

Risk insurance for geothermal projects

”

Session VI: "Legal, environmental & financial aspects

Florence JAUDIN



Pisa, 10 October 2013



Content

- **Risks associated with geothermal projects:**
a significant financial barrier
- **Existing insurance for geothermal projects**
- **Risk insurance scheme at European level**



The notion of risk

RISK - Risk is usually defined as the potential that a chosen action/inaction will lead to a loss. The notion implies that a choice having an influence on the outcome exists.

Risks associated with project

- Political
- Regulatory
- Technical
- Business
- Economical

These are usual business risks.

In addition, a geothermal project may have to face specific risks resulting from the particular financial configuration of a geothermal project and specificity of the resource,

The risks associated with geothermal projects

The whole bankability of a geothermal project relies on the geothermal resource economical potential.



➔ **This potential has to be assessed. It can never be fully and accurately assessed until drilling has taken place though.**

As a consequence, drilling is required and **high upfront investments** have to be made before and without certainty as to the geothermal resource bankability, which may eventually be unfit for economical production.

The risks associated with geothermal projects

=

Geological Risk

→ **Drilling phase** : Short-term risk

of not finding an economically sustainable geothermal resource after drilling

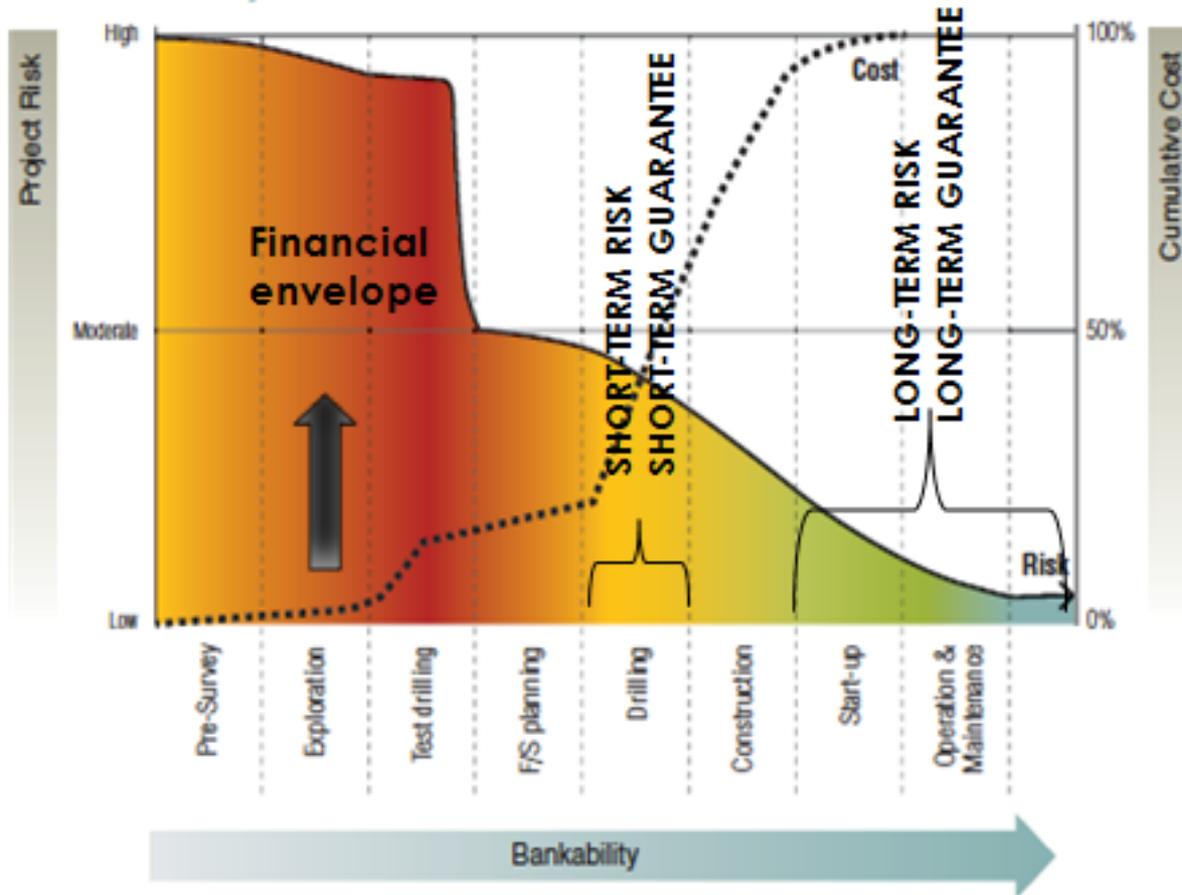
→ **Exploitation phase** : Long-term risk

of the geothermal resource naturally depleting rendering the long-term production economically unprofitable

Phases of a geothermal projects

When may the risks occur?

Geothermal Project Risk and Cumulative Investment Cost



Geological risk perception in Europe



In Europe, the geological risk is traditionally shunned
by the private insurance sector.

- **fairly small number of operations**
not allowing a sufficient statistical basis to assess their probability of success;
- **the particular nature of the resource risk;**

Geological risk

Risk Management



As usual, risk management relies on several steps
that shall apply throughout the whole geothermal project:

- evaluate the geological risk;
- manage it/take action to reduce it; transfer it
- measure/monitor the geological risk;

Existing insurance

to cover the geological risk in Europe

Country	Energy		Governance		Type of insurance		Location	
	Heat	Electricity	Public	Private sector	Purely insurance-related	Insurance mixed with financing	National	Foreign countries
France	X		X		X		X	
Germany	X	X	X	X		X	X	
	X	X		X	X	X	X	X
Iceland	X		X			X	X	
The Netherlands	X		X		X		X	
Switzerland	X	X	X	X	X		X	

Existing insurance to cover the geological risk in Europe



→ **Private insurance policies:** the German exception

- made-to-measure

→ **National insurance funds**

- post-damage guarantee
- guaranteed loan

Existing insurance

to cover the geological risk in Europe

- **post-damage guarantee**
- **guaranteed loan**
 - Short Term Risk
 - Long Term Risk



information to be provided

- A detailed presentation (identity, legal form, information on contractors and key personnel);
 - The location of the exploration site;
 - A detailed program;
 - Available financing and proof of financial capacity to achieve the whole exploration program;
- Legal permits and licences;

Specific case of EGS: where EGS are considered, the developer shall in addition submit:

- ✓ The reservoir development concept;
- ✓ Seismicity studies;
- ✓ Stimulation modelling ie expected impact of chemical, hydraulic or thermal stimulations;

Risk insurance scheme at European level



- The GEOELEC project
- Removing the financial barrier hampering geothermal development
- **EGRIF**
European Geothermal Risk Insurance Fund

A risk insurance scheme at European level: why ?



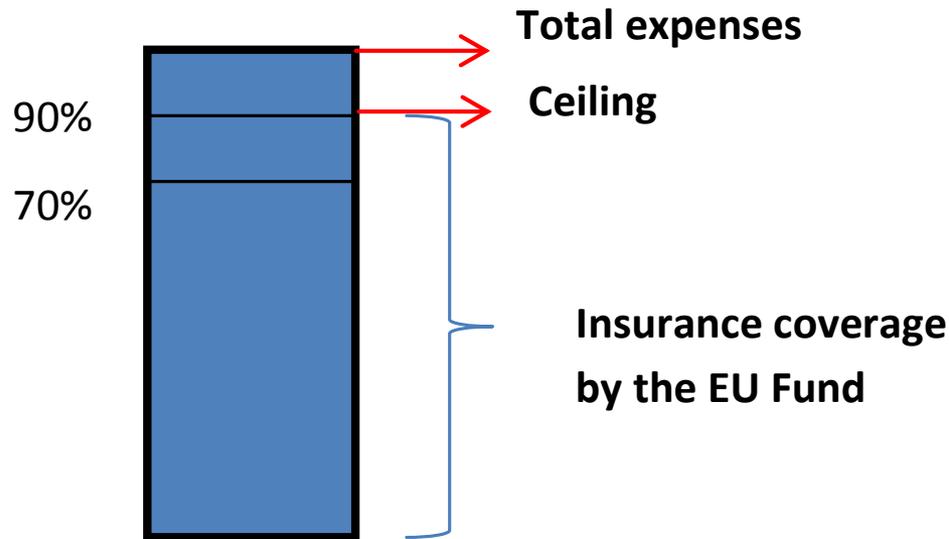
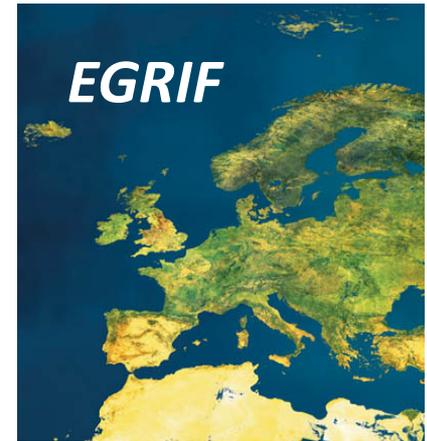
- **Shortage of insurance policies**
 - Limited current market size
 - No statistical basis to assess the probability of success
 - Allow the technology to progress along its learning curve (EGS)
- **Pooling of the resource risk at a European level**
- **Not a competitor to national insurance policies**
- **When mature: replaced by private schemes**

What type of insurance?



- **The exploration phase:**
a repayable advance
 - No clear success or failure criteria
 - To be reimbursed in case of production
 - A classical interest rate
+ a “bonus” depending on the estimated risk
- **The short term risk: a post-damage guarantee**
 - To cover a significant amount of projects
 - Fee depending on the estimated risk
- **The long term risk: a post-damage guarantee**
 - Be cautious to prevent unsustainable reservoir management
 - Annual fee

Short-term risk : 1st option



- A homogeneous and generous rate for all EU developers
- A potential competition with existing national insurances

Short-term risk : 2nd option

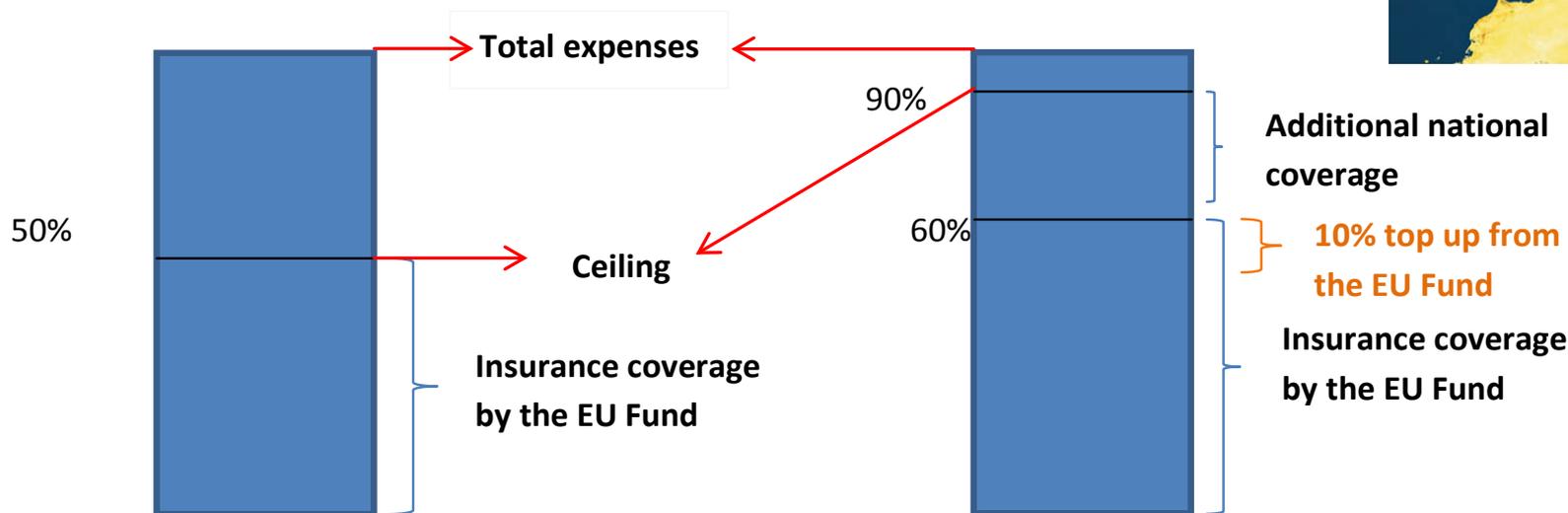


Countries without insurance

Countries with insurance

Eligible expenses/drilling

Eligible expenses/drilling



- A lever for the development of national insurances
- A differentiated treatment between countries

What governance?

- **An exclusive management an EU institution or a shared management with a national institution**
- **A secretariat and a board** (shareholders, geothermal professionals, experts, for some applications a representative of the national insurance system)
- **A rapporteur and the use of experts**
- **A seed capital of 50-100 Mio €**
- **The obligation to disclose the data collected**

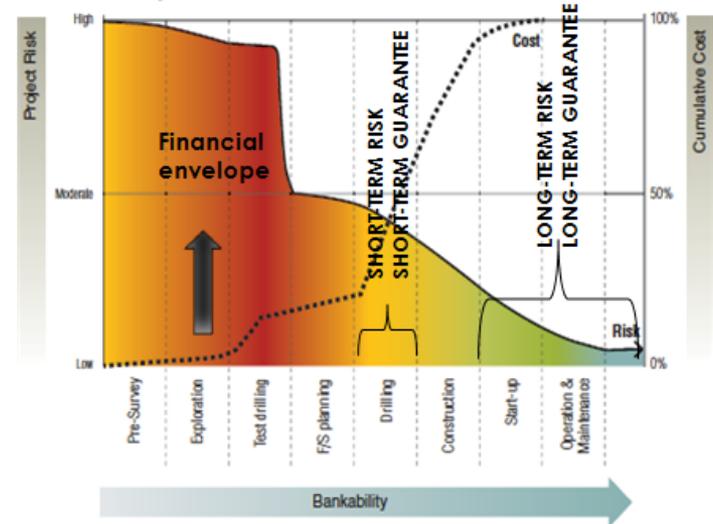


Conclusion

- ❑ The geological risk must be managed and mitigated
- ❑ European geothermal resources better harnessed thanks to European insurance scheme
- ❑ **GEOELEC** proposes how such a structure could be established and managed at EU level

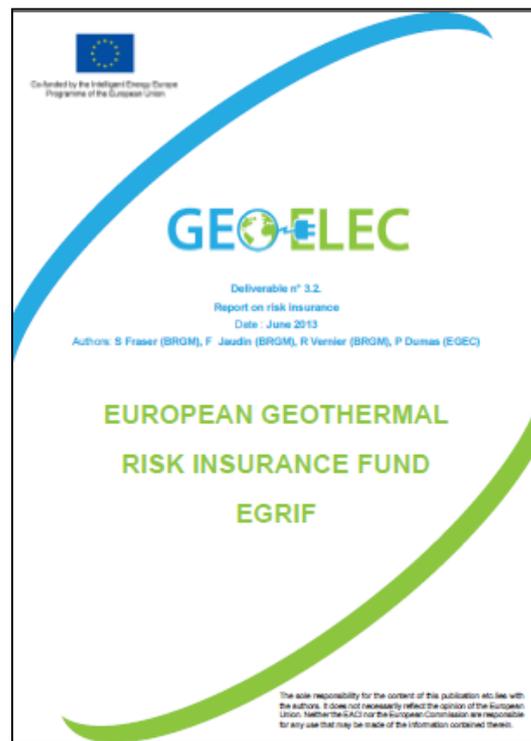
EGRIF: European Geothermal Risk Insurance Fund

Geothermal Project Risk and Cumulative Investment Cost



EUROPEAN GEOTHERMAL RISK INSURANCE FUND EGRIF

<http://www.geoelec.eu/>



GEO-ELEC

Supported by
**INTELLIGENT ENERGY
EUROPE**



Thank You!
VISIT GEOELEC.EU

