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Energy Research Knowledge Center

# Energy Research Knowledge Centre

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# What is the ERKC

The screenshot shows the ERKC website homepage. At the top, there is a blue header with the European Commission logo and the text "ERKC Energy Research Knowledge Centre". Below the header is a navigation menu with links for Home, Research themes, Programmes, Projects, Newsroom, Key Publications, FAQ, and SETIS. The main content area features a "Welcome to the ERKC" section with a paragraph explaining the EU's commitment to reducing greenhouse gas emissions and ensuring energy security. A "Read more" button is located at the bottom right of this section. To the right of the main text is a smaller ERKC logo and a "ERKC Newsletter" sign-up box.

## Browse by Countries

Want to learn about energy research of a specific EU Member State? The browse by country functionality allows you to look for energy research projects of a specific country. The structure is twofold:

- When clicking on a country flag, you will see a short summary of research programmes and projects of that particular country.
- When clicking on the country name, a short description of that country is presented along with a list of the most important Research Centres, followed by all relevant programmes and projects.





# What is the purpose of ERKC?

- *The Energy Research Knowledge Centre (ERKC) aims to bridge the information gap among the great amount of data on energy research programmes, projects, actors, funding and initiatives currently available across Europe*





# What does the ERKC offer?

- **Vast and unique database of energy research activities and results** with a unique thematic structure and powerful search tools
- Comprehensive **information on energy research actors, funding and activities** throughout Europe
- **Permanent and easily searchable** records of energy research **programmes** and **projects**
- Regularly published **analyses of energy research-related themes and policies**
- High-quality **referenced and validated data**, thanks to its editorial and scientific review process
- **Newsletter, news** items and **events** calendar





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# Thematic structure

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# ERKC themes

## ■ Priority area 1: Low-carbon heat and power supply

Bioenergy / Geothermal / Ocean energy / Photovoltaics / Concentrated solar power / Wind  
Hydropower / Advanced fossil fuel power generation / Fossil fuel with CCS / Nuclear fission  
Nuclear fusion / Cogeneration / Heating and cooling from renewable sources

## ■ Priority area 2: Alternative fuels and energy sources for transport

Biofuels / Hydrogen and fuel cells / Other alternative transport fuels

## ■ Priority area 3: Smart cities and communities

Smart electricity grids / Behavioural aspects - SCC / Small scale electricity storage /  
Energy savings in buildings / ICT in energy / Smart district heating and cooling grids - demand  
Energy savings in appliances / Building energy system integration

## ■ Priority area 4: Smart grids

Transmission / Distribution / Storage / Smart district heating and cooling grids - supply

## ■ Priority area 5: Energy efficiency in industry

Process efficiency / Ancillary equipment

## ■ Priority area 6: New knowledge and technologies

Basic research / Materials

## ■ Priority area 7: Energy innovation and market uptake

Techno-economic assessment / Life-cycle assessment Cost-benefit analysis  
(Market-) decision support tools / Security-of-supply studies / Private investment assessment

## ■ Priority area 8: Socio-economic analysis

Public acceptability / User participation / Behavioural aspects

## ■ Priority area 9: Policy studies

Market uptake support / Modelling and scenarios / Environmental impacts / International cooperation







# Research themes

## PRIORITY AREA 1: LOW-CARBON HEAT AND POWER SUPPLY

### Advanced fossil fuel power generation



Fossil fuel power generation uses the heating value of gas, liquid and solid fossil fuels to create electricity and heat. The fuel is burned in a combustion chamber, with the resulting hot flue gases either driving a gas turbine or used to produce steam which drives a steam turbine. In each case, the shaft power from the turbine drives a generator to produce electricity. Gains in conversion efficiency translate to energy savings and cuts in greenhouse gases emissions.

In plants burning coal, fuel efficiency increases when the steam is generated at very high temperatures and pressures (advanced "supercritical" and "ultra-supercritical" plants). For natural gas, advanced technologies include "combined-cycle" plants which use both a gas turbine and a steam turbine - these are currently the

[read more](#)

### Bioenergy



**Bioenergy** is renewable energy made available from materials derived from **biological sources**. **Bioenergy** may include a diverse set of feedstocks as primary energy sources. These include feedstocks that are cultivated, harvested, transported, stored and eventually pre-treated, such as wood, wood waste, straw, manure, sugarcane and by-products from agricultural processes, as well as dedicated energy crops such as short rotation forestry/short rotation coppice (SRF/SRC) and energy grasses. **Municipal waste and sewage** are also considered feedstocks for bioenergy.

Several technologies can convert biomass into **heat and electricity**; all of them are based on two main process types: **thermochemical** (combustion, pyrolysis and gasification) and **biological** (anaerobic digestion and fermentation), respectively. The development stages of these conversion technologies range

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## PRIORITY AREA 4: SMART GRIDS

### Distribution



Smart electricity distribution grids are power networks optimised through the inclusion of devices, software and services that allow bidirectional real-time communication among network users (both suppliers and consumers) and network components. An important aim is to match demand with the fluctuating supply available from distributed renewable electricity sources. A key element of the smart grid is therefore short-term storage capacity to enable supply-side management.

Components of the smart grid include the telecommunications infrastructure (including power line communications) needed to channel

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### Smart district heating and cooling grids - supply



Smart district heating and cooling grids manage the supply side through the intelligent use of heat storage and absorption refrigerators, with appropriate control systems. Such systems balance the heating or cooling available - taking into account the availability of stored energy, waste heat from industry, heat from CHP plants (which varies according to electricity demand), and solar heat - with the current demand.

Several smart district heating networks have been already implemented in Sweden and Denmark, predominantly in residential sector. In the mid term they can be expected to spread across

[read more](#)





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# Programmes and projects





## Germany

Energy research in Germany is motivated by the decision of the German government to foster energy efficiency and renewable energy and to phase out nuclear energy by 2022. The German Energy Research... more

- See this country programmes
- See this country projects

## PROGRAMMES LISTING

Programmes in the context of ERKC are Energy Research Programmes that generally means activities which finance or promote energy research. A programme may be a formal grouping of projects, or it may be simply a loose group of projects funded by a certain ministry or other body on an ad hoc basis. Semi-state and non-governmental bodies, such as research institutions which fund their own internal programmes, are also included. Some programmes are commercially confidential and not included in this section. However, energy research also includes other non-energy related activities. Generally the programmes can be divided into:

### By country

Want to learn about energy research projects of a specific country. The browse by country functional...

### Database search

Do you know the name or acronym of a programme? You can use the database search by acronym, name, country, funding...

## 6TH ENERGY RESEARCH PROGRAMME: RESEARCH FOR AN ENVIRONMENTALLY SOUND, RELIABLE AND AFFORDABLE ENERGY SUPPLY

Profile	Duration	Funding	Contact	Budget	Description	Projects
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Priority area(s):

Low-carbon heat and power supply, Alternative fuels and energy sources for transport, Smart grids

Programme background and strategy objectives:

In its 6th Energy Research Programme, entitled "Research for an environmentally sound, reliable and affordable energy supply", the Federal Government defines the basic tenets and main areas of focus of its funding policy for the coming years. This programme represents an important step towards implementing the Energy Concept of 28 September 2010, based on which the Federal Government intends to embark on a new age of renewable energy. Its vision is for Germany to become one of the most energy-efficient and environmentally sound economies in the world.

Programme organisation:

The 6th Energy Research Programme is the framework programme of the German federal government for financial support of more specific programmes, initiatives and supports and acknowledgements.

### 6th Energy Research Programme: Research for an Environmentally Sound, Reliable and Affordable Energy Supply

6. Energieforschungsprogramm - For Research for an Environmentally Sound, Reliable and Affordable Energy Supply



In its 6th Energy Research Programme, entitled "Research for an environmentally sound, reliable and affordable energy supply", the Federal Government defines the basic tenets and main areas of focus of its funding policy for the coming years.



# ERKC Compendium



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## RESEARCH THEMES

### PRIORITY AREA 4: SMART GRIDS

#### Distribution



Smart electricity distribution grids are power

#### DISTRIBUTION

Description **Related projects**



AEEG 39-10

**Acronym:** A2A GAVARDO  
**Main Theme:** Smart electricity gr  
**Country:** IT  
**Duration:** 02/2011 to 02/2011



AEEG 39-10

**Acronym:** A2A CP LAMBRATE  
**Main Theme:** Smart electricity gr  
**Country:** IT  
**Duration:** 02/2011 to 02/2011



### AEEG 39-10 A2A CP GAVARDO

**Details** Themes Contact Funding

The project is proposed in response to the call from the Italian Regulator published under the Deliberation n.39/10. The call asked for projects having the following characteristics: - Real grid: A real case in existing distribution networks: real grid, real customers and real generators - Focus on DG integration in MV networks [1-35 kV]: on this voltage level 75% of DG power will be connected - Active grid: the selected MV network has to be characterized by a reverse power flow at least 1% of yearly time with reverse power-flow from MV level to HV - Automated & controlled grid: the selected MV network has to be controlled (voltage limits/anti-islanding), the project must show a real time control system at MV level - Open grid: the project must show non-proprietary communication protocols only, in view of minimizing customer costs at the network interface. The specific project concerns one HV-MV substation in Gavardo - Lombardy, and more specifically 4 MV feeders. the generators connected are presently 5 (hydro). the project foresees the development and installation of network monitoring and operation devices for the medium voltage network to optimise power flows and the use of all means for the voltage regulation with the participation of local generators. bi-directional communication is foreseen, participation of DSO to ancillary services and markets is foreseen, no storage, no infrastructure pf electrical mobility, no demand response.

Acronym: A2A GAVARDO

Link to Programme: Programme for promoting Smart Grids by electric power distributors

#### Smart district h



Smart intel cont into from with Seve and expe read

#### Storage



Ener to st them The well-flow gas

#### Themes: priority

- Priority area 1: Low-carbon
- Priority area 2: Alternative
- Priority area 3: Smart
- Priority area 4: Smart
- Priority area 5: Energy
- Priority area 6: New
- Priority area 7: Energy
- Priority area 8: Socio-
- Priority area 9: Policy



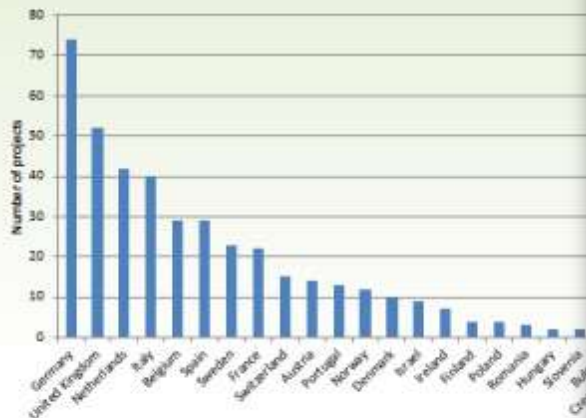
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# Analysis

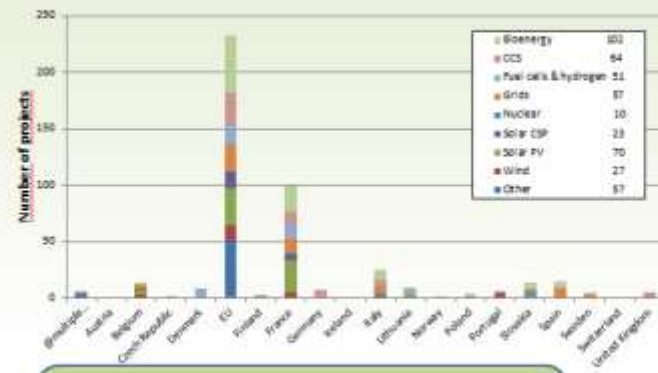


# Country overviews

## Countries participating in FP7 projects



## Countries participating in FP7 per SET-Plan technology



Division of five national energy research priorities are selected into SET-Plan technologies.  
 Research insight which countries may serve as innovation hubs for SET-Plan technologies, given the amount of national and EU projects present.  
 Identify which countries are most likely to take up additional efforts in specific SET-Plan technologies due to existing research infrastructure.

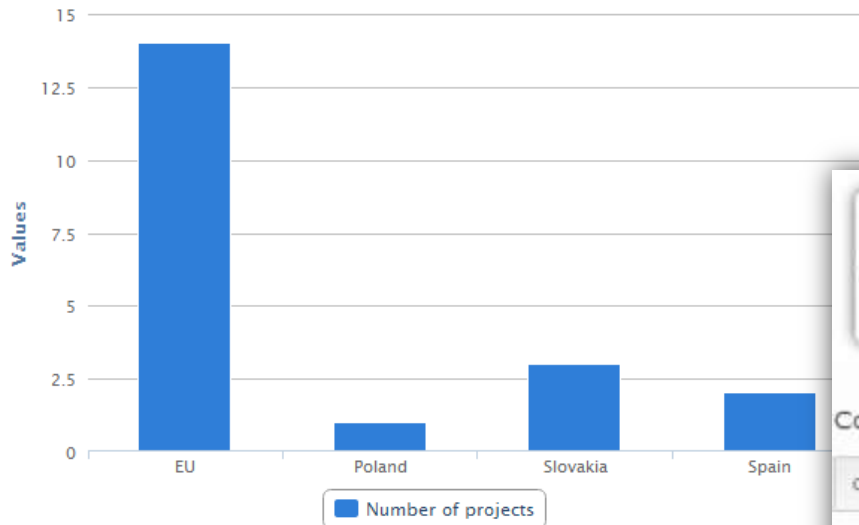




# BIOENERGY

Description **Visualisation**

### Bioenergy: Number of projects by Countries



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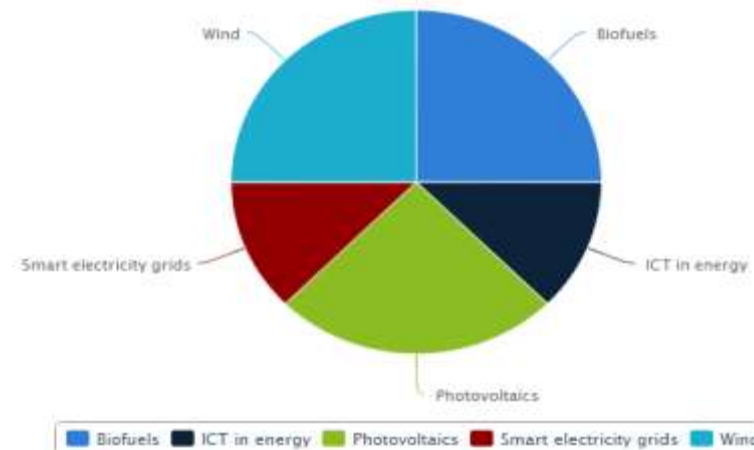


## Belgium

### Country Page

Compendium Related Programmes Related Projects **Visualisation**

### Belgium: Number of projects by Main theme



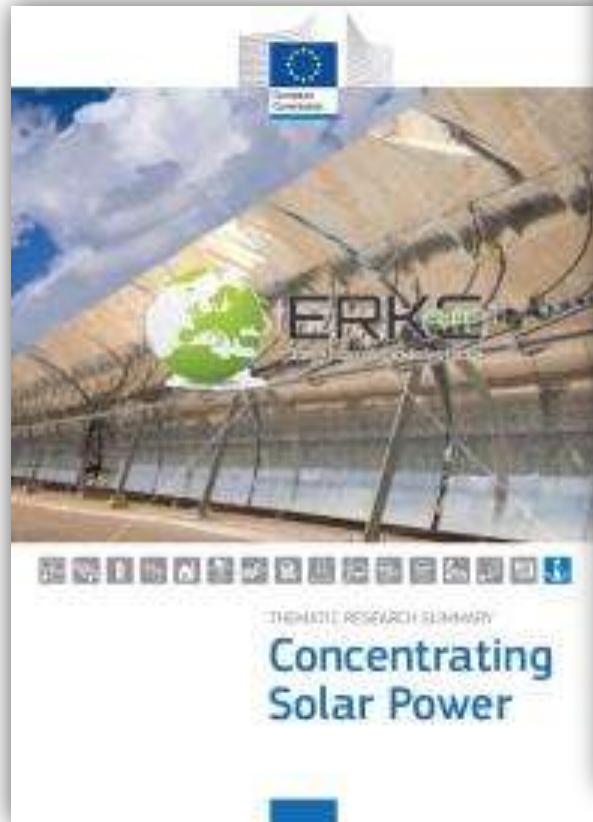
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# ERKC publications





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**How can you  
participate?**

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# How can you participate?

- **Working in energy research?** Is your project already covered, and is it up to date?
  - Join the site to submit project news and results, and to raise your profile
- **Are you in charge of an energy-related website?**
  - Use the advanced tools to keep your audience up to date. Syndicate any of the dozens of RSS feeds on the site, or customise your own.
- **Do you run an energy-related database?**
  - Contact us to see how we can present your database's content to our audience using federated search and machine translation. All traffic will return to your site.





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# Thank you!

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[setis.ec.europa.eu/energy-research](https://setis.ec.europa.eu/energy-research)