



# Risk governance for induced seismicity: a view from the social sciences

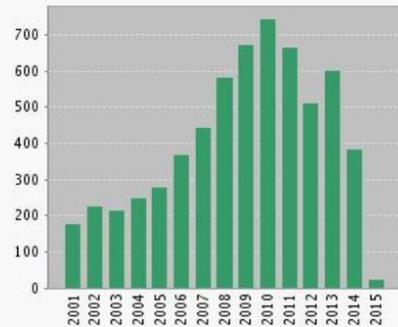
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AGIS Workshop on Induced Seismicity, 10 - 13 March, 2015, Davos Schatzalp

# “Risk governance”: old wine in new bottles or something substantially novel?

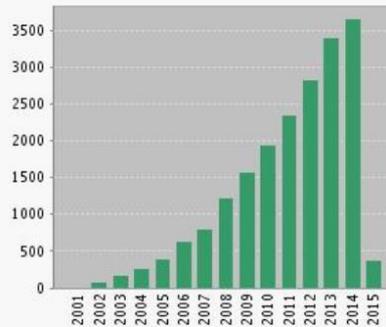
Risk management

Published Items in Each Year



The latest 20 years are displayed.

Citations in Each Year

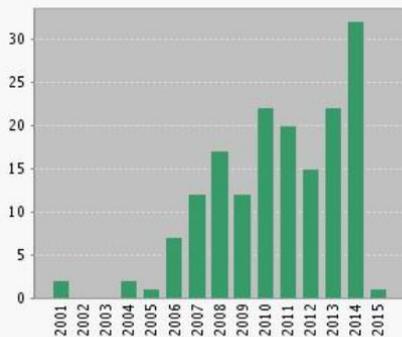


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h-index [?]:	51

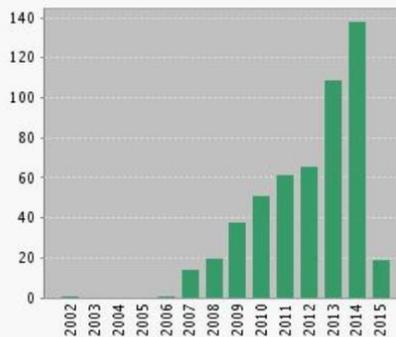
Risk governance

Published Items in Each Year



The latest 20 years are displayed.

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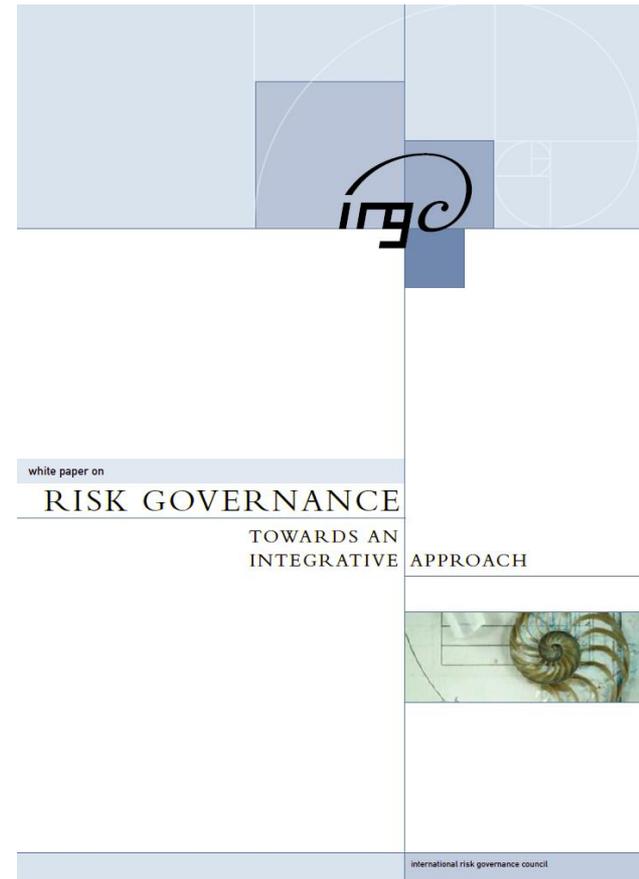
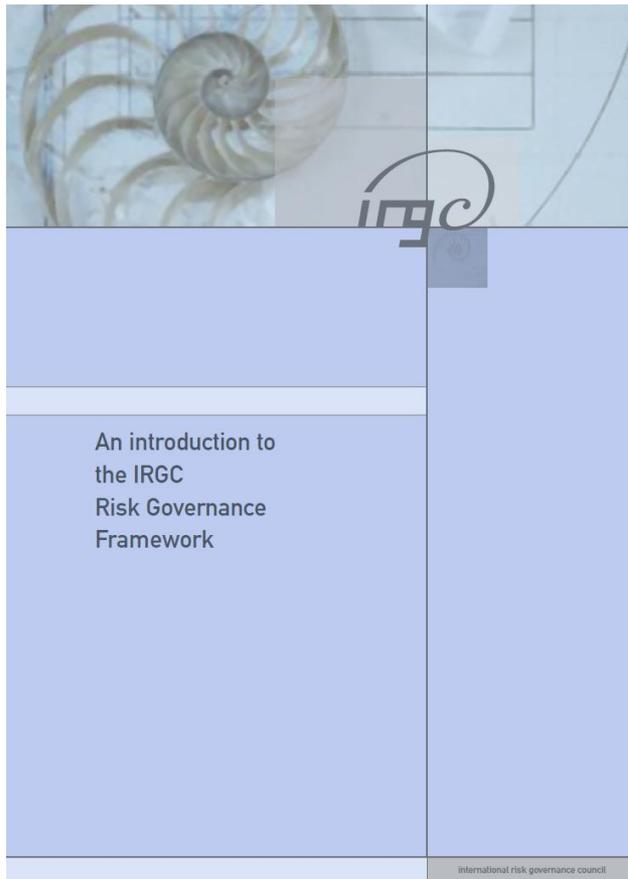


The latest 20 years are displayed.

Results found:	165
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Sum of Times Cited without self-citations [?]:	463
Citing Articles [?]:	454
Citing Articles without self-citations [?]:	429
Average Citations per Item [?]:	3.15
h-index [?]:	9

# Framework of the International Risk Governance Council

# Core documents by the IRGC - International Risk Governance Council

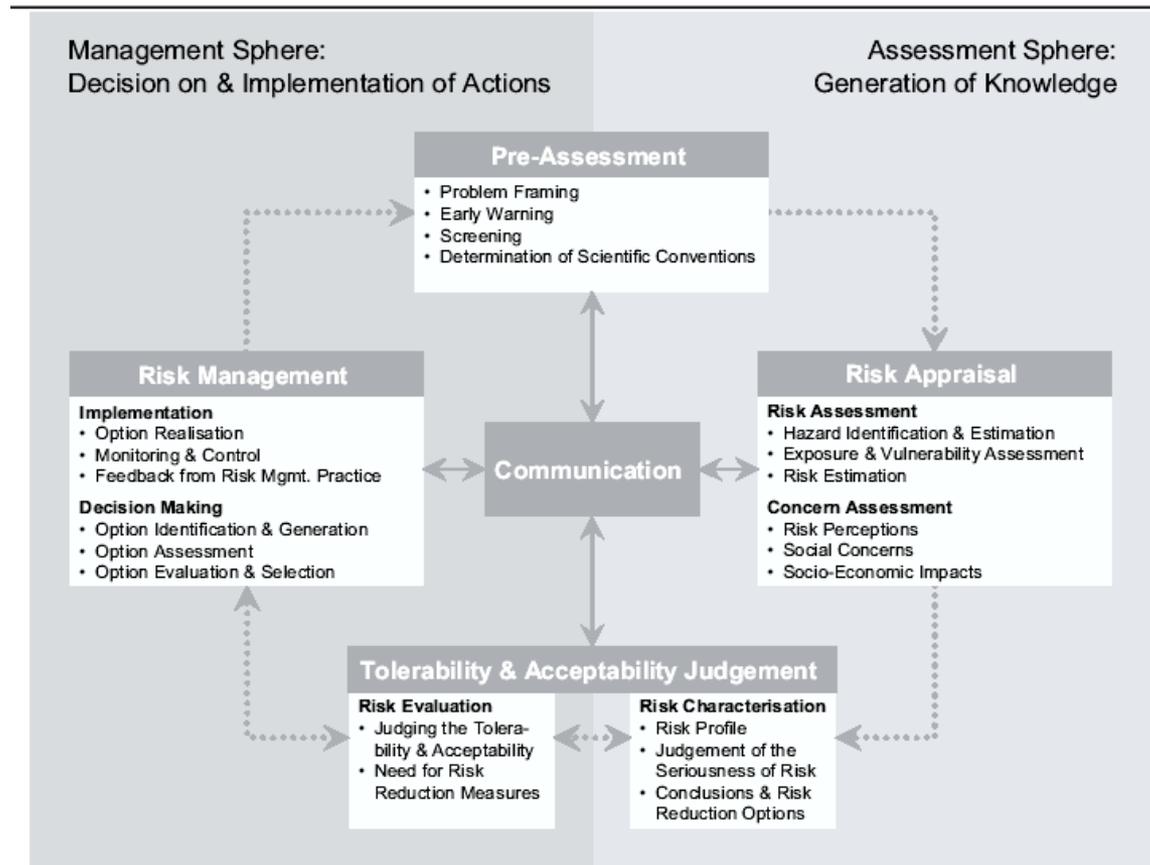


## IRGC (2008): An introduction to the IRGC Risk Governance Framework (p. 4)

**Governance** refers to the actions, processes, traditions and institutions by which authority is exercised and decisions are taken and implemented.

**Risk governance** deals with the identification, assessment, management and communication of risks in a broad context. It includes the totality of actors, rules, conventions, processes and mechanisms and is concerned with how relevant risk information is collected, analysed and communicated, and how management decisions are taken. It applies the principles of good governance that include transparency, effectiveness and efficiency, accountability, strategic focus, sustainability, equity and fairness, respect for the rule of law and the need for the chosen solution to be politically and legally feasible as well as ethically and publicly acceptable.

# Renn, O. (2005): Risk governance – towards an integrative approach. Geneva: IRGC (p. 13)



## Communication key throughout the whole process (IRGC, 2008, p. 6)

IRGC also emphasises the crucial role of **communication**. This includes not only informing people of a risk or of a risk management decision, but also **establishing the two-way dialogue needed at all stages of the risk handling process – including communication between those responsible for taking risk-related decisions and those responsible for providing the knowledge on which the decisions are based**. Excellent communication is particularly important for the involvement of stakeholders in **participative risk-related decision making and conflict resolution** and for ensuring that they can make informed choices about the risk, balancing factual knowledge about it with their own interests, concerns, beliefs and resources.

## Just one of many important points: two classes of risk perception (Renn, 2005, p. 32)

classical factors of risk assessment based on which risk is usually judged, i.e. level of probability and degree of possible harm. Here, psychologists differentiate between two classes of qualitative perception patterns: on the one hand *risk-related patterns*, which are based on the properties of the source of risk; on the other hand *situation-related patterns*, based on the idiosyncrasies of the risky situation (Fischhoff et al. 1978; Slovic 1987; Slovic 1992).

One example of a risk-related pattern is the perceived 'dread' of the consequences of a possible harmful event. If, for example, a person is riding in a car and thinking about possible accidents, s/he will always be under the impression s/he would, with high probability, get away unscathed in a car accident ('fender-bender mentality'). However, if the same person is sitting in an airplane s/he will be under the impression that if something happens here there is no getting away. This feeling of apprehensiveness does not subside even when this person knows the odds and is convinced that statistically many more people die in car accidents than in airplane crashes. Situation-related patterns of perception include aspects such as voluntariness and the ability to exercise self-control. If a person is of the opinion that s/he can control the risk, then s/he will perceive it as less serious. This mode of

## And: context matters! Different socio-political contexts (Renn, 2005, p. 32)

- The **'adversarial' approach** is characterised by an open forum in which different actors compete for social and political influence in the respective policy arena. The actors in such an arena use and need scientific evidence to support their position. Policy makers pay specific attention to formal proofs of evidence because their decisions can be challenged by social groups on the basis of insufficient use or negligence of scientific knowledge. Risk management and communication is essential for risk regulation in an adversarial setting because stakeholders demand to be informed and consulted. Within this socio-political context, stakeholder involvement is mandatory.
- In the **'fiduciary' approach**, the decision making process is confined to a group of patrons who are obliged to make the 'common good' the guiding principle of their action. Public scrutiny and involvement of the affected public are alien to this approach. The public can provide input to and arguments for the patrons but is not allowed to be part of the negotiation or policy formulation process. The system relies on producing faith in the competence and the fairness of the patrons involved in the decision making process. Advisors are selected according to national prestige or personal affiliations. In this political context, stakeholder involvement may even be regarded as a sign of weakness or a diffusion of personal accountability.

## And: context matters! Different socio-political contexts (Renn, 2005, p. 32)

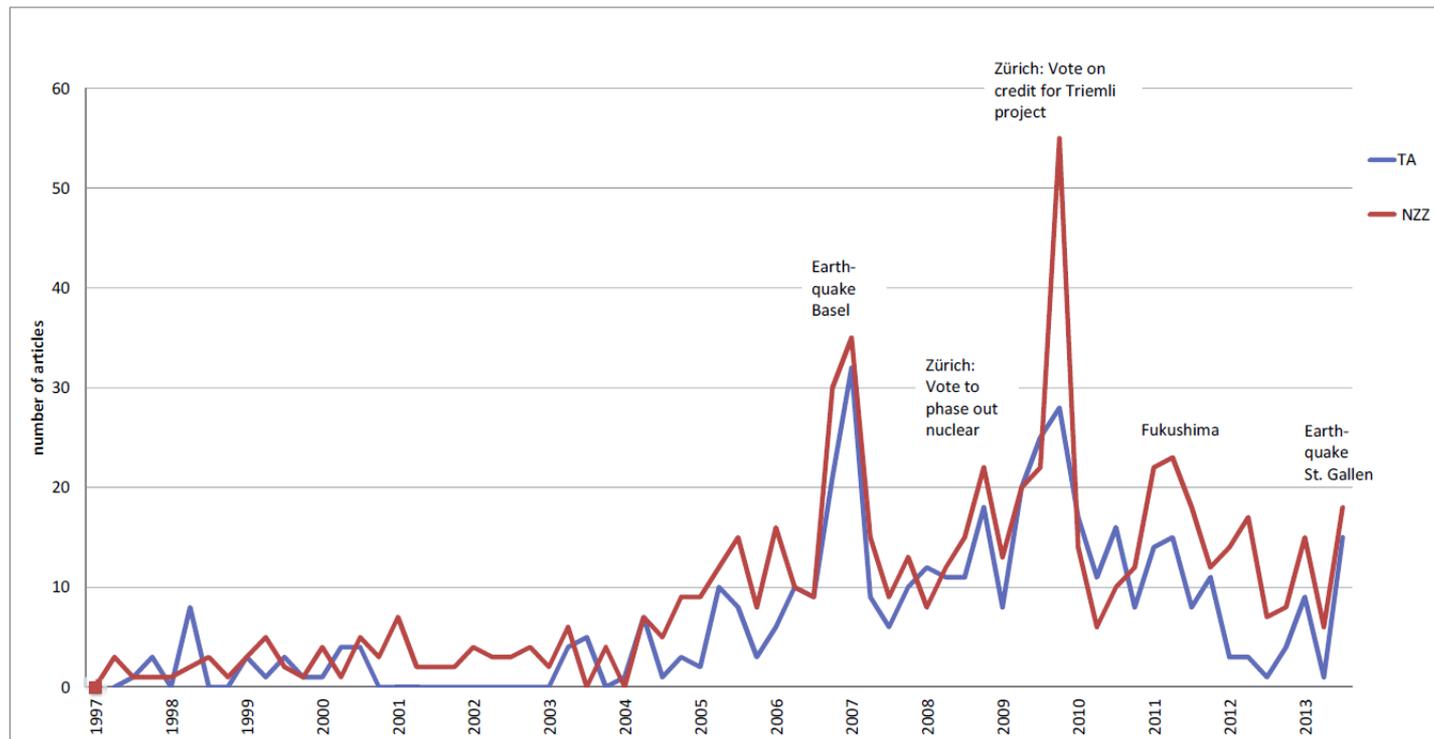
- The **'consensual' approach** is based on a closed circle of influential actors who negotiate behind closed doors. Social groups and scientists work together to reach a predefined goal. Controversy is not present and conflicts are reconciled on a one-to-one basis before formal negotiations take place. Risk communication in this context serves two major goals: it is supposed to reassure the public that the 'club' acts in the best interest of the public good and to convey the feeling that the relevant voices have been heard and adequately considered. Stakeholder participation is only required to the extent that the club needs further insights from the affected groups or that the composition of the club is challenged.
- The **'corporatist' approach** is similar to the consensual approach, but is far more formalised. Well-known experts are invited to join a group of carefully selected policy makers representing the major forces in society (such as the employers, the unions, the churches, the professional associations, the environmentalists). Similar to the consensual approach, risk communication is mainly addressed to the outsiders: they should gain the impression that the club is open to all 'reasonable' public demands and that it tries to find a fair compromise between public protection and innovation. Often the groups represented within the club are asked to organise their own risk management and communication programmes as a means of enhancing the credibility of the whole management process.

**But: is it really risk that matters? The case  
example of deep geothermal energy**

## Yes, but not only seismic risks

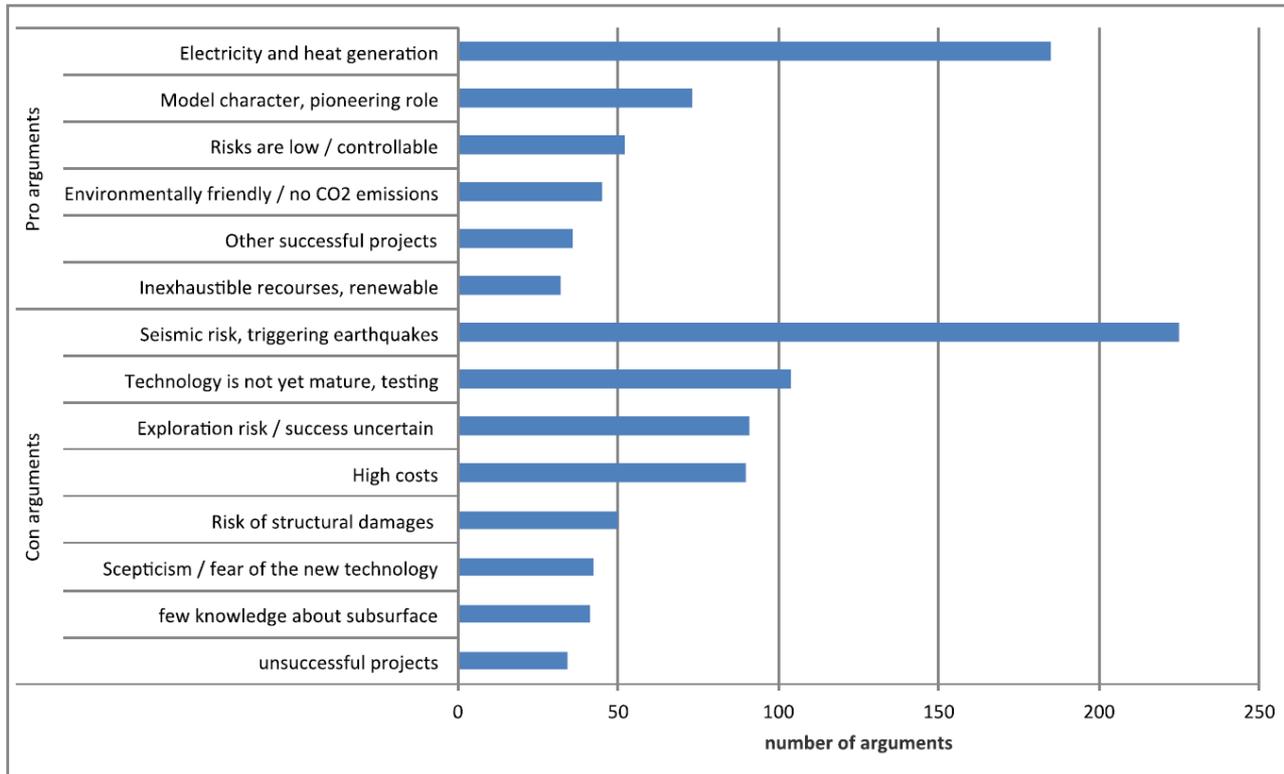


## And: how is the topic discussed (framed) in the media? (TA Swiss Study 2014, Muggli et al. 2015, p. 309)



**Figure 127:** Frequency of newspaper articles containing the keywords "Geothermie or Erdwärme" over time in TA and NZZ (N = 1119 articles).

# Seismicity dominant but not only negative argument (Muggli et al. 2015, p. 310)



**Figure 128:** Distribution of the most frequent arguments in NZZ and TA from 1997 to 2013 (N = 1100 arguments).

# Scientists dominantly refer to risks, industry to energy potential (Muggli et al. 2015, p. 318)

**Table 38:** Distribution of arguments of the different actor groups within the identified frames (N = 382 arguments attributable to specific actor groups).

	Energy transition		Risks		Technology		Costs		Total
	Opportunity (n=90)	Unrealistic option (n=12)	Uncertainties and risks (n=71)	Risks under control (n=66)	Benefits (n=33)	Handicaps (n=43)	Economic (n=14)	Expensive (n=53)	
Politicians (n=128)	21%	8%	9%	16%	9%	15%	3%	18%	100%
Public authorities (n=67)	25%	0%	19%	18%	4%	13%	1%	18%	100%
Industry (n=99)	40%	0%	6%	15%	13%	6%	8%	11%	100%
Scientists (n=88)	7%	2%	45%	20%	6%	10%	1%	8%	100%

# St. Gallen as success story and blueprint for other projects? Anecdotal evidence, but research necessary



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- Summer School Workshop
- Transdisciplinary Case Study**
- Current Case Study
- Block days 6–7 March 2015
- Former Case Studies
- Case Study Books and Booklets
- Transdisciplinary Reports
- Theses

## Current Case Study

### Transdisciplinary Case Study 2015 "Deep Geothermal Energy: the St. Gallen project"

[Short Information \(in German\) \(PDF, 685 KB\)](#) ↓



The TdCS of the Spring Term 2015 will be organized within the [CCES](#) → [CCEM](#) ↗ project [Geotherm2](#) →. The strategic goal of the project is the development of Enhanced Geothermal System (EGS) technology that will allow the vast heat resources that reside at depths of several kilometers to be mined for electricity and heat production.

### Guiding question

What can we learn from the geothermal project in St. Gallen ([Information in German](#)) ↗ for future projects in Switzerland?

# Some hypotheses (!): strong and charismatic political leader? intensive communication efforts? else?



A screenshot of a website titled 'Das Geothermie-Projekt der Stadt St. Gallen'. The website has a red header with navigation links: 'Home', 'Kontakt', 'Login', 'Sitemap'. Below the header is a search bar with the text 'Suchbegriff'. The main content area is titled 'Aktuell' and features an article 'Rückblick auf das Geothermie-Projekt'. The article text reads: 'Seit Mai 2014 ist es Gewissheit: Das Geothermie-Projekt der Stadt St. Gallen kann nicht umgesetzt werden. Grund dafür ist die Kombination aus unzureichender Wasserföndigkeit, erhöhtem Erdbebenrisiko sowie einer überraschenden Gasföhrung in den erschlossenen Gesteinsschichten. Auf dieser Website erfahren Sie alles über den Verlauf der Arbeiten vom Beginn der seismischen Messungen bis zum Abbruch des Projekts. Eine mögliche Nutzung des im Intergrund...'. To the right of the article is a 'Kontakt' section with the text: 'Haben Sie Fragen zum Projekt? Dann zögern Sie nicht uns zu kontaktieren. Wir sind gerne für Sie da!' and contact information: 'Gratisnummer 0800 747 903' and 'E-Mail geohermie@sgsw.ch'. The bottom of the screenshot shows three photographs: a white truck on a road, a drilling rig, and a large industrial structure.

# Conclusions

## Different *contributions from social sciences* in the risk governance of deep geothermal

- Rather not: educate the public and help increasing acceptance, yet, some of our research results can inform such activities:
  - Scientific research on framings, concerns, perceptions, trade-offs, etc. of various actors (pre-assessment, appraisal but as well monitoring during operation)
  - Scientific research on roles, interests and responsibilities of various actors, including scientists, regulators, industry, etc.
  - Analysis of local/national socio-political-cultural context
  - Help designing stakeholder and public engagement (over whole process)
- ➔ This needs close collaboration with technical, natural science – i.e. social science not just as “add-on” and in “service” function

**Thank you for your attention**

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