

WORKING TOGETHER FOR SUCCESS

An Introduction to Fraunhofer

ITIF Lunch Briefing

October 18, 2011. Washington D.C.

Dr. William F. Hartman, Dr. Anke Hellwig

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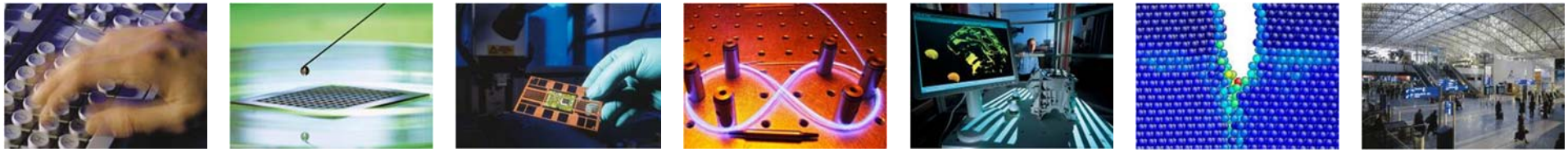
Fraunhofer Profile 2011



non-profit

60 Institutes

18,000 employees

1.65 billion € budget

\+ subsidiaries abroad

7 Groups:

- Information and Communication Technology
- Life Sciences
- Microelectronics
- Light & Surfaces
- Production
- Materials and Components
- Defence and Security

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“Markets Beyond Tomorrow“



- Starting from the global social challenges that have to be faced, Fraunhofer examined its portfolio across all of its Institutes, in a process that identified five future issues which can be expected to create growth markets and require considerable research:
  - Low-loss generation, distribution and use of electricity.
  - Affordable health.
  - Recycling of materials in production.
  - Low-emission, reliable mobility in urban areas.
  - Disaster prediction and management.
- Fraunhofer offers integrated solutions for these ”Markets Beyond Tomorrow” and aims to be the technology leader on the European research landscape.

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Industry – Science Research Alliance



Dr. Manfred Wittenstein, Staatssekretär Dr. Georg Schütte, Prof. Dr. Michael Baumann, Prof. Dr. Wolfgang Wahlster, Prof. Dr. Dr. Andreas Barner, Parlamentarischer Staatssekretär Thomas Rachel, Dr. Andreas Kreimeyer, Parlamentarischer Staatssekretär Ernst Burgbacher, Prof. Dr. Hans-Jörg Bullinger, Prof. Dr. Henning Kagermann, Dr. Johannes Helbig, Dr. Arend Oetker, Prof. Dr. Jürgen Mlynek, Prof. Dr. Gisela Lanza, Dorte Höppner, Prof. Dr. Matthias Kleiner, Prof. Dr. Dr. Jörg Hacker, Prof. Dr. August-Wilhelm Scheer and Dr. Thomas Weber

- Federal Research Minister Schavan established the Industry - Science Research Alliance in 2010, in order to promote closer links between knowledge and skills related to research and innovation.
- Its members, leading representatives from science, industry and politics discuss potential strategies for strengthening Germany as a high-tech location. They are responsible for accompanying the implementation of the High Tech Strategy.

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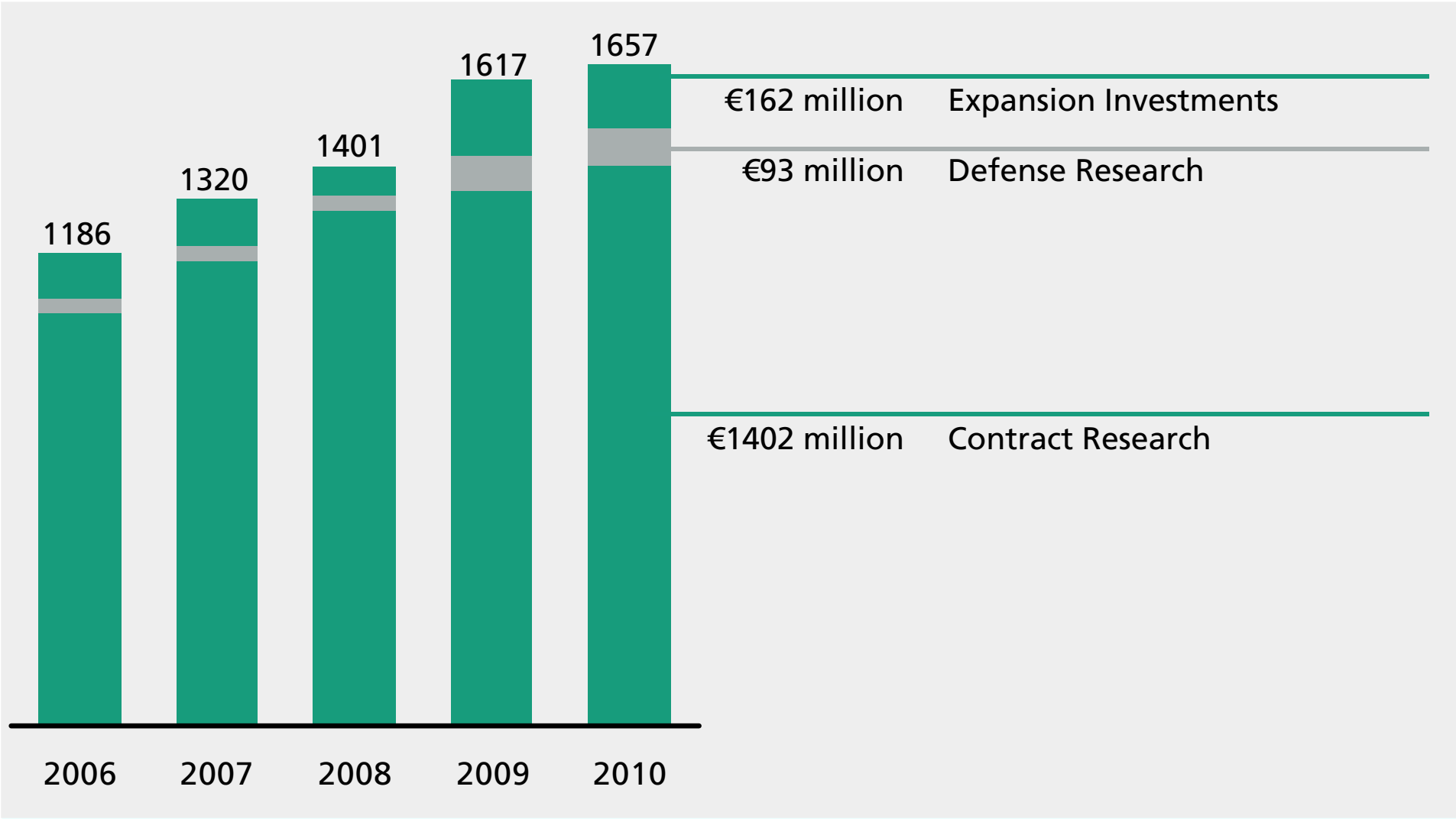
Financial Structure of the Fraunhofer-Gesellschaft

(million euros)



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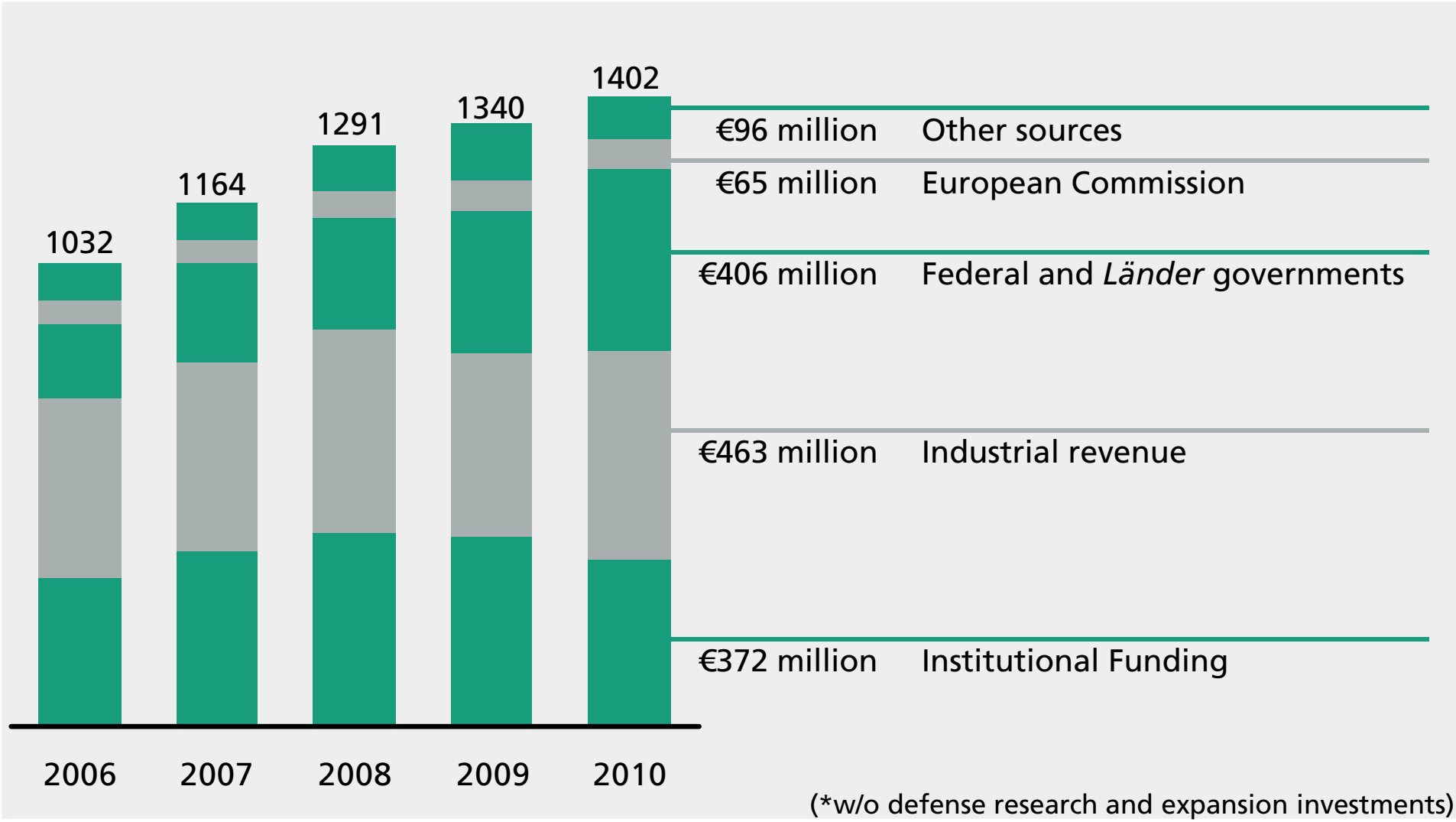
Key financial figures

Contract research budget* (Mio €)



(*w/o defense research and expansion investments)

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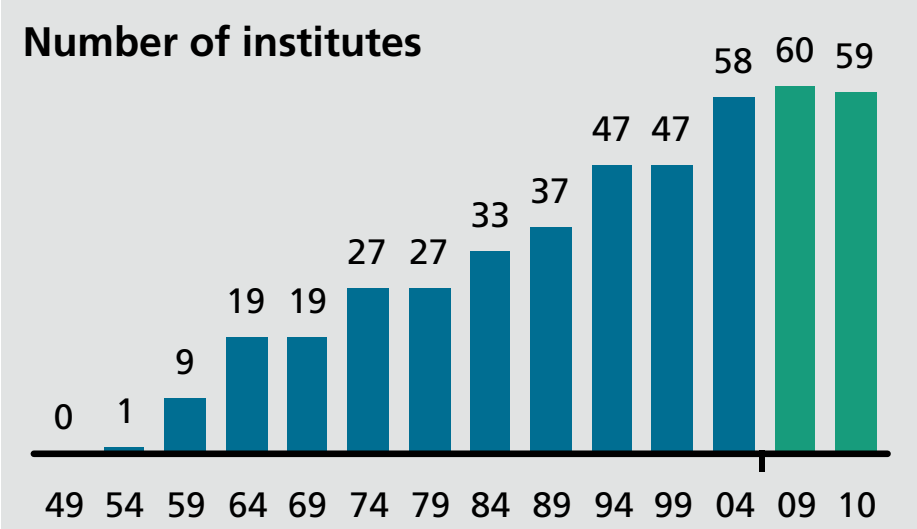
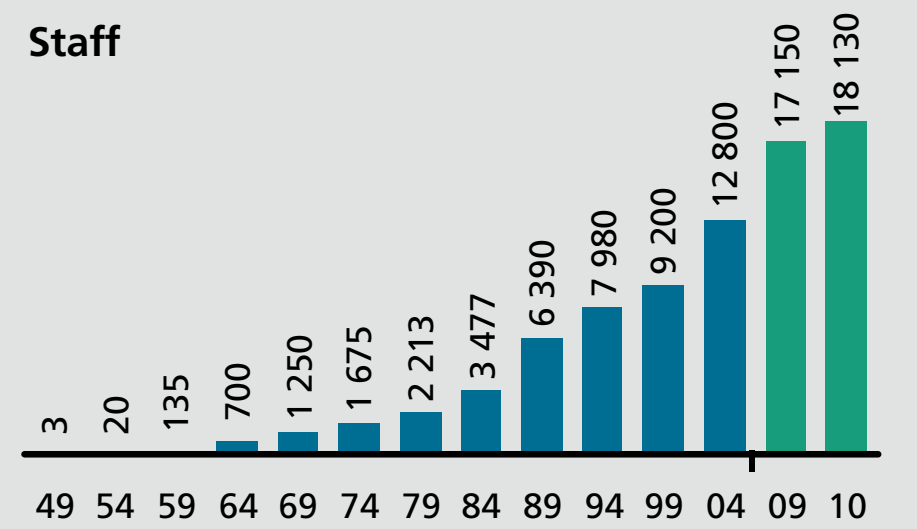
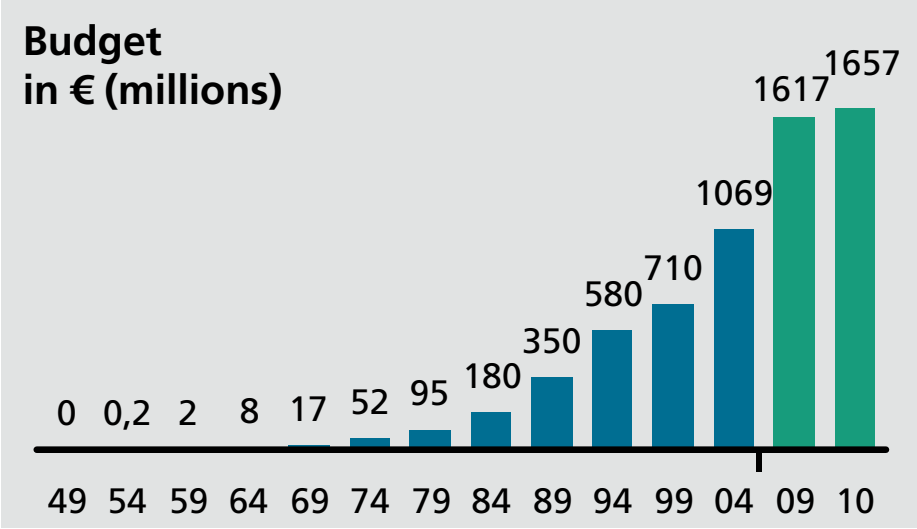
From a small association to the leading organization for applied research in Europe







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Example of Groundbreaking Inventions

mp3 - a Fraunhofer innovation



Research creates value: The mp3 technology led to the creation of 9,000 jobs and generates annual tax revenue of about € 300 million.

Fraunhofer IIS

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Example of Cooperation with SME: Low Fat Sausage

- Challenge: reduce fat content without compromising the flavor
- Solution: tightly temperature controlled mixing and cutting process, release more proteins.
- Idea came up at a family owned butcher shop. Butcher experimented with different ingredients but did not achieve results of consistent high quality.



- Fraunhofer had the necessary processing experts, professional equipment and upscaling know-how.
- Result: low fat sausage with less than 3% fat.
- Today the sausage is part of the product portfolio of a major German supermarket chain. License revenues are invested in new R&D programs.

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Cooperation between Universities and Fraunhofer

Institutional integration by dual appointment:

Fraunhofer Institute Director = University Professor (Chair)

Fraunhofer Institute

- access to basic research
- recruitment of junior scientists
- recruitment of students (interns, undergraduates)
- opportunities for employees to gain scientific qualification (doctorate, professorship)

University Chair

- cooperation in industry-oriented projects; opportunities for interns, under-graduates and graduates to gain practical experience
- integration of practical applications into the curriculum
- access to cost-intensive equipment

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Fraunhofer in a nutshell

- professional R&D services to industry
- demand driven research combined with scientific excellence
- strong integration with academia
- autonomy of institutes combined with simple corporate rules and strong brand

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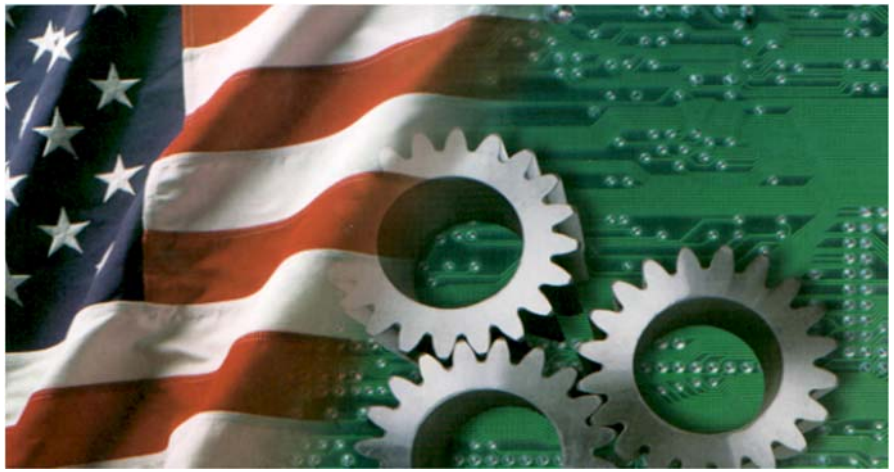
Fraunhofer in the USA



Fraunhofer USA is a non-profit U.S. corporation performing applied research in several emerging technologies. We work with university partners and provide a bridge from innovation to commercialization. Our projects are funded by industry, governments, and private donors.

By combining the culture of German engineering with the entrepreneurial spirit of US high-tech communities, we provide important expertise in the critical early stages of a new technology.

International exchange and collaboration by Fraunhofer in applied research contributes to the economic development and competitiveness of industrial society.

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Overview of Fraunhofer USA

200 employees, $50 million budget, 9 locations in 5 States

Leading Centers of Applied R&D

- Translational research
- Dual-Use research for government
- Consortia building that benefits entire industries

Business Oriented Operation

- >75% of budget comes from earned income
- Centers are managed as profit centers
- Spinoffs and licensing are business objectives

Providing a Public Service

- Provide applied R&D for organizations at subsidized rates
- Educate next generation of applied scientists and engineers

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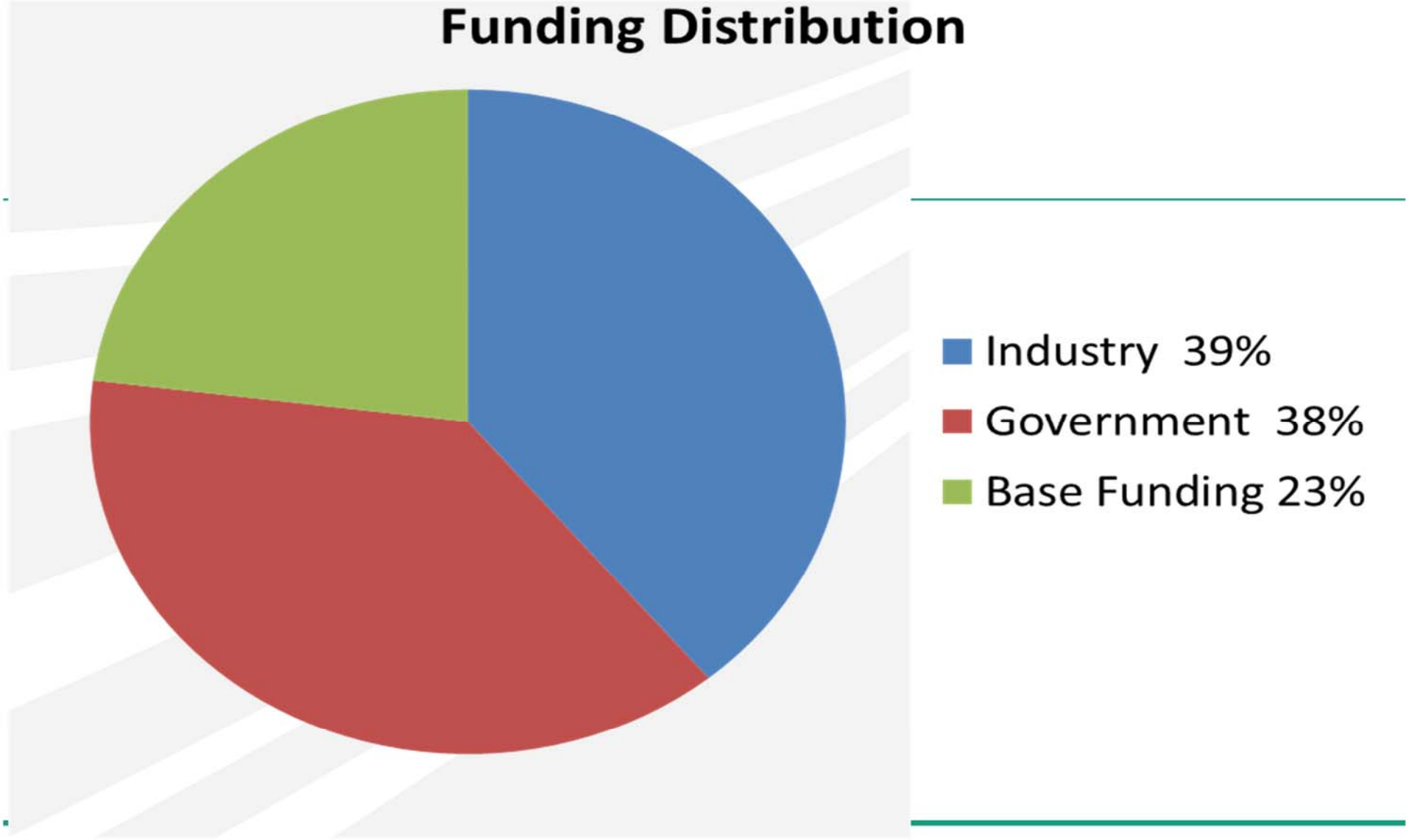
Funding Sources



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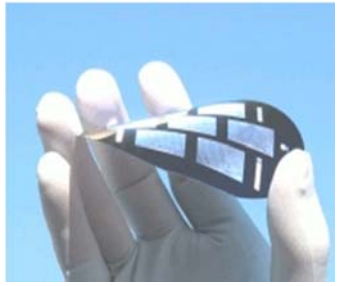
Fraunhofer USA – 2011

- CLT Laser Technology, 1994
- CMI Manufacturing Innovation, 1994
- CCL Coatings and Laser Applications, 1994
- CESE Experimental Software Engineering, 1999
- CMB Molecular Biotechnology, 2001
- DMT Digital Media Technologies, 2007
- CSE Sustainable Energy Systems, 2008
- HHI Imaging for Medical and Security Technologies, 2011





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Profile 2011

U.S. Universities as partners and Collaborators:

- Michigan State University
- Boston University
- Massachusetts Institute of Technology
- University of Maryland
- University of Michigan
- Johns Hopkins University
- University of Delaware

Collaborations with 15 Fraunhofer Institutes

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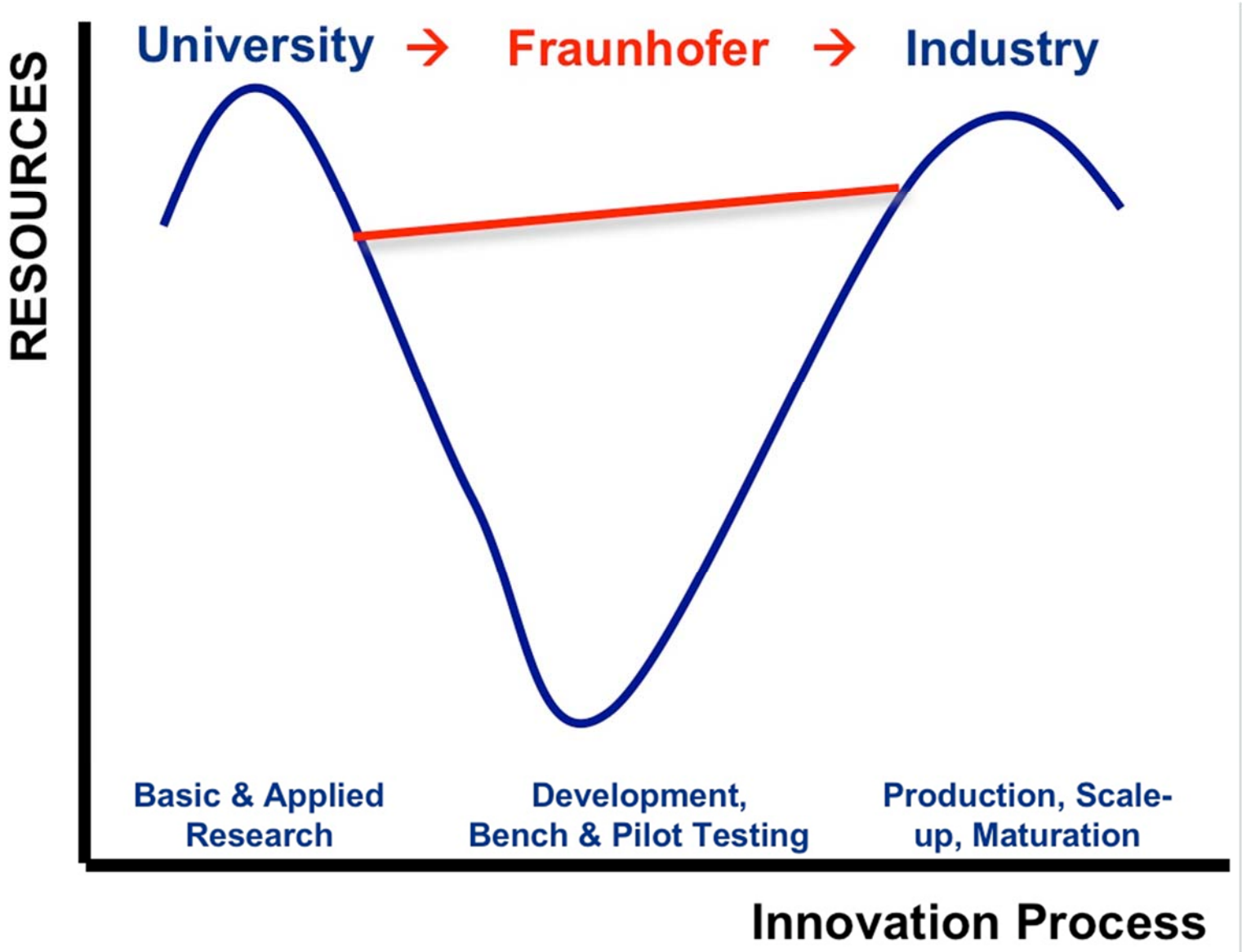
“Bridging the Gap”



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TECHBRIDGE™

The Fraunhofer TechBridge is a program designed to identify, assess and facilitate the commercial deployment of innovative technologies by bringing together researchers, entrepreneurs and investors.

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Example of Enhancing Competitiveness

Innovative Vaccine Factory



- Working together CMB and CMI developed a fully automated, scalable “factory” that uses natural green plants to efficiently produce large quantities of vaccines within weeks. The factory’s robotically -tended machines plant seeds, nurture the growing plants, introduce viral vectors that direct the plant to produce target proteins and harvest the resulting biomass.
- Industrial partner I-Bio commercializing

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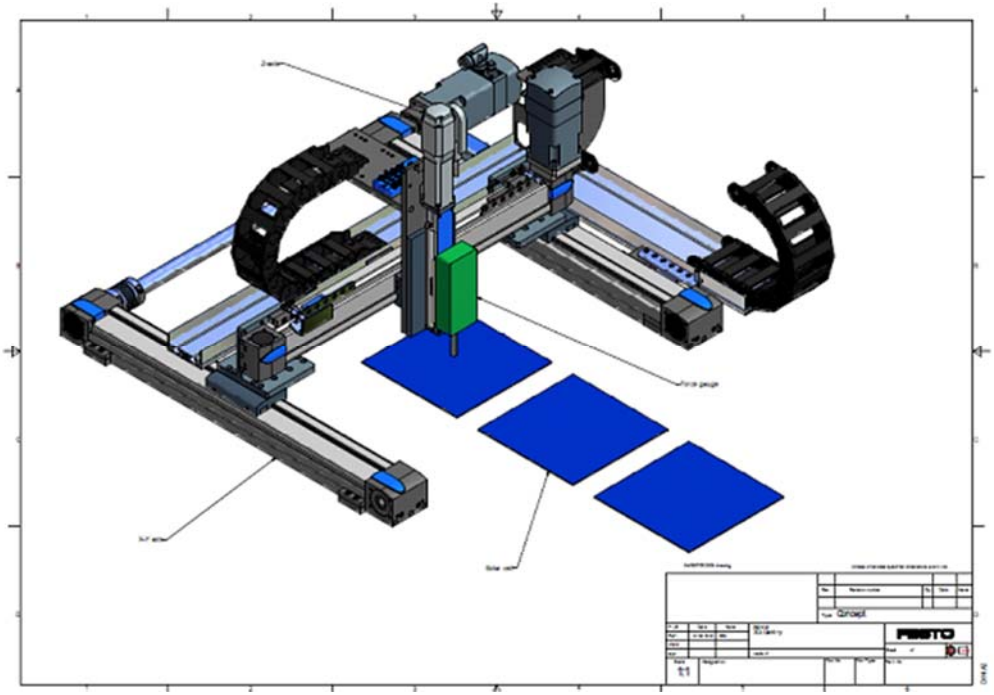
Example of Enhancing Competitiveness Photovoltaic Module Production Tool





John Lloyd, CSE Intern developing Quality Assurance In-Line Non-Destructive PV Module Metrology Tool. Will provide **$200M in revenue** opportunities for US licensee. **Base funding cost: $172,000.**

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Fraunhofer Leads Public-Private Industrial Consortia

Building Energy Efficiency Group Recognized as Leading Research Organization

- High-Performance Energy Efficiency Residential Retrofits
- $19.5M project for 3 years





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A Key to Competitiveness

Successful competitiveness in business results from distinction of functionality and/or cost

Distinction results from innovation

Innovation requires imagination and ability

Therefore encourage imagination and improve ability

THINK OUT OF THE BOX AND ALWAYS LEARN

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