

# Innovative schemes in support of geothermal energy in France

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Geothermal Global Alliance stakeholders meeting

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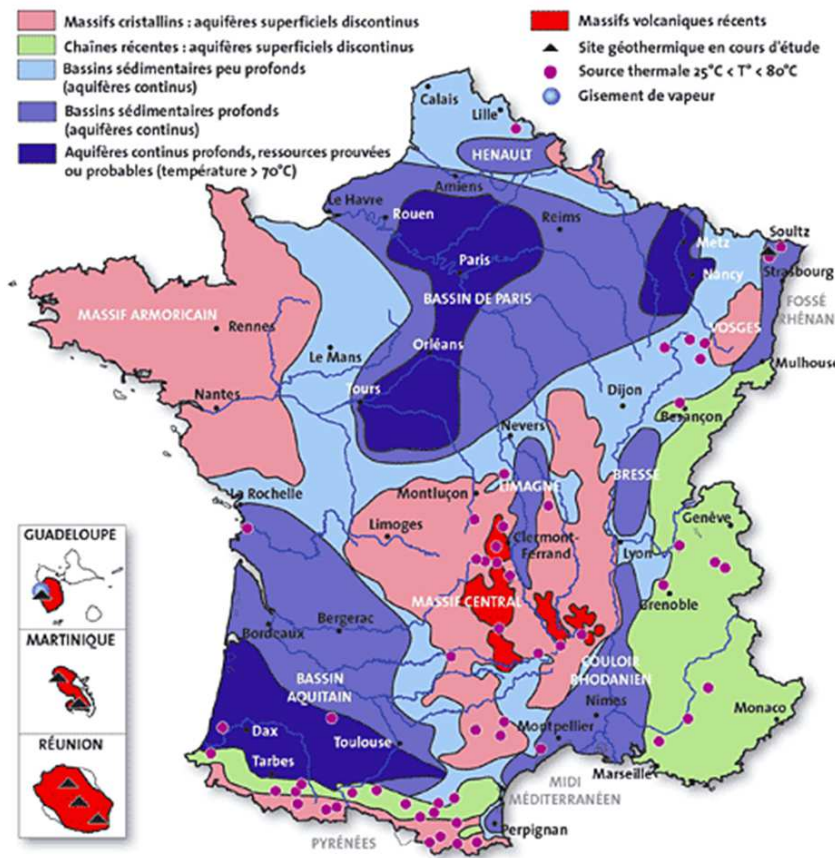
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# Three main geothermal sectors are being actively developed in France

- **Shallow geothermal** ⇒ **ground – source heat pumps**
- **Low temperature geothermal** ⇒ **district heating systems (Paris basin)**
- High temperature geothermal** ⇒ **overseas departments (volcanic resources)**

*and in mainland France (EGS)*



# Legal framework

## « deep geothermal » ressources

➤ **Geothermal resources are legally considered as mines, and therefore belong to the state who « concedes » their exploitation.**

- Mining Code\* :
  - “high temperature” resources
  - “low temperature” resources
  - “low-temperature resources of minimal importance” [shallow geothermal]
- Both high and low temperature resources can be considered as deep geothermal.

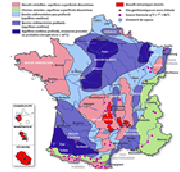
	Temperature at surface	Permitting	
		Exploration	Exploitation
Low temperature	$\leq 150^{\circ} \text{C}$	Exploration authorisation	Exploitation permit
High temperature	$> 150^{\circ} \text{C}$	Exclusive exploration permit	Concession

\*and associated decrees



# Deep geothermal in France

## - *state of play* -



Heat

- About 345 MWth of installed capacity, mostly used for **district heating**
- 4 out of 5 end users live in the **Paris basin** where more than 30 district heating systems are being exploited.
- Rehabilitation of existing plants and new projects under preparation.

Power

- Power production from **volcanic resources in the French overseas departments** (Guadeloupe)
- Development of **EGS technologies in mainland France**, mostly for CHP plants
- Renewed interest since 2011 : more than 20 projects filing for exploration permits

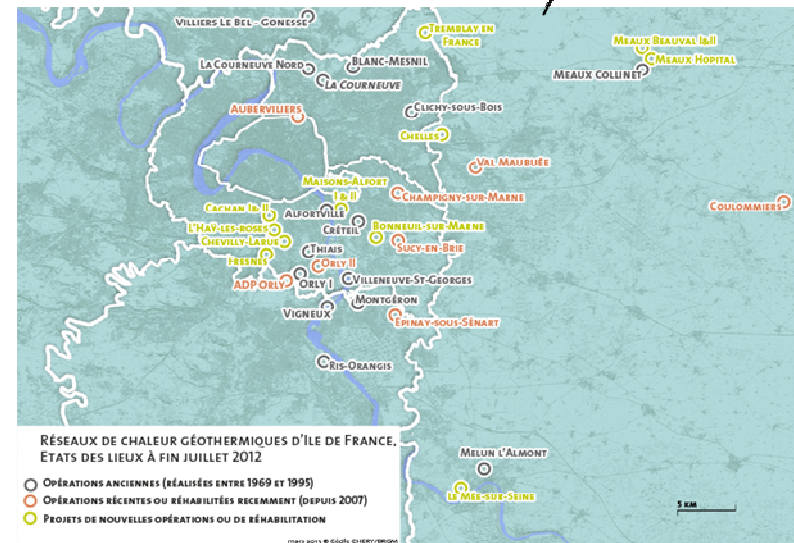
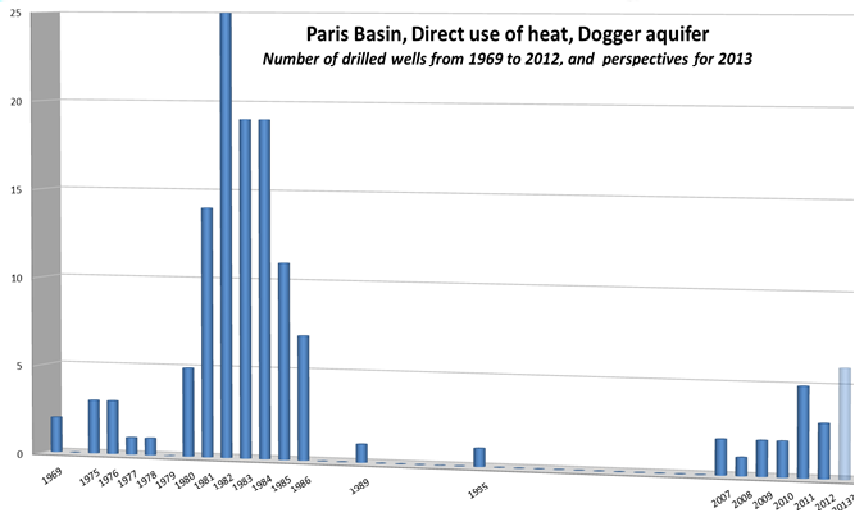
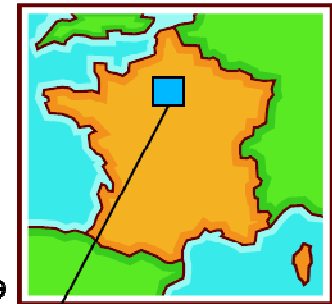
# Deep geothermal heat market

➤ **Geothermal district heating systems in the Paris basin are the historical backbone of the French deep geothermal heat market. Diversification is under way.**

■ Geothermal district heating systems :

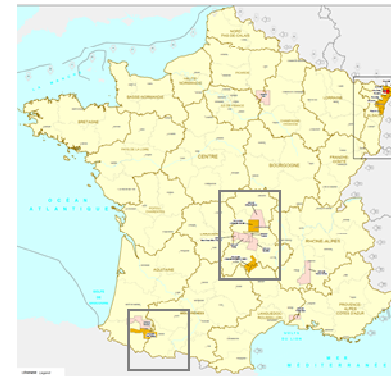
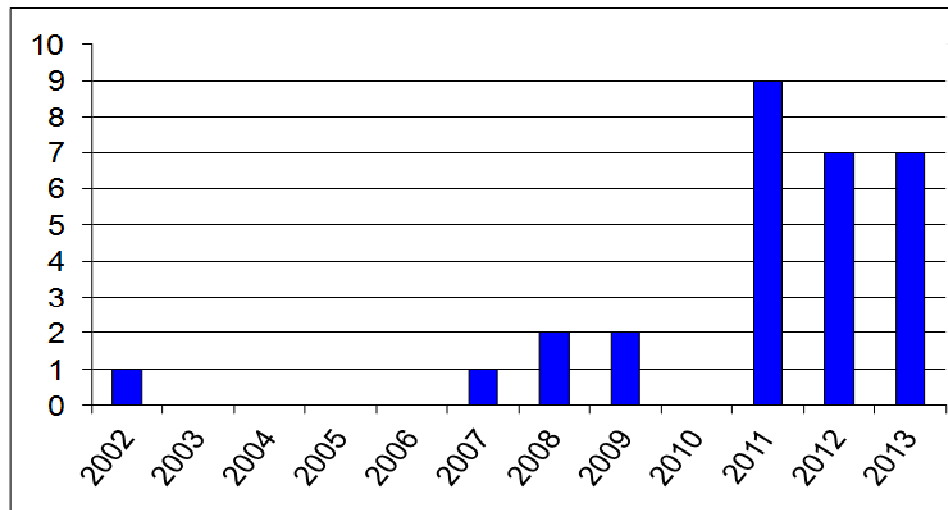
- Developed since the late 1960s
- >75% of installed capacity
- FR : highest number of operating geothermal district heating systems in Europe

■ Importance of risk mitigation schemes



# Deep geothermal power market

- **A renewed interest in geothermal power production, both in the overseas departments (conventional) and in mainland France (EGS).**



- **Conventional** power production from volcanic resources in the French overseas departments : Guadeloupe, Dominica, new permit applications
- **Geothermal CHP in mainland France** : Soultz-sous-Forêts, new permit applications, importance of heat co-production



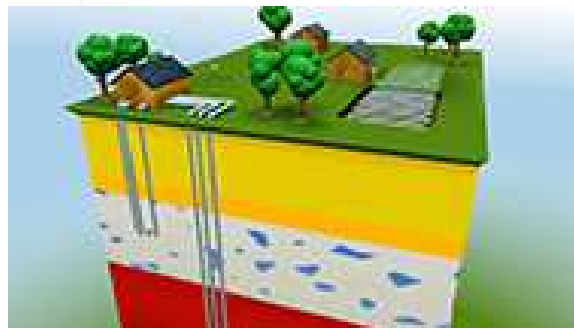
# Shallow geothermal: a new legal framework

***A decree simplifying and modernizing the legal framework for shallow geothermal project is in its very final stretches***

➤ This decree offers:

- The implementation of a simplified « declaration » system
- National requirements for the implementation and monitoring of geothermal works
- Qualification of the drillers by accredited organizations

➤ But also, limitation of the declarative system for shallow geothermal activities in areas with risk or environmental issues. In this case, the advice of a registered expert is needed.



# Geothermal energy: integral part of the national policy on renewable energy

***The bill on Energy transition end green growth now before the french parliament deals with some obstacles to geothermal development:***

- ***Public acceptance -> Institutes an insurance scheme to guarantee the neighbours of a geothermal site against damages.***
- ***The bill sets up a Pluriannual Program for Energy process which will contain precise goals and budget allocations for geothermal development.***





# Development of deep geothermal resources

## - *key success factors* -

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- **Robust legal framework** with clear provisions on the exploration and exploitation of deep geothermal resources
- Public acceptance - **engagement with local communities** and industries at an early stage in the project development process
- **Risk mitigation schemes** to lift upstream investment barriers
- **Investment in RD&D** to reduce costs, supported by appropriate national and European support schemes
- **Knowledge sharing** and pooling of competences on an international level



# Policies on deep geothermal - objectives & incentives -

- **Deployment objectives for 2020 set an ambitious growth path for deep geothermal energy in France. Different incentive schemes for both heat and power generation have been put in place.**
- Deep geothermal for both heat and power production is supported through different incentive schemes, such as :
  - Heat : **investment grants** via “Fonds Chaleur”, public-private risk mitigation scheme (“fonds de garantie géothermie”), VAT reduction
  - Power : **feed-in tariff\***
  - **GEODEEP funds** just put in place (Ademe, CDC and industrials) to ensure the geological risk
- **Targeted RD&D support** through call for proposals by the National Research Agency (ANR), the Environment and Energy Management Agency (ADEME), the Geodenergies alliance.
- **European and international cooperation**



\* support schemes for renewables under review

# Geothermal energy in the perspective of COP21

- Geothermal energy is seen by the french government as being a clean renewable form of energy that should play a bigger role in the fight against climate change
- France will therefore support international initiatives in that field, such as the GGA through its participation in IRENA
- We expect this initiative to produce results that could be part of the « agenda of solutions » for the COP21



Thank you for your attention

