ENGINE (ENhanced Geothermal Innovative Network for Europe): A European Coordination Action as a major step forward to move Enhanced Geothermal Systems ahead

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An intitiative for building an innovative research network for Europe

- An expression of interest from the EC FP6 for a coordination action for developing Unconventional Geothermal Resources
- A major scope is the identification of gaps that hamper the development of geothermal energy and definition of research targets for the future

ENhanced Geothermal Innovative Network for Europe (ENGINE, http://engine.brgm.fr)

ENGINE breakdown structure

A scientific and technical European Reference Manual for the development of Enhanced Geothermal Systems

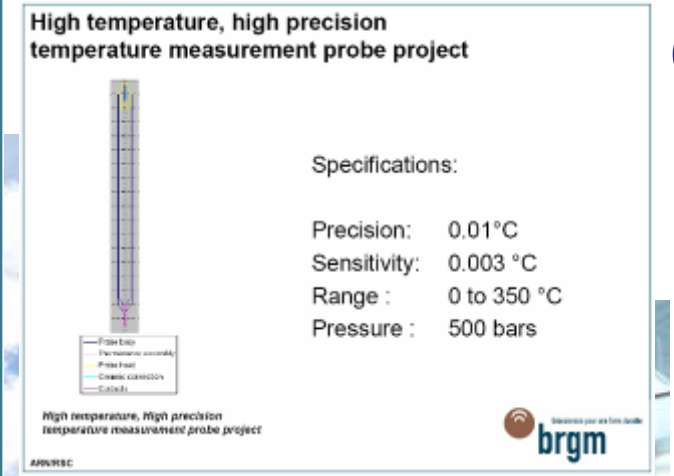
An updated framework of activities concerning Enhanced Geothermal Systems in Europe

Best Practice Handbook and innovative concepts

- Start 1 November 2005, Ended 31 May 2008
- 30 months, 2,3 M€, 31 European partners + 4 from Third Countries, 20 countries involved in Geothermal R&D

http://engine.brgm.fr

Enhanced Geothermal Systems: the concept



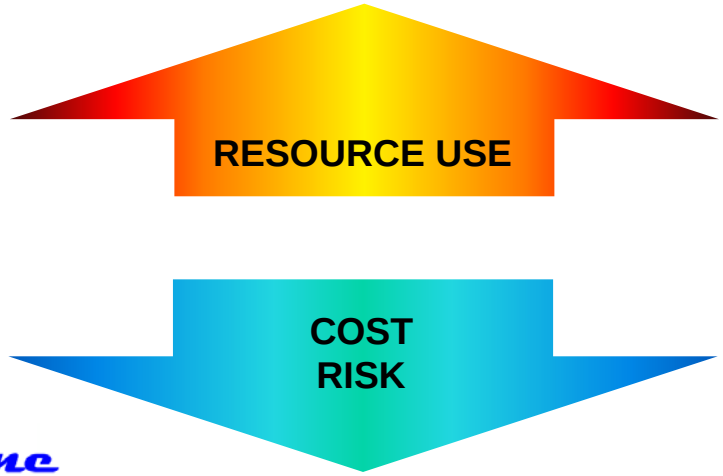
> Enhancing and broadening geothermal energy reserves

- stimulating reservoirs in Hot Dry Rock systems and enlarging the extent of productive geothermal fields
- improving thermodynamic cycles,
- improving exploration methods for deep geothermal resources
- improving drilling and reservoir assessment technology,
- defining new targets and new tools for reaching supercritical fluid systems, especially high-temperature down-hole tools and instruments

brgm
Géosciences pour une Terre durable

The Enhancement challenge:

- The use of non-conventional methods for exploring, developing and exploiting geothermal resources that are not economically viable by conventional methods.
- Reservoirs at depth must be engineered to improve their hydraulic performance.
- The final objective: development of a technology to produce electricity and/or heat from a basically ubiquitous resource - the internal heat of the Earth - in an economically viable manner relatively independent of site conditions.



- exploration
- resource assessment
- resource management
- advanced drilling
- advanced stimulation
- efficient power cycles
- environmental impact

After two years, 7 workshops and 3 conferences…

- ENGINE, a R&D task force for defining research projects
  - A network
  - Identification of bottlenecks and prioritisation of research needs
- ENGINE, along with other coordinating initiatives (European Commission, IEA-GIA, MIT expert panel, EHDRA, IGA, EGEC…) can
  - contribute to the construction of an international strategy
  - consolidate the available information systems
- Several major geothermal projects have been developed (Germany, Iceland), renewed interest for unconventional geothermal energy worldwide (Australia, US)
- Economic and environmental constrains have changed
  - increase of the energy price, threats of global warming (greenhouse gas concentration in the atmosphere)
  - new EU objectives: 20% Renewable Energy in 2020

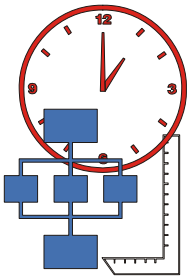
The state-of-the-art: promoting best practices and filling the gaps in knowledge

Investigation of UGR and EGS

Drilling stimulation and reservoir assessment

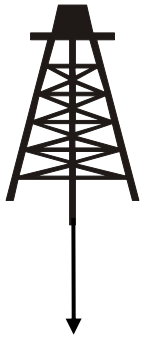
Exploitation, economic, environmental and social impacts

Concept



General planning and geological screening
- conceptual
- technical
- political and environmental
- financial

Site exploration



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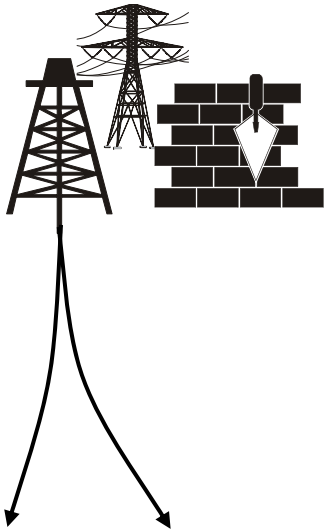
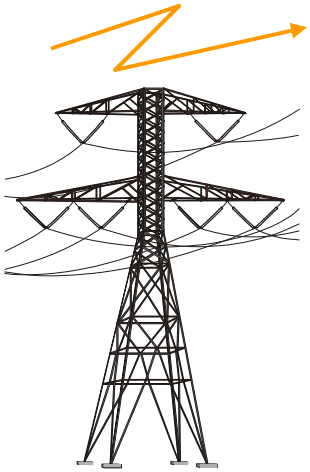
- Site screening
- Pilot borehole
- Stimulation tests
- Production modelling

Site development



- Inj./Prod boreholes
- Intensive stimulation
- Production tests
- Surface installations

Production



- Power/Heat production
- Maintenance

Abandonment

If no re-investment for this site: Deconstruction

Milestones

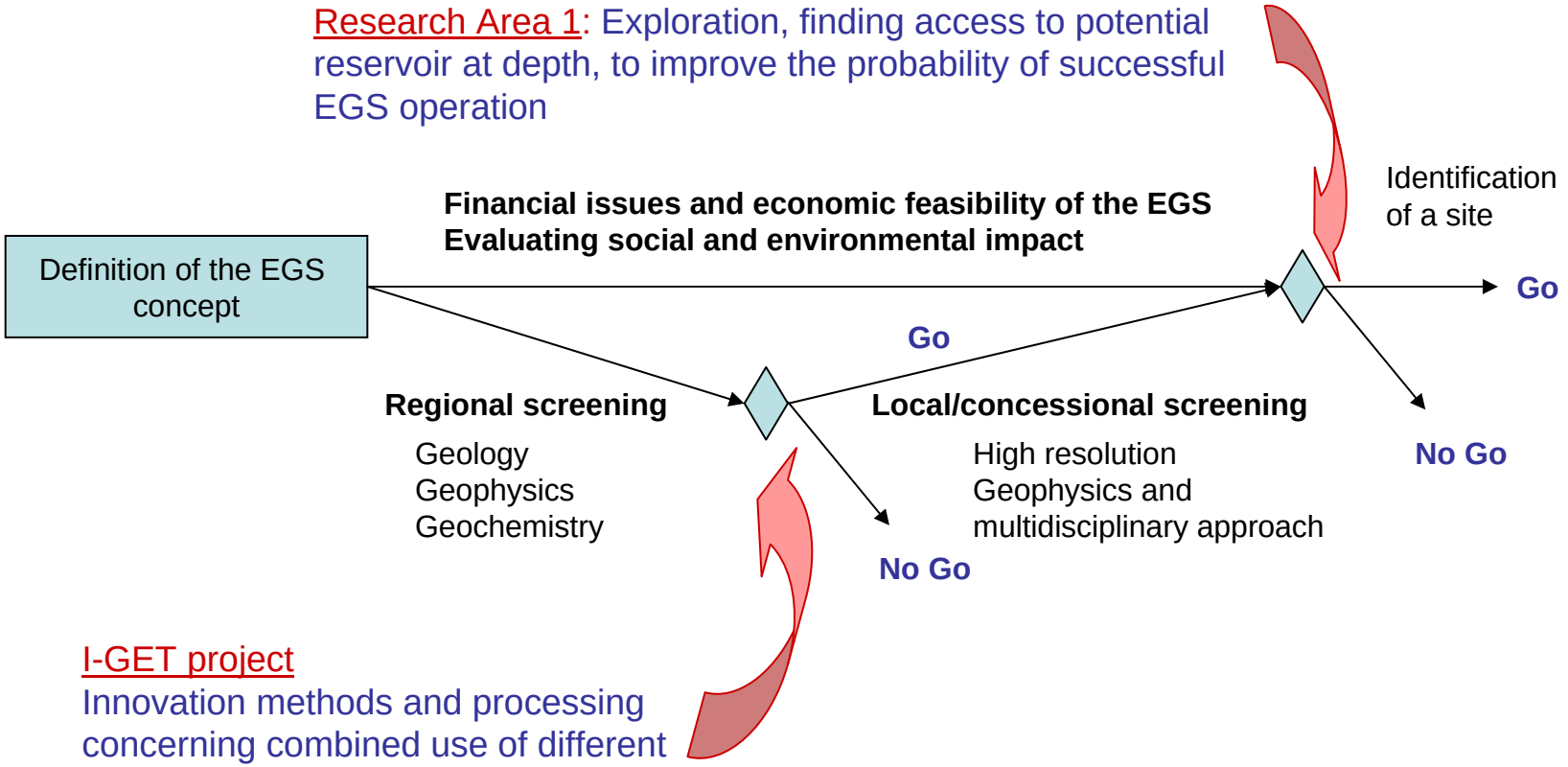
- Site selected
- Feasibility of EGS at site demonstrated
- Installations and reservoir ready for production
- Production lifetime reached

Defining priorities in the field of medium to long-term research investment

- Each stage includes several phases and involves pluridisciplinary approaches that can be run in parallel or successively
- Decisions are taken at critical moments of the development of the project, marked by go/no go milestones
- Review of best practices and lessons learned from the different projects and partners enable the definition of a workflow on which well proven methods and risk assessment can be identified

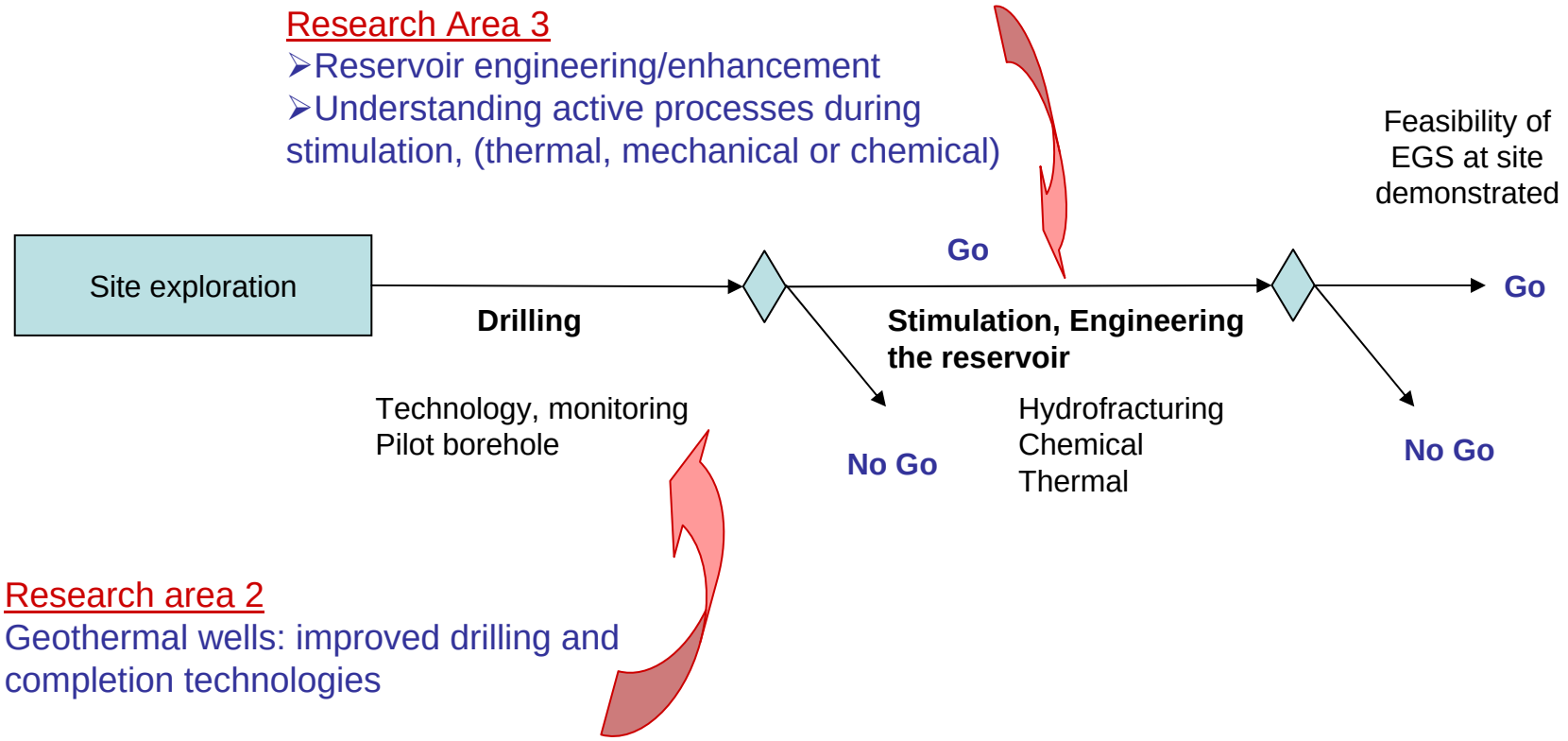
Investigation of UGR and EGS: R&D contribution for increasing Probability of Success at critical steps of EGS development

Research Area 1: Exploration, finding access to potential reservoir at depth, to improve the probability of successful EGS operation

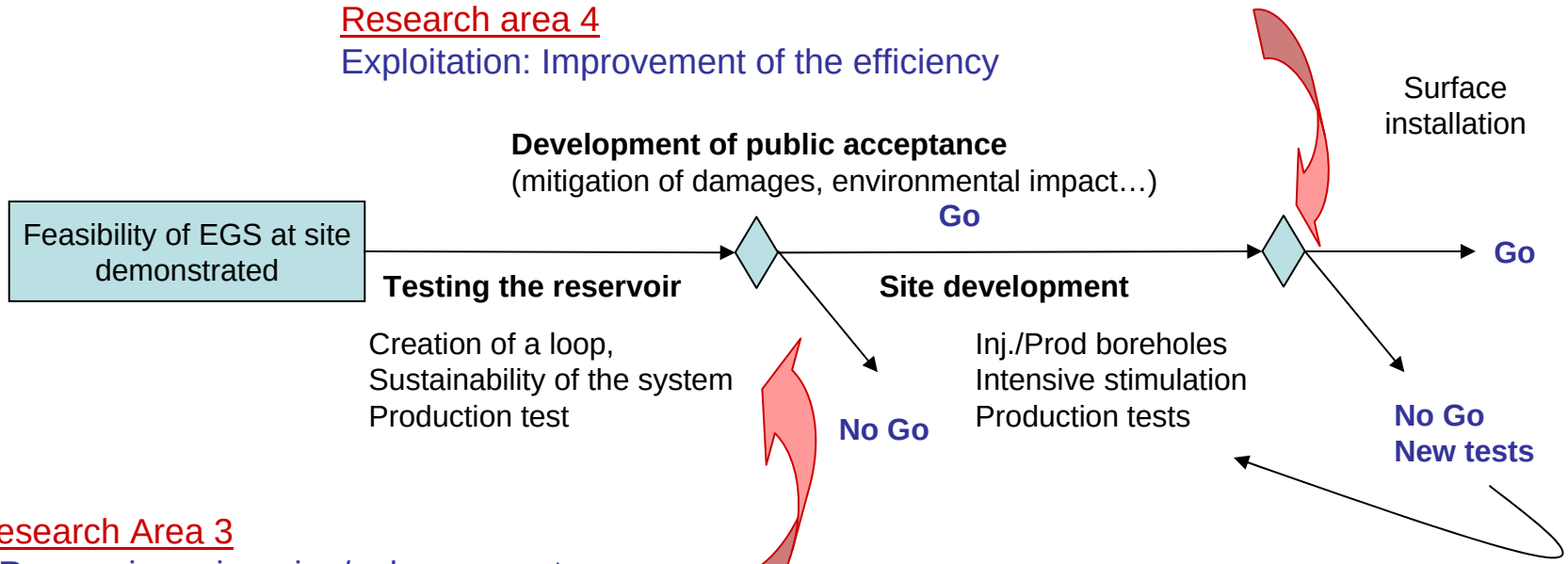


I-GET project
Innovation methods and processing concerning combined use of different geophysical methods

Drilling, stimulation: R&D contribution for increasing Probability of Success at critical steps of EGS development



Reservoir assessment: R&D contribution for increasing Probability of Success at critical steps of EGS development



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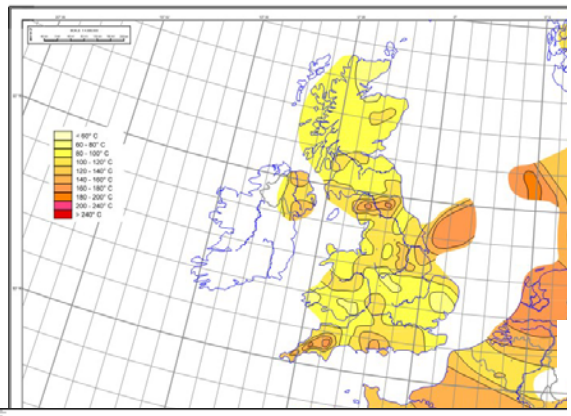
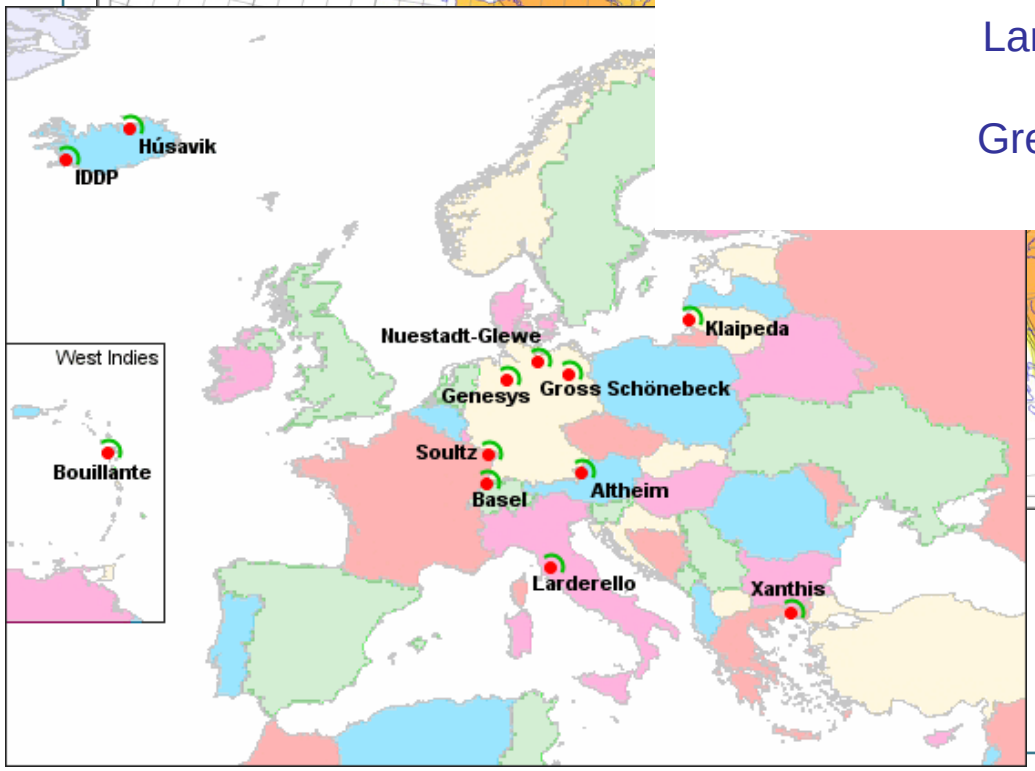
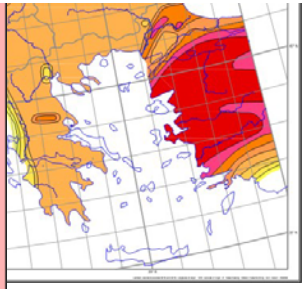
EGS Perspectives, with industrial partners…





Towards a demonstration program integrating the different research areas

Soultz power plant (2008)
Icelandic Deep Drilling Program (2008-2009)
Zala County and Fabiansebestyen drill sites (Hungary 2008-2009)
Roquette project in the Rhine Graben (France, 2009)
Kosice (Slovakia, 2009-2010)
Groß Schönebeck power plant (Germany, 2009)
Bruchsal power plant (Germany, 2009)
Unterhaching co-generation plant (Germany, 2008)
Landau power plant (Germany, 2008-2009)
Podhale power plant (Poland, 2009)
Green Campus Izmir project (Turkey, 2009)
…



The heat rush in Germany…

And new investors in Spain and Hungaria…

Bietigheim
Schriesheim
Wiesloch
Karlsdorf
Rhust-Whyl
Freiburg-West
Speyerdorf
Landau in der Pfalz
Offenbach an der Queich
Bellheim
Speyer
Riedstadt
Bad Bergzabern
Steinfeld
.....

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POWER FROM THE EARTH

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Start Here

If this is your first time to the website, please review our quick snapshot of the company and its goals, then move on to explore the rest of the site. Learn more

Frequently Asked Questions

Answers to your questions may be available in our Frequently Asked Questions page.

Calendar

View the calendar for Geodynamics' important dates and meetings.

Latest News

5-Aug-2008
Cooper Basin Project Update

Geodynamics advises that the drilling of Jolokia 1 is progressing well. Over the last two weeks we have drilled a total of 308 metres with three bit changes. The current depth is 4,344 metres making the well now deeper than Habanero 3.

24-Jul-2008
Cooper Basin Project Update

Email Alerts

Join our free email alerts service to receive the latest news


View a Shareholder Update May 2008 (26.8MB).


Review the "How does HFR Geothermal Energy work?" animation.

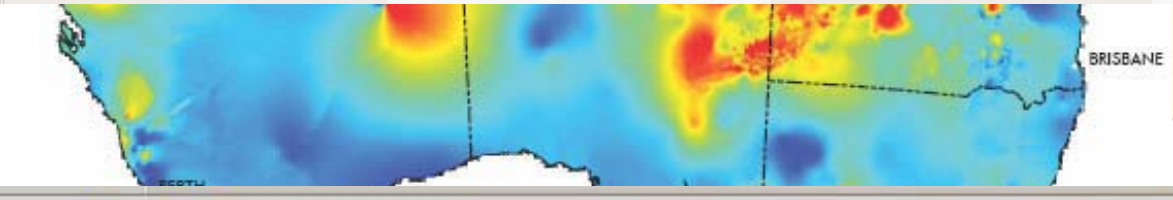

Visit our Media Room for all publications and images.


Visit the Education Room to access resources for school projects and career descriptions.

Share Price Information

Latest Stock Price
ASX (20 min delay)
8/11/2008 8:31 PM

Code: GDY
Last: 1.400
Open: 1.450
High: 1.530
Low: 1.400
Vol: 286622



petratherm
Exploring for and Developing Geothermal Energy

The US expert panel contribution: J. Tester et al.

The Future of Geothermal Energy

Impact of Enhanced Geothermal Systems (EGS) on the United States in the 21st Century

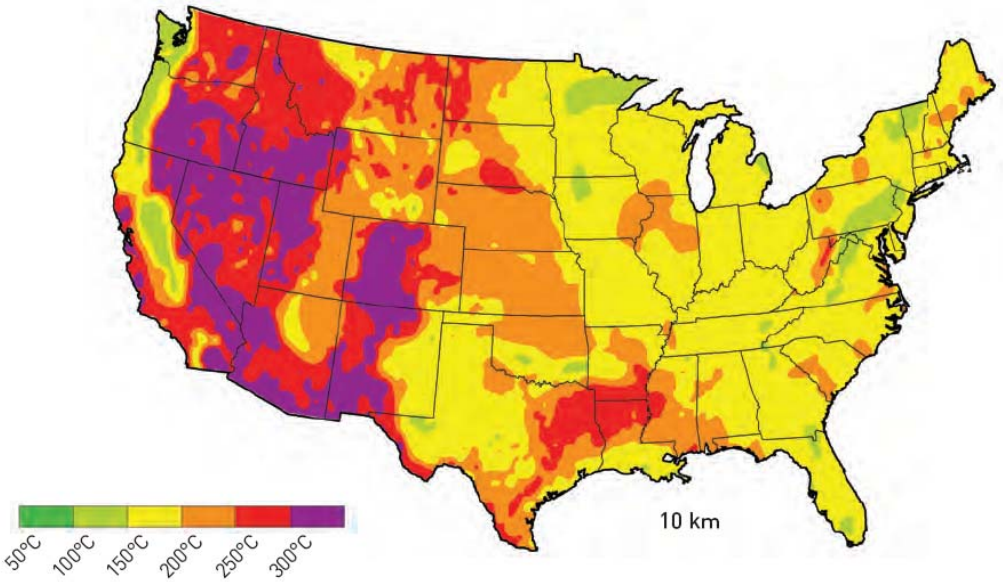


Figure 2.7f Average temperature at 10.0 km.

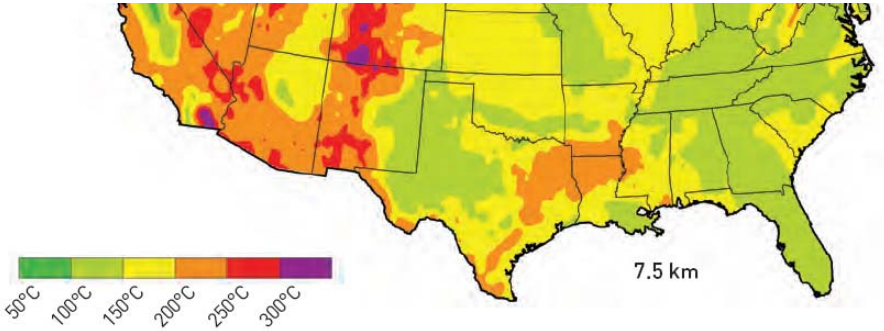


Figure 2.7e Average temperature at 7.5 km.

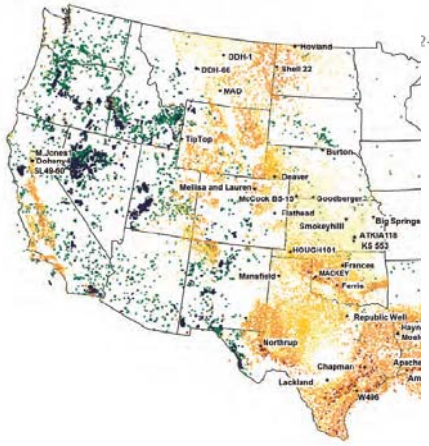


Figure 2.2 All BHT sites in the conterminous United States in t based on depth and temperature (heat flow is not available fo preparation of the Geothermal Map of North America). The na regional heat flow and geothermal database sites are also sh

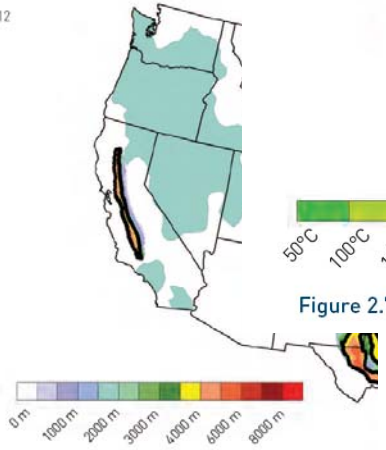
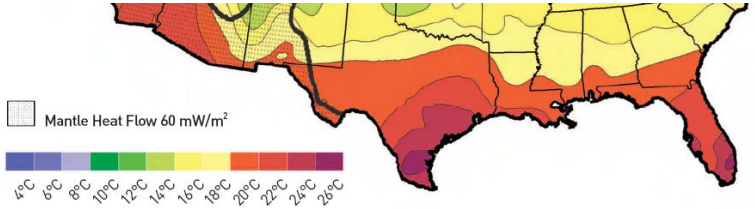
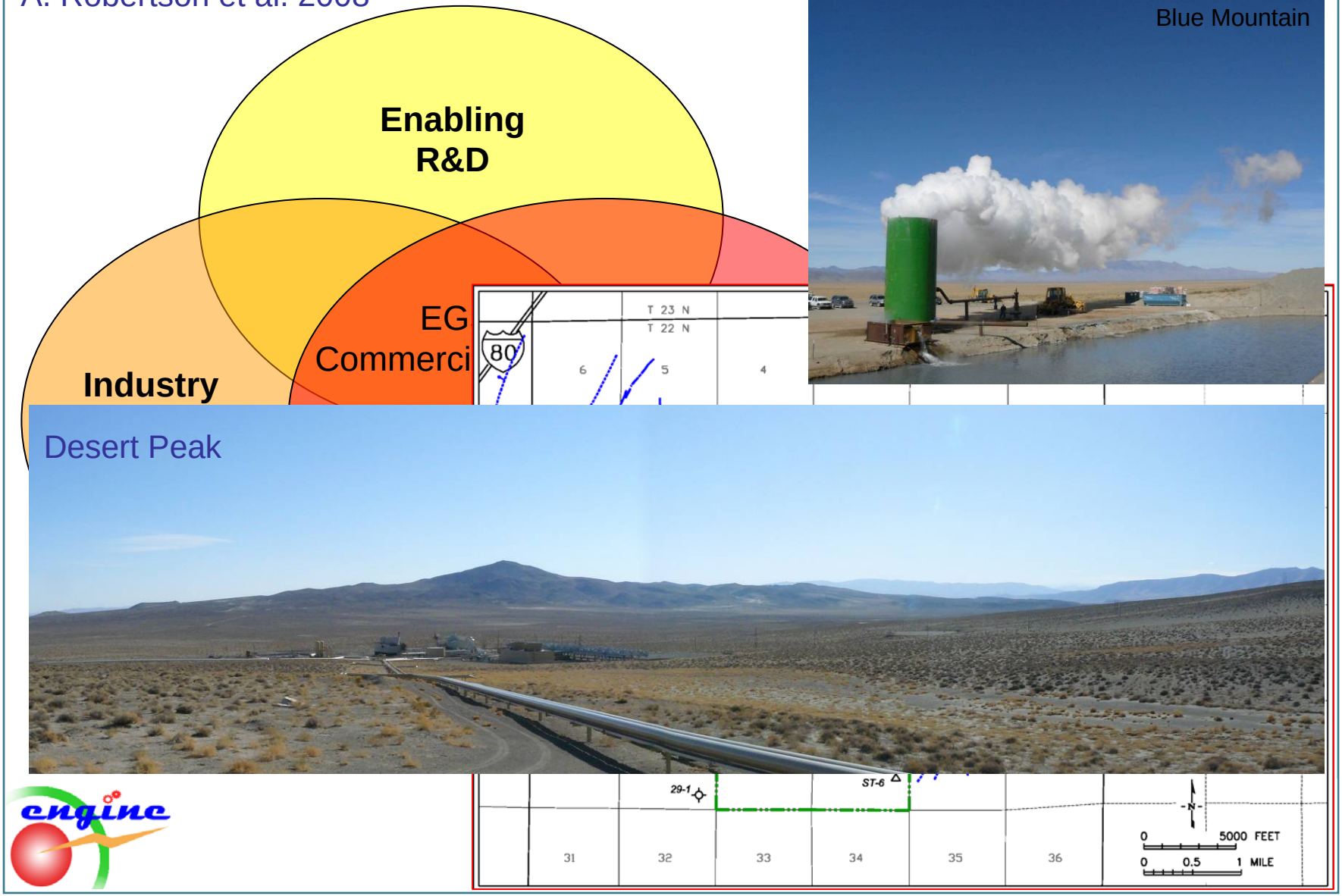


Figure 2.5 Sediment thickness map (in m 1978). The 4 km depth contour is outlinec western United States are in blue/green.



Soon, a new experimental site in Nevada

A. Robertson et al. 2008



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Conclusions

- An European perspective
  - On going and planned EGS projects
  - A call for proposal in the FP7
    - *Topic ENERGY.2008.2.4.1: Increased electricity production from Enhanced Geothermal Systems and from low enthalpy geothermal sources*
    - *Overall expected impact: a continued reduction in cost through innovative developments, learning curve effects and co-generation of heat and power should lead to an electricity cost from enhanced geothermal systems of around 0.05 €/kWh in 2020.*
  - Future FP7 calls
    - *Induced seismicity*
    - *ENGINE 2?*
- An international perspective


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