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# FP7 Euratom Indirect Actions “Fission & Radiation Protection” Work Programme 2007

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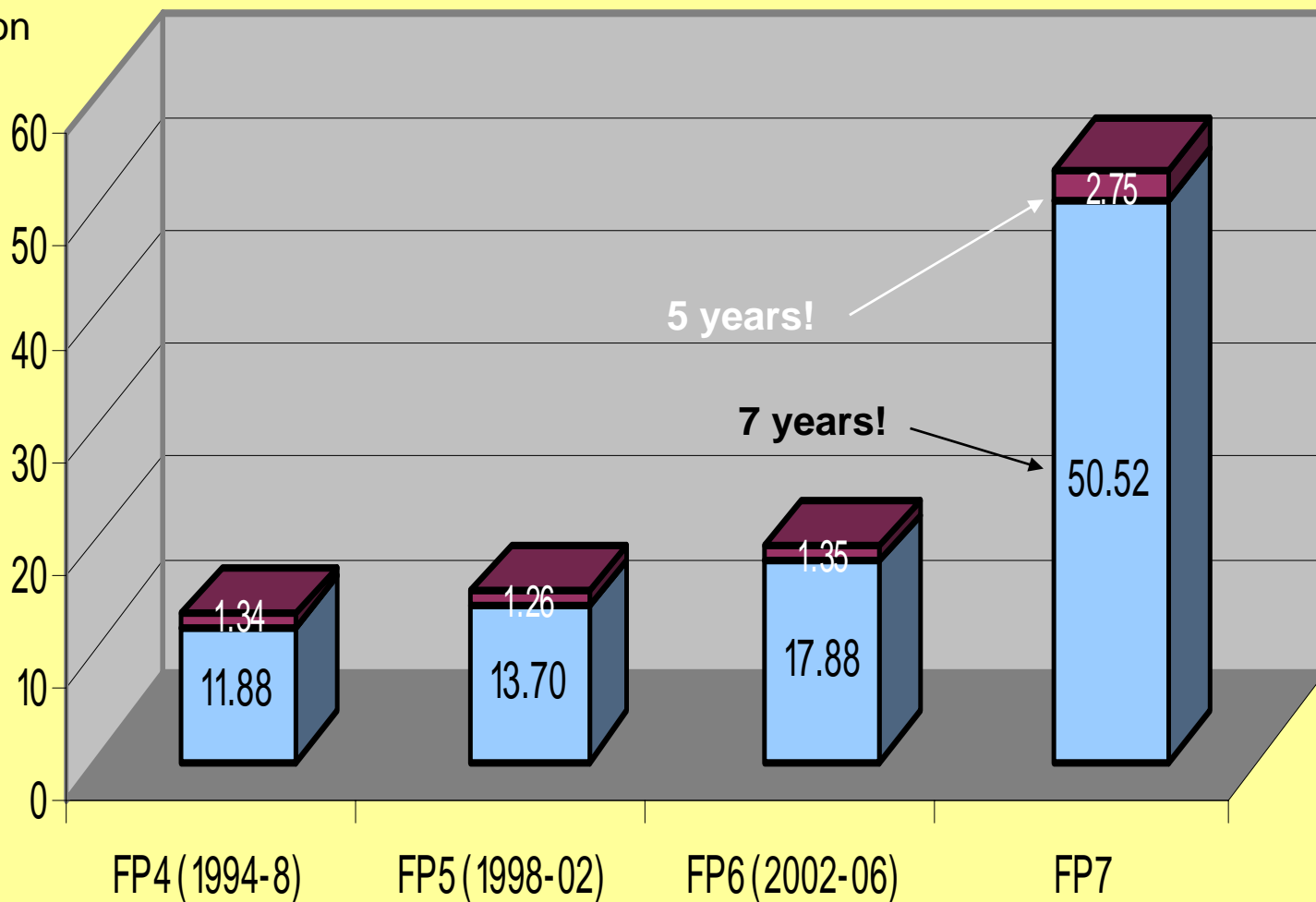
- **General remarks**
  - ➔ Brief overview of FP6
  - ➔ Strategy & structure for FP7
- **Work programme for 2007**
  - ➔ Presentation by activity / area / topic





# EC vs. Euratom

€ Billion



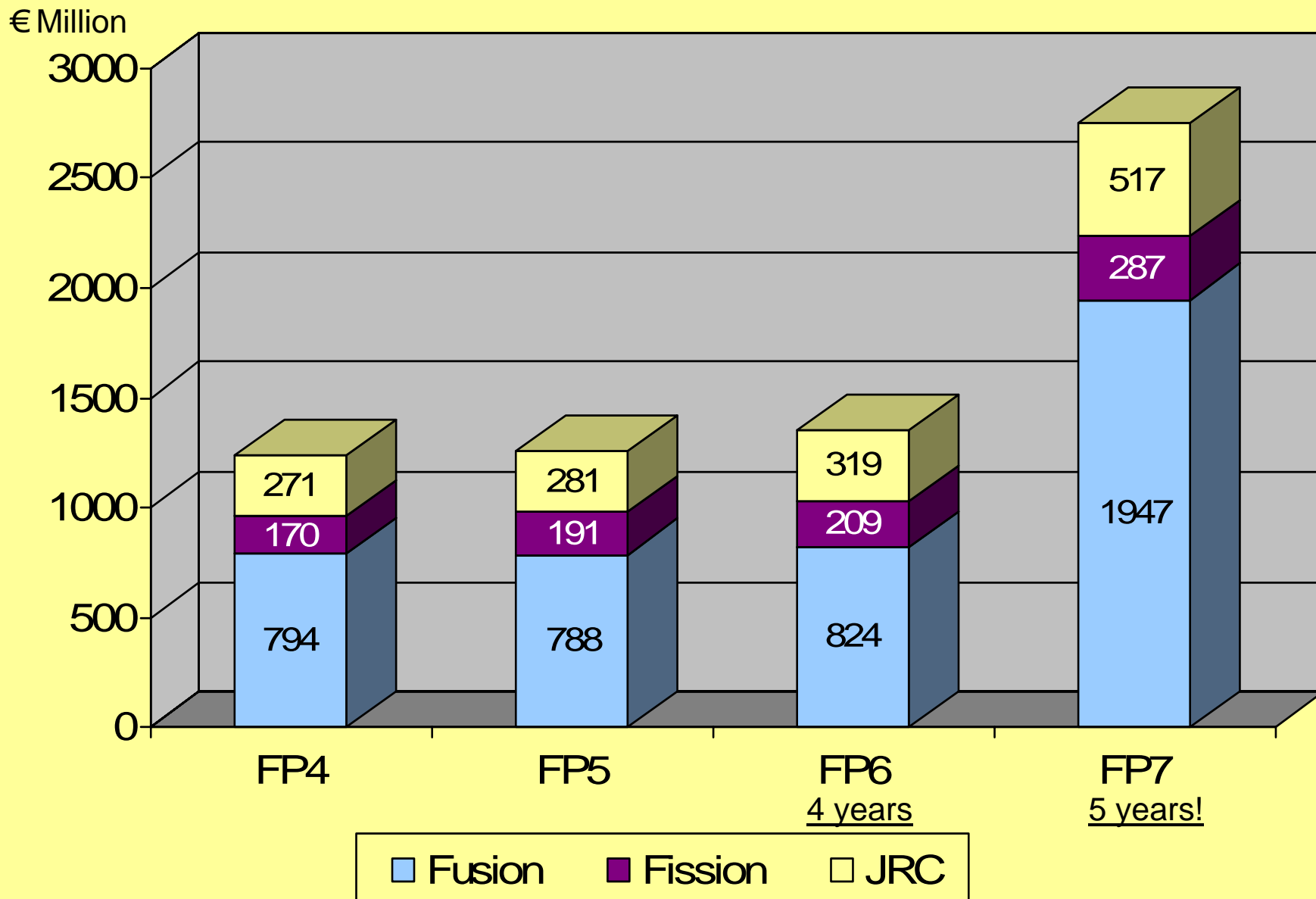
5 years!

7 years!

■ EC ■ EURATOM



# Euratom research budget





# Final status of FP6 “fission” programme

- **Three fixed deadline calls for proposals**
  - 1<sup>st</sup> deadline 6 May 2003: €67M used
  - 2<sup>nd</sup> deadline 14 April 2004: €61M used
  - 3<sup>rd</sup> and final deadline 11<sup>th</sup> October 2005: €52M used
- **A continuously open call for proposals with cut-off dates every 6 months**
  - 2003 – 2004: €1M used per cut-off date
  - 2005 – 2006: €1.5M per cut-off date
  - Final cut-off date was 11<sup>th</sup> April 2006





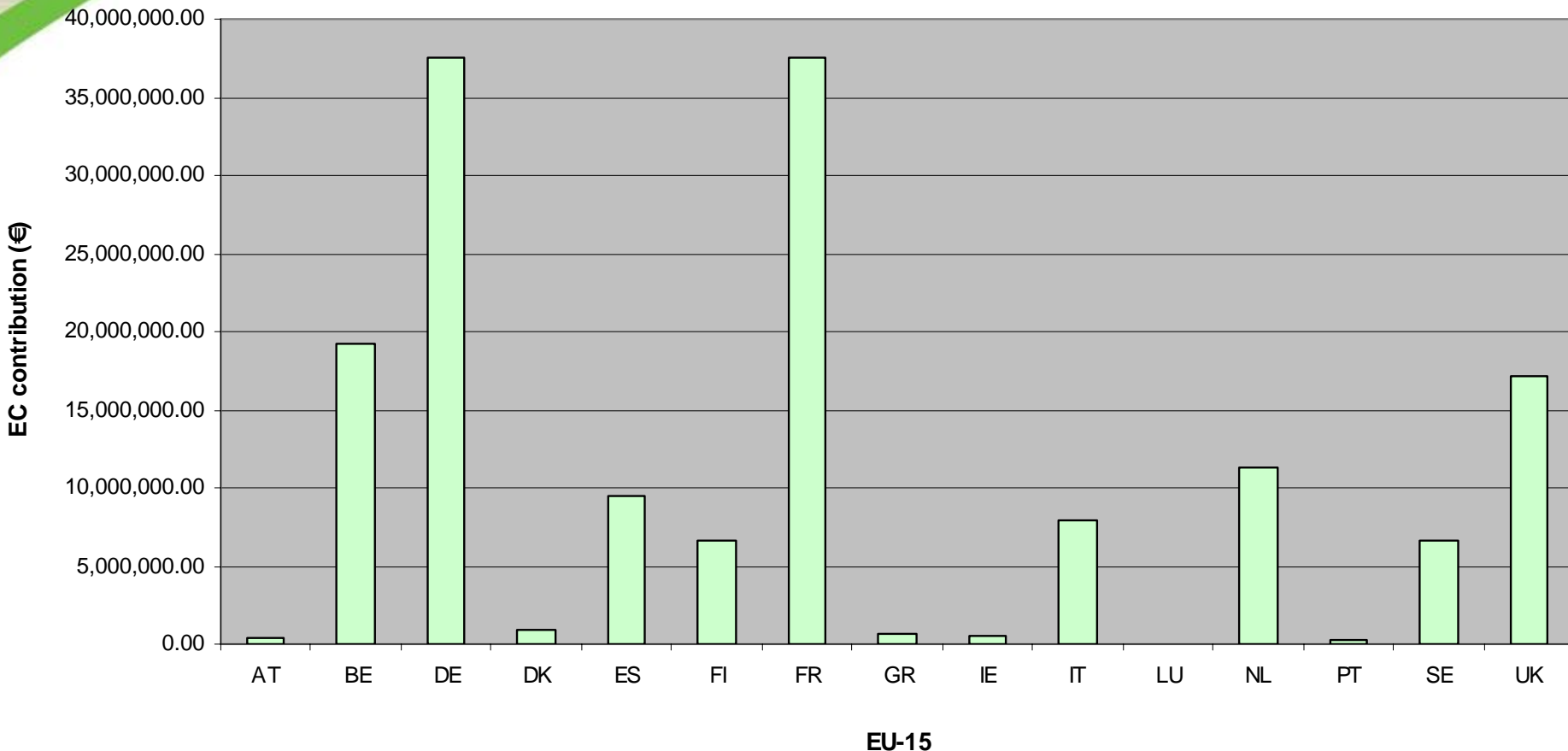
# Euratom FP6: "Fission" indirect actions: 3 areas of activity

- **Management of radioactive waste - €90M**
  - geological disposal
  - P&T
- **Radiation protection - €50M**
  - low doses, medical exposures, emergency management
  - Natural sources of radiation, protection of the workplace
- **Other activities in the field of nuclear technologies - €50M**
  - safety of existing installations
  - innovative concepts
  - education & training





# Geographical distribution (EU-15) of EC contribution in Euratom FP6 projects

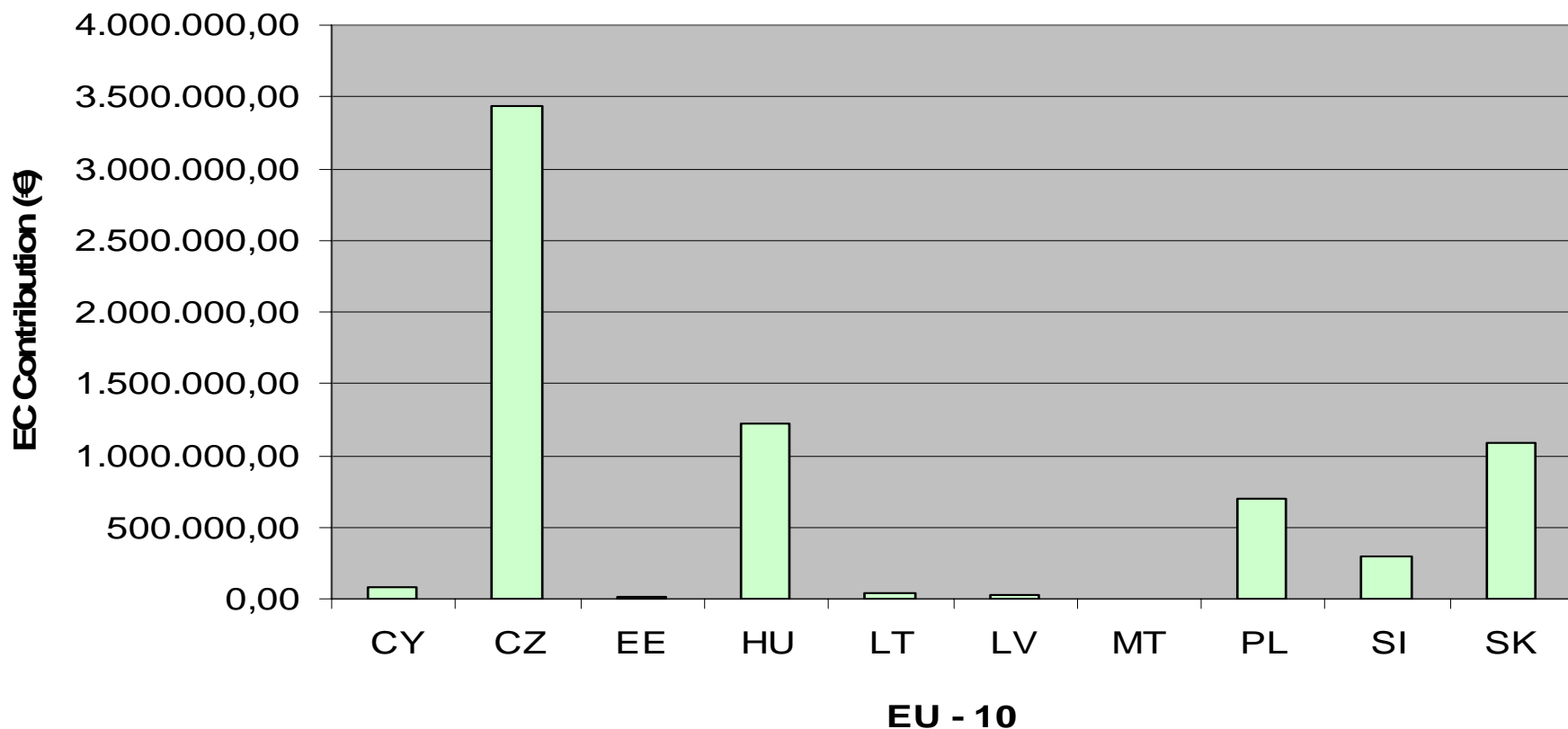


AT: Austria; BE: Belgium; DE: Deutschland; DK: Danmark; ES: Spain; FI: Finland; FR: France; GR: Greece;  
IE: Ireland; IT: Italy; LU: Luxembourg; NL: The Netherlands; PT: Portugal; SE: Sweden; UK: United Kingdom





# Geographical distribution (EU-10) of EC contribution in Euratom FP6 projects



CY: Cyprus; CZ: Czeck Republik; EE: Estonia; HU: Hungary; LT: Lituania; LV: Latvia; MT: Malta; PL: Poland; SI: Slovenia; SK: Slovakia.



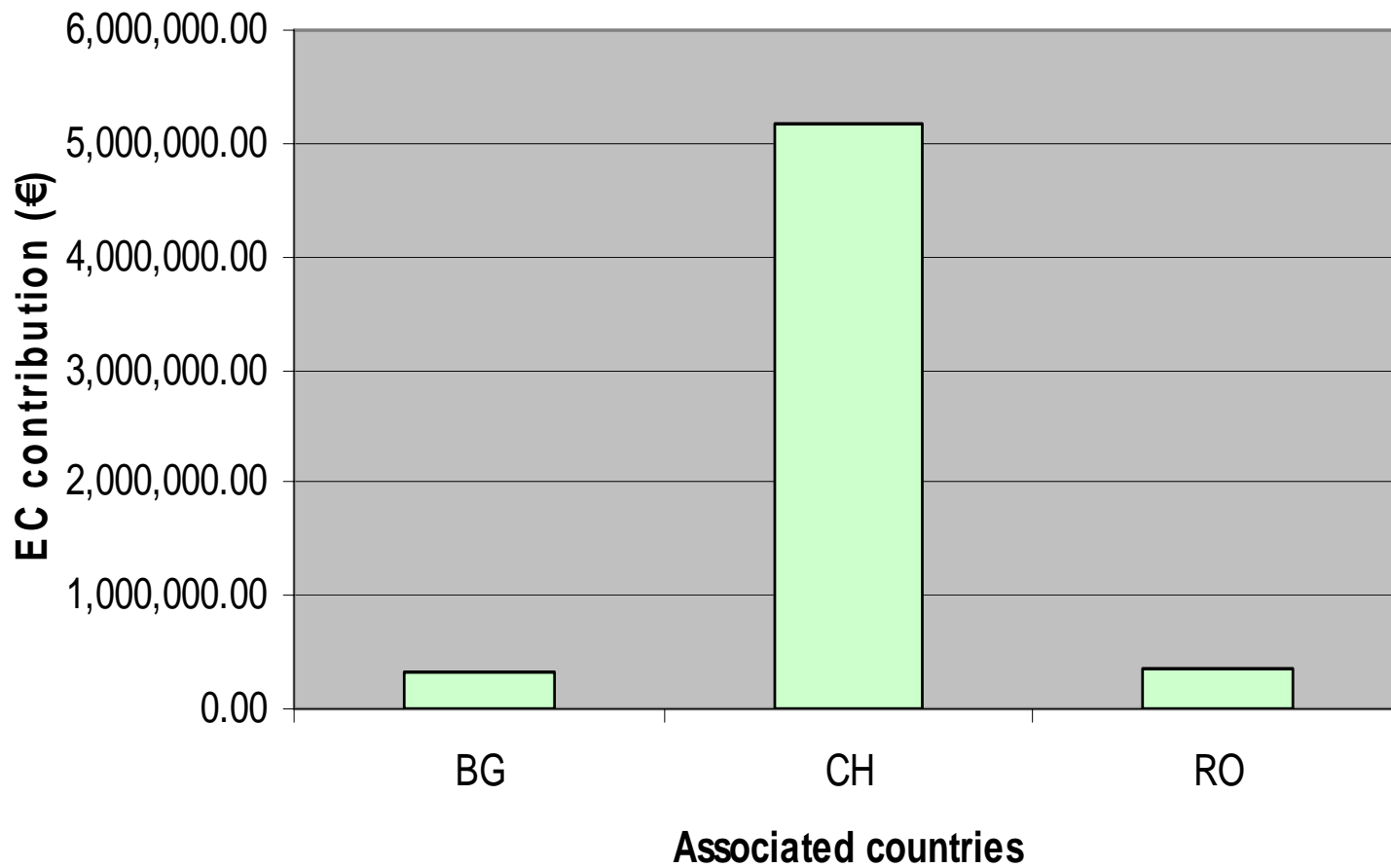




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# Geographical distribution (AS) of EC contribution in Euratom FP6 projects



BG: Bulgaria; CH: Switzerland; RO: Romania





# Fission programme FP7 – key issues for implementation

- Programme must remain flexible to respond effectively to results of on-going research, emerging issues and political priorities
- Similar funding schemes to FP6 allow important continuity
- Enhanced coordination with national & industrial programmes essential
  - ➔ “Technology Platforms” can build on the structuring effect of FP6 instruments & enable more effective use of FP funds
- International cooperation a key overall policy objective





# Specific Programme – fission & RP areas of activity

C  
A  
R  
D

## Management of radioactive waste:

- Geological disposal
- Partitioning & Transmutation

S  
N  
F  
I  
T  
P

## Reactor systems:

- Nuclear installation safety
- Sustainable nuclear systems

## Radiation protection:

- Risk from low doses
- Medical uses of radiation
- Emergency management

## Key cross-cutting activities:

### Research infrastructures

- Supporting ...
- Access to ...

### HR, mobility & training

- Training
- Mobility of researchers



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# WP2007 – consultation and input

- End 2004: 4 CCE-Fi working groups
- Status of on-going major FP6 projects
- FISA2006
- Consultation Day 22 June 06
- Ad hoc stakeholder input
- ISC launched 13 Oct
- Programme Committee CCE-Fi 7 Nov





# WP2007 – General remarks

- **One fixed deadline call of €52M**
- **Published end Dec.? Deadline week 18?**
- **No Open Call**
  - ➔ Support for human resources to be channelled through major projects, with training schemes planned for WP2008
- **Single budget line**
  - ➔ No ring-fencing, but intention to spend roughly equal amounts in each thematic area (over full duration of programme)
  - ➔ Every attempt to prevent evaluation bias: excellence is key criterion
- **Indication of topics for WP2008**
- **No influence of TPs before 2008 at earliest**
- **Special attention to international cooperation**
- **NCP network may be reinforced**





# Topics in WP2007 – Radwaste management

## ● Geological disposal

### → Phenomenology and PA: *collaborative project(s)*

- Diffusion in clay, transport in high pH
- Gas generation
- Full-scale prototypes of repository sub-systems (monitoring, validation of numerical simulations)
- Modeling tools for long time period / large scale simulation

### → Technology demonstration of safe repository operation: *collaborative project*

- Mechanical demonstrators to solve key issues of repository operation – emphasis on licence application
- Scope: safe on-site handling / transport, feasibility of construction, reversibility, monitoring strategies





# Topics in WP2007 – Radwaste management

## ● Partitioning & Transmutation

→ Partitioning processes for viable recycling strategies:

*collaborative project(s)*

- Develop the mature aqueous separation processes (compatible with fuel fabrication & viable recycling strategies) + go beyond current state of the art in pyro-chemical separation – view to full demo at pilot level
- Scope: most promising aqueous separation, exploratory R&D on new molecules, pyro-chemistry, PIE if necessary, detailed engineering & systems studies





# Topics in WP2007 – Reactor systems

## ● Nuclear installation safety

- Numerical coupling of safety-relevant phenomena: *collaborative project*
  - Coupling of core physics and thermal hydraulics numerical simulation tools for reactor safety computations and experimental validation of these tools
- Prediction of irradiation effects on reactor internals and/or claddings: *collaborative project*
  - Development of multi-scale simulation tools to predict the combined effects of irradiation and corrosion on internals and/or claddings and experimental validation of these tools

*Both projects:* sensitivity / uncertainty analysis,  
experimental validation, setting up of user group







# Topics in WP2007 – Reactor systems

## ● Nuclear installation safety (contd.)

- Advanced safety assessment methodologies: *coordination action*
  - Develop best practice guidelines for the performance of Level-2 PSA methodologies with a view to harmonisation at EU level
  - Close collaboration with regulators essential
- The man-machine organisation (MMO) interface and plant safety management: *support action*
  - Improve understanding of the human factor in operation of nuclear installations and develop techniques to quantify and improve the “softer” aspects of safety through consideration of the man-machine interface (MMI)





# Topics in WP2007 – Reactor systems

## ● Sustainable nuclear systems

→ Innovative fuel and cladding for Generation IV systems:  
*collaborative project*

- Development and qualification of innovative fuel and cladding in the framework of GIF, with emphasis on viability, & increase efficiency of EU research in support to GIF by focussing on cross-cutting and generic issues applicable to more than one reactor system
- Should reinforce collaboration between national R&D programmes: pooling of the expertise and experimental facilities. International collaboration with research organisations outside the EU.





# Topics in WP2007 – Radiation protection

## ● Quantification of risks for low/protracted exposures

→ Non-cancer effects: *collaborative project(s)*

- Understand the mechanisms of and quantify the risks for non-cancer health effects resulting from exposure to low and protracted doses
- In particular cardio- and cerebro-vascular diseases

→ Prospective cohort of medically exposed children: *support action*

- To assess feasibility of establishing a trans-national cohort for longer term follow-up of those exposed in infancy or childhood to significant medical exposure





# Topics in WP2007 – Radiation protection

## ● Medical uses of radiation

→ Enhanced safety and efficacy in the medical uses of radiation:  
*collaborative project(s) and/or coordination actions*

- Enhance the safety and efficacy of the uses of radiation in diagnosis and therapy through new technological developments and achieving a proper balance between the benefits and risks of radiation

## ● Emergency management and rehabilitation

→ Optimal approaches for monitoring: *collaborative project*

- To develop a methodology for optimising the design of monitoring systems for timely and effective decision making in an emergency





# Topics in WP2007 – Infrastructures

## ● Supporting infrastructures

- Networking of URLs: *coordination or support action*
  - Develop the pooling of facilities and expertise in underground research for radioactive waste disposal
- Support to new research infrastructures of pan-European interest: *collaborative project*
  - To support development of mature RIs identified through ESFRI roadmap process
- Databases and tissue banks: *collaborative project(s) and/or coordination/support actions*
- Radiobiology infrastructures: *support action*





# Topics in WP2007 – Infrastructures

- **Access to infrastructures**

- Trans-national access to large infrastructures: *support action(s)*
  - To promote access for researchers to infrastructures that provide essential and unique services to the European research community

## Human resources, mobility & training

- **Training & mobility of research workers**

- These actions will be implemented largely via the inclusion of appropriated work packages and other initiatives in the major projects under the various activities





# Topics in WP2007 – Cross-cutting

- Treatment & disposal of irradiated graphite: *collaborative project*
- Materials for transmutation technologies and advanced reactors: *collaborative project(s)*
  - Development and qualification of high temperature and irradiation resistant materials for advanced fission reactors (GIF) and transmutation systems, with emphasis on viability
- Database of competences and facilities: *coordination action*
- Actions supporting programme implementation and other activities: *support action(s)*
- Support the preparation of a report on EBS + safety of deep geological repositories for high-level radioactive waste (*non competitive*)





# Possible topics in WP2008

- Disposal of long-lived low- & intermediate-level waste
- Issues related to the governance of radwaste
- Support for the secretariat of TP on geological disposal
- Plant lifetime management
- Severe accident analysis
- Support for the secretariat of Sustainable Nuclear Fission-TP
- Innovative concepts and processes for nuclear energy that fit the GIF performance criteria
- Support to the NEA's GIF scientific secretariat activities
- Further low-dose / medical uses research, possible NoE in radioecology
- Fast neutron spectrum test facility or transmutation device
- Geological disposal and URLs
- Harmonisation of nuclear education and training schemes across EU
- Euratom fission training schemes







# Topics in WP2007 – summary

## ● Radwaste management

- Operational safety of geological repositories
- Phenomenology & PA
- Partitioning processes

## ● Nuclear systems

- Numerical simulation tools
- Innovative fuel / cladding for Gen.IV systems

## ● Radiation protection

- Non-cancer low dose effects
- Medical uses of radiation
- Optimal approaches to emergency monitoring

## ● Infrastructures

- Support to ESFRI roadmap projects

## ● Human resources

- Training schemes planned for 2008 work programme

## ● Cross-cutting

- Materials for Gen.IV & transmutation technologies

**One call of  
€52M**





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*MERCI!*

