



Towards
a low carbon
future

Science and Energy

**A perspective from the European Commission
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EU political objectives

AN ENERGY POLICY FOR EUROPE

- **By 2020 – the three 20s:**

- **20% reduction in greenhouse gas emissions compared to 1990 levels (30% if global agreement)**
- **20% reduction in global primary energy use (through energy efficiency)**
- **20% of renewable energy in the EU's overall mix (minimum target for biofuels of 10% of vehicle fuel)**

- **By 2050 : indicative 60 to 80% reduction in GHG**

energy for a changing world



Achieving the political vision

- **First and foremost, energy efficiency**
- **2020 targets: reinforced research and proactive support measures**
- **2050 vision: develop new generation of technologies through breakthroughs**
- **A collective endeavour to deliver results**
- **Actions for industry, Member States, the European Community and at global level**



Key EU technology challenges for the next 10 years

2020

- 2nd generation biofuels
- Commercialisation CCS
- Larger wind turbines
- Large scale PV and CSP
- Enable a single, smart grid
- Market energy efficiency devices
- Long-term waste management

2050

- Next generation of renewables
- Breakthroughs in energy storage
- Hydrogen fuel cell vehicles
- Gen-IV
- Complete ITER
- Alternative vision TEN-E and systems
- Breakthroughs in materials, nano-science, ICT, bio-science, ...



Science is needed to fulfil this vision

- **If objectives for 2020 can be reached with incremental changes**
- **We need Technological Breakthroughs to meet the objectives for 2050**
- **Only Science can help us to achieve those breakthroughs**



The Community is the vehicle to:

- **Enable the pooling of resources and sharing of risks to develop new technologies**
- **Facilitate strategic planning at both the technology and energy system levels**
- **Provide a regular and reliable gathering and sharing of data and information**
- **Ensure coherence and critical mass in international cooperation efforts**
- **Address common problems and non-technological barriers**



FP7 2007 –2013 | Specific Programmes

Cooperation – Collaborative research

Ideas – Frontier Research

People – Marie Curie Actions

Capacities – Research Capacity



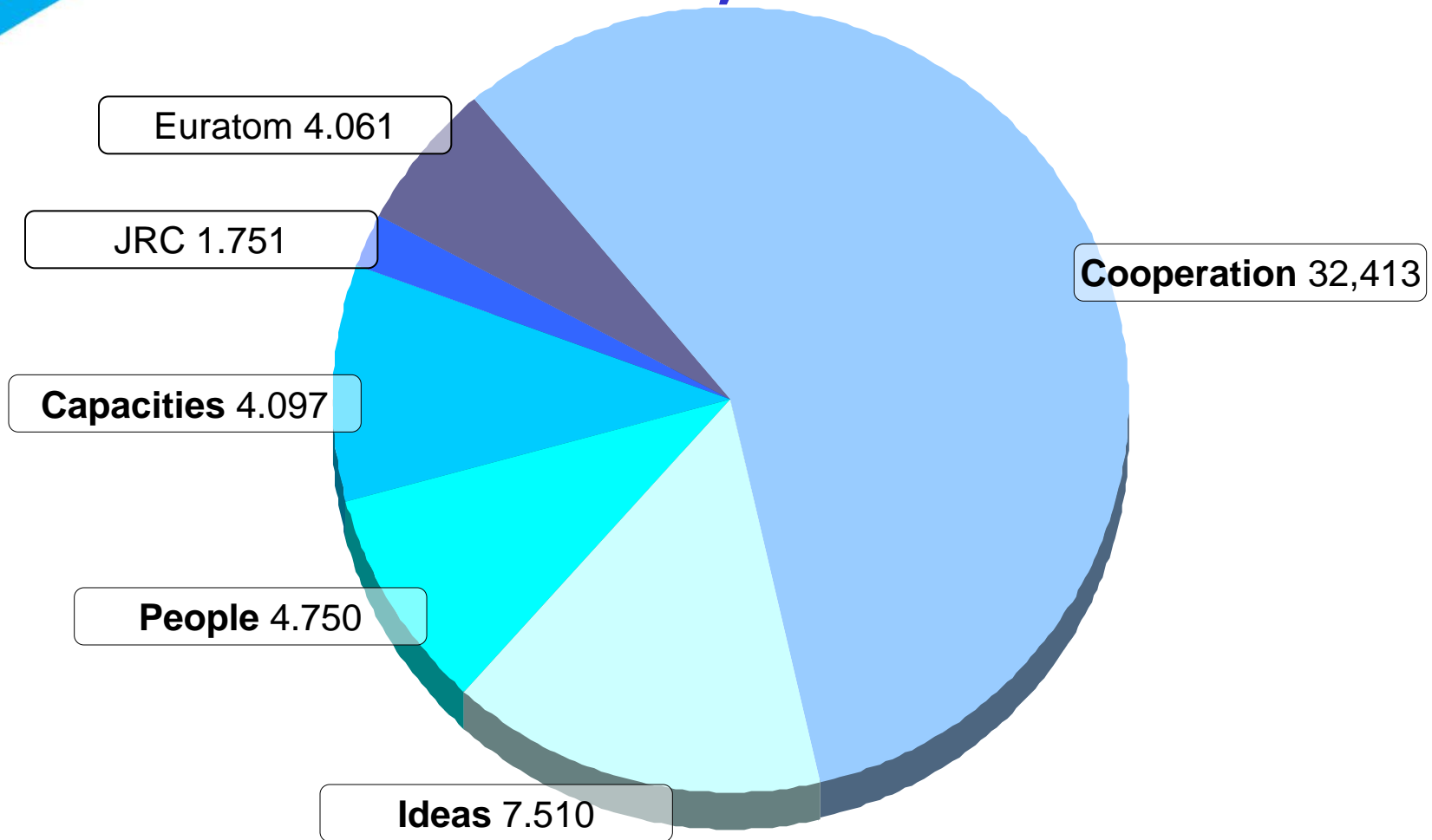
JRC non-nuclear research

Euratom direct actions – JRC nuclear research

Euratom indirect actions – nuclear fusion and fission research



FP7 structure and budget: 50,521 M€





'Cooperation' indicative budget breakdown

Theme	Budget Breakdown (M€)	
1. Health	6,100	19 %
2. Food, agriculture and biotechnology,	1,935	6 %
3. Information and Communication Technologies	9,050	29 %
4. Nanosciences, Nanotechnologies, materials and new production technologies	3,475	11 %
5. Energy	2,350	7 %
6. Environment (including Climate change)	1,890	6 %
7. Transport (including Aeronautics)	4,160	13 %
8. Socio-economic sciences and the Humanities	623	2 %
9. Security and space	2,830	9 %
TOTAL	32,413	



Basic Research applied to energy

Some examples chosen at random:

- **Nanomaterials used to increase energy efficiency in lighting**
- **Nanotechnologies for photovoltaic energy conversion improvements**
- **The exploitation of post-modern genomics for biofuels and biomaterials**
- **Science of cellulosic ethanol**

....



Basic Research applied to energy

A number of activities Fostering the application of Basic Research to Energy:

- 1. Future Emerging Technologies Under the Energy Programme**
- 2. Joint Energy calls with other thematic programmes**
- 3. Energy related calls under other thematic programmes**
- 4. Research Infrastructures supported under the Capacities Programme**
- 5. Frontier Research under the Idea Programme**
- 6. ERA Nets**



1- Energy Programme

Future Emerging Technologies

- **Explore new scientific opportunities for energy research**
- **A budget of about 20 million Euro every two years**



2- Energy Programme

Joint calls for proposals with other thematic programmes

- **Biorefineries**
- **Smart Grids**
- **Materials for energy**



2- Energy Programme

Benefits of Joint calls:

- **Large Cross cutting projects of critical size**
- **Innovative technologies and concepts applied to energy issues**
- **Cross fertilisation between researchers of different horizons**



3 - Other Thematic Programmes

- **ICT**
- **Biotechnology**
- **Materials**
- **Transport**
- **....**

**Deal with Energy issues from their
respective perspectives**



4 - Infrastructures

- **Optimise use and development of best research infrastructures in Europe**
- **Help create necessary new infrastructures of pan-European interest**
- **A means to deliver research to solve Energy Issues**
- **But also a place for cross fertilisation between researchers and stakeholders from various horizons**



Non targeted « Frontier » Research NEST (FP6) ERC (FP7)

- **Support investigator-driven research over all areas of research**
- **« Potluck » approach to Energy**
- **Innovative concepts developed in a limited number of projects**



Coordination of national Policies

- **INNER project gathered 13 partners**
- **With a view to « establish a co-operation between those European research programmes and strategies that aim to identify and stimulate emerging sustainable energy technologies ».**



Current State of play

- **Dispersed basic research energy capacities and policies**
 - **Fragmentation and duplication of efforts and policies :** Individual and dispersed strategies and work plans, « Drip-feed » effect of FPs funding on a project-by-project basis, Insufficiency of traditional instruments of coordination
 - **Huge resource for Europe in terms of researchers and facilities:** Excellent research teams in universities and specialised centres **and** Strong National Research Institutes for Energy in Europe



The Strategic Energy Technology (SET) Plan

- **Part of the Energy and Climate Change package**
- **Accelerate the development of innovative Energy Technologies**
- **To fulfill the objectives of the EU**
- **By creating effectively a European Energy Research area**



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Community research

The European energy Research Alliance (EERA)

Organize a greater research cooperation at Community level : The EERA

- **Part of the initiatives of the SET Plan**
- **Tackle the fragmentation issue/Enable the pooling of resources in research for energy**
- **Settle a new paradigm of implementing programmes from collaborating on projects to co-financing and implementing joint programs**
- **Align these programmes with the Set plan priorities and the challenges we face**



EERA Objectives

Key objectives :

- **To conceive and implement Joint Programmes of research in support of the SET-Plan priorities.**
- **To work towards a long term, durable integration of excellent but dispersed research capacities across the EU.**
- **To develop links and sustained partnerships with industry.**
- **To develop training, education and outreach activities.**



EERA Progress

EERA effective implementation:

- **Key areas yet identified** (CCS, Wind Solar PV and solar thermal, Second generation bio fuels, Materials for nuclear, Fuel cells, Smart grids, Geothermal power, Marine applications, More to follow....) **for future JPs**
- **First pilot workshops yet organised on CCS, CSP, Wind, geothermal energy** to test the methodology and explore the potential to work together...



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