Master STEP, IPGP, Paris. Frontiers in geosciences class, 21/03/2008.

CCS: Acceptability and risks

Messages

- Risks are lived with
- Acceptability is politically constructed with communities

1. CO_2 risks are lived with

- CO_2 tends to leak
  - Lighter than water
  - An acid than may react with the rock
- But
  - Natural analogues (volcanism)
  - Artificial analogues (workers ≠ public)
  - Models are improving

Volcanism: CO_2 is dangerous

- Rabaul, Papua New Guinea: In June of 1990, three people died of suffocation in a vent of the east side of Tavurvur. Three more died trying to retrieve the bodies.
- Vestmannaeyjar (Heimaey), Iceland: During the 1973 eruption a sleeping man was killed by carbon dioxide as it pooled in the basement of his house.
- Italy 1650 : eruption of Etna caused about 40 deaths; some caused by opthalmias from sulfurous vapors and suffocation. The crew of a ship suffocated as it passed the volcano.

Lac Nyos, Cameroun: August 21st, 1986, 1700 deaths.

Artificial risks
CO_2 in the workplace

- Coal mining
- Agriculture and food industry
- Fire suppression systems

Community risk: A more plausible analog of orphaned well leakage

CO2 leaks already managed

Summary:
CCS risky but manageable

- People live near industrial risks
- People live near CO_2 leaks

2. The acceptance issue

- What is acceptability ?
- Psychological approach
- Sociological studies

Acceptability by whom ?

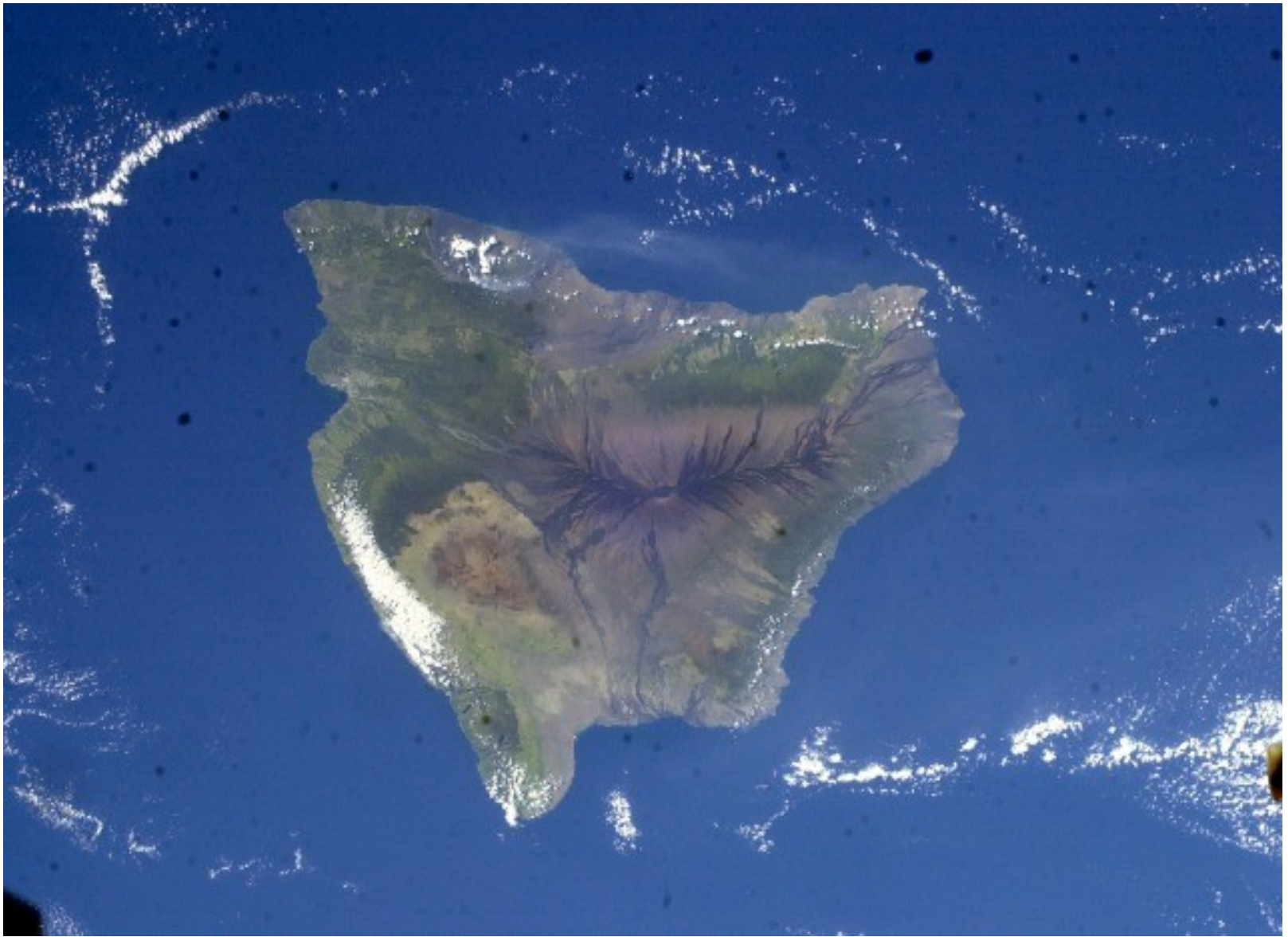
- Stakeholders:
  - Local administration
  - Central administration
  - Industry
  - Non governmental organisations
- The public at large

Acceptability of what ?

- A project: Community acceptability
- An reply to climate change: Sociopolitical acceptability
- A technology: Market acceptability

Non-acceptance case

"Feds to Test Impact of Dumping CO2 into Kona Waters" *West Hawaii Today*, 18/3/1999.



Regulation and acceptance in other projects

- Existing “large” projects (1MtCO2/yr)
  Sleipner, In Salah, Weyburn

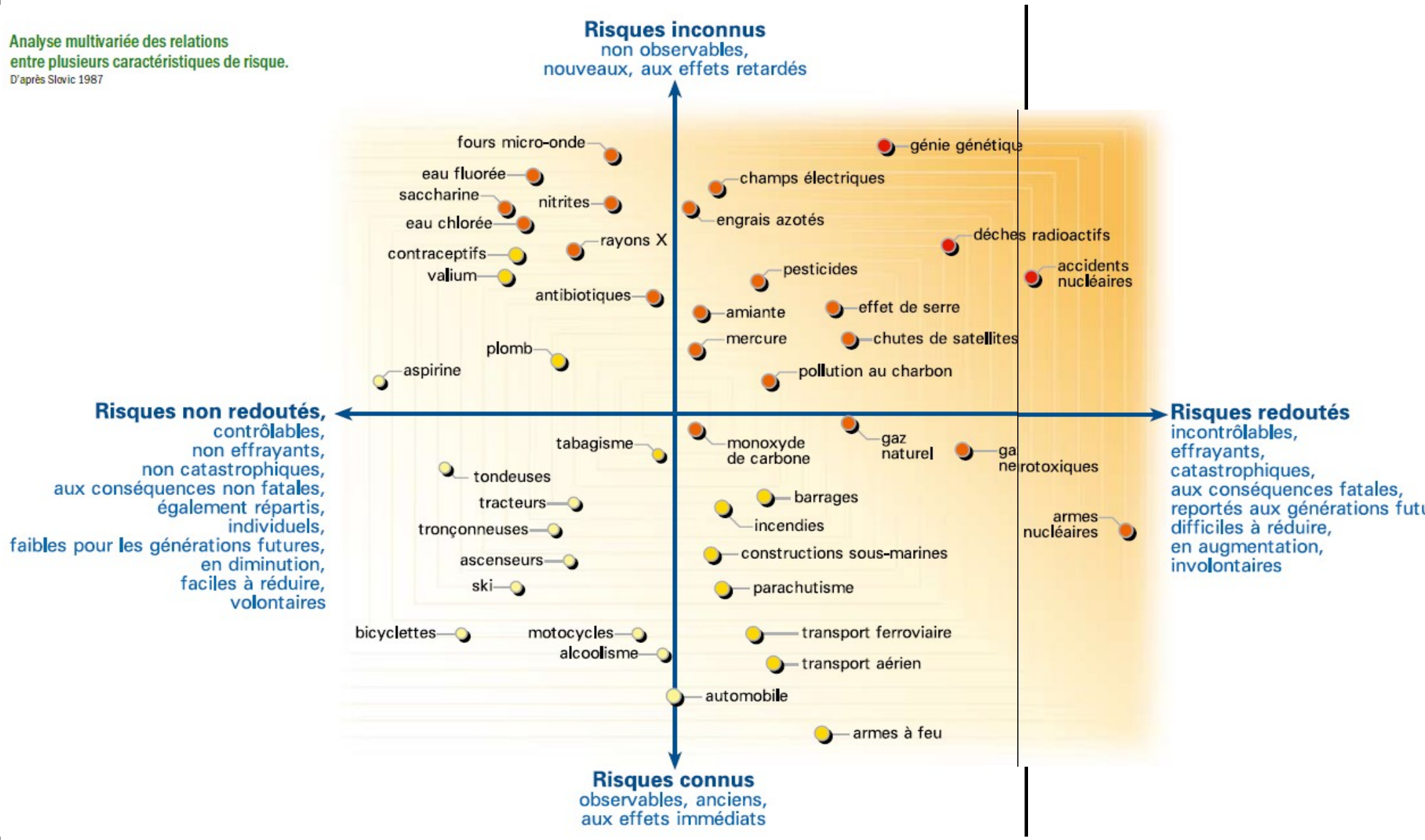
- Many smaller, pilot projects today to
  - Master the technological chain
  - Engage the administrations
  - Explore local acceptance issues

Psychological risk attributes

Bad	Good
Imposed	Just
Artificial	Moral
Catastrophic	Controlled
Unknown	Familliar
Memorable	Trusted actors
Feared	

Ref: Afsset, Janvier 2006 Perception du risque et participation du public

Perceived risk attributes: Multivariate analysis



Lessons of sociological studies: sociopolitical acceptability

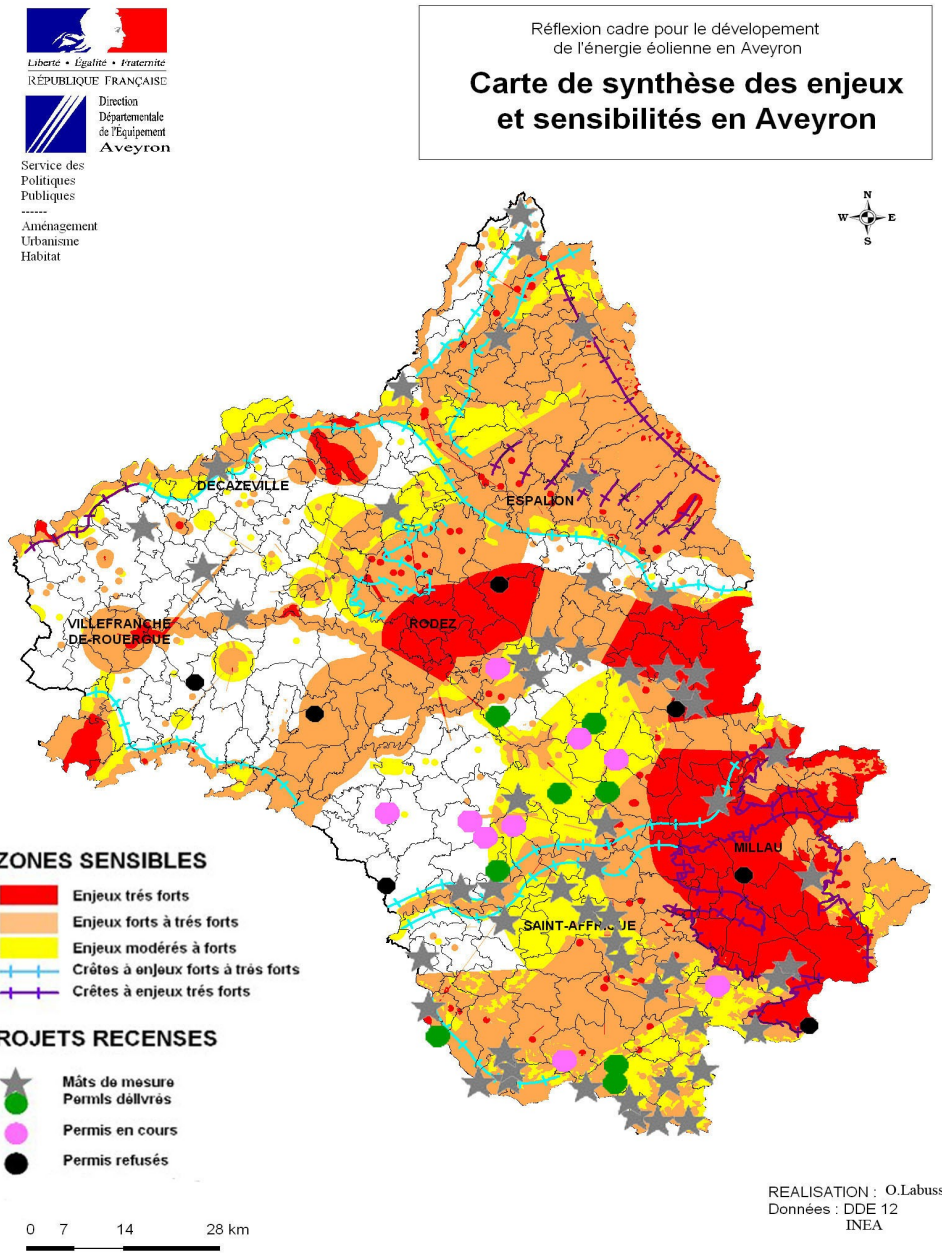
- Oceanic storage is out
- Onshore still in (France at least)
- Approval conditional on accepting the necessity of climate change action
- CCS < renewables or conservation

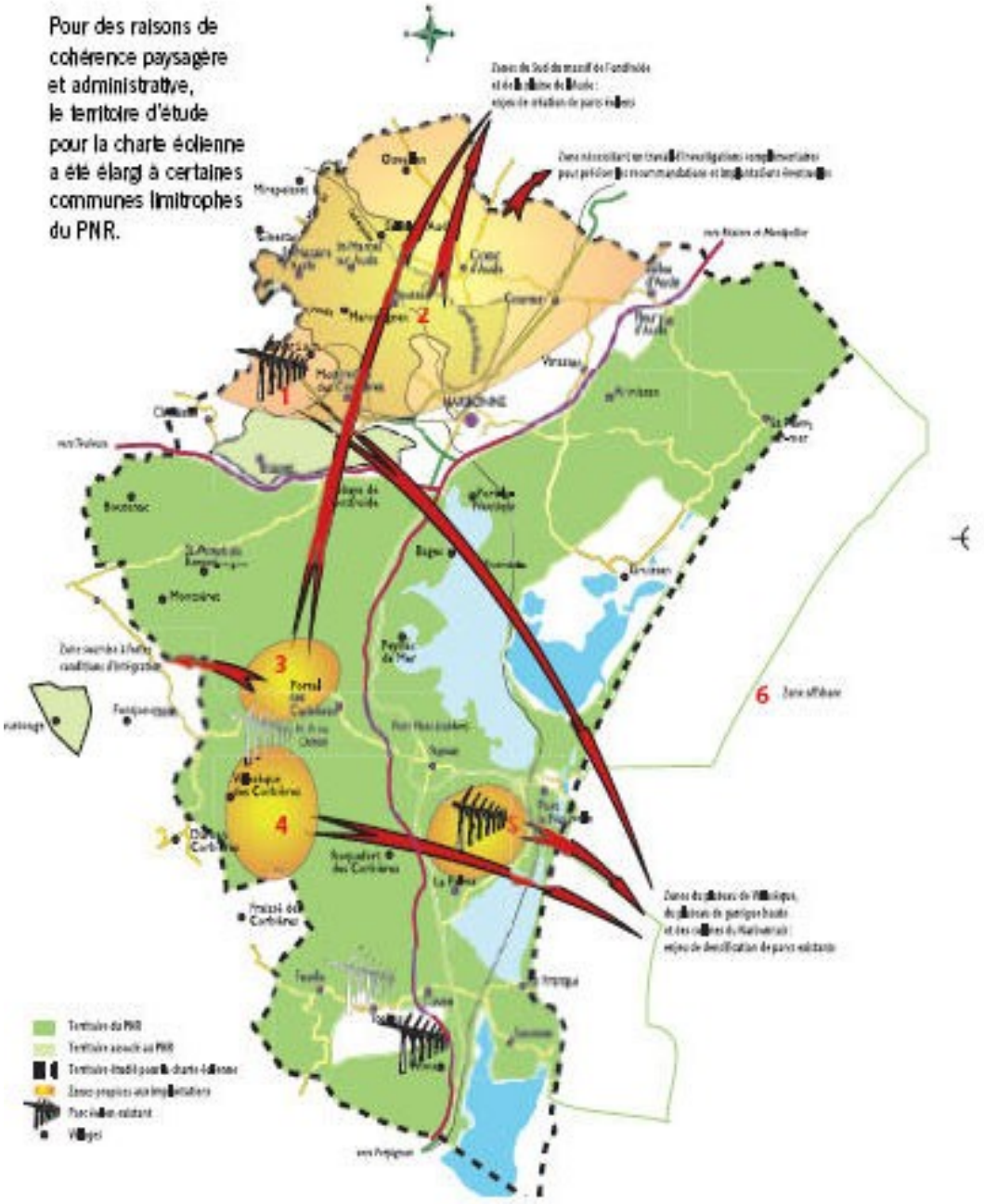
Lessons of sociological studies: community acceptability

- No CCS cases yet
- Lessons from windmill sitting plans:

Technical approach (SIG layers)
vs.
Political approach (negociation)

Technical map vs. political map





Conclusions

- CCS risks seem more manageable than many other risks: climate change, nanotech, GMOs
- Sociopolitical and local acceptability remain to be co-constructed