnership.

More background to this consultation can be found here.

Please note that there is also a consultation where feedback is requested from the perspective of past or ongoing projects (see here).

Via this consultation, you are invited as an experts/stakeholder to comment and rate (in terms of importance) the suggested priorities for the WP 25-27 that are described in this document.

Your prioritisation and comments would address observations such as:

- Which priorities are key for the work programme 25-27? You can express the importance of the priorities by rating them from 0 to 100 in steps of 10.
- Please add comments to explain why a priority matters in order to generate impact on the competitiveness and sustainability of Manufacturing in Europe.
- If the R&I Objectives were only partially addressed in the past, please describe which aspects should be addressed more specifically in the next work programme.

Please also note that:

- For this consultation, your answer to the consultation is publicly available via your profile page on the EFFRA Innovation portal.
- You can edit and refine your input at any time. You just need to save the comments when you edit your response. There is no 'final submission button'.

Access to the consultation:
First, please make sure that you are logged in on the EFFRA Innovation Portal (https://portal.effra.eu).

Consultation Made in Europe WP 25-27 - Projects' perspective

More background to the consultations in preparation of the Made in Europe Partnership can be found here.

This page concerns the track that focusses on obtaining information from the project's perspective.

The guidance regarding the consultation from the expert/stakeholder perspective can be found here.

The suggested priorities for the WP 25-27 that are described in this document have been included in a taxonomy list on the EFFRA Innovation Portal.

Project representatives are requested to provide the following feedback:

- Indicate the priorities to which your project has contributed most. Please only indicate the items that are really relevant (You can use the rating bar to indicate differences in the relevance).
- Please add a comment that explains briefly:
  - what the project has contributed essentially
  - which future developments are in particular necessary, drawing from the (expected) outcome of your project

Please note that the information that is provided by the projects is made publicly available via the respective project pages on the EFFRA Innovation Portal. Also, you can add and edit feedback in several steps. The list and editing permissions will stay available.

If you wish to include and promote other projects (also national and regional projects) on the EFFRA Innovation Portal, then please let us know.

Please see the screenshot of a project page here below - the edit buttons are only available to these users that have editing permissions on the project.
Contribute via your profile or via your project
Agenda 23 May 2023

12h45 – 13h15
Welcome by EFFRA and the European Commission
Made in Europe Work Programme(s) 25-27 - where we stand

13h15 – 15h00
• The overall set of proposed priorities (consultation document)
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• Proposed priorities from the perspective of environmental sustainability in manufacturing
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• Introduction to the modalities of the consultation
• Q & A
THANK YOU

Contact:
info@effra.eu