

# Funding of the Materials Research in Germany

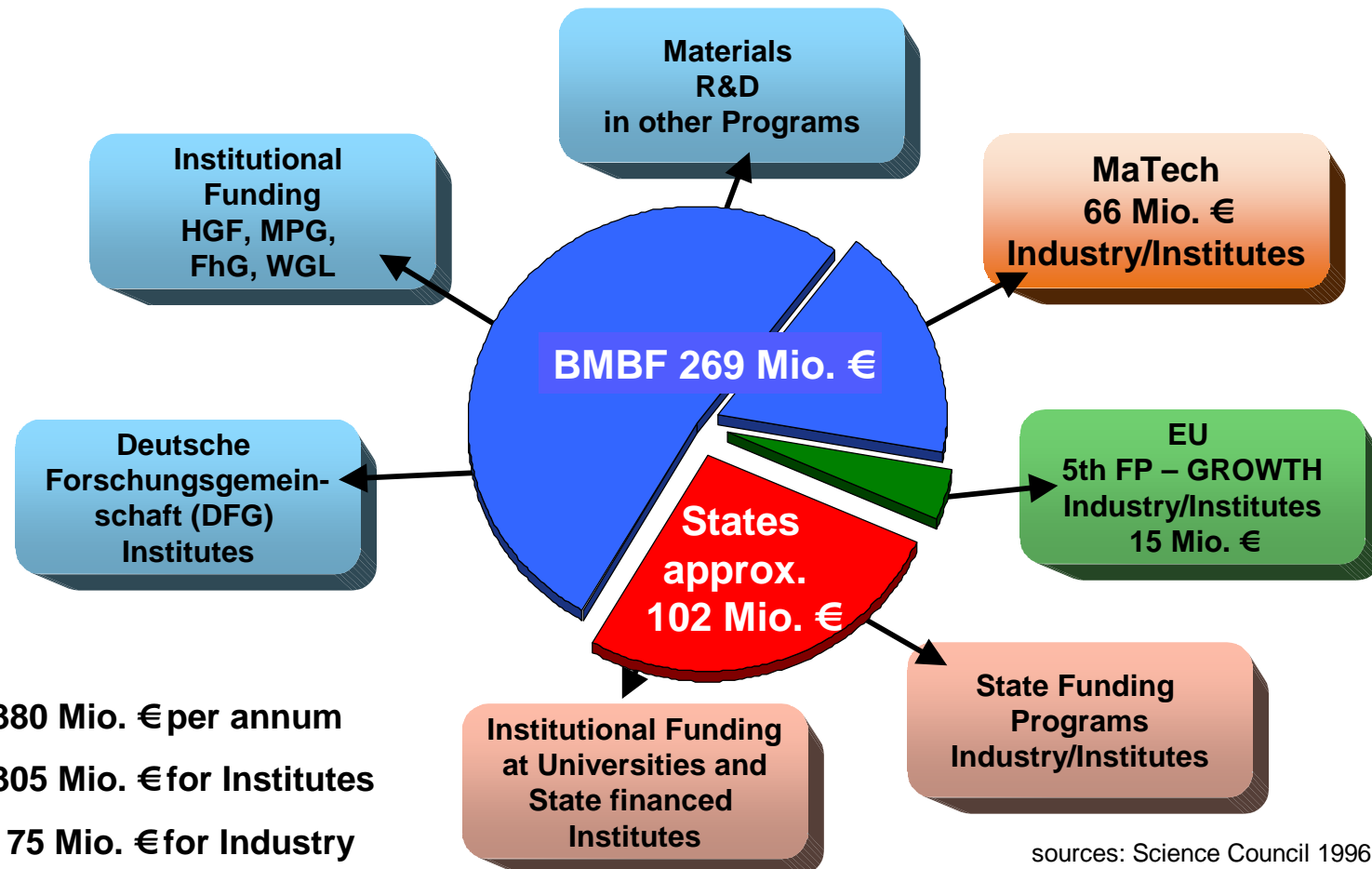
## Presentation at the

### CAME GT - Workshop

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# Public Funded Materials Research in Germany



Budget: appr. 380 Mio. € per annum  
of which: appr. 305 Mio. € for Institutes  
and appr. 75 Mio. € for Industry

sources: Science Council 1996 / NMT

## Overview of the Main Actors in German Publicly Funded Materials Research

Organization	Funding	Type of Research Activity
University	Institutional	basic to applied, young scientists
WGL „Blue List“	“	basic, long term, more academic research
MPG „Max Planck“	“	Bas., sometimes applic. Oriented, centres of Excellence
HGF „Nat. Labs“	“	Bas. to applied, large complex tasks, long term
FhG „Fraunhofer“	“	Applic. Oriented, intensive cooperation with Industry
DFG „Research Council“	Projects	Basic research, also more complex tasks
Foundations	“	Basic, somt. Appl. Oriented
BMBF	“	Appl. Orient., compound proj. with Industrial participation
Fed. States	“	Appl. Orient., SME
AiF	“	Appl. Orient., SME, close to market, sectorial themes

## Actual Topics for Energy Related Materials Research

### Fossile:

- ✍ High Temp. Heat Exch. (Ceramic) for Pressurized Combustion of Coal (E)
- ✍ Materials for 650 C Life Steam (E)
- ✍ Hot Gas Filters
- ✍ Single Crystal; Directed Solidification,
- ✍ CMC for High Temperatures; MoSi<sub>2</sub> – Composites (T>1350<sup>0</sup> C)
- ✍ Intermetallics (NiAl),
- ✍ Coating for T>1350 C

### Renewables:

- ✍ Coating of Hydro Turbine Blades, Silicon for Photovoltaics (E)
- ✍ Fuel Cell: Membranes, Optimized Components

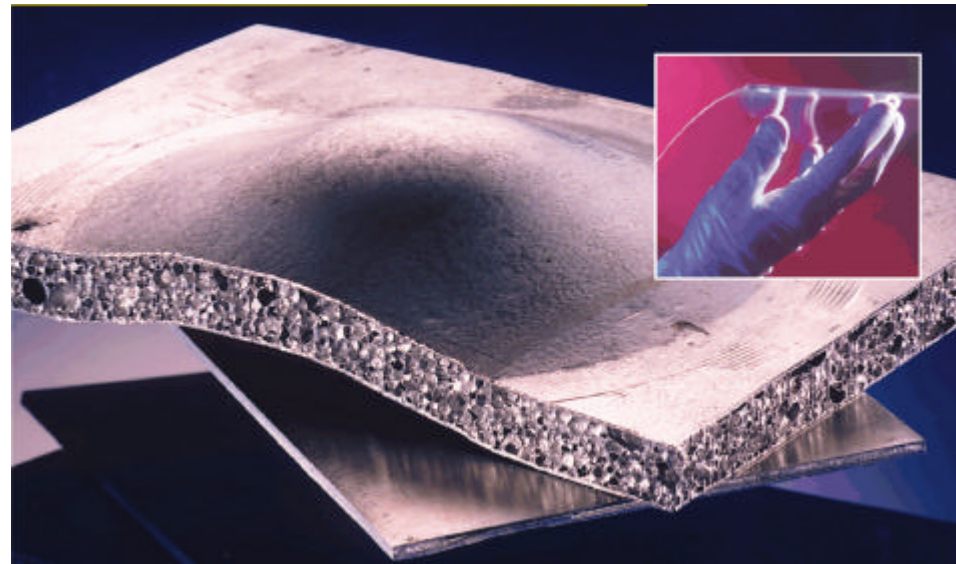
### Rational Use of Energy:

- ✍ Energy Storage: H<sub>2</sub>, Batteries, Thermoelectric Convertors,
- ✍ Ceramic Bearings

***(E): Funded in the scope of the Energy Research Programme***

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**MaTech - New Materials for Key Technologies of the 21st Century**  
**Program of the German Federal Ministry of Education and Research (BMBF)**



**MaTech: Linking Basic Research with Industrial Activities,  
Shortening the Period from Knowledge Innovation to Product Innovation**

**Annual Budget: ~130 Mill DM; (~65 Mill €)**

**Running Time: 1994 - 2003**

# Strategic Goals and Priorities in MaTech

- ✍ Improvement of the materials based technology position
- ✍ Acceleration of R&D results into practical application
- ✍ Linking the value-added stages in the innovation process
- ✍ Application orientation to internationally important technology fields



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# Topical Priorities

## Materials for Information Technology

e.g. electrical, optical, magnetic Materials  
- higher functional integration, multifunctionality, miniaturization

## Materials for Energy Technology

e.g. high-temperature stability, creep and corrosion resistance  
- improved efficiency and service life  
- reduced raw material consumption, emissions

## Materials for Traffic and Transport

e.g. lightweight construction, drive efficiency  
- reducing fuel, pollutants, noise  
- improving safety and efficiency

## Materials for Medical Engineering

e.g. long-term stable, biocompatible, resorbable for diagnostics and therapy

## Materials for Manufacturing Technology

e.g. creative forming, metal working, cutting  
- increasing productivity, reducing costs, avoiding waste

## New Fields and Cross sectionals

e.g. characterising and modelling; biomimetic and multifunctional materials

## Project Types in MaTech

### **Industrial collaborative research projects (main focus)**

- Industrial leadership
- Institutional R&D-partners / sub-contractors
- linking the value-added stages / application oriented

### **Institute collaboration and young scientists support**

- long term basic research with visionary applications
- accompanied by industrial companies

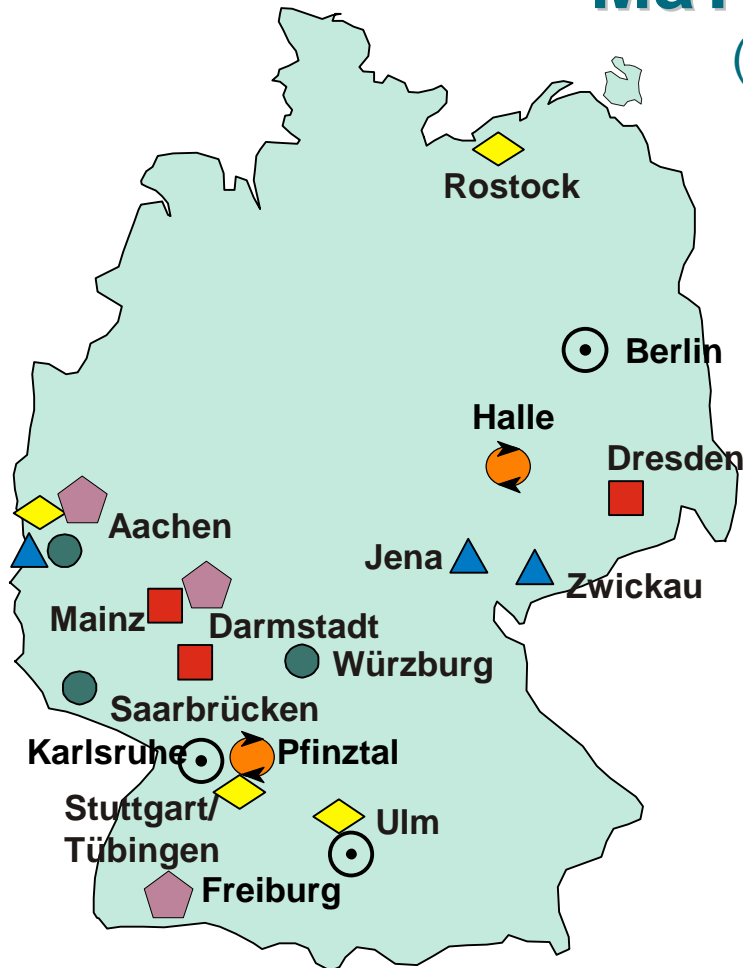
### **Transfer centres at host institutes as providers of know-how**

- rapid transfer of R&D-results into practical application / SMEs
- qualification and training of staff from the enterprises
- sustainability beyond the funding period (independent enterprise)



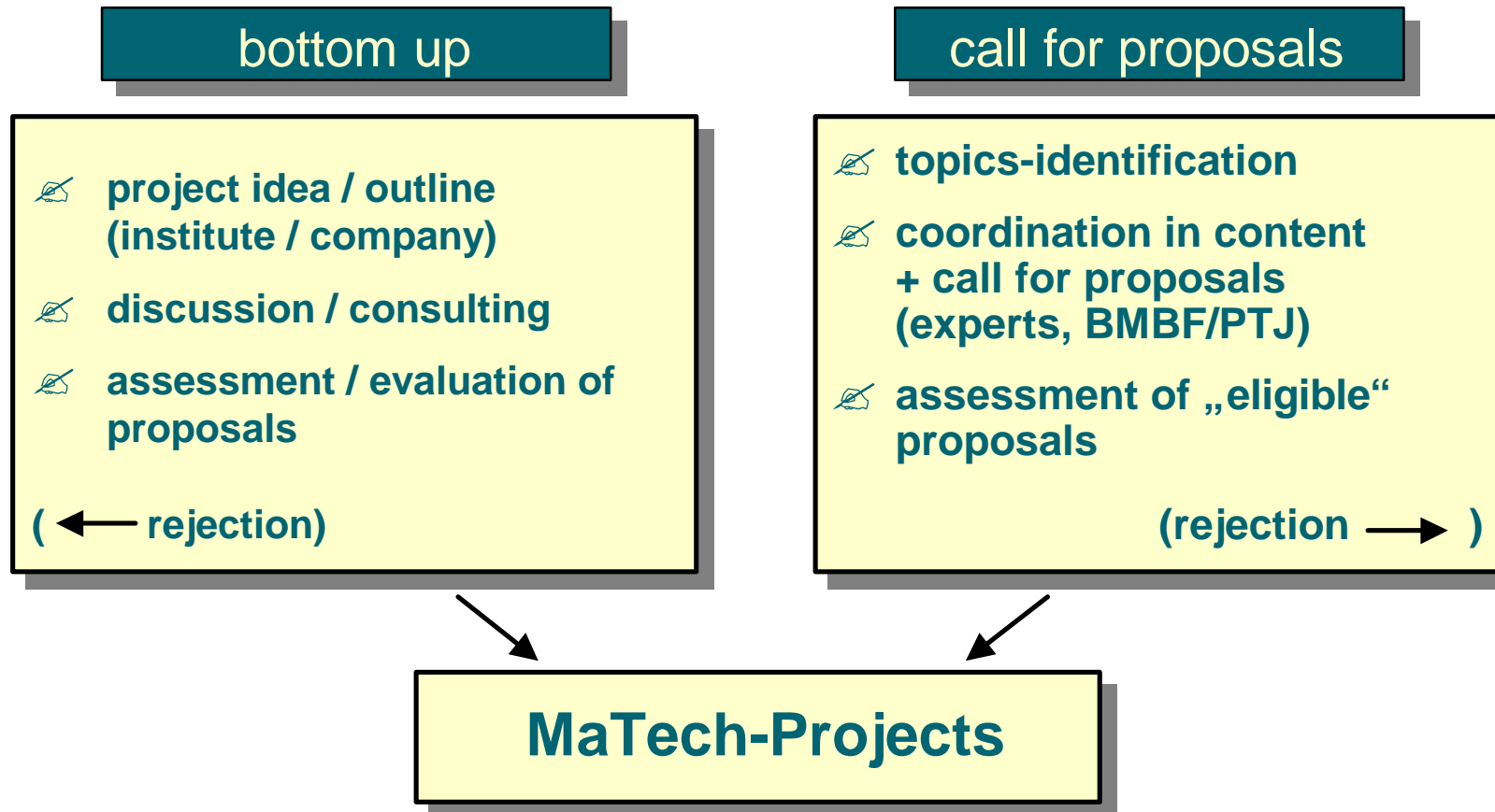
# MaTech-Centres

(1994 – 2004)



- Machining of new Materials** (1994-1998)
- Inorganic Coatings (wet chemistry)** (1995-1999)
- Characterization of Polymers** (1995-1999)
- Biomaterials (medicine)** (1997-2002)
- Life cycle assessment  
Reuse / Recycling of New Materials** (1999-2003)
- Modelling of Materials  
Simulation of Processes and Components**  
(2000-2004)
- New Materials of Microtechnology** (2000-2004)

# Programme Implementation



## MaTech – Calls for Proposals 2000/2001

Topic	Type
„Hot Topics“ – Interdisciplinary Materials Research with Young Scientists (8/2000)	Single and collaborative projects of institutes endorsed by industrial companies
Biocompatible Materials for Oral Medicine (4/2000)	Joint projects industry/institutes
Multifunctional Materials – Manufacturing, processing, application (8/2000)	Joint projects industry/institutes
Ultra-Light Construction Materials – Materials and Production (5/2000)	Joint projects industry/institutes
Biomimetic Materials – Manufacturing, processing, application (11/2000)	Joint projects industry/institutes

# MaTech Project Example

## Spraycompacted Cylinder Liner, Fa. PEAK, Velbert

Production of cylinder liner:

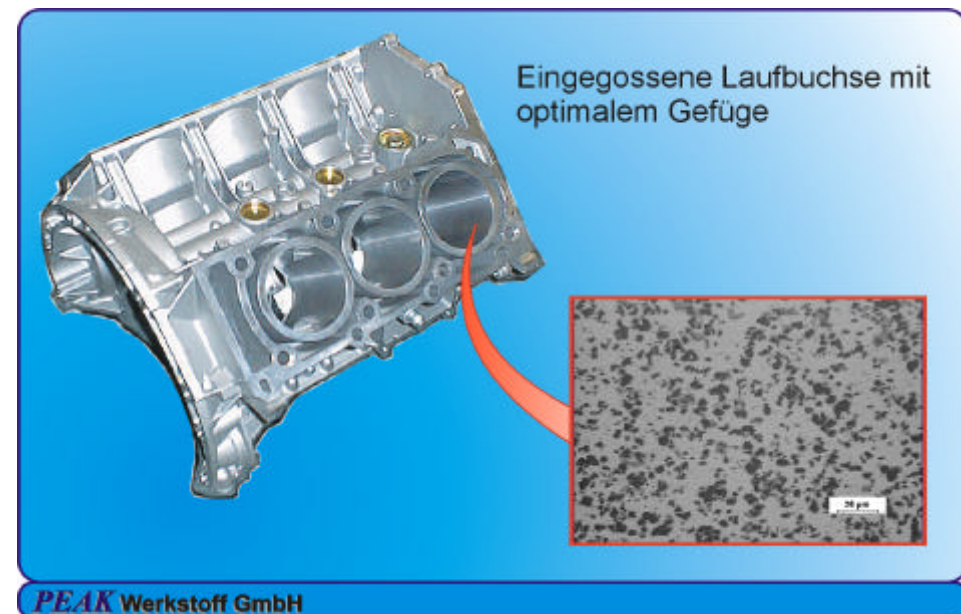
- Spraycompaction of AlSi-alloys
- Extrusion of tubes
- Forging/etching-processes
- Pressure die casting

Advantages: Reducing of

- friction
- fuel and oil consumption
- emissions

Daily production for DC: 18.000 pcs

*VDI-Materials Award 1999*



**Improved technology position, ecological effects, new jobs**