SUMMARY REPORT ON EXISTING ENERGY PLANING STRATEGIES IN THE EU CONSIDERING THE USE OF SHALLOW GEOTHERMAL ENERGY

Appendix I
Review of previous and current projects, initiatives and policy documents

Deliverable: D.T4.1.3, Final version 09.2018

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Appendix I Review of previous and current projects, initiatives and policy documents

Acronym	Title of project / initiative	Website	Duration	Financing program / source	Summary	Type document organization project web portal	Relevance to the GeoPLASMA-CE project with respect to WPT4 high medium low	Impact on WPT4
BPIE	The Buildings Performance Institute Europe	http://bpie.eu/			The Buildings Performance Institute Europe (BPIE) is a not-for-profit think tank with a focus on independent analysis and knowledge dissemination, supporting evidence-based policy making in the field of energy performance in buildings. It focuses on policy analysis and advice and shares knowledge through studies, policy briefs, presentations and events. BPIE is promoting best practice approaches to improve the energy performance of buildings.	organization	low	
BRUGEO		http://geothermie.brussels/en	2016-2020	European Regional Development Fund, the Brussels-Capital region	In the Brussels area installing new geothermal systems can be more difficult because of lack of accurate data thus the systems cannot be properly sized and/or that cost-benefit analyses cannot be carried out before investing in the projects on a larger scale. The project focuses on shallow geothermics (up to ~250 metres) - both the closed and open systems, coupled with a geothermal heat pump on the surface. The actions promoting the geothermal potential of the Brussels-Capital region include: 1) pooling data from various partners which will provide comprehensive geological, hydrogeological, and thermal data, 2) conducting new laboratory and field tests in order to complete geological analyses in less-explored areas, 3) mapping the geothermal potential of the Brussels area in order to evaluate the amount of energy that can be provided by or stored into the ground, 4) creating and developing a website dedicated to the promotion of geothermal energy in Brussels, 5) organising a number of awareness-raising events for citizens, industry professionals and officials.	project	medium	The project website provides exhaustive information on principles of shallow and deep geothermal energy, legal situation, suitability of geothermal systems in the Brussels Region, a register of existing systems and a very well prepared section with guidelines for investors. The website can serve as an example or starting point for partners who wish to implement an information service as part of their strategy.
Cheap-GSHPs	Cheap and efficient application of reliable Ground Source Heat exchangers and Pumps	http://cheap-gshp.eu/	2015-2019	EU's Horizon 2020 Research and Innovation Programme	The project aims to reduce capital and operating costs of shallow geothermal installation for heating and cooling, as well as improve their safety during installation and operation. To achieve these goals the project is improving drilling and installation machines and is developing new designs of ground source heat exchangers (GSHEs), in combination with a holistic approach for optimum selection, design and implementation of complete systems across different underground and climate conditions. This is being accomplished by drastically improving the existing, innovative vertical borehole installation technologies and methodology.	project	medium	WP7 is concerned with regulations and technical standards of SGE and thus relevant to GeoPLASMA-CE WP2. However, it also includes a life cycle cost analysis which may be of interest to GeoPLASMA-CE WP4. WP8 contains an analysis of the market situation, including identification of barriers and business opportunities; although concerned with the market introduction of a new product, these may nevertheless be of interest to GeoPLASMA-CE WP4.
Compact of Mayors	Global Covenant of Mayors for Climate & Energy	http://impact.compactofmayors.org/		Cities and towns worldwide	The Compact of Mayors aims to: Enable recognition of new and existing four city-level commitments through the Compact by making annual reporting data on local climate actions publically available; Establish robust and transparent data collection standards; Commit to common reporting processes for local climate actions that allow for consistent and reliable assessment of progress towards meeting those targets; Create a database of the greenhouse gas impact of city action to enable capital flows into cities to support city governments taking further action and to take the responsibilities for their actions and the associated investments.	organization	medium	The website visualizes the impact of pledges taken by the compact of mayors. The individual action plans are available via the covenant of mayors (see above).
DECARB HEAT		http://decarbheat.eu/decarb-heat-initiative-2/			The aim of this initiative is to fully decarbonize the heating and cooling sector in Europe by 2050. The association that gathers more than 120 members from 28 countries, joins forces with Bioenergy Europe, COGEN Europe, EHPA, EPEE and Euroheat & Power and in their efforts to create a policy and market framework supporting an energy efficient and renewable thermal energy system in Europe and to make heating and cooling one of EU's top policy priorities. The initiative is an attempt of a joint action for linking the potential of industry, policy framework and market conditions with broad support by the energy stakeholders to the vision of a 100% decarbonised European heating and cooling system.	organization	medium	The initiative publishes "Guiding Policy Principles" supporting policy-action at European, national, regional and local level. Signing the "Industry Pledge" or declaring support for an emission-free energy system through the initiative may be considered as a measure for local energy strategies.

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Directive 2000/60/EC, Water Framework Directive	Directive 2000/60/EC establishing a framework for Community action in the field of water policy	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 http://ec.europa.eu/environment/water/water-framework/index_en.html	since 2000 until now		The WFD 2000/60/EC is an EU directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies, including groundwater and marine waters up to one nautical mile from shore, by 2015. It is a framework in the sense that it prescribes steps to reach the common goal rather than adopting the more traditional limit value approach.	document	medium	The Directive aims for a 'good status' for all ground and surface waters in the EU. In this context it is important for the GSHPs in open systems and may be relevant for partners working towards integrated management concepts for subsurface utilization in urban areas.
Directive 2001/81/EC, NEC Directive	Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:309:0022:0030:EN:PDF	since 2016 until now		The National Emission Ceilings Directive sets national emission reduction commitments for Member States and the EU for five important air pollutants: nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO2), ammonia (NH3) and fine particulate matter (PM2.5). These pollutants contribute to poor air quality, leading to significant negative impacts on human health and the environment.	document	medium	Member States report their emission inventories and emission projections each year. Avoidance of emissions is one of the key motivations for SGE usage and is expected to be of importance in SGE strategies of several partners. Also, the quantification of avoided emissions touches on the topics of monitoring and information systems which are addressed in GeoPLASMA-CE work packages 2 and 4.
Directive 2006/118/EC, Groundwater Directive	Directive 2006/118/EC on the protection of groundwater against pollution and deterioration	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF	since 2006 until now		The Directive details the procedure for assessing groundwater chemical status and provides criteria for identifying and preventing significant and sustained upward trends in groundwater pollution.	document	medium	The Directive is especially important for work package 2, but is also of relevance to those SGE strategies addressing the licensing process itself or working towards an integrated management concept of the subsurface.
Directive 2008/50/EC, Air Quality Directive	DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050&from=GA http://ec.europa.eu/environment/air/quality/time_extensions.htm	since 2008 until now		This Directive defines objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole. Member States are required to produce air quality plans for zones where target or limit values are exceeded and must take all necessary measures (not entailing disproportionate costs for target values and long-term	document	medium	Air quality plans can provide a powerful motivation for the implementation of SGE strategies. An integration of air quality plan and SGE strategy would be mutually beneficial and thus very valuable.
EGEC	European Geothermal Energy Council	https://www.egec.org/	since 1998 until now	membership fees	EGEC, the European Geothermal Energy Council, is a non-profit international organisation founded in 1998 to promote the European geothermal industry and enable its development both in Europe and worldwide, by shaping policy, improving business condition, and driving more research and development.	organization	high	The European Geothermal Energy Council is an Associated Partner of GeoPLASMA-CE and is aimed to be involved in the final review of the joint strategies for fostering the use of shallow geothermal energy in central Europe (D.T4.4.1).
EGIP	European Geothermal Information Platform	http://egip.igg.cnr.it/		The 7th EU Framework Programme for Research and Innovation (FP7)via the Geothermal ERA-NET coordination project	The core function of the EGIP is to organize geothermal data and information at a European scale. The EGIP pilot is aimed to demonstrate the platform capabilities and usefulness to the main geothermal actors in Europe (i.e., scientists, politics and industrials). The main aims behind the EGIP are to: i) reduce information fragmentation, ii) simplify data provision, iii) reduce project risks (economic aspects), iv) raise awareness about geothermal energy by providing an overview of its application at the European scale, and v) increase the focus on and investments in geothermal energy.	web portal	low	
Energy Cities	European Association of local authorities in energy transition	http://www.energy-cities.eu/-about-cities-network-	since 1990 until now	membership fees	Energy Cities is the European Association of local authorities in energy transition. The association created in 1990 represents now more than 1,000 towns and cities in 30 countries. Main objectives: 1. To strengthen your role and skills in the field of sustainable energy, 2. To represent your interests and influence the policies and proposals made by European Union institutions in the fields of energy, environmental protection and urban policy, 3. To develop and promote your initiatives through exchange of experiences, the transfer of know-how and the implementation of joint projects.	organization	medium	Energy Cities regularly publishes position papers as regards the various Community legislative documents in relation with its fields of action. We might refer to the latest position paper in the joint strategy (D.T4.4.1).

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Energy Efficiency Directive 2012/27/EU	Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance	https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1399375464230&uri=CELEX:32012L0027	since 2012 until now	European Parliament	The directive establishes a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. The update from 2016 establishes a new 30% energy efficiency target for 2030, and measures to update the directive to make sure the new target is met. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain, from production to final consumption. EU member countries must draw up National Energy Efficiency Action Plans and issue Annual Reports every 3 years.	document	medium	One of the measures addressed by the directive is the promotion of efficient heating and cooling. It can be used as an argument to underline the relevance of SGE in heating and cooling supply for the joint strategy (D.T4.4.1).
Energy Performance of Buildings Directive 2010/31/EU	Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings	https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings https://eur-lex.europa.eu/legal-content/EN/ALL/;ELX_SESSIONID=FZMjThLLzfxmmMCQGp2Y1s2d3TjwtD8QS3pqdkhXZbwqGwlgY9KN%212064651424?uri=CELEX:32010L0031	since 2010 until now	European Parliament	The directive, adopted in 2010 and revised in 2018, promotes the improvement of the energy performance of buildings and providing a stable environment for investment decisions to be taken. It has made possible for consumers to make informed choices that will help them save energy and money, and has resulted in a positive change of trends in the energy performance of buildings. The revised directive aims at accelerating the cost-effective renovation of existing buildings, with the vision of a decarbonised building stock by 2050 and the mobilisation of investments. It also supports new provisions to enhance smart technologies and technical building systems.	document	low	
FALCO	Financing Ambitious Local Climate Objectives	http://www.klimabuendnis.org/aktivitaeten/projekte/falco.html http://www.3e.eu/financing-ambitious-local-climate-objectives/	2017 - 2021	Horizon 2020	Implementing ambitious local climate action plans is paramount in the fight against climate change. While sheer aggregated investment volume contained in these plans can contribute meaningfully to the economy, the lack of a comprehensive funding solution undermines their realisation. The FALCO project, addresses this problem by developing a financing solution for the climate plans of over 180 Flemish Covenant of Mayors signatories.	project	medium	The project has started only very recently and does not present any outputs yet; however, it could provide ideas regarding the financing of measures or concepts developed within WP4. If relevant preliminary results are available by the beginning of 2019, they will be included in the joint strategy (D.T4.4.1)
FROnT	Fair Renewable Heating and Cooling Options and Trade	http://www.front-rhc.eu/	2014-2016	Intelligent Energy Europe (IEE)	The Fair Renewable Heating and Cooling Options and Trade (FROnT) project aims at promoting a level playing field for Renewable Heating and Cooling (RHC) in Europe. It will develop strategies for RHC deployment and improve understanding of the costs of RHC vs fossil fuel use. It analyses both existing support schemes and end user decision factors, in order to help establish strategic policy priorities for RES-H&C. The project will help establish a framework for more efficient and effective support schemes, and enhance clear and transparent communication with European consumers. The website provides online tools aimed at end users (cost calculator, decision making tool, fact sheets), policy documents, market analysis and best practice guides.	project	medium	The report "Strategic Policy Priorities for Renewable Heating and Cooling in Europe" addresses barriers also identified in GeoPLASMA-CE (low awareness, high investment costs). Although not issued specifically for SGE, the recommendations may be adapted and included in both, the regional strategies (D.T4.2.3) and the joint strategy (D.T4.4.1).

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GABI	European network for shallow geothermal energy applications in buildings and infrastructures. Transport and Urban Development, COST Action	https://www.foundationgeotherm.org/, http://www.cost.eu/COST_Actions/tud/TU1405		European Cooperation in Science and Technology	The main objective of this Action is to build a new European network of researchers and engineers to address the challenges of thermoactive geostructures in terms of thermal and mechanical design. Based on multidisciplinary approaches dealing with thermal energy efficiency, geological engineering and geotechnical engineering, this group will develop collective understanding, share techniques, facilities and data, and work jointly in disseminating the obtained results across the EU. The widespread application of thermoactive geostructures is currently hindered by the large heterogeneity in the development and regulatory framework in European countries. By sharing knowledge and experiences, the use of thermoactive geostructures will increase, especially in countries with less experience. This newly created network will ensure an inclusive and open platform for scientific discussion to define European best practice rules for geothermal applications, promote public awareness and confidence in this technique, and foster advancement in knowledge through collaboration.	organization	medium	Research task 3 may provide insights which can be utilized in energy strategies for urban areas. If relevant preliminary results are available by the beginning of 2019, they will be included in the joint strategy (D.T4.4.1)
GeoCom	The GEOTHERMAL COMMUNITIES	http://geothermalcommunities.eu/	2010-2015	The 7th EU Framework Programme for Research and Innovation (FP7)	The Geothermal Communities (GEOCOM) project was launched in 2010 with a vision to increase the visibility of direct heat applications of geothermal energy throughout Europe. The main objective of the project is to implement pilot-scale demonstration of the geothermal energy utilisation on 3 selected demo-sites. There are applied research tasks on system optimisation and system integration, and also on the socio-economic aspects of current and future investments.	project	low	
GEOCOND	Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage	http://geocond-project.eu/	2017-2020	EU's Horizon 2020 Research and Innovation Programme	Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage: The project is focused on the development of new materials to enhance the efficiency of geothermal systems (e.g. pipes, grouting additives).	project	medium	If preliminary results are available by the beginning of 2019, some of the outcomes for promoting cost reduction measures of shallow geothermal installations could be included in the joint strategy (D.T4.4.1).
GeoDH	Geothermal District Heating	http://geodh.eu/	2012-2014	Intelligent Energy Europe (IEE)	The project was concerned with the promotion of geothermal energy use in district heating systems. The project targeted administrative and economical barriers preventing the implementation of such systems. Stated goals of the project: - Increasing awareness amongst policy and decision makers from national authorities about the potential of this technology. - Developing strategies for the simplification of the administrative and regulatory procedures and, in some cases, the filling of regulatory gaps. - Developing Innovative Financial Models. - Training technicians, civil servants and decision-makers of regional and local authorities in order to provide the technical background necessary to approve and support projects.	project	low	GeoDH provides a set of recommendations for removing barriers and improving regulatory frameworks. Some of its goals, e.g. raising awareness of the technology and transfer of best practices to national and local authorities, are relevant to WP4 and project reports may yield useful approaches for the regional strategies (D.T4.2.3) and the joint strategy (D.T4.4.1). However, the expected impact is rather low as GeoDH was focusing on direct heat use at higher temperature levels.

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GEOFAR	Geothermal Finance and Awareness in European Regions	https://ec.europa.eu/energy/intelligent/projects/en/projects/geofar	2008 - 2011	IEE	GEOFAR aims to reduce financial barriers in the initial stages of geothermal energy projects by developing appropriate financing and funding schemes suitable to boost the development and investment in geothermal energy projects. GEOFAR also aims to raise the awareness of emerging (industrial) geothermal applications and to change the understanding and behaviour of the local and regional decision makers as well as key stakeholders by providing relevant information and by organising exchange and know-how transfer seminars.	project	low	
GeoMol	Assessing subsurface potentials of the Alpine Foreland Basins for sustainable planning and use of natural resources	http://www.geomol.eu/home/index_html	2012-2015	Alpine Space Programme 2007-2013	The GeoMol project prepared data on the geological structures of the Molasse and Po Basins in order to serve transnational decision-making and to make them available also to the interested public. GeoMol provides consistent 3-dimensional subsurface information based on coherent evaluation methods and commonly developed criteria and guidelines.	project	low	
GEOT€CH	Geothermal Technology for Economic Cooling and Heating	http://www.geotech-project.eu/	2015-2019	EU's Horizon 2020 Research and Innovation Programme	GEOTeCH aims to stimulate and promote greater utilization of renewable heating and cooling using shallow geothermal GSHP systems through advancement of innovative drilling and ground heat exchanger technologies that are significantly more cost-effective, affordable and efficient than current technology.	project	medium	If preliminary results are available by the beginning of 2019, some of the outcomes for promoting cost reduction measures of shallow geothermal installations could be included in the regional- (D.T4.2.3) and joint strategies (D.T4.4.1).
GEOTABS	Towards optimal design and control of geothermal heat pumps combined with thermally activated building systems in offices	https://www.geotabs.eu/	2011-2013	ERA-NET Programme	The overall aim of the project is to improve the system design and control of GEO-HP-TABS in office buildings by using monitoring, comfort survey and simulation data.	project	low	The outputs include guidelines, recommendations for commissioning, case studies and a new (REHVA) guidebook which may be useful for WPT2.
Geothermal ERA-NET		http://www.geothermaleranet.is/	2012-2016	The 7th EU Framework Programme for Research and Innovation (FP7)	The project aims to deepen the cooperation of national program owners and administrators and thus to be an enabler for the integration of national research and development agendas into a coherent European geothermal R&D program.	project	low	Although similar in scope, the project's deliverables are geared towards deep geothermal energy.
Geothermal4PL	Support for the sustainable development and use of shallow geothermal energy in the areas covered by the Mieszkanie Plus programme in Poland	https://www.pgi.gov.pl/en/geothermal4pl-2.html	2017	EEA Financial Mechanism 2009–2014, Bilateral Cooperation Fund, Programme PL04 "Energy saving and promotion of renewable sources of energy"	The project aims to support the sustainable development and the use of shallow geothermal energy in Poland, particularly in the areas covered by the Mieszkanie Plus programme, through the exchange of experience and the acquisition of new knowledge by PIG-PIB experts and target users of the project in cooperation with a Norwegian partner and experts. The project stems from the need to show the applicability of shallow geothermal energy as well as from the need to reduce emissions of gases and dust from the combustion of conventional fuels.	project	low	

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GEOTHERMICA		http://www.geothermica.eu/			GEOTHERMICA's objective is to combine the financial resources and know-how of 17 geothermal energy research and innovation programme owners and managers from 14 countries and their regions. GEOTHERMICA will call for innovative demonstration projects and technology development projects that accelerate geothermal energy deployment.	organization	low	
GeoTrainet	GeoTrainet AISBL	http://geotrainet.eu/	since 2012 until now	Membership fees	GeoTrainet is the organisation behind the European wide training and certification programme for shallow geothermal installers, specifically designers (those who carry out feasibility and design studies, including geology) and drillers (who make the boreholes and insert the tubes). Our aim is to ensure high quality installations for a sustainable market.	organization	medium	Didactic materials or course attendance/certification might be incorporated into individual measures, e.g. stakeholder training. Course content and quality is coordinated across European countries.
GeoTrainet	Geo-Education for a sustainable geothermal heating and cooling market	https://ec.europa.eu/energy/intelligent/projects/en/projects/geotrainet	2008-2011	Intelligent Energy Europe (IEE)	The GEOTRAINET project, aims to develop a European-wide educational programme as an important step towards the certification of geothermal installations. From the different groups of professionals involved in a GSHP installation, the GEOTRAINET project focuses on two target groups: designers (those who carry out feasibility and design studies, including geology) and drillers (who make the boreholes and insert the tubes).	project	high	Didactic materials or course attendance/certification might be incorporated into individual measures, e.g. stakeholder training. Course content and quality coordinated across European countries. Those contain excellent information and guidelines on shallow geothermal energy including drilling techniques, designing GSHP systems and legal requirements in EU.
GRETA	Near-surface Geothermal Resources in the Territory of the Alpine Space	http://www.alpine-space.eu/projects/greta/en/home	2015-2018	Interreg Alpine Space 2014-2020	The GRETA project aims to demonstrate the potential of NSGE in the Alpine Space and to share its knowledge to foster the integration of this technology into future energy plans in the area at different administrative levels. The main results of the project are decision support tools (geothermal potential maps, guidelines for energy planning), legal and technical guidelines for the utilization of NSGE, based on an exchange of best practices.	project	high	GRETA's WP5 is relevant, however, the results not published yet. It will provide procedures and tools developed to integrate SGE into energy plans and respective guidelines.
GROUND-MED	Advanced ground source heat pump systems for heating and cooling in Mediterranean climate	http://groundmed.eu/about_ground_med/	2009-2015	The 7th EU Framework Programme for Research and Innovation (FP7)	The GROUND-MED project demonstrates the next generation of geothermal heat pump systems for heating and cooling in 8 demonstration sites of South Europe. A measured seasonal performance higher than 5,0 will be demonstrated.	project	low	
Ground-Reach	Reaching the Kyoto targets by means of a wide introduction of ground coupled heat pumps (GCHP) in the built environment	https://ec.europa.eu/energy/intelligent/projects/en/projects/ground-reach	2006-2008	Intelligent Energy Europe (IEE)	The GROUND-REACH project supported ground coupled heat pumps to penetrate the heating and cooling market of Europe. The project (a) identified present status and future potential of ground-coupled heat pumps towards reducing CO2 emissions and primary energy demand, (b) analysed their contribution towards the European Directive on the Energy Performance of Buildings, (c) compiled and evaluated best practice information from all over EU, (d) defined measures to overcome barriers and set up a strategic promotion plan for long term market penetration, and (e) launched a large scale promotional campaign addressing the awareness and attitudes of key professional groups.	project	medium	Ground-Reach work packages 5, 6 and 7 are relevant to GeoPLASMA-CE WP4. Although dating to 2007, the deliverables "Barriers to GSHP Market Penetration" and "Proposals for Measures to overcome Barriers", as well as other project outputs, may still be relevant.

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GTR-H	GeoThermal Regulation - Heat	https://ec.europa.eu/energy/intelligent/projects/en/projects/gtr-h	2006-2008	Intelligent Energy Europe (IEE)	The GTR-H project aims to develop a framework of geothermal heat legislation/regulation for 4 target countries, Hungary, Ireland, Northern Ireland and Poland, which will be used to guide implementation of regulations across the EU. GTR-H will also provide broader guidelines for establishment of geothermal regulation in other EU countries. The key elements of international best practice will also be reviewed to place the framework in context. Development of a geothermal framework will follow with appropriate consultation and dissemination to maximise the applicability of the results. It is envisaged that there will be broad transferability of the framework to the remaining EU-25 (27) countries.	project	low	One of the project's outputs, the report "Specific framework for geothermal regulation - Recommendations & Template for Country Specific Action Plans" contains a list of measures which addresses the topics legal guidelines, support schemes and awareness.
Heat and the City	Heat and the City	https://heatandthecity.org.uk/		UK Research Councils, the Energy Technologies Institute and the Scottish Government	We focus on policy and political processes and cross-sector interactions in the governance of innovation. We examine local heat and energy efficiency strategies, decision-making about options for low carbon heat systems, the development and operation of district heat (and cooling) networks, management of improvements to the fabric of buildings and actions to reduce energy use.	organization	medium	Although focused on the UK and concerning all RES, several reports contain information which might be transferred and adapted to GeoPLASMA-CE countries, e.g. the report "What We Know about Local Authority Engagement in UK Energy Systems " suggests solutions to the lack of financing in local authorities. We could refer to the outcomes available in our joint strategy D.T4.4.1.
Heat pump -Apply for permission	Heat pump Apply for permission	http://varmepumpar.stockholm.se/Pages/Where.aspx	2015	Stockholm City, The Environment Department of Health Protection,	The web-portal “Heat pump - Apply for permission” managed by the Stockholm local authorities is an “e-service” place, where owners of single houses located in the city of Stockholm can apply for permission to install geothermal heat pumps. Using this portal one can find the information needed both for an application and after the application has been registered.	web portal	medium	Some approaches for documenting existing use, such as involving neighbours into the licensing procedures, could be interesting for the joint GeoPLASMA-CE strategy.
HRE4	Heat Roadmap Europe 4	http://www.heatroadmap.eu/	2016-2019	EU’s Framework Programme for Research and Innovation Horizon 2020	The overall aim in HRE4 is to develop low-carbon heating and cooling strategies, which are called Heat Roadmaps, and subsequently to quantify the impact of implementing them at a national level for 14 EU Member States. Its main goal is to study the heating and cooling sector in Europe by quantifying the effects of increased energy efficiency on both the demand and supply side, in terms of energy consumption, environmental impacts and costs.	project	medium	HRE4 involves the most detailed spatial mapping of heat demands and renewable heat resources up to date; includes the potential for reducing heat demands through cost-efficient energy efficiency measures in both the heating and the cooling sector.
ITER	Improving Thermal Efficiency of horizontal ground heat exchangers	http://iter-geo.eu/	2015-2017	EU’s Framework Programme for Research and Innovation Horizon 2020, the Marie Skłodowska-Curie Grant	The overall aim of ITER is to ensure the sustainability of ground coupled heating-cooling systems and especially the very shallow horizontal ground heat exchangers systems. “Very shallow” means horizontal collector systems or special forms (i.e. helix system), interesting the first 2 m depth from ground level, up to 10 m depth maximum.	project	low	

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MUSE	Managing Urban Shallow geothermal Energy	http://geoera.eu/projects/muse/	2018 - 2021	GeoERA, ERA-NET Co-Fund Action	MUSE investigates resources and possible conflicts of use associated with the use of shallow geothermal energy (SGE) in European urban areas and delivers key geoscientific subsurface data to stakeholders via a user-friendly web based GeoERA information platform (GIP). The assessment of geothermal resources and conflicts of use will lead to the development of management strategies considering both efficient planning and monitoring of environmental impacts to feed into general framework strategies of cities like Sustainable Energy Action Plans (SEAPs). The developed methods and approaches will be tested and evaluated together with input from local stakeholders in 14 urban pilot areas across Europe representative for different conditions of SGE use.	project	low	MUSE represents a follow up measure of GeoPLASMA-CE and will adapt results of WPT4.
progRESsHEAT		http://www.progressheat.eu/	2015 - 2017	Horizon 2020	The progRESsHEAT project aims at assisting local, regional, national and EU political leaders in developing policy and strategies to ensure a quick and efficient deployment of renewables in heating and cooling networks. progRESsHEAT is intended to support the market uptake of existing and emerging renewable electricity, heating and cooling technologies. More specifically, the project helps policy makers develop integrated, effective and efficient policy strategies aimed at achieving a fast and strong penetration of renewable and efficient heating and cooling systems.	project	high	The project analysed barriers, issued recommendations for the promotion of geothermal energy and elaborated energy strategies for each its 6 pilot areas. Although focused on the use of geothermal energy for district heating grids and using different pilot areas, much of the content is highly relevant since three partner countries are also represented in GeoPLASMA. Consequently, a number of documents overlap in content with GeoPLASMA-CE outputs, e.g. "Using Renewable Energy for Heating and Cooling: Barriers and Drivers at Local Level"; "Policy recommendations to decarbonise European heating and cooling systems" or "Heating & cooling: Policy frameworks in six European cities, their regions and countries".
ProHeatPump	Promotion of efficient heat pumps for heating	https://ec.europa.eu/energy/intelligent/projects/en/projects/proheatpump	2006-2009	Intelligent Energy Europe (IEE)	The key objective of the project was to promote energy efficient heat pumps for heating. The project focused on the systems for the residential sector and SMEs, i.e. small to medium size heat pumps and in particular in the refurbishment stage where the needs for promotion is higher than for the new buildings. Promotion of heat pumps has been done by the means of improved and steady information for the target groups, end users and installers as well as policy makers. Another important project topic was the investigation and evaluation of the possibilities to combine heat pumps and renewables.	project	low	
Recast Directive 2009/125/EC	Recast Directive 2009/125/EC establishing a framework for the setting of Ecodesign requirements for energy-related products	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0125&from=EN	since 2009 until now		This Directive aims to improve the energy efficiency and environmental impact of energy-related products, i.e. products that affect energy consumption throughout their life cycle. However, this Directive does not introduce directly binding requirements for specific product categories, but rather outlines the conditions and criteria relating to environmental characteristics of products, such as energy and water waste, or lifespan, so they can be improved quickly and efficiently.	document	low	The recommendations given might be interesting in WPT4 in case we would like to provide schemes for life cycle cost analyses of the entire product chain related to shallow geothermal energy. However, such analyses are not foreseen in the project Application Form and might only be investigated in case of free resources.
ReGeoCities	Regulations of Geothermal HP systems at local and regional level in Europe	http://regeocities.eu/	2012-2015	Intelligent Energy Europe (IEE)	The ReGeoCities project was focused on the achievement of the National Renewable Energy Action Plans geothermal targets 2020 marked by countries with ambitious objectives regarding ground source heat pumps by means of the removal and clarification of the non-technical administrative/regulatory barriers at local and regional level. The project worked on the integration of shallow geothermal energy at a local and regional level. It examined and promoted best practices and an intelligent regulatory framework, supporting cities to reach their Sustainable Energy Action Plans and the 2020 climate and energy goals.	project	high	The appendix of the document "Report on the activities undertaken and on the methodology followed and on the results obtained as part of the task on promoting the inclusion of SGE in SEAPs of representative cities" lists actions for the promotion of SGE extracted from 47 SEAPs across Europe.

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Renewable Energy Directive 2009/28/EC	DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC	https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive			The Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.	document	high	The directive specifies national renewable energy targets for each country and represents the motivation behind the GeoPLASMA-CE project. It refers at several places to geothermal energy and provides its legal definition.
REPOWERMAP	A European map for renewable energies and energy efficiency	http://www.repowermap.org/	since 2011 until now	Intelligent Energy Europe (IEE)	repowermap.org is a non-profit initiative to promote renewable energies and energy efficiency by making visible real-world examples and related local information in each person's neighbourhood. To this objective, an interactive map is developed jointly by a large network of organizations, institutions, regional and local authorities and other energy actors. The idea of the initiative is to encourage people to use renewable energies and energy efficiency, by making them aware of concrete examples in their region, their city and in their own neighbourhood.	project	medium	The repowermap best practice web application will be linked to GeoPLASMA-CE for promoting best practice examples in the pilot regions. The description of best practice examples is part of WPT4.
RHC-ETIP	The European Technology and Innovation Platform on Renewable Heating & Cooling (RHC-ETIP); Geothermal Technology Panel	http://www.rhc-platform.org/index.php?id=7	since 2009 until now	European Technology and Innovation Platform	The European Technology and Innovation Platform on Renewable Heating & Cooling (RHC-ETIP) brings together stakeholders from the biomass, geothermal, solar thermal and heat pump sectors – including the related industries such as district heating and cooling, thermal energy storage, and hybrid systems – to define a common strategy for increasing the use of renewable energy technologies for heating and cooling.	organization	medium	Provides a roadmap for geothermal energy (both deep and shallow) which defines KPI, identifies R&D requirements, and presents an implementation plan.
SET-Plan	The European Strategic Energy Technology Plan	https://ec.europa.eu/energy/en/topics/technology-and-innovation/strategic-energy-technology-plan		European Commission	The European Strategic Energy Technology Plan (SET-Plan) aims to accelerate the development and deployment of low-carbon technologies. It seeks to improve new technologies and bring down costs by coordinating national research efforts and helping to finance projects. The SET-Plan promotes research and innovation efforts across Europe by supporting the most impactful technologies in the EU's transformation to a low-carbon energy system. It promotes cooperation amongst EU countries, companies, research institutions, and the EU itself. The SET-Plan comprises the SET-Plan Steering Group, the European Technology and Innovation Platforms, the European Energy Research Alliance, and the SET-Plan Information System (SETIS). The European Technology and Innovation Platforms (ETIPs), including the European Geothermal Energy Council, were created to support the implementation of the SET Plan.	document	medium	The website is a useful repository providing statistical data, analyses and publications. Amongst others, all EU directives, national action plans and progress reports are listed here.
Smart Geotherm		www.smartgeotherm.be/abstract/	2015-2018		Smart Geotherm aims at using geothermal, thermal mass and other techniques to create nearly zero-energy buildings. We do this with all of the project partners by insulating the buildings in such a way that the net heat requirement can be largely completed by renewable energy. Aside from that we also use intelligent and integrated techniques, such as: • Short or long term thermal energy storage systems in the structural mass or in the soil • Building and disseminating knowledge, applications and new developments in the field of ground coupled heat pumps • Developing smart control systems • A maximum feeding of the process by cheap or renewable energy	project	low	

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STEP UP	Strategies Towards Energy Performance and Urban Planning	https://www.stepupsmartcities.eu/	2012-2015	The 7th EU Framework Programme for Research and Innovation (FP7) via the Geothermal ERA-NET coordination project	STEP UP aims to enhance the existing SEAPs in the four partnering cities, including: 1) creating a model for energy planning that will deliver faster and greater impact, contributing to meeting Europe's 2020 energy and climate change targets, 2) to help delivering wider policy objectives such as improving security of energy supplies, achieving urban regeneration, economic growth, tackling fuel poverty.	project	high	The project website provides a guidebook for the improvement of existing SEAPs complete with associated templates to aid the process. It also provides a series of webinars on energy planning for cities, ranging from gaining stakeholder and political support to financing SEAP actions. Project results could be very valuable for both devising individual measures and designing an entire energy strategy.
SUB-URBAN	A European network to improve understanding and use of the ground beneath our cities	http://www.cost.eu/COST_Actions/tud/TU1206	since 2012 until now	Transport and Urban Development COST Action TU1206	The Action will establish a network to co-ordinate, integrate and accelerate the world-leading research into modelling the subsurface taking place in European institutions and to develop a Toolbox to enable subsurface knowledge to be widely disseminated.	project	low	
Tesse2b	Thermal Energy Storage Systems for Energy Efficient Buildings; An integrated solution for residential building energy storage by solar and geothermal resources	http://www.tesse2b.eu/tesse2b/newsTesse2bProject	2015-2019	EU Horizon 2020 Research and Innovation Programme	TESSe2b project will enable the optimal use of renewable energy and provide advantageous solutions for correcting the mismatch that often occurs between the supply and demand of energy in residential buildings. TESSe2b design, develop, validate and demonstrate a modular and low cost thermal storage technology based on solar collectors and highly efficient geothermal heat pumps for heating, cooling and domestic hot water production. That is achieved by integrating compact Thermal Energy Storage Tanks with Phase Change Materials coupled with enhanced Phase Change Materials inside the borehole heat exchangers exploiting both solar and geothermal energy.	project	low	
The Heat Under Your Feet	The Heat Under Your Feet	http://www.heatunderyourfeet.eu/	since 2015 until now	Intelligent Energy Europe (IEE)	The Heat Under Your Feet is an initiative launched within the framework of the ReGeoCities project to disseminate information and awareness about geothermal heat pumps in Europe and to promote their use.	web portal	medium	The knowledge hub with project show cases can be linked to the GeoPLASMA-CE web portal.
ThermoMap	Area Mapping of Superficial Geothermic Resources by Soil and Groundwater Data	http://geoweb2.sbg.ac.at/thermomap/	2010-2013	The 7th EU Framework Programme for Research and Innovation (FP7) , the Information and Communication Technologies Policy Support Programme (ICT-PSP)	The ThermoMap project focuses on fostering the information environment on shallow geothermal potential across Europe. The key objective of the ThermoMap project is to provide an adequate, area-covering estimation of the superficial geothermal potential (up to 10 metres) of the nine countries which are involved in this project on a large to medium scale. ThermoMaps also aims to the harmonisation of geographical information for superficial geothermal resources across Europe and to make the digital content exploited by citizens, governments and businesses (overall target of the programme).	project	low	
THERMOS	Thermal Energy Resource Modelling and Optimisation System	https://www.thermos-project.eu/about/introducing-thermos/	2016 - 2019	Horizon 2020	The overall aim of the THERMOS project is to provide the methods, data, and tools to enable more sophisticated thermal energy system planning rapidly and cheaply. THERMOS aims to accelerate the development of new low-carbon heating and cooling systems across Europe, and enable faster upgrade, refurbishment, and expansion of existing systems. To this end, THERMOS is: • Developing a state-of-the-art modelling methodology for address-level energy system maps. • Using this methodology to produce a set of these maps for the pilot cities involved in the project. • Creating modelling algorithms for analysing these maps in order to support planners with decision making. • Testing these methodologies in four replication cities. • Developing and publishing free, open-source software for use by local authorities or other interested parties.	project	low	

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Transenergy	Transboundary Geothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia	http://transenergy-eu.geologie.ac.at/	2010-2013	Interreg Central Europe 2007-2014	The aim of Transenergy is to create a common geothermal information system in four central European countries. Having an environmental focus the purpose is seeking for sustainable, transboundary utilization of geothermal energy resources. The project addresses the key problem of using natural resources that are shared by different countries in a sustainable way. Natural resources, such as geothermal energy whose main carrying medium are deep groundwaters along regional flow paths are strongly linked to geological structures that do not stop at state borders. Therefore only a transboundary approach can handle the assessment of geothermal energy and conditions of its sustainable use. The project focuses on decision makers' and stakeholders' needs by providing a user friendly web-based decision supporting tool as a main core output of the project.	project	low	
TransGeoTherm	Geothermal Energy for Transboundary Development of the Neisse Region. Pilot Project	http://www.transgeotherm.eu/	2012-2014	Operational Programme for Transboundary Cooperation Poland – Saxony 2007-2013	The main target of the project TransGeoTherm is to introduce and establish the use of low temperature geothermal energy as a low emission energy in the Saxon-Polish transboundary project area. For that purpose specified geological, hydrogeological and geothermal data are combined and processed with 3D numerical modelling. As a result of the works a series of maps, illustrating the estimated geothermal conditions for several depths (40, 70, 100 and 130 metres below the ground level) will be created.	project	low	Map of SGE potentials, relevance limited geographically to Polish-Saxon transboundary area

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Directive 2000/60/EC, Water Framework Directive	Directive 2000/60/EC establishing a framework for Community action in the field of water policy	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 http://ec.europa.eu/environment/water/water-framework/index_en.html	since 2000 until now		The WFD 2000/60/EC is an EU directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies, including groundwater and marine waters up to one nautical mile from shore, by 2015. It is a framework in the sense that it prescribes steps to reach the common goal rather than adopting the more traditional limit value approach.	document	medium	The Directive aims for a 'good status' for all ground and surface waters in the EU. In this context it is important for the GSHPs in open systems and may be relevant for partners working towards integrated management concepts for subsurface utilization in urban areas.
Directive 2001/81/EC, NEC Directive	Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:309:0022:0030:EN:PDF	since 2016 until now		The National Emission Ceilings Directive sets national emission reduction commitments for Member States and the EU for five important air pollutants: nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO2), ammonia (NH3) and fine particulate matter (PM2.5). These pollutants contribute to poor air quality, leading to significant negative impacts on human health and the environment.	document	medium	Member States report their emission inventories and emission projections each year. Avoidance of emissions is one of the key motivations for SGE usage and is expected to be of importance in SGE strategies of several partners. Also, the quantification of avoided emissions touches on the topics of monitoring and information systems which are addressed in GeoPLASMA-CE work packages 2 and 4.
Directive 2006/118/EC, Groundwater Directive	Directive 2006/118/EC on the protection of groundwater against pollution and deterioration	https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF	since 2006 until now		The Directive details the procedure for assessing groundwater chemical status and provides criteria for identifying and preventing significant and sustained upward trends in groundwater pollution.	document	medium	The Directive is especially important for work package 2, but is also of relevance to those SGE strategies addressing the licensing process itself or working towards an integrated management concept of the subsurface.
Directive 2008/50/EC, Air Quality Directive	DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050&from=GA http://ec.europa.eu/environment/air/quality/time_extensions.htm	since 2008 until now		This Directive defines objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole. Member States are required to produce air quality plans for zones where target or limit values are exceeded and must take all necessary measures (not entailing disproportionate costs for target values and long-term	document	medium	Air quality plans can provide a powerful motivation for the implementation of SGE strategies. An integration of air quality plan and SGE strategy would be mutually beneficial and thus very valuable.
EGEC	European Geothermal Energy Council	https://www.egec.org/	since 1998 until now	membership fees	EGEC, the European Geothermal Energy Council, is a non-profit international organisation founded in 1998 to promote the European geothermal industry and enable its development both in Europe and worldwide, by shaping policy, improving business condition, and driving more research and development.	organization	high	The European Geothermal Energy Council is an Associated Partner of GeoPLASMA-CE and is aimed to be involved in the final review of the joint strategies for fostering the use of shallow geothermal energy in central Europe (D.T4.4.1).
EGIP	European Geothermal Information Platform	http://egip.igg.cnr.it/		The 7th EU Framework Programme for Research and Innovation (FP7)via the Geothermal ERA-NET coordination project	The core function of the EGIP is to organize geothermal data and information at a European scale. The EGIP pilot is aimed to demonstrate the platform capabilities and usefulness to the main geothermal actors in Europe (i.e., scientists, politics and industrials). The main aims behind the EGIP are to: i) reduce information fragmentation, ii) simplify data provision, iii) reduce project risks (economic aspects), iv) raise awareness about geothermal energy by providing an overview of its application at the European scale, and v) increase the focus on and investments in geothermal energy.	web portal	low	
Energy Cities	European Association of local authorities in energy transition	http://www.energy-cities.eu/-about-cities-network-	since 1990 until now	membership fees	Energy Cities is the European Association of local authorities in energy transition. The association created in 1990 represents now more than 1,000 towns and cities in 30 countries. Main objectives: 1. To strengthen your role and skills in the field of sustainable energy, 2. To represent your interests and influence the policies and proposals made by European Union institutions in the fields of energy, environmental protection and urban policy, 3. To develop and promote your initiatives through exchange of experiences, the transfer of know-how and the implementation of joint projects.	organization	medium	Energy Cities regularly publishes position papers as regards the various Community legislative documents in relation with its fields of action. We might refer to the latest position paper in the joint strategy (D.T4.4.1).

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Energy Efficiency Directive 2012/27/EU	Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance	https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1399375464230&uri=CELEX:32012L0027	since 2012 until now	European Parliament	The directive establishes a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. The update from 2016 establishes a new 30% energy efficiency target for 2030, and measures to update the directive to make sure the new target is met. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain, from production to final consumption. EU member countries must draw up National Energy Efficiency Action Plans and issue Annual Reports every 3 years.	document	medium	One of the measures addressed by the directive is the promotion of efficient heating and cooling. It can be used as an argument to underline the relevance of SGE in heating and cooling supply for the joint strategy (D.T4.4.1).
Energy Performance of Buildings Directive 2010/31/EU	Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings	https://ec.europa.eu/energy/en/topics/energy-efficiency/buildings https://eur-lex.europa.eu/legal-content/EN/ALL/;ELX_SESSIONID=FZMjThLLzfxmmMCQGp2Y1s2d3TjwtD8QS3pqdkhXZbwqGwlgY9KN%212064651424?uri=CELEX:32010L0031	since 2010 until now	European Parliament	The directive, adopted in 2010 and revised in 2018, promotes the improvement of the energy performance of buildings and providing a stable environment for investment decisions to be taken. It has made possible for consumers to make informed choices that will help them save energy and money, and has resulted in a positive change of trends in the energy performance of buildings. The revised directive aims at accelerating the cost-effective renovation of existing buildings, with the vision of a decarbonised building stock by 2050 and the mobilisation of investments. It also supports new provisions to enhance smart technologies and technical building systems.	document	low	
FALCO	Financing Ambitious Local Climate Objectives	http://www.klimabuendnis.org/aktivitaeten/projekte/falco.html http://www.3e.eu/financing-ambitious-local-climate-objectives/	2017 - 2021	Horizon 2020	Implementing ambitious local climate action plans is paramount in the fight against climate change. While sheer aggregated investment volume contained in these plans can contribute meaningfully to the economy, the lack of a comprehensive funding solution undermines their realisation. The FALCO project, addresses this problem by developing a financing solution for the climate plans of over 180 Flemish Covenant of Mayors signatories.	project	medium	The project has started only very recently and does not present any outputs yet; however, it could provide ideas regarding the financing of measures or concepts developed within WP4. If relevant preliminary results are available by the beginning of 2019, they will be included in the joint strategy (D.T4.4.1)
FROnT	Fair Renewable Heating and Cooling Options and Trade	http://www.front-rhc.eu/	2014-2016	Intelligent Energy Europe (IEE)	The Fair Renewable Heating and Cooling Options and Trade (FROnT) project aims at promoting a level playing field for Renewable Heating and Cooling (RHC) in Europe. It will develop strategies for RHC deployment and improve understanding of the costs of RHC vs fossil fuel use. It analyses both existing support schemes and end user decision factors, in order to help establish strategic policy priorities for RES-H&C. The project will help establish a framework for more efficient and effective support schemes, and enhance clear and transparent communication with European consumers. The website provides online tools aimed at end users (cost calculator, decision making tool, fact sheets), policy documents, market analysis and best practice guides.	project	medium	The report "Strategic Policy Priorities for Renewable Heating and Cooling in Europe" addresses barriers also identified in GeoPLASMA-CE (low awareness, high investment costs). Although not issued specifically for SGE, the recommendations may be adapted and included in both, the regional strategies (D.T4.2.3) and the joint strategy (D.T4.4.1).

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GABI	European network for shallow geothermal energy applications in buildings and infrastructures. Transport and Urban Development, COST Action	https://www.foundationgeotherm.org/, http://www.cost.eu/COST_Actions/tud/TU1405		European Cooperation in Science and Technology	The main objective of this Action is to build a new European network of researchers and engineers to address the challenges of thermoactive geostructures in terms of thermal and mechanical design. Based on multidisciplinary approaches dealing with thermal energy efficiency, geological engineering and geotechnical engineering, this group will develop collective understanding, share techniques, facilities and data, and work jointly in disseminating the obtained results across the EU. The widespread application of thermoactive geostructures is currently hindered by the large heterogeneity in the development and regulatory framework in European countries. By sharing knowledge and experiences, the use of thermoactive geostructures will increase, especially in countries with less experience. This newly created network will ensure an inclusive and open platform for scientific discussion to define European best practice rules for geothermal applications, promote public awareness and confidence in this technique, and foster advancement in knowledge through collaboration.	organization	medium	Research task 3 may provide insights which can be utilized in energy strategies for urban areas. If relevant preliminary results are available by the beginning of 2019, they will be included in the joint strategy (D.T4.4.1)
GeoCom	The GEOTHERMAL COMMUNITIES	http://geothermalcommunities.eu/	2010-2015	The 7th EU Framework Programme for Research and Innovation (FP7)	The Geothermal Communities (GEOCOM) project was launched in 2010 with a vision to increase the visibility of direct heat applications of geothermal energy throughout Europe. The main objective of the project is to implement pilot-scale demonstration of the geothermal energy utilisation on 3 selected demo-sites. There are applied research tasks on system optimisation and system integration, and also on the socio-economic aspects of current and future investments.	project	low	
GEOCOND	Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage	http://geocond-project.eu/	2017-2020	EU's Horizon 2020 Research and Innovation Programme	Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage: The project is focused on the development of new materials to enhance the efficiency of geothermal systems (e.g. pipes, grouting additives).	project	medium	If preliminary results are available by the beginning of 2019, some of the outcomes for promoting cost reduction measures of shallow geothermal installations could be included in the joint strategy (D.T4.4.1).
GeoDH	Geothermal District Heating	http://geodh.eu/	2012-2014	Intelligent Energy Europe (IEE)	The project was concerned with the promotion of geothermal energy use in district heating systems. The project targeted administrative and economical barriers preventing the implementation of such systems. Stated goals of the project: - Increasing awareness amongst policy and decision makers from national authorities about the potential of this technology. - Developing strategies for the simplification of the administrative and regulatory procedures and, in some cases, the filling of regulatory gaps. - Developing Innovative Financial Models. - Training technicians, civil servants and decision-makers of regional and local authorities in order to provide the technical background necessary to approve and support projects.	project	low	GeoDH provides a set of recommendations for removing barriers and improving regulatory frameworks. Some of its goals, e.g. raising awareness of the technology and transfer of best practices to national and local authorities, are relevant to WP4 and project reports may yield useful approaches for the regional strategies (D.T4.2.3) and the joint strategy (D.T4.4.1). However, the expected impact is rather low as GeoDH was focusing on direct heat use at higher temperature levels.

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Acronym	Title of project / initiative	Website	Duration	Financing program / source	Summary	Type document organization project web portal	Relevance to the GeoPLASMA-CE project with respect to WPT4 high medium low	Impact on WPT4
GEOFAR	Geothermal Finance and Awareness in European Regions	https://ec.europa.eu/energy/intelligent/projects/en/projects/geofar	2008 - 2011	IEE	GEOFAR aims to reduce financial barriers in the initial stages of geothermal energy projects by developing appropriate financing and funding schemes suitable to boost the development and investment in geothermal energy projects. GEOFAR also aims to raise the awareness of emerging (industrial) geothermal applications and to change the understanding and behaviour of the local and regional decision makers as well as key stakeholders by providing relevant information and by organising exchange and know-how transfer seminars.	project	low	
GeoMol	Assessing subsurface potentials of the Alpine Foreland Basins for sustainable planning and use of natural resources	http://www.geomol.eu/home/index_html	2012-2015	Alpine Space Programme 2007-2013	The GeoMol project prepared data on the geological structures of the Molasse and Po Basins in order to serve transnational decision-making and to make them available also to the interested public. GeoMol provides consistent 3-dimensional subsurface information based on coherent evaluation methods and commonly developed criteria and guidelines.	project	low	
GEOT€CH	Geothermal Technology for Economic Cooling and Heating	http://www.geotech-project.eu/	2015-2019	EU's Horizon 2020 Research and Innovation Programme	GEOTeCH aims to stimulate and promote greater utilization of renewable heating and cooling using shallow geothermal GSHP systems through advancement of innovative drilling and ground heat exchanger technologies that are significantly more cost-effective, affordable and efficient than current technology.	project	medium	If preliminary results are available by the beginning of 2019, some of the outcomes for promoting cost reduction measures of shallow geothermal installations could be included in the regional- (D.T4.2.3) and joint strategies (D.T4.4.1).
GEOTABS	Towards optimal design and control of geothermal heat pumps combined with thermally activated building systems in offices	https://www.geotabs.eu/	2011-2013	ERA-NET Programme	The overall aim of the project is to improve the system design and control of GEO-HP-TABS in office buildings by using monitoring, comfort survey and simulation data.	project	low	The outputs include guidelines, recommendations for commissioning, case studies and a new (REHVA) guidebook which may be useful for WPT2.
Geothermal ERA-NET		http://www.geothermaleranet.is/	2012-2016	The 7th EU Framework Programme for Research and Innovation (FP7)	The project aims to deepen the cooperation of national program owners and administrators and thus to be an enabler for the integration of national research and development agendas into a coherent European geothermal R&D program.	project	low	Although similar in scope, the project's deliverables are geared towards deep geothermal energy.
Geothermal4PL	Support for the sustainable development and use of shallow geothermal energy in the areas covered by the Mieszkanie Plus programme in Poland	https://www.pgi.gov.pl/en/geothermal4pl-2.html	2017	EEA Financial Mechanism 2009–2014, Bilateral Cooperation Fund, Programme PL04 "Energy saving and promotion of renewable sources of energy"	The project aims to support the sustainable development and the use of shallow geothermal energy in Poland, particularly in the areas covered by the Mieszkanie Plus programme, through the exchange of experience and the acquisition of new knowledge by PIG-PIB experts and target users of the project in cooperation with a Norwegian partner and experts. The project stems from the need to show the applicability of shallow geothermal energy as well as from the need to reduce emissions of gases and dust from the combustion of conventional fuels.	project	low	

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GEOTHERMICA		http://www.geothermica.eu/			GEOTHERMICA's objective is to combine the financial resources and know-how of 17 geothermal energy research and innovation programme owners and managers from 14 countries and their regions. GEOTHERMICA will call for innovative demonstration projects and technology development projects that accelerate geothermal energy deployment.	organization	low	
GeoTrainet	GeoTrainet AISBL	http://geotrainet.eu/	since 2012 until now	Membership fees	GeoTrainet is the organisation behind the European wide training and certification programme for shallow geothermal installers, specifically designers (those who carry out feasibility and design studies, including geology) and drillers (who make the boreholes and insert the tubes). Our aim is to ensure high quality installations for a sustainable market.	organization	medium	Didactic materials or course attendance/certification might be incorporated into individual measures, e.g. stakeholder training. Course content and quality is coordinated across European countries.
GeoTrainet	Geo-Education for a sustainable geothermal heating and cooling market	https://ec.europa.eu/energy/intelligent/projects/en/projects/geotrainet	2008-2011	Intelligent Energy Europe (IEE)	The GEOTRAINET project, aims to develop a European-wide educational programme as an important step towards the certification of geothermal installations. From the different groups of professionals involved in a GSHP installation, the GEOTRAINET project focuses on two target groups: designers (those who carry out feasibility and design studies, including geology) and drillers (who make the boreholes and insert the tubes).	project	high	Didactic materials or course attendance/certification might be incorporated into individual measures, e.g. stakeholder training. Course content and quality coordinated across European countries. Those contain excellent information and guidelines on shallow geothermal energy including drilling techniques, designing GSHP systems and legal requirements in EU.
GRETA	Near-surface Geothermal Resources in the Territory of the Alpine Space	http://www.alpine-space.eu/projects/greta/en/home	2015-2018	Interreg Alpine Space 2014-2020	The GRETA project aims to demonstrate the potential of NSGE in the Alpine Space and to share its knowledge to foster the integration of this technology into future energy plans in the area at different administrative levels. The main results of the project are decision support tools (geothermal potential maps, guidelines for energy planning), legal and technical guidelines for the utilization of NSGE, based on an exchange of best practices.	project	high	GRETA's WP5 is relevant, however, the results not published yet. It will provide procedures and tools developed to integrate SGE into energy plans and respective guidelines.
GROUND-MED	Advanced ground source heat pump systems for heating and cooling in Mediterranean climate	http://groundmed.eu/about_ground_med/	2009-2015	The 7th EU Framework Programme for Research and Innovation (FP7)	The GROUND-MED project demonstrates the next generation of geothermal heat pump systems for heating and cooling in 8 demonstration sites of South Europe. A measured seasonal performance higher than 5,0 will be demonstrated.	project	low	
Ground-Reach	Reaching the Kyoto targets by means of a wide introduction of ground coupled heat pumps (GCHP) in the built environment	https://ec.europa.eu/energy/intelligent/projects/en/projects/ground-reach	2006-2008	Intelligent Energy Europe (IEE)	The GROUND-REACH project supported ground coupled heat pumps to penetrate the heating and cooling market of Europe. The project (a) identified present status and future potential of ground-coupled heat pumps towards reducing CO2 emissions and primary energy demand, (b) analysed their contribution towards the European Directive on the Energy Performance of Buildings, (c) compiled and evaluated best practice information from all over EU, (d) defined measures to overcome barriers and set up a strategic promotion plan for long term market penetration, and (e) launched a large scale promotional campaign addressing the awareness and attitudes of key professional groups.	project	medium	Ground-Reach work packages 5, 6 and 7 are relevant to GeoPLASMA-CE WP4. Although dating to 2007, the deliverables "Barriers to GSHP Market Penetration" and "Proposals for Measures to overcome Barriers", as well as other project outputs, may still be relevant.

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GTR-H	GeoThermal Regulation - Heat	https://ec.europa.eu/energy/intelligent/projects/en/projects/gtr-h	2006-2008	Intelligent Energy Europe (IEE)	The GTR-H project aims to develop a framework of geothermal heat legislation/regulation for 4 target countries, Hungary, Ireland, Northern Ireland and Poland, which will be used to guide implementation of regulations across the EU. GTR-H will also provide broader guidelines for establishment of geothermal regulation in other EU countries. The key elements of international best practice will also be reviewed to place the framework in context. Development of a geothermal framework will follow with appropriate consultation and dissemination to maximise the applicability of the results. It is envisaged that there will be broad transferability of the framework to the remaining EU-25 (27) countries.	project	low	One of the project's outputs, the report "Specific framework for geothermal regulation - Recommendations & Template for Country Specific Action Plans" contains a list of measures which addresses the topics legal guidelines, support schemes and awareness.
Heat and the City	Heat and the City	https://heatandthecity.org.uk/		UK Research Councils, the Energy Technologies Institute and the Scottish Government	We focus on policy and political processes and cross-sector interactions in the governance of innovation. We examine local heat and energy efficiency strategies, decision-making about options for low carbon heat systems, the development and operation of district heat (and cooling) networks, management of improvements to the fabric of buildings and actions to reduce energy use.	organization	medium	Although focused on the UK and concerning all RES, several reports contain information which might be transferred and adapted to GeoPLASMA-CE countries, e.g. the report "What We Know about Local Authority Engagement in UK Energy Systems " suggests solutions to the lack of financing in local authorities. We could refer to the outcomes available in our joint strategy D.T4.4.1.
Heat pump -Apply for permission	Heat pump Apply for permission	http://varmepumpar.stockholm.se/Pages/Where.aspx	2015	Stockholm City, The Environment Department of Health Protection,	The web-portal “Heat pump - Apply for permission” managed by the Stockholm local authorities is an “e-service” place, where owners of single houses located in the city of Stockholm can apply for permission to install geothermal heat pumps. Using this portal one can find the information needed both for an application and after the application has been registered.	web portal	medium	Some approaches for documenting existing use, such as involving neighbours into the licensing procedures, could be interesting for the joint GeoPLASMA-CE strategy.
HRE4	Heat Roadmap Europe 4	http://www.heatroadmap.eu/	2016-2019	EU’s Framework Programme for Research and Innovation Horizon 2020	The overall aim in HRE4 is to develop low-carbon heating and cooling strategies, which are called Heat Roadmaps, and subsequently to quantify the impact of implementing them at a national level for 14 EU Member States. Its main goal is to study the heating and cooling sector in Europe by quantifying the effects of increased energy efficiency on both the demand and supply side, in terms of energy consumption, environmental impacts and costs.	project	medium	HRE4 involves the most detailed spatial mapping of heat demands and renewable heat resources up to date; includes the potential for reducing heat demands through cost-efficient energy efficiency measures in both the heating and the cooling sector.
ITER	Improving Thermal Efficiency of horizontal ground heat exchangers	http://iter-geo.eu/	2015-2017	EU’s Framework Programme for Research and Innovation Horizon 2020, the Marie Skłodowska-Curie Grant	The overall aim of ITER is to ensure the sustainability of ground coupled heating-cooling systems and especially the very shallow horizontal ground heat exchangers systems. “Very shallow” means horizontal collector systems or special forms (i.e. helix system), interesting the first 2 m depth from ground level, up to 10 m depth maximum.	project	low	

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MUSE	Managing Urban Shallow geothermal Energy	http://geoera.eu/projects/muse/	2018 - 2021	GeoERA, ERA-NET Co-Fund Action	MUSE investigates resources and possible conflicts of use associated with the use of shallow geothermal energy (SGE) in European urban areas and delivers key geoscientific subsurface data to stakeholders via a user-friendly web based GeoERA information platform (GIP). The assessment of geothermal resources and conflicts of use will lead to the development of management strategies considering both efficient planning and monitoring of environmental impacts to feed into general framework strategies of cities like Sustainable Energy Action Plans (SEAPs). The developed methods and approaches will be tested and evaluated together with input from local stakeholders in 14 urban pilot areas across Europe representative for different conditions of SGE use.	project	low	MUSE represents a follow up measure of GeoPLASMA-CE and will adapt results of WPT4.
progRESsHEAT		http://www.progressheat.eu/	2015 - 2017	Horizon 2020	The progRESsHEAT project aims at assisting local, regional, national and EU political leaders in developing policy and strategies to ensure a quick and efficient deployment of renewables in heating and cooling networks. progRESsHEAT is intended to support the market uptake of existing and emerging renewable electricity, heating and cooling technologies. More specifically, the project helps policy makers develop integrated, effective and efficient policy strategies aimed at achieving a fast and strong penetration of renewable and efficient heating and cooling systems.	project	high	The project analysed barriers, issued recommendations for the promotion of geothermal energy and elaborated energy strategies for each its 6 pilot areas. Although focused on the use of geothermal energy for district heating grids and using different pilot areas, much of the content is highly relevant since three partner countries are also represented in GeoPLASMA. Consequently, a number of documents overlap in content with GeoPLASMA-CE outputs, e.g. "Using Renewable Energy for Heating and Cooling: Barriers and Drivers at Local Level"; "Policy recommendations to decarbonise European heating and cooling systems" or "Heating & cooling: Policy frameworks in six European cities, their regions and countries".
ProHeatPump	Promotion of efficient heat pumps for heating	https://ec.europa.eu/energy/intelligent/projects/en/projects/proheatpump	2006-2009	Intelligent Energy Europe (IEE)	The key objective of the project was to promote energy efficient heat pumps for heating. The project focused on the systems for the residential sector and SMEs, i.e. small to medium size heat pumps and in particular in the refurbishment stage where the needs for promotion is higher than for the new buildings. Promotion of heat pumps has been done by the means of improved and steady information for the target groups, end users and installers as well as policy makers. Another important project topic was the investigation and evaluation of the possibilities to combine heat pumps and renewables.	project	low	
Recast Directive 2009/125/EC	Recast Directive 2009/125/EC establishing a framework for the setting of Ecodesign requirements for energy-related products	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0125&from=EN	since 2009 until now		This Directive aims to improve the energy efficiency and environmental impact of energy-related products, i.e. products that affect energy consumption throughout their life cycle. However, this Directive does not introduce directly binding requirements for specific product categories, but rather outlines the conditions and criteria relating to environmental characteristics of products, such as energy and water waste, or lifespan, so they can be improved quickly and efficiently.	document	low	The recommendations given might be interesting in WPT4 in case we would like to provide schemes for life cycle cost analyses of the entire product chain related to shallow geothermal energy. However, such analyses are not foreseen in the project Application Form and might only be investigated in case of free resources.
ReGeoCities	Regulations of Geothermal HP systems at local and regional level in Europe	http://regeocities.eu/	2012-2015	Intelligent Energy Europe (IEE)	The ReGeoCities project was focused on the achievement of the National Renewable Energy Action Plans geothermal targets 2020 marked by countries with ambitious objectives regarding ground source heat pumps by means of the removal and clarification of the non-technical administrative/regulatory barriers at local and regional level. The project worked on the integration of shallow geothermal energy at a local and regional level. It examined and promoted best practices and an intelligent regulatory framework, supporting cities to reach their Sustainable Energy Action Plans and the 2020 climate and energy goals.	project	high	The appendix of the document "Report on the activities undertaken and on the methodology followed and on the results obtained as part of the task on promoting the inclusion of SGE in SEAPs of representative cities" lists actions for the promotion of SGE extracted from 47 SEAPs across Europe.

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Renewable Energy Directive 2009/28/EC	DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC	https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive			The Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.	document	high	The directive specifies national renewable energy targets for each country and represents the motivation behind the GeoPLASMA-CE project. It refers at several places to geothermal energy and provides its legal definition.
REPOWERMAP	A European map for renewable energies and energy efficiency	http://www.repowermap.org/	since 2011 until now	Intelligent Energy Europe (IEE)	repowermap.org is a non-profit initiative to promote renewable energies and energy efficiency by making visible real-world examples and related local information in each person's neighbourhood. To this objective, an interactive map is developed jointly by a large network of organizations, institutions, regional and local authorities and other energy actors. The idea of the initiative is to encourage people to use renewable energies and energy efficiency, by making them aware of concrete examples in their region, their city and in their own neighbourhood.	project	medium	The repowermap best practice web application will be linked to GeoPLASMA-CE for promoting best practice examples in the pilot regions. The description of best practice examples is part of WPT4.
RHC-ETIP	The European Technology and Innovation Platform on Renewable Heating & Cooling (RHC-ETIP); Geothermal Technology Panel	http://www.rhc-platform.org/index.php?id=7	since 2009 until now	European Technology and Innovation Platform	The European Technology and Innovation Platform on Renewable Heating & Cooling (RHC-ETIP) brings together stakeholders from the biomass, geothermal, solar thermal and heat pump sectors – including the related industries such as district heating and cooling, thermal energy storage, and hybrid systems – to define a common strategy for increasing the use of renewable energy technologies for heating and cooling.	organization	medium	Provides a roadmap for geothermal energy (both deep and shallow) which defines KPI, identifies R&D requirements, and presents an implementation plan.
SET-Plan	The European Strategic Energy Technology Plan	https://ec.europa.eu/energy/en/topics/technology-and-innovation/strategic-energy-technology-plan		European Commission	The European Strategic Energy Technology Plan (SET-Plan) aims to accelerate the development and deployment of low-carbon technologies. It seeks to improve new technologies and bring down costs by coordinating national research efforts and helping to finance projects. The SET-Plan promotes research and innovation efforts across Europe by supporting the most impactful technologies in the EU's transformation to a low-carbon energy system. It promotes cooperation amongst EU countries, companies, research institutions, and the EU itself. The SET-Plan comprises the SET-Plan Steering Group, the European Technology and Innovation Platforms, the European Energy Research Alliance, and the SET-Plan Information System (SETIS). The European Technology and Innovation Platforms (ETIPs), including the European Geothermal Energy Council, were created to support the implementation of the SET Plan.	document	medium	The website is a useful repository providing statistical data, analyses and publications. Amongst others, all EU directives, national action plans and progress reports are listed here.
Smart Geotherm		www.smartgeotherm.be/abstract/	2015-2018		Smart Geotherm aims at using geothermal, thermal mass and other techniques to create nearly zero-energy buildings. We do this with all of the project partners by insulating the buildings in such a way that the net heat requirement can be largely completed by renewable energy. Aside from that we also use intelligent and integrated techniques, such as: • Short or long term thermal energy storage systems in the structural mass or in the soil • Building and disseminating knowledge, applications and new developments in the field of ground coupled heat pumps • Developing smart control systems • A maximum feeding of the process by cheap or renewable energy	project	low	

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STEP UP	Strategies Towards Energy Performance and Urban Planning	https://www.stepupsmartcities.eu/	2012-2015	The 7th EU Framework Programme for Research and Innovation (FP7) via the Geothermal ERA-NET coordination project	STEP UP aims to enhance the existing SEAPs in the four partnering cities, including: 1) creating a model for energy planning that will deliver faster and greater impact, contributing to meeting Europe's 2020 energy and climate change targets, 2) to help delivering wider policy objectives such as improving security of energy supplies, achieving urban regeneration, economic growth, tackling fuel poverty.	project	high	The project website provides a guidebook for the improvement of existing SEAPs complete with associated templates to aid the process. It also provides a series of webinars on energy planning for cities, ranging from gaining stakeholder and political support to financing SEAP actions. Project results could be very valuable for both devising individual measures and designing an entire energy strategy.
SUB-URBAN	A European network to improve understanding and use of the ground beneath our cities	http://www.cost.eu/COST_Actions/tud/TU1206	since 2012 until now	Transport and Urban Development COST Action TU1206	The Action will establish a network to co-ordinate, integrate and accelerate the world-leading research into modelling the subsurface taking place in European institutions and to develop a Toolbox to enable subsurface knowledge to be widely disseminated.	project	low	
Tesse2b	Thermal Energy Storage Systems for Energy Efficient Buildings; An integrated solution for residential building energy storage by solar and geothermal resources	http://www.tesse2b.eu/tesse2b/newsTesse2bProject	2015-2019	EU Horizon 2020 Research and Innovation Programme	TESSe2b project will enable the optimal use of renewable energy and provide advantageous solutions for correcting the mismatch that often occurs between the supply and demand of energy in residential buildings. TESSe2b design, develop, validate and demonstrate a modular and low cost thermal storage technology based on solar collectors and highly efficient geothermal heat pumps for heating, cooling and domestic hot water production. That is achieved by integrating compact Thermal Energy Storage Tanks with Phase Change Materials coupled with enhanced Phase Change Materials inside the borehole heat exchangers exploiting both solar and geothermal energy.	project	low	
The Heat Under Your Feet	The Heat Under Your Feet	http://www.heatunderyourfeet.eu/	since 2015 until now	Intelligent Energy Europe (IEE)	The Heat Under Your Feet is an initiative launched within the framework of the ReGeoCities project to disseminate information and awareness about geothermal heat pumps in Europe and to promote their use.	web portal	medium	The knowledge hub with project show cases can be linked to the GeoPLASMA-CE web portal.
ThermoMap	Area Mapping of Superficial Geothermic Resources by Soil and Groundwater Data	http://geoweb2.sbg.ac.at/thermomap/	2010-2013	The 7th EU Framework Programme for Research and Innovation (FP7) , the Information and Communication Technologies Policy Support Programme (ICT-PSP)	The ThermoMap project focuses on fostering the information environment on shallow geothermal potential across Europe. The key objective of the ThermoMap project is to provide an adequate, area-covering estimation of the superficial geothermal potential (up to 10 metres) of the nine countries which are involved in this project on a large to medium scale. ThermoMaps also aims to the harmonisation of geographical information for superficial geothermal resources across Europe and to make the digital content exploited by citizens, governments and businesses (overall target of the programme).	project	low	
THERMOS	Thermal Energy Resource Modelling and Optimisation System	https://www.thermos-project.eu/about/introducing-thermos/	2016 - 2019	Horizon 2020	The overall aim of the THERMOS project is to provide the methods, data, and tools to enable more sophisticated thermal energy system planning rapidly and cheaply. THERMOS aims to accelerate the development of new low-carbon heating and cooling systems across Europe, and enable faster upgrade, refurbishment, and expansion of existing systems. To this end, THERMOS is: • Developing a state-of-the-art modelling methodology for address-level energy system maps. • Using this methodology to produce a set of these maps for the pilot cities involved in the project. • Creating modelling algorithms for analysing these maps in order to support planners with decision making. • Testing these methodologies in four replication cities. • Developing and publishing free, open-source software for use by local authorities or other interested parties.	project	low	

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Transenergy	Transboundary Geothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia	http://transenergy-eu.geologie.ac.at/	2010-2013	Interreg Central Europe 2007-2014	The aim of Transenergy is to create a common geothermal information system in four central European countries. Having an environmental focus the purpose is seeking for sustainable, transboundary utilization of geothermal energy resources. The project addresses the key problem of using natural resources that are shared by different countries in a sustainable way. Natural resources, such as geothermal energy whose main carrying medium are deep groundwaters along regional flow paths are strongly linked to geological structures that do not stop at state borders. Therefore only a transboundary approach can handle the assessment of geothermal energy and conditions of its sustainable use. The project focuses on decision makers' and stakeholders' needs by providing a user friendly web-based decision supporting tool as a main core output of the project.	project	low	
TransGeoTherm	Geothermal Energy for Transboundary Development of the Neisse Region. Pilot Project	http://www.transgeotherm.eu/	2012-2014	Operational Programme for Transboundary Cooperation Poland – Saxony 2007-2013	The main target of the project TransGeoTherm is to introduce and establish the use of low temperature geothermal energy as a low emission energy in the Saxon-Polish transboundary project area. For that purpose specified geological, hydrogeological and geothermal data are combined and processed with 3D numerical modelling. As a result of the works a series of maps, illustrating the estimated geothermal conditions for several depths (40, 70, 100 and 130 metres below the ground level) will be created.	project	low	Map of SGE potentials, relevance limited geographically to Polish-Saxon transboundary area