Bruxelles - 19 June 2019

Kick off meeting of the EuGeoReg - S3 Partnership of European Regions for Geothermal Energy 2.0

Introduction to the EuGeoReg S3 Partnership Preliminary one-year Workplan

Dario Bonciani and Loredana Torsello

CoSviG – Consortium for the development of geothermal areas

Commission

Smart Specialisation Platform on Energy (S3PEnergy)

Joint initiative that engages DGs REGIO, ENER and JRC

S3 SMART SPECIALISATION PLATFORM

DG REGIO | DG ENER | DG JRC

Main objectives

- Support the implementation of the S3 of the regions/countries that have chosen energy-related priorities in their S3 (Thematic Obj TO1)
- Assist countries in the optimal uptake of the Cohesion Policy funding opportunities for energy (TO4 & TO7e).

SCOPING NOTE ON SUB-THEMATIC AREA "GEOTHERMAL ENERGY"

- The exploitation of geothermal energy is continuously growing across the world and in Europe, despite the potential available would allow a further development of the geothermal market.
- new challenges have emerged for geothermal. Currently, a further expansion of this market is indeed limited by some social and environmental concerns, often closely linked to technological constraints.
- In order to overcome these problems and continue to expand the use of geothermal energy and continue increase the use of the heat of the Earth, both for electricity and heat, a new model of governance which respects territories and boost sustainable development is necessary.

GEOTHERMAL 2.0
Regional Partnership for S3 joint strategy on Geothermal issues

- In next future (2020), by the medium term horizon (2050) a synthesis among purposes, expectations and contrasts of communities, towards sustainable development, vocation of territories and private businesses.
- The way to achieve these objectives should give great attention to citizens: Regional Authorities should listen local communities, involving municipalities in decision making processes and collecting positive remarks from citizens.

Challenges

- Technological innovation should then steer innovative solutions to overcome gaps and concerns.
- It is indeed important to show the sustainability of activities in geothermal sector, demonstrating for example that the amount of emissions of new geothermal power plants are much lower than those from operating plants, or that landscape impacts of further systems are lower than today.
- To reach these objectives it is clear that there should be an effective synergy among the private and public sector and research centers, able to promote technology innovation.

GEOTHERMAL Partnership
EuGeoReg
Goals and strategies

Goals

- Searching for a synthesis between expectations and market&technological maturity level within the communities,
- For the sustainable development of geothermal potential,
- respecting the vocation of territories and communities and support for private companies.
- to launch a survey on regional capacities and interests,
- to improve effective policies for geothermal development, strengthening the links between programmatic and financial instruments, such as structural funds and programs for investment for growth and employment.

Cooperation strategy based on increasing attention to citizens:

- regional authorities should
- listen to local communities,
- involve municipalities in decision-making processes
- gather feedback from citizens.

The interregional geothermal partnership is an opportunity for the participating regions to strengthen their cooperation.

The partnership will transfer examples of good practice from regions with mature geothermal markets to those with less developed markets, as well as establishing an effective synergy between the private sector, public authorities and universities (to promote technological innovation).

Lo spazio della cooperazione per Geothermal 2.0

A pioneer group of Regions started formally the cooperation inside the EuGeoReg Partnership

1. **IT: Toscana**
2. **ES: Asturias**
3. **ES: Canary Islands**
4. **FI: North East Finland (Pohjois-Pohjanmaa)**
5. **HU: Northern Hungary (Borsod-Abaúj-Zemplén County)**
6. **IT: Lombardy**
7. **NL: East Netherlands**
8. **NL: Groningen**
9. **NL: South Holland**
10. **PT: Azores**
11. **UK: Scotland**
12. **TK: West Turkish provinces (Zafer)**

The Scope of EuGeoReg Partnership

Technologies for energy production

- hydrothermal systems,
- direct uses of geothermal heat (a
- shallow geothermal e
- thermal st

The ben

- pollution.
- rmal market boosted an incr
- innovative technological solutions
- more opportunities for jobs and busine

Promotion of effective cooperation in each of these technological supply chains among stakeholders interested both in the implementation of new projects (also innovative), and in improving the energy and environmental performance of existing plants, in compliance with sustainability criteria and with a better acceptance social.

The main challenges to be faced within the interregional geothermal partnership will be a better knowledge of the state of the art in each region, for the promotion of a new model for geothermal energy, based on effective cooperation within the geothermal partnership interregional, also through the development of funded call for proposals

- **from structural funds**
- **from EU direct funds**

Improve awareness of capabilities for better exploitation or geothermal potential

- Although a long journey has already been made in our ability to use heat under our feet, today we could activate smarter solutions to improve the sustainability profile or the chosen development models.
- For a better understanding of what the next steps should be in order to implement a coherent factual approach between the different regions, we should improve the awareness of the existing competences, of the anticipated evolutions and of the available potential or of the geothermal resources to be cultivated in each interested area.
- For the reasons explained above, we propose to define and implement a shared methodological approach in the Regions willing to cooperate

METHODOLOGIC APPROACH: a proposal

IN PROGRESS

- In order to evolve towards a profitable cooperation through the S3 ENERGY Platform, an important step is a cluster/actor analysis, focused on services and technologies of geothermal energy to help characterizing value chains related to geothermal energy. The division between technology and services would help in identify skills of subjects in each participating region, since:
  - Technology issues as far as hardware and plant engineering of a geothermal project
  - Service issues as far as designing and modeling. In challenge category, services are intended as services for environmental monitoring and train citizens.

Cluster/value chain approach

How the "geothermal / value" chain is composed

A mapping tool is needed and a cluster analysis distinguishes in the geothermal supply chain in

- Power Generation (hydrothermal and EGS),
- direct uses (district heating and other direct uses
- geothermal from super-surface resources (GSHP, UTES / ATES).

The three value chains refer to different markets, with different actors. Furthermore, each of these has been divided into 3 main categories, in order to make the different technologies used in a system that uses underground thermal energy easier to distinguish:

Furthermore, the technological fields:

- **SUBSERVICE SYSTEMS**: all the services and structures installed and operating underground, for a geothermal plant (eg. Wells and various drilling technologies, installation in the subsoil as heat exchangers, underground thermal storage, underground engineering and modeling, etc.));

- **SURFACE SYSTEMS**: surface structures, to be exploited (for energy generation and direct heat use) and geothermal heat distribution and services for their optimization (for example plant components, integration with other energy sources and storage systems, plant design and studies to prevent scaling and corrosion);

- **CHALLENGES**: all the main challenges that GEOTHERMAL ENERGY 2.0 will have to face in order to reach a higher level of competitiveness and sustainability, taking into account the specificities of the territories, the environmental aspects and the involvement of local communities (for example reduction of impacts, use of products of waste, environmental monitoring, landscape, participatory processes, communication, training and building skills).

In addition, best practices and case studies will be identified, highlighting the main strengths and weaknesses in each participating region and shared within the interregional partnership.

Some general examples of technologies and services

Subsurface systems

- EGS – Enhanced geothermal systems
- BHC – borehole heat exchangers
- STORAGE – underground heat storage
- DRILLING TECHNOLOGIES – to drill well
- REINJECTION – reinjiection of fluids and/or gasses
- RESERVOIRS MODELLING
- EXPLORATIONS
- DRILLINGS
- ……..

Surface systems

- BYNARY CYCLES
- EXCHANGERS
- PUMPS
- PIPING
- HEAT PUMPS
- TURBINES
- HYBRID SYSTEMS
- PLANT DESIGN
- SCALING AND CORROSION PREVENTION
- ……..

Challenges

- IMPACT REDUCTION
- REUSE OF WASTE PRODUCTS

- DEMO SITES & LABS
- SYSMICITY
- LCA
- LANDSCAPE
- LAND USE
- LOCAL COMMUNITIES INVOLVEMENT
- BUILDING CAPACITIES
- ……

Simplified mapping tool

		POWER GENERATION			DIRECT USES			SHALLOW RESOURCES		
		SUBSURFACE SYSTEMS	SURFACE SYSTEMS	NT CHALLENGES	SUBSURFACE SYSTEMS	SURFACE SYSTEMS	NT CHALLENGES	SUBSURFACE SYSTEMS	SURFACE SYSTEMS	NT CHALLENGES
REGION	TYPE OF ACTORS POTENTIALLY INVOLVED									
	Research institute / university									
	Project developer									
	Utility									
	Exploration / drilling									
	Building/engineering contractor									
	engineering / technical services									
	Industry association									
	Investor									
	technical consultancy									
	Land owner									
	Heat pumps PRODUCERS									
	CLUSTER									
	OTHER									

The matrix proposed: the model

			SUBSURFACE SYSTEMS								SURFACE SYSTEMS									CHALLENGES								
			TECHNOLGIES					SERVICES			TECHNOLOGIES						SERVICES			TECHNOLOGIES			SERVICES & MONITORING					
NAME OF THE ACTOR	REGION	TYPE OF ACTOR	EGS	BHC	STORAGE	DRILLING TECHNOLOGIES	REINJECTION	RESERVOIRS MODELLING	EXPLORATIONS	DRILLINGS	BYNARY CYCLES	EXCHANGERS	PUMPS	PIPING	HEAT PUMPS	TURBINES	HYBRID SYSTEMS	PLANT DESIGN	SCALING AND CORROSION PREVENTION	IMPACT REDUCTION	REUSE OF WASTE PRODUCTS	DEMO SITES & LABS	SYSMICITY	LCA	LANDSCAPE	LAND USE	LOCAL COMMUNITIES INVOLVEMENT	BUILDING CAPACITIES
A																												
B																												
C																												
D																												
E																												

Participating Regions are requested to fill in one table for each value chain, selecting among:

- Deep geothermal
- Shallow geothermal
- ……

			SUBSURFACE SYSTEMS								SURFACE SYSTEMS									CHALLENGES								
			TECHNOLGIES					SERVICES			TECHNOLOGIES						SERVICES			TECHNOLOGIES			SERVICES & MONITORING					
NAME OF THE ACTOR	REGION	TYPE OF ACTOR	EGS	BHC	STORAGE	DRILLING TECHNOLOGIES	REINJECTION	RESERVOIRS MODELLING	EXPLORATIONS	DRILLINGS	BYNARY CYCLES	EXCHANGERS	PUMPS	PIPING	HEAT PUMPS	TURBINES	HYBRID SYSTEMS	PLANT DESIGN	SCALING AND CORROSION PREVENTION	IMPACT REDUCTION	REUSE OF WASTE PRODUCTS	DEMO SITES & LABS	SYSMICITY	LCA	LANDSCAPE	LAND USE	LOCAL COMMUNITIES INVOLVEMENT	BUILDING CAPACITIES
Magma energy	Tuscany	Plant owner																									
Sorgenia	Tuscany	Plant owner																									
Graziella Green Power	Tuscany	Plant owner																									
GEC - geothermal energy consulti	Tuscany	Geology consulting																									
Steam	Tuscany	Engineering and geogology consulting																									
GES	Tuscany	Plant owner																									
Amiata Energia	Tuscany	Plant owner																									
CoSviG	Tuscany	Consultancy																									
Enel Green Power	Tuscany	Plant owner																									
GE-BHI	Tuscany	components manufacturer																									
UNIPI	Tuscany	RTO																									
CNR	Tuscany	RTO																									
UNIFI	Tuscany	RTO																									
UNISI	Tuscany	RTO																									
SSSUP	Tuscany	RTO																									
Rete Geotermica	Tuscany	Association																									
Turboden	Tuscany	components manufacturer																									
Exergy	Tuscany	components manufacturer																									
Hydrodrilling	Tuscany	Drilling company																									
Idrogeo	Tuscany	Geology consulting																									
PES	Tuscany	Plant maintenance																									
Total Tuscany			**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**													
Total All			***0***	***0***	***0***	***0***	***0***	***0***	***0***		***0***	***0***	***0***	***0***													

			SUBSURFACE SYSTEMS								SURFACE SYSTEMS									CHALLENGES							
			TECHNOLGIES					SERVICES			TECHNOLOGIES						SERVICES			TECHNOLOGIES			SERVICES & MONITORING					
NAME OF THE ACTOR	REGION	TYPE OF ACTOR	EGS	BHC	STORAGE	DRILLING TECHNOLOGIES	REINJECTION	RESERVOIRS MODELLING	EXPLORATIONS	DRILLINGS	BYNARY CYCLES	EXCHANGERS	PUMPS	PIPING	HEAT PUMPS	TURBINES	HYBRID SYSTEMS	PLANT DESIGN	SCALING AND CORROSION PREVENTION	IMPACT REDUCTION	REUSE OF WASTE PRODUCTS	DEMO SITES & LABS	SYSMICITY	LCA	LANDSCAPE	LAND USE	LOCAL COMMUNITIES INVOLVEMENT	BUILDING CAPACITIES
Samminiatese pozzi		Drilling company																										
Terra Energy		Geology consulting																										
Idrogeo		Geology consulting																										
Primetec		Engeneering consulting																										
UNIPI		RTO																										
CNR		RTO																										
UNIFI		RTO																										
UNISI		RTO																										
SSSUP		RTO																										
Total Tuscany			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**												
Total All			***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***												

Type of actors

The goal is to involve all stakeholders, both private and public

- RTO (Universities and research centers);
- Plant owner;
- Geological consulting,
- Engineering consulting,
- Component manufacturers,
- Drilling company,
- associations
- Civil society
- Cluster
- …… ..

Matrice dei Servizi e delle Tecnologie: Usi diretti

			SISTEMI SOTTERRANEI								SISTEMI DI SUPERFICIE									SFIDE								
			TECNOLOGIE					SERVIZI			TECNOLOGIE						SERVIZI			TECNOLOGIE			SERVIZI E MONITORAGGIO					
NOME ATTORE FILIERA (riportare anche nome dipartimento se necessario)	AMBITO TERRITORIALE DI AZIONE	TIPOLOGIA DI ATTORE	EGS	BHE	ACCUMULO	TECNOLOGIE PER LA PERFORAZIONE	REINIEZIONE	MODELLISTICA DEI SERBATOI/ACQUIFERI	RICERCA DELLE RISORSE	PERFORAZIONE	CICLI BINARI	SCAMBIATORI	POMPE	PIPING	POMPE DI CALORE	TURBINE	SISTEMI IBRIDI	PROGETTAZIONE IMPIANTISTICA	PREVENZIONE SCALING E CORROSIONE	RIDUZIONE DEGLI IMPATTI	RIUTILIZZO PRODOTTI DI SCARTO	DEMO SITES & LABS	SISMICITA'	LCA	PAESAGGIO	USO DEL SUOLO	COINVOLGIMENTO DELLE COMUNITA' LOCALI	CAPACITY BUILDING
GES	Nazionale	Utility e sviluppatori										1	1	1			1	1	1			1						1
Amiata Energia	Nazionale	Utility										1						1	1									
CoSviG	Nazionale	Utility e sviluppatori																									1	1
UNIPI	Europeo	Istituti di ricerca / università	1																									1
CNR - IGG	Europeo	Istituti di ricerca / università																									1	
UNIFI																												1
UNISI																												1
SSSUP																												1
PES																												
Totale a																												
Totale ar																												
Totale amb																												
Totale ambito E																												
Totale ambito Interco																												
TOTALE GENERAL																												

- 9 subjects surveyed: 4 industrial 5 research
- 26 technologies considered
- 3 major categories:
  - Underground systems
  - Surface systems
  - Challenges
- 2 areas in which nobody offers (heat pumps, LCA)
- 16 areas do not see companies among those offering

Matrix of Services and Technologies Superficial geothermal resources and exchange

			SISTEMI SOTTERRANEI								SISTEMI DI SUPERFICIE									SFIDE								
			TECNOLOGIE					SERVIZI			TECNOLOGIE						SERVIZI			TECNOLOGIE			SERVIZI E MONITORAGGIO					
NOME ATTORE FILIERA (riportare anche nome dipartimento se necessario)	AMBITO TERRITORIALE DI AZIONE	TIPOLOGIA DI ATTORE	EGS	BHE	ACCUMULO	TECNOLOGIE PER LA PERFORAZIONE	REINIEZIONE	MODELLISTICA DEI SERBATOI/ACQUIFERI	RICERCA DELLE RISORSE	PERFORAZIONE	CICLI BINARI	SCAMBIATORI	POMPE	PIPING	POMPE DI CALORE	TURBINE	SISTEMI IBRIDI	PROGETTAZIONE IMPIANTISTICA	PREVENZIONE SCALING E CORROSIONE	RIDUZIONE DEGLI IMPATTI	RIUTILIZZO PRODOTTI DI SCARTO	DEMO SITES & LABS	SISMICITA'	LCA	PAESAGGIO	USO DEL SUOLO	COINVOLGIMENTO DELLE COMUNITA' LOCALI	CAPACITY BUILDING
Samminiatese pozzi	Nazionale	Ingegneria / sevizi tecnici		1		1				1																	
Terra Energy	Nazionale	Consulenza tecnica		1				1	1	1							1										
Idrogeo	Nazionale	Consulenza tecnica		1					1	1																	
Primetec	Nazionale	Istituti di ricerca / università																									
UNIPI	Europeo																										1
CNR	Euro																										
UNIFI																											1
UNISI																											1
SSSUP																											1
CoSviG																											
Idrogeo																											
Totale ambito Locale																											
Totale ambito Regionale																											
Totale ambito Nazional																											2
Totale ambito Europe																										0	3
Totale ambito Interco																									0	0	0
TOTALE GENERALE																								0	1	2	5

- 10 subjects surveyed: 5 industrial + 5 research
- 26 technologies considered
- 3 major categories:
- Underground systems
- Surface systems
- Challenges
- 3 areas in which nobody offers (EGS, reuse waste, landscape)
- 11 areas do not see companies among those offering

Management of EuGeoReg

Once the cluster / actor mapping and analysis has been carried out, **co-leader and participant regions** will be identified for each geothermal energy sector, based on their capacities and interests and the actors involved in geothermal energy at the regional level.

The co-leader and participant regions will then provide additional information regarding:

- Existing programs and tools that can be used for joint activities and funding in the geothermal energy sector (for example, specific budget allocated, independently of the EU, national or regional, timing of existing calls, etc.);

- Internal resources available (human and financial) to actively participate in the platform.

The information collected from previous activities will allow:

- identify complementarities and gaps between all the regions involved in the partnership,

- select and collect regions, actors and demo sites

- develop a joint call for proposals under the ERDF operational programs

Regarding an agenda of long-term activities, the regions will evaluate the possible interregional cooperation under EU programs (INTERREG, Horizon 2020, etc.), as well as specific activities for the development of future cohesion and research policy initiatives and development (after the 2020 programming).

State of art of Partnership

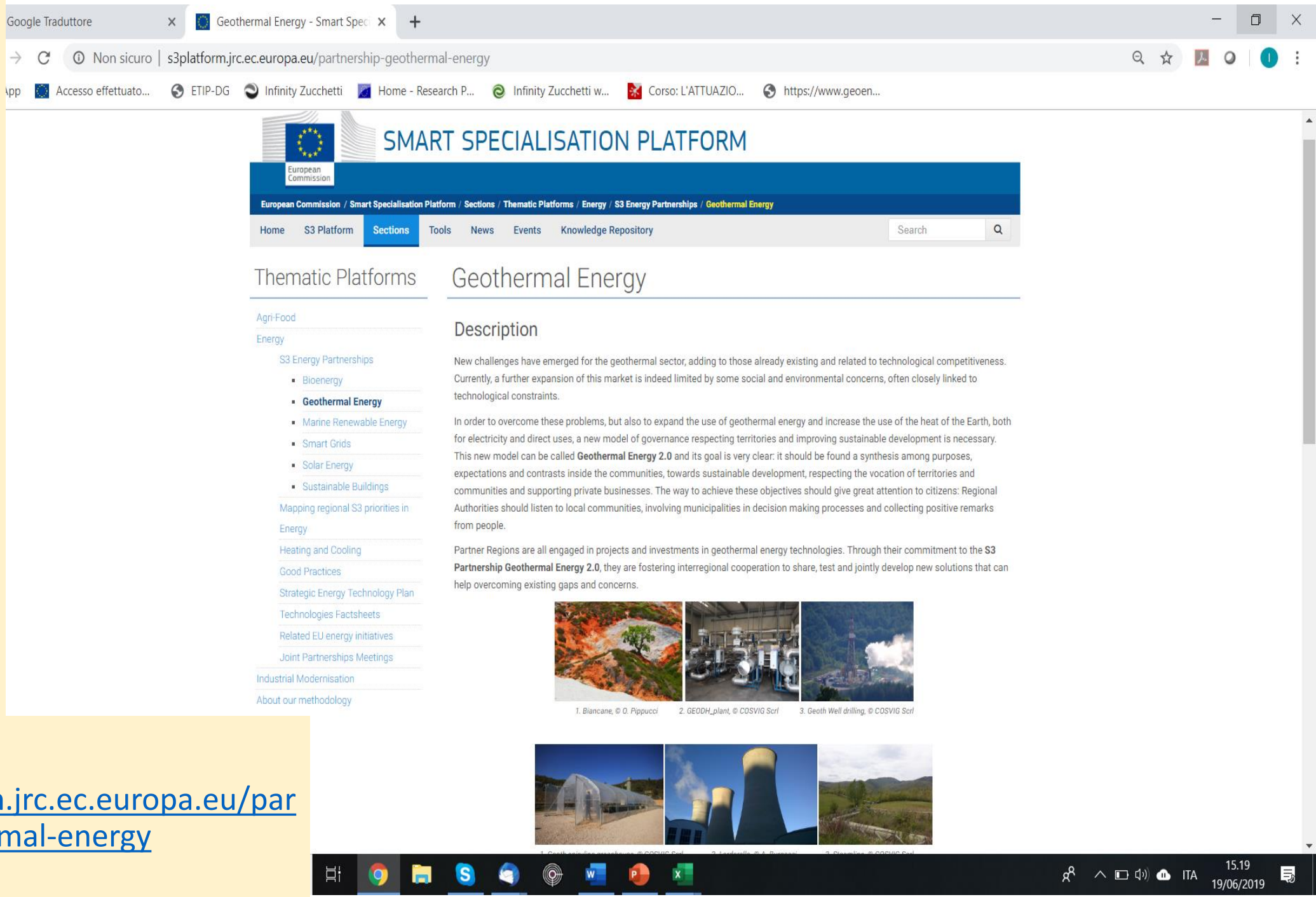
Members of EuGeoReg	Commitment Letter	Simplified mapping	Geothermal Matrix	Information sheet	
IT: Toscana		OK	OK	OK	
ES: Asturias	OK	OK	OK		
ES: Canary Islands					
FI: North East Finland (Pohjois-Pohjanmaa)		OK	OK	OK	
HU: Northern Hungary (Borsod-Abaúj-Zemplén County)					
IT: Lombardy					
NL: East Netherlands					
NL: Groningen					
NL: South Holland		OK	OK	OK	
PT: Azores	OK	OK	OK	OK	
UK: Scotland	OK	OK		OK	
TK: West Turkish provinces (Zafer)					

External organization supporting the EuGeoReg	Support Letter
EGEC	OK
ETIP-DG	
ETIP-RHC (geothermal)	
CTN Energia	
UGI	
GEO-ENERGY Europe	
…	

Communication package

Web page:

http://s3platform.jrc.ec.europa.eu/partnership-geothermal-energy



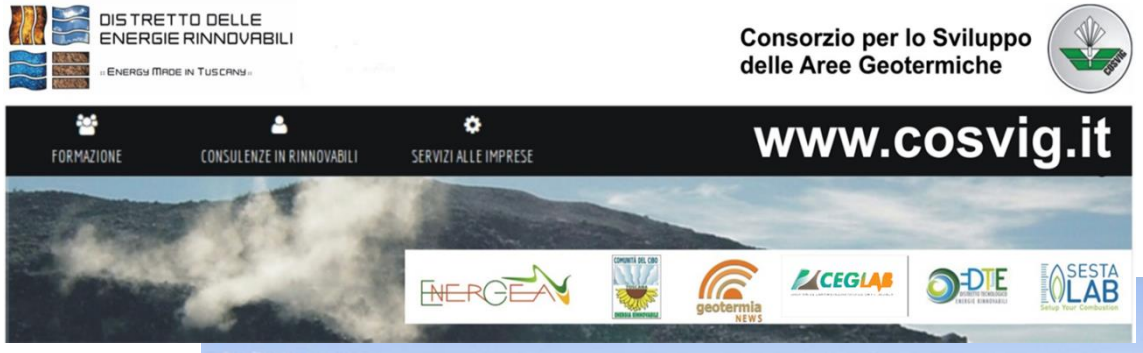
Communication package

Looking for a logo

Logo A

Logo B

Logo C



Thank you for your precious attention!

L.torsello@cosvig.it