

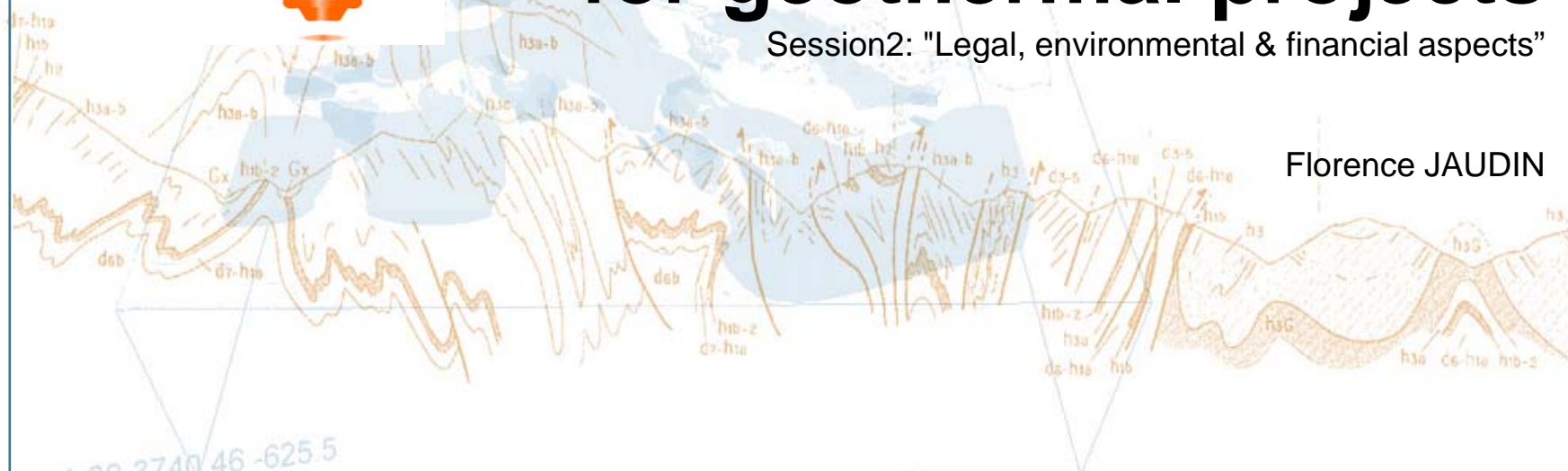
GEOELEC



Risk insurance for geothermal projects

Session2: "Legal, environmental & financial aspects"

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Content

- **The notion of risk**
- **Risks associated with geothermal projects:**
a significant financial barrier
- **Risk insurance for geothermal projects**
 - Existing insurance
 - 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 geothermal projects may appear to investors, banks and geothermal developers as significant and dissuasive constraints.

- Political
- Regulatory
- Technical
- Business
- Economical

These are usual business risks though. 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

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Geological Risk

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

of not finding an economically sustainable geothermal resource after drilling

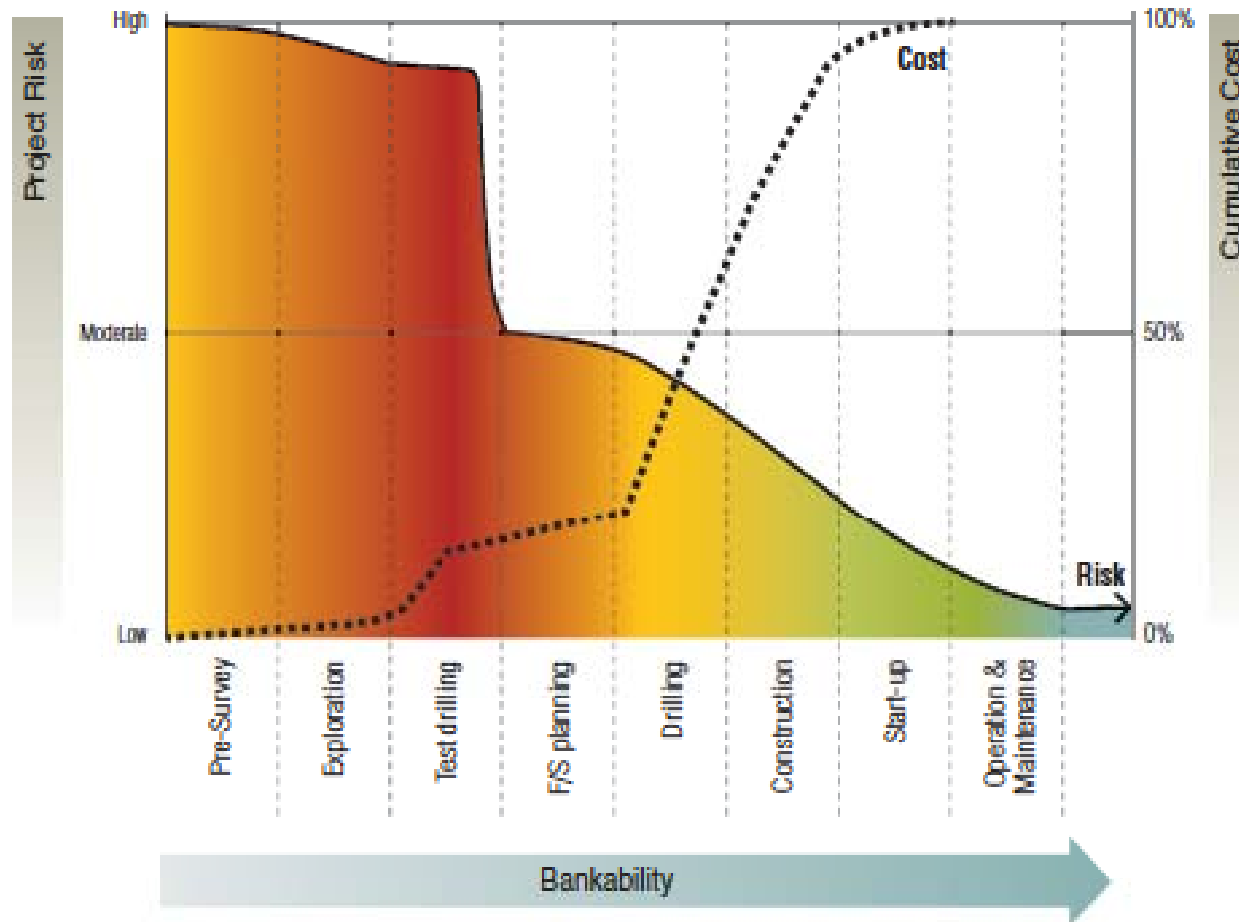
→ **Exploitation phase** : Long-term risk

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;
- measure/monitor the geological risk;

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

→ Private insurance policies: the German exception

- Geothermal projects insured
- Eligible costs
- Criteria for compensation
- Information to submit to the insurance company
- Premiums
- The German experience



Existing insurance to cover the geological risk in Europe

→ National insurance funds

(France, the Netherlands, Switzerland)

- post-damage guarantee
- guaranteed loan



Existing insurance to cover the geological risk in Europe

→ **National insurance funds** (France, the Netherlands, Switzerland)
▪ post-damage guarantee

- ✓ Scope of insurance
- ✓ Governance
- ✓ Expertise
- ✓ Applications
- ✓ Capital and financial structure
- ✓ Coverage ratio
- ✓ Agreement
- ✓ Insurance process



Existing insurance to cover the geological risk in Europe

→ **National insurance funds** (France, the Netherlands, Switzerland)

▪ Guarantee loan (Island and Germany)

- ✓ Scope of insurance
- ✓ Governance
- ✓ Expertise
- ✓ Applications
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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



Risk insurance scheme at European level The GEOELEC Project



Potsdam – 15th of April 2013



Risk insurance scheme at European level



- The GEOELEC project
- Removing the financial barrier hampering geothermal development
- Scenarios for an EU insurance scheme

Risk insurance scheme at European level



type of insurance : post-damage guarantee/ guaranteed loan;

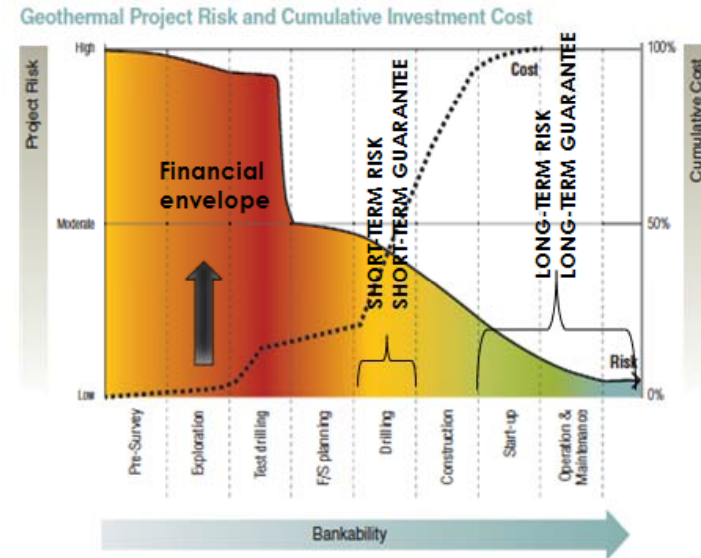
the risk insured : short-term risk/long-term risk

phases of the geothermal electricity project concerned with the insurance;

- financial envelope;
- the governance of the Fund;
- the seed capital and the operating incomes;
- the application to reinsurance to provide some financial relief to the European Fund;
- the beneficiaries of the scheme;
- eligible expenses for coverage;
- *% of eligible costs cover;*
- the insurance process ;
- required information and expertise;
-

Conclusion

- ❑ The geological risk can be managed and mitigated
- ❑ Insurance concepts are developing in Europe
- ❑ European geothermal resources better harnessed thanks to European insurance scheme



THANK YOU FOR YOUR ATTENTION

