Europäische Energieforschung im 7. Rahmenprogramm (2007 - 2013)

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Overview

- Forschung und Energieforschung - Grunddaten
- Grundzüge des siebten Forschungsrahmenprogramms FP7
- Energieforschung im FP7
- einige Forschungsaspekte

Disclaimer: The author is not acting on behalf of any organisation and assumes no responsibility for the correctness, completeness of the information provided in this presentation nor of any use thereof.
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Rechtliche Grundlagen

- Vertrag zur Gründung der Europäischen Gemeinschaft (konsol. Fassung 2002)
- Vertrag zur Gründung der Europäischen Atomgemeinschaft (n.off. konsol. Fassung 1996)
- Vertrag über die Gründung der Europäischen Gemeinschaft für Kohle und Stahl (1951)
- Vertrag über die Europäische Union (konsol. Fassung 2002)

EC-Vertrag: TITEL XVIII FORSCHUNG UND TECHNOLOGISCHE ENTWICKLUNG

Artikel 163

(1) Die Gemeinschaft hat zum Ziel, die **wissenschaftlichen und technologischen Grundlagen der Industrie** der Gemeinschaft zu stärken und die Entwicklung ihrer **internationalen Wettbewerbsfähigkeit** zu fördern sowie alle Forschungsmaßnahmen zu unterstützen, die aufgrund anderer Kapitel dieses Vertrags für erforderlich gehalten werden.

...

Artikel 166

(1) Der Rat stellt gemäß dem Verfahren des Artikels 251 und nach Anhörung des Wirtschafts- und Sozialausschusses ein **mehrjähriges Rahmenprogramm** auf, in dem alle Aktionen der Gemeinschaft zusammengefasst werden.

In dem Rahmenprogramm werden - die **wissenschaftlichen und technologischen Ziele**, ..., sowie die jeweiligen Prioritäten festgelegt;... der Gesamthöchstbetrag ... der finanziellen Beteiligung der Gemeinschaft am Rahmenprogramm ... .

(2) Das Rahmenprogramm wird je nach Entwicklung der Lage angepasst oder ergänzt.

(3) Die Durchführung des Rahmenprogramms erfolgt durch **spezifische Programme**,....

...

EC Vertrag TITEL XVIII FORSCHUNG UND TECHNOLOGISCHE ENTWICKLUNG

Artikel 169

Die Gemeinschaft kann im Einvernehmen mit den betreffenden Mitgliedstaaten bei der Durchführung des mehrjährigen Rahmenprogramms eine Beteiligung an Forschungs- und Entwicklungsprogrammen mehrerer Mitgliedstaaten, einschließlich der Beteiligung an den zu ihrer Durchführung geschaffenen Strukturen, vorsehen.

Artikel 170 - Die Gemeinschaft kann ... eine Zusammenarbeit ... mit dritten Ländern oder internationalen Organisationen vorsehen. ... (Einzelheiten Gegenstand von Abkommen zwischen der Gemeinschaft und den betreffenden dritten Partnern)

Artikel 171

Die Gemeinschaft kann gemeinsame Unternehmen gründen oder andere Strukturen schaffen, die für die ordnungsgemäße Durchführung der Programme für gemeinschaftliche Forschung, technologische Entwicklung und Demonstration erforderlich sind.

...

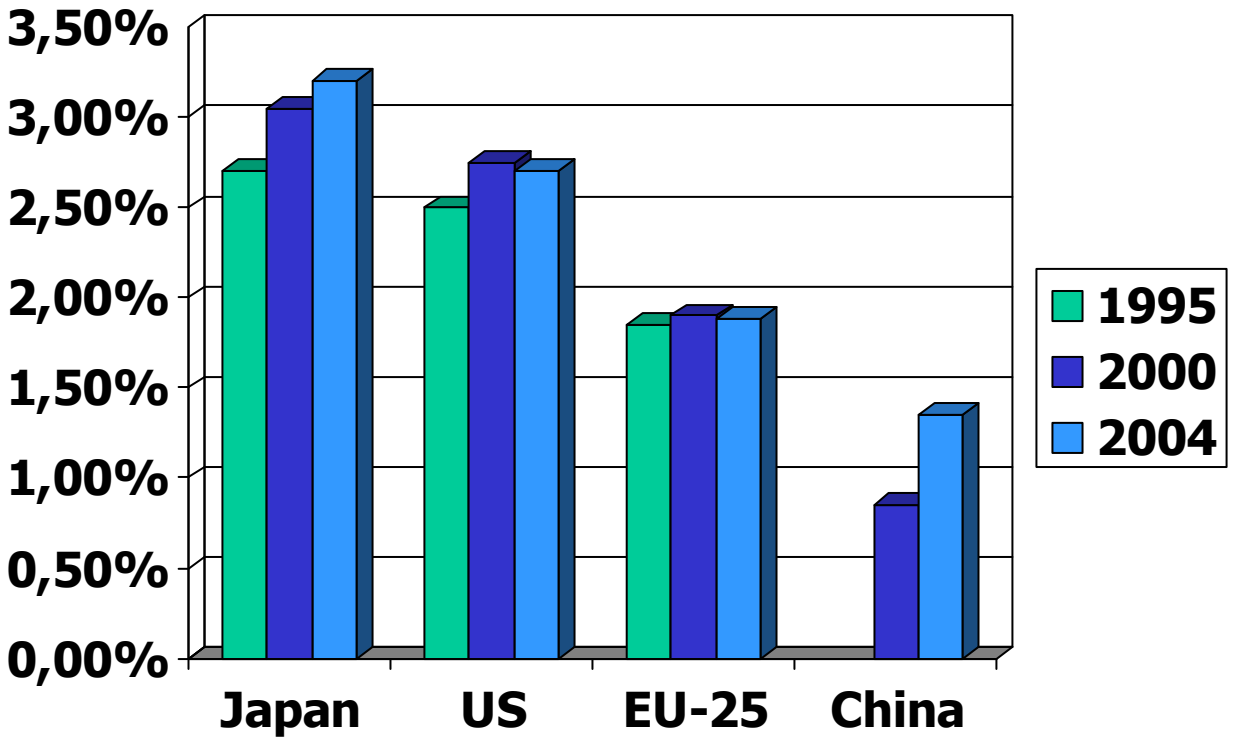
Euratom Treaty
Research and Training

- Title II, Chapter I, Art. 4
- Art. 4.1.: The Commission shall be responsible for promoting and facilitating nuclear research in the Member States and for complementing it by carrying out a Community research and training proramme. ...
- Art. 7 : Community research and training programmes shall be determined by the Council acting unanimously ... . These Programmes shall be drawn up for a period of not more than five years. ...

Die Akteure

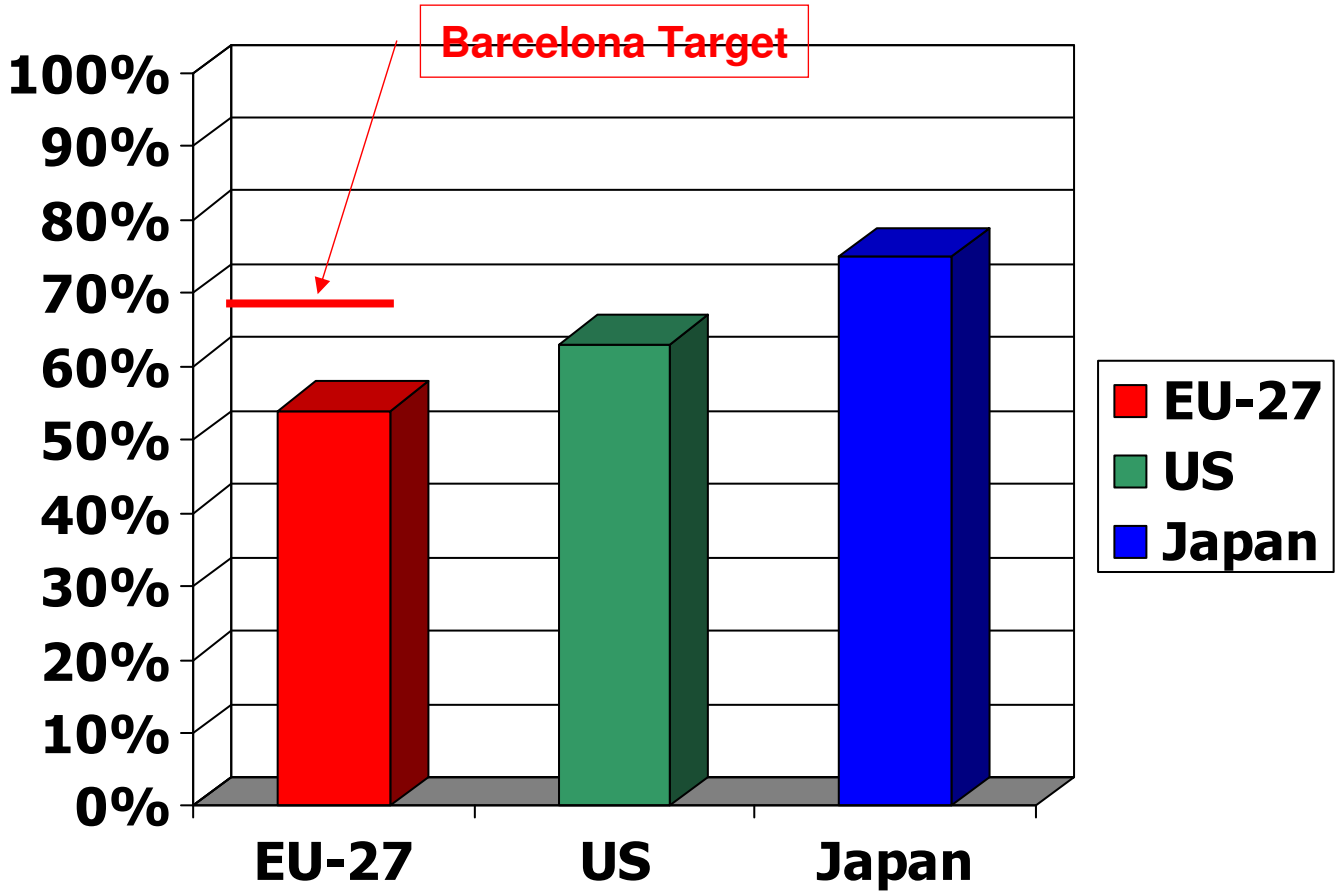
- **"Europa"**
  - Europäische Kommission
    - Generaldirektion Energie und Transport
    - Generaldirektion Forschung
  - Europäischer Wirtschafts- und Sozialausschuß / Ausschuß der Regionen
  - Europäisches Parlament (Ausschuß ITRE (Industry, Research, Energy))
  - Europäischer Rat – Ministerrat (D hat z.Zt. Präsidentschaft)
  - Europäischer Rechnungshof / Europäischer Gerichtshof
- **Mitgliedsstaaten**
- **Internationale Einrichtungen (IEA, IAEA, OECD ...)**
- **Interessenvertretungen**
  - Industrie, Forschungsverbünde
  - Regionale und städtische Vertretungen
  - NGOs
  - ...

R&D intensity
Gross expenditure for R&D as percentage of GDP



source of data: European Commission DG Research and Eurostat, zit. nach European Commission SEC(2007) 412/2

R&D spending
Business share

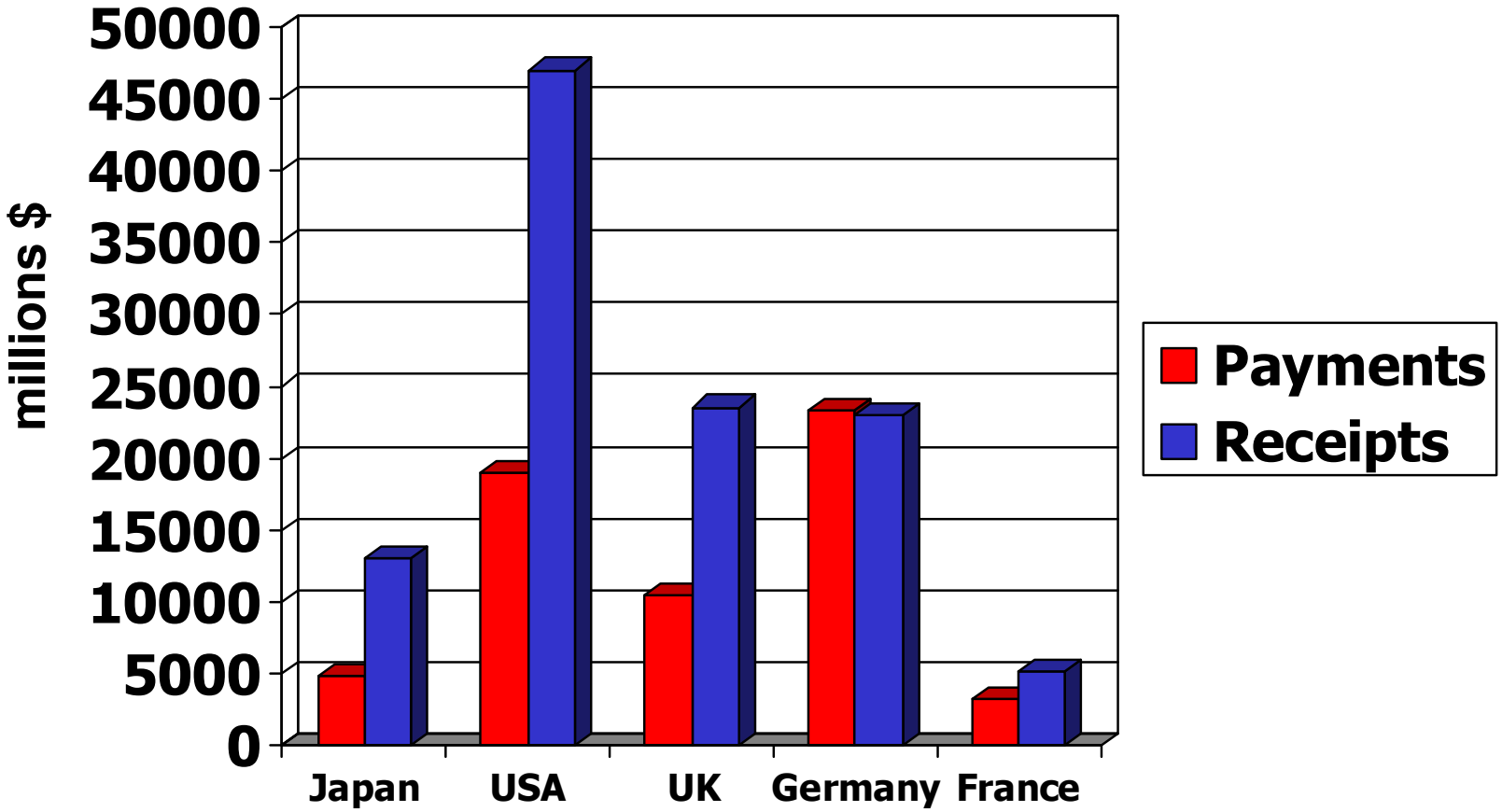


Turn of the tide: R&D expenditure outflows from EU-15 to US/Japan

- **In 1997 R&D expenditure flows**
  - EU ←→ US were equal
  - EU ←→ Japan were in favour of EU by 20%
- **In 2003 R&D expenditure flows**
  - EU ←→ US were in favour of US by 25%
  - EU ←→ Japan were in favour of Japan by 66%

data: European Commission, DG Research

International competitivity: Technology balance of payments (licenses, patents, know-how)



source: OECD, Main Science and Technology indicators, 2006, zit. nach European Commission SEC(2007) 412/2

Current Situation in R&D

Lisbon / Barcelona

- Target: 3% of GDP spending for R&D – thereof 2/3 from the business sector
- Currently stagnating at 1.9% of GDP,
- companies have increased their global R&D expenditure by >5% in 2006 but:
  - lower increase than in competing economies
  - increasing net-outflow of R&D
  - EU based industry invests mor in R&D in the US than US-based industry in Europe

Europe needs to

- reduce fragmentation of public R&D, create favourable conditions for the commercialisation of technologies
- generate adequate numbers of well-trained and mobile researchers responsive to needs of industry
- enhance interactions between the public research base and industry

Perspektives for European R&D

- **Realising a single labour market for researchers**
  - remove institutional and national boundaries for international careers
  - establish portability of social security provisions
- **Developing world class research infrastructures**
- **Strengthening research institutions**
  - counteract dispersion of resources
  - enhance interaction with industry → technology platforms, JTI

  → virtual centres of excellence, networks of excellence
- **Sharing knowledge**
- **Optimising Research programmes and priorities**
- **Opening to the world: international S&T cooperation**

The 7th Framework Programme RTD 2007-2013*

- **DECISION No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)** (30.12.2006 EN Official Journal of the European Union L 412/1)
- **DECISION 2006/970/EURATOM of the Council 18 December 2006 Concerning the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011) (2006/970/EURATOM)**
  (Corrigendum 22.2.2007 EN Official Journal of the European Union L 54/21)

*** Euratom Decision for 2007-2011 with indicative figures for 2012,2013**

FP 7

7th Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)

Most relevant new elements compared to FP6:

- **Duration increased from 4 to 7 years (Euratom 5 years)**
- **Budget 48.770 B€ (50.521 B€ incl. JRC direct actions)**
  - Annual budget increased (⇒ <~€7 billion>)
- **European Research Council: Frontier research (~ €1 billion per year)**
- **Demonstration projects funded at 50% instead of 35%**
- **Joint Technology Initiatives (FP6: Technology platforms)**
- **Themes – changes of technical coverage (e.g. Clean coal)**

Simplification in FP7

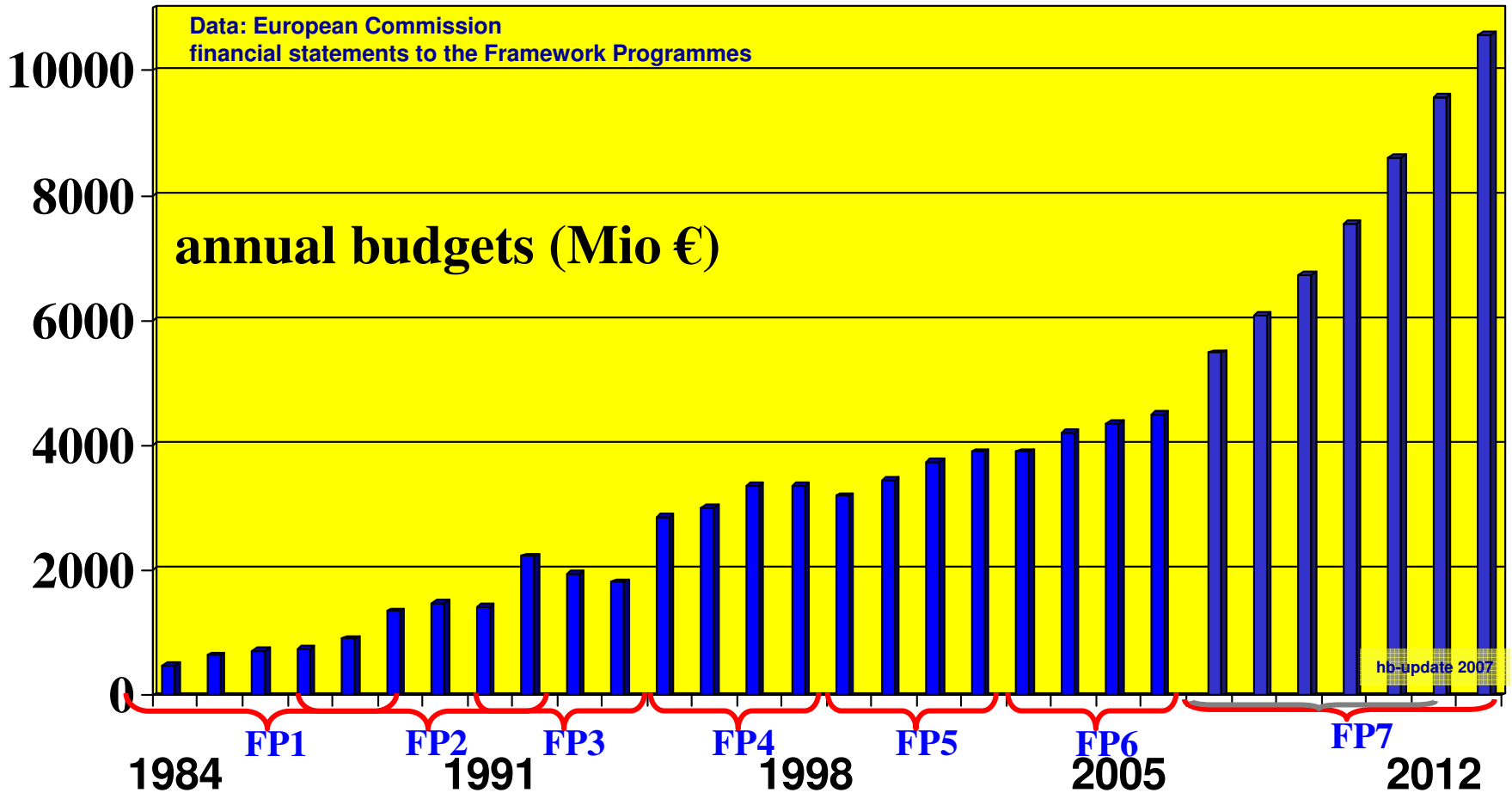
- New, clearer structure: Cooperation, Ideas, People, Capacities
- Annual Work Programmes
- Simplified application procedures: unique registration facility
- More user-friendly Guides for Applicants
- Simplified funding schemes
- Standardised contract models and information
- Fewer pre-contract checks
- Greater autonomy of consortia
- Cost reporting models (FC, AC, etc) have been eliminated
- joint liability not required in certain cases
- Sounding Board set up by Commissioner Potočnik: Input and advice on all aspects

New terms in FP7

- 4 Specific Programmes in FP7- was only one in FP6
  - Cooperation, Ideas, People, Capacities
  - plus 1 Euratom specific programme (Fusion & Fission)
  - plus JRC specifi programmes (non-nuclear & nuclear)
- Theme
  - e.g. Energy, Transport ...
- Activity
  - e.g. Renewable electricity generation or Hydrogen and Fuel Cells ...
- Area
  - e.g. PV, Wind, Biofuels ...
- Topic
  - project-level subjects in calls for proposals – change each call

- Funding Schemes
  - were called "Instruments" in FP6
  - e.g. Collaborative Project, Network of Excellence

European Research and Development: Framework Programmes since 1984



The specific programmes

- **Cooperation** **(see later)**
- **Ideas** - European Research Council
  - **Frontier research actions** ***(support to investigators – no thematic constraints)***
- **People** - Human Potential, Marie Curie actions
  - **Initial training of researchers - Marie Curie Networks**
  - **Life-long training and career development - Individual fellowships**
  - **Industry-academia pathways and partnerships**
  - **International dimension - outgoing and incoming fellowships, international cooperation scheme, reintegration grants**
  - **Excellence Awards**
- **Capacities** - Research capacities
  - **Research infrastructures**
  - **Research for the benefit of SMEs**
  - **Regions of Knowledge**
  - **Research Potential**
  - **Science in Society**
  - **Support to the coherent development of research policies**
  - **Specific activities of international cooperation**

Maximum funding rates

- **Research activities: 50% of eligible costs except for:**
  - SMEs: 75%
  - Public bodies: 75%
  - Secondary and higher education establishments: 75%
  - Research organisations (non-profit): 75%
- **European Research Council frontier research actions: 100%**
- **Coordination and support actions: 100%**
- **Training and career development of researchers actions: 100%**
- **Demonstration activities: 50% of eligible costs (was 35% in FP6)**
- **Networks of Excellence: special lump sum system**

- **Euratom – Fusion: Associations 20% / 40%**

FP7 as catalyst to activities in the Member States

FP7 complements activities carried out in the Member States and other Community actions necessary for meeting the Lisbon goals.

Objectives

- **transnational cooperation at every scale**
- **investigator-driven basic research based on excellence**
- **strengthening (quantitatively and qualitatively, women) of human potential in research and technology encouraging mobility and career development (esp. in the most productive period of life)**
- **and**
  - intensifying dialogue between science and society in Europe
  - strengthening research and innovation capacities
  - a wide use and dissemination of knowledge generated by publicly funded research

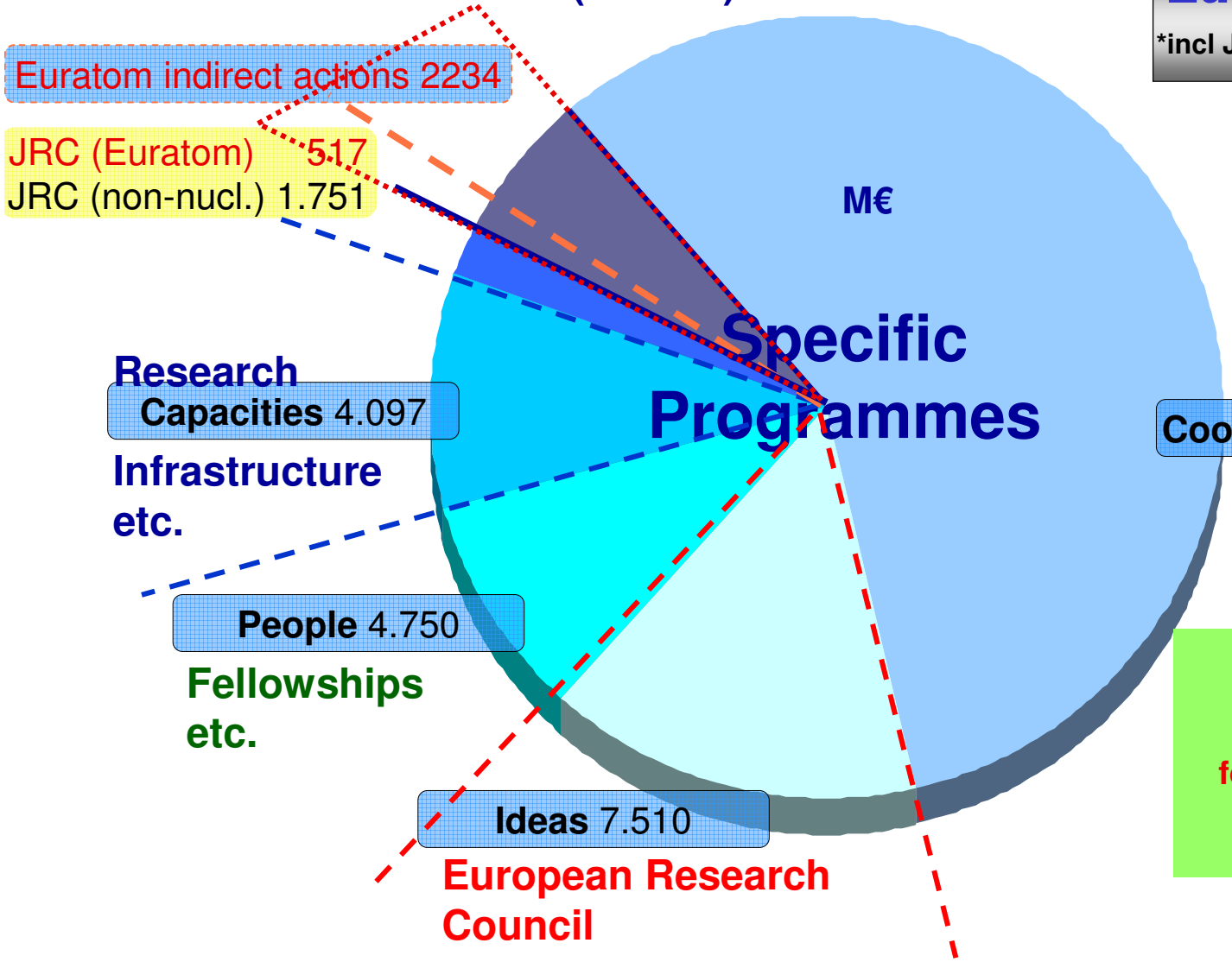
FP7 structure and budget

EC: 50,521 M€

Euratom*: 2751 M€

*incl JRC nuclear ctivities (517 M€)

Fusion (1947 M€)
Fission + Rad Protection(287 M€)



Euratom period is 2007-2011.
If indicative figures are added for 2012-13, then total Euratom is 4.062 M€ and EC+Euratom = 54.583 M€

Outside FP 7: additionally 60 M€ /year from the Research Fund for Coal and Steel (remnant from European Coal and Steel Community

Cooperation specific programme – Budget

Cooperation	Budget M€
1. Health	6100
2. Biotechnology, food and agriculture	1935
3. Information society	9050
4. Nanotechnologies, materials and production	3475
5. Energy	2350
6. Environment	1890
7. Transport	4160
8. Socio-economic research	623
9. Space	1430
10. Security	1400
Total	32413 M€

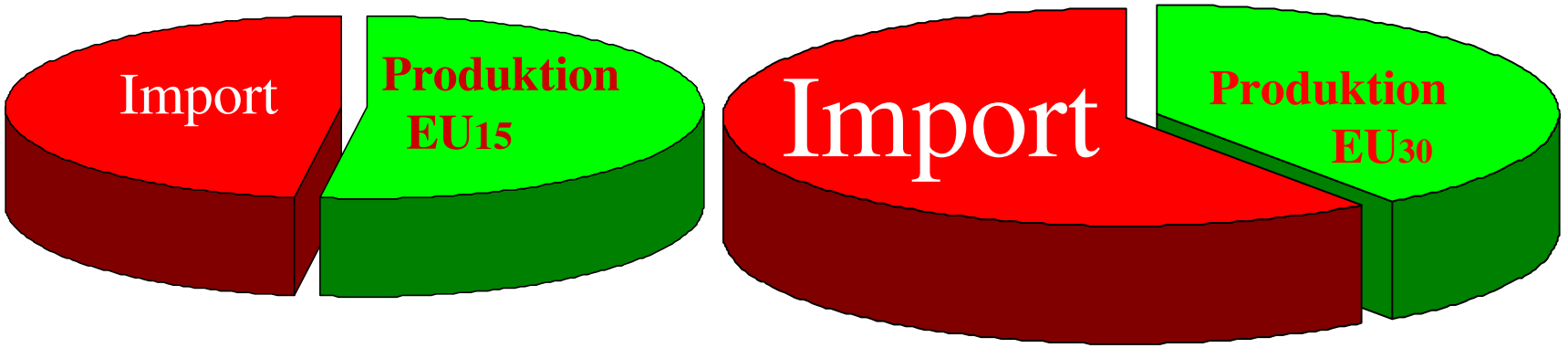
Energie: die wesentlichen Herausforderungen

- **Globaler Energiebedarf könnte in den nächsten 30 Jahren um 60% (100%?) wachsen.**
- **Begrenzte konventionelle Öl- und Gasreserven in der EU**
- **Energieversorgungsabhängigkeit der EU könnte bis 2030 bei "business as usual" von 50% auf >70% steigen mit erhöhtem Risiko bei ansteigendem Ölpreis und instabilen geopolitischen Verhältnissen.**
- **Energieverbrauch ist verantwortlich für mehr als 90% der EU CO_2 Emissionen. → Klimawandel.**
- **Globale Investitionen in Energiesysteme:**
  - €12000 Milliarden sind bis 2030 erforderlich
  - ein gewaltiges Marktpotential für Europäische Industrie bei scharfem globalem Wettbewerb.

EU15 → EU30: Wachsende Importabhängigkeit bei Primärenergie

1998
1438 Million toe

2020
2400 Millionen toe



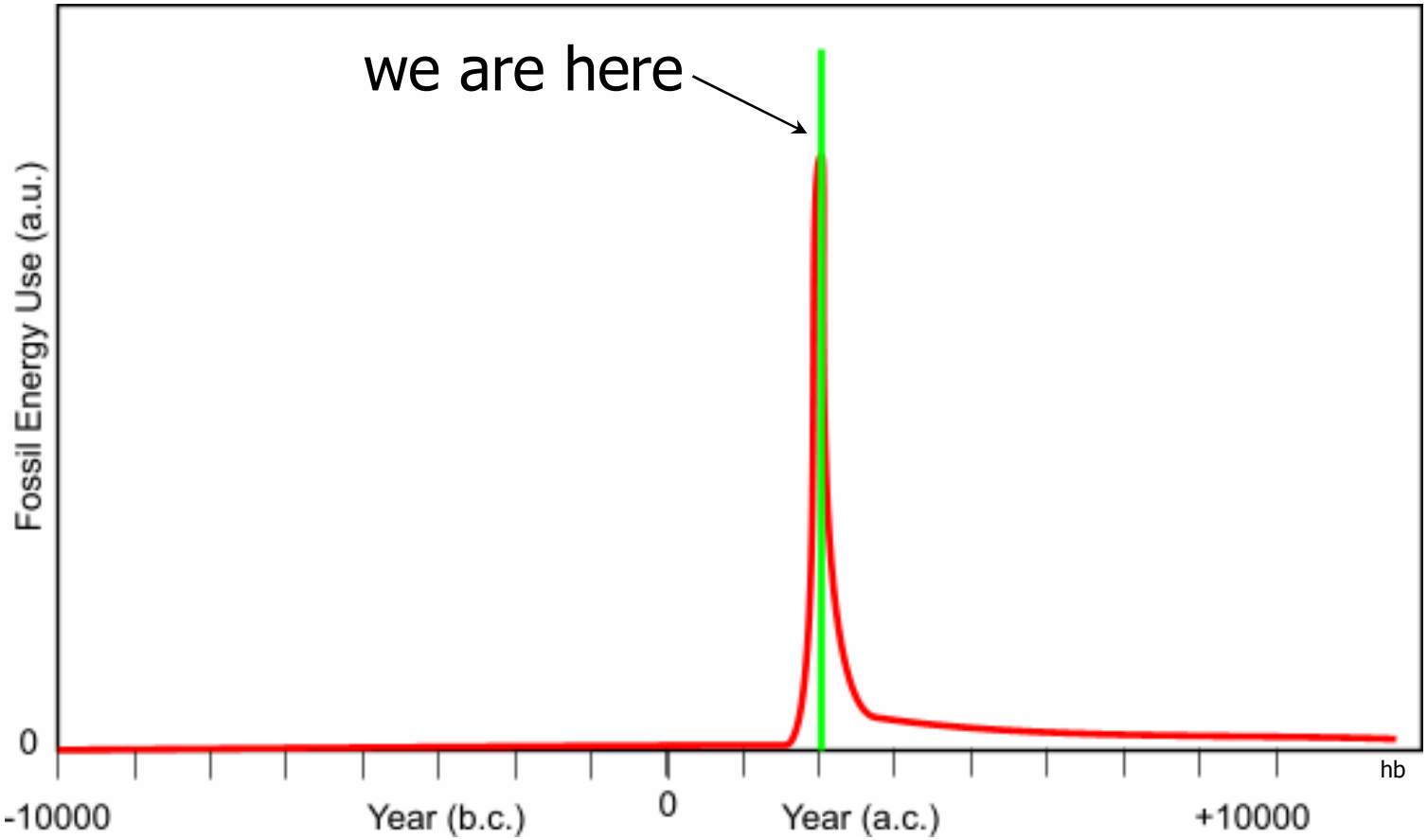
Der Import von Energie wird sich mehr als verdoppeln!

1998: 691 Mtoe (EU15) → 2020: 1440 Mtoe (EU30)

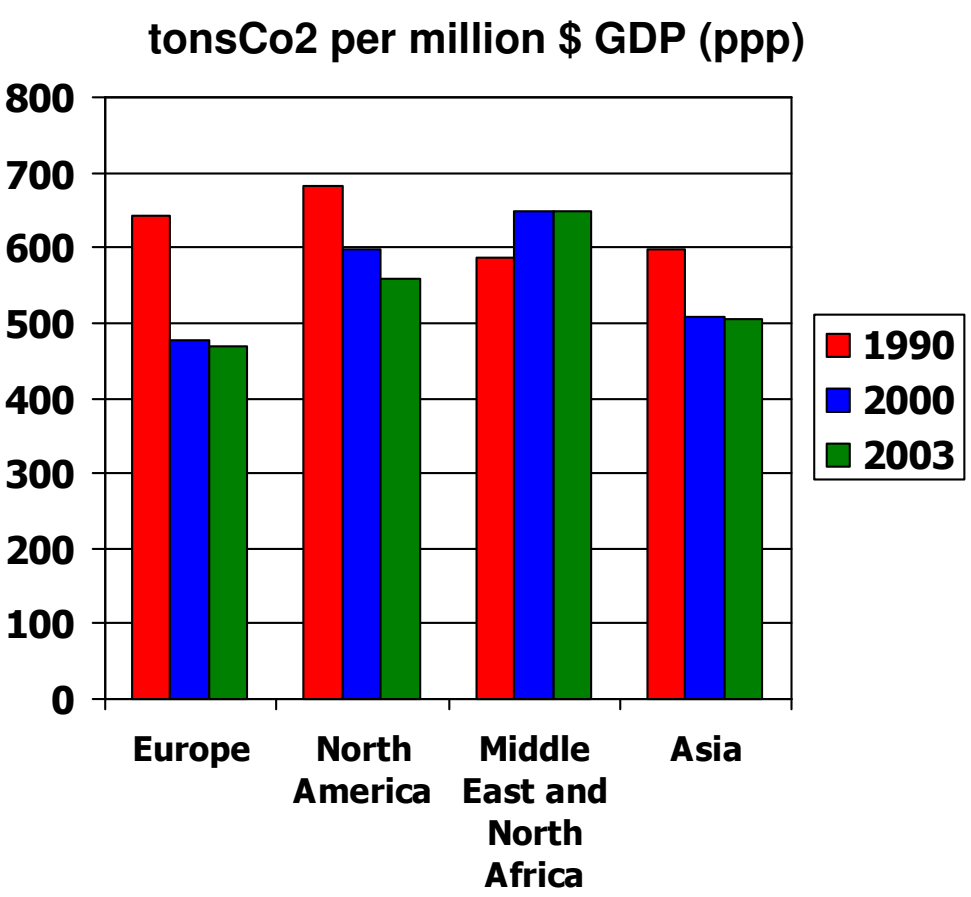
(28% der Primärenergie werden für Elektrizitätserzeugung genutzt)

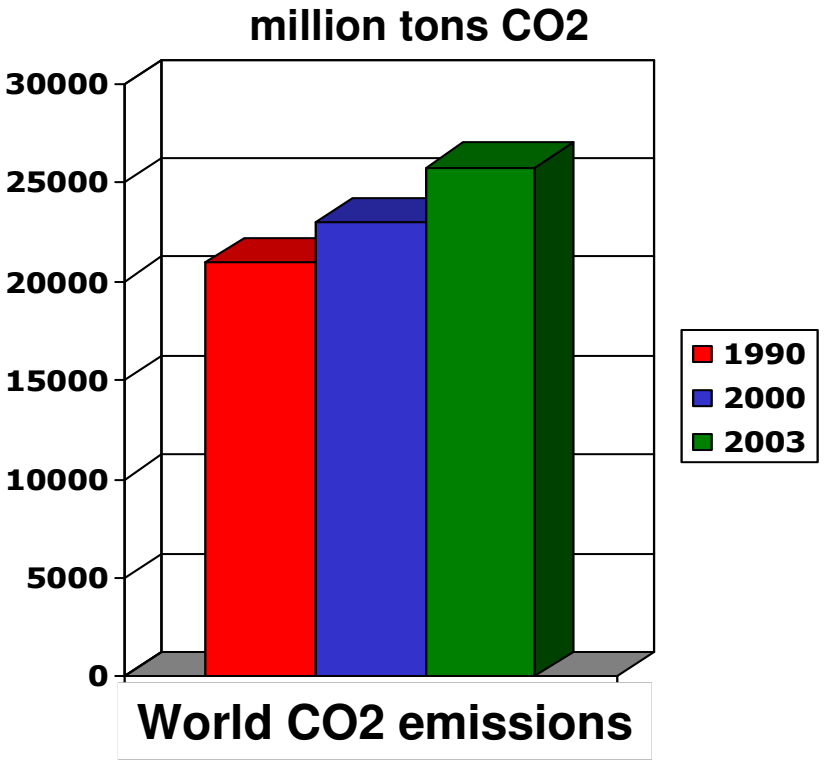
Source: Eurostat, 31st Ed. 1999
EU-Commission (Green Book on Security of Energy Supply 2002)

Fossil Energy Use – a longterm view



CO2 intensity and world CO2 emission





data source: IEA

Energy policy: initiative papers by the European Commission

- **Green Paper "Towards a European strategy for the security of energy supply (**COM(2000)769 and COM(2002)321 final) leading to
  - Directive 2001/77/EC on electricity production from renewable sources
  - Directive 2002/91/EC on energy savings in buildings
  - Directive 2003/30/EC on the promotion of biofuels
  - White Paper on European transport policy for 2010 (COM(2001)370 final)*
- **Green Paper on a European strategy for sustainable, competitive and secure energy (**COM(2006)105**)**

*transport accounts for 32% of energy consumption and 28% of total CO2 emissions)

Hauptziele der Energiepolitik

- **Versorgungssicherheit**
- **Klimaverträglichkeit**
- **Liberalisierung der nationalen Märkte und Schaffung eines europäischen Energie-Binnenmarktes**
  - Wettbewerb insbesondere für Elektrizität und Gas
  - transparente Großhandelsmärkte
  - Abschaffung von Monopolstellungen, insbes. durch wirtschaftliche, funktionelle bzw. organisatorische Trennung von bisheriger vertikaler Integration
  - Schaffung eines Marktes, auf dem Endverbraucher Lieferanten und Versorger wählen können.

Towards an Energy Policy for Europe (EPE):

- **An integrated climate and energy policy** *
  - limit global average temperature increase to <2°C above pre-industrial levels
  - **Energy Policy for Europe** with three objectives
    - increasing security of supply
    - ensuring the competitiveness of European economies and availability of affordable energy
    - promoting environmental sustainability and combating climate change
- **Strategic Energy Technology Plan to be examined in spring 2008**
- **Updated Strategic Energy Review in early 2009**
- **New Energy Action Plan from 2010 onwards to be adopted in 2010**

* **Presidency Conclusions of European Council, 8/9 March 2007 Council doc. 7224/07**

Energy Policy for Europe (EPE) *

- **Key Issues:**
  - Internal Market for Gas and Electricity
  - Security of Supply
  - International Energy Policy
  - Energy Efficiency and Renewable Energies
  - Energy Technologies

* Presidency Conclusions of European Council, 8/9 March 2007 Council doc. 7224/07, Annex I

Energy Policy for Europe
Energy Technologies*

- **strengthen energy research**
  - accelerate competitiveness of sustainable energies, notably renewables, low carbon technologies and energy efficiency technologies
- **possible global benefits of sustainable use of fossil fuels:**
  - generation efficiency and clean fossil fuel technologies
  - R&D and regulatory framework for safe Carbon Capture and Sequestration, if possible by 2020
  - stimulation of construction and operation by 2015 of up to 12 demonstration plants of sustainable fossil fuel technologies in commercial power generation
- **choice whether to use nuclear is up to the Member States**
  - support to R&D on waste management
  - high level group on nuclear satefy and waste management

*** Presidency Conclusions of European Council, 8/9 March 2007 Council doc. 7224/07, Annex I**

Main objectives of European Energy Research in FP7

- Improve energy efficiency throughout the energy system
- Accelerate the penetration of renewable energy sources
- Decarbonise power generation and, in the longer term, substantially decarbonise transport
- Reduce greenhouse gas emissions
- Diversify Europe's energy mix
- Enhance the competitiveness of European industry including a better involvement of SME's

Cooperation specific programme – Energy theme - ten activities

- Renewable electricity generation
- Energy savings and energy efficiency
- Renewable fuel production
- CO_2 capture and storage for zero emission power generation
- Renewables for heating and cooling
- Clean coal technologies
- Smart energy networks
- Hydrogen and fuel cells
- Knowledge for energy policy making
- Horizontal programme actions

Cooperation specific programme – Theme implementation

Collaborative research
(Collaborative projects; Networks of Excellence; Coordination/support actions)

Joint Technology Initiatives
(limited number of long-term public-private partnerships for large scope and scale of resources)

Coordination of non-Community research programmes
(ERA-NET; ERA-NET+; Article 169)

International Cooperation

Emerging needs, unforeseen policy needs, dissemination & transfer of results

up to 800 M€ (400 M€ for 2007-2010) to European Investment Bank Risk-Sharing Finance Facility (RSFF) for higher risk investments and for catalytic effect in leveraging private investment

Renewable electricity generation

Technologies to increase overall conversion efficiency, cost efficiency and reliability, driving down the cost of electricity production from indigenous renewable energy sources, including biodegradable waste, and the development and the demonstration of technologies suited to different regional conditions.

Goal for 2010

21% of green electricity

Renewables for heating and cooling

Technologies to increase efficiencies and drive down the costs of active and passive heating and cooling from renewable energy sources, ensuring their use in different regional conditions (e.g. district/dedicated space heating and cooling, building integration, energy storage)

Overall goal for 2010

12% of renewable energy sources in the energy mix

Renewable fuel production

Integrated fuel production systems and conversion technologies: to develop and drive down the unit cost of solid, liquid and gaseous (including hydrogen) fuels produced from renewable energy sources including biodegradable waste, aiming at the cost-effective production, storage and use of carbon-neutral fuels, in particular biofuels for transport and electricity generation.

Goal for 2010

5.75% of alternative transport fuel

Hydrogen and fuel cells

Transport, stationary and portable applications

Critical materials, processes and emerging technologies

Fundamental and applied research and technological development
Large-scale demonstration (“lighthouse”) projects

Hydrogen and Fuel Cell Technology Platform
Possible Joint Technology Initiative

CO_2 capture and storage technologies for zero emission power generation

Fossil fuels in World Primary Energy 80% now, 78-82% (2030) (IEA)

Aim: reduce adverse environmental impacts of fossil fuel use

Highly efficient power and steam generation with near zero emissions

Efficient and reliable CO_2 capture and storage technologies:
Particularly underground storage
Decrease cost to <20€/tonne
Capture rates above 90%
Prove the long-term stability, safety & reliability of CO_2 storage

Clean coal technologies

Coal share of World Primary Energy
~25% now, ~20-25% in 2030 (IEA scenarios)

Development and demonstration of clean coal & other solid fuel conversion technologies to:
significantly increase plant efficiency and reliability
minimise pollutant emissions
reduce overall costs
also produce secondary energy carriers (including H_2) and liquid or gaseous fuels

Complementary to CO_2 capture and storage technologies.

Smart energy networks

To increase the efficiency, flexibility, safety and reliability of the more integrated European electricity and gas networks

Electricity:

Interactive customers/operators network
Large scale integration of RES
Distributed generation: fuel cells, micro-turbines
Innovative ICT solutions, RES storage, power electronics & High Temperature Superconducting devices

Gas:

Intelligent and efficient gas transport and distribution
Integration of RES technologies

Energy efficiency and savings

Vast potential to reduce energy demand at low cost through energy savings & improved energy efficiency

New concepts and technologies for optimising community energy systems for buildings, transport, services and industry

Eco-buildings, minimum climate impact buildings
Renewable energy co-generation and poly-generation
Integrated demand management in cities & communities

Large-scale demonstration plus innovative R&D on specific technologies

Knowledge for energy policy making

Development of tools, methods and models to assess the main economic and social issues related to energy technologies

Databases and scenarios
Impact of technological progress on EU energy policies Impact of energy policies and technologies on security of supply, environment, society and competitiveness

Horizontal Programme Actions

European Research Area (ERA) and programme management and coordination

Coordination of FP7 Energy and Member States' and Associated Countries' initiatives using the ERA NET scheme

Trans-national co-operation among NCPs

Monitoring the expected impacts of FP7 Energy projects

Energy activities in the workprogramme 2007

- *ACTIVITY ENERGY.1:* HYDROGEN AND FUEL CELLS
- *ACTIVITY ENERGY.2:* RENEWABLE ELECTRICITY GENERATION
- *ACTIVITY ENERGY.3:* RENEWABLE FUEL PRODUCTION
- *ACTIVITY ENERGY.4:* RENEWABLES FOR HEATING AND COOLING
- *ACTIVITY ENERGY.5:* CO2 CAPTURE AND STORAGE TECHNOLOGIES FOR ZERO EMISSION POWER GENERATION
- *ACTIVITY ENERGY.6:* CLEAN COAL TECHNOLOGIES
- *ACTIVITY ENERGY.5&6:* CROSS-CUTTING ACTIONS BETWEEN ACTIVITIES ENERGY.5 AND ENERGY.6
- *ACTIVITY ENERGY.7:* SMART ENERGY NETWORKS
- *ACTIVITY ENERGY.8:* ENERGY EFFICIENCY AND SAVINGS
- *ACTIVITY ENERGY.9:* KNOWLEDGE FOR ENERGY POLICY MAKING
- *ACTIVITY ENERGY.10:* HORIZONTAL PROGRAMME ACTIONS

Topical areas of the first call 2007

- **1 Hydrogen and Fuel cells**
  - 1.1. Fuel cells
- **2. Renewable electricity generation**
  - 2.1 Photovoltaics
  - 2.2 Biomass
  - 2.3 Wind
  - 2.4 Geothermal
  - 2.5 Concentrated solar power
  - 2.6 Ocean
  - 2.7 Hydro
  - 2.8 Cross-cutting issues
- **3. Renewable fuel production**
  - ...
- **4. Renewables for Heating and Cooling**
  - ...
  - ...

Photovoltaics topics of first call 2007

- Intermediate band materials and cells
- Dye-sensitised PV solar cells
- Concentrating PV cells, optics, modules
- Research for binary thin-film photovoltaics
- Environmental aspects of PV
- Alternative approaches for crystalline silicon PV
- supply of feedstock for the PV industry
- Improved production equipment and cost reduction
- Innovative/improved PV manufacturing processes
- Development and demonstration of standardised building compoments
- Multiple benefits of PV systems (power quality, urban security of supply ...)

Biomass
topics of first call 2007

- **Renewable electricity production**
  - Advanced gas cleaning technologies for biomass
  - Innovative technologies for efficient electricity production in biomass-fired IGCC
  - New and improved slagging and corrosion control technologies for large-sale biomass co-firing processes
  - Large-scale co-firing (biomass + fossil fuels)
  - Novel solid biofuels for elelctricity generation (straw ...)
  - High-efficiency mediom-to-large scale electricity generation from biomass
- **Renewables for heating and cooling**
  - no topics open in this call

Geothermal topics of first call 2007

- **Geothermal**
  - Renewable electricity production
    - Understanding and mitigation of induced seismicity associated with geothermal field development
  - Renewables for heating and cooling
    - Improved ground source heat pumps
    - Improved underground systems

Solar thermal topics of first call 2007

- **Renewable electricity production**
  - Concentrated solar power (CSP)
    - Key components for CSP
    - Using CSP for water desalination
    - low cost, high efficiency daily storage systems (demonstration)
    - Improve theenvironmental profile of the CSP installations
    - CSP: Innovative heat transfer concepts
    - Intermediate size, lower concentration ratio CSP systems
- **Renewables for heating and cooling**
  - Low/Medium temperature solar thermal energy
    - Collector design and components
    - Small scale thermal cooling units
    - Small distributed systems for seawater desalination
    - Large scale systems for industrial heat processes

Energy theme – joint responsibility

DG RTD Research	DG TREN Transport and Energy
Research	Research & Demonstration
Time frame Longer term	Time frame Shorter term

FP7 First Calls

Launch 22 Dec 2006 Deadline 3 May 2007	DG RTD Call FP7-ENERGY-2007-1-RTD Budget 109.3 M€ for 2007 (& 35 M€ for 2008?)
Launch 22 Dec 2006 Deadline 3 May 2007	DG TREN Call FP7-ENERGY-2007-2-TREN Budget 128 M€ for 2007
Launch 22 Dec 2006 Deadline July 2007	ERA-NET Joint Call FP7-ERANET-2007-RTD (Budget 7.5 M€ for 2008)

Indicative project funding in First Calls

- Collaborative projects
  - Small-medium in DG RTD Call: typically 1-3 M€
  - Large in DG RTD Call: typically 5-8 M€
  - In DG TREN Call: not specified
- Coordination and Support Action
  - CA type: typically 1-2 M€
  - SA type: Typically <1 M€
- NB: Eligibility Criterion in DG RTD Call only:
  - Large Collaborative Project > 4 M€
  - Small-Medium Collaborative Project < 4 M€

SME Participation

Enable at least 15 % of the funding available under the "Cooperation" programme to go to SMEs. Facilitate their participation through

- **improved financial and administrative procedures**
- **more flexibility in choosing the appropriate financial scheme.**
- **research needs and potential of SMEs are duly taken into account in developing the content of the thematic areas of this Specific Programme**
- **areas which are of particular interest to SMEs will be identified in the work programme.**
- **Concrete measures, including support actions in the framework of a strategy to be developed under each theme.**
- **Specific actions to support research for the benefit of SMEs or SME associations are included in the "Capacities" Specific Programme**
- **Actions to promote SME participation across the Framework Programme will be funded under the "Competitiveness and Innovation" Programme.**

Joint Technology Initiatives

(resulting from European Technology Platforms)

- **Use only in a very limited number of cases**
  - inability of existing instruments to ac… …ctive,
  - scale of the impact on industri… …d growth,
  - added-value of Europe…
  - the degree and cl… …jective and deliverables to be pursued, and i… …ution to broader policy objectives including l…
  - str… …esource commitment from industry,
  - …tional national support and leverage current or …ing.

possible JTIs in the energy sector:
- Hydrogen and Fuel Cells
- …

- **clear … …tions required for**
  - financial commitments;
  - duration of the commitment of the participants;
  - rules for entering and exiting the contract;
  - intellectual property rights.

Coordination of non-Community research programmes

- **ERA-NET**
  - develop and strengthen the coordination of national and regional research activities
    - Information exchange
    - Definition and preparation of joint activities
    - Implementationof joint activities
    - Funding of joint transnational research actions
- **ERA-NET+**
  - facilitate joint calls for proposals between national / regional programmes
- **Participation in jointly implemented national research programmes (Art. 169, "variable geometry")**
- **enhance complementarity and synergy with intergouvernmental structures**
  - EUREKA, EIROforum COST ...

International cooperation

- strategic research partnerships with third countries
- address specific problems facing third countries or of global character on basis of mutual interest and benefit

promote the EU's role as a global player through multilateral international research programmes

contribute to global sustainable development ... and ensure a balanced thematic and geographic participation by third countries and regions

→ enhanced participation of researchers and research institutions from all cooperation and industrialised countries

→ specific cooperation actions in each thematic area dedicated to third countries

outside FP7

Competitiveness and Innovation Framework Programme (CIP)

- **coherent and integrated response to the objectives of the renewed Lisbon strategy.**
- **Budget 3.621 M€ for 2007-2013**
- **Three specific programmes**
  - Entrepreneurship and Innovation Programme (2.166 M€)
  - ICT Policy Support Programme (728 M€)
  - Intelligent Energy-Europe Programme (727 M€)

Decision No 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) OJ L 310/15, 09.11.2006

outside FP7

Intelligent Energy Europe Arbeitsprogramm 2007

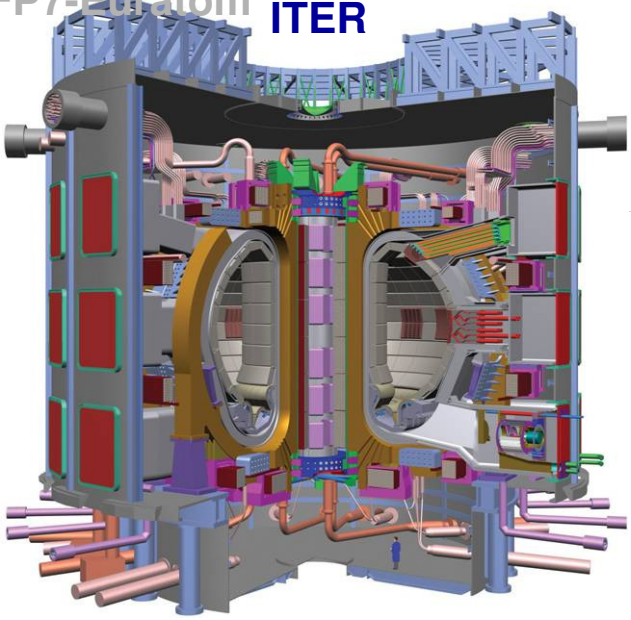
- Übergeordnete Ziele:
  - **Verbesserung der Energieeffizienz und rationelle Nutzung der Energiequellen;**
  - **Förderung neuer und erneuerbarer Energiequellen und Diversifizierung der Energieversorgung;**
  - **Verbesserung der Energieeffizienz und Förderung der Nutzung neuer und erneuerbarer Energiequellen im Verkehrswesen.**
- Projektziele (~350 Projekte): Untermauerung politischer Konzepte und Strategien, Umstellung des Marktes, Änderung der Verhaltensmuster, Zugang zum Kapital, Aus- und Fortbildung
- Koordinierung mit dem 7. Forschungsrahmenprogramm
  - **IEE: Förderung von Energieprodukten, nicht-technische Markthemmnisse**
  - **FP7: Forschung & Demonstration, Verbreitung neuer Kenntnisse**

FP7
Euratom
(2007-2011)

- **Fusion**

- **Fission and Radiation Protection**

ITER



Fusion Energy Research

- **Objective:**
  - developing the knowledge base,
  - realising ITER as the major step

  towards the creation of prototype reactors for power stations (safe, sustainable, environmentally responsible, economically viable)

- **Strategy:**
  - ITER (major experimental facility for demonstration of scientific and technological feasibility of fusion power)
  - DEMO ("demonstration" fusion power station)
- **Involvement of**
  - European Industry
  - Associated fusion laboratories (European and third countries, in particular parties to the ITER agreement)
- **Funding**
  - 1947M€ of which at least 900 M€ for activities other than the construction of ITER

Fusion Energy Research
The activities

- **Realisation of ITER (construction starts 2007, lasting ~10 years)**
  - joint realisation, site preparation, establishment of ITER organisation and European Joint Undertaking for ITER, technical and administrative support, construction of equipment ...(ITER will be an element of the new research Infrastructures)
- **R&D in preparation of ITER operation**
  - exp.&theor. work on JET and other devices (Tokamaks, Stellarators, RFPs)
  - assessment of specific key ITER technologies, consolidation of ITER project choices
- **Technology activities in preparation of DEMO**
  - blankets
  - International Fusion Materials Irradiation Facility (IFMIF)
- **R&D for the longer term**
  - Concept improvement (W7-X stellarator), theory&modelling, keep-in-touch on IFE
- **Human resources education and training**
- **Coordination and Support Actions ("keep-in-touch" with inertail fsion)**
- **Technology transfer** (new&flexible structures)

Nuclear Fission and Radiation Protection and Nuclear Activities of the JRC :

Objective & Rationale:

- accelerate developments for safer management of long-lived rad-waste, enhancing safety performance, resource efficiency, cost-effectiveness of nuclear power
- ensuring robust and socially acceptable system of protection of man and the environment against effects of ionising radiation

Activities

- Management of radioactive waste**
  - **geolocigal disposal**
  - **partitioning and transmutation**
- Reactor systems**
  - **nuclear installation safety**
  - **advanced reactor systems**
- Radiation protection**
  - **risks from low doses, medical use, accident management, research on minimising nucl. and radiol. terrorism and diversion of material**
- Infrastructures (material test facilities, underground research laboratories, radiobiological facilities, tissue banks)
- Human resources, mobility and training

**also in part element of the JRC Euratom activities

L 400/72 EN Official Journal of the European Union 30.12.2006

Conclusions

- **The 7th Framework Programme is a significant new step in the European R&D strategy albeit the budget is not as high as proposed by the Commission.**
  - Annual FP7 EC budgets are growing from 5082 M€ (2007) to 9914 (2013).
  - FP7 EC energy R&D annual budgets rise from 121 M€ to 226 M€.
  - FP7 Euratom budgets rise from 404 M€ to (indicatively) 664 M€ in the same period
- **The new structure and simplifications should make applications more attractive.**
- **Energy themes pursue essentially established research lines on energy savings, improving technical and economical feasibility of renewables and with enhanced emphasis on clean coal.**
- **Euratom research has a new priority with ITER construction.**

- **A *Strategic Energy Technology Plan*, as foreseen in the *Energy Policy for Europe* could provide further impetus for energy research, possibly from 2008/9 onwards.**