

ADRA-e workshop - Impact of AI, Big Data and Robotics on CO2 reduction

29 March 2023

Statements from EFFRA



Partnership Story line



FP7

FOF 2020

Factories 4.0 and Beyond



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

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**

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**

Challenges to the use of AI

- Availability and quality of data
- Return of investment not always clear and immediate
- Integration in legacy enterprise systems
 - Integration with other technologies and approaches: e.g., security
 - Long life-time of manufacturing infrastructure may slow down the adoption/integration of AI in production
- Questions about regulations and ethics
 - e.g., data sharing agreements, privacy & data protection
- Missing skills/competences at different levels
 - SMEs
 - Heterogeneity of actors in the manufacturing sector.

Requirements

There is a need for

- explanation and traceability of the methods used
- handling of missing data or too small amounts of data;
- development of methods with a very low error rate;
- methods with low configuration and engineering effort.
- intuitive application/use, comprehensible decision making

Incorporation of domain knowledge into the AI approaches
'Demystify' AI for manufacturing

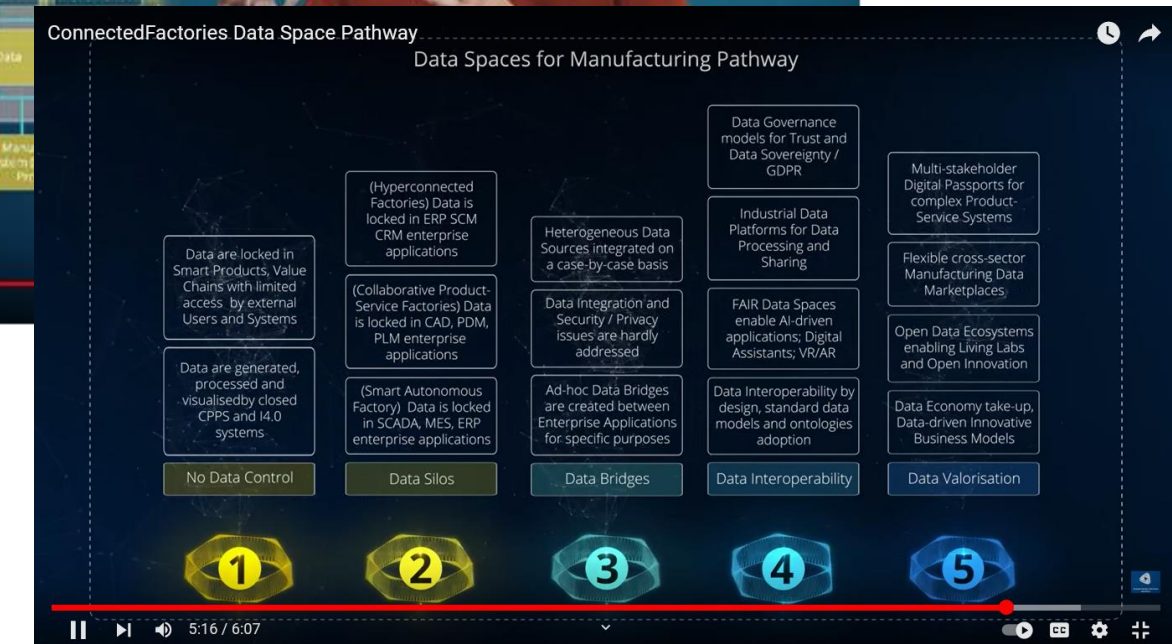
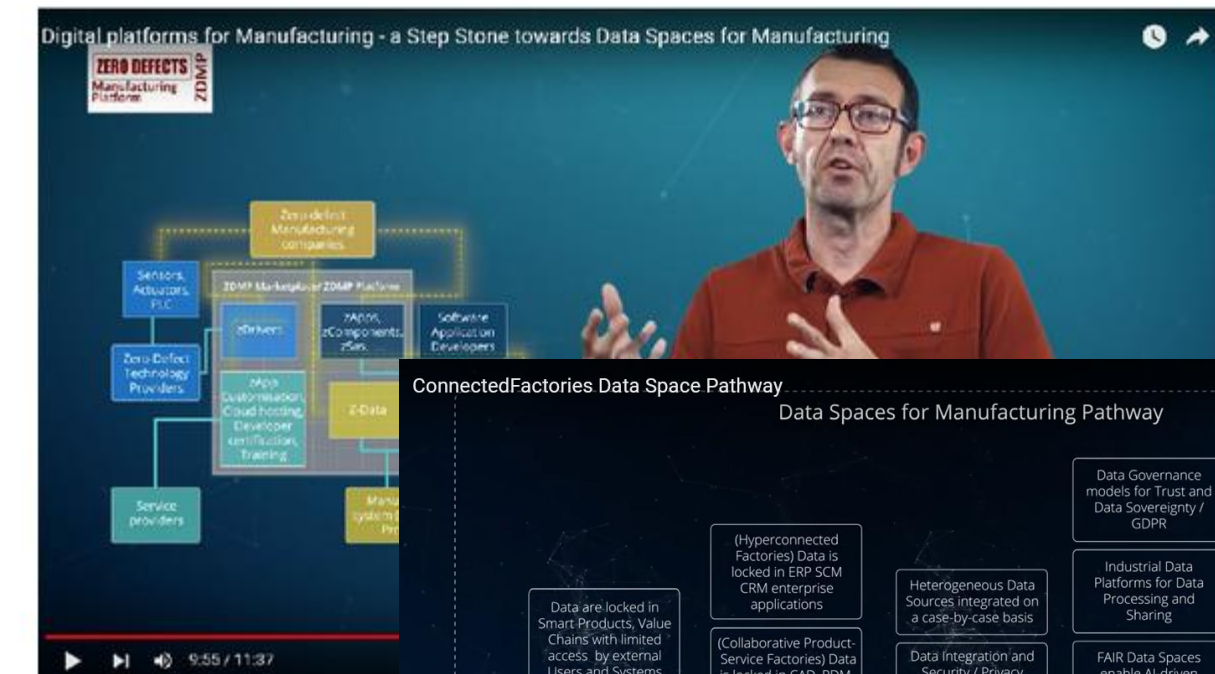
Data Space Pathway

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



Circular Economy for Manufacturing Pathway



DT-FOF-09-2020 Energy-efficient manufacturing system management (IA)

Toggle all information ▲



ECOFACT | ECO-innovative Energy FACTory Management System based on enhanced LCA and LCCA towards resource-efficient manufacturing

01-10-2020 - 30-09-2024

🌱: 17

Show more information ▲

Factories of the Future Partnership - Made in Europe Partnership

H2020 - Factories of the Future

H2020-FoF-2020

DT-FOF-09-2020 Energy-efficient manufacturing system management (IA) ✓ ✎



E2COMATION | Life-cycle optimization of industrial energy efficiency by a distributed control and decision-making automation platform

01-11-2020 - 30-04-2024

🌱: 3

Show more information ▲

Factories of the Future Partnership - Made in Europe Partnership

H2020 - Factories of the Future

H2020-FoF-2020

DT-FOF-09-2020 Energy-efficient manufacturing system management (IA) ✓ ✎



DENiM | Digital intelligence for collaborative Energy management in Manufacturing

01-11-2020 - 31-10-2024

🌱: 10

Show more information ▲

Factories of the Future Partnership - Made in Europe Partnership

H2020 - Factories of the Future

H2020-FoF-2020

DT-FOF-09-2020 Energy-efficient manufacturing system management (IA) ✓ ✎



EnerMan | ENERgy-efficient manufacturing system MANAGEMENT

01-01-2021 - 31-12-2023

🌱: 28 | 👁: 1

Show more information ▲

Factories of the Future Partnership - Made in Europe Partnership

H2020 - Factories of the Future

H2020-FoF-2020

DT-FOF-09-2020 Energy-efficient manufacturing system management (IA) ✓ ✎

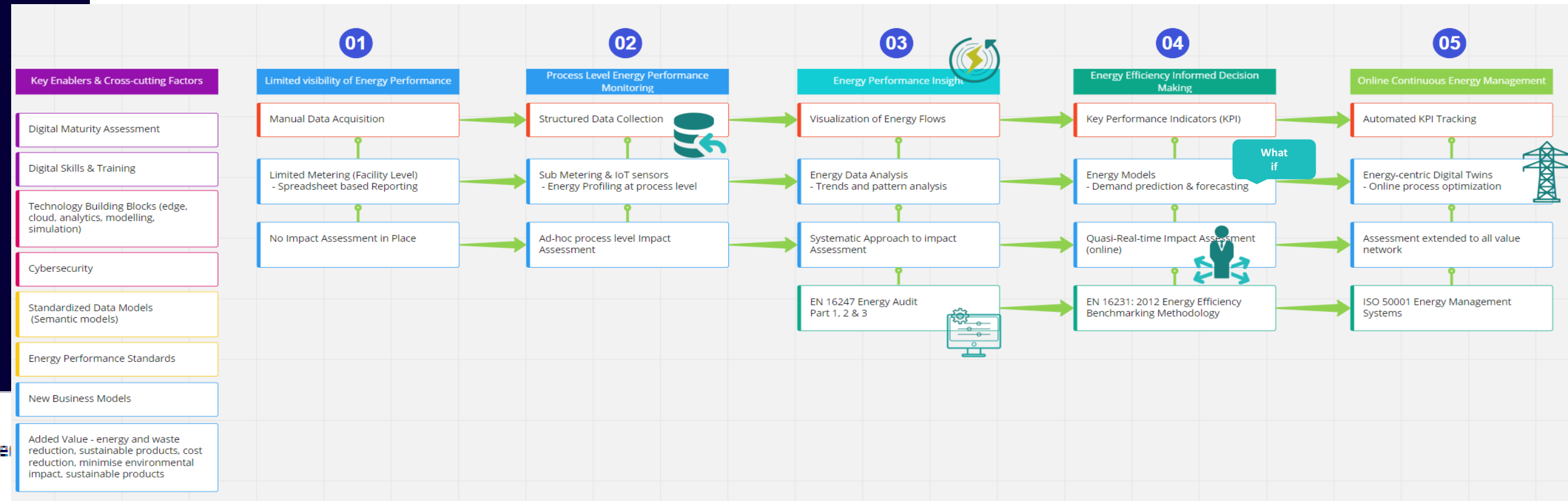
Pathway to Energy Efficiency

Paint a holistic picture of pathways for industry to leverage digital technologies that can enable energy efficient manufacturing.

Facilitation Tip

Add sticky notes with your thoughts on levels.

Cross-industry collaboration is key



01 Limited visibility of Energy Performance

Awareness

Added Value - energy and waste reduction, sustainable products, cost reduction, minimise environmental impact, sustainable products

02 Process Level Energy Performance Monitoring

Sense

<https://denim-fof.eu/2023/03/15/pathways-to-energy-efficient-manufacturing-through-digitisation/>

For DENiM it is about defining the pathway for energy efficiency using digital technologies

03 Energy Performance Insight

Learn

04 Energy Efficiency Informed Decision Making

Act

05 Online Continuous Energy Performance Management

Operate



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

THANK YOU

Contact:
chris.decubber@effra.eu

 @EFFRA_Live

 EFFRA.EU

