

### 1 DOING MORE WITH LESS

Process industries represent the foremost part of the manufacturing base, **around 20% of the total European manufacturing industry**, which include:

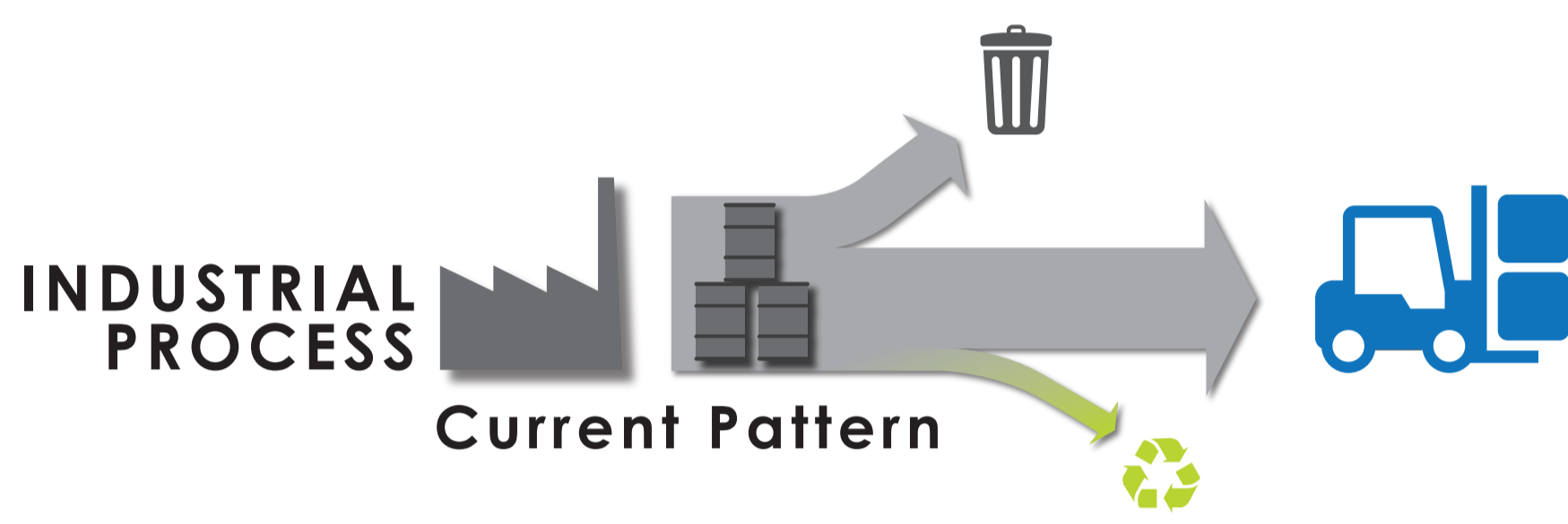
- More than **450,000 individual enterprises** (EU27)
- Employment of around **6.8 million citizens**
- Generation of more than **1,600 billion € turnover**.

Process industries are largely **dependent on resources imports from international markets**. Industry accounted for **more than a quarter of total energy consumption** in 2014 in Europe.

This represents both an **opportunity and responsibility** of this sector contribution to the sustainability challenges of European societies, being imperative to drastically reduce the **environmental footprint** and increase competitiveness and production **systems efficiency**.

### 2 THE GOAL

MAESTRI project aims to advance the **sustainability of European manufacturing and process industries** by providing a management system in the form of a flexible and scalable platform to promote and simplify the implementation of an innovative approach, the **TOTAL EFFICIENCY FRAMEWORK**.



### 3 PROJECT VISION

Manufacturing Industries should **deliver competitively priced goods and services** that satisfy **human needs and bring quality of life**, by finding progressively smarter and finer trade-offs between business and sustainability concerns.

### 5 TOTAL EFFICIENCY FRAMEWORK

The overall aim is to **promote improvement culture within process industries by assisting decision-making process, supporting the development of improvement strategies and helping on the definition of priorities to improve the companies' environmental and economic performance**.

This approach will be based on four main pillars:

1. An effective **Management System** targeted for process and continuous improvement;
2. **Efficiency assessment tools** to define improvement and optimization strategies and support decision making process;
3. Integration with **Industrial Symbiosis** concept addressing material and energy exchange;
4. An **IoT Platform** to simplify the concept implementation and ensure an integrated control of improvement process;

### 6 OBJECTIVES

MAESTRI main objectives:

- Develop a software platform, incorporating the Total Efficiency Management System;
- Demonstrate eco-efficiency decision support methodologies-tools-software and systems in real industrial environments;
- Develop models to identify and simulate appropriate consumption patterns and waste flows;
- Evaluate and manage energy and resource efficiency of industries;
- Investigate and adopt real time metering for energy and resource flows by adopting the Internet of Things (IoT) concept;
- Definition and monitoring of relevant KPIs aiming the identification of potential improvement initiatives and decision support making process;
- Adopt a new industrial symbiosis approach;
- Support the Implementation of SPIRE PPP RoadMap;

**A** Promote and simplify the implementation of the Total Efficiency Framework

**Increase Eco-Efficiency**  
"make more with less"

**B** Identification and assessment of the main inefficiencies in resource and energy consumption

**Increase Efficiency**  
"better use of resources"

**C** Support the decision making process for the implementation of added-value improvements

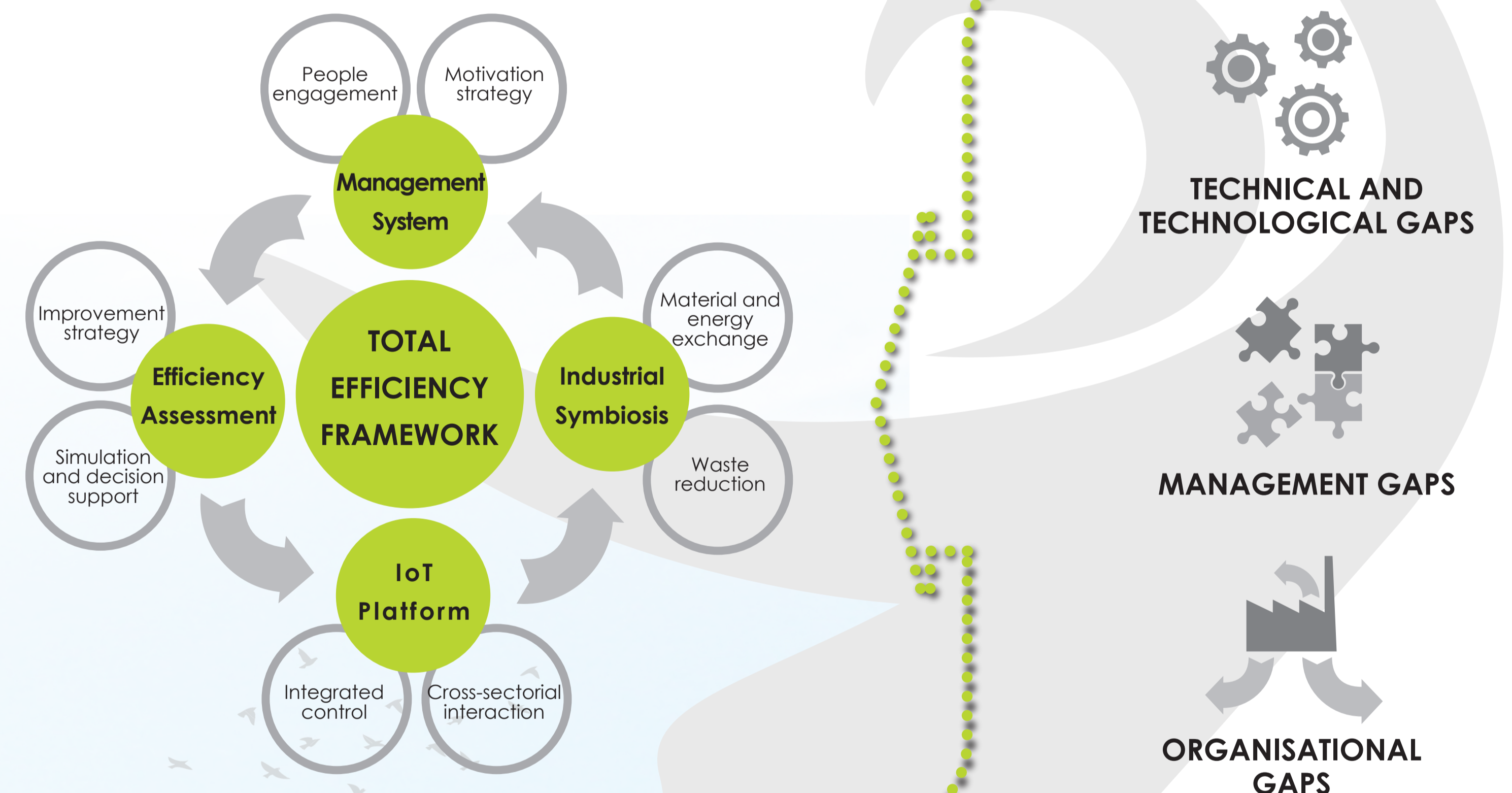
**VALUE CHAIN**

Enhance Cross-sectorial Interaction

**SUSTAINABILITY OF EUROPEAN MANUFACTURING AND PROCESS INDUSTRIES**

### 4 GAPS AND SOLUTIONS

Three main gaps for an effective implementation of energy and resource management were identified. To address these gaps, MAESTRI will be develop an innovative and integrated platform combining holistic **efficiency assessment tools**, a novel **management system** and an innovative approach for **industrial symbiosis** implementation.



### 7 IMPACTS

#### TECHNOLOGICAL

- Highly replicable and flexible solutions because of the software platform's flexibility and scalability;

#### ECONOMIC & SOCIAL

- Strengthen European process industries competitiveness;
- Improve resource efficiency and energy efficiency performance by 20%;
- Reduce energy and resources costs by over 20%;
- Creation of more robust and highly productive organisations and better jobs;

#### ENVIRONMENTAL

- Reduction of process industry environmental footprint;
- Reduction of residues disposed of as waste by maximizing the "waste2resource" ratio via in-plant symbiosis and outside the plant (value-chain symbiosis);