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Geothermal energy R&D in the 7th Framework Programme and beyond

Andreas Piontek

European Commission, DG Research



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Outline

- ✓ **Geothermal energy use in the EU**
- ✓ **Geothermal RTD&D in the 7th Framework Programme**
- ✓ **Beyond FP7**

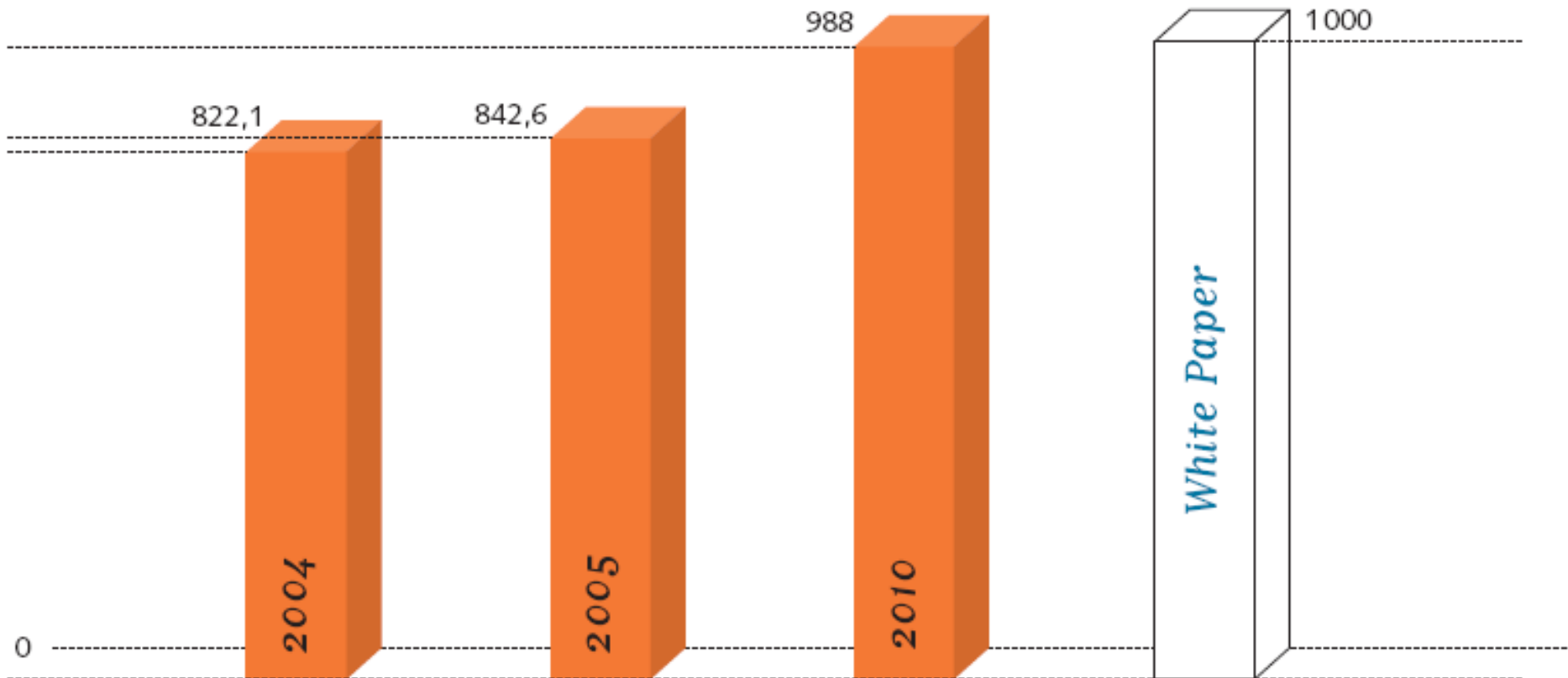


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Geothermal power: current trend

Comparison between current trend and White Paper objectives for electricity production (in MWe)

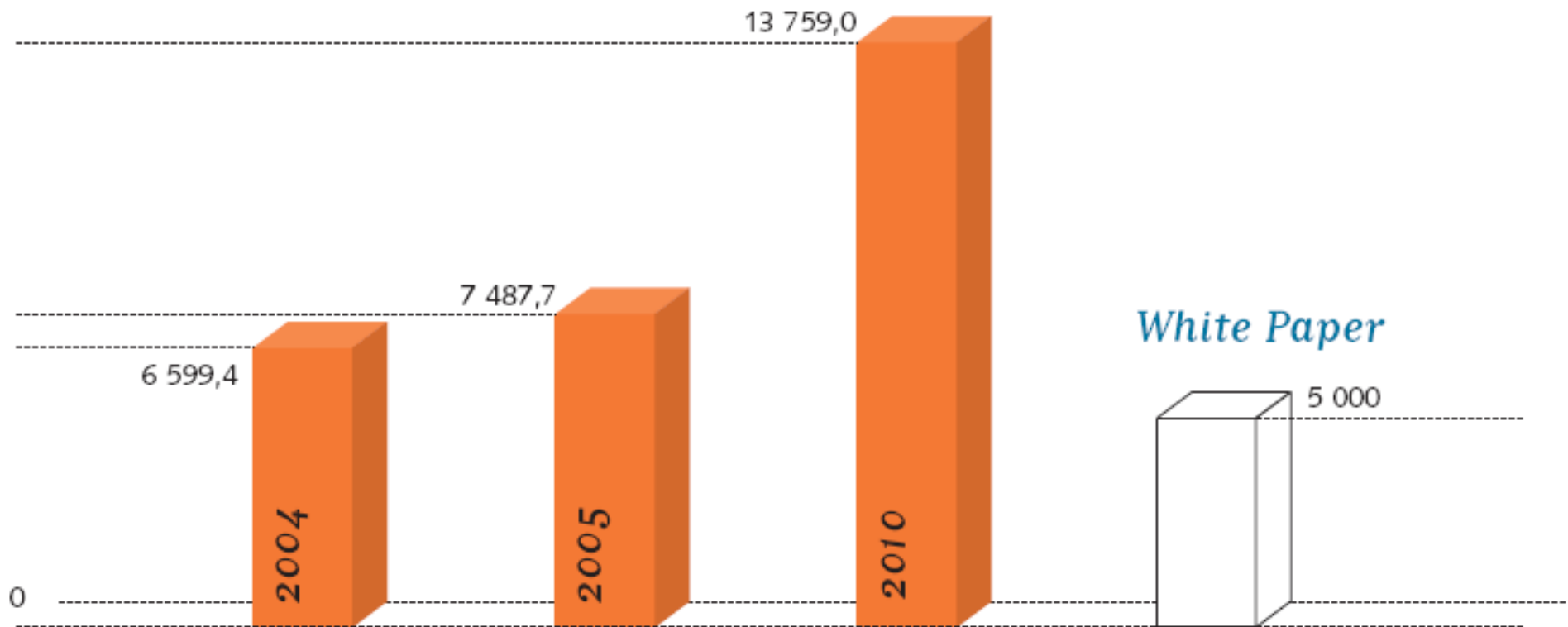


EurObserv'ER 2006



Geothermal heat: current trend

Comparison between current trend and White Paper objectives
for heat production (in MWth)



EurObserv'ER 2006



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We need to :

Expand the use of heat and power

- Foster the proliferation of EGS
- Improve exploration accuracy
- Understand induced seismicity
- Improve heat pump technology
- Deploy district heating

Lower the unit cost of energy

- Improve power conversion efficiency
- Improve components and systems
- Increase operational lifetime (corrosion, scaling...)

Co-operate in R&D, in Europe and internationally



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FP6

Total budget for Geothermal

~ **€12mil** (DG RTD only)

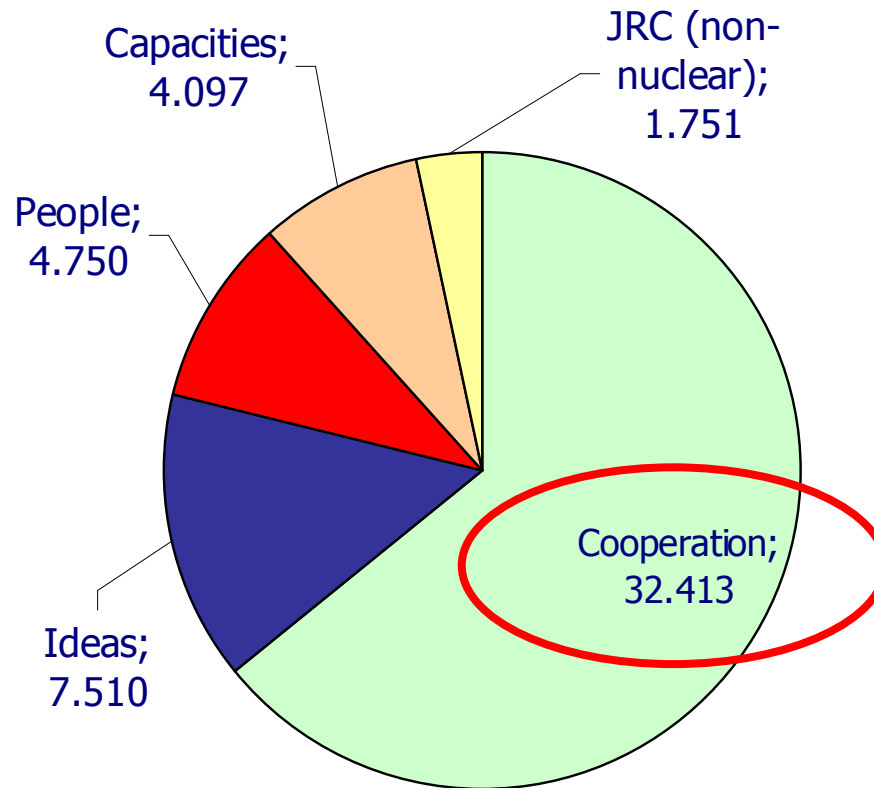
EGS Pilot Plant (Soultz Project)	DG RTD
I-GET: Integrated Geophysical Exploration Technology	DG RTD
HITI: High-Temperature Equipment	DG RTD
ENGINE	DG RTD



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FP7 (2007 – 2013) Total budget €50bn

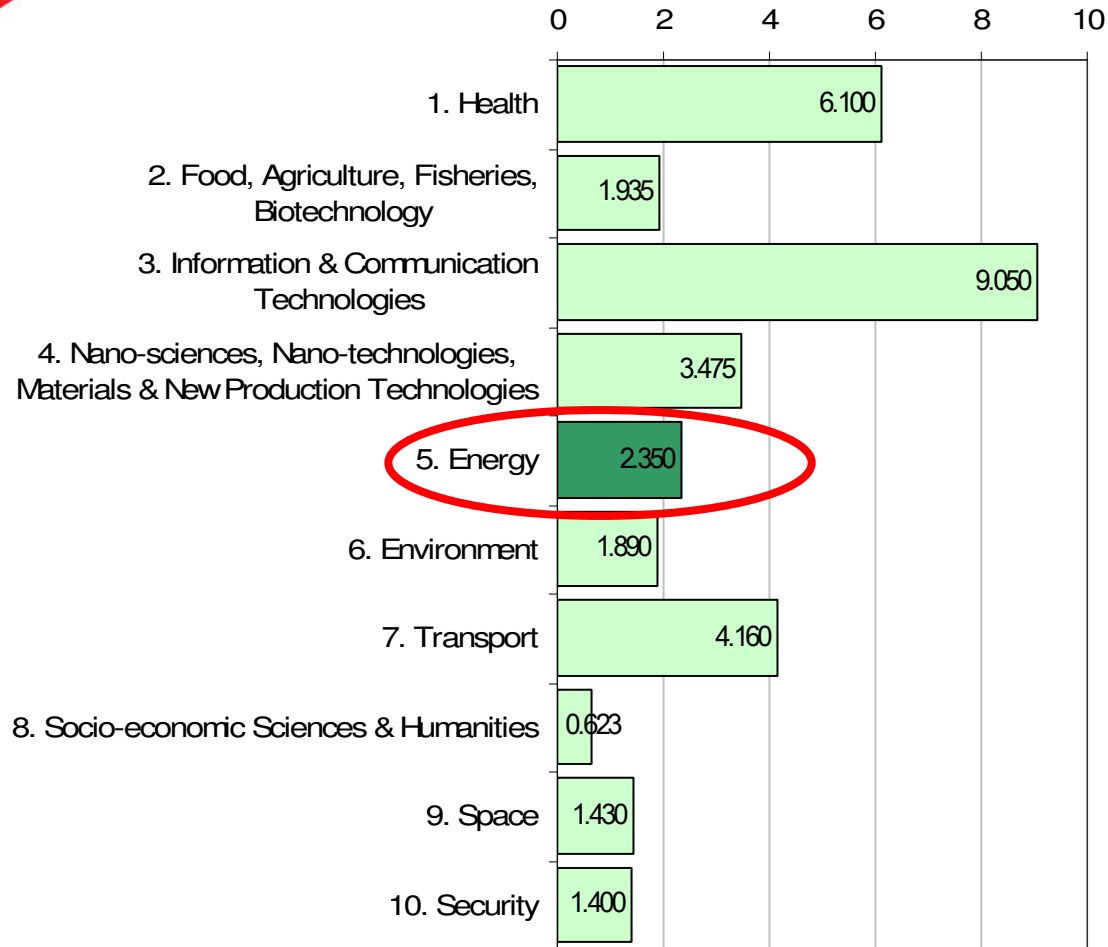




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FP7 (2007 – 2013) Cooperation €32.413bn





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FP7 – Energy (€2.350bn)

(DG Research & DG Energy and Transport)

Hydrogen and fuel cells

**CO2 capture and storage
technologies for zero
emission power generation**

**Renewable
electricity
generation**

**Clean coal
technologies**

**Renewable
fuel production**

**Smart energy
networks**

**Renewables
for heating and cooling**

**Energy savings
and energy efficiency**

Knowledge for energy policy making



Geothermal RTD&D: 2007 Call

Electricity production - DG RTD

Aims to develop **enabling technologies** for the exploitation of high-temperature resources, and to prove the feasibility and sustainability of EGS technology in representative EU sites.

- ❖ **Understanding and Mitigation of Induced Seismicity Associated with Geothermal Field Development**

Heating and cooling - DG TREN

Aims to improving the performance of geothermal heat pumps and to improve the reliability and ease of maintenance of the underground components of the heat pumps.

- ❖ **Improved geothermal heat pumps**
- ❖ **Improved underground systems**



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Geothermal RTD&D: 2008 Call

Electricity production - DG RTD

smaller call because budget partially spent in 2007

published 30 Nov 2007 (all info www.cordis.lu)

deadline 26 Feb 2008 17:00 (1st stage)

NO specific GEOTHERMAL TOPIC!

Topics of potential interest:

- ×**ENERGY.2008.10.1.2**: Novel materials for energy applications
- ×**ENERGY.2008.10.1.1**: Future Emerging Technologies (FET)

Heating and cooling - DG TREN

Call in preparation, will be published soon



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Geothermal RTD&D: 2009 Call

Electricity production - DG RTD

Call in preparation (budget, topics)

- ✘ Discussion on the topics for the Geothermal energy will take into account the outcome and suggestions of the ENGINE project



Stakeholder input : a crucial role for ENGINE

A researchers' network that aims to

- × Co-ordinate ongoing research and promote the development and uptake of new technologies
- × Organise conferences and dedicated workshops (drilling, electricity generation)
- × Establish links between researchers, industry, international organisations...
- × Integrate scientific and technical know-how and practices
- × Compile a Best Practice Manual for EGS/UGS
- × define **priorities** in the field of medium to long term research investment

A roadmap for researchers, industry and funding agencies !



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A new context ...

AN ENERGY POLICY FOR EUROPE



energy for a changing world



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With new key targets ...



Presidency Conclusions, Brussels European Council

8/9 March 2007

- ✓ GHG emissions reduced by 20%
- ✓ Renewable energy to 20% of consumption
- ✓ Bio-fuels to supply 10% of all transport fuel
- ✓ Energy efficiency increase of 20%



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With Strategic Energy Technology (SET) Plan...

EU to develop a Strategic Energy Technology Plan:

- ✓ Address a portfolio of technologies
- ✓ Spread risk & avoid locking-in

Objectives:

- ✓ Orient research & innovation towards technologies capable to deliver EU energy policy targets
- ✓ Transform EU Governance of energy & innovation system
- ✓ Revitalize public and private investment

energy for a changing world





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EU Energy Policy: 2020 Targets

European Commission proposals 23/01/08:

- ✓ A new EU emissions trading scheme with a European (not national) cap, auctioning of allowances: to generate reductions in GHG of 21%
- ✓ New national targets to achieve a 10% GHG reduction in non ETS sectors
- ✓ A framework to promote the development of CO₂ capture and storage
- ✓ New guidelines on state aid for environmental protection
- ✓ An update on the implementation of the Energy Efficiency Action Plan
- ✓ New directive to reach the **20% renewable energy target** and 10% biofuels target



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EU Energy Policy: 2020 Targets

European Commission proposals 23/01/08:

What are the benefits of the package?

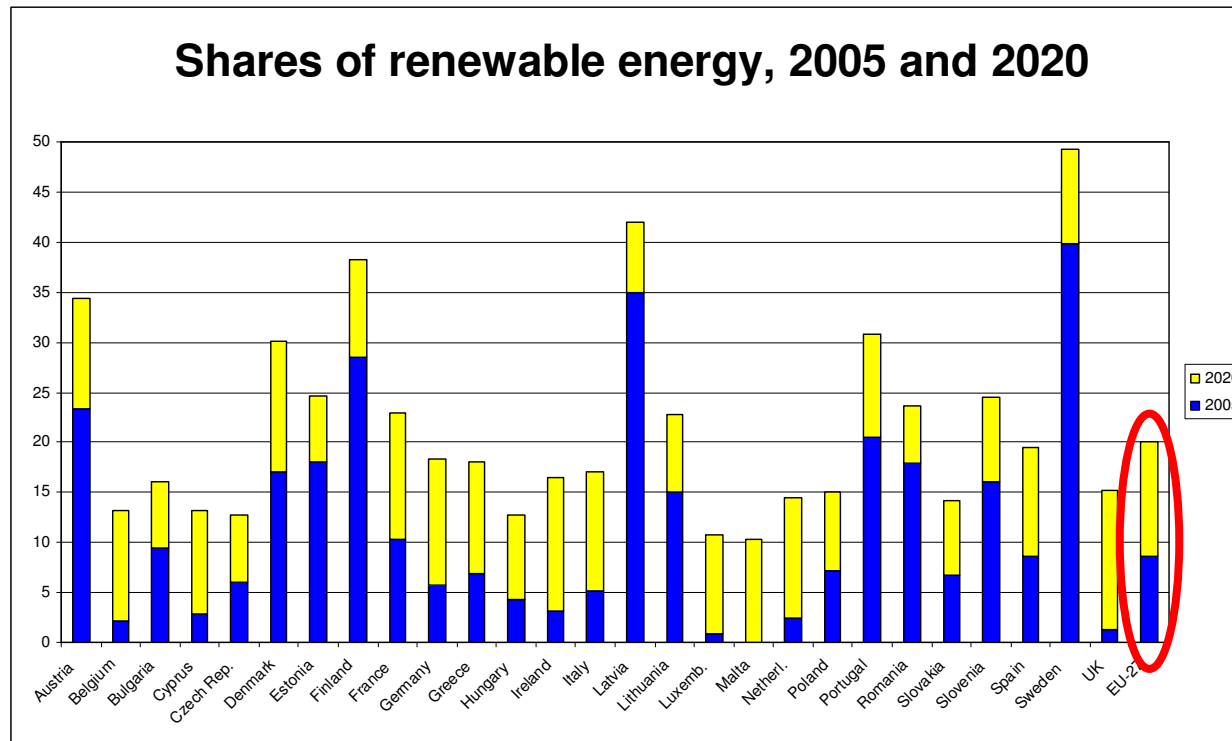
- ✓ The ultimate goal: avoid the cost of climate change impacts:
5-20% of global GDP (Stern)
- ✓ Large scale innovation in the energy sector
- ✓ First mover advantage, aiming for technological leadership in low carbon technology
- ✓ Significant energy efficiency improvements
- ✓ Energy security:
reduction of oil and gas import of €50 billion per year (at \$61 per barrel of oil)
- ✓ Reduced air pollution giving significant health benefits
- ✓ Reduced need for air pollution control measures:
€11 billion per year in 2020



EU Energy Policy: 2020 Targets

The renewables Directive 23/01/08:

- ✓ Sets mandatory national targets for renewable energy shares, including 10% biofuels share, in 2020 from 8.5% to 20% for the EU overall



- ✓ Improves renewables' access to the electricity grid



Conclusions (1)

The geothermal sector needs:

- × Generic technologies to expand the use of heat and power
- × Public acceptance (reduced environmental impact - induced seismicity)
- × A common strategy and roadmap
- × A demonstration programme?

Current efforts are insufficient

- × Meeting our 2020 targets requires a collective endeavour by Member States, the Community, industry and the research community
- × International cooperation has to be strengthened to stimulate global development, commercialisation, deployment and access to technologies



Conclusions (2)

The EC will:

- × Continue to give support to geothermal energy in its research programmes

The SET-Plan challenge is to:

- × Mobilise *additional financial resources*, particularly for industrial-scale demonstration projects, early market deployment and new infrastructure
- × Promote *education and training* to deliver the quantity and quality of human resources that will be required, by making full use of the FP7 People Programme
- × Design *support schemes* for renewables and other low-carbon technologies, co-generation and heating and cooling, energy efficient vehicles, and energy efficient buildings

Thank you for your attention

