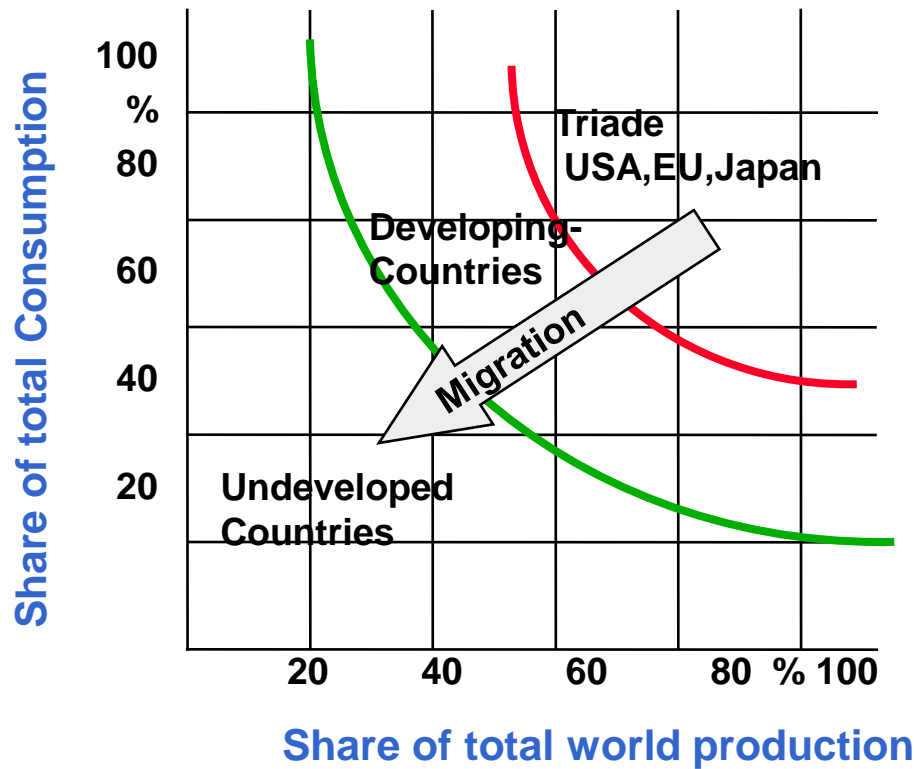

European Manufacturing on Change Manufuture Technology Platform

Engelbert Westkämper

Fraunhofer-Institutes für Produktionstechnik und Automatisierung (IPA)
Fraunhofer-Gesellschaft

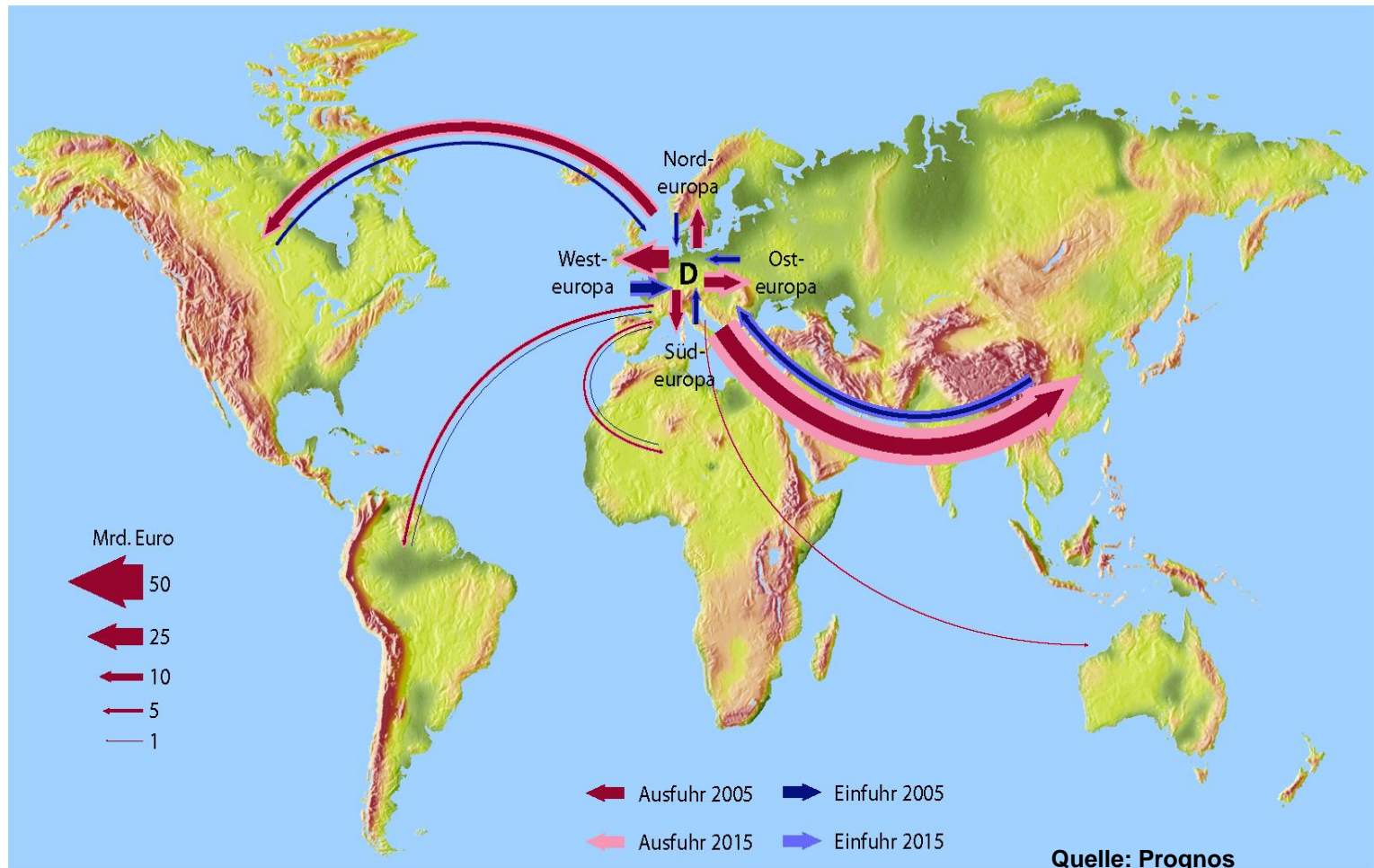


The shift of production and consumption accelerated ...

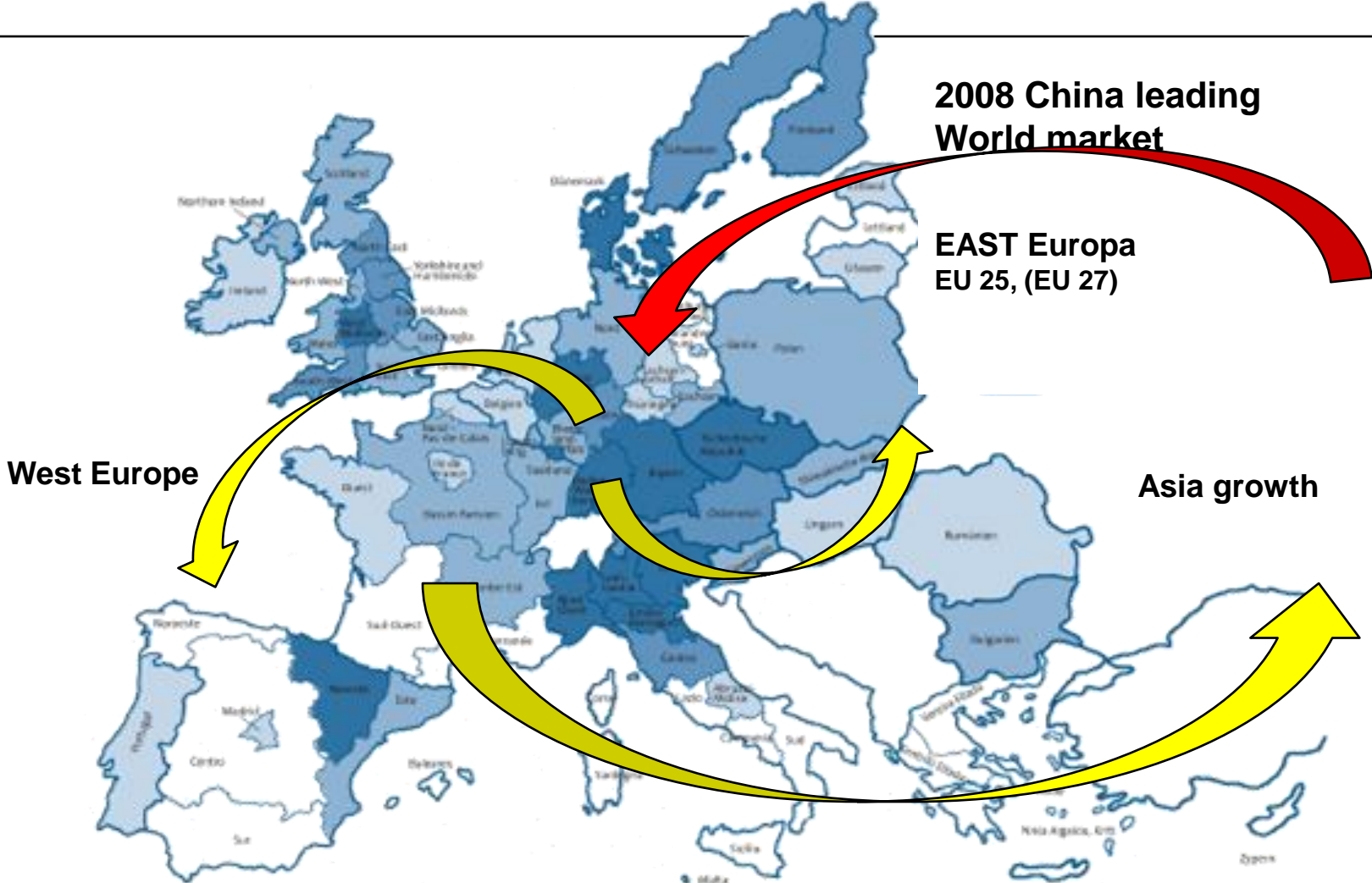


... from here result deficits in employment and innovation

Future Markets are Asia and East of Europe



Migration of Production

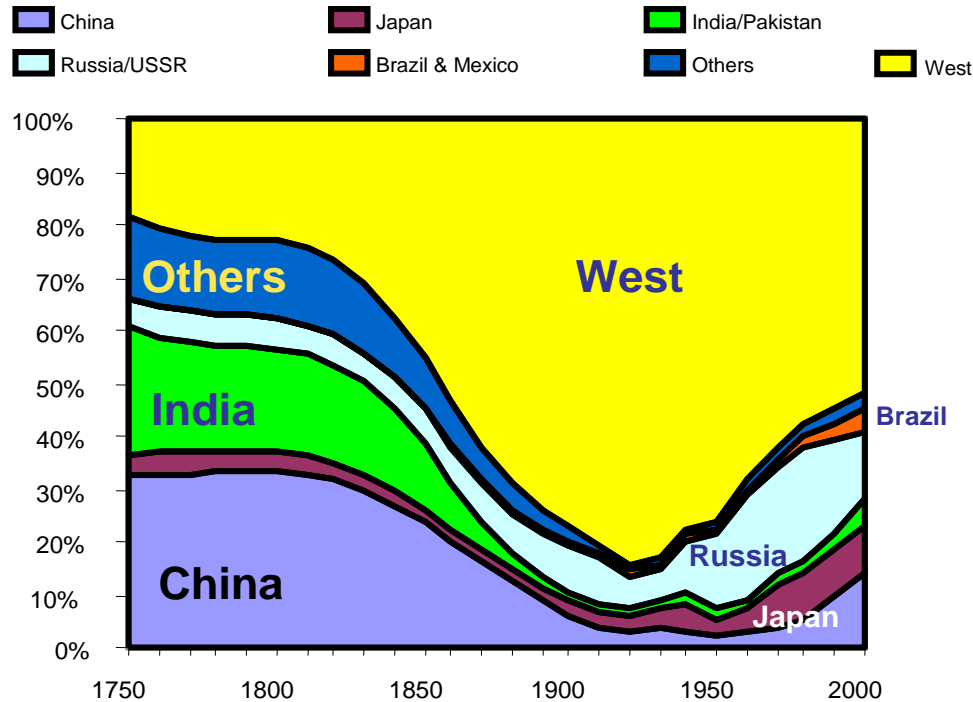


Global Manufacturing - Changings



Contribution to Global Output

Shares of World Manufacturing Output by Civilization or Country, 1750-2000 (in percentages. World=100%)



Source: Mitchell Tseng, CIRP

Manufuture European Technology Platform

Manufuture is an European Initiative to activate research for Innovation in Manufacturing

Based on:

- CIRP generic model
- Vision 2020
- Strategic Research Agenda
- Road Map

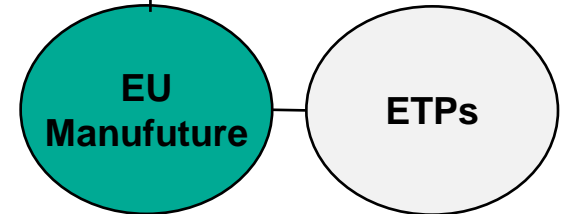
Oriented to:

- knowledge economies
- more and better jobs
- social standards
- Competition
- Sustainability

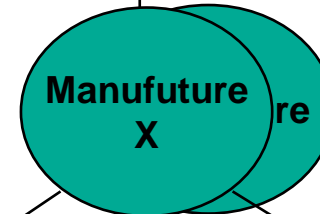
IMS
global



Continents
Manufuture Platform
Subplatforms



Countries
22 National Platforms



Regions
Regional
Cluster



Manufuture Approach

Knowledge-based manufacturing

ManuFuture



Compete by
REDUCING COSTS

Cheap labour,
Automation

MANUFACTURING
Research-Innovation based

European industrial sectors

Compete by
HIGH VALUE ADDED

High performance
Customization
New business models
New human capital



ManuFuture Model

Changing Paradigms of Manufacturing

From....

- cost, economic
- cheap labor
- Quality
- Taylorism
-

Enterprises
Management

to...

- High Adding Value
 - Competition
 - Sustainability
 - Innovation
- in the Knowledge
Economy and Society

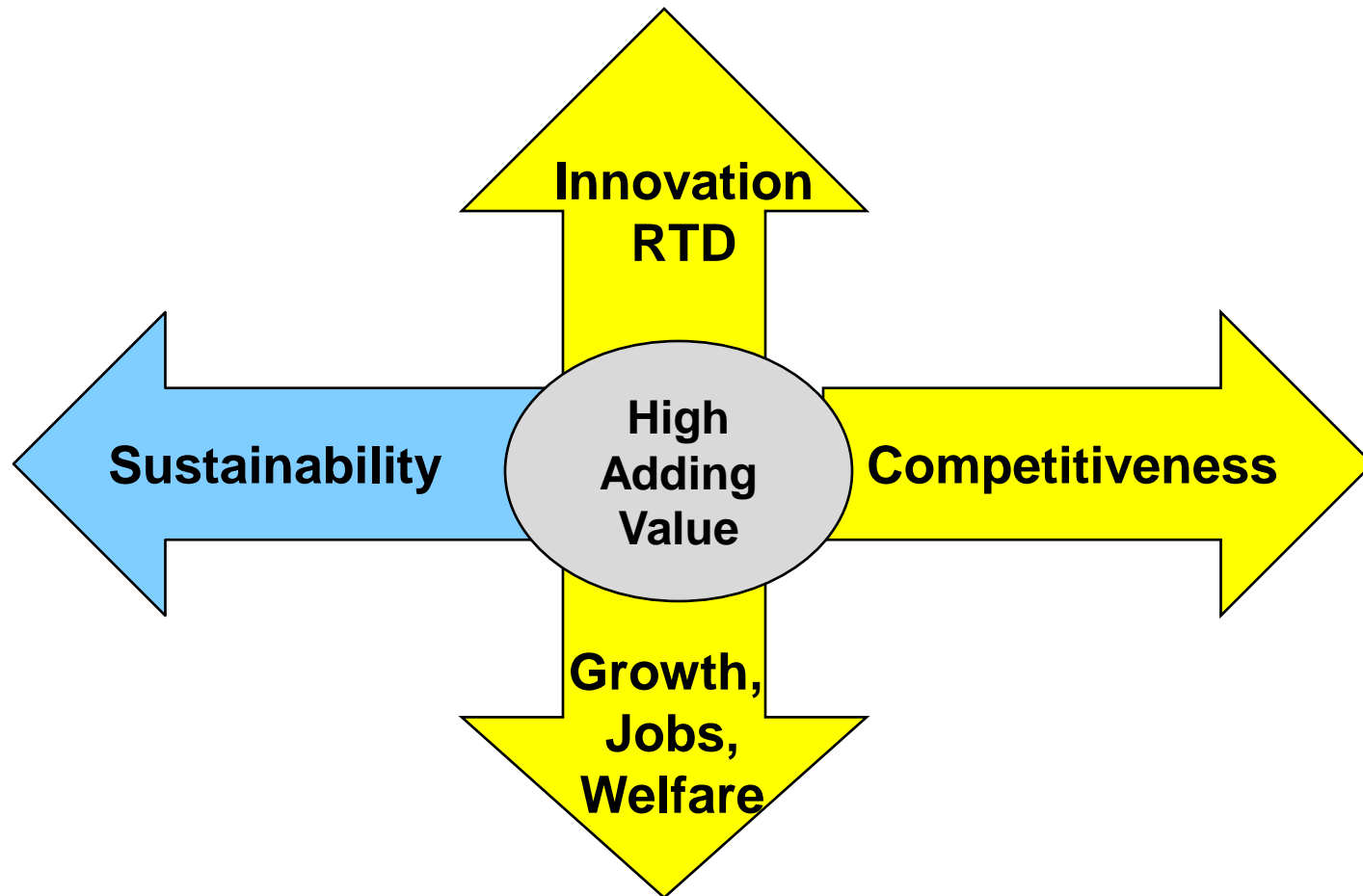
Holistic
Production
System

Products

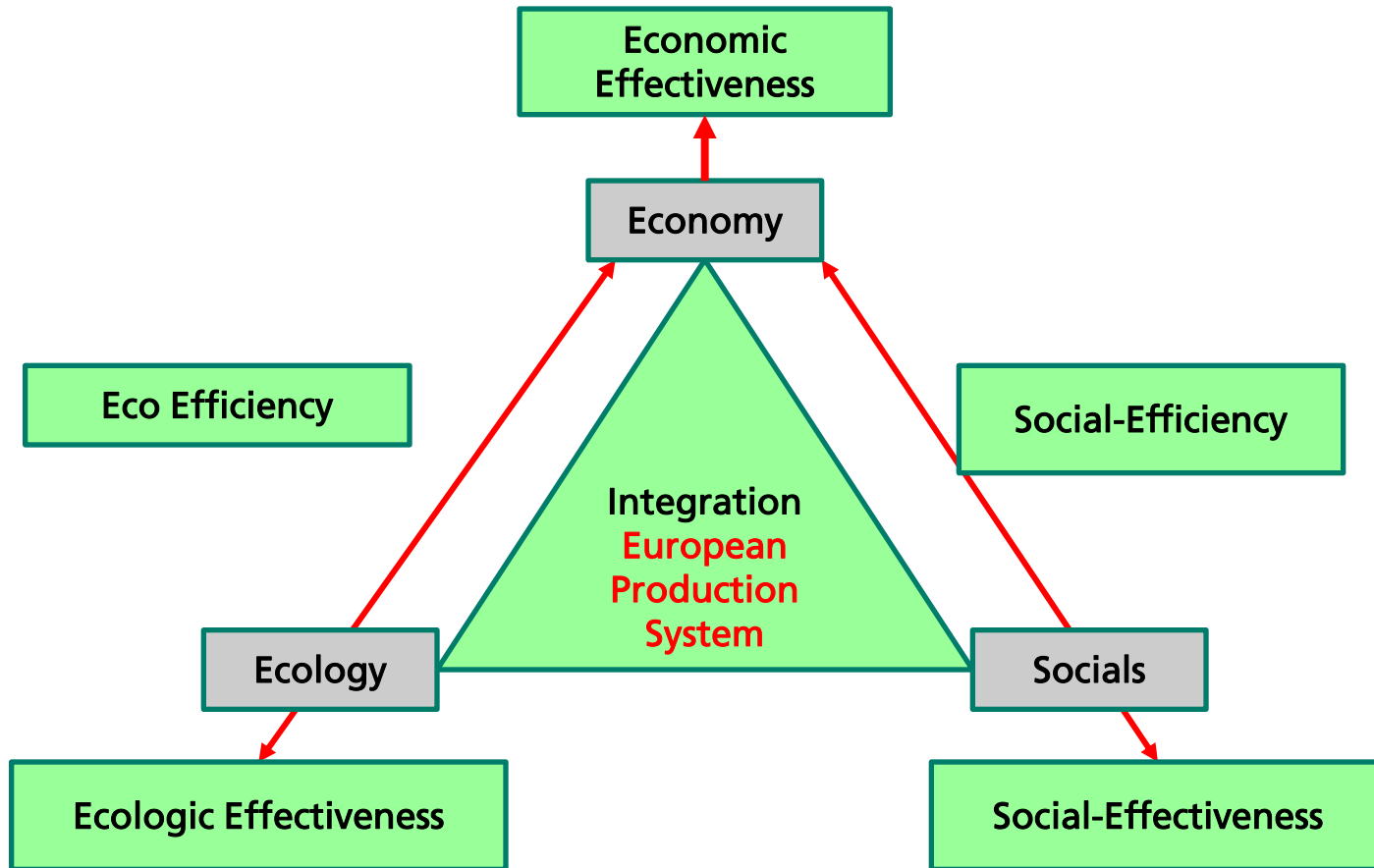
Processes



Strategies to make Industries Sustainable



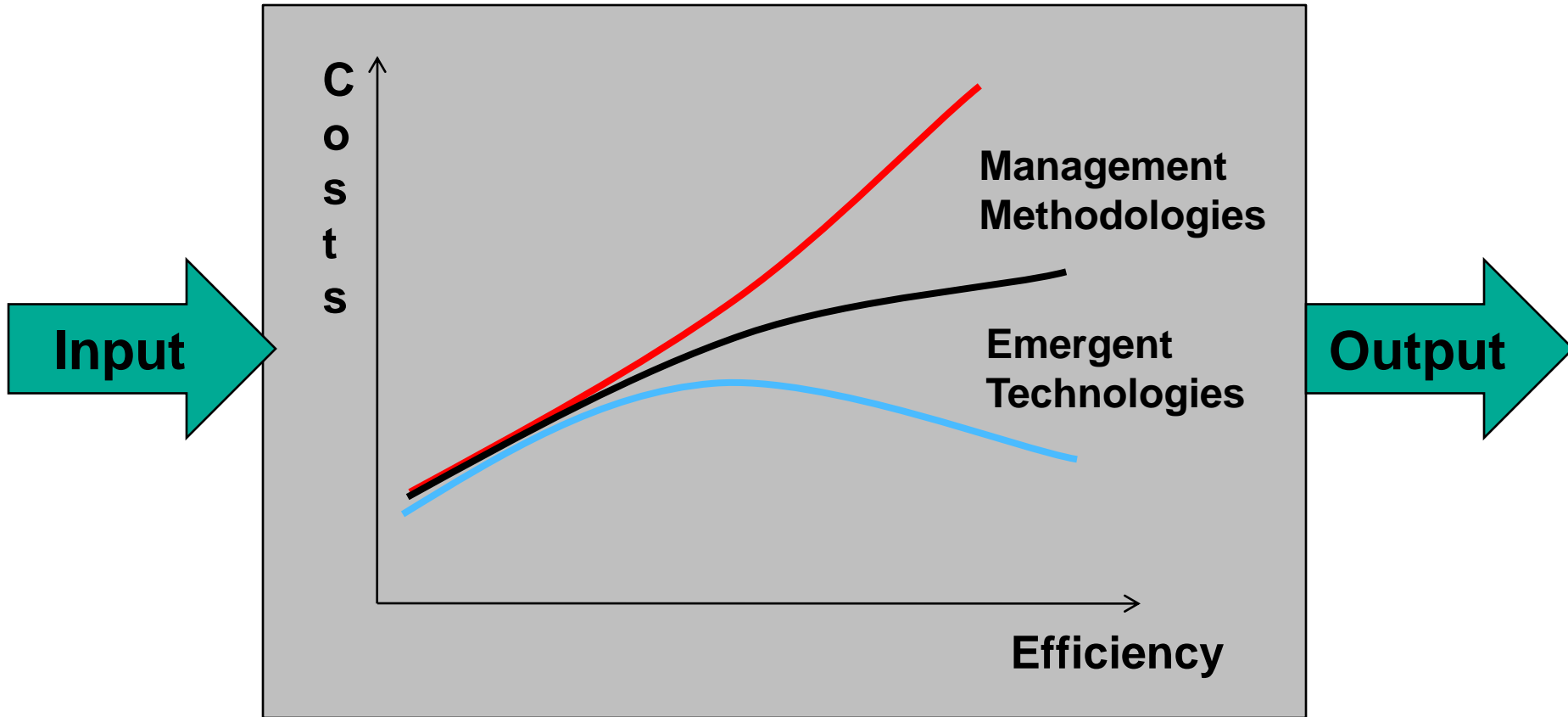
Sustainability – A Perspective for Manufacturing



Source: BMU econsense



Efficiency of Resources in the Transformation Process



The Position of Manufacturing Enabler of Sustainability

- Manufacturing is the backbone of the European economy
 - Manufacturing has the Potential for High Adding Value and Sustainability
 - The Manufacturing Platform is oriented to
 - Sustainability, Competition and Innovation
 - Life Cycle of Products, Innovative Production
 - R&D for Manufacturing, the development of the European Infrastructure and Education Systems are contributions for Sustainability
-



Factories are Products

Manufuture Vision

European Platform for **High Adding Value and Sustainability**
in Manufacturing Industries

Life cycle oriented

Networking

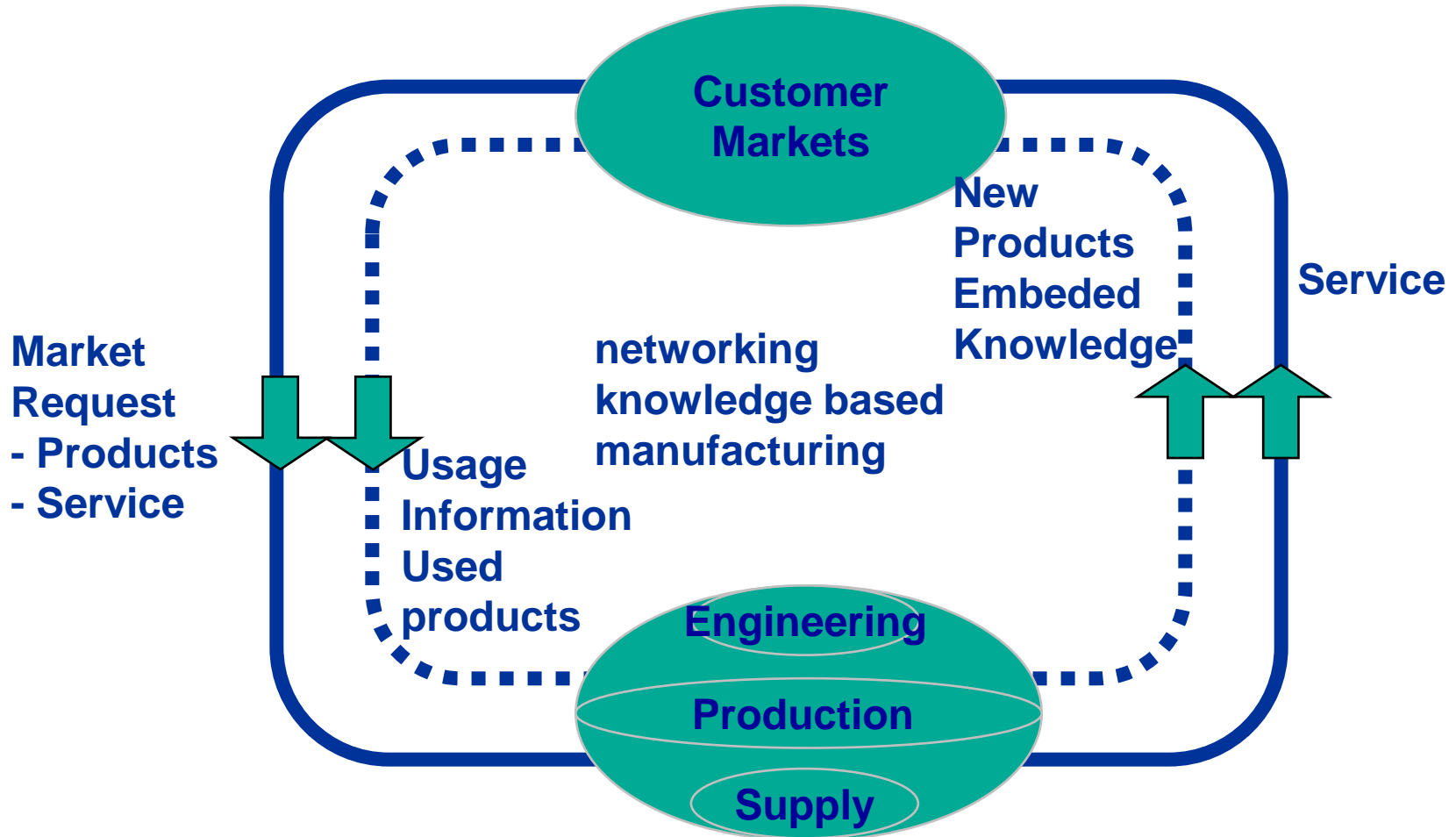
Integrated Knowledge

Intelligent Production

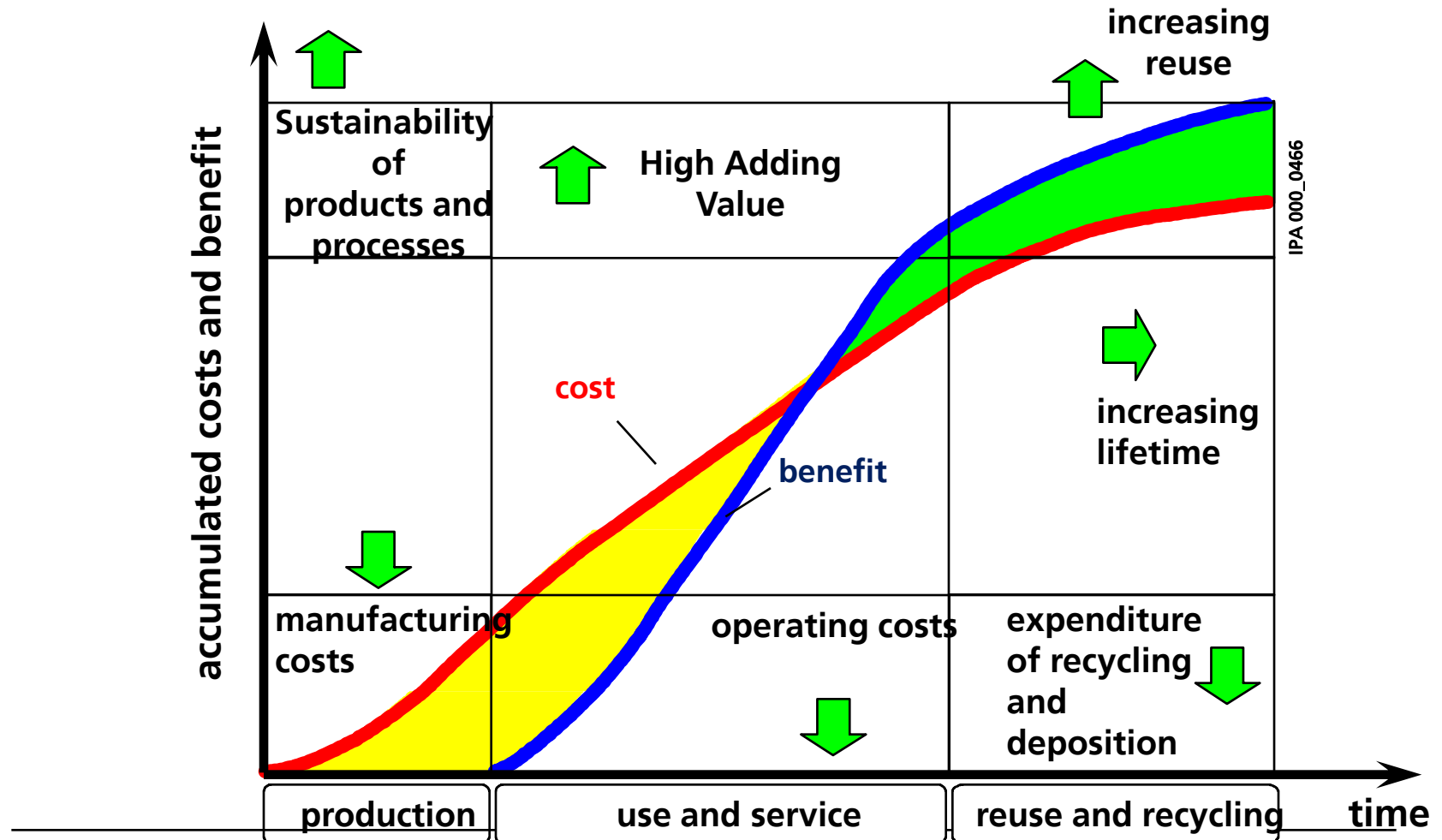


Fraunhofer
Verbund
Produktion

Life Cycle Orientation in the global Market



Sustainability of Manufacturing



Sustainable Management –Business Models

Long term Business

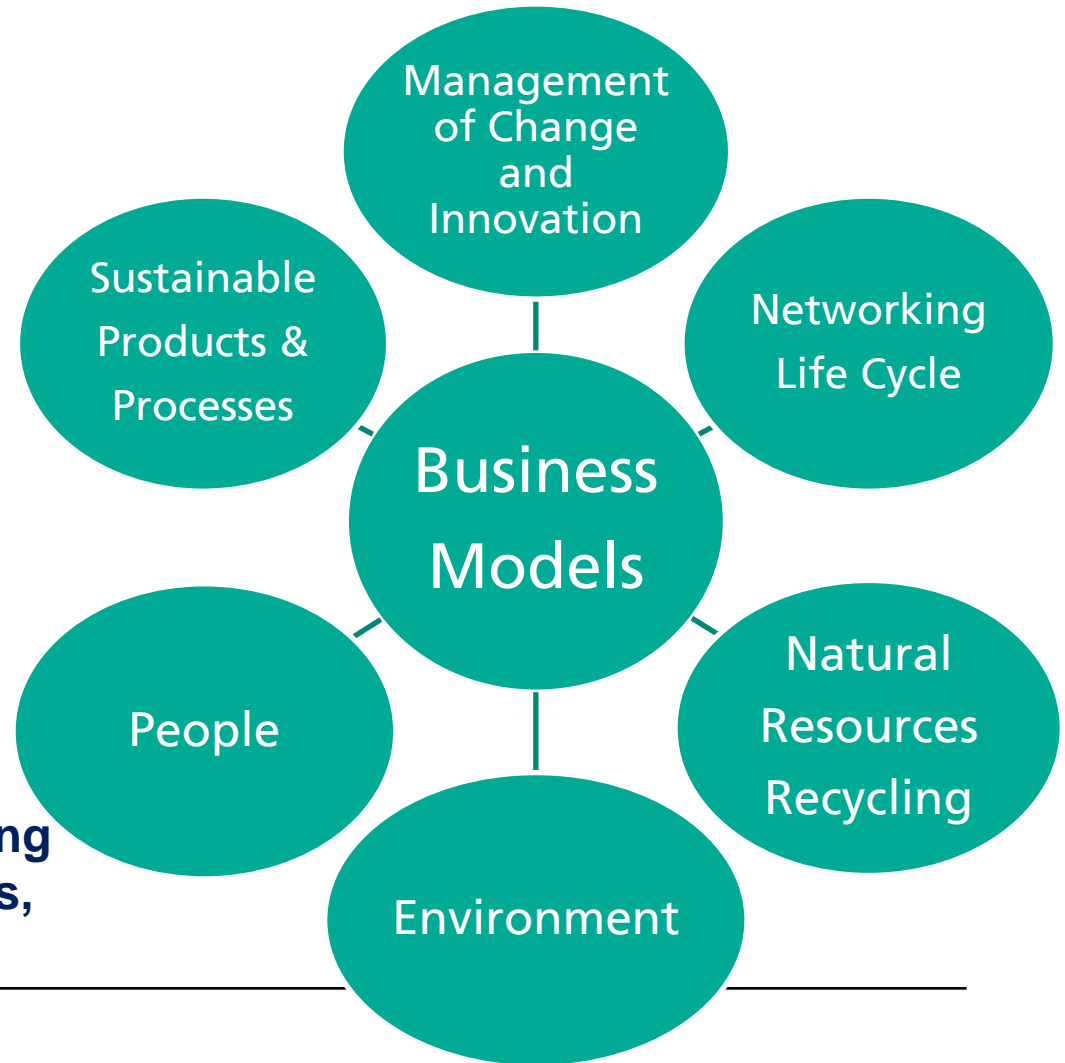
- Customisation
- Lean Production
- Total Quality Mgt.
- Total Energy Mgt.

Investment in

- R&D
- Human capital
- Low emissions
- Synergetic Networking
- Sustainable Technologies

World Standards of Manufacturing

- social, environmental, business,
- management, technical, IP



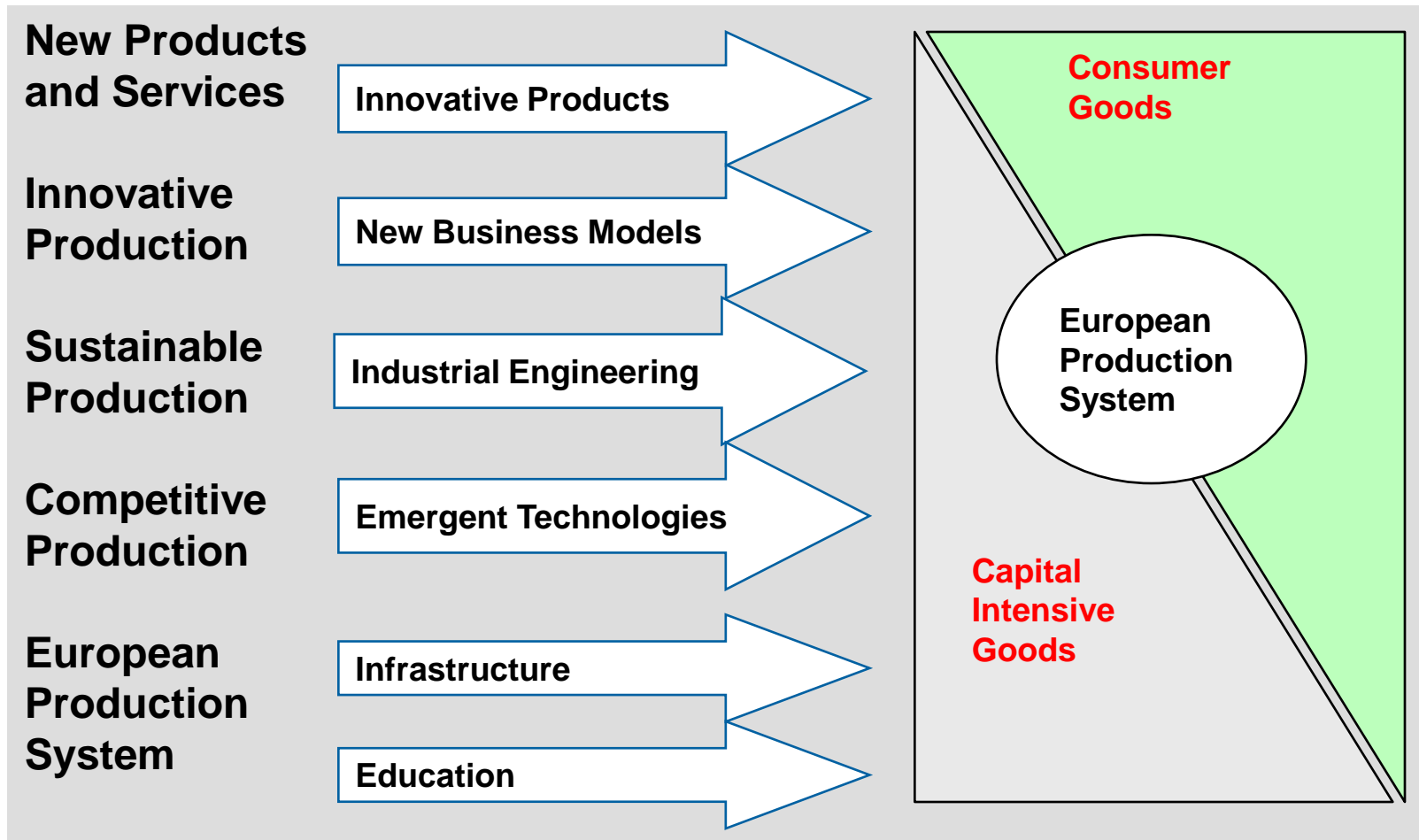
Actions in the Manufuture Road Map

- **Innovative Technologies in Manufacturing**
 - Light weight construction
 - Efficient Heat Systems
 - Renewable Energy Sources
 - Process technologies
 - **Technologies for Energy-Factories**
 - Solar, Fuel-Cells, Bio-
 - **Low Energy Facilities**
 - **Recycling of Materials**
 - **Reduction of Waste**
 - **Management of Resources**
 - Design for sustainability in products life cycle
 - LCA, LCD
 - Continuous improvement
 - Lean management
 - **Clean Manufacturing**
 - **Knowledge- management**
-

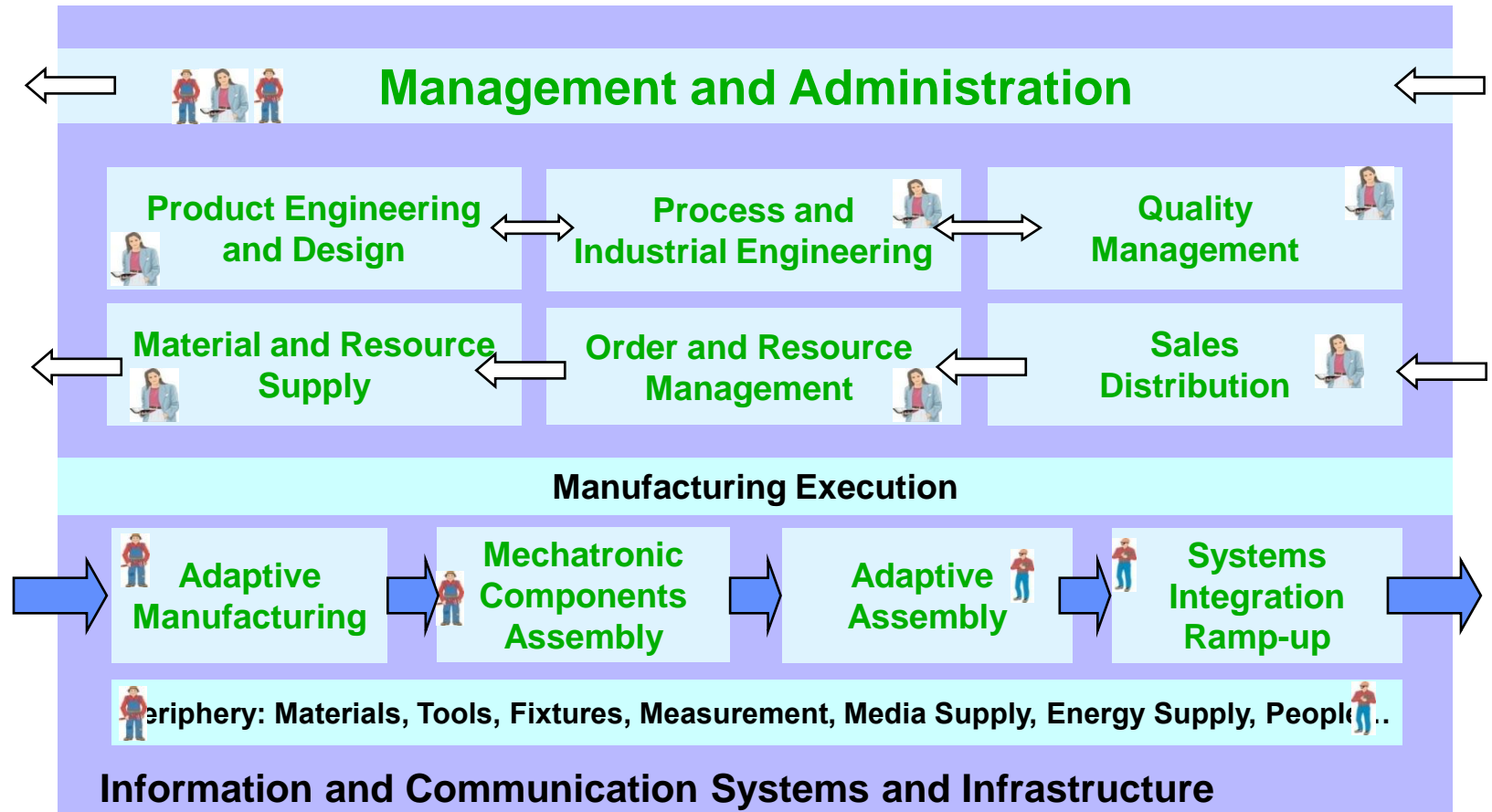


Manufacture

High Adding Value and Sustainability in Manufacturing



Knowledge Integration by ICT Factory Functionalities

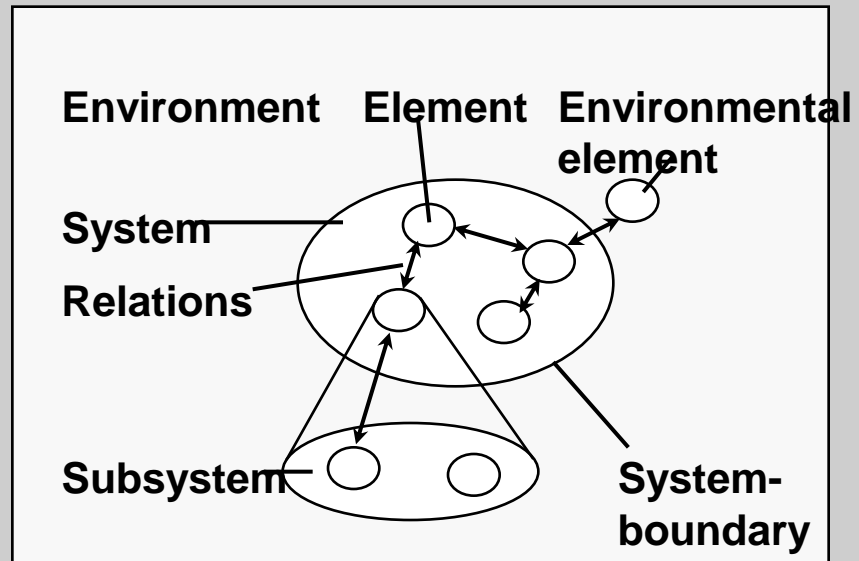


R&D Key Challenges

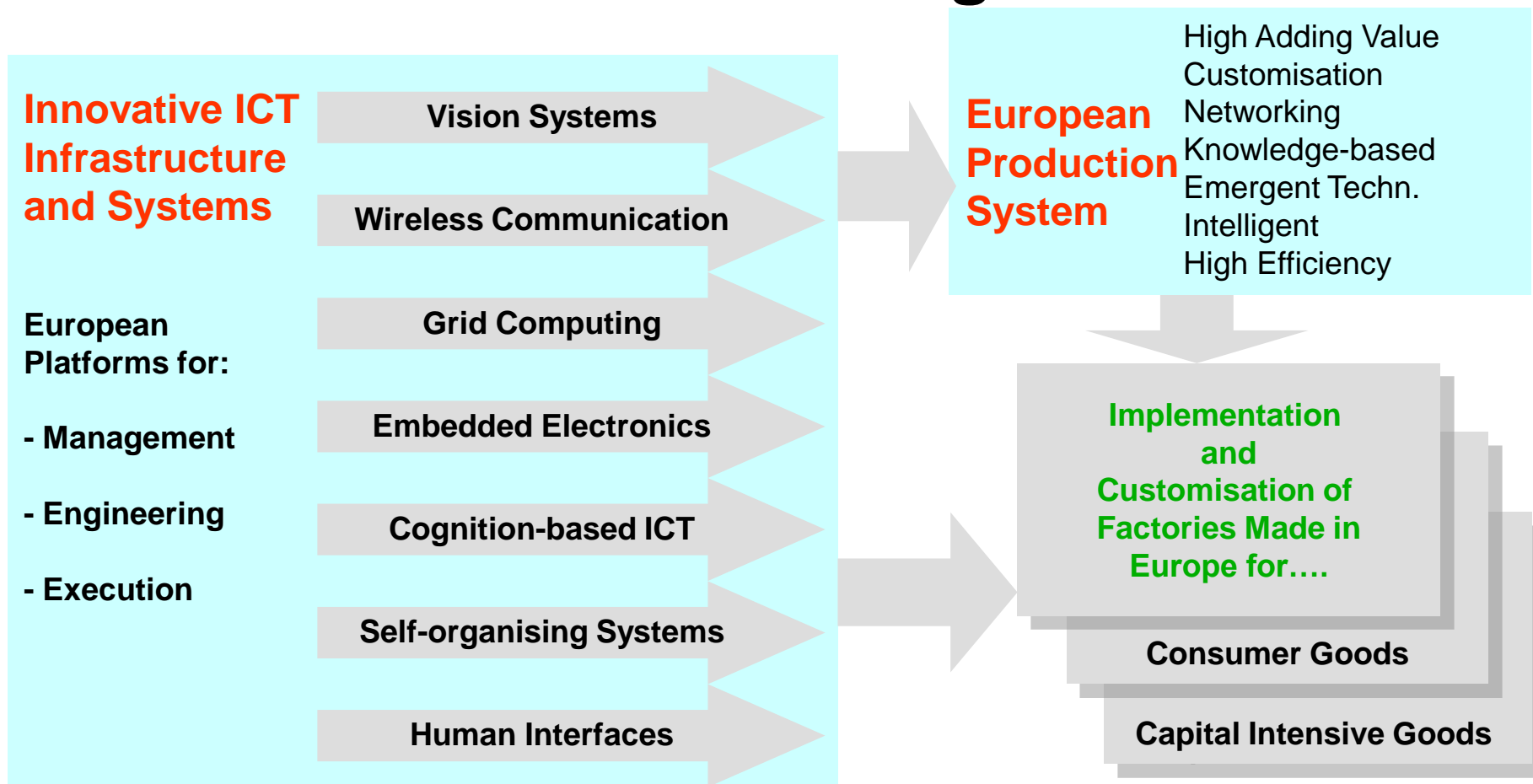
Product Integrated Knowledge (Intelligent Products)
Product oriented Services
Life Cycle Orientation



- Adaptive
- Digital and Virtual
- Integrated Networkes
- Knowledge based
- High Performance
- New Taylorism



ICT for Intelligent Manufacturing



Technologies beyond Borders

High Performance

cost, time, quality

Dimensions

micro- and nanoscale

Environmental

clean, sustainable

Generative Processes

rapid technologies

Adaptive Processes

self-organisation

Energy Efficiency

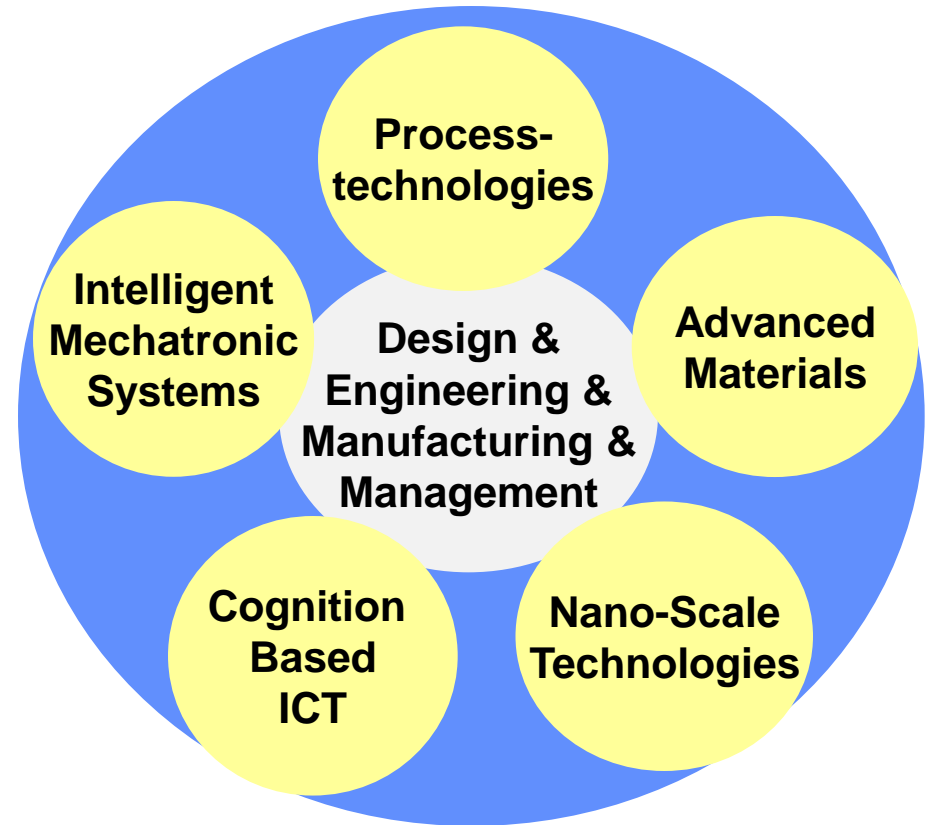
electric, heat,

Resource Efficiency

material, air, oil,...

Management Efficiency

organisation, optimisation



**Implementation in intelligent manufacturing systems
in all sectors of manufacturing**

Manufacturing of the Future

Advanced
Materials

Nano-Scale
Technologies

Cognition
Information
Processing

Emergent Technologies
beyond existing Borders: High Performance ..

Intelligent Products, Processes & Management

Manufacturing engineering : knowledge-based
tools New business models

Manufacturing
Europe

Grid
Infrastructure

Education

European Partnership of Competence: Competition & Sustainability



Fraunhofer

Institut
Produktionstechnik und
Automatisierung

Universität
Stuttgart



Institut für Industrielle
Fertigung und Fabrikbetrieb