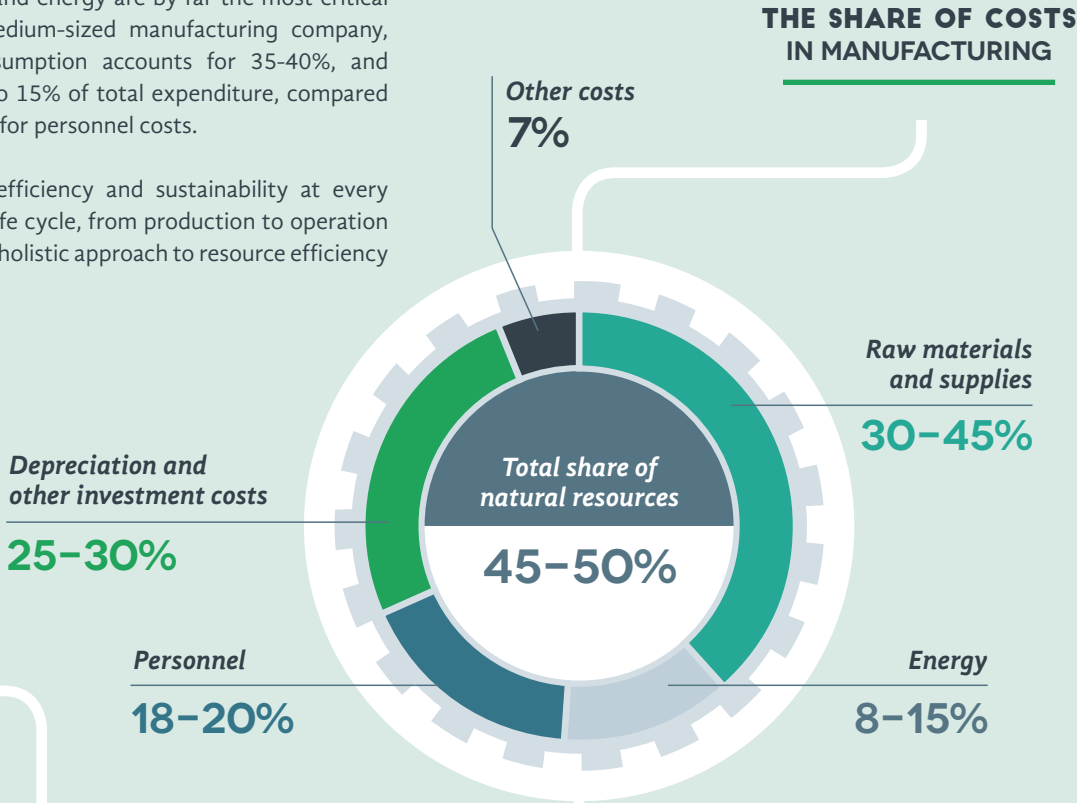


TOWARDS RESOURCE EFFICIENT MANUFACTURING

Growing awareness of climate change and the increasing scarcity and rising prices of natural resources have subjected the use of energy and resources in manufacturing and production to close scrutiny. Manufacturing industries account for a significant part of the world's consumption of resources and generation of waste. Their energy consumption accounts for nearly a third of today's global energy use, and 36% of global carbon dioxide emissions¹. Manufacturing industries nevertheless have the potential to become a driving force for the creation of a sustainable society.

By using fewer resources and optimising their use, businesses can become more environmentally friendly, competitive and profitable. Materials and energy are by far the most critical cost factors in a medium-sized manufacturing company, where material consumption accounts for 35-40%, and energy costs for up to 15% of total expenditure, compared to an average of 20% for personnel costs.

To enable resource efficiency and sustainability at every stage of a product's life cycle, from production to operation and recycling, a more holistic approach to resource efficiency has to be adopted.



¹ (IEA 2007).

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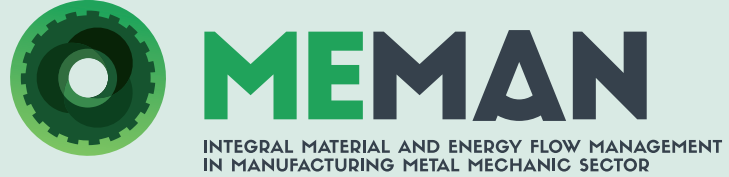
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WWW.MEMAN.EU



MEMAN stands for "Integral Material and Energy Flow MANAGEMENT in MANufacturing metal mechanic sector".
This project has received funding from the European Union's Horizon 2020 Programme under grant agreement no.636926.



UNLOCKING THE RESOURCE SAVING POTENTIAL OF THE METAL MECHANICAL SECTOR



MEMAN - UNLOCKING THE RESOURCE SAVING POTENTIAL OF THE METAL MECHANICAL SECTOR

The MEMAN project will support European companies in the metal mechanical sector in their efforts to maximise their resource saving potential and increase competitiveness. The project is based on an innovative approach that addresses optimisation of whole manufacturing value chain instead of isolated single company or process optimisation, and includes energy, raw materials, supplies and waste.

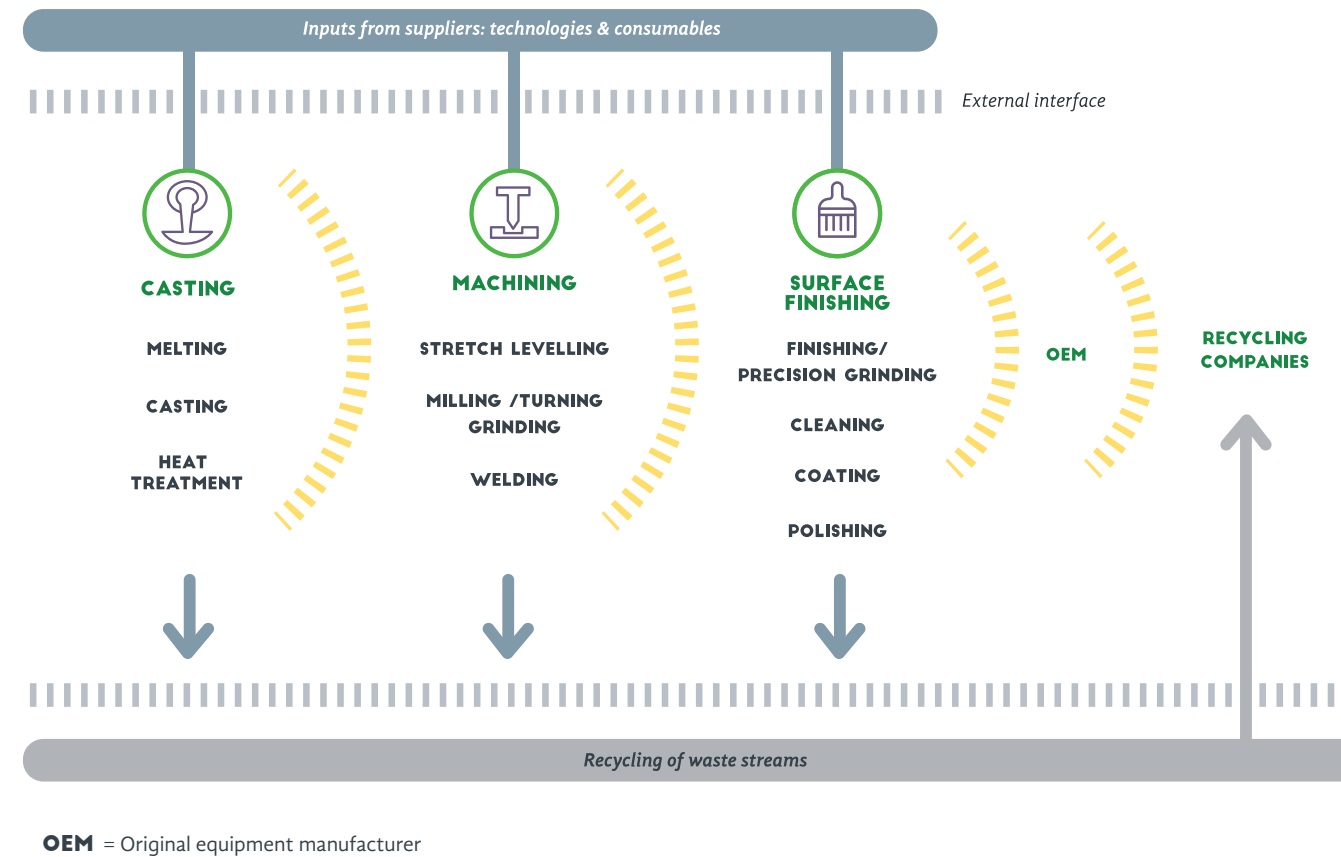
Fourteen partners, including industrial enterprises, SMEs, and experts in eco-innovative business models, will be working on optimising resource efficiency across the complete metal mechanical value chain, from casting through machining to surface finishing. This will be done through the full validation of new business models that allow for collaboration of different companies along the whole value chain, and provide tools for practical decision-making support.

It is expected that the MEMAN project will modify the consumption patterns of the whole metalworking value chain, achieving a reduction of energy consumption and CO₂ emissions of at least 30%, and over 10% of the product Life Cycle Cost of existing and future products. Given the significantly increasing need to limit greenhouse gas emissions, as well as escalating costs of energy resources and raw materials, the project is of strategic importance for the European economy.

THE MEMAN PROJECT AIMS TO MAXIMISE RESOURCE SAVING POTENTIALS OF THE MANUFACTURING INDUSTRY THROUGH INTEGRAL MATERIAL AND ENERGY FLOW MANAGEMENT. MEMAN ADDRESSES THE COMPLETE METAL MECHANICAL VALUE CHAIN FOR WHICH IT DEVELOPS TOOLS FOR PRACTICAL DECISION-MAKING, AND NEW COLLABORATIVE BUSINESS MODELS TO BENEFIT ALL COMPANIES IN THE VALUE CHAIN.

CLUSTERS

The development of approaches for organisational and technological optimisation will be led by three competence clusters: **Casting**, **Machining**, and **Surface Finishing**. The real life demonstration of the resource saving potential will be validated on three concrete examples: a **control arm component** for automotive sector, an **aero-structural and engine components** for aerospace sector and **hydraulic piston rods** for mechanical engineering applications.



CASTING COMPETENCE CLUSTER

Led by **MONDRAGON Corporation** - Entrepreneurial Innovation Cluster, Basque Country, Spain
Partners involved: Loramendi, Fagor Ederlan, Insertec, eiffo, Acciona

The cluster comprises a large number of sectors, including transport (aviation, rail, shipping, automotive), energy, agribusiness, and chemicals. The companies in all sectors directly employ around 34,960 people. Within the framework of the MEMAN project, the cluster will test innovative technological processes of **suspension control**

arm production, making use of light alloys and new design methods. The possibility of manufacturing the part in aluminium will be explored, together with the assessment of the alternative technologies such as new casting, cooling, and heat treatment processes.



MACHINING COMPETENCE CLUSTER

Led by **CETIM** – Technical Centre with Mecanic Vallée - Business cluster, Limousin and Midi-Pyrénées Region, France
Partners involved: MONDRAGON, eiffo, Technofi

Mecanic Vallée is a business and innovation cluster, specialised in aeronautics, spare parts for automotive industry, and machines tools. Uniting 173 members, it represents 87% of employees and constitutes 85% of turnover (€1.85M) in the area. Within the MEMAN project, the cluster will analyse and scrutinise the Product Life Cycle of the **aero-structural**

component and a **jet engine component** for the aerospace sector. Activities will include the assessment of alternative technologies in different process stages, including milling, drilling, boring, and laser cutting, amongst others. The aim is to significantly reduce the time, cost, and energy involved in the production of the components.



SURFACE FINISHING COMPETENCE CLUSTER

Led by **EIFFO** - Industrial Innovation Cluster, Germany - Austria
Partners involved: Stahl Judenburg, CETIM, Mecanic Vallée, THOMA

The cluster, focused on surface technology and finishing, includes over 200 companies and factories. It employs 12,000 people and has an accumulated turnover of about €1.4 bn. The sector is strongly affected by higher resource costs, as energy accounts for 12%, and materials and chemical supplies for 25 – 35 % of total operating costs. The MEMAN project is therefore expected to enable a better re-design

and re-engineering of stainless steel **hydraulic piston rods** and their manufacturing processes. These optimisations will contribute to a substantially increased resource efficiency in the manufacturing of chromium plated products with reduced chromium use and losses, as well as increased chromium recycling and safer handling procedures.