US-German Bilateral Future – WS on April 20th 2012, Cincinnati

German Research Perspectives

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JENA GEOS Ingenieurbüro GmbH

Bauhaus-Universität Weimar

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Outline

1. Overview:
   Research Interests and Funding in Germany
2. Research Interests at the UFZ
3. Research Interests of JENA-GEOS®
4. Research Interests of Bauhaus-University

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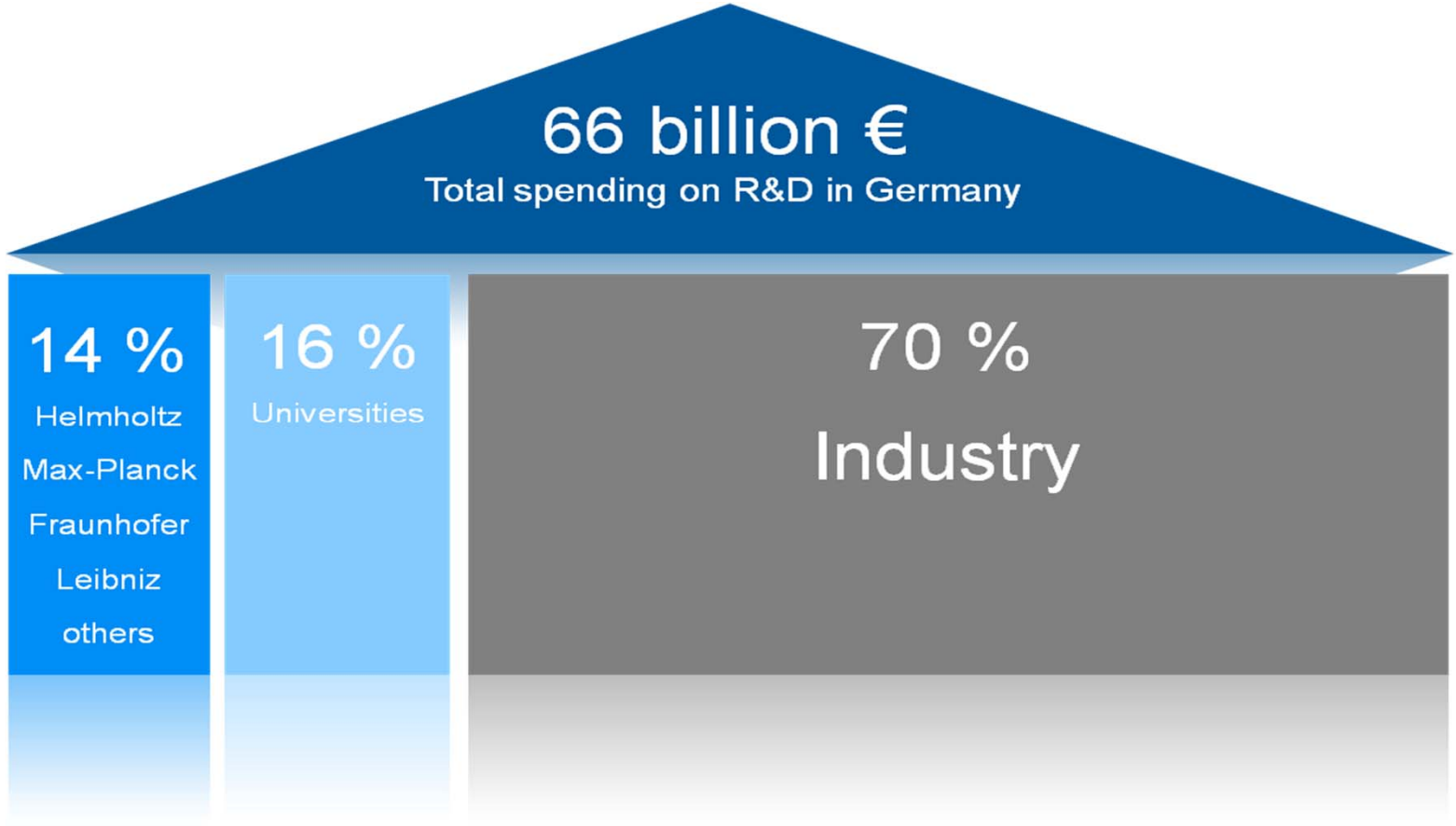
1 Research and its Funding in Germany

- Research in Germany:



1 Research and its Funding in Germany

- Scientific research: EU and national level are important
- Potentials for funding research cooperation with the USA within the 7th Framework Program of the EU (until 2013), call spring 2012
- National level: German Ministry for Education and Research, other ministries (Environment, Agriculture …)
- Bilateral funding programs

2 Research Interests at the Helmholtz Centre for Environmental Research – UFZ

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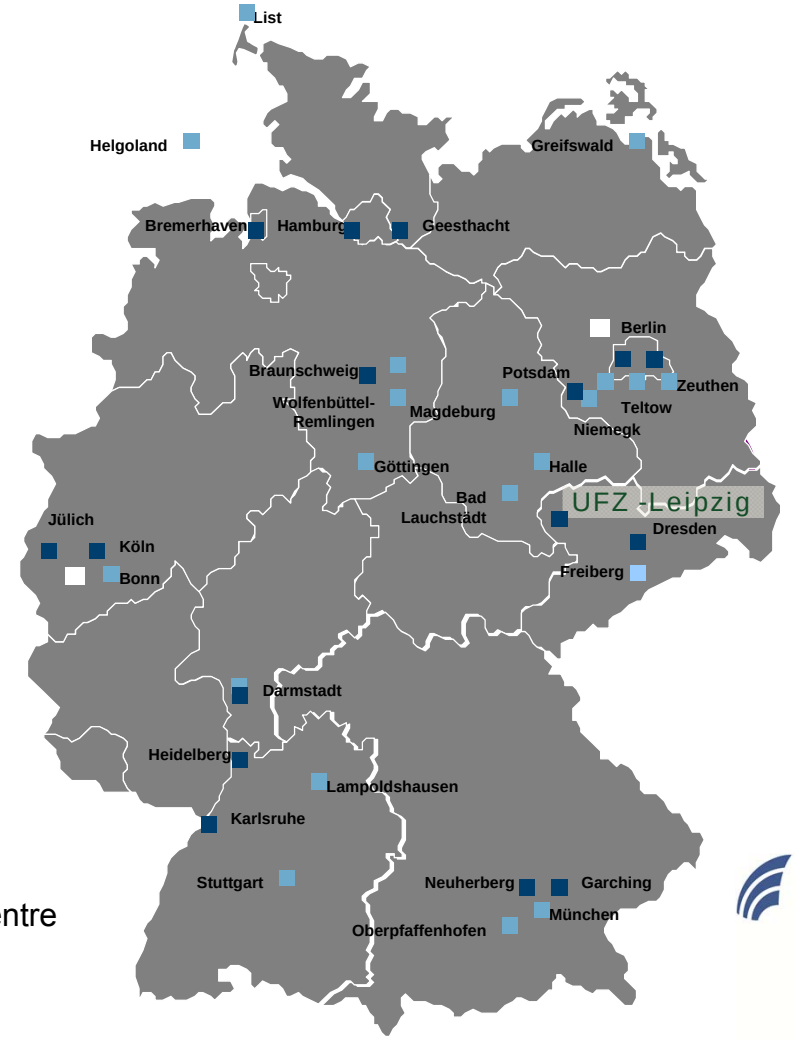
2 Helmholtz Centre for Environmental Research – UFZ within the Helmholtz Association

- UFZ: Part of the Helmholtz Association
- Focus on applied transdisciplinary research



Helmholtz Centres
Branch of a Helmholtz Centre
Helmholtz Head Office

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2 UFZ – Data and Facts

Personnel 2011

- > 1000 employees
- approx. 250 postgraduates and post-docs
- approx. 200 guest scientists
- approx. 70 trainees in eight different fields

Budget 2011

- € 60 mio from the Federal Ministry of Education and Research (BMBF) and the Federal States
- € 30 mio third party funding (e.g. Federal Government, EU, industry)
- € 10 mio large scale infrastructure

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2 UFZ within the Helmholtz Research Fields

Programme 1: **Renewable Energies**
UFZ: Biogas conversion, Geothermal Energy

Programme 5:
Technology, Innovation & Society
UFZ: Environmental system analysis

Programme 5:

Environmental Health

UFZ: Indoor health effects

Energy	**Earth & Environment**	Key Technologies	Structur of Matter	Health	Aeronautics, Space and Transport

Programme 4: **Terrestrial Environment**
UFZ: Land Use Options
Water Resources Systems
Aquifer Ecosystem Services
Chemicals in the Environment
Modelling and Monitoring Terrestrial Systems

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2 Focal points of UFZ research

Land use changes and ecosystem function

- How can the sustainable use of land resources be achieved in times of climate change, urban sprawl and declining biodiversity?

Analysis, protection, remediation and sustainable management of water resources

- How can water resources be secured in the long term?

Chemicals in environment and society

- How can the risk posed by chemical use on the environment and human health be minimized?
  Is the preventive use of chemicals a realistic goal to achieve?

Bioenergy and environment

- How can the increasing use of renewable energies – especially bioenergy – be made sustainable?

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2 Research at Helmholtz Centre for Environmental Research – UFZ

Transdisciplinary research on

- Climate and energy
- Land-use in urban areas (including remote sensing)
- Efficient resource-use
  (including non-conventional, water, soils)

Focusing on

- ➢ Science-policy-interface
- ➢ Evaluation of environmental impacts
- ➢ Integrative approaches

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3 Research Interests of JENA-GEOS®

3 Break away from sector-oriented remediation – through to integrated site development!

- Advancement of optirisk® (e.g. web-based tool)
- Use of international input and solutions (USA, Austria, Poland…)
- Increased implementation of the sustainability approach (e.g. sustainability certification for remediated sites)
- Improvement of tools (web-based) und GIS solutions (e.g. modeling of subareas with unit prices for clean-up/waste disposal)
- Implementation of site appreciation through energy potentials into the market value assessment

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3 Use of fallow site potentials for energy-efficient urban redevelopment

- Advancement of guide und tool ‚Old Sites – New Energy‘
- Advancement of tool ‘EPASch’
- Valuation of land competition and of stigmas in the frame of reuse of inner-city brownfields
- Implementation of inner-city brownfields into concepts for decentralized energy supply
- At inner-city brownfields with ecological hazards – adapting of remediation goals to specific energetic reuse (principle of proportionality)
- Site improvement through implementation of energy potentials into the market value assessment -> means of overcoming development constraints, inducement to clean-up/redevelopment

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3 Advancement and practical tests of innovative technologies

- Phytoremediation through bio-augmentation
- Short-rotation plantation / brownfields / intermediate uses
- ‚Bio-geothermics‘
- Use of TerraPreta, bio char, humic sand
- Geo-sensors (e.g. for geothermics, slides of embankments, etc.)

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4 Research Interests of Bauhaus-University

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4 Resource- & Energy-efficient neighborhoods (scale= quarter)

Conditions

- Land-use as condition for spatial & social cohesion
- Polarisation and co-existence of growth / shrinkage
- Target: Equal living conditions in post-growth society
- Awareness-raising activities (processual)
- Prevention of mono-structural development

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4 Resource- & Energy-efficient neighborhoods (scale= quarter)

Approaches

- Extension of integrated urban development concepts
- Merging existing technologies with land use definitions
- Stimulation of compact forms versus suburbanization
- Balanced + intergenerational mobility concepts (equity) and integrated neighborhood concepts (ISEK)
- Re-scaling of energy provision (e.g. combined heat and power unit CHP)
- Certification systems towards urban social environment

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4 Resource- & Energy-efficient neighborhoods (scale= quarter)

Existing Programs / Projects

- **EQ**: Requirements for energy-efficient and climate-neutral neighborhoods
  (BBSR with DSK et al.: 6 model quarters)

  Goal: integrated Neighborhood concepts related to energetic urban rehabilitation to fulfill the 2020 and 2050 climate objectives (EU-20-20-20)
- **URB.Energy**: Energy Efficient and Integrated Urban Development Action (German Association for Housing, Urban and Spatial Development DV e.V. et al.)

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4 Resource- & Energy-efficient neighborhoods (scale= quarter)

„**MoMo**“ (Prof. Dr. Londong)
Integrated water ressources management ←→ adaption strategies for demographic and climate change

„**KREIS**“(Prof. Dr. Kraft)
Demonstration project „Neighborhood Jenfelder Au“ (Hamburg) – coupling regenerative energy production with innovative urban draining (decentralized)

„**FOGEB**“(Prof. Dr. Ruth)
Forschungsvorhaben Green Efficient Building

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Thank you for your attention!

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