

“Financing risk in public research organizations: the German experience with particular focus on Fraunhofer”

EXPERT SEMINAR: “FINANCING HIGH-RISK INNOVATIVE PROJECTS”
Minsk, Belarus, 11 July 2012

Structure of Presentation

1 **Introducing Risk: Fraunhofer Lessons from Restructuring the German Research System after Re-unification**

2 **Risk, Incentives, and Commercialization**
The Fraunhofer Business Model
Good Practice Example: Fraunhofer Venture

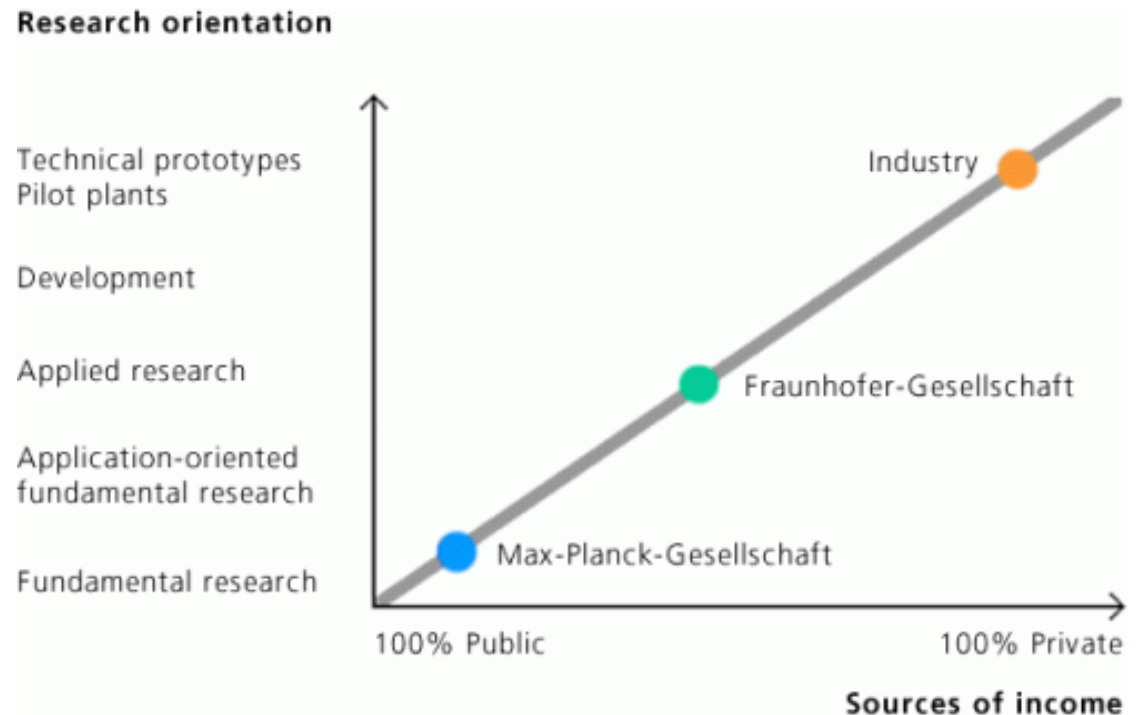
3 **Managing Risk: Internal Programmes**

4 **Conclusion: Key Messages**

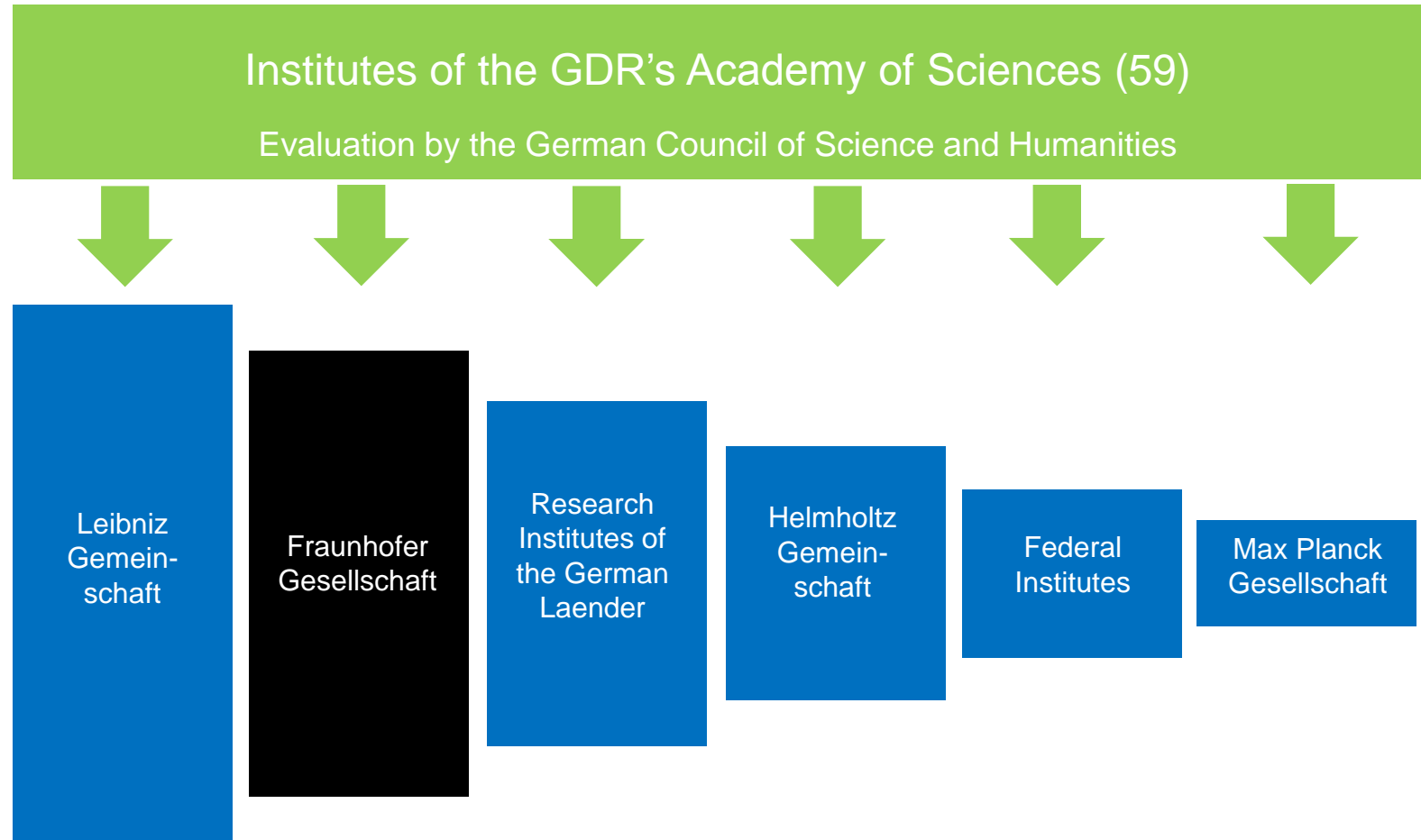
Fraunhofer within the German Research System

- Fraunhofer operates in a dynamic equilibrium between application-oriented fundamental research and innovative development projects

- Research output must be market and customer oriented



Restructuring of the German Research System



Restructuring of the German Research System

Strengths

Excellent scientific basis

Highly qualified research staff, esp. in natural and engineering disciplines

Distinct creativity concerning the development of alternative technological solutions

Weaknesses

Serious deficit concerning endowment and thus effectiveness of research

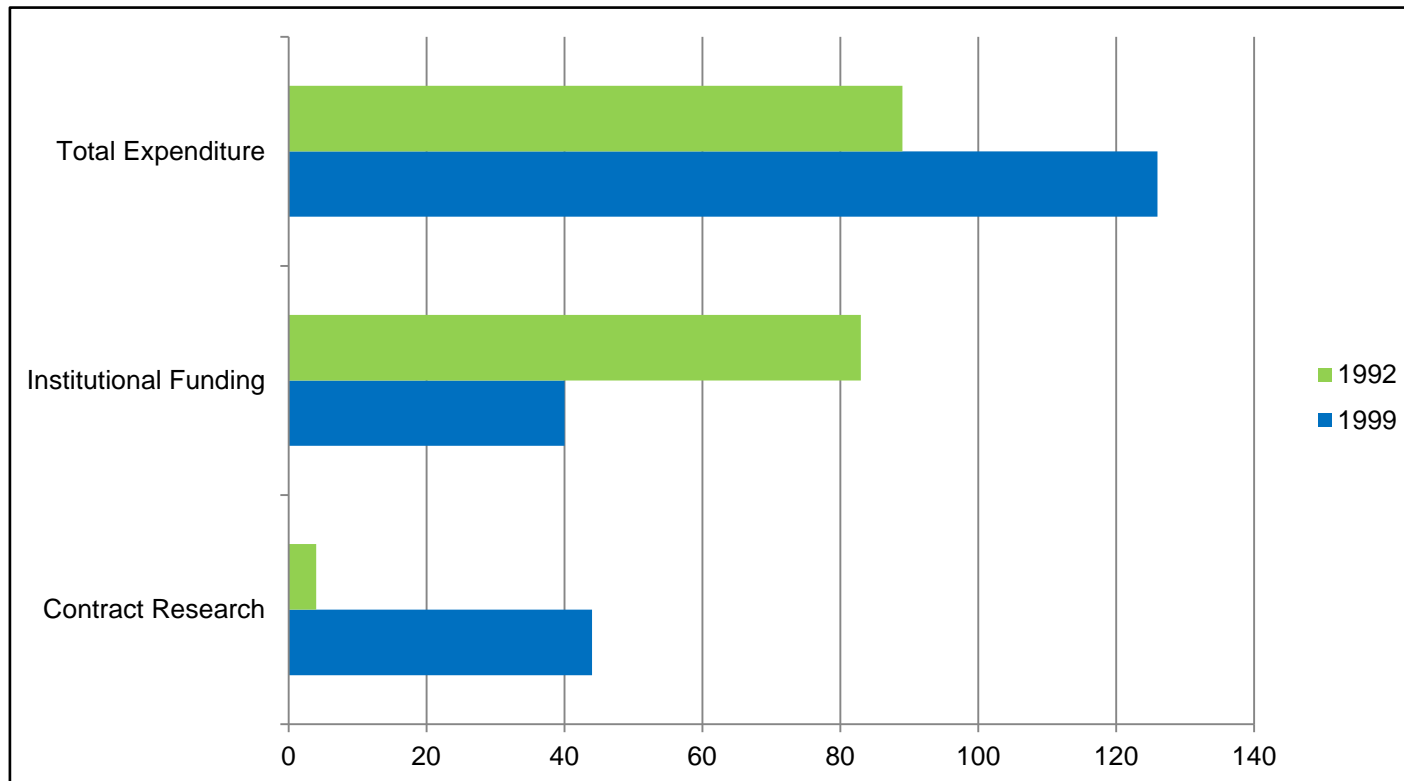
Lack of access to high technologies compared to Western standards

Challenges for Fraunhofer

- ▶ Estimation of integration capacity of AoS Institutes into the Fraunhofer portfolio
- ▶ Estimation of development perspective for significant industrial contract research

Financial Structure of New Fraunhofer Institutes

Financial Structure of new Fraunhofer Institutes (Mio. €)

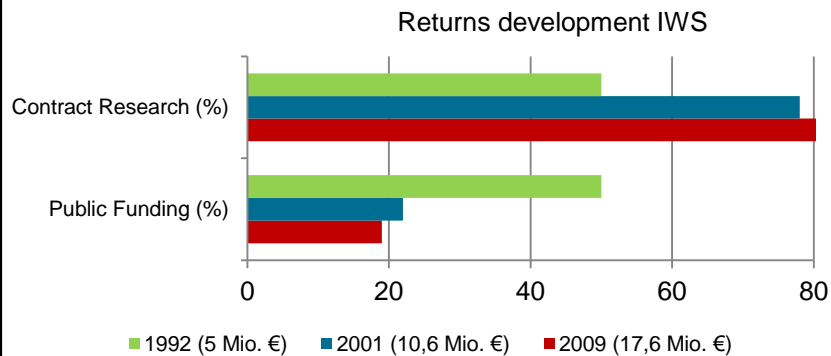


Source: Fraunhofer Annual Report 1999

Integration of GDR's Academy Institutes: Success Stories

Fraunhofer Institute for Material and Beam Technology (IWS), Dresden

- ▶ IWS has followed from the Academy of Sciences in 1991
- ▶ Worldwide renown for excellence in laser and surface technology



▶ Staff: 180 (2001); 279 (2009)

Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), Jena

- ▶ Leading Position in international research landscape
- ▶ Development of optical systems for future technology areas such as energy, environment, health, security, information and mobility

▶ Jena always was a center for optical technologies (Zeiss, Jenoptik, etc.)

▶ Strong ties to regional, national and international industry partners

▶ 90 % contract research, 10 % public funding (2008)

▶ Staff: > 200 (2009)

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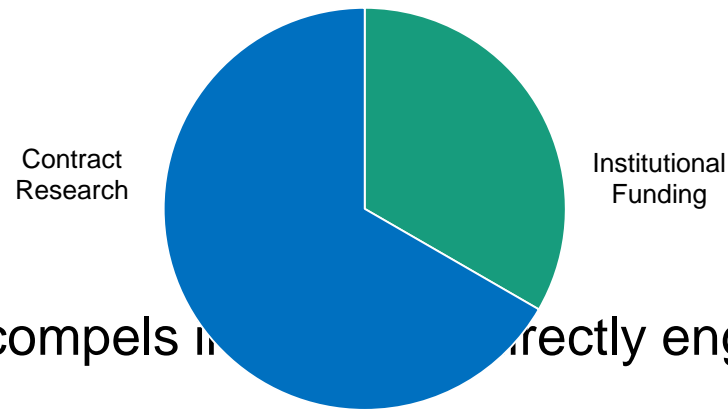
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The Fraunhofer Business Model

Performance-related funding model of Fraunhofer-Gesellschaft

Due to “applicability” Fraunhofer gains high share of contract funding

- Institutes' Funding: 1/3 institutional funding, 2/3 contract research



- Business model compels institutes to directly engage with the private sector

General Terms and Conditions for Research and Development contracted to Fraunhofer-Gesellschaft

“Fraunhofer-Gesellschaft pursues exclusively and directly non-profit objectives, conducting contractual research in the field of applied research and breaking new ground in doing so. The following General Terms and Conditions reflect the nature of these objectives. (...)

7. Liability

7.1 Fraunhofer-Gesellschaft shall be responsible for applying scientific care and for complying with accepted scientific standards but not for actually achieving the research and development goal.

(...)

Risk, Incentives, and Commercialization of Research Findings

Fraunhofer Venture - Overview

- Fraunhofer actively encourages researchers to found their own companies
- Fraunhofer Venture was founded in 1999
- More than 120 Fraunhofer spin-offs, 37 successful technology transfers, 70 Fraunhofer investments, know-how with more than 4.500 patent families
- Provides professional backing for the spin-off activities by offering consulting services, such as:
 - Development and optimization of business plans
 - Selection of the legal corporate form
 - Drafting of contracts
 - Search for financing, research and industrial partners
- Fraunhofer might even offer part of the seed investment

Risk, Incentives, and Commercialization of Research Findings

Fraunhofer Venture - Instruments

- Operates primarily before actual founding of company
- Target group: researchers of Fraunhofer institutes who developed innovative and profitable products or services
- Starting point: innovations stemming from Fraunhofer research
- Financing: 2 support programs
 - FME: pre-founding funding to formulate business plan
 - Up to 150.000 € per project (up to 3 employees for up to 1 year)
 - FMM: pre-founding support through dedicated external managers
 - Chosen jointly by entrepreneurs and FV
 - Duties: demand analysis, production planning, PR, ...
 - Possibility to become executive director after founding

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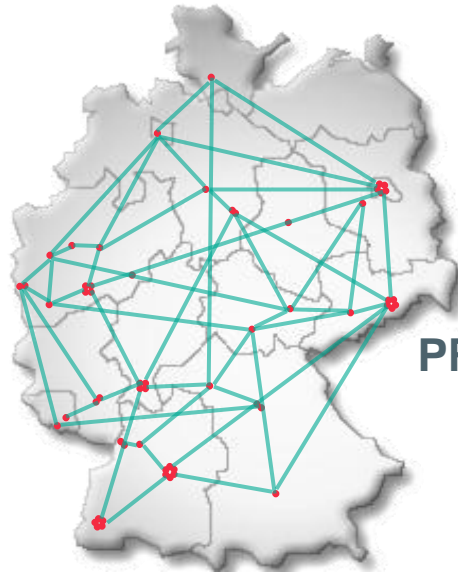
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FRAUNHOFER INTERNAL PROGRAMS

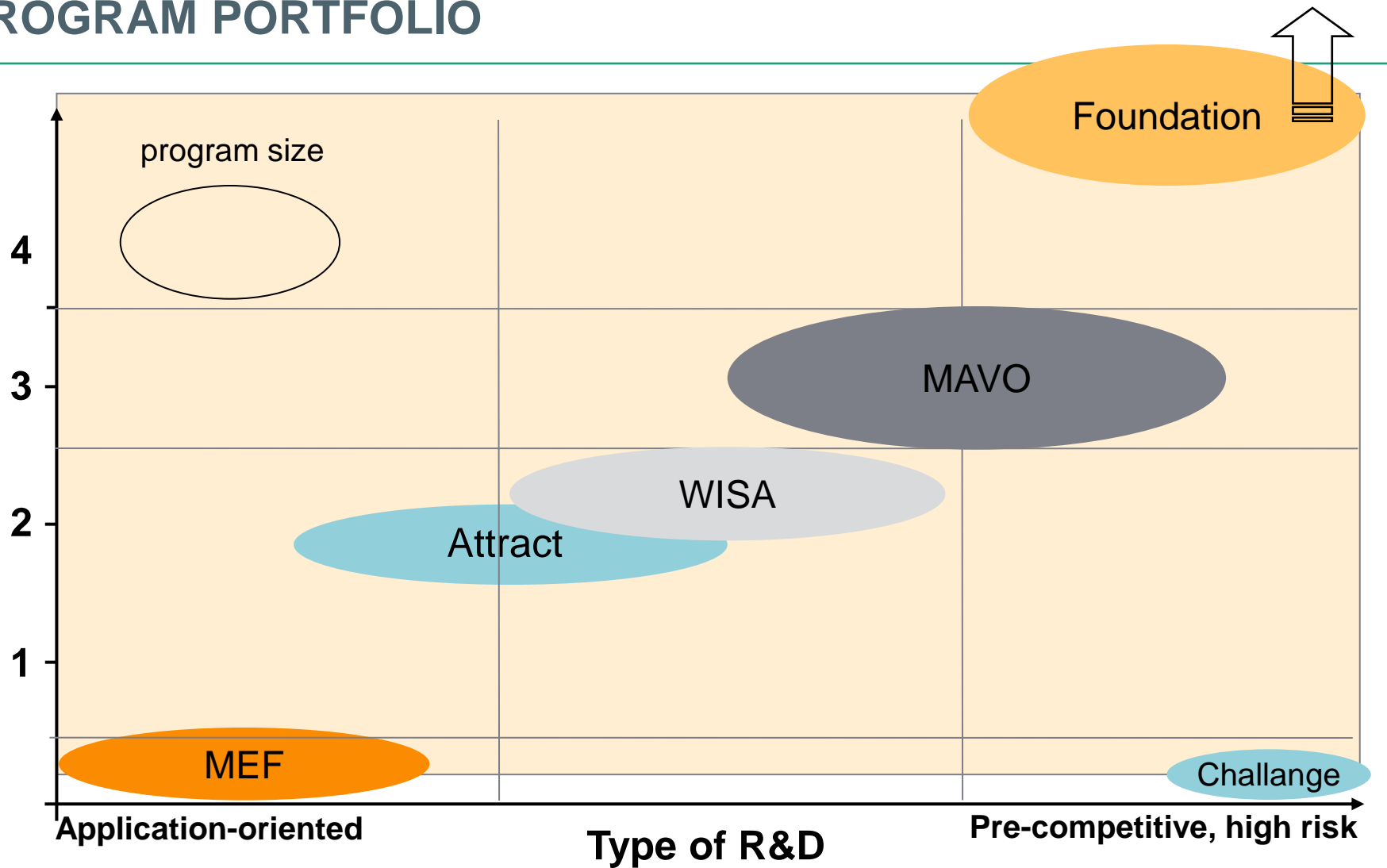


- GOALS**
- finance of risky/ early stages projects
 - open up new R&D markets
 - assure leadership in strategic fields
 - promote cooperation

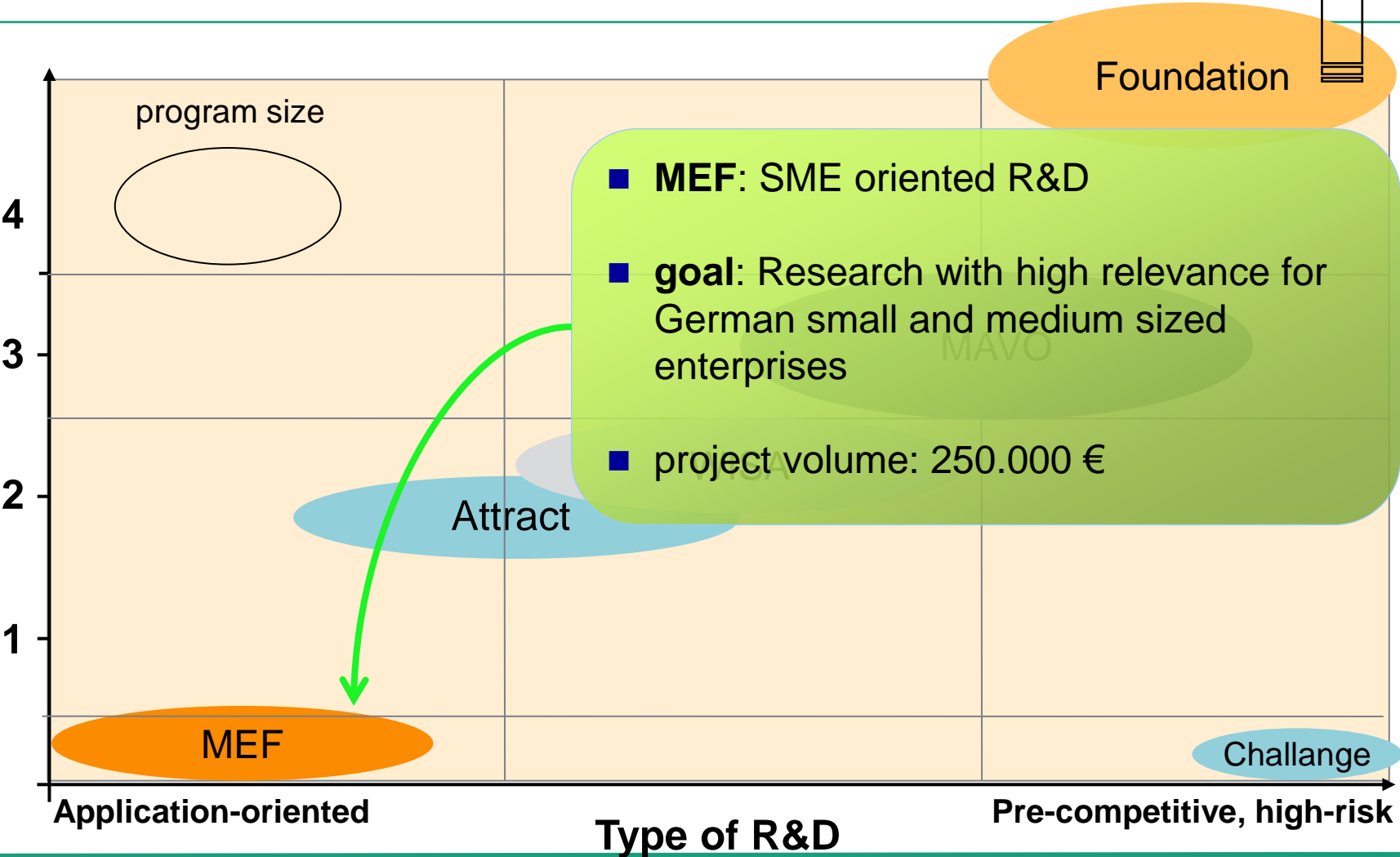
- GENERAL PRINCIPLES**
- The Executive Board funds R&D projects
 - Fraunhofer institutes generate extra RoI
 - Internal Programs are organized as funding competition with fair and transparent rules
 - High-risk projects are possible
 - central quality assurance

BUDGET \approx 9% of institutional funding
(WISA,MAVO,MEF, Attract)

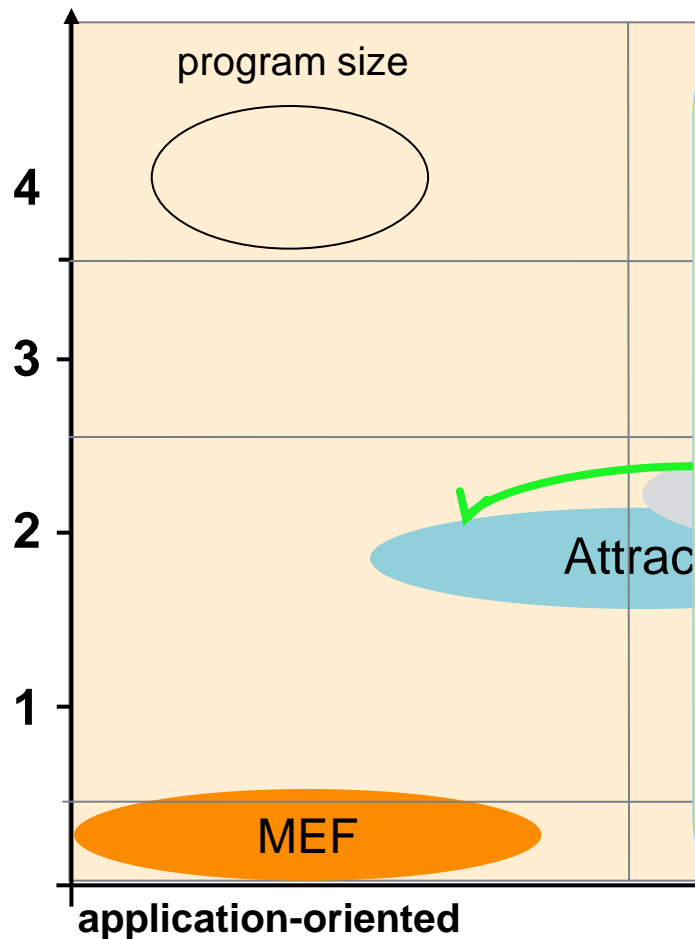
PROGRAM PORTFOLIO



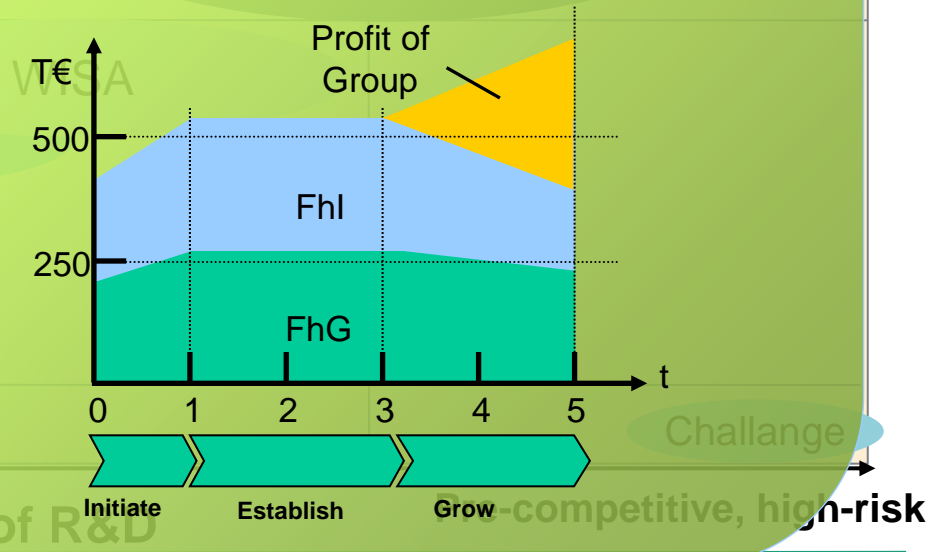
PROGRAM PORTFOLIO



PROGRAM PORTFOLIO



- **Attract:** Competition for the best talents
- **goal:** offer perfect framework conditions to develop ideas to innovations close to the market.
- 2007-2009: to start 40 new research groups



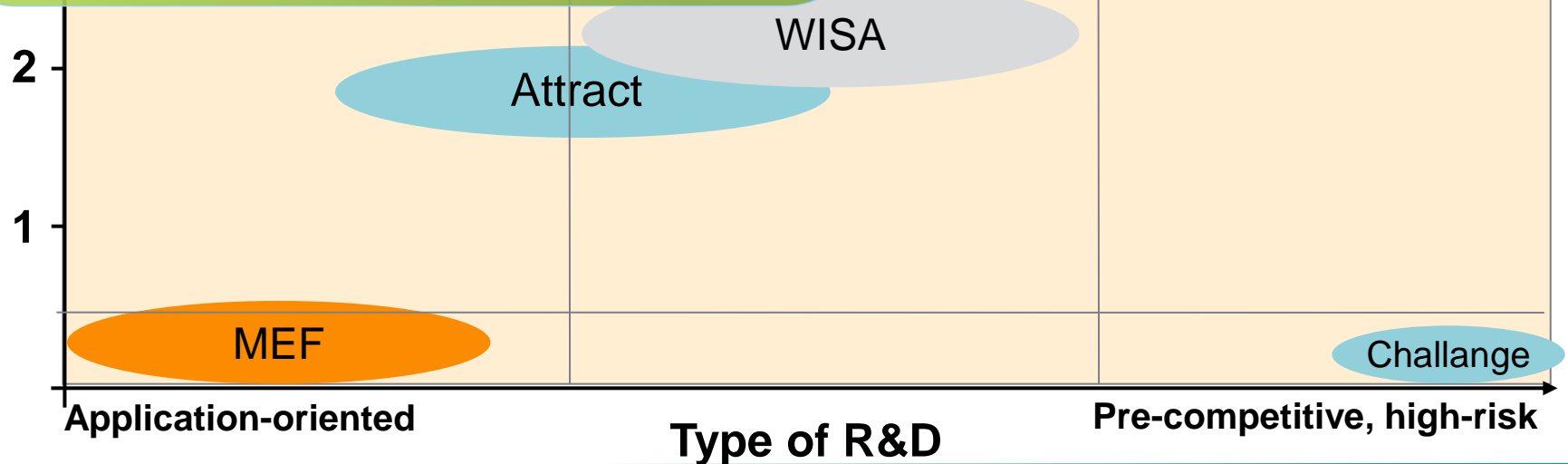
PROGRAM PORTFOLIO

- **WISA:** Strategic Alliances

program size

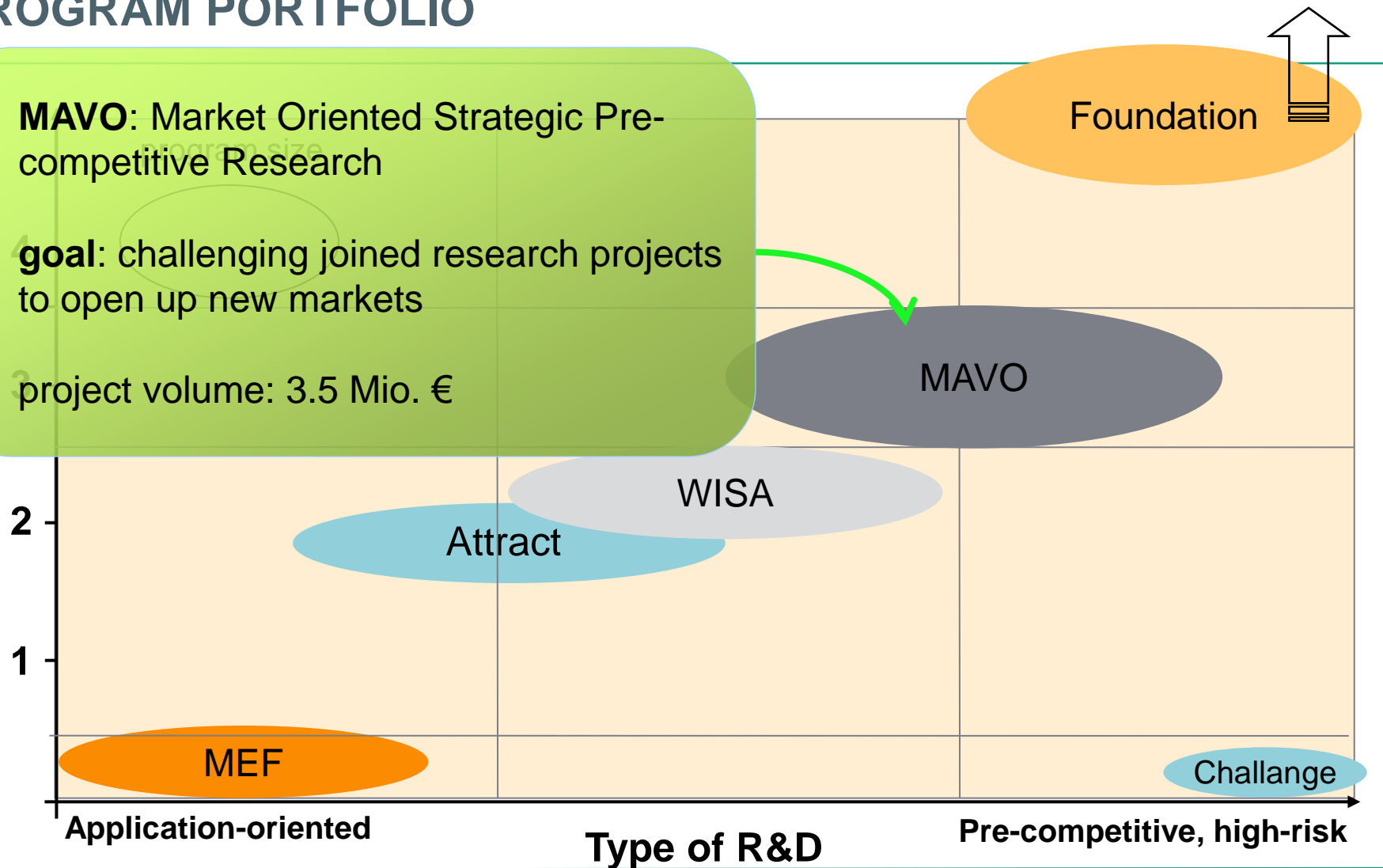
- **goal:** joined strategic R&D projects to claim leadership in specific fields of technology

- project volume: 2.5 Mio. €

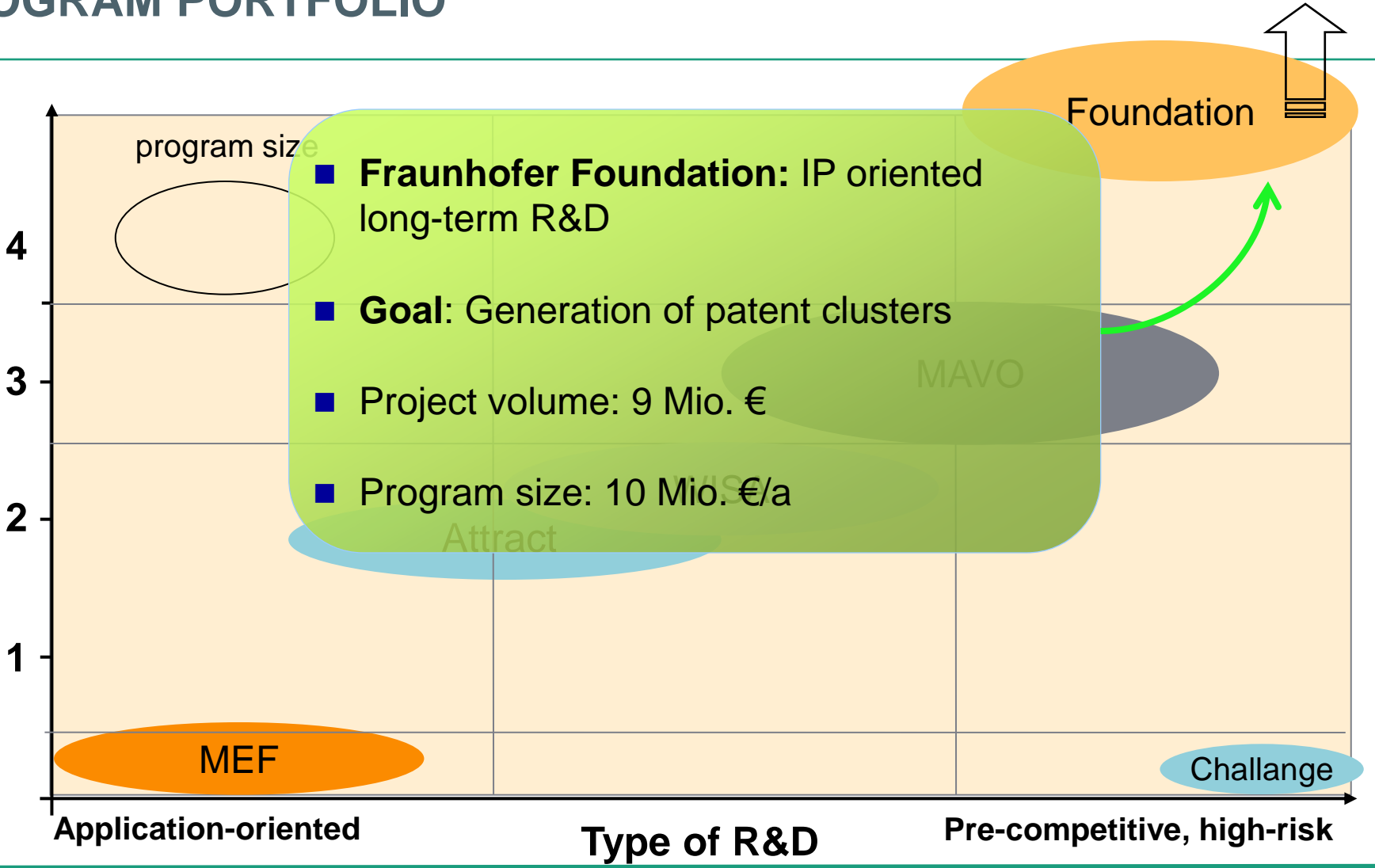


PROGRAM PORTFOLIO

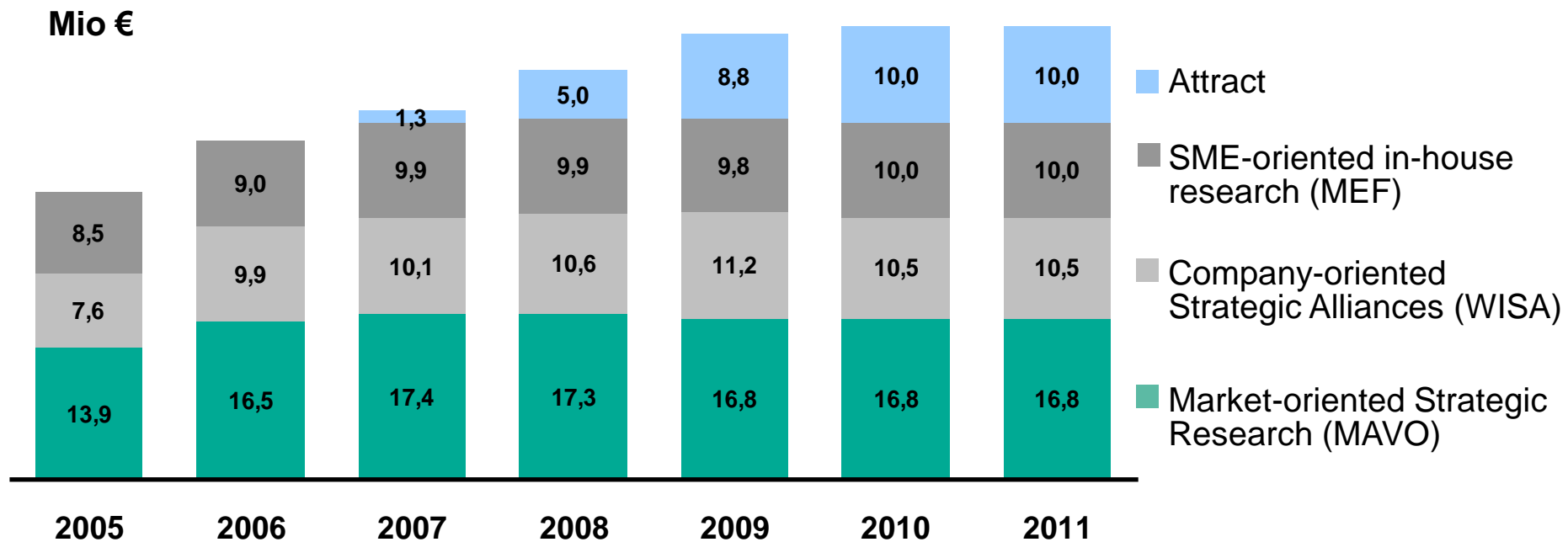
- **MAVO**: Market Oriented Strategic Pre-competitive Research
- **goal**: challenging joined research projects to open up new markets
- project volume: 3.5 Mio. €



PROGRAM PORTFOLIO

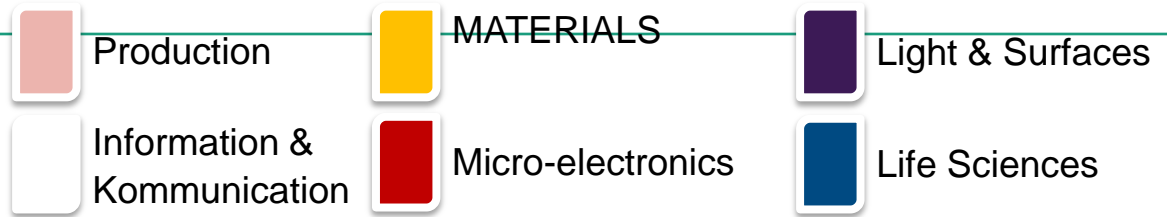


PROGRAM VOLUME



SOCIAL NETWORKS INDUCED BY WISA/MAVO CALLS

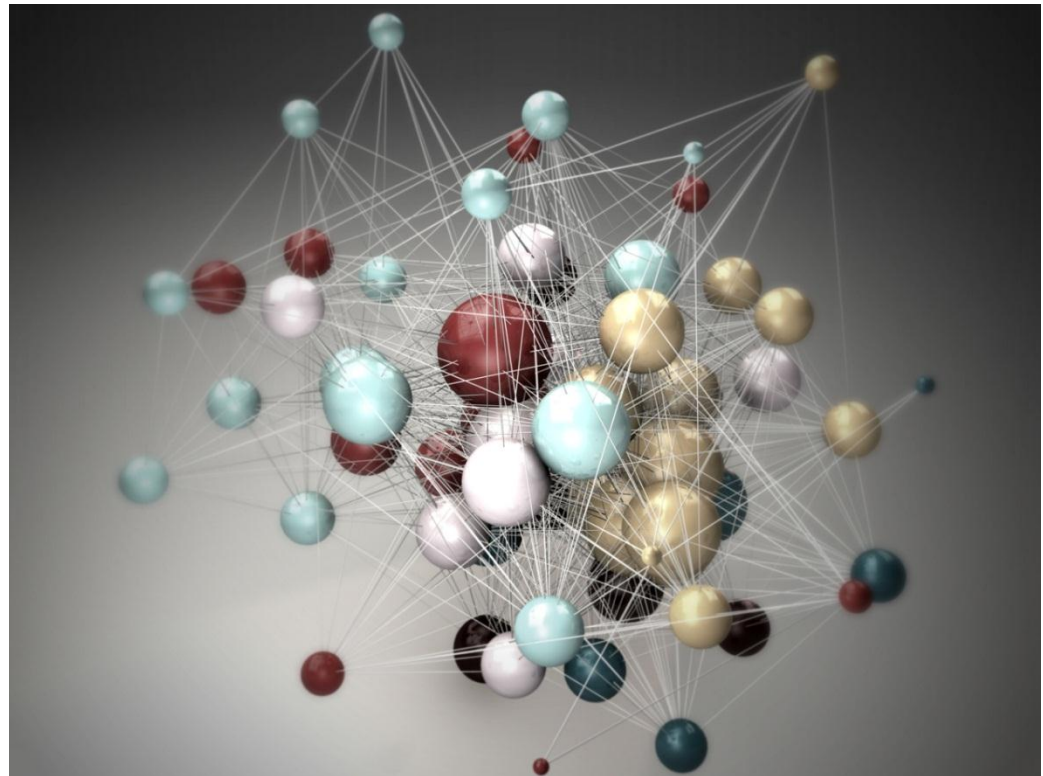
2004-2010



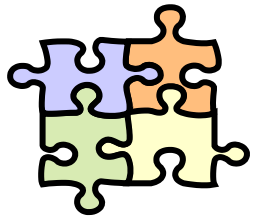
- **Nodes:** FhI participating with a short proposal
- **Arcs:** all partners of a joined proposal are connected
- **Size** of the nodes: number of connections
- **Color** of the nodes: Fraunhofer group

59 Nodes (institutes)

2900 strategically motivated co-operations



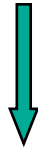
STRATEGIC GOALS OF THE MAVO PROGRAM



**Link
Institutes**



Initial Research



**Joined
Marketing**

- **Linking competencies which complement one another.**
- **Development of new business areas**
- **Challenging pre-competitive research**
- **Support of unconventional research**
- **Generation of innovations**
- **Strengthening of competitiveness and IP position**
- **Joined dissemination**

MAVO PROGRAM: Quality Assurance

- ➔ **Fraunhofer Evaluation Committee (FEC)(*) + Division »Research Planning A1«** Evaluation of the short proposal (A1) und full proposals (FEC)
- ➔ **Advisors**
Customer focused supervision
- ➔ **Project Supervision**
Division »Strategy and Programs«
- ➔ **Generation of »Return on Investment« (RoI)** in the scope of the project (otherwise reclaim of funding)

MAVO: RoI = 0.2 x funding (1 year after project end)

(*) one institute director of each Fraunhofer group + Head of Division »Patents and Licences«

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Key Messages

▶ Developing a culture of risk and entrepreneurial spirit in PROs takes time. Don't expect too much in too little time.

▶ Set appropriate incentives and develop internal programs, both on the individual (researchers) and institutional (institutes) level.

▶ Tolerate Failure! Taking and financing risk pays off in 10% of cases. These profits usually cover parallel losses.

▶ Establish close links between all stakeholders. Implement instruments for risk-sharing, monitoring, evaluation, learning.

▶ However, “every supply creates its demand”: innovation policy makers must create favorable framework conditions (incentives, programs, finance) for PROs and client companies

**Благодарю вас за ваше внимание.
Thank you for your kind attention.**

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