



# Functional Materials

## Functional Materials 2007-2013



Tekes



# Functional Materials Programme

Functional  
Materials

**The Functional Materials programme aims to develop new applications and create competitive advantage through material technologies for Finnish industrial sectors.**

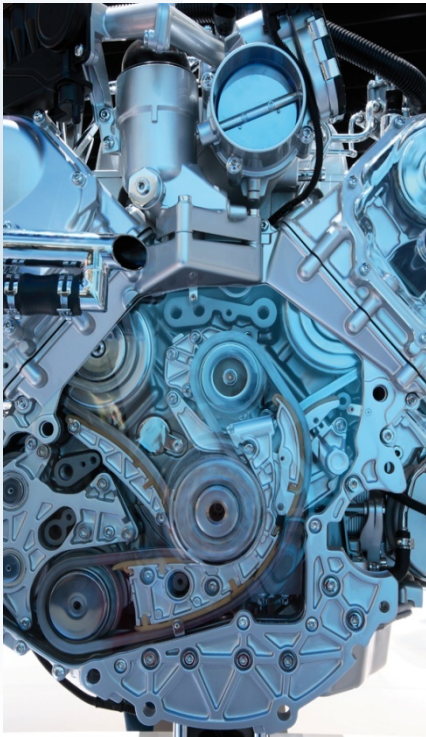
- Programme duration: 2007-2013
- Programme volume: approx. 211 million euros, of which Tekes accounts for 90 million euros
- More information: [www.tekes.fi/eng/materials](http://www.tekes.fi/eng/materials)





# Definition of functional materials

## Functional Materials



- **Certain designed properties serving specified application needs**
- **Important is to be *able to control* the properties**
- **Examples of end applications using functional materials**
  - **Smart materials, e.g. printable electronics and sensors that react on changing environmental conditions**
  - **New metallic alloys performing reliably in demanding conditions such as in fuel cells or engines**



Tekes



Functional  
Materials

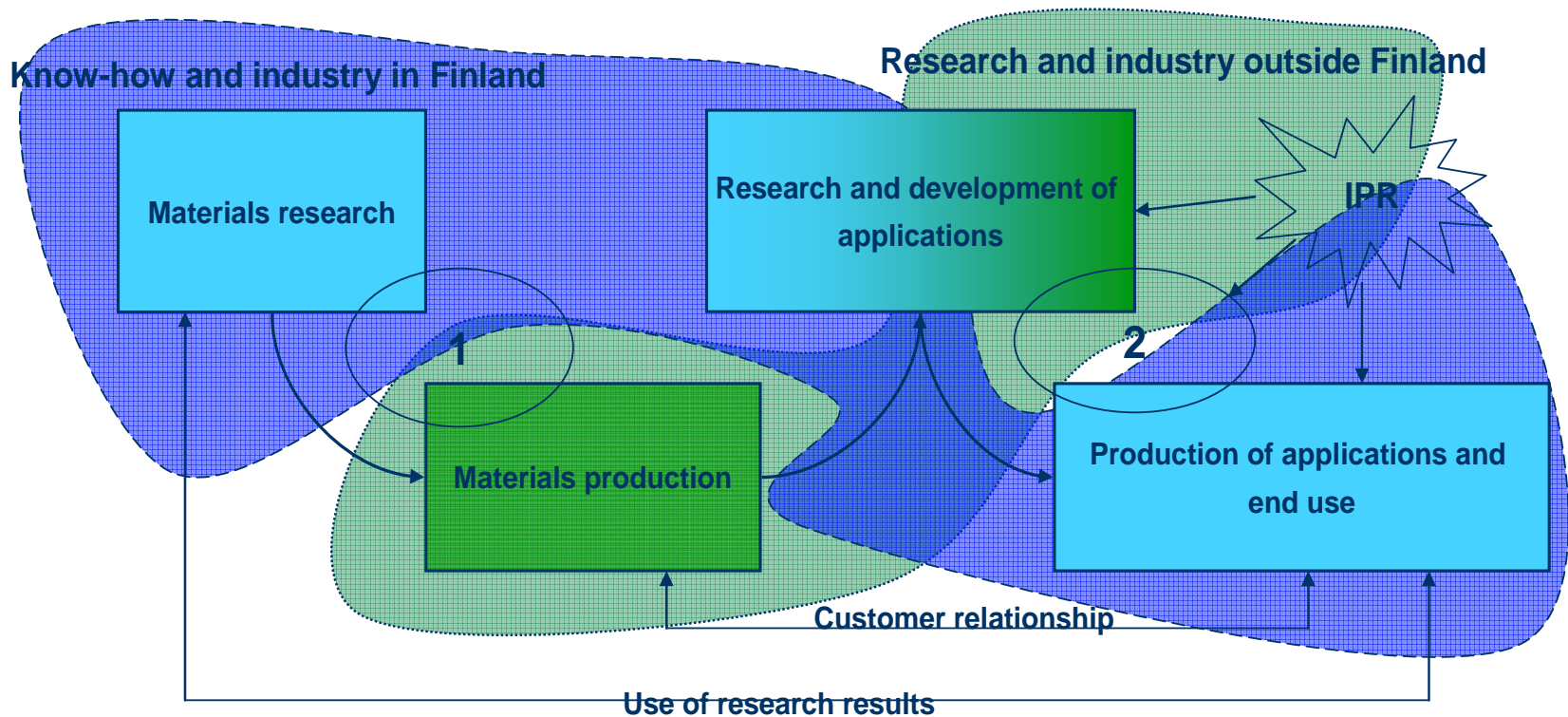
# Key points of the programme





# Materials value chain

Functional  
Materials



- International cooperation completes the value chain
- (1) and (2) are the key points for cooperation in the value chain



# Use of research results

Functional  
Materials



- To strengthen and renew the commercialisation of existing businesses – both SMEs and large companies
- Paper, metal, energy and ICT industries
- Creating new Spin-offs
- Commercialisation projects with specific commercialisation partners
- Cooperation with international materials businesses
  - The missing pieces in the value chain
  - Investments in Finland

**Commercialising project will be started 2008 (2008-2014)**





## Functional Materials



# Research themes

- 1. Understanding materials and their properties**
  - Materials physics and chemistry
  - Modelling and simulation
  - Characterisation
- 2. Control of materials properties and tailoring of functionalities**
  - Physical and chemical properties
  - Durability to wear and temperature changes, and against corrosion, stability, self-cleaning properties
- 3. Processing aspects**
  - Processability
  - Designability
  - Coating technologies
  - Production technologies



# Research themes

## 4. Examples of application areas of functional materials

- Printable electronics
- Sensors
- Applications based on functional metals and their alloys
- Applications based on polymers and other organic materials
- Optics and optoelectronics
- Functional construction and packaging materials

## 5. Life cycle management of materials

- Materials and energy efficiency, life cycle assessment, EHS issues
- Supply and recyclability of raw materials
- Recyclability







# Thematic Groups have started to identify the technology needs and problems to be solved

## Functional Materials



### 1. High durability materials

- Durability, wearing, heat resistance etc.
- Metals, plastics, ceramics, composites, self recurring materials

### 2. Light structures

- Metals, plastics, composites, combination materials

### 3. New energy technology materials

### 4. Bio & Medical purpose materials

### 5. Materials and integrated solutions to consumer products

- Printed intelligence and roll-to-roll solutions, telecommunication, electronic & RF device, sensors, sensing surfaces, coatings, intelligent packaging, 3d moulded device with integrated intelligence
- Cost effective mass-production ability



# General themes and drivers common for all groups:

Functional  
Materials



## Environmental aspects - sustainable development

- Material efficiency
- Energy efficiency
- Life-cycle issues, recycling, renewable solutions

## Cost reduction aspects

- Energy savings in production
- Cost effective solutions in materials, products and production
- Light solutions

## International aspects



# International cooperation

- **MATERA ERA-NET 2008 February**
- **Within Europe through EU FP7**
  - **EU FP7 Indicative priorities for the next call - Dec 2007**
- **Global cooperation**
  - **In the first call 2007 joint research projects with Japanese partners**
  - **In the second call 2008 cooperation with emphasis on USA and China**
  - **In the third call 2010, trying to establish cooperation with new countries; possible are India, Brazil or South-Africa**
  - **Cooperation with Russia in neighbouring areas**





Functional  
Materials

## Next event

- **NMP Finland Seminar 16-17.4 .2008**
- **International network and partnering opportunities**



Tekes



# Programme status

**March, 2008**

- **The first call - decision process is nearly complete**
  - **Tekes funding for research institution projects is 11 million euros**
  - **Altogether 16 project consortia funded**
- **Several industrial R&D projects have been financed – for 2008 six million euros is reserved**
- **The second call for research organisations will be announced in April 2008**
  - **Focus areas will be decided based on the work done in the thematic groups**





# Contact information

- Programme manager: Solveig Roschier, Tekes  
[solveig.roschier@tekes.fi](mailto:solveig.roschier@tekes.fi)
- Programme coordination: Anneli Ojapalo, Spinverse Oy  
[anneli.ojapalo@spinverse.com](mailto:anneli.ojapalo@spinverse.com)
- Further information: [www.tekes.fi/eng/materials](http://www.tekes.fi/eng/materials)

