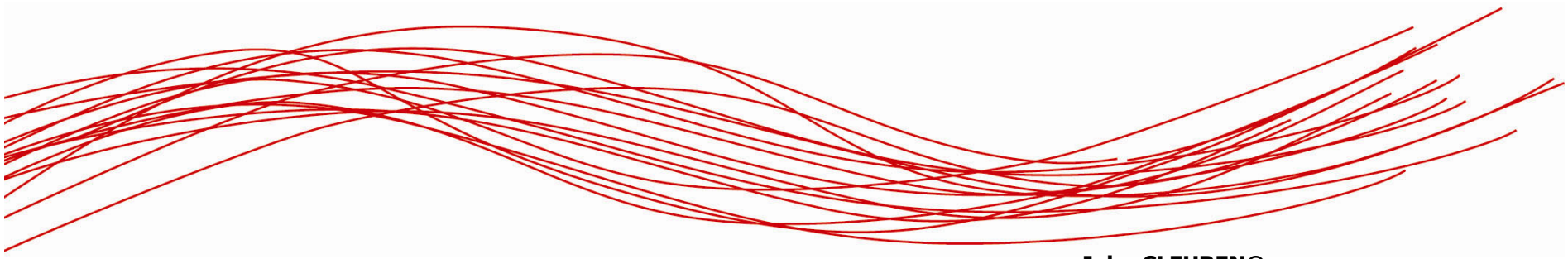
EUROPEAN COMMISSION / European Research Area / 7th Framework Programme

PPP FoF NMP Call Topics in WP 2012



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EUROPEAN COMMISSION
DG for Research and Innovation
Unit G2: New forms of production

Research PPPs Info-Day, Brussels, 11th-12th July 2011

COOPERATION

FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near to-zero emissions in manufacturing processes

Roberta.Salonna@ec.europa.eu

FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment

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FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems

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COOPERATION

FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy

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FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts

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FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level

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FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes

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COOPERATION

FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near-to-zero emissions in manufacturing processes (1/4)

Technical content/scope: One of the cornerstones for a sustainable development of the manufacturing sector lies in achieving high productivity rates while reducing the environmental impacts associated with the manufacturing processes. This challenge can be tackled by designing in an integrated manner adaptive production systems for eco-efficient processes and systems, using the information of sensors and in-process measurement methods. A suitable energy efficiency performance measuring system would help fulfilling customer needs with the minimum possible use of energy and material resources. This control system needs to focus on concepts which facilitate the evaluation, control and improvement of energy efficiency in manufacturing processes. Firstly, an energy performance measurement system at European or global level with suitable and measurable energy Key Performance Indicators (KPIs) has to be developed, utilising new sensors and visual systems for in-process measurement as enablers. Secondly, concepts for evaluating this KPI related information have to be developed, followed by decision support, i.e. which control mechanisms and improvement measures have to be implemented on the basis of this information. With the development of such concepts, factories would know their energy performance in real-time, facilitating more effective business decisions based on accurate and up-to-date information.

COOPERATION

FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near-to-zero emissions in manufacturing processes (2/4)

Technical content/scope: Research activities should address all of the following areas:

- Environment-conscious, life cycle and holistic process-machine approaches, to minimise the overall impact of production systems and to produce added-value products with minimised consumption of resources and process emissions.
- The definition of effective (specific and quantitatively measureable) Energy KPIs as well as the visualisation of these KPIs, together with the development of conceptual frameworks and software to measure and evaluate Energy-KPIs.
- Technologies capable of harvesting and recovering portions of the energy involved in the production processes, both at machine and at a system level, as well as in the plant environment.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

COOPERATION

FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near-to-zero emissions in manufacturing processes (3/4)

Special features: This topic is particularly suitable for collaboration at international level, particularly under the IMS scheme. Project partnerships that include independent organisations from at least three IMS regions are therefore encouraged.

IMS (Intelligent Manufacturing Systems) is an industry-led, global, collaborative research and development programme, started in 1995 as the world's only multilateral collaborative R&D framework: www.ims.org

The current member regions of IMS are the European Union, the United States of America, Korea, Mexico and the EFTA states of Norway and Switzerland.

FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near-to-zero emissions in manufacturing processes (4/4)

Funding Scheme: Large-scale integrated collaborative projects.

Expected impact: An efficient use of material and energy resources along the lifecycle of manufacturing processes will lead to notable reductions in environmental impacts while at the same time a sustainable economic growth and an increased social well-being will be assured. These processes will know their energy performance in real-time, facilitating more effective business decisions and reactions, based on accurate and up-to-date information. In quantified terms, the new generation of production processes and systems of near-to-zero emissions will be expected to lead to the following impacts along their lifecycle:

- At the use stage, reduction above 40% in the consumption of energy resources when compared with conventional manufacturing processes.
- At the use stage, reduction in the process emissions (e.g. chemicals, hazardous materials, dust, air, water, oil) far below the prescriptive limits and standards to almost zero.
- At the end-of-life stage, contribution towards a 100% reuse of machine components in new life cycles.

These quantified impacts will have to be corroborated by appropriate Life Cycle Assessment techniques. Moreover tools and methods developed in this research topic will help end-users become compliant with the new standards EN16001 or ISO50001 for Energy Management Systems. Projects are also expected to generate knowledge of new scientific, technical, economic and social factors to support European policy development and promote the standardisation and definition of eco-labelled processes and products. Finally, projects will have to support EU policies and legislation on eco-design activities in the manufacturing sector.

COOPERATION

FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment (1/4)

Technical content/scope: Maintenance methodologies and approaches based on intelligent data processing techniques are crucial when improving productivity and reducing machine stoppages, but also in order to avoid expensive repair costs. Detection of potential failure and the corresponding corrective maintenance are well established and accomplished, but predictive maintenance derived from a correct failure prediction is not yet a reality.
Intelligent methods for collecting and organising data (e.g. Artificial Intelligence and Data Mining) will provide new concepts of advanced maintenance addressing flexibility, easy integration in production environments and easy to interpret recommendations and results. By combining different sources of process data coming from advanced embedded information devices, the knowledge inferred from production equipment will be reinforced and re-used in the maintenance learning/training process. These techniques will also provide a useful decision making support tool based on optimal planning and scheduling of maintenance operations in order to optimise the energy consumption.

COOPERATION

FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment (2/4)

Technical content/scope: Research activities should address ALL of the following areas:

- Developing R&M (Reliability & Maintainability) design practices/methods (including organisation) to predict and assess the availability of equipment during production already at an early design stage;
- Developing and integrating of advanced and generic embedded information devices designed to capture relevant information, with data pre-processing capabilities (sensors, ambient intelligence devices, RFID tags etc);
- Defining new algorithms and techniques based, for example, on Artificial Intelligence and Data Mining methodologies, in order to provide intelligent data processing and knowledge extraction from information gathered from production equipment and in order to integrate knowledge reuse into production.

FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment (3/4)

Technical content/scope: By improving predictive maintenance, the lifetime of the system and the availability of the whole process will be increased. The detection of unforeseen decline on its operational life cycle, depending on process data and contextual information (operational time, number of stoppages, environmental conditions, etc), will be the key issue in maintenance tasks in order to provide a higher resistance of equipment, leading to improvements in future design of components involved in manufacturing processes.

SMEs

In order to ensure an efficient implementation and maximum impact of SME-related activities, the leading role of SMEs with R&D capacities will be evaluated under the criteria 'Implementation' and 'Impact': the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.

FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment (4/4)

Funding Scheme: SME-targeted collaborative projects.

Expected impact: Manufacturing companies in Europe are investing in new smart and agile maintenance approaches that may increase the lifetime and energy efficiency of the production equipment and reduce maintenance costs. New tools and methodologies for the sustainable maintenance of production equipment should contribute, in particular, to energy consumption management and optimisation tools, reducing energy costs and environmental pollution by a factor of 20%. Moreover, research projects in this field should contribute to their worldwide competitiveness and to the creation of new jobs.

FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems (1/4)

Technical content/scope: '**Plug-and-Produce**' is a coveted feature for the realisation of increasingly **agile manufacturing** systems in a globalised industry that demands **continuous change of processes, products and production volumes**. This feature should allow the automatic configuration and seamless integration of heterogeneous devices in(to) a system. The so-called smart factories are meant to be production sites featuring higher levels of **(cost- and time-) efficiency, productivity and re-configurability**. A successful realisation of this paradigm requests the incorporation of the latest developments in automation, control, mechatronics, ICT technologies, human-machine interaction, optimisation techniques, strategic planning and smart robotics. Moreover, the further integration of any newly developed technologies into the production lines and the industrial environments requires complementary research and innovation efforts.

'Plug-and-Produce' devices allowing the **adaptive connection of automation equipment** would need to focus on concepts and solutions in the fields of advanced agent-oriented software and service-oriented architecture middleware that pave the way for the actualisation of smart factories compliant to the 'plug-and-produce' principles. Some instances of the outcome of the research might be results in configuration modules, communication protocols, discovery -and retrieval of abilities- and negotiation protocols and tools, end-user interfaces.

COOPERATION

FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems (2/4)

Technical content/scope: The incorporation of extensions guaranteeing interoperability and harmonised cooperation among intelligent manufacturing components whilst yielding enhanced fault-tolerance and self-configuration skills at system level shall be welcome. Future smart factories are meant to increasingly comprise, probably heterogeneous, intelligent machine-tools, automation equipment, peripheral devices, robots and actuators, smart sensors and industrial IT systems, including safety-oriented systems.
Research is needed on concepts or solutions for such manufacturing systems that guarantees interoperability. Research should **focus on several of the following areas:**

- **Scalable extension** of the system capabilities through addition of **new components**;
- **Reconfiguration** of the system functionality whenever new components are brought into it;
- **Reuse** of manufacturing equipments on all levels;
- **Migration and transition** of the manufacturing systems **to modern architectures** (e.g. service oriented architectures) with the objective to reduce commissioning effort or ramp-up time);
- **Customisation of products** by flexible manufacturing.

COOPERATION

FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems (3/4)

Technical content/scope: All these features should be enabled in a **seamless and user-friendly** manner such that all the intelligent, but probably heterogeneous, elements in the ensuing system can still successfully operate in a cooperative manner, which exploits the full potential of the installed components in a safe and ergonomically designed working environment.
In order to ensure an efficient implementation and maximum impact of SME-related activities, the **leading role of SMEs with R&D capacities** will be evaluated under the criteria 'Implementation' and 'Impact': the coordinator does not need to be an SME but the participating SMEs should have the decision making power in the project management; and the output should be for the benefit of the participating SMEs and the targeted SME dominated industrial communities.
This topic is complementary to topic FoF-ICT-2011.7.1(b), which deals with large-scale validation of advanced industrial robotics systems.

COOPERATION

FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems (4/4)

Funding Scheme: **SME-targeted** collaborative projects.

Expected impact: Standardisation and developments in 'Plug-and-Produce' should **lessen the commissioning effort and ramp-up time** whilst **enhancing context-awareness, maintainability, modularity, re-usability, safety and versatility** of manufacturing systems. Such capabilities explain the relevance of the subject to SMEs as in addition to the enumerated benefits, 'Plug-and-Produce' should imply big **savings in terms of the expertise required for both customisation and system integration** as well as in time devoted to installation and configuration of new elements. Intelligent manufacturing should help Europe to catch up on **competitiveness** with respect to other major industrial players through the **easy incorporation of latest technology developments** to manufacturing sites. Versatile manufacturing should lead to safe production sites with a large variety of sophisticated products featuring flexible, short cycle-time manufacturing capability.

COOPERATION

FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy (1/4)

Technical content/scope: The current industrial market is characterised by a turbulent and uncertain demand for highly customised products, of a complexity which is in constant increase. Compared to the past, customers require higher quality, faster delivery times, and shorter times between successive generations of products. Moreover, manufacturers nowadays need to reduce investments in production resources over time and sustainability issues impose that machines are able to efficiently and ecologically support the production of new products without being substituted. All this requires high flexibility and permanent adaptation of machines, process equipment and production systems to any changes in products and in process evolution.

The reliability and availability of machines, equipment and production systems are paramount for efficient production. The key goal is to have maximum availability of machinery, producing high-quality parts with almost zero-defects and in-specification materials at highest production rates. As an example, mechatronic strategies based on adaptronic systems or intelligent materials can compensate deviations from initial accuracy requirements detected by the continuous monitoring and control systems.

FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy (2/4)

Technical content/scope: Research activities should focus on new high performance manufacturing technologies in terms of efficiency (volumes, speed, process capability), flexibility, robustness and accuracy based on new system architectures with self-adaptive machine structures and on mechatronic modules, multi-layer controls and highly redundant measurement, sensing and actuator structures. These R&D lines should lead to new equipment, lean and smart machines and production systems which are capable of taking into account tacit knowledge from operators and require less shop-floor space, by means of reduction of peripherals, reduction of system complexity, optimisation of cycles and process planning.
The aim is to allow improvements through successive investments in production equipment using flexible technologies such as modular production units.
Furthermore, the new solutions should bring the integration of the necessary ICT support providing simplification and real user friendliness.

FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy (3/4)

Technical content/scope: In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.
The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value.
Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy (4/4)

Funding Scheme: DEMO-targeted collaborative projects.
Expected impact: An increase in competitiveness and in production flexibility has become a critical aspect for the European manufacturing industries in the changing and uncertain global scenario. For most manufacturing factories, activities such as material handling, scheduling, part or process setup or changeover times still occupy too large a fraction of the total time that parts are 'in process'. In some cases, up to 90% of product manufacturing time represents non-value-added delays. Reducing this wasted throughput time is and will continue to be a major driver for improvement in productivity.
The achievement of more reliable and efficient manufacturing systems (e.g. machine tools, fixtures, cutting tools, process and peripheral equipment), integrating process modelling and part quality prediction, is expected to give rise to benefits such as:

- Reduction of the number of rejected components or products and the amount of raw material used by a factor of 20%;
- Reduction of power consumption, down time of the equipment, and effective required floor space by making it less sensitive to distortion from outside;
- Increased throughput and capability of processes, endurance, tool and equipment life and productivity maintaining repeatability and accuracy by a factor of 20%;
- Reducing volume of scrap/chips/waste and number of finishing operations with a minimal use of additional operating materials, fluids (coolants), additives and substances;
- Minimisation (or even elimination) of the use of services, e.g. air, water, coolants, by a factor of 30%.

COOPERATION

FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts (1/4)

Technical content/scope: Production technologies are clearly advancing towards the **manufacturing of** topologically 3D optimised **parts with complex internal structures** such as conductive or cooling channels/micro reaction chambers and material gradient structures. **Miniaturisation** of products and production appliances and integrated compact systems design will be key issues. **High quality and high performance** (e.g. accuracy tolerances, repeatability) manufacturing, **parts consolidation and simplification, multiple materials and the reduction of manufacturing and assembly costs** must therefore be addressed. In order to ensure efficiency, reliability, robustness and high product quality, novel **in-line monitoring and quality inspection systems**, including non-statistical process control for maximum yield, are needed as well as equipment that can evaluate, in an automated way, the quality properties and their evolution under conditions of use.

FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts (2/4)

Technical content/scope: Research activities related to the micro-parts and micro-topography should focus on some of the following areas, as appropriate:

- **Novel approaches** for 3D micro-parts production, including 3D micro-components **using a wide range of materials** (e.g. metallic alloys, composites, polymers, bio-polymers, ceramics, smart materials) and in **large volume production**;
- New process chains **integrating different process technologies** (e.g. micro-forming, machining by µEDM, Micro Powder Injection Moulding, Micromilling, Stereo Micro Lithography and printing), as well as multitasking machines **integrating multi-process capabilities** in one setup **combining different production technologies**;
- **Tolerance system** for micro parts and micro topography **to evaluate the accuracy** and/or precision which can be the base for **standardisation**;
- Analysis of the **micro-structural behaviour of materials and its interaction with the production process**, together with systems and devices for quality check of the micro-components;
- **Measurement** technologies and equipment (e.g. for micro-parts with high aspect ratio features, 3D-metrology), new **handling, manipulation and fixture** devices and systems.

COOPERATION

FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts (3/4)

Technical content/scope: Projects should also involve research activities related to the development of **new micro-factory and micro-manufacturing concepts and systems** capable to reduce finishing operations which should focus on the following areas, as relevant:

- **Easily configurable assembly lines taking up a small space to assemble and test small parts** (e.g. MEMS, devices, sensors, actuators, micro reactors);
- New generation of modular macro/meso/micro machine tools and fast, accurate and energy efficient robots with **self adaptive and reconfigurable capabilities to implement a portable and easily configurable factory** for manufacturing and assembly of high tech miniaturised devices;

Projects are expected to yield **innovative processes and equipments** for manufacturing of **3D micro-parts/systems** with **increased precision and accuracy** to ensure small tolerances for the products, **high quality standards and enhanced product reliability** and to demonstrate the potential for **high-throughput, cost efficient** manufacturing.

In order to ensure the potential for high-throughput, cost efficient manufacturing (industrial relevance and impact of the research effort), the **active participation of industrial partners**, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover **demonstration activities, including pilot implementations** in industrial settings, and this will be likewise reflected in the evaluation.

COOPERATION

FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts (4/4)

Funding Scheme: **Small** or medium-sized collaborative projects.

Expected impact: The micro-parts manufacturing industry in Europe is becoming increasingly important in terms of production and jobs and the research addressed in this topic should contribute to its competitiveness. The production of 3D micro parts/systems and the structuring of materials at the micro-scale introduce new functionalities that will enable a new generation of products with improved features, create new market opportunities, improve competitiveness and generate new jobs. The projects are expected to **enable industry to realise economically and sustainably the specific functional and technical requirements of new emerging products** in sectors such as medical/surgical, micro reactors, communication and consumer products.

New processes and equipment for micro-parts production should contribute in particular to all of the following objectives:

- Improving the capacity of European manufacturing industry concerning **competitive production of innovative micro-components and devices** (in terms of geometric complexity, high precision, high throughput, low cost and high flexibility) that allow high mix – high volume production;
- **Improving the technological base and the competitiveness of European industry, in particular of those innovation fields which show high economic potential for the use of Micro-technology** (e.g. micro-tooling, bio-medical, high-precision measurement and testing, process control and automation);
- **Reduction of emissions** by at least 30% (e.g. chemicals, hazardous materials, dust, waste) and of the consumption of energy resources when compared with conventional micro-manufacturing processes in line with a **significant cost reduction**.

COOPERATION

FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level (1/4)

Technical content/scope: New product varieties, and high-performance processes, machines and production systems will require new methods and tools for the design of production systems and operation monitoring. Considering the need for production systems to evolve in line with products and processes, new ways to manage initial and ongoing system configurations are needed. Knowledge-based tools supporting production planning should be developed, and simulation methodologies should be introduced in Manufacturing Execution Systems (MES) and on board in machines, integrated with process control. Using the input from sensorial supervision and monitoring and to measure the current demand compared to manufacturing capacity, it will be possible to predict the process and system behaviour and, if necessary, to compensate for deviations from required precision and accuracy or to plan future manufacturing processes.

FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level (2/4)

Technical content/scope: These systems must be smooth (smart and fault-tolerant) in their interaction with human workers. Research activities should address some of the following areas:

- Development of platforms and tools integrated in the information and execution system of factories for non-linear process planning;
- New tools and methodologies that enable robust optimisation of process chains in the design phase in order to achieve first-time-right processes;
- New tools which will allow, by considering local production, the optimisation and monitoring of manufacturing processes seen from a factory perspective, wherever in the world these are performed;
- Design of structures to support processes of human-system interaction, system mediated human-human interaction, and human psycho-social considerations, in developing high reliability, responsive/adaptable systems, with high performance outcomes.

FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level (3/4)

Technical content/scope: Projects should also include an integrated process simulation focused on one or more of the following areas, as appropriate:

- Modelling tools that will allow changes to be made at a design level to both the product and the corresponding manufacturing process in order to maximize the system efficiency.
- Modelling and system knowledge management tools working in an integrated way on different shop-floor levels (process, machine, cell, line and factory).
- Multi-level decision support management systems based on on-time simulation starting from the real current status and on the interaction between the machine and the production system.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact. The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be likewise reflected in the evaluation.

COOPERATION

FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level (4/4)

Funding Scheme: Small or medium-sized collaborative projects.

Expected impact: With the growing importance of manufacturing SMEs within the European economy in terms of GDP and number of jobs, the research addressed in this topic should contribute to their competitiveness and production flexibility. The application of knowledge-based tools for process planning and integrated shop-floor simulation that can be adapted to SME requirements will improve scheduling, process set-up or change-over times, contributing to increased SME competitiveness.

Moreover, projects should contribute to some of the following objectives:

- Reducing consumption of resources by a factor of 40% through the use of energy- and material-efficient processes and machinery, and smart energy management;
- Higher and more stable product and customer service quality through 30% higher process robustness and accuracy;
- 30% higher productivity and reduced cycle times under more reliable and efficient manufacturing conditions.

COOPERATION

FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes (1/4)

Technical content/scope: Manufacturing technologies shall move towards sustainable, low resource consuming, flexible and high performance processes at low cost to ensure competitiveness. The recycling aspect is also a key issue for future manufacturing processes. New process technologies are needed to support casting and forming processes, material removing and additive manufacturing technologies, considering product and process life-cycle impacts as well as the performance requirements for these processes (e.g. tolerances, accuracy, surface quality, robustness, and higher properties). New approaches are demanded for low resource consuming processes and process intensification, integrated with hybrid processes, as well as knowledge-based processes exploiting advanced modelling, simulation and optimisation techniques for processes and equipment.

FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes (2/4)

Technical content/scope: In addition, the European industries are increasingly working with new materials including nano-alloys to take advantage of enhanced functionality, lower weight, lower environmental burden and improved energy efficiency all along the production process. This is needed to achieve a sustainable manufacturing base when moving to high added value products and customised production. New materials pose new challenges for cost efficient and sustainable manufacturing. These new materials include, among others, 'carbon neutral' materials as well as materials for improved product quality, versatility, weight saving and improved behaviour and functionality.

FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes (3/4)

Technical content/scope: In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The proposals should cover both research and demonstration activities. Prototypes and pilot implementations in real industrial settings represent a clear added-value. Whilst there is no lower or upper limit on the requested EU contribution, the target is that proposals allocate around 50% of the total eligible costs of the project (excluding management costs) to demonstration activities and this objective will be taken into account in the evaluation under the criteria S/T Excellence and Impact.

FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes (4/4)

Funding Scheme: DEMO-targeted collaborative projects.

Expected impact: Manufacturing companies are nowadays facing more and more demanding production processes, while they cannot compete with the low labour costs of emerging countries. Thus, research addressed in this topic should contribute to their competitiveness. The development of new casting, material removing and forming manufacturing technologies should contribute to some of the following objectives:

- Have a direct economic impact on innovation and research in manufacturing, for reducing process chains from raw material to finished parts being applicable across many industrial sectors;
- Facilitate the development of cost-effective, safe, capable, affordable and sustainable technology and its incorporation into an industrial environment;
- Increase the efficiency of material use including improved recyclability and of energy consumption in the range of around 20%, depending on the specific technologies;
- Performance and capability of processes with high value added materials and engineered materials for new functionalities of products.

COOPERATION

FP7 Information

EU research:

http://europa.eu/comm/research

Information on the Research PPPs

http://ec.europa.eu/research/industrial_technologies/

Research programmes and projects:

http://cordis.europa.eu/fp7/home_en.html

Thank you for your attention!

COOPERATION