



Social aspects of geothermal development and policy implications

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As a collective result from the work of many
and more expert colleagues

result from the work of many leagues

Report on results, concepts and
surveys for public engagement

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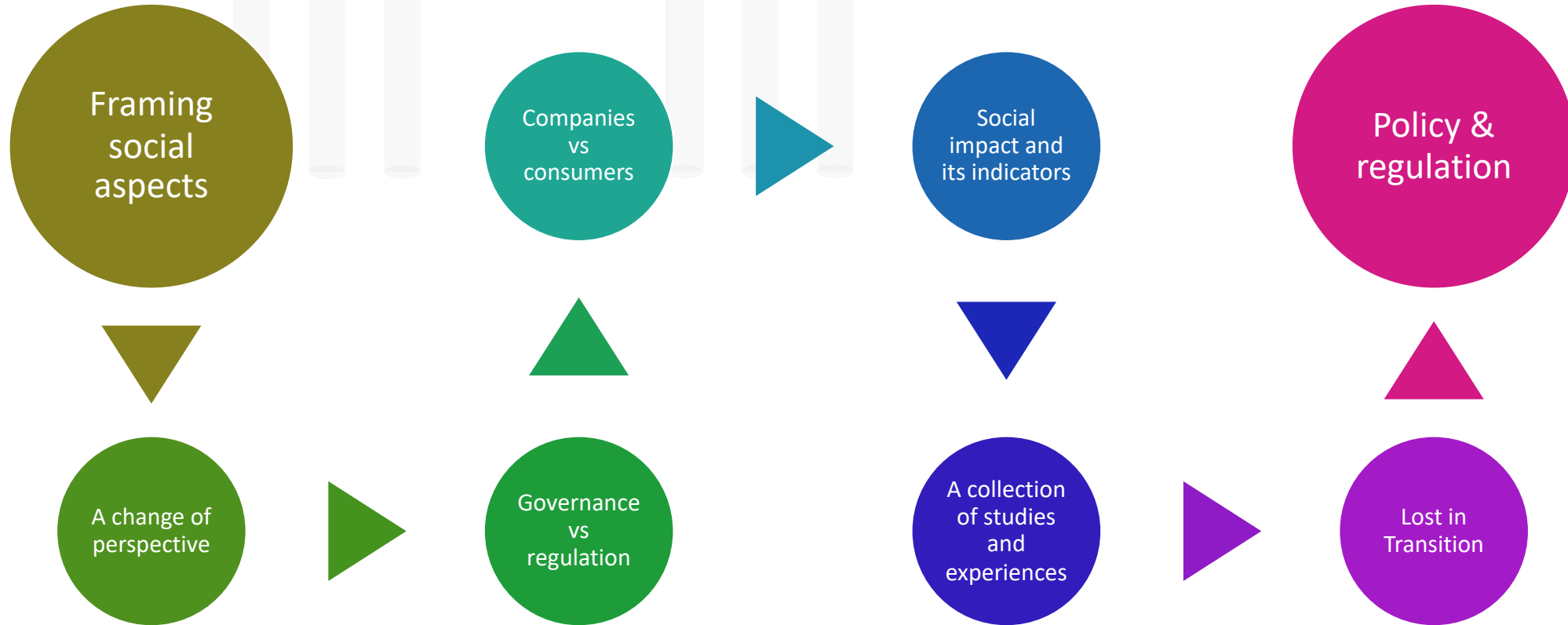
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GEOENVI

Outline of the presentation



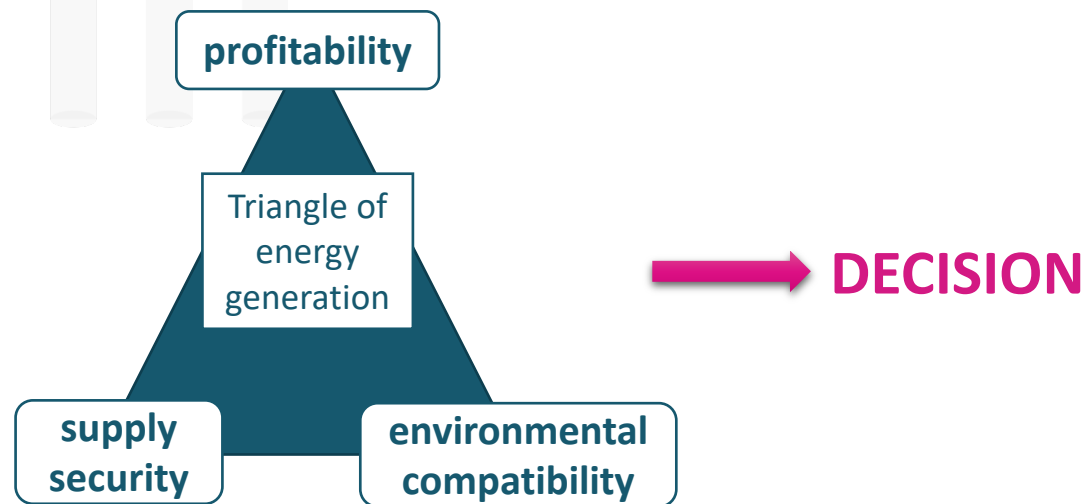
A global and general issue

We are not an exception

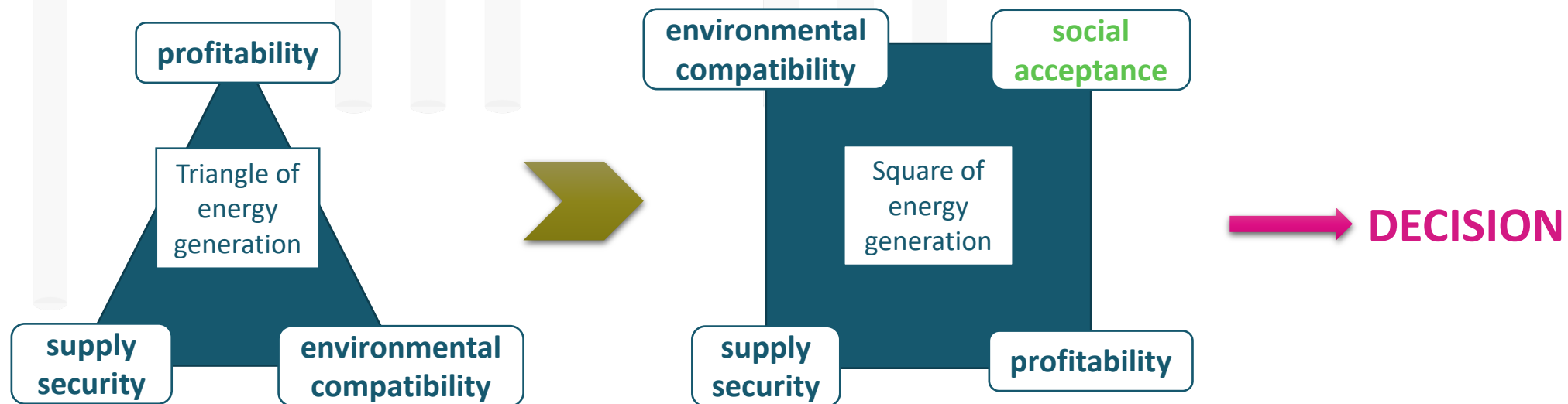
“Sustainable energy solutions, including renewable energy, have sometimes suffered from the perception that they come with too many trade-offs, at the expense of overall socio-economic development. Undoubtedly, as governments around the world strive to put the 2015 Paris climate agreement into practice, they need to balance the urgency of the energy transition against numerous other considerations that affect people’s welfare.”

*from Renewable energy benefits: understanding the socio-economics,
International Renewable Energy Agency (IRENA)*

A change of perspective



A change of perspective



Square/ Triangle of energy generation (modified from Hauff, et al. 2011)

A difference in perspective

- economic benefits
- socially responsible: by fighting **global-scale** issues – e.g. through GHG emission reduction and climate change mitigation

- direct economic benefit
- avoid (perceived) negative impacts at the **local scale**

policy makers
energy companies



Decisions concerning the use of energy resources are made at many levels: individual, community, national, and international

territories and
citizens



Social factors

Questions of ethics, morality, and social norms affect energy decision making at all levels.

Social factors often involve political factors (e.g. governmental structure and power balances, actions taken by politicians, and partisan-based or self-serving actions taken by individuals and groups).

Socio-technical systems: systems in which technical components are framed into a social context that they contribute to shape being at the same time shaped (Walker and Cass, 2011).

Governance vs regulation

An attempt to shelter the institutional crisis (of legitimacy, credibility and above all trust of citizens) was the introduction of the concept of **governance** (a negotiation process that guarantees a form of social regulation) as an alternative to top-down political regulation (i.e. to the hierarchical control of central institutions), to the strictly intended market regulation (based on the principle of utility exchange) and to community regulation (based on the principle of reciprocity).

The geothermal is in most cases a commodity-based sector: main focus

Novel add-on to the complex picture is related to the applications for which prosumers and energy communities come into play

Companies vs consumers

Corporate Social Responsibility (CSR) is “the set of relationships that the firm has with all stakeholders: customers, employees, community, shareholders, governments, suppliers and competitors. The elements of social responsibility include investing in the community, the relationships with employees, creating and maintaining jobs, being concerned about the environment and financial performance”.

Envisager la responsabilité sociale dans le cadre des... Gendron, 2002

Consumers are key stakeholders for companies, and are becoming more concerned about the impact of companies' activities on the social and natural environment.

The importance of quality of products and reputation.

Companies vs consumers

Especially in commodity-based sectors “the payoff from socially responsible programs is not guaranteed and may take time” (Mohr and Webb 2005) and companies often adopt a *passive CSR* by merely complying with social and environmental mandatory standards (Kim, 2015).

In commodity-based context, the price represents the main factor through which companies can compete as well as establish positive relations between themselves and consumers, distinguishing their product (or service) from others. However, CSR practices – even though limited only on environmental practices – represent a relevant factor of companies’ recognisability for consumers.

Companies vs consumers

Studies analysing “when and why people might respond negatively to energy companies that engage in CSR activities in the environmental domain” (Vries et al., 2015) concluded that consumers believe that a company’s investment is an act of greenwashing or rethoric when companies adopt public-serving motives (i.e. environmental motives for investing) and suspect less when the energy company communicates firm-serving motives for investing, for example, in an emission reduction technology.

The link between adoption of CSR and loyalty/trust of consumers requires more research and data.

Why measuring social output and impacts

«what gets measured, gets valued» (from The New Economics Foundation)

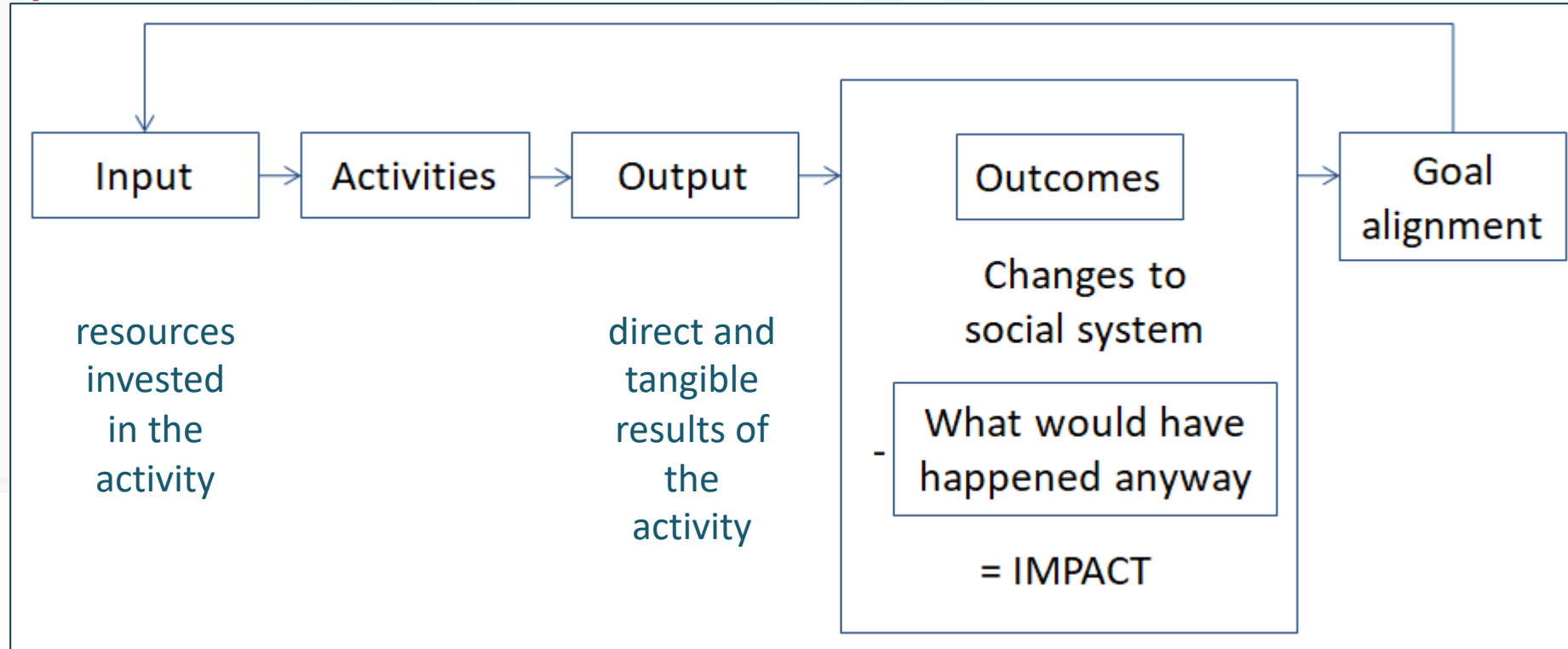
Advantages for the companies

- Improve accountability and credibility through the provision of measurable results
- Identify issues early, thus avoiding and reducing costs, compared to unplanned solutions
- Enhance product and service innovation by understanding needs of costumers
- Maintain license to operate

Understanding and quantifying non-energy interests of stakeholders (communities, government authorities, etc.) can benefit efficiency opportunities through program design and marketing

What is a social impact/output/effect?

Many definitions



Social impact/output, effect, outcome, return → social value creation
Social change process

*Impact value chain; modified from
Clark et al. (2004)*

Social aspects

Different classifications and ranking

Renewable energies, although associated with sustainability or environmental friendliness, have the potential to cause social resistance.

Four main categories have the potential to cause social resistance:

- Environmental issues
- “Missing-involvement” issues
- Financial issues
- NIMBY (Not In My BackYard) issues

Social acceptance of renewable energy innovation (from Wüstenhagen, Wolsink and Bürer 2007)

Social aspects

Different classifications and ranking

Main categories of factors influencing the level of acceptance for RES proj.:

- Personal factors: socio-demographic characteristics such as age, gender and social class
- Socio-cultural factors: *Degree of awareness and understanding; Political beliefs; Environmental beliefs and concern; Place attachment; Perceived fairness and levels of trust*
- Contextual factors: *Technological factors: scale and type; Institutional factors: ownership structures, the distribution of benefits and the use of participatory approaches to public engagement; Spatial factors: regional and local context, spatial proximity and NIMBYism*

Reconsidering public attitudes and public acceptance of renewable energy technologies: a critical review

(mod. from Devine-Wright, 2007)

Social aspects

Different classifications and ranking

Social impacts of RES projects can be classified into four categories:

- public perceptions (e.g. aesthetics, environment, impact of lifestyle, social benefits, impact on property values),
- employment (e.g. job creation, addition to employment diversity, poverty alleviation, technological advances and transfer),
- health & safety (e.g. public safety, work safety)
- local infrastructure development (e.g. development of infrastructure, local empowerment)

Social and political impacts of renewable energy: literature review, Sheikh et al., 2016

How to reduce social resistance

Only for developers?

Through three steps (Hauff, et al. 2011):

- ***Communication and information:***

Affected citizens have to be informed openly and in advance about costs, risks and benefits of a technology.

- ***Integration and involvement***

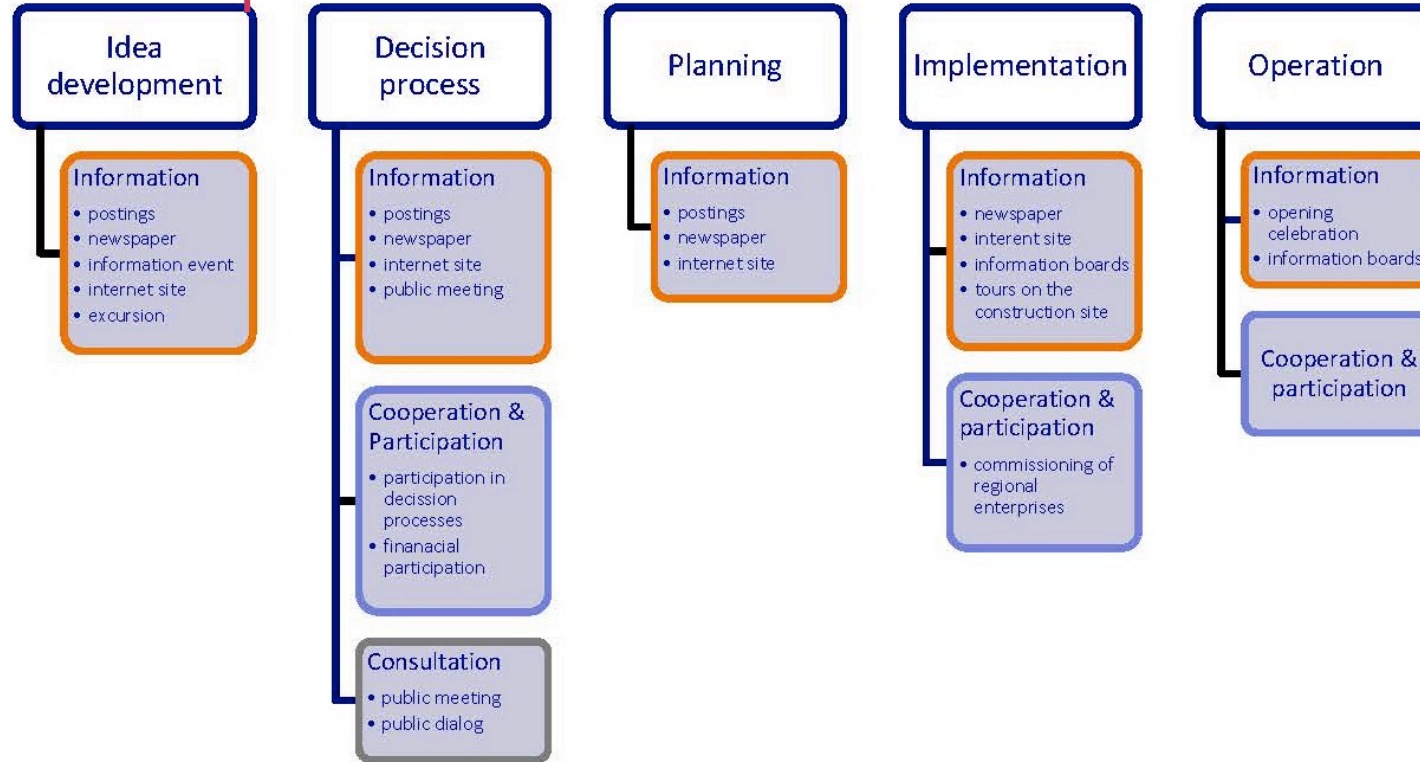
Additionally one could think about models of direct financial participation in a project or other local benefits like heat supply in case of geothermal power plants.

- ***Balance of interests and conflict resolution***

If conflicts occur, the project developer should try to find a dialogue without predefined results.

How to reduce social resistance

Only for developers?



Since the beginning the project should be extensively communicated within the public and up to the completion of the power plant, with a ceremonial opening and the visit to the power plant.

Implementation of renewable energies (from Arndt, et al. 2013)

Policy implications

Evolution

DEFICIT MODEL

Oppositions arise from a lack of knowledge → the solution was planned one way/top down communication from experts to non-experts (**Public communication**)

RESEARCH OF ATTITUDES AND SET OF BELIEFS

Understanding the views of the public (**Public Consultations**)

PUBLIC ENGAGEMENT

Dialogue model → communication is considered a multidirectional exchange of knowledge. Citizens play an active role and science and innovation are co-produced (**Public participation**)

Public participation

For a long while, ordinary citizens had few opportunities to make their voices heard in the formulation of a public policy or intervention, especially as single manifestation. In some cases they organised as *groups of interest* or *committees*.

Nowadays, participatory and deliberative processes are often required by regulation. They have consultative and non-decisional value and have to be intended as tools to integrate and strengthen and not to replace current democratic and representative decision-making processes.

In organising public participation it is extremely important that all the phases are rigorously conducted by professional super-partes facilitators

Social impact measurement

How is it done in practice?

Until now no common framework on social impact measurement exists (European Union/ OECD, 2015)

In the White Paper: A guide to measuring social impact (Medrum et al.), social impact should be measured by answering to the questions: a) what are the impacts?; b) who will you ask to?; c) what will you ask? (indicators), d) what is the change?

Social impact measurement

How is it done in practice?

The GECES sub-group on Social Impact Measurement (2013) the methodology consists of 5 stages:

- identification of objectives (why to measure?),
- identification of stakeholders (who and how is involved?),
- setting relevant measurement (how to measure?),
- measuring, validating and valuing,
- reporting, learning and improving



Social impact measurement

How is it done in practice?

The “Measuring socio-economic impact: A guide for business” (WBCSD, 2013) provides advice on how to better communicate the measured impacts to all relevant stakeholders:

- Be open on the decisions made, concerning what and why is measured;
- Assist them to understand your way of thinking; this way they can give more useful feedback;
- Offer them relevant, honest and clear information;
- As far as it is possible, a) use well-accepted methods, b) present finding in the proper context and c) acknowledge negative impacts;
- Receive feedback from them, in order to confirm that your way of thinking and hypotheses are correct, or if any other variables have not been taken into account.

Social impact measurement

How is it done in practice?

it is difficult to create precise and transparent indicators that can accurately represent the amount of generated social impact since social impacts are often difficult to measure and quantify.

Two historical trends:

- The social accounting and audit (SAA) accounting for an organization's social, environmental and economic activities
- The social impact assessment (SIA) is meant to monitor and analyze unintended consequences of planned interventions.

The latter has been applied but was not resolute. E.g. in Mexico, Martinez & Komendantova (2020) report that it improved the situation but « its effectiveness is constrained by diverse issues related to its institutional and regulatory design, government implementation, practices of companies and consultants, and **restricted social involvement**», and it has essentially a problem-fixing role.

Lost in transition

A not-so-romantic movie

As for other RES, the perception is not always positive and what is the best way to move on is not clear.

Do we need

- further studies and research on social impacts?
- expanded competences > training?
- policy tools?

Europe and RRI

Opportunities for further studies

Responsible Research and Innovation (RRI) is becoming a keyword in European funding, including those for renewable energies and geothermal. RRI is an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation.

RRI is key action of the ‘Science with and for Society’ objective, and also a ‘cross-cutting issue’ in Horizon 2020, and many calls on energy has referred to it. This has created the opportunity to deepen studies of social communication and engagement for geothermal development. It will play a role also for future calls.

A comparison of national experiences

A book to collect information and compare experiences

- What drives the harnessing of geothermal resources?
- Different perception of heating&cooling and electricity production technologies
- Ownership and management of geothermal resources
- Attitude toward geothermal energy technologies
- Forms of societal engagement

Preface

Basics and Generals

Chapters 1-4

- Geothermal Energy
- Policy&Regulations
- Business Strategies
- Social Perspectives

Chapter 5 Toward Public Engagement

Country Case Studies

Chapters 6-16

- Australia
- Canada
- France
- Greece
- Iceland
- Italy
- Japan
- New Zealand
- Philippines
- Switzerland
- Turkey

Conclusions

Public engagement with geothermal energy

- Few social studies in the energy field
- Growing literature
- Disconnected case studies
- Different approaches (RRI, Geoethics, social innovation, STS studies, Technology Assessment, etc.)

Table 1 Results of a desk research in ScienceDirect in the timeframe 2008–2018.

Technology		Number of publications	Social/Total rate %
Energy	Total	387,437	0.14
	Social related issues	528	
Geothermal	Total	4666	0.43
	Social related issues	20	
Solar energy	Total	26,422	0.06
	Social related issues	17	
Wind energy	Total	11,486	0.37
	Social related issues	43	
Biomass	Total	52,159	0.12
	Social related issues	61	
Nuclear energy	Total	11,329	0.23
	Social related issues	26	
Hydroelectric	Total	1064	0.28
	Social related issues	3	
CCS	Total	4777	2.22
	Social related issues	106	
Genomics	Total	31,641	0.04
	Social related issues	14	
Geo-engineering	Total	142	4.23
	Social related issues	6	

We searched articles containing—in keywords, in abstract or in title—the word “geothermal” together with one of the following: “public engagement” or “social aspects” or “public perception” or “social acceptance”. Data Source: Science Direct 2008–2018

A comparison of national experiences

Various methodologies:

- Interviews (Australia, Switzerland)
- Surveys (Canada, Japan, Italy, Philippines)
- Social media analyses (Switzerland)
- Focus groups (France, Greece)
- Workshop (Australia, France, Greece, New Zealand)
- Media analyses (Australia, Switzerland)
- True public/local communities consultations introduced – and applied - by law (New Zealand, Philippines)

Sources of perplexities

- Are perplexities about geothermal technologies or about geothermal governance?
- Hard energy path/soft energy path raise different issue
- Lack of information
- Environmental concerns
- Unfortunate experiences
- How would energy be used? (what is the final goal?)

The key role of communication

To society and decision-makers

- Sparse, incomplete information
- Geothermal energy is less familiar than other energy sources
- Geothermal energy is shrouded in uncertainty
- Trust in scientists and researchers as source of information
- Curricula in science communication
- Professionals and economic resources within industrial and research organizations

Policy implications

What we need

- Consolidate forms of dialogue, to facilitate taking into account the views of local communities and the general public.
- Quantitative and semi-quantitative data on social aspects, otherwise we are lost in the perception realm. But also a common measuring approach, enabling data comparison, also among different sectors.
- To bridge competences and roles.
- Common “places” (e.g. platforms as ETIP-DG, citizen’ forums, open research centres).
- It is necessary to optimize regulation to embed these aspect in an efficient way.

It does not regard only social acceptance, it is about co-creating the future together with citizens and society as a whole

Public participation in EU

Some activity in the Horizon2020 GEOENVI project



EU legislation establish a legal obligation of public participation before a deep geothermal project is granted a development consent: **the public must be given the opportunity to be informed and express its opinion.**

This legal inquiry is flexible, and Member States determine how they wish to inform the public.

Quality of public participation

Some activity in the Horizon2020 GEOENVI project



Results of the public inquiry may not reflect the public position on a project, as public can remain silent or choose other ways to express opposition, like litigation.

GEOENVI analysis:

- There is often a low participation of the population
- Difficulty to communicate
- Difficulty to take into account the opinions expressed, sometimes “unconstructive”, on a very engineered object (impression that there is not a lot of practical options to be discussed)

⇒ The public inquiries can reflect a feeble consent or be a platform for protests, it is a common democratic issue. Each project has its specificities (unique socio-technical object)

Recommendations for public participation

Some activity in the Horizon2020 GEOENVI project



1. Deepen the process: aiming at a good quality dialogue

- Fostering the public participation (e.g. Geothermal project development incorporated in the primary/secondary school education programme (Hungary, Flanders), site visits), and go further than the legal minimum requirements (with stakeholder committees, pre-project consultation), with a transparent and harmonized protocol.
- Improving communication both ways and mutual knowledge
- Seeking Protocols (e.g. Geothermal Sustainability Assessment Protocol GSAP) to take into account the environmental, social, technical, and financial issues.
- Accepting the project to be questioned and taking the opinions into account

Recommendations for public participation

Some activity in the Horizon2020 GEOENVI project

GEOENVI



European Union's Horizon 2020 G.A. 818242

2. Expand the perimeter

- Geographic perimeter: reach the population actually concerned by the project (neighbourhood cities and intercommunal level),
- Governance perimeter: importance of the involvement of the local authorities, if general public is difficult to reach, some associations or other stakeholders can be involved

3. Adapt the timing

- Importance of early communication on the project
- Ongoing process

4. Adapt the process to the territory

- Seek project-based dynamic communication, information, and participation processes, combining formal and informal means of communication with the local population

Recommendation for improving data sharing

Some activity in the Horizon2020 GEOENVI project

GEOENVI



European Union's Horizon 2020 G.A. 818242

1. **Define a European standard on information sharing**, defining the minimum amount and type of data and encouraging to go further
2. **Choose and collect the relevant information** to be able to compare geothermal utilisation to the utilisation of other energy media, comparable data should be collected and FAIR (Findable, Accessible, Interoperable and Reusable) principles in data management should be adopted.
3. **Adapt the communication to the target:** mediation, clear terminology and best dissemination support according to the target group
4. **Improve data accessibility and awareness of accessible information**
5. **Share reliable information and data**

Recommendation for improving, highlighting and communicating local benefits

Some activity in the Horizon2020 GEOENVI project

GEOENVI



European Union's Horizon 2020 G.A. 818242

1. **Establish a Fund** derived from taxes/royalties **to support the local communities and regions**
2. **Support the local utilization of geothermal heat** to create a circular and co-designed use of local geothermal resources
3. **Establish a plan for valorising local benefits:** information collection (jobs, benefits...), information, training

Thank you very much for your attention



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