

## Partners:



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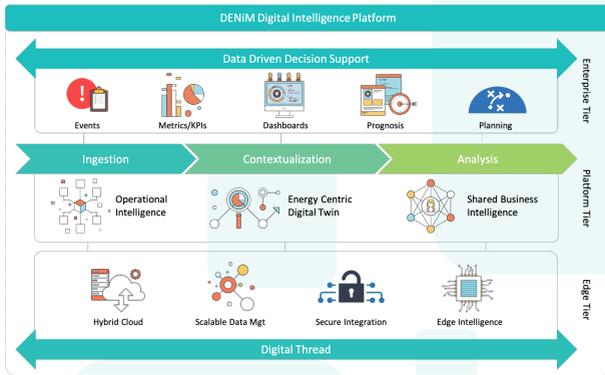
*Unlocking the Energy Saving Potential  
in Manufacturing Systems*



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# DENiM Vision

DENiM project is developing an **integrated toolchain** for the provision of advanced digital services including secure-edge connectivity leveraging the Internet of Things (IoT), **data analytics, digital twin, energy modelling and automation**. This is done by designing a **three tiers platform** supporting **Performance Management in Energy Optimisation**.



## DENiM Platform

The **Edge Tier** supports the **transition** from **real to digital world** through the development of a **hybrid edge/cloud software stack** that provides the backbone for collecting and creating real-time data workflows.

The **Platform Tier** supports the **creation and communication of data and insights on energy performance**, by providing **modelling, optimisation and assessment tools** to create energy-centric, **operational intelligence** based on **LCA and LCCA**.

The **Enterprise Tier** includes digital tools to **support organisation and business processes**, including support tools that leverage the intelligence generated at the platform tier to inform **production planning, support data visualisation and interpretation** through **metrics and energy labelling**.



# Key Objectives



## Enabling Technologies

DENiM will leverage innovative digital technologies to provide advanced services towards energy and cost reduction and sustainability improvement

## Workforce Development

New digital skills will be developed to enable industry to take advantage of digital services and technologies



## Business Practices

DENiM will showcase advanced digital technologies for energy management and will adopt energy related standards

## Best Practice

## Digital Services

Tools and mechanisms will be developed to transform digital data extracted from heterogenous sources into real-time, actionable, energy-centric insights



# DENiM Demonstrators



## Medical Device Manufacturing

**DePuy Synthes** is a medical device manufacturer mindful of their impact on the environment that will leverage on the DENiM technologies to achieve a sustainable production planning & a maximisation of the use of renewable energy.

## Steel Components Manufacturing



**Sidenor** and **CIE Galfor** are two companies pertaining to the same value network in the steelmaking industry, for the automotive sector. DENiM will support the improvement of the current production by addressing the energy-efficient management of the steelmaking and forging processes.



## Plastics Processing

**MET** is a highly dynamic SME focusing on the production of mechanical components for the machinery industry. Acting on its highly variable production process DENiM will support the integration of IoT based solutions for energy management, combining digital twin and energy modelling and optimisation technologies.

## Tools Production For Metal Processing



**Gorenje ORODJARNA** is one of the biggest Slovenian manufacturers of tools for sheet metal processing working with very high energy-intensive processes. DENiM will support the identification of the most promising optimisations in terms of energy usage by extensively integrating digital twins of machining processes for production planning optimisation.