Sustainable technologies created with Fraunhofer™
- an initiative of Fraunhofer

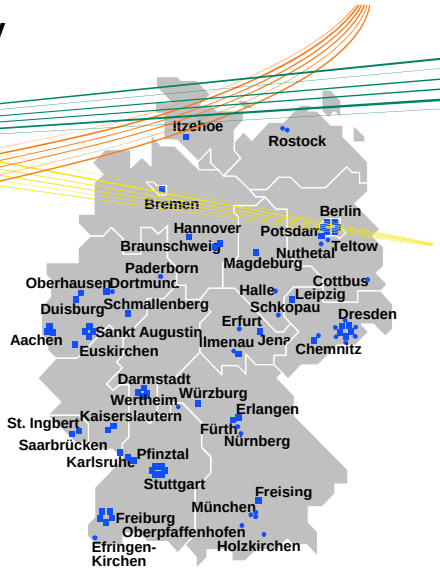
Fraunhofer Gesellschaft

5. BMBF Forum für Nachhaltigkeit

Berlin, 24. September 2008

Fraunhofer-Gesellschaft in Germany

56 Research Institutes
13 400 employees
about €1,4billion
research budget



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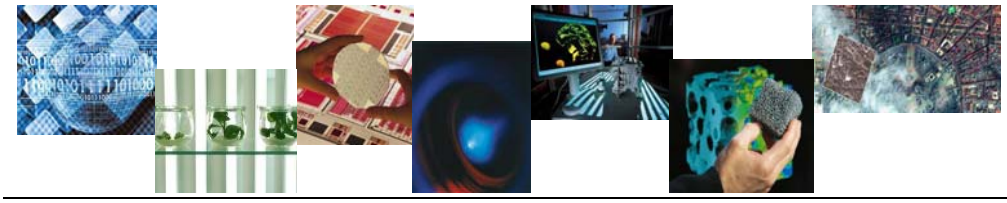
Fraunhofer Profile in 2008

7 thematic Alliances

- Information and Communication Technology
- Life Sciences
- Materials and Components
- Microelectronics
- Production
- Surface Technology and Photonics
- Defense and Security



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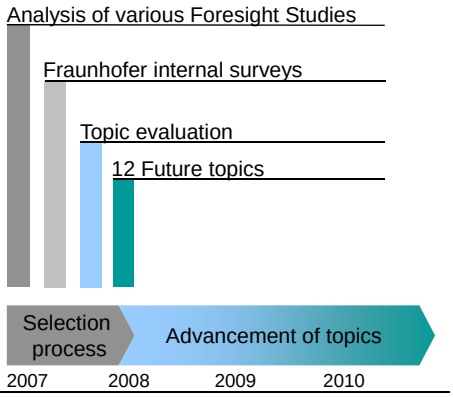
Fraunhofer future research topics - selection process

Converging technologies and increasing complexity of the challenges demand interdisciplinary approaches in R&D

➔ every 3 years Fraunhofer conducts an internal foresight process to identify Fraunhofer-specific future research topics, which:

- focus on macro trends and future societal needs
- face ambitious R&D-challenges until market implementation
- promise a dynamic contract research market in the near futures
- require significant cross domain Fraunhofer competencies
- offer a window of opportunity now to advance the topic



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Fraunhofer topics for future lead markets

Assisted personal health..... **The electronic guardian angel**
Bio-functional surfaces..... **High tech with a sensitive skin**
Food chain management..... **Always fresh on the table**
Decentralized integrated water management..... **Saving precious water**
Energy-efficient modernization..... **More than just a facade**
Solid-state light sources..... **Bright and efficient illumination**
Energy storage in power grids..... **Solar and wind-generated electricity on demand**
Green powertrain technologies..... **New impetus for eco-friendly cars**
Energy self-sufficient sensors and sensor networks..... **Vigilant clusters**
Visual analytics..... **A clear overview in the data jungle**
Hybrid material structures..... **Combining the best of the best**
Integrated localization technology..... **Quick and safe on the move**

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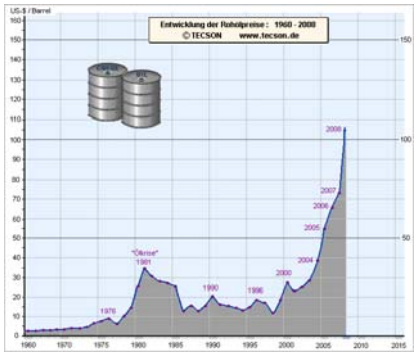
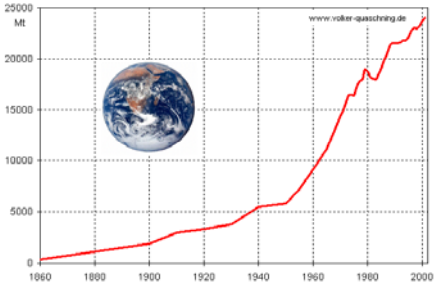
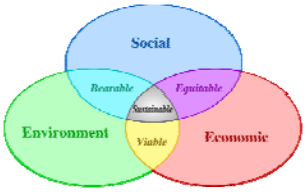
Drivers for sustainable development

- Growing population
- Increasing energy prizes
- Scarcity of resources
- Climate change







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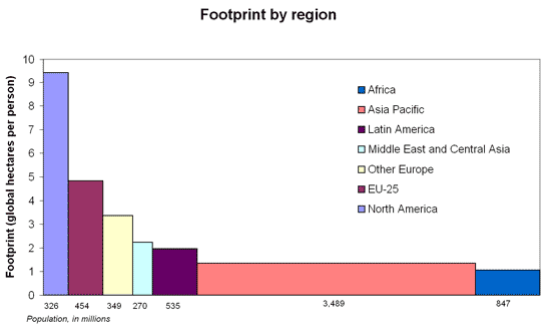
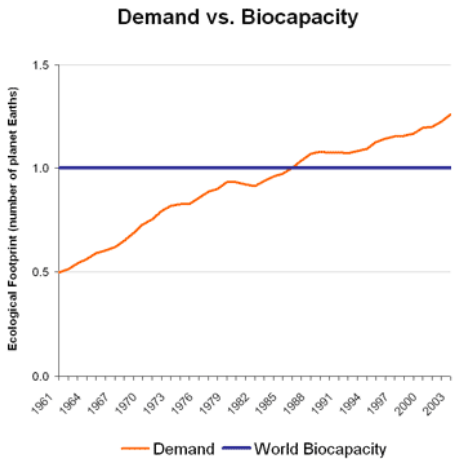
jl1

Humanity`s Ecological footprint 1960 - 2003





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EU Sustainable Development Strategy until 2010

- Climate change and clean energy
- Sustainable transport
- Sustainable consumption & production
- Conservation and management of natural resources
- Public Health
- Social inclusion, demography and migration
- Global poverty and sustainable development challenges

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Folie 7

jl1 johanna leissner; 24.09.2008

Communication of the EU Commission 16 July 2008

"Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy"

- eco-design
- standards for a wider range of products
- improved energy and environmental labelling
- incentives rewarding eco-friendly products
- green public procurement
- work with retailers and consumers
- support to eco-innovation and environmental industries
- action to promote **sustainable industry and production internationally**

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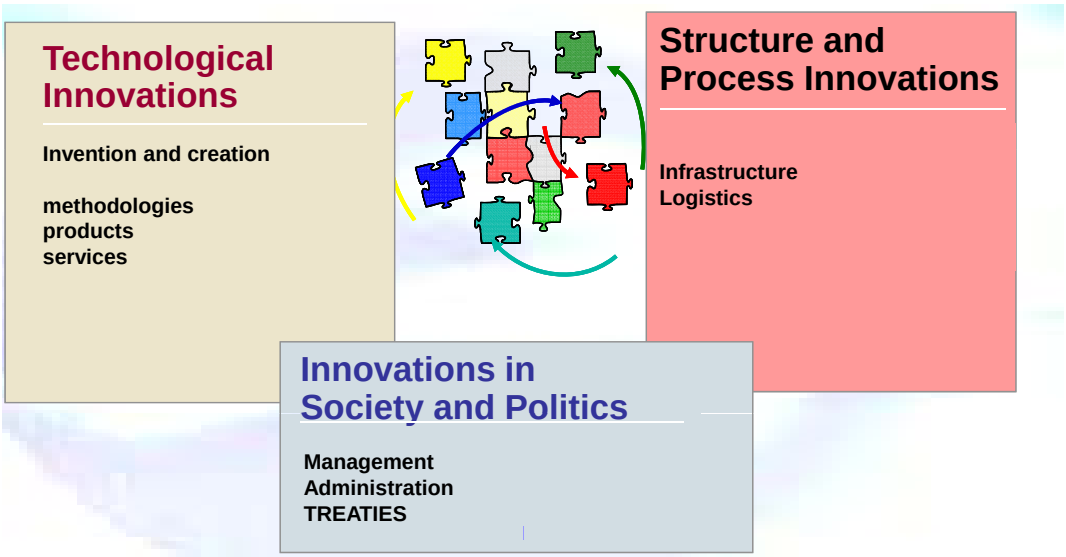
Meeting the needs of today: Only one Earth, don`t waste it!

With Innovations towards Sustainability and Lisbon goals



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Fraunhofer Future Topics (I)

Decentralized integrated water management -

Saving precious water

UN Millennium–Development Goals aim at securing
- access to safe drinking water
- basic sanitation

Fraunhofer: Development of innovative technologies to
- reduce water consumption
- achieve wastewater concepts

Example:
Decentralized water management system »SysWasser«
➔ a cost- and energy efficient solution for water treatment

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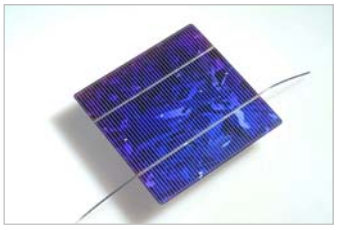
Fraunhofer Future Topics (II)

Energy storage in power grids -

Solar and wind-generated electricity on demand



The need for renewable resources is increasing.

Problem: feed-in to the grid depends on
- weather
- time of day

Fraunhofer develops
- cost-effective
- eco-friendly

solutions for storing and managing energy.

Example: energy reservoirs based on lithium technologies

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Fraunhofer Future Topics (III)

Green powertrain technologies -

New impetus for eco-friendly cars

Tomorrow's cars must respond to a variety of needs:

- Resource efficient production
- Eco-friendly usage
- Low maintenance

Fraunhofer improves the power train.

Example: use of various lightweight materials to develop a low energy motor & light weight steering units.

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Fraunhofer Future Topics (VI)

Energy-efficient modernization -

More than just a facade

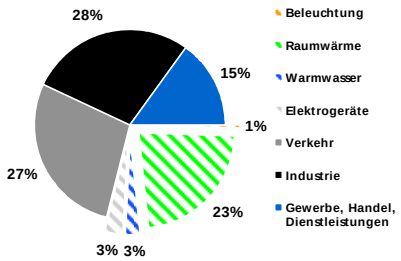
- 40% of energy consumed in Europe goes into temperature regulation in buildings
- Up to 80% of this energy could be saved through modernization

Fraunhofer: Development of multi-functional facade modules;

an easy, energy-efficient and cost-effective means of

➔ modernizing buildings

➔ reducing CO2 emissions.



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Sustainable technologies for cultural heritage –

Fraunhofer research alliance with research museums of
the Leibniz Association and the Stiftung Preußischer Kulturbesitz

Topics
Impacts of climate change and energy efficiency
of historic houses

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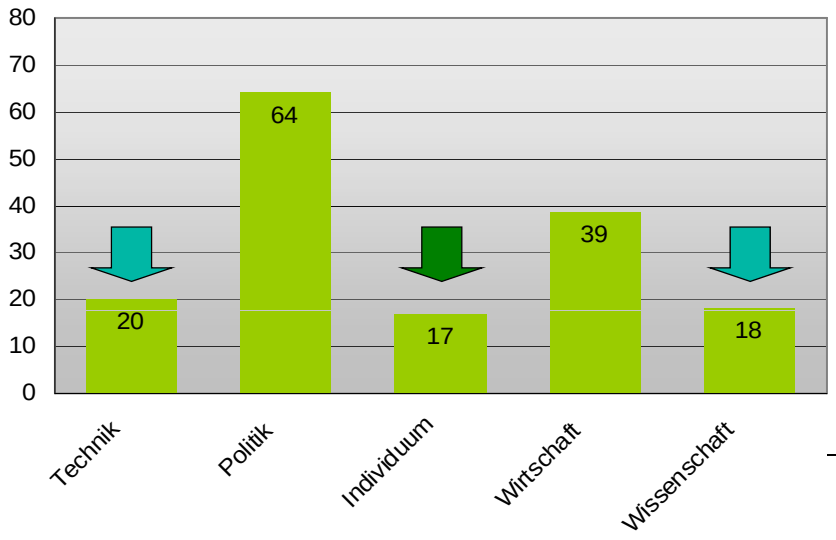
Sustainable development needs Innovation needs Research

Initiative – Sustainable technologies created with Fraunhofer

- May 2007 _ German EU Presidency Conference and 4th BMBF FONA Forum – Leipzig Declaration signed by Fraunhofer, Max-Planck, Helmholtz and Leibniz
- December 2007 – establishment of the Fraunhofer Working Group „ Sustainability and Research“
- Fraunhofer`s focus is applied research - main customers are industry and SMEs
- Sustainable development requires solutions for highly complex processes
- Highlighting better the contribution and responsibility of Fraunhofer for sustainable development

Who speaks and how often about Sustainability



Schwender, Jacobs
University Bremen

RESULTS OF DOW JONES SUSTAINABILITY INDEXES REVIEW – 04 September 2008

The new 2008/2009 super sector leaders

- **adidas** (Personal & Household Goods)
- Air France-KLM (Travel & Leisure),
- **BASF** (Chemicals), **BMW** (Automobiles), BT Group (Telecommunications)
- ENI (Oil & Gas), Grupo Iberdrola (Utilities),
- Holcim (Construction & Materials)
- Intel (Technology), Investimentos Itau (Financial Services)
- Kingfisher (Retail), Land Securities (Real Estate)
- Novartis (Health Care), Pearson (Media), Swiss Re (Insurance)
- **TNT** (Industrial Goods & Services),
- Unilever (Food & Beverage), and Xstrata (Basic Resources).