International Cooperation as a Key Element for Promoting Excellence in Research

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- Germany – Trendsetter in Green Innovation
- DFG – Key Facts
- DFG – Green Innovation Funding
- DFG – Support of International Cooperation

Germany – Trendsetter in Green Innovation

Facts and Figures

Germany as a manufacturing country for Green Innovation

►In world-wide production, every third solar cell and every second windmill is produced in Germany.

►In 2007 more than 250.000 jobs in renewable energy sector, another 1 Mill. jobs in clean technology (water pollution control, filter technology, recycling, renaturation).

►The industry sector related to improved efficiency is a large job motor:

- high-efficiency power stations, Combined Heat and Power (CHP)
- fuel-efficient vehicles, modernising insulation of buildings

Brilliant prospects for the Renewable Energy Sector

►Increasing cost pressure on green electricity technology is the driving force.

►A consistent environmental policy is the key factor for securing economic competitiveness.

►By the year 2020 this economic sector will contribute 14 % to Germany‘s GDP.

Germany – Trendsetter in Green Innovation

Legal Steps towards Green Technology

Policies to promote Renewable Energy

►From the early 1990s several policies made this sector very attractive and economically viable.

►The Renewable Energy Sources Act (2000) is the key market incentive programme to foster the use of Renewable Energies.

Integrated Energy and Climate Programme

►Implemented in 2007, it aims at further separating economic development from emissions.

►Self-set goals: CO_2 emissions reduced by 40 % of the 1990 level by 2020.

Germany as one internationally leading country

►Many countries have adopted basic legislative features and global strategies of Germany‘s policies.

DFG – Key Facts

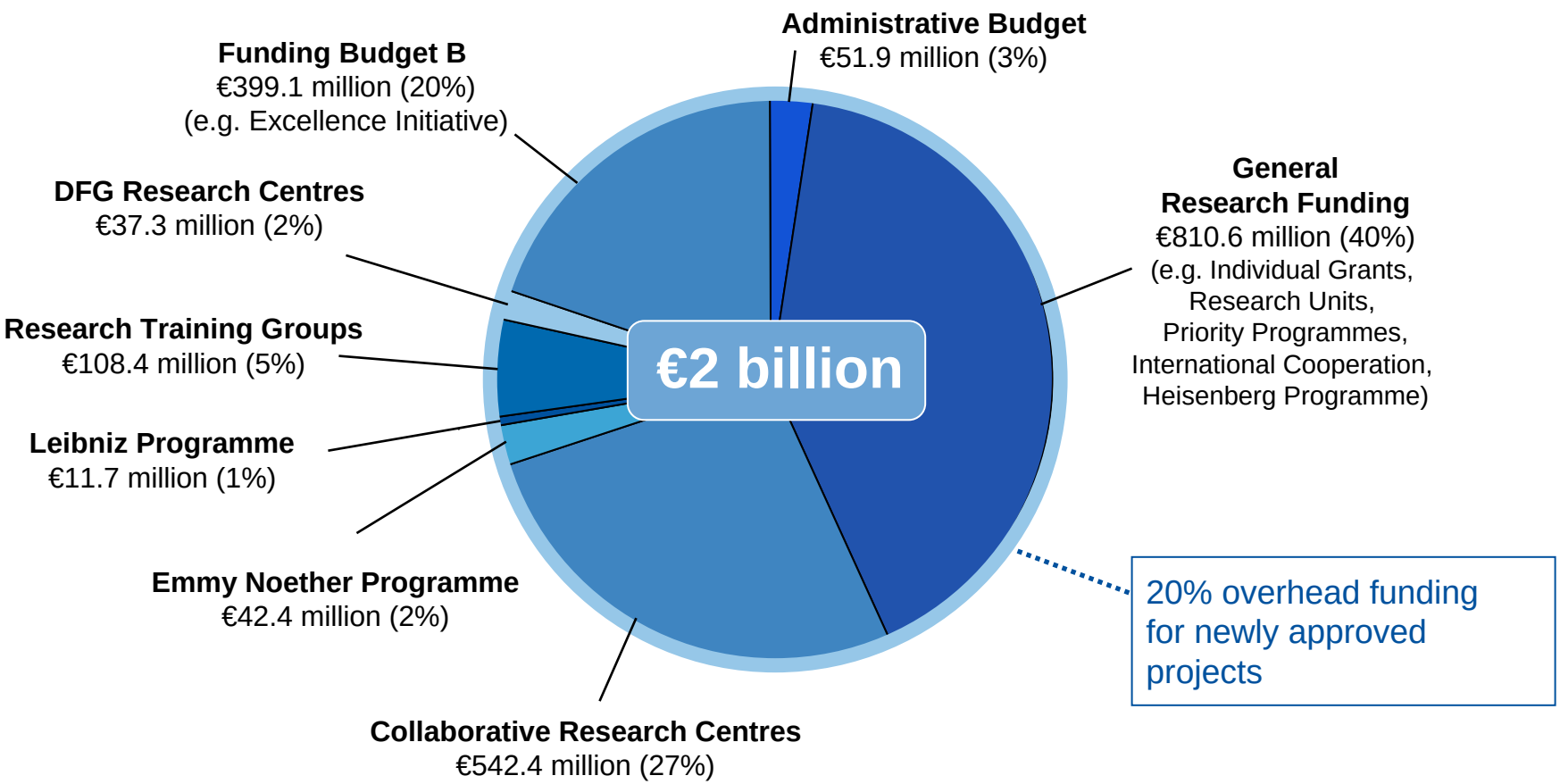
The DFG

- is Germany´s **largest research funding organisation**
- is a **self-governing** body and has a **bottom-up** approach
- serves **all branches of science and the humanities** by funding projects for **basic research** and facilitating cooperation among researchers
- fosters **relations between research in academia and the private sector** based on findings coming from **DFG basic research projects**
- supports **international cooperation**
- receives the large majority of its funds (**expenditures in 2008: € 2 billion**) from the German States and the Federal Government

The federal ministries like the Ministry of Education and Research, the Ministry of Economics and Technology and the Ministry for the Environment, Nature Conservation and Nuclear Safety support **applied research** through funding programmes announced via **thematic calls** of their own.

DFG – Key Facts

Actual Expenditures 2008



DFG – Green Innovation Funding

Examples of Collaborative Projects

Energy Conversion and Storage

- photovoltaics
- thermoelectrics
- advanced battery materials

Materials Science and Engineering

- high-performance lightweight materials
- self-healing materials

Catalysis

- from green chemistry to development of tailor-made fuels from biomass

Systems Engineering

- logistics and mobility

DFG – Green Innovation Funding

Energy Conversion and Storage

Priority Programme 1355: Elementary Processes in Organic Photovoltaics

- coordination: Prof. Karl Leo, TU Dresden
- funding: € 8.8 million for 4 years (total duration 6 years)

methodological approach

- cooperation between chemical synthesis and physics
- entire process chain from synthesis to devices

current research (examples)

- electronic properties
- interfaces and heterojunctions
- tiophene derivatives

1st wave: OLED Displays

2nd wave: OLED lighting

3rd wave: Solar cells

4th wave: Organic electronics

DFG – Green Innovation Funding

Energy Conversion and Storage

Priority Programme 1386: Nanostructured Thermoelectrics: Theory, Model Systems, and controlled synthesis

- coordination: Prof. Kornelius Nielsch, University of Hamburg
- funding: € 8.8 million for 3 years (total duration 6 years)

long term goal

- harvesting energy through thermoelectrics
- efficient energy conversion

research areas

- development of clearly defined experimental model systems (epitaxial multilayers, nanorods, quantum structures, monodisperse nanoparticles)
- structural and thermoelectric characterisation
- development of models for understanding the transport processes

DFG – Green Innovation Funding

Energy Conversion and Storage

Priority Programme 1473:
Materials with New Design for Improved Lithium Ion Batteries

►coordination: Prof. Hans-Jürgen Seifert, TU Bergakademie Freiberg

►funding: € 6.2 million for 3 years (total duration 6 years)

scientific aim

►complete design of batteries before the experimental work starts

focus of research

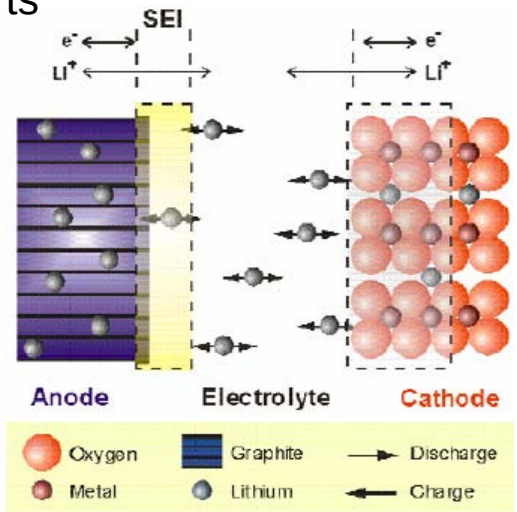
►investigation of relationships between thermodynamics, kinetics and nanostructure

research areas

►advanced active materials

►modelling to provide high-performance operation

►energetics and thermodynamic safety on the materials level



Priority Programme 1123:
Textile Composite Design and Manufacturing Technologies of Lightweight Structures for Mechanical Engineering and Vehicle Engineering

- coordination: Prof. Werner Hufenbach, TU Dresden
- funding: € 8 million for 3 years

research areas

- load-adapted design of textile preforms and components
- function integration and dynamic behaviour

follow-up projects

- effects of defects
- very high-cycle fatigue of complex fibre-reinforced composite materials

DFG – Green Innovation Funding

Catalysis

Excellence Cluster 314: Unifying Concepts in Catalysis (UNICAT)

- ►TU Berlin
- ►funding: € 34 million for 5 years

research areas

- ►bridging the materials gap in complex catalysis
- ►‚intelligent' natural and artificial enzymes
- ►complex reaction engineering

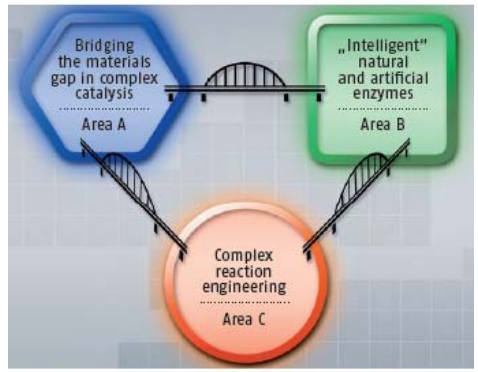
current research projects (examples)

- ►oxidative transformations of natural gas to ethene
- ►biological hydrogen production and hydrogen driven fuels

http://www.unicat.tu-berlin.de/

unicat

Cluster of Excellence



"Unifying Concepts in Catalysis"

DFG – Green Innovation Funding

Catalysis

Excellence Cluster 236: Tailor-made fuels from biomass (TMFB)

- ►RWTH Aachen
- ►funding: € 35 million for 5 years

research areas

- ►biocatalysis, chemocatalysis
- ►chemical engineering
- ►combustion research, engine development

current research projects (examples)

- ►fuels from biomass
- ►novel synthesis and production routes

http://www.fuelcenter.rwth-aachen.de/index.php?&L=2

international workshop: Aachen, June 23/24, 2010

DFG – Green Innovation Funding

Systems Engineering

Collaborative Research Centre 637: Autonomous Cooperating Logistic Processes – A Paradigm Shift and its Limitations

- Bremen University
- funding: € 16 million for 8 years (total duration 12 years)

research areas

- ‚autonomy' concept and a theoretical framework for the modeling
- methods and tools for efficient dynamic control systems
- impacts on logistics systems
- transfer, prototypical implementation and verification

http://www.sfb637.uni-bremen.de/?&L=2





DFG – Support of International Cooperation

The DFG fosters international cooperation **in all funding programmes**

And through specific measures including

- initial funding for bilateral cooperation
- fellowships abroad for postdoctoral researchers
- joint calls for proposals with partner organisations
- International Research Training Groups
- international scientific events
- Mercator Programme

International modules, such as additional travel expenses, personnel exchanges, etc., may be applied for in all DFG funding programmes.

The DFG welcomes initiatives for international cooperation!

DFG – Support of International Cooperation

Through its Representative and Liaison Offices Abroad

- Sino-German Center for Research Promotion in **Bejing** (2000)
- DFG offices in
  - **Washington/New York** (2002/2007)
  - **Moscow** (2003)
  - **New Delhi** (2006) and
  - **Tokyo** (15 April 2009)

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At the opening of DFG Office Japan in Tokyo

A representative office in **Vietnam** was established in 2008, and the DFG also works with liaison officers in Latin America (**Brazil** and **Chile**) and **Poland**.

Thank you for your attention

We are looking forward to continued international cooperation!

For more information

►on the DFG: **www.dfg.de/en/**; DFG Japan Office: **www.dfg.de/japan**

►on over 17.000 German research institutions :
http://research-explorer.dfg.de/research_explorer.en.html