

MTP Theme: Sustainable Manufacturing

GOAL

Main goal is to elaborate relevant actions to increase **resource and energy efficiency** in manufacturing. Efficiency goals shall get broader impact on total-cost-of-ownership models. Machines designed according to efficiency requirements should become a better perspective on the market: even if short-term investment is higher, the savings of energy and material will bring long-term benefit. Building on regional cluster concepts across Europe, this MTP will expand these concepts to consider global perspectives. Mentoring of less developed regions and Internalization beyond Europe's borders (IMS relevant)

Manuela-MTP

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1 Initiative Title:

Manuela-MTP: Manufacturing at Resource Efficient Levels and Above

1.1 R&D Objectives

- To expand to the international level the clustering efforts of four European regions to develop common approaches in order to support the development of high resource-efficient production systems.
- To develop strategies for a better establishing of TCO aspects in investment decisions of the machinery customer on the one but also for a better support of the R&D and manufacturing processes of the machine manufacturer in order to reach a consistent and marketable relationship between investments and savings concerning the consumption of energy and materials
- To expand a EU-centred SWOT analysis to one that considers all participating regions in the identification of weaknesses, challenges, and opportunities that affect all sides of the production process: the manufacture of the machine, its users, and the consumers as well.
- To use suitable dissemination activities in order to stimulate the interest for efficiency aspects in relevant steps of the production of goods

1.2 Overview of the Initiative

The manufacturing sector is one of the most important resource consumers of the modern society. On the one hand it is responsible for the energy and material efficiency of production tools, on the other hand it uses such tools by its own. Facing the first role, the manufacturing sector has to face continuously challenges like shrinking margins, an increasing cost pressure and extensive customization demands. To be competitive the manufacturer of industrial engineering products has to develop individual solutions with respect to flexibility, cost-efficiency, reliability, safety and security.

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Against this resource-efficiency is given often only a low priority concerning the investment decisions of the procurement of new machinery. In the Refitting sector of old machinery also an only low readiness to invest in resource efficiency can be observed, although in nearly every production system many potential sources for repayments could be identified. The reasons for this inadequate low priority are manifold. One the one hand, the purchaser of the machinery is not willing to take account of its total cost of ownership (TCO). In other words: purchasers often show favoritism to a short-term saving of investment over long term savings resulting from energy consumptions. But also the production management is not able or willing to make changes within a “running system”. So the manufacturer of the machinery takes often a high risk regarding the investment in R&D for more resource efficient solutions that are mostly also more expensive for the customer. This dissatisfying situation demands for new strategies in order to overcome the numerous reserves on the way to high resource-efficient production systems with respect to technical reasons and non-technical reasons as well.

1.3 Planned Work, Resources and Timing

MANUELA-MTP has 5 Steps (Workpackages) in the next 3 years with the formation state starting now and its proposed launch beginning 6 months after initiation of the Manuela Project (3/2013). The final goal is to establish a worldwide platform for resource efficient manufacturing. The planned WPs at this time are Formation Phase, SWOT, Roadmapping, Dissemination and Internationalisation.

Formation Phase: In the formulation Phase starting beginning in January 2012 and lasting until about 6 Months after the Start of the Manuela project, the WPs of the MTPs will be more clearly formulated and a search for relevant projects and industrial partners which will bring in their knowledge and share the results elaborated in MANUELA will be conducted.

SWOT: A **SWOT** (Strength-Weaknesses-Opportunities-Threats) analysis will then be carried out to identify the strengths and weakness of the manufacturing technology provision to match the market needs of Manufacturing businesses including SMEs

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including a comparison of Europe with other involved Countries. A **SWOT** charts established for the sector of Resource efficient production will facilitate this consolidation. This Chart and the whole SWOT Analyses will be periodically monitored and (if necessary) updated.

Roadmapping: The Joint Action Plan (JAP) describes the overall strategy to drive sustainable economic development through research and technological development and innovation activities in the identified research fields. The MANUELA JAP will be based on a two-stage-approach. In the first stage, the JAP will be deduced from the evaluation of the results of WP2 and 3 by common workshops. The elaborated Directory of RTD (new materials, resource efficient technology solutions, IT-support especially for the engineering process) and the results from barrier analysis (especially research demands for new findings in the field of non-technology coherences) will determine the key areas to be addressed by JAP and define interregional commonalities and regional specialisation issues to a Research Roadmap. This First stage JAP sets also the framework for the first Financial Plan (FP1) as well as for a long-term dissemination and internationalisation strategy based on the possibilities to integrate other clusters in a “resource efficiency community” which grants sustainable regional, interregional and international platforms for the exchange of experiences and the supply with measures (see WP5). Long term objective is an international exchange platform which enhances the availability of important experiences about the technical and non-technical environment of resource efficiency issues. From that background the RTD activities of business and research cluster actors can be enriched with important support services which facilitates the access especially to private funding for resource efficiency related RTD and innovation.

In this sense the first stage JAP will define objectives and the framework for policy recommendations facing the three different target groups and the different connection factors of manufacturing related resource efficiency issues.

Specific statements of the case and easy comprehensive case studies will be elaborated in order to reach the key stakeholders within the policy making level. This includes

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methods and measures for triple-helix knowledge sharing as a pre-condition for involving local stakeholders as part of the consensus building and dissemination processes around the project. Main objective is to strengthen the comprehension level for a very complex topic which can facilitate implementing the JAP and promoting its objectives. So this task deals not only with the “what” but the “how” of policy recommendations.

Dissemination: A set of dissemination and communication activities will be defined for the duration of the project to address targeted user groups covering all triple-helix actors and all kinds of manufacturing industries. This will include:

- Publications
- Production of project information material (project flyer, and presentations)
- Communication with interested organizations
- Management of participation in relevant scientific conferences and events

Next to the outlined media, the work includes the usage of various communication channels and types of media such as partners’ websites, daily and weekly newspapers, magazines, press releases on latest findings and project progress, scientific journals, conferences, events and workshops, as well as personal contacts and networks. The scientific partners of MANUELA (PRO, FhG-IPA, POLIMI, ManuF, FhG-PCCM) shall focus on disseminating the project into the scientific community through conference presentations, scientific publications and discussions within their networks.

After the start of the project, a project website will be established and properly maintained. This site will provide information on the aim and the current achievements of the MANUELA project and will be the main contact point between the consortium and third parties. Its basic structure will consist of an abstract of the project, information about the project partners, news about the progress in the project implementation, and information about the related events. It will be populated with all the announcements of the project as well as its public deliverables. The updating will be permanent during the whole project lifetime.

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Internationalisation beyond European Borders: The manufacturing sector, and especially its SMEs intending to expand towards global markets, are facing severe obstacles. This is reflected in all related statistics, showing that only one out of ten small enterprises are currently operating beyond European borders. In an intensely antagonistic international market, where SMEs are considered the backbone of economic growth, this may be considered a serious barrier in any attempt toward development.

The cross-border character of the consortium, enumerating several knowledge-driven clusters and high profile Universities/Research Institutes, will capitalize on both, the good practice apparent within the consortium and the implementation of the frontier technological know-how of its R&D performers. This will develop a strong bond between academia and industries and provide the opportunity to create resource-efficient pathways beyond European borders. Strategic alliances to international (non-European) clusters and markets will be generated and nurtured, creating a gateway for domestic manufacturing sectors.

The approach will be based on a series of cross-disciplinary activities, including mentoring of less evolved regions, integration of virtual engineering portals to raise awareness, as well as involvement of intermediary, cross-border cluster support initiatives.

Main steps in this task are:

Identification of relevant international partnerships (cluster, sector and resource efficiency issues): The R&D performers and participating clusters will, in an attempt to create a pathway towards global markets, identify key figures on an international basis. This will include among others the synthesis of alliances to clusters in fast growing markets, like Asia and South America, while emphasizing on the analysis and removal of the existing barriers. Due to the complex nature of the task at hand, the approach is to initially sustain complementary roles between Europe-based enterprises and global partners and evolve these into strong collaborations.

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Development of internationalisation measures according (when indicated integrate partners in pilot-case): The consortium envisions the integration of both European and non-European clusters into an international exchange platform, in order to develop a “resource efficiency community”. This will facilitate the bilateral transfer of unique experiences concerning resource efficiency and sustainable manufacturing.

Based on this exchange platform, the RTD performers and participating cluster, will develop internationalisation measures, to assist enterprises of the European manufacturing sector to adapt to the specific requirements of non-European markets and vice-versa.

Gant Chart:

Task	Year 1				Year 2				Year 3			
Formation Phase												
SWOT												
Roadmapping												
Dissemination												
Internationalisation												

1.4 Participating Regions, Projects involved and Partners

The actual project consortium is made up of four regional groups in Austria, Germany, Italy and Switzerland plus one project partner from Greece. The four regional groups have three partners each. One of them is from industry, one from research and one from administration (triple helix approach). This is the consortium which applies for funding in FP7 Regions.

Project partners are

Participant no.	Participant organisation name (Short name)	Country
1 (Coordinator)	Technology and Innovation Center Steyr GmbH (TIC)	Austria
2	Clusterland Upper Austria GmbH; Mechatronics	Austria

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	Cluster (COG)	
3	Profactor GmbH (PRO)	Austria
4	marecon* management & research (MRC)	Austria
5	Stuttgart Region Economic Development Corporation (WRS)	Germany
6	Virtual Dimension Center Fellbach (VDC)	Germany
7	Fraunhofer Institute for Manufacturing Engineering and Automation (FhG-IPA)	Germany
8	Center for the technological development, energy and competitiveness of Lombard SMEs SpA (CESTEC)	Italy
9	Politecnico di Milano, Department of Mechanical Engineering (POLIMI)	Italy
10	Euroimpresa Legnano - Agenzia di Sviluppo Territoriale (Euroimpresa)	Italy
11	Regional management and planning authority, Region Zürcher Oberland (RZO)	Switzerland
12	Association ManuFuture-CH (ManuF)	Switzerland
13	Automotive Network Switzerland - Autocluster.ch (Auto)	Switzerland
14	Fraunhofer Project Center Coatings in Manufacturing, Center for Research and Technology Hellas (FhG-PCCM)	Greece

European Union: In Austria, Clusterland Upper Austria's Mechatronics Cluster (COG) takes part. The COG bundles more than 330 companies doing business in mechatronics, most of them in manufacturing applications. Furthermore the VPTÖ (Vereinigung zur Förderung der Modernisierung der Produktionstechnologien in Österreich / Association for the Modernization of Manufacturing Technology in Austria) in Steyr / Austria, with 25 members participates. The Virtual Dimension Center (VDC) in Fellbach /Germany is a company network of 70 members working in virtual engineering technologies. Italy's Energy Cluster of euroimpresa consists of more than 80 companies

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from the energy and plant sector. Summing up all above mentioned numbers, a total of more than 500 companies, including ABB, BMW, MAN, SKF, Festo, Magna, Rockwell, Siemens, and many other big and small enterprises takes part through the involved networks.

Switzerland: From Switzerland, the platform Manufacture-CH (36 members) and the Automotive Network Switzerland participate in the project.

1.5 Internationalization and relevance to IMS

MANUELA is based on a consortium of the leading production regions in Central Europe including policy makers, innovation agencies, clusters and leading research institutes in production technologies. All these regions have a broad and international network so that internationalisation in both directions (Input of needs etc. – Output of results), which is very important and easy to do. Leading organisations worldwide (**IMS – International Manufacturing systems**), Inside Europe (Manufacture, EUREKA ProFactoryPlus), in regions outside the regions of the consortium (Karlsruhe, Budapest, UK...) support the MANUELA Proposal and most of them have signed letters of support. This has a very important leverage and leads to a platform of experts (resource efficiency platform).

Also some relevant projects in FP7 (CSAs for Manufacturing) and from the Central Europe Regions Program support the Proposal in FP7. Therefore it is secured that the most important Regions and Countries in Europe are covered.

Nevertheless to establish a worldwide network including as well well developed countries like USA, Korea, Mexico and potentially others is desired and will be done as part of

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1.6 Contact Information

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