

# LOGISTICS FOR RESOURCES AND RESOURCE MANAGEMENT





## SUSTAINABLE AND EFFICIENT CYCLES

Material and energy efficiency play a more and more important role in the light of decreasing natural resources. The efficient use of resources becomes the important factor of success for the competitiveness of manufacturing enterprises. Besides an economical utilization of resources, consequently closed material cycles are the second essential step in coping with this challenge. Here, Fraunhofer IML provides future-orientated ecological and economic perspectives with efficient logistic concepts, solutions and processes.

### Material flow management

To receive balanced resource budgets, it is increasingly necessary to establish a material-orientated view in addition to the classical, goods-orientated one. Goal of material flow management is to decrease the material throughput, extract hazardous substances for human beings and environment from the economic cycle and also to efficiently return recyclables into this cycle. This development is, last but not least, reflected by both the resource strategy of the European Union and the legislation.

Material flow management takes effect at various levels of political and economic action. This poses a new challenge to both public institutions as well as enterprises.

**Material flow management at a political and administrative level** sets the general framework and urges all attempts promoting a consistent conversion of the recycling management and sustainably leading out pollutants from these cycles. Fraunhofer IML supports political institutions and public administration on issues of optimized material flow systems:

- Waste management concepts at regional and national level
- Development and assessment of recycling strategies (global, national and regional)
- Consulting authorities with the transposition of legal requirements (e.g. EU environmental regulations)

**Material flow management in manufacturing enterprises** means the best possible reduction of pollutant emissions and waste, the optimal utilization of resources plus the increase of energy efficiency. Today most of the enterprises and corporate associations are already able to reduce their resource consumption considerably or to profitably reintegrate their waste and by-products in the supply chains: Therefore, on the one hand resource-efficient technologies are needed and however, on the other hand, new organizational models as well.

Especially in industries where a variety of different resources directly or indirectly form the final product, numerous enterprises are organized in complex supply chains. Fraunhofer IML has set itself the task to conceive concepts at managing resource-efficient and closed cycles in these systems. For enterprises Fraunhofer IML provides:



- Process and material flow optimization
- Cleaner production
- Life cycle assessment
- Concepts for the in-plant resource and waste management
- Studies on resource efficiency
- Potential studies on the future availability of secondary raw materials for both energy generation and material processing

For **waste management enterprises** give priority to maximize the collection rates of recyclable and hazardous materials, guide the material flows to suitable plants (recycling, disposal) and improve the quality of secondary raw materials. Especially relating to closed material cycles the essential challenge is to make resources, received from the »urban mines«, available in the demanded quantity and in equal quality. Since, secondary raw materials from private and industrial waste and remnant collection accure in small quantities and considerably vary in quantity, quality and composition. By making use of an appropriate process technology, suitable logistic processes and new methods recycling and processing enterprises have here to ensure a constant quality.

Fraunhofer IML – together with industrial partners – planned strategies, technologies and processes suitable for these challenges.

### List of services

The services offered by Fraunhofer IML for enterprises of waste and recycling management comprise:

- Methods for a dynamic material flow management
- Collection and reverse logistics concepts
- Logistic concepts for the provision of secondary raw materials
- Logistic concepts for renewable energies, e. g. biomass logistics
- Potential studies and market analyzes
- System selection and tests (container systems, RFID and telematics)

### Benefits

#### Politics and administration

- Conserving natural resources
- Protecting the health of the population
- Long-term recycling safety

#### Producing enterprises

- Savings by efficient utilization of material and energy
- Cost minimization by lower fees and tax
- Reliable fulfillment of legal conditions

#### Waste and recycling management

- Maximal collection and recycling rates for recyclables
- Improvement of marketing opportunities for secondary raw materials by higher or equal quality
- Optimal workload of existing plants and contingents

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