



Eco-Innovation  
REMake

# Resource Efficient Manufacturing

## Policy Recommendations

### A better understanding of resource efficiency

The European Commission has made strong first steps with measures such as the Roadmap for a Resource Efficient Europe and HORIZON 2020, which will contribute to the objective of a sustainable, resource efficient economy, but *more emphasis on integrated optimisation of resource efficiency is needed.*

Resource efficiency is not only a critical environmental issue; it plays a decisive role for manufacturing competitiveness. There are four dimensions to 'resources' – raw materials, energy, supplies and wastes – which are strongly interlinked across the life-cycle of a product, requiring integrated optimisation get optimal results.

Resource efficiency can be improved at **three interlinked levels** of innovation:

1. Resource efficient manufacturing and recycling processes **at single factory level**;
2. **Eco-efficient product design** enabling low resource consumption during product use as well as efficient manufacturing and recycling;
3. Integrated optimisation across the various interfaces (e.g. between factories) of the complex manufacturing **value chains**, including waste recovery and recycling/re-use.

Resource efficiency is not just about energy consumption or critical raw material substitution; it is about the most intelligent way of using all of our natural and residual resources. *Today the different dimensions of resource efficiency are addressed separately, missing the synergies of an integrated approach.*

### Addressing the needs of manufacturing companies

Manufacturing SMEs have been slow to adopt resource efficiency measures, despite the clear environmental and economic advantages that can be achieved. This concerns in particular:

- ◆ A lack of awareness within SME decision-makers on the relevance and opportunities of resource efficiency;
- ◆ Insufficient data such as benchmarking of production processes and alternative technologies, lifecycle data and impacts;
- ◆ Knowledge gaps concerning access to technologies and innovative solutions and between actors;
- ◆ Insufficient incentive to invest in resource efficient technology due to the complexity of integrating new technology into existing processes.

## Focusing European policies and support measures

The following recommendations are for the implementation of resource efficiency at a broader scale.

- ◆ Unclear and conflicting policy signals coming from a lack of coordination and correlation between different EU policies need to be avoided;
- ◆ Better integrate RDI efforts on resource efficiency to avoid fragmentation – it is critical that there is an integrated approach to materials and energy efficiency;
- ◆ Broader dissemination of knowledge and awareness raising are required to reverse current limitations in sharing of up-to-date information on life-cycle impacts;
- ◆ Environmental standards and regulations can be a key driver for resource efficient manufacturing, but need to be better defined, harmonised and implemented at the national level;
- ◆ Regulatory measures must be flexible and not impose restrictions on development and implementation of innovative products and processes;
- ◆ There is an opportunity to build on the Best Available Techniques (BAT) Reference Documents developed by industry sectors in support of the IPPC Directive, which are setting *de facto* standards for technologies and industrial installations;
- ◆ Finally, there is a need for SME-friendly support instruments to implement resource efficient products and processes at a broad scale:
  - A flexible fast-track resource efficiency program for SMEs tackling their diverse needs e.g. through resource efficiency vouchers for technology and business expertise;
  - A specific program for labour qualification on resource efficiency;
  - New financing solutions for more resource efficient equipment;
  - Co-ordinating European and national initiatives, including best practice exchange.

## Research, development and innovation

The European Factories of the Future Research Association has named ‘scarcity of resources’ as one of seven critical trends for manufacturing industries and it is crucial to better understand the potential of resource efficiency through R&D and analysis of materials and energy flows, product properties, waste recovery and recycling methods. Manufacturing SMEs need:

- ◆ Easy-to-handle life-cycle analysis methods adapted to specific sector needs and sector specific performance;
- ◆ Benchmarks for SMEs;
- ◆ Inclusion of life-cycle performance and resource efficiency information in simulation tools, design tools and manufacturing information systems;
- ◆ Integrated optimisation of energy, material efficiency and recycling;
- ◆ Dedicated R&D projects to improve resource efficiency across entire value chains.

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**Zentralverband Oberflächentechnik** (ZVO) is an umbrella organisation of German surface finishing and technology associations representing about 1,200 persons and 500 companies. ZVO co-ordinates and focuses the sector’s activities in environmental, quality and working management as well as in science and technology.

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**Greenovate! Europe** is a European non-for-profit, independent expert group working at EU level in support of eco-innovation processes. Over 500 innovation experts and 2,000 technical experts work together with research and industry to bring green solutions to the market faster and to help traditional industries become more resource efficient.

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