

## German Aerospace Center (DLR)

DLR organisation of FCH research  
Vision on a European FCH research strategy  
For the Horizon 2020 Period

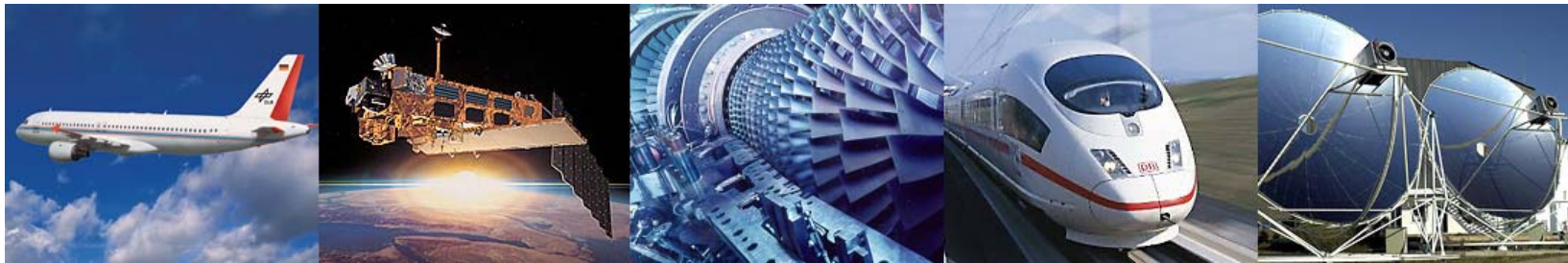
Dr. Christian Sattler  
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Solar Chemical Engineering

Vice-President  
N.ERGHY



Knowledge for Tomorrow

## DLR German Aerospace Center



- Research Institution
- Space Agency
- Project Management Agency



## Participation in the Helmholtz Association

- Success in obtaining program-oriented funding
- Added value from support of the Helmholtz Association
- Helping to shape the organisational development process



HelmholtzZentrum münchen



## Research Areas

- Aeronautics
- Space Research and Technology
- Transport
- Energy
- Space Administration
- Project Management Agency



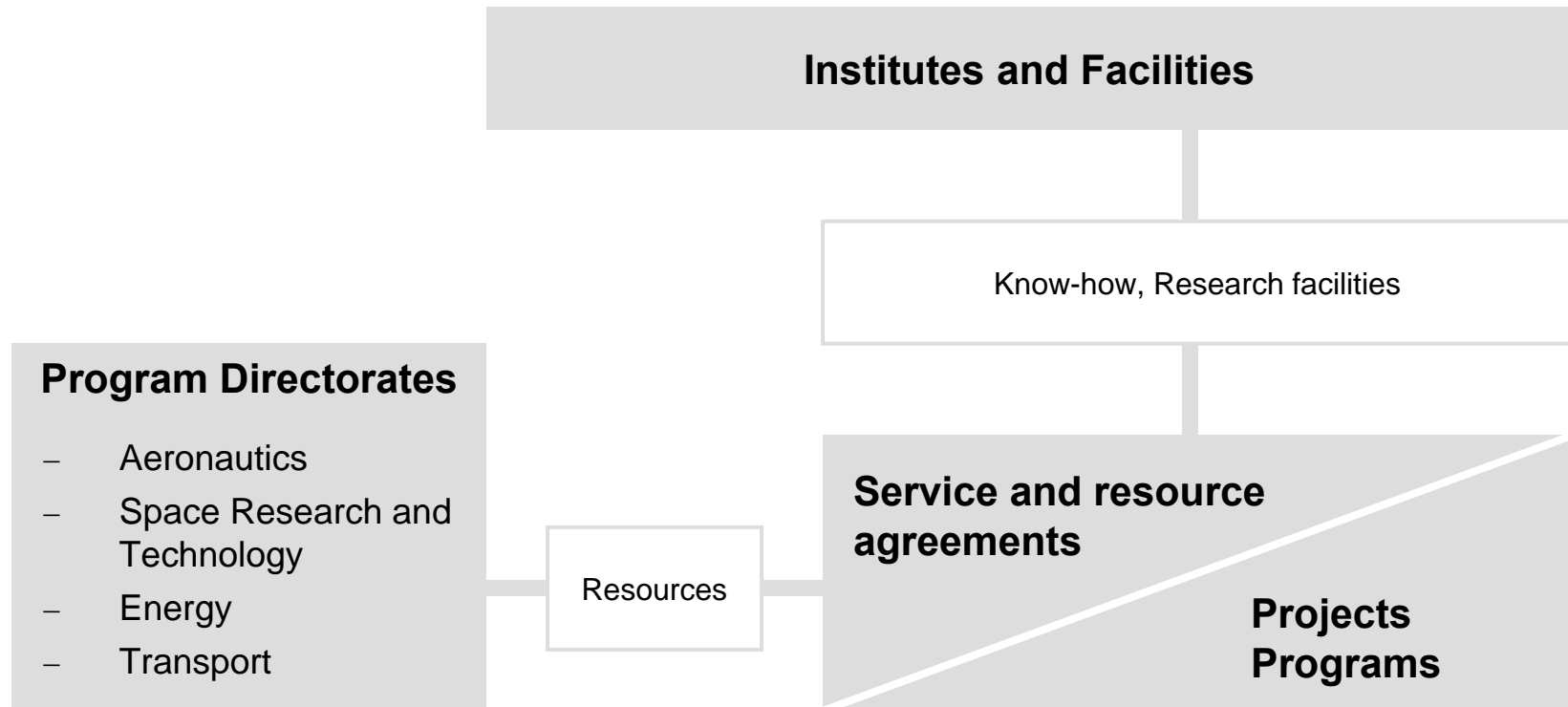
## Locations and employees

7200 employees across  
32 institutes and facilities at  
■ 16 sites.

Offices in Brussels,  
Paris and Washington.



# Program Management

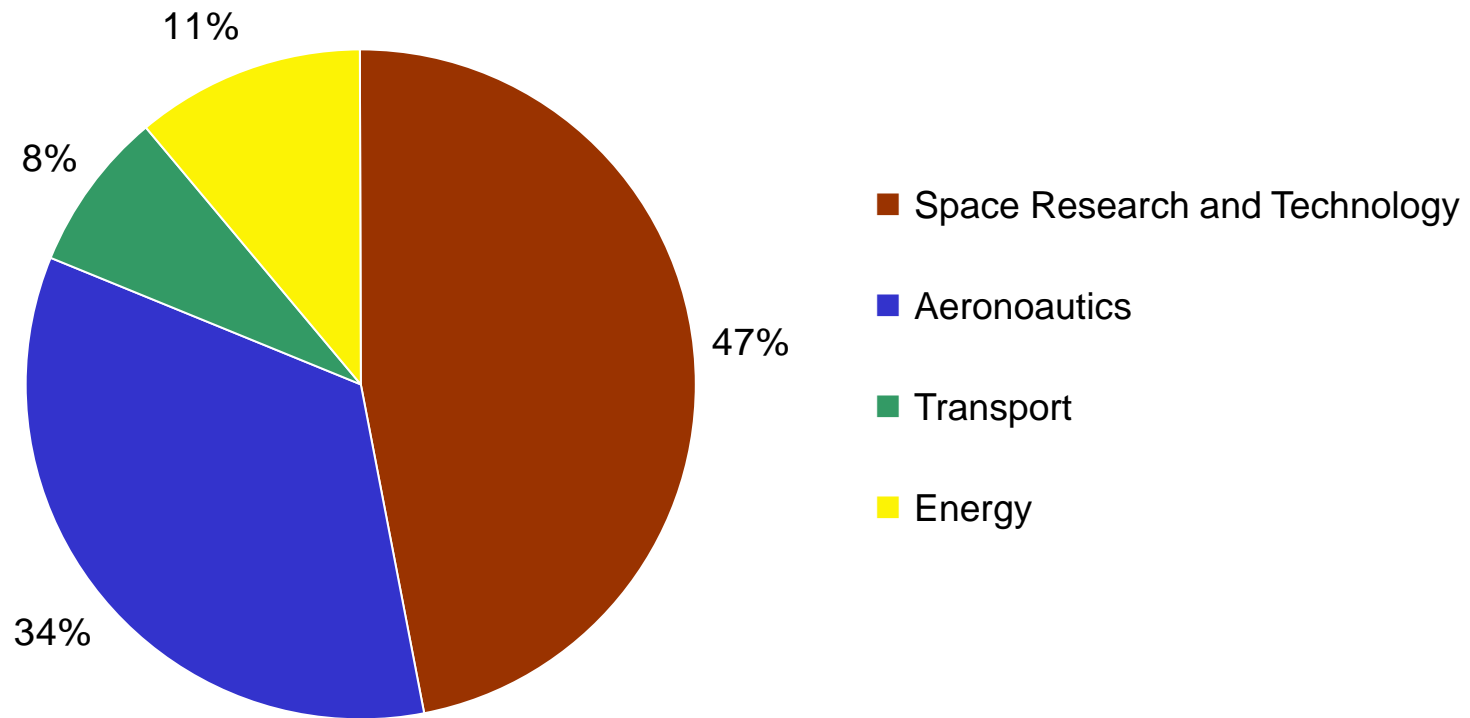


## Main Aspects of the Overall Strategy

- Pursuit of leadership by assuming the role of architect while emphasising autonomy and maintaining a reserved attitude towards concepts of overarching institutional integration within the European framework
- Powerful growth in the Transport and Energy business areas based on great political and public demand
- Wider scope for the two cross-discipline fields of defence technology and security research
- Greater emphasis on DLR's activities in its four R&D business areas, which are of importance to Germany as a business location, without any fundamental change in its portfolio of basic research, application-related activities and the operation of large-scale facilities



## Percentage of overall income from research and operations 2011





# National and International Networking

**Customers and partners:** Governments and ministries, agencies and organisations, industry and commerce, science and research



# Human Resources Development and Development of Young Talents

- Further development of human resources policy instruments for employee motivation
- Systematic development and recruitment of young talent
- Communicating the fascination of research and technology to the next generation
- Representation in European organisations and promoting staff exchanges with industry and other national and international partners



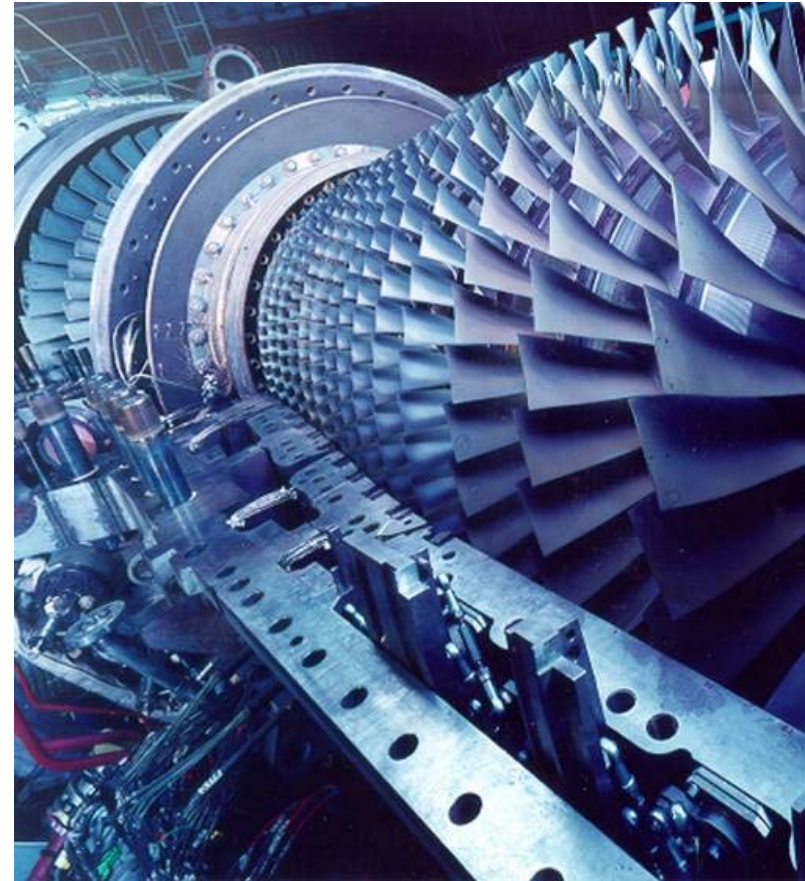
# Energy



## DLR Energy

DLR Energy Research concentrates on:

- **CO<sub>2</sub> avoidance** through efficiency and renewable energies
- **synergies** within the DLR
- major research specific themes that are **relevant to the energy economy**



## Goals of DLR Energy

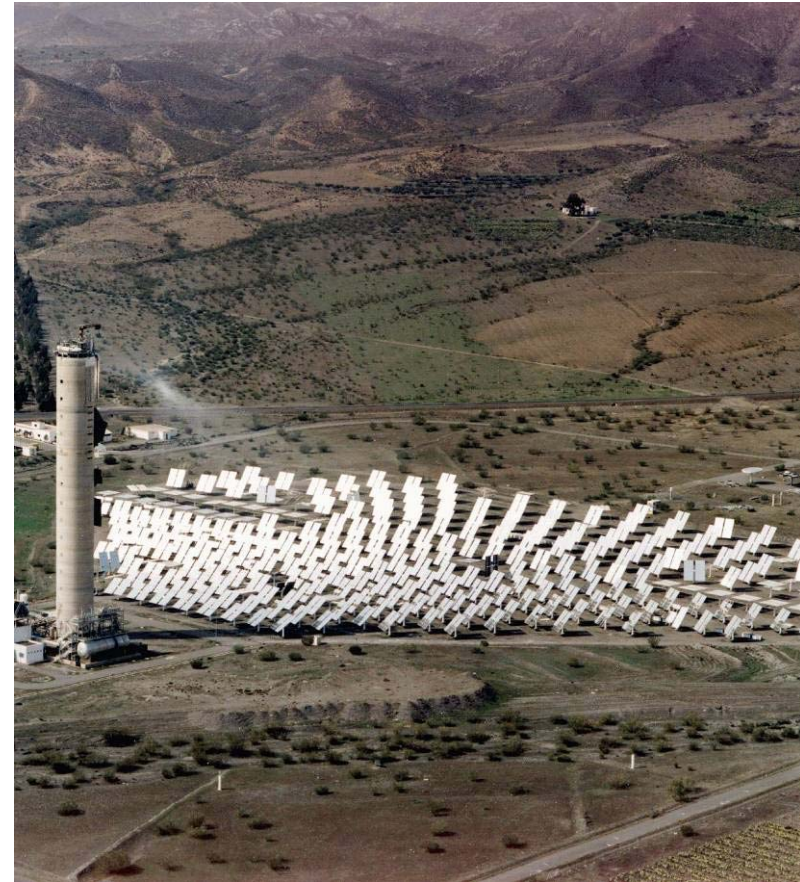
### **Sustainability of future energy supplies:**

- Supply security
- Economic viability
- Safety and reliability
- Efficiency
- Emissions avoidance
- Conservation of natural resources
- Strengthening of German and European industry



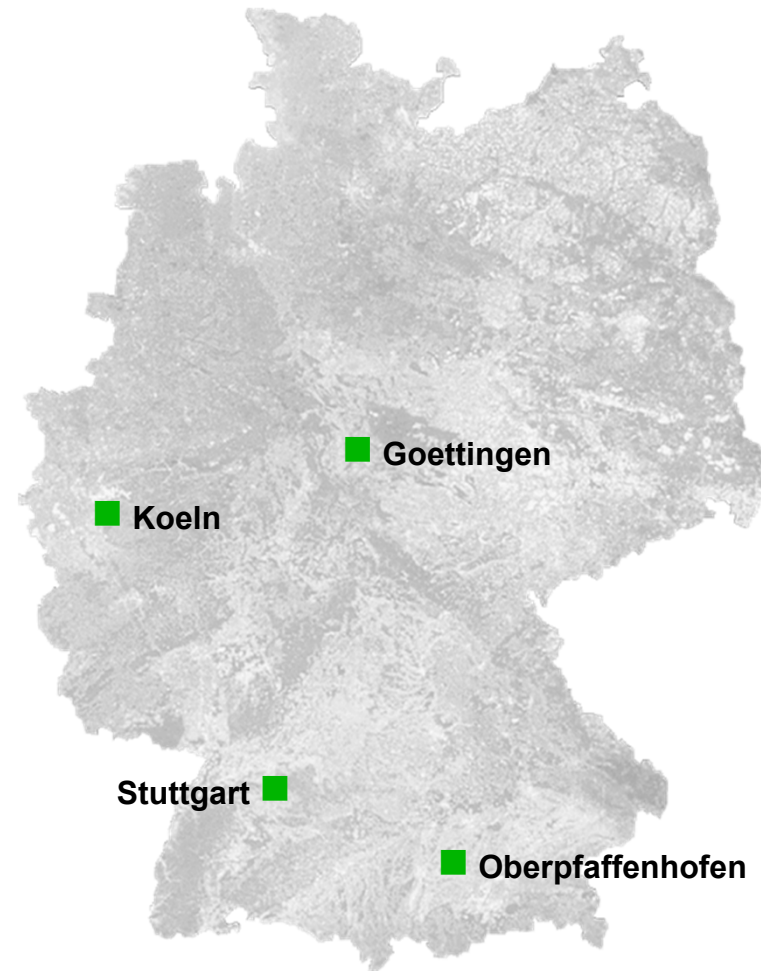
## Energy Program Themes

- Efficient and environmentally compatible fossil-fuel power stations  
(turbo machines, combustion chambers, heat exchangers)
- Solar thermal power plant technology, **solar fuels**
- Thermal and **chemical energy storage**
- **High and low temperature fuel cells**
- **Systems analysis and technology assessment**



# Institutes and Facilities Involved in Energy

- [Goettingen](#)  
Institute of Aerodynamics and Flow Technology
- [Cologne](#)  
Institutes of Propulsion Technology, Solar Research and Materials Research
- [Stuttgart](#)  
Institutes of Technical Thermodynamics and Combustion Technology
- [Oberpfaffenhofen](#)  
Institute of Communications and Navigation
- Almería (Spain)  
Permanent team from the Institute of Solar Research at the Plataforma Solar de Almería (PSA)



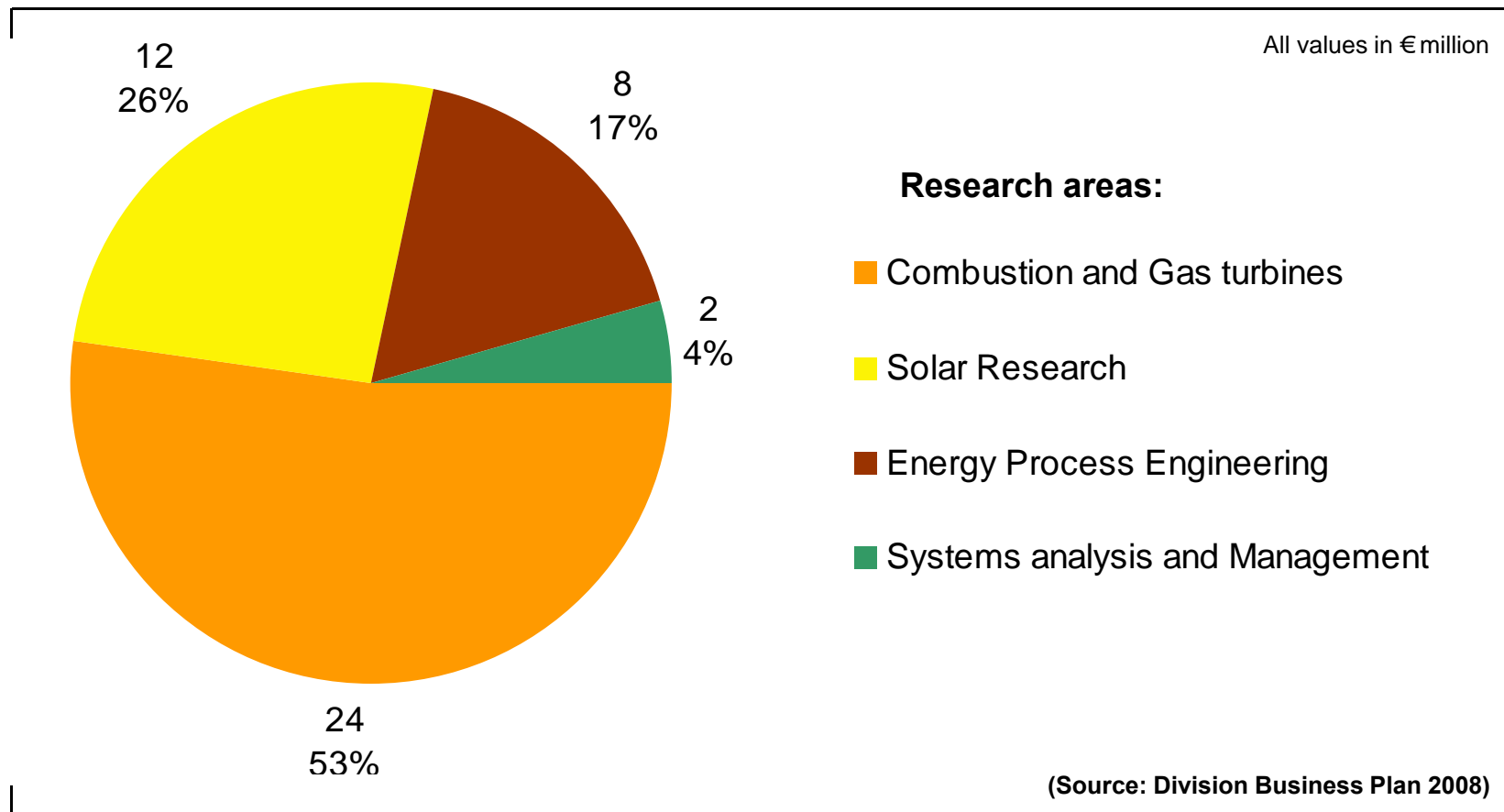
## Key Figures

- Approx. 400 employees
- Approx. €35 million turnover
- Third-party financing approx. 50%
- Second largest research centre in Germany for non-nuclear energy
- Main activities based in Stuttgart, Koeln and Almeria (Spain)





## Budget of Energy 2010 (planned)



## Vision developed in the actual FCH JU for the timeframe 2014-2020

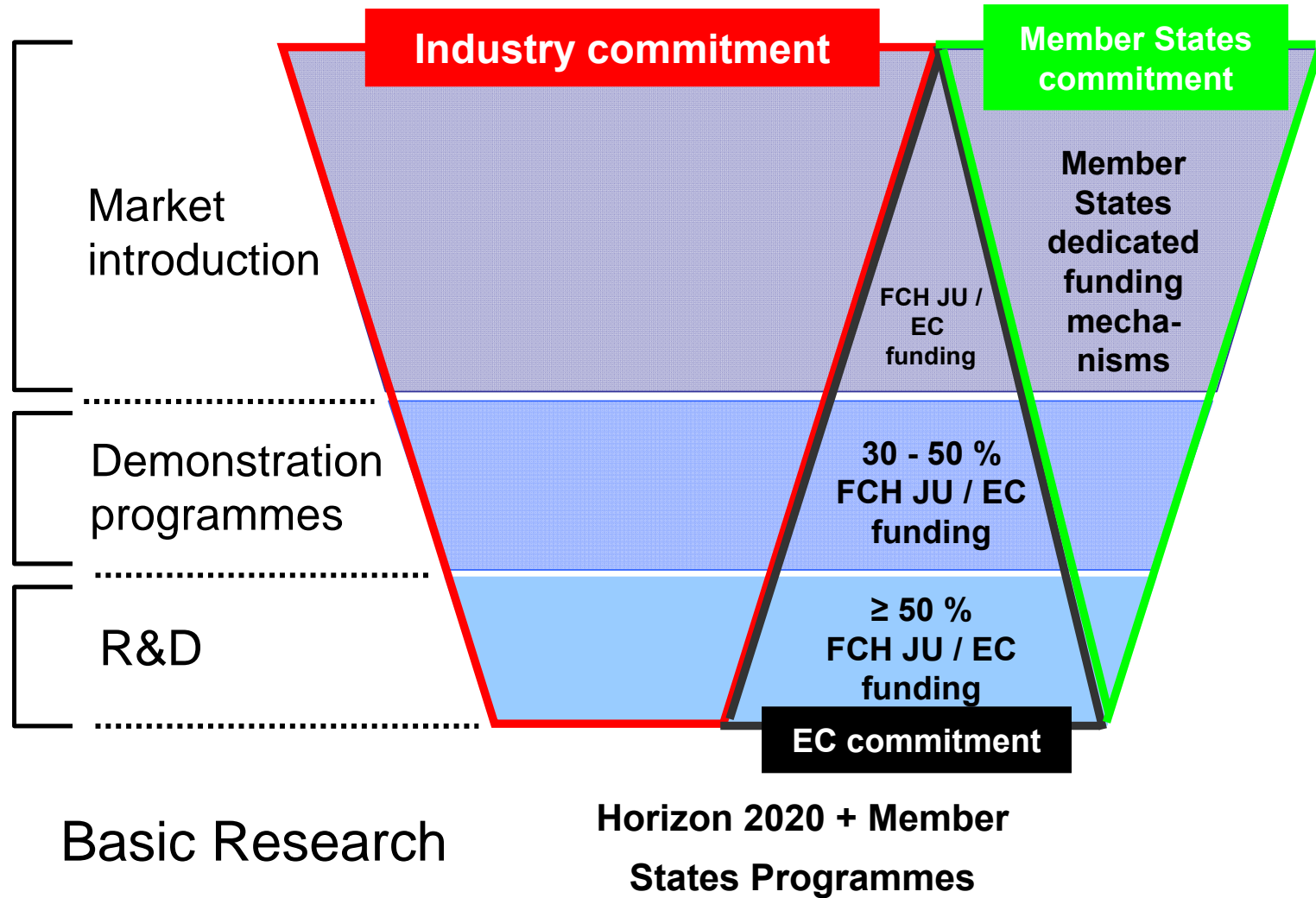
*“Develop by 2020 to the point of **market readiness**, a portfolio of **clean, efficient and affordable** solutions that fully exploit the properties of **hydrogen as an energy carrier** and of **fuel cells as energy converters**, as part of a system that integrates **sustainable and secure energy supply** with **low carbon transport**”.*

Contributing significantly to

- the goals of the European Strategic Energy Technology Plan (SET Plan)
- the European transport-technology strategy (STTP),
- the transformation to a low carbon economy by 2050.



# Structure



## FCH JU 2.0

- An industry-led integrated Programme of Research, Development and Demonstration For Fuel Cell and Hydrogen Technologies, for the period 2014 - 2020.
- A "modernized" FCH JU, will provide a stable, long-term instrument supporting the necessary investments required to introduce FCH technologies into the market
- Members: NEW-IG, N.ERGHY, EC
- Organisation: Programme Office
- Stronger integration of the Member States



## Research efforts to be integrated

- Additionally R&D have to be carried out
  - On basic research in several HORIZON 2020 programmes examples could be
    - FET – Future Emerging Technologies
    - NMP – Nanoscience, Nanotechnologies, Materials and New production Technologies
    - EERA – European Energy Research Alliance
- and in (joint) R,D&D efforts by the Member States and



## Structure

- Innovation pillar 1: FCH Technologies for Transportation Systems
- Innovation pillar 2: FCH technologies for Energy Systems
- Cluster of cross-cutting research activities: Complementing the technical research activities



# Innovation pillar 1: FCH Technologies for Transportation Systems

- Road vehicles
- Non-road mobile vehicles and machinery
- Refuelling infrastructure
- Maritime, rail and aviation applications



## Innovation pillar 2: FCH technologies for Energy Systems

- Hydrogen production, storage and distribution
- Hydrogen technologies for electricity storage and grid balancing
- Heat and power generation with stationary fuel cell systems for residential and industrial uses
- Mini, micro and portable fuel cell systems
- Several technologies are important for both systems as well transportation as energy like pressurised or solid state storage.





## Cross-cutting research activities

- Social acceptance and public awareness issues;
- Education and training for FCH sector scientists, engineers, technicians and decision/policy makers outside the sector;
- Policy and strategy development;
- Pre-Normative Research;
- Regulations, Codes and Standards, including safety standards and norms.
- Identification and developments of investment and financing mechanisms and structures



## Issues

- Funding regulations of Horizon 2020 not finally decided yet
- FCH JU regulations should be similar
- Additionally a matching rule shall demonstrate the commitment of industry – 50:50?
- Proposed simple regulations are not favouring large research institutions
- They will result in funding rates for research projects e.g. for DLR below 45%
- Not attractive, competition with other programmes
- Search for a solution



# Thank you very much for your attention!

Thanks to all funding organisations and industrial partners that support us and work with us on the development of FCH technologies

DLR H<sub>2</sub> Aircraft  
ANTARES

