D.3.2 TABLE PRESENTING THE RESULTS OF THE SURVEY ON EXISTING ADMINISTRATIVE BARRIERS (Final Version)

Administrative barriers	BG	CZ	DE	DK	FR	HU	IE	IT	NL	PL	RO	SI	SK	UK
Geothermal DH on **National Renewable Energy Action Plan**	It is included in National Renewable Energy Action Plan. The plan was prepared in 2012. There are special goals for RES and especially for heat pumps, and local DH. Also it is mentioned the obligatory of each municipality to prepare SEAP with measures for using geothermal recourses and possibilities for DH. The Water act is regulated the using of geothermal water. The government have representative at local level - Basin directorate for water management in each region in Bulgaria. To use a geothermal sourse for energy production have to a concession contract with local Basin directorate. There are a fee to use geothermal water, which is regulated by government. The fee is depending from temperature of the water. Currently the fee is: t<=30°C, the fee is 0.15 BGN/m3 30°C< t<=50°C the fee is 0.35 BGN/m3 t>50°C the fee is 0.50 BGN/m3 The level of fee is really suitable to use geothermal recourses for heating and cooling.	NRE Action Plan do exist for energy from renewble resources: - Elaboration of the National RE Action Plan of the Czech Republic assumes in 2020 achieving 14% share energy from renewable sources in gross final energy consumption and 10.8% share energy from renewable sources in gross final consumption in transportation (energy shares set by european comission are 13% and 10%, resp.) - geothermal energy growth is in NAP predicted with zero potential - DH not particularly specified		No contribution is reported from geothermal energy, which must be a mistake, as Denmark already has 3 GeoDH plants in operation. Denmark has 3 operating gethermal plants, but all are operating in a system with heat pumps in order to increase the temperature level. An assessment (not target) has been approx. 15 % of total district heating demand. the current supply is less than 1%.	Direct uses of geothermal are included in the NREAP with clear targets for 2020	NREAP gives targets only for direct use, and within that does not differentiate between types of use. In Hungary geothermal heating in agriculture is significant (27% of installed capacity and 20% of annual use), which is thus also included. In direct heat (including agriculture) 388% increase is foreseen between 2010 and 2020, i.e. reach 16.43 PJ by 2020.	Currently not considered as part of the NREAP - no coherent national policy for either geothermal or district heating	DHs shall be included in Planning, Projecting, building and refurbishment of residential, industrial and commercial areas, or in urban planning measures. **Targets by 2020:** 17,09 % H/C consumption from RES (increased to 20% by the national energy strategy), GT heat excluding HP -> 300 ktoe; GSHP -> 533 ktoe; DH from RES -> 0,9 Mtoe	No plan for the transition to district heating and cooling due to fossil fuel interests.	**v. low** (ca. 3% of all uses by 2020)	NREAP Romania includes very few information and no objectives referring geothermal energy. Some achievements are set out in geothermal DH (Nadlac, Oradea, Beius, Sanmartin, Lovrin, Calimanesti) without detailed quantified information. No objectives regarding GeoDH, GSHP and electricity production in particular. In 2006 the total geothermal heat supplied for buildings was 131.000 Gcal/year and "it suppose" to double until 2020. No plans regarding specific measures, actions, responsibilities and intermediary / final deadlines for geothermal energy (GeoDH, GSHP and electricity).	Renewable energy, no special emphasis. Scheme for cofinancing the construction of district heating systems using wood biomass and geothermal energy - A public tender for cofinancing district heating using geothermal energy is being drafted. The framework for implementation of the scheme is the same as cofinancing wood biomass district heating.	Exists	Currently not considered as part of the NREAP
Geothermal DH on **Renewable Energy Action Plans of targeted regions**	UBBSLA is united 21 municipalities on black sea coast. Also UBBSLA is supporting structure of "Covenant of mayors. As a SS we prepared SEAP's of most of members municipality. Up to now ready and accepted SEAP have theses municipality - Varna. Burgas, Malko Tyrnovo, Dalgopol, Aksakovo, Beloslav, Nesebar. In process of preparing the SEAPs are municipality - Avren, Kavarna, Sozopol Valchi Dol. In each SEAP are included activities for geothermal DH. The responsible government body for UBBSLA's member municipality is Basin directorate for water management in black sea region. On the nord black sea region there are 115 geothermal sources which is ready for using. In sought black sea region the geothermal sources are 18. The temperature of sources is between 35°C - 50°C. In each municipality SEAP is described the geothermal resources, also is propose concrete measures to use it.	Ditto No target regions for GeoDH		N.A. Energy planning is based on projects and the municipalities. Strategic energy planning involving several municipalities is developing. This process could lead to formulation of targets for geothermal energy.	Each regions (22) has realized or is realizing its plan which includes, when assuming reasonnable and affordable ressources, the use of geothermal energy	Such Regional Plans officially do not exist. However several municipalities plan to establish/expand their DH systems	District Heating and geothermal resource development are considered only Dublin as part of the Dublin SEAP. Other local initiatives make reference to GeoDH in counties Cork, Waterford, Meath & Ballymena (N. Ireland), Antrim (N. Ireland)	Not all Italian regions have a plan. **Tuscany:** a regional energy-environmental plan is under approval; Geothermal DHs are important to develop heat supply chains; Geothermal DHs will be supported with laws, regulations, financial incentives and research; **Tuscan geothermal DHs 2020 objectives**: 43,9 ktoe	Only small network under leadership of projects or local governments	**Yes** (some cases, not main RES envisaged for DH)	NREAP objectives are not split on regions.	There is no special emphasis on geothermal DH in Renewable Energy Action Plans. It is considered with other renewables.	Few of the regions have geothermal energy involved	Several individual Renewable Energy Strategies in the UK make reference to the potential use of geothermal energy resources where these have been previously identified through historical geothermal studies and more recent research. Similar policies highlight the benefits of district heating.
Current implementation of **EU RES Directive**	There are national rules for each step of geothermal DH. The responsible bodies are - Basin directorate for water management in black sea region and local authority. The step are: 1. Application form with: - estimation with report according NATURA 2000; - technical project for joining; - description of necessary water capacity; 2. Introdusing the full documentation for agreement of parameters of water taking. 3. Public introducing of procedure for editing of permit; 4. Edition of permit; Next step is building of heating pipeline. The permit ion is responsible of local authority. The traces of pipeline have to be coordinating with all utility company. Second step is preparation of technical projects. The technical project is adopted by municipality. The municipality is developed SEAP where is described specific measures for support. The technical project for new building have to have estimation for using RES for own energy needs. The stimulation for existing buildings to use RES is tax exemption. The information is available in specific websites. When some program is open for new calls there are announce in newsletters.	- Following the 28/2009/CE directive, previous Act on the promotion of electricity production from renewable energy sources (No.180/2005Coll.) was replaced by the Act on Supported Energy Sources and the Amendment of Certain Acts (No.165/2012 Coll.). - 28/2009/CE Directive is implemented in NRE Action Plan: National target of the rate of RS on the gross final energy consumption set on 14% and 10,8% in transportation (according National Action Plan) Article 13.1. Fifty energy consultant centres are distributed within the Czech Republic. Consulting is free of charge. Energy Regulation Office of the Czech Republic provides on its website detailed information for applicants for licences including all necessary application forms. Analysis of the Czech legislation was carried out and established critical points prolonging approval processes in the scope of regional and construction management. This analysis resulted in several measures in order to facilitate the authorization, certification and licensing procedures: • Centralization of approval process • Integration of approval processes (concerning primarily regional and construction management)		Table 11 on p 110 in the national renewable energy action plan (DK version) includes targets for geothermal via heat pumps. Target for 2020 is 8 PJ.	The current implementation of the directive is on going, the last number indicates that the targets are on line for 2012.	Parlament Decision 77/2011 (X. 14) on the National Energy Strategy: general framework for integrated energy and climate policy. Government Decision (1002/2011. (I. 14.) on NREAP. Planned total RES share for 2012 was 7,4% however the realized number was 9% (Nevertheless the growth is mostly in biomass).	**Article 13.1** - this is a difficult question to answer for Ireland as nor the heat market or geothermal are regulated. Local authorities, the Sustainable Energy Authority of Ireland (SEAI), the EPA, DCENR and GSI provide information - when relevant- on environmental permits required or on registers of approved equipment. **Article 13.3** - Approved equipment and installer lists through the Sustainable Energy Authority of Ireland (Triple E register) - http://www.seai.ie/Your_Business/Triple_E_Product_Register/ **Article 14.1** - support measures for renewable technologies are centrally managed by the SEAI through an application process. information on available grant and eligible technologies in included in (http://www.seai.ie/Grants/Better_energy_homes/) - Most of these measures do not directly support GeoDH, please note that they are not included in legislation	The **28/2011 RES national decree** is the Italian transposing decree of the RES directive. **Article 13.1**: the national energy services manager (GSE) issued two reports about the regulatory framework concerning authorizations and licensing procedures for RES plants, both at national and regional level. Info provided by these reports are mainly focused on power plants. Moreover the website of GSE has a section with info about legislation, authorizations and licensing procedures for RES plants, both at regional and local level. **Article 13.3**: DHs and geothermal DHs are considered strategic: DH networks are considered primary infrastructure works and availability of third parties to build DH during design and planning infrastructures. Municipalities with population > 50000 have to draft DH development plans. From 2017 RES consumption for DHW and H/C in new buildings shall achieve 50%, except in those connected to DH. **Article 14.1**: the website of GSE has a section with info and instructions about national support measures for RES plants, divided by type of energy source and by energy produced (power and heat/cool production) Despite what above reported, DH operators still declare a lack of geoDH specific implementing decrees.	Implementation of art. 13.1 has no effect on DHs. The legal instruments are mainly focussed on large projects, like wind energy and biomass. Art. 13.3 has a link with DHs in the sense that from Jan 2011 a new calculationtool is introduced called EMG. This tool facilitates the calculation of value for DHs with heating in the energy performande indicator for buildings. However during the workshop on 3-4-'13 it was expressed that the calculation of heat and natural gas for the building permit still has a preference for natural gas. Implementation of art 14.1 is mainly worked out as dissemination of information with regard to RES	**9.4% RES, 0.2% geothermal (heat)** in gross final energy consumption/ 2012	The document that transposes RES Directive in national legislation is Law 220/2008. In fact, it limits RES energy to electricity production based on RES - No thermal energy provisions. As far as the electricity production based on geothermal is 0 (zero) and in 2020 will be 0 (zero) according to NREAP provisions, it means that the Green Certificates incentives provided by Law 220 for geothermal electricity are only theoretical. Regarding Art 13.1 of RES Directive, there are not national rules concerning the availability of information on the authorization, certification and licensing procedures applied to plants and associated infrastructure for the RES heat and cool distribution and the clarity in coordinating and defining respective responsibilities of national, regional and local administrative bodies for authorisation, certification and licensing procedures including spatial planning. The Law 220 was almost yearly updated and do not contain provisions on RES DH and GSHP. At the beginning it provided 3 Green Certificates / Mwh for electricity from geothermal plus another 1 for high efficiency co-generation situations. In 2003 the Emergency Ordinance no. 57/2013 modified the law by suspending the initial green certificates approach (3 GC for 1 Mwh) up to 2017-2018. In NREAP Progress Report from 2011 the total geothermal energy consumption (reported for in 2009) is 24 Mtoe, primary production is 24 Mtoe and production in Geothermal District Heating plants is 0 (zero). In 2010 the Geothermal H&C – direct use was 0,6% from the total RES H&C. The difference of 99,4% was H&C from	The new Energy Law (in the process of adopting) lays down the conditions and procedures that must be met for the provision of public services. It also allows the municipality to impose a connection to the distribution system (in the case of public utilities) and prioritisation of heating in the municipal area. For both the necessary basis should be prepared in Local energy plan. Heat distribution can be performed as optional local public service or regulated economic activity subject to public interest. Law also determines the rate of heat produced from renewable sources to be achieved by each of the district heating system. Information on authorization and certification are available at Public Energy which is authorised for issuing licences. Law also provides that the Ministry responsible for Energy and Eco Fund are allocating subsidies for projects and energy efficiency measures, district heating and for the production of heat from renewable sources. Eco Fund executes it in the name and on behalf of the ministry. Information on support measures is available at Eco Fund.	RES Act No. 309/2009 Coll. (Act on the Support of Renewable Energy Sources). The act is periodically amended and as mentioned by Tomas Malatinsky, Minister of Economy responsible for energy legislation, on 14/10/2013: "I think the current amendment the Act, as well as any subsequent, will be based on getting bigger and bigger experience that in this area we have. We will monitor our aims to bring RES into irreplaceable position in the Slovak energy mix without much impact on raising prices for consumers and therefore we will amend this law almost permanently"	**PLEASE NOTE THE UK & Northern Ireland Distinctions - Article 13.1** - this is done nationally through the Micro generation Certification Scheme (MCS) in the UK & Northern Ireland - http://www.microgenerationcertification.org/ **Article 13.3** - Refer to the point above. **Article 14.1** - This is outlined in the UK through the Renewable Heat Incentive Scheme (refer to https://www.gov.uk/government/policies/increasing-the-use-of-low-carbon-technologies/supporting-pages/renewable-heat-incentive-rhi) - Northern Ireland this is done through a similar (but separate scheme with different tariffs) the Northern Ireland Renewable Heat Incentive (http://www.detini.gov.uk/deti-energy-index/deti-energy-template-menu-5.htm) Please also note Renewable Heat Premium Scheme for Social Landlords (Renewable Heat Premium Payment scheme)
Current implementation of **other EU Directives concerning Geothermal DH**	The directives are transposed in Bulgarian legislation. According the directives the Government was developed Energy efficiency act, Acto for RES and bio fuels. Also was developed strategy for increase the chare of RES at national level. Each municipality have to develop special own action plan for energy efficiency and RES. The focus is mainly of district heating. Because almost all of operating DH company in Bulgaria is on bad financial condition.	2012/27/EU - submitted in August 2013 at the government in order to implement in the czech legislation (particularlyArticle 5 and 7)		National political energy agreement 2012-2020 in force from March 2012.		No specific refernces to GeoDH in any implementation acts	**2006/32/EC** transposed to Irish law through S.I. 542 of 2009 - little mention of district heating and GeoDH in the implementation strategy - **2012/27/EU** - for GeoDH nothing relevant	**2006/32/EC**: the impact of the implementation is expected to be positive on planning, distribution and demand. **2012/27/UE** not yet implemented	None (Directive 2009/28/EC and EU/2012/27)	**No specific references to GeoDH** in any implementation acts of EU Directives conc. DH	No geothermal DH specific provisions in national legislation that transpose EU Directives.	There is no special emphasis on geothermal DH. It is considered with other DH.	Decree No. 133/2012 regulating the training and certification of installers (The certification of RES installers applies to installers of boilers and furnaces for biomass, PV and solar thermal installations, shallow geothermal plants and heat pumps (§ 13 a par. 2 in conjunction with § 2 par. 1 Decree No. 133/2012)	**2006/32/EC** and heat metering is still under debate in the UCC. Heat metering is applied as part of the non-domestic RHI scheme where all renewable heat generators including GT are metered. The domestic scheme is operated based on a deeming system. **2012/27/EU** - for GeoDH in consultation in both UK and Northern Ireland
National support measures for Geothermal DHs	National Energy Strategy is deal mainly with DH and RES. There are specific Strategy for stability and developing of DH in Bulgaria. The document is only for exist DH company. The using of geothermal water is regulated in Water act. The energy potential of Geothermal resources is analysed by government. All geothermal sources are executive government property. They can be used trough concession.	- National Energy Strategy was agreed in 10/03/2004 and defines national priorities and aims which are to be reached in 2030 (not geoDH specified, only renewable resources). - Act No. 406/2000 Coll. on Energy Management defines and regulates rights and obligations in the energy management, including governmental rights and responsibilities. This Act includes major documents related to energy policy of the Czech Republic and use of its renewable and secondary sources (e.g. National Energy Strategy). Support for district heating & cooling from RES: - investment support from structural fonds EU - liberation from "property taxes" if using geothermal energy sources (including heat pumps) - indirect support via support of combined electricity and geat generation from renewable energy sources - direct support for heat from RES via annual green bonuses according to Act No.165/2012 Coll.		Limited ressources (< MEUR 1,5) has been set aside for different analyses etc. in the period 2012-2015	The nattional support using the "Heat fund" of ADEME is operational since 2009 and will end in 2013. The subsidies were calculated for each project to ensure a cost for geothermal KWh at 5% below the gas cost.	Act XVIII (2005) on District Heating. DH is public service and a major part of HU's energy policy. Act LXVII (2008) on the competitiveness of District Heating. Governmental Decree 157/2005 (VIII.15.) on the execution of the Act on District Heating. 51/2011 (IX.30.) Decree of the Ministry of National Development on the support of districtheating. An Action Plan on the modernization of District Heating is elaborated and is under parlamentary discussion. In 2013 the Government decreased feeof DH in public sector by 10%. This unfavorable effects the competitiveness of GeoDH.	N/A	Main laws: the **28/2011 RES national Decree** and the **22/2010 Legislative Decree**, the Italian reference law concerning the exploration and exploitation of geothermal resources. The national energy strategy (2013) increases to 20% the 2020 targets for H/C cons. from RES, but does not support explicitly support DH networks	A national support mechanism for geothermal heat was introduced in 2012 by the inclusion of geothermal energy in the existing general programme for the production of renewable energy (SDE+). Before 2012 energy in the form of heat was not supported by this SDE scheme. SDE+ for geothermal heat bridges the difference between cost price and (fossil fueled) market price of heat (roughly 5 to 7 euro per GigaJoule) and is comparable to Feed in Tariff mechanisms. SDE+ supports basically the geothermal well and does not take into account whether the heat is used in district heating systems or by one horticultural or industrial user.	Since 2013 no national support for geothermal resources' exploration drilling and subsurface parts of GeoDH systems. Some support for above-surface parts of GeoDH systems: technological infrastructure, networks, etc (specially if related to thermal retrofitting, modernization, energy efficiency) – via some state and EU programs managed by the state (less available in 2013; waiting for next financing perspective since 2014/15). Plus some space for GeoDH – related international initiatives in frame of eg. Norway Grants and EEA grants (in latter case not for investments!, in contrary to eg. Hungary)	No specific support measures at national level in NREAP or other laws and decrees.	National support measures do not differentiate between different renewable sources. Granted purchase of electric energy produced from OVE with subsidized prices or financial operational support. It is obligatory to supply 25 % of energy to buildings from renewable energy sources.	Not existing	DECC - Renewable Heat Incentive - dedicated deep geothermal tariff of £0.05 per kWh to be implemented in 2014 (currently banded with large scale GSHP at £0.034 per kWh)
Regional support measures for Geothermal DHs	The Bulgarian municipality can not ensure financial support for Geothermal DH plants. The reason is permanent lack of finance. The only way to be included is trough Operative programs. Most of the municipality have developed SEAP. Geothermal recourses is one of the RES which is part of the SEAP. In the SEAP is included several measures to support the developing of GeoDH. The effects are increasing the interest of the investors to implement the GeoDH. The municipality help the investors with fast administrative services, possibility to use municipality property for geoDH.	Ditto, no specific regional support		N/A	_		N/A	**Wide differences among Italian regions**: in some central and northern regions, the legislative framework is playing a positive effect on the construction of local DHs, by the provision of **territorial planning** of new DHs, **long term agreement** with geothermal companies or with ESCOs, **guarantee funds** and **co-financing** the construction of DHs. Other regions have no support measures.	12 different regimes in all Dutch Provinces. F.e. in Limburg there is LEF (limburg Economic Fund), in which projects can be financed when they have a reasonable/viable business case	**In some regions some forms of support for above-surface parts of GeoDH systems** available: technological infrastructure, networks, etc (specially if related to thermal retrofitting, modernization, energy efficiency) – via some regional and EU regional operational programs managed by the state (less available in 2013; waiting for next financing perspective since 2014/15). **Some Regional Funds for Environmental protection and Water Management and Energy Agencies offer support** (grants, but loans mostly) to public entities for e.g. heat pumps used for DH	No specific support measures at regional level.	There are none regional support measures.	Not existing	Regional Growth Funds for District Heating schemes - policy related supports include individual city and borough council initiatives to develop district energy (egg. Manchester, Liverpool, Stoke on Trent, Southampton)
Temperature / Depth / Flowrate Cut Off	The resources are differentiated with these parameters: temperatures, total debit, used debit, total mineralization. For some resources there are more information.	- Flow rate & temperature not regulated. - Different legal criteria are applied for geothermal energy use with regard to the type of geothermal resource and the way of the exploitation. - According to Water Act No. 254/2001 Coll., geothermal fluid extracted from the aquifer has to be (after cooling) injected back to the same aquifer (water authority sets the maximal amount and minimal temperature of the injected water depending on situation, however particular values are not specified) - in case of industrial use (DH), parameters are defined within EIA (which is mandatory for that case)		40 °C - 75 °C / 1,2 km - 2,6 km / 200 m3/h - 350 m3/h	Low Temperature Plants<150°C High Temperature Plants ≥150°C	Temperature and flow-rate not regulated.	Currently not set due to the lack of legislation & regulation. Current proposal **MAY** be that resources below 400m depth are considered as deep geothermal	"**National related geothermal resources**": High enthalpy (>150°C) GT fluids and/or GT projects > 20 MWt; "**Local related geothermal resources**": Medium (90°-150°C) and Low (<90°C) enthalpy GT fluids and/or GT projects < 20 MWt; "**Small local utilizations**": wells < 400m and GT projects < 2 MWt.	Temperature gradient of 3 degrees/ highest flowrates deeper than 500 meters	Geothermal energy /"thermal" water acc. to formal term/ is regulated in the Geological & Mining Law. The resources are differentiated by the temperature of water measured at the surface outflow /from natural spring or well/. "Thermal water" is the water which minimum temperature is 20°C measured at the outlet of the intake /spring or well head/. Note: still the formal term 'thermal water' exists as obligatory in the Geological & Mining Law (sic!). Therefore it has be formally used in reports and documents, specially those submitted for administration and legal purposes. The term "thermal water" was introduced for balneological purposes mainly in 1906, i.e. year, long before geothermal energy science, technology and practice development in many countries. The suggestions to introduce the term "geothermal water" as a synonym were not considered yet. This term is commonly used in scientific and technical literature and practice.	In Romania, the maximum temperature of deep geothermal resources is 120-125 Celsius (between 25 and 125 according NREAP). The average depth is 100 m.	The sources are appropriate for low temperature district heating. The financial side of analyses of deep drilling, to reach higher temperatures, does not look promising.		
Regulation covering the GT **resource ownership**	Water act and regulation documents	Mining Act No.44/1988 Coll.	Mining Code for resource below 100m if the energy is not completely use within the property	Deep GT: Subsoil Act. Shallow GT: building regulations	Mining code for both shallow and deep. For shallow plants : just a simple declaration if the depth of the drilling is < 100m and if the total power extracted is <232 KWth. (in that case it is considered as geothermal enegy of minimal importance).	Mining Act (Below 2500 m and in case GT is exploited without water abstraction), or Water Management Act (exexploitation of GT by abstraction of thermal water down to a depth of -2500 m). In both cases GT is in state property	N/A (Geothermal Development Bill under development in Ireland - EA Water Abstraction Licensing **may** be used in N. Ireland)	National and local resource ownership is regulated by the **22/2010 Legislative Decree and the Civil Code** (art. 826), ownership of small local utilizations is regulated by the **152/2006 legislative decree and the Civil Code** (art. 826)	Water Act for resources below 100m: permit required but once produced ownership is transferred to concession holder/Mining Code for resources below 500 meters	The **constitution** and the **Geological and Mining Act**	The geothermal resources are regulated by Romanian Constitution, Mining Law no. 85/2003 and the implementation norms No. 1208/2003. All of them are regulating deep geothermal waters (normally at > 100m). For GSHP applications (shallow geothermal) there are NO specific regulations regarding the ownership. The applicable laws are Water Law for open shallow geothermal technology and <100 m depth and Mining Law for > 100 m depth. The main authorities are the National Agency for Mineral Resources – ANRM for > 100 m depth; and National Authority "Romanian Waters" for < 100 m. The open shallow geothermal applications are mainly treated as any other water supply for consumption use application. Environment permits are requested in all the cases. In deep geothermal applications, small private users only notify the authorities. The licenses are requested and issued for large commercial projects. The royalty due to state budget is set by Mining Law at 2% of the value produced. The law also provide specific taxes for prospecting, exploration and exploitation of geothermal waters. The prospecting tax is a fixed value per square km and the authorization beneficiary reports at every 6 month the prospecting progress. The exploring tax is also a fixed tax per square km, become double after 2 years and five times bigger after 4 years. The exploration license is acorded only to the winner of a public offers contest organized by ANRM for 5 years with a possibility to prolong with 3 years. The exploitation tax is also a fixed value per square km payable yearly, in advance. The exploitation	Mining Act and Water Act. The main emphasis is on preserving good water and water ecosystems conditions. The regulation is deficient.	Slovak Act on Poweer Engineering no. 251/2012	No specific legislation for geothermal energy ownership, this is licensed currently under water legislation by the Environment Agency
GT resource ownership	The geothermal resources are executive government property.	State	State - Not landowner	State	State - Not landowner. No royalties are due.	State	Not addressed - seen as a major issue in the development of GT regulation	National and local GT resources belong to **"mines" category, unavailable heritage of the Italian State** (the national) and of the **regions** (the local); small local utilizations are underground resources, belonging to **groundwater category, unavailable heritage** of the **Italian State**	See above : State, Mining Code for > 500 meter, however, geothermal energy is not seen as a natural resource within the Mining Code like coal, oil and natural gas	Geothermal resources – both deep and shallow located **below 3 m** below surface level (bsl) belongs to the **state treasury** (and it is regulated by the Geological & Mining law). **Shallower** geothermal system (less than 3 m bsl) **belong to the owner** of the property /ground) and are regulated by Building Law (procedures are more simple)	The State for deep geothermal. Geothermal waters are considered mineral resources. NO specific rules for shallow geothermal.	State	State	Not defined - needs to be addressed through dedicated legislation
Complexity of permitting and development process	1. Application form with: - estimation with report according NATURA 2000; - technical project for joining; - description of necessary water capacity; 2. Introdusing the full documentation for agreement of parameters of water taking. 3. Public introducing of procedure for editing of permit; 4. Edition of permit; The permitting phase is described in Water act. The local basing directorate is responsible body.	Easy for shallow geothermal. For deep geothermal the regulations are more complex with legal gaps, legislation not focussed on geothermal	Complexity mainly due to federal structure	Straight forward	The file to be realized is not complex but heavy and costly because of environmental issues to be treated before public inquiries.	Rather complex with legal gaps and collisions. Permits for water abstraction - Green Authorities. Permits for DH system operation: Hungarian Energy and Public Utility Regulatory Authority (responsibel for the entire regulation of District Heating) www.mekh.hu	N/A but regulation of other natural resources is streamlined for exploration but can have delays in exploitation	**Complex and changing region by region**. The national legislation concerning the technical and administrative procedures for issuing GT research permits is fragmentary and out of date. Moreover too many offices and authorities involved make this phase complex and long lasting. The permitting phase may last more than 3 y, from the ready GeoDH technical design to the launch of its building sites.	Complex but high quality: complexity mostly in relation to subject matter; some oddities	**Moderate since 2012** (see also point 11) : new G&M Law introduced several simplifications and shortenings of procedures, specially 1-step licensing procedure – only for exploitation issued by the Regional Marshal (earlier: licenses both for exploration and exploitation issued by the minister of environment). **Also – less and lower fees and royalties, no fee for geothermal water exploitation** (by 31 Dec 2020)	Easy for shallow geothermal exploited with GSHP – only from water and environment authorities. Taxes are not prohibitive. For deep geothermal the regulations are more complex; only for certified companies qualified to obtain exploration / exploitation license given by the National Authority for Mineral Resources - ANRM. Exploration licenses are given for 5 years (with a possibility to prolong with 3 years). Exploitation licenses must be approved by the Government. The duration is 20 years with the possibility to extend 5 years (successively). The taxes are regulated by article 44 and 45 of Mining law and yearly updated.	Easy for shallow with heat pumps. Complex for deep with concessions.	Rather complex with significant obstacles	The EA water abstraction legislation and permitting system is not particularly complex, however license is granted on a tiered application process with the 1st stage being a conceptual model completed in advance of exploration. This model required to be updated to Tier after drilling completion and testing of the first well. The final tier and license is completed when both wells are completed and tested.
Permits and **authorities** responsible for issuing authorizations for low enthalpy GT fluids **Exploration**	It is the same as above.	- No permit required, only statement of County council, exploration must be carried out by the authorised person - EIA not required for exploration		For shallow: Approval from municipality. For deep: Approval pursuant the subsoil act from the Danish Energy Agency.	The permit required is the same from 100m depth to deep drillings down to 6000m.	Water Authority: Preliminary Water Permit for exploration	This is a significant barrier in Ireland at present as there is lack of clarity of permitting requirements (shallow or deep). Where an abstraction license is required (generally the case for most larger schemes) applications are to the local authorities	**Exploration permit:** It allows to perform all the activities for the determination of GT resources on a specific area and it requires to demonstrate adequate **technical and financial capability (e.g. bank guarantee)**, a **work plan** and **EIA** if required by a previous EIA screening. Maximum surface of each permit: **300 km^2**, up to a total of 1000 km^2 at regional level and 5000 km^2 at national level. **Unique Authorization:** for small local utilization; plants < 1 MW are excluded from EIA screening. Authorities in charge for the administrative and vigilance functions: **Italian Regions or other delegated authorities** (e.g. Provinces)	Since 1 July 2013 an new regulation is in force called Regulation soil energy, with mapping as ain purpose. Municipalities are in charge for the legal procedure of permitting.	**Since 2012 permits for geothermal water exploitation only** (more simple decision for exploration stage) issued by the Regional Marshal, While **exploration is a subject of approval on a basis of Project of geological works** by the Marshal	For low enthalpy geothermal waters the applicable provisions were presented in the previous lines. Shallow Geothermal energy applications (low enthalpy energy in GSHP applications) are not regulated by specific and detailed lows and norms.	Needed permits are: Water permit and a concession (issued by Agency for environment).		Environment Agency (EA) - Water Abstraction licensing System
Total overall Administrative **time and costs** for **Exploration** phase permitting	1-2 years is the administrative time. The cost is depending of water necessary, location of the drill, water quality and etc. It is impossible to put some average price.	Several months or more	Several monthrs or more	Up to 3 months.	Dependingon the level of expertise of the administartive staff of each region, the duration is in months	3-4 months, ~200€	Est. Based on planning application and EIS requirements on minimum 3 months (not including additional possible permits covering abstraction, discharge/re-injection)	**max. 240 days** but it could be longer, mostly for the environmental assessment; It lasts 4 y plus 2-extension y. Maximum annual lease for exploration permits: **325 €/km^2**, but it may be updated annually at national level, regions may also decide lower leases; Need of a **bank or insurance guarantee** for the environmental recovery.	7 months excluding file preparation	For exploration phase total administrative time is ca. half of the year (**6 months**). The fee for issuing the decision (approval of the project of geological works – drilling) is 10 PLN (**ca. 2.5 Euro**)	3-12 months for deep geothermal (authority ANRM). Less for shallow geothermal (authority Romanian Waters and local Environment authority).	1 year	About 1 year	planning and permitting for exploration work (other than drilling) is not required.
Standards for **drilling** wells and **installers** of GeoDHs or DHs	Drilling can be done only by certificated company.	- Construction & technical standards for installations - Legislation for geological works		No	There is a standard for water wells drillings which applies to geothermal wells too. The number of the standard is NF-X-10 999.	Separate drilling and construction technical standards	There are currently no specific standards available for GeoDH	**Drilling activities**: any specific standard, all rules in this regard are in 22/2010 LD	Project specific for wells and there is no (legal) framework for infrastructure	**No specific for GeoDH so far**. General standards and rules applicable in all other drilling and DH installation works are in use (G&M Law and related provisions, Health and Safety, etc.)	No specific rules or standards for drillers / installers for GeoDH or for geothermal heat exchanger in GSHP applications. In 2013 the specialization of GHE (ground heat exchanger) drillers was included in the national specialization file.	Ministry of infrastructure and spatial planning		No dedicated deep GT well construction standards - detailed standards from the Ground Source Heat Pump Association (GSHPA) for shallow boreholes & EA Geothermal Guidelines including decommissioning of deep and large diameter wells
Permits and **authorities** responsible for **issuing drilling authorizations**	The permition is issued by local basing directorate.	- not permits required for drilling, only notification to County council (for wells >30m notification to Mining Authority)	Requested for all drill holes > 100m	Deep GT: Approval pursuant the subsoil act from the Danish Energy Agency. Shallow GT: Municipality.	The administrative bodyin charge of issuing drilling permits is DRIRE for Ile-de-Fance and DREAL for the 21 other French regions. The permit is signed by the Préfet of the region. For temperature over 150°C the permit is instructed by the same administrative body but the authorisation is given by the Ministry of Ecology.	Mining or Water Authority (deeper or lower 2500 m.)	Currently N/A (for either shallow or deep in Ireland) - Unclear position in Northern Ireland but EA may be the required administration	Permits for drilling are part of the exploration and exploitation authorizations.	Central government/ coal authority is, under the Mining Act, responsible for the permit in case of wells below 500 meter. Wells below 100 untill 500 meter get their permit, under the Water Act, of the local Province. Wells above 100 meters need to be noted in a system which is organised by Municipalities, which can be seen as a spatial planning map of the subsurface. No permits are requested for the DHs on itself.	All geothermal exploration, including drilling phase are regulated by Geological & Mining Law and require the **approval of drilling /operation plan** by **Mining authority**	The drilling process is still under the incidence of the Environmental Protection Law for the storage and disposal of hazardous fluids (fuels, lubricants, drilling mud), as well as air and noise pollution. Permit included in the environment authorization. NO specific provisions for geothermal waters. There are some instructions since the 70'- 80' regarding geological research drilling. No special request for the certification of geothermal drillers.	Minning Inspectorate		Environment Agency (EA) - Groundwater Investigation Consent
Total overall Administrative **time** for **Drilling** phase permitting	1 year	not specified		Up to 3 months.	Depending on the region in between 6 and 18 months.	~12-14 months for Water Construction Permit	N/A Ireland - Estimated Min 3 months in N. Ireland	It is included in exploitation and exploration permits	Not specified	**7-14 months**	Duration not specified (as long as it takes).	Length not specified	Dependent on applicant	This requires planning in the UK and there is no fixed statutory time
Drilling costs	**The cost is depending of water necessary, location of the drill, water quality and etc. It is impossible to put some average price**	Administrative costs are standard	High costs	High	High costs	High costs	High costs	**High costs**, depending on the depth and on the type of rocks: medium costs in soft rocks and clays. Possibly decreasing by using double headed systems in overburden soils. Because of a geological risk insurance scheme doesn't exist, it can result in failure.	High costs. In several geothermal wells some dissolved natural gas was found (in small quantities). However as far as safety precautions are concerned, the standards are similar to gas wells.	Fee for approval the **Drilling plan**: 505 PLN (ca. 126 Euro) (for orientation: approval of Geothermal **water exploitation plan**: fee 835 PLN (ca. 209 Euro)	Rather high and expected to increase. Usually few information about costs are public and transparent. In GSHP applications, the drilling cost is 15-25 Euro/m depending on depth and technology.	Due to difficult terrain and relative low GT potential the costs are expected to be high. But there are no reliable estimates.	High	High costs
Permits and **authorities** responsible for **issuing authorizations** for the **Exploitation** of low enthalpy GT resource	. Application form with: - estimation with report according NATURA 2000; - technical project for joining; - description of necessary water capacity; 2. Introdusing the full documentation for agreement of parameters of water taking. 3. Public introducing of procedure for editing of permit; 4. Edition of permit; The permitting phase is described in Water act. The local basing directorate is responsible body.	- EIA (issued by Ministry of Environment) for industrial exploitation only - For small installations: permit of Building Authority (Water Bureau if groundwater withdraw)		Deep GT: Approval pursuant the subsoil act from the Danish Energy Agency. Shallow GT: Municipality.	Exactly the same as for exploration. If the result of the well is closed to the anticipated power to be produced, there is no need for a new application and the exploration permit is transformed in an exploitation permit (between 20 to 30 years).	Water Authority: Water Operation Permit	Currently N/A (for either shallow or deep in Ireland) - Unclear position in Northern Ireland but EA may be the required administration (through the Water Abstraction licensing process)	**Mining Lease:** it allows to perform all the activities for the exploitation of geothermal resources on a specific area and it requires a **work plan** and **EIA** if required by a previous EIA screening. **Unique Authorization**: as above mentioned. Authorities in charge for the administrative and vigilance functions: **regions or other delegated authorities**, in agreement with the opinions of the Ministry of the Economic Development and the concerned Municipalities	Ministry of Economic Affairs for projects under Mining Code (below 500 meter)/ Provinces for projects under Water Act (100-500 meter)	Since 2012 permits / **licenses for geothermal water exploitation are issued by the Regional Marshal** (by 2012 by the minister of environment)	See line 12.	Needed permits are: Water permit and a concession (issued by Agency for environment). If the heat is not extracted by water (ground heat pumps) a permit in line with the Mining act is needed.		Environment Agency, (UK & N. Ireland). Coal Authority (UK) - DETINI GSNI for Northern Ireland
Total overall Administrative **time and costs** for **Exploitation** phase permitting	Average time - 2 years. The cost is depending of water necessary, location of the drill, water quality and etc. It is impossible to put some average price	- Several months or more depending on project - Small installations: standard costs - Industrial exploitation: high costs	Several monthrs or more	Up to 3 months.	Depending on the region - in between 6 and 18 months.	14-16 months, ~4000€	Unclear at present	**max. 220 days** but it could be longer, mostly for the environmental assessment; The request of a mining lease can be submitted after a maximum of 6 months from the recognition of the identified GT resource by the competent authority and it lasts 30 y. Maximum annual lease for GT exploitation: **650 €/km^2**, but it may be updated at national level; regions may also decide lower leases; Need of a **bank or insurance guarantee** for the environmental recovery. Usually **38 months** is the total average time to obtain all permits (exploitation, exploration and EIA)	7 months excluding file preparation	**1-1,5 year. Costs depending** of mining area boundaries plus 150 € for administrative permission costs	3-12 months	Very case specific. Relative long time is expected.	18-24 months	Min 6 months for necessary permits / does not include the time related to planning and EIA for the drilling operations and plant construction - Modest cost
Legal obligation for **Re-injection** of GT fluids	Condition of Re-injection is part of permit of using the each drill. There is no common rules.	yes, Water Act No. 254/2001 Coll., - extracted groundwater must be returned back in the same aquifer	No, based on case by case for deep Geothermal resource	No, but discharge not an option due to environmental legislation.	There is obligation to reinject. Some exception if the water is tap water and if the temperature is below 30°C. In that case a file is neede to evaluate the impact of this discharge on the environnement.	No general obligations for re-injection, from summer 2013 based on individual decision of green authorities	No legal obligation as such for re-injection but permits required for either re-injection to and aquifer or treatment and discharge both in Ireland and in N. Ireland	**NO**, not at a national level. Reinjection is alternative to surface disposal, for which the purification is mandatory. According to the decree 22/2010, previous GT implementing decrees and regional regulations, reinjections are authorized by the competent authority (regions or their delegated authorities).	Legislation under the Mining Act is based on exploration of natural resources. This means that the netto effect must be neutral of more energy needs to be extracted from the soil that re-injected. Storage is, officialy, not allowed under the Mining Act, as far as the balance is kept.	**No one general legal rule regulating this issue exists.** Recommended in many cases, individual decision are given for particular cases	For deep geothermal - Only if production (abstraction) is above the approved annual average flow rate, or if surface disposal is prohibited for environmental reasons. Otherwise the re-injection is not compulsory. The royalty calculation does not depend on the re-injection of GT fluids.	There are two legislation acts that regulate the exploitation fees (water act and mining act) and there are also several regulations which regulate the environmental tax. The terms for the thermal water concessions according the water act are still in preparation. One of discussed possibility is that concession should be proportional to extracted water quantity and to heat quantity that could originate from thermal water that would cool down by conduction in the environment with the constant temperature of 285 K. This potential energy pproach is being introduced.	Yes if there are environmental constrains on the surface	No legal obligation for re-injection per say - requirement for Discharge licensing application (surface discharge or re-injection to aquifer) with strict requirements for Hydrochemical parameter submission (this can be sometimes difficult in areas where little or no information is available on fluid chemistry prior to drilling the first well)
Technical standards or guidelines for GeoDHs or DHs designers and builders	Regulation 15 for design HVAC systems	- No specific standards for GeoDHs do exist - Construction & technical standards for installations;		No, but guidelines are being developed.	No special standard for geothermal district heating because no circulation of the geothermal fluids.	Separate drilling and construction technical standards	N/A	Technical standards to obtain **White Certificates** for DHC systems and DHW production by DH; **European Technical Standards** for Design and installation of preinsulated bonded pipe systems, valves etc., max heat consumption for end users, also considering further connections after the network construction; The **AIRU** (Italian Association for the Urban Heating) **technical guidelines** on plant design, installation, setup and test and other technical specifications	No	Geothermal installations operating in Poland often supply heat to the already existing district heating systems in the consumers' buildings. There are not the systems designed and implemented from the very beginning in order to use geothermal energy ! this is one of the major problem of geothermal energy uses' projects taking into account the Polish reservoir conditions (temperature of geothermal water up to 85°C). Large district heating systems are often designed for the typical	No	There are no such standards available.		Good Practice Guide 377; & UK District Energy Association (UKDEA) technical guidance with many guides currently in planning.
Permits and **authorities** responsible for **issuing authorizations** for **DH network building**	Permit from municipality, the permit is issued by city architect, Coordination with utility company.	Building Authority		Approval pursuant the Heat Supply Act from municipality.	No special constraint. The law is the same as for buildings and road construction below 20 MW.	Hungarian Energy and Public Utility Regulatory Authority (responsibel for the entire regulation of District Heating) www.mekh.hu	Local Councils	**Provinces**: for any roads interruption and/or diversion during the construction; **Commission for the Architectural and Landscape Heritage**: opinion for landscape and architectural constraints; **Commission for the Archeological Heritage**: archeological constraints, it constantly monitors the building works; **Civil Engineering Office**: geological and hydrogeological constraints, derivation and use of public waters, compulsory purchase; **Municipality**: changes in urban code and in other municipal planning tools; Positive opinions of: **public utility** (e.g. Integrated urban water manager companies) and **local health centre**	Municipality under the Construction Act	For the design of district heating and district heating plants needed are design certified by a duly authorized industry (construction license for the design of sanitary installations: water supply, gas networks, sewer systems, heating and air conditioning systems). **There are not special certification** just for designing of district heating.	The local authorities that manage DH in their area (RADET in Bucharest) under the coordination of Autoritatea Nationala de Reglementare pentru Serviciile Comunitare de Utilitati Publice (National Authority for Community Services and Public Utilities Regulations).	Ministry of infrastructure and spatial planning, Energy Agency of the Republic of Slovenia. A concession is needed for systems above 1 MW.		Local Councils
Total overall Administrative **time and costs** for **DH network building** phase permitting	The administrative time is not specified into the law. Usualy the admistrative time is about 1 year. The cost is specified in each municipality by city council.	Several months or more depending on project		From weeks to years (in very complicated cases) - normally 2-4 months	Less than 4 months.	4 months, ~1000€	Dependant on the size and extent of the scheme	An unit value price (e.g. per MWt) is **difficult to establish**, since building costs per unit value increase with decreasing load of users per network km.	Depends per project/no guideline	**6 months/ca 100 €** for administrative permission costs	Not specified. No information. Each case is a unique project.	No information		Dependant on the size and extent of the scheme
Tresholds above which a **screening** for **EIA** is required for **DH systems**	Pipeline system and heat exchanger have to pass screen for EIA. First step is investigation of ncesery to pass EIA. Depends of the result from this report it is possible two variants – 1. It is not necessary to pass screen for EIA; 2 Have to pass screen for EIA.	Pipeline system longer than 5km and diameter above 300mm		DH networks are normally not the subject of an EIA unless situated in environmentally sensitive areas. Production units including GeoDH plants are subject to an EIA.	NA	EIA has to be prepared for activities that include thermal groundwater abstraction exceeding 5 million m3/year, or re-injection of 3 million m3/year, or in all cases where thermal groundwater exploitation from karstic aquifers exceeds 500 m3/day, or 2000 m3/day from porous aquifers	n/a	An EIA screening is **always required for geothermal projects** (exploration and exploitation). The study mainly concerns the **external heat exchanger** and **main pipelines**.	Depends per project/ no regulation for heating and cooling infrastructure	**Above 1000 m.** Work with use of explosives	Always	Always		Dependant on the size and extent of the scheme
Tresholds above which a screening for **EIA** is required for **drilling wells**	Drilling wells have to pass screen for EIA. First step is investigation of ncesery to pass EIA. Depends of the result from this report it is possible two variants – 1. It is not necessary to pass screen for EIA; 2 Have to pass screen for EIA.	Tresholds are not exactly specified, defined as "deep geothermal boreholes"		Allways.	NA	Included in EIA for DH systems	N/A	Small local utilizations (for < 1 MW plants) with wells < 400 m and borehole heat exchangers are **excluded from EIA screening**. EIA for drilling wells is **part of the above mentioned permits** for explorations and exploitations. As for the other authorizations, the authority in charge for the assessment are the regions	No treshold for wells > 500 meter depth. The ministry decides on the necessity of EIA in the permit letter.	**Above 1000 m**	Always	Always		Dependant on the size and extent of the scheme - generally deep geothermal wells other than for research purposes require planning permission. EA requirement will be dependent on the size of the scheme, it's location and strategic local importance.
Lack of **qualified specialists** in the sector of GeoDH	Generally there are very few deep drilling specialists and in particular there is a lack in deep drilling specialists for geothermics. Designers have not experience for design such a system. But designers have experience to design DH systems.	- Lack of administrative expertise in geothermal development in general and in GeoDH in particular - Very few geothermal specialists, particularly for deep drilling	Yes, there is new academic eduction as in Aachen, Bochum, Karlsruhe, Mainz and the Drilling School in Celle is expanding. Still lack in all other fields	GeoDH is still under development with just 3 plants commissioned in a period of nearly 30 years, so there is a natural lack of qualified specialists.	The expertise is in the hands of 5 to 6 engineering companies and 4 to 5 utilities which are used to running GeoDH plants for more than 30 years.	Partly true. There is geothermal special enginneer education, but only few well educated specialists.	Limited in Ireland and N. Ireland	Yes, mainly due to a greater deficiency of a lobbying in DHs sector, compared to other RES. This implies the use of applications developed for other sectors. The few existing DH specialists, have high expertise	starts to become a possible constraint	**Sufficient** availability of qualified specialist in GeoDH sector	Lack of specialists with lobbying capacity. Lack of administrative expertise in geothermal development in general and in GeoDH and GSHP in particular. Lack of medium and long term planning. Lack of financial resources at national, municipal and private level. Lack of state-private partnerships. Incomplete legislation. Lack of trust. Lack of middle and long term visions and strategies. Lack of predictability.	Lack of administrative and practical expertise in geothermal development, Lack of enough free financial resources - state, municipal and private	Yes, it is a problem due to the small sector	Sector in infancy - a problem
Average **technical costs** for exploration / drilling / use of GT resource / building of DH network	The main technical cost are for: Drill, heat exchanger, heat pumps, pipeline system, compressor station and etc. The most expansive is drilling processes but there are a lot of already drilled sources with free capacity power for using. Pipeline is also very expensive average price is 800 EUR per meter (all necessary works are included). Compressor, heat exchangers and heat pumps very varied from the power and other different parameters. The average price for GeoDH system can be 2500 – 4500 EUR/kW.	Depends on the project extent		GeoDH plant (doublet): MEUR 20-35 including exploration, construction and commissioning.	Drilling and geothermal loop : an average of 1,2 million € per MWth installed. For DH itself (including central station and back up) if to be created: between 1 to 2 millions € per kilometre.	~0.5-1.5 M€/MWth	??	Technical costs depend on the drilling costs and the applied technologies: direct use of hot water/steam or borehole heat exchanger, use of heat pump, size of the network, etc. For a 5,5 MWt GeoDH: 80000 € total exploration costs, 500000 € DH network designing costs, lease for the exploitation of the GT resource are calculated according to the geothermal law (22/2010 LD)	Depends on the project and its specific elements	It often happens that the most expensive cost-element is the heating system of pipelines. The cost of the double pipeline calculated to the 1 m length (supply/return) depends on the diameter and utilities in which pipelines are laid. For the initial calculations and diameters of 100 mm and cost of laying a pipeline pre-insulated can be estimated at around 360 Euro/m (with tube and its laying).	No information. Few application. Not public. Each case is a unique project.	Scarce information. Very case specific.		Drilling c. £4.4M to £4.8M for 2,500m / other exploration costs
Prices and rules for calculating **tariffs** for the supply of heat/cool to the **end user**	The price is depending from investment cost, geothermal water price, salary cost and exploitation cost. The invstement cost are descbed in #27. The geothermal cost are depend from water temperature: t<=30°C, the fee is 0.15 BGN/m3 30°C< t<=50°C the fee is 0.35 BGN/m3 t>50°C the fee is 0.50 BGN/m3 Average salary in Bulgaria in the DH fields is about 600EUR/mount. The average exploitation cost is 3-5 EUR/MWh	Price and rules specified by Energy Regulatory Office		According to the Heat Supply Act only 'necessary costs' can be included in the price.	NA	Maximum heat price is determined, but it is high enough, doesn't relates to GeoDH	N/A	A **specific regulation doesn't exist**. Tariffs are proportioned to the heat use and are **usually** established equivalent to those to pay using the **same heat produced by natural gas**, more avoided costs for DH users: boiler replacement, maintenance, mandatory checks, etc. In addition, users have to pay a **one-off connection fee** to use the DH service. If geoDHs are coupled with a GT power plant, tariffs may decrease a lot. Fiscal and commercial rebates to DH customers are listed in "*economic tools to support geoDHs*".	Prices in heat Act/rules for calculating based on users of natural gas	In the setting of tariffs for heat billing (Polish geothermal systems only provide heat for hot water and central heating) from geothermal sources, the general rules for the sale of thermal energy market are applied. According to the regulation of the Polish Energy Law all installations with capacity above 5 MWt have billing tariffs approved by the President of the Energy Regulatory Office (URE). These tariffs may be adjusted annually if there is a change of reasonable costs (qualified) manufacturing or distribution of heat. Tariffs must be socially acceptable /main assumption/.	The price level is set in the negotiation phase between the investor and the state (National Authority for Energy Regulations). According the initial contract in Beius case for example, the state imposed in 1997 a fixed price at the consumer that the company should keep constant at least 15 years. In fact the price was adjusted in 2010 (due to the increase of royalties) and in 2011 (due to the increase of VAT). The price in 2012 was 80 RON / Gcal = approx. 18 Euro/Gcal. This is so far the lowest price for thermal energy in DH in Romania.	Regulated prices above 1 MW. They have to be based on actual costs. Systems below 1 MW can operate freely on the market.	Based on the Regulatory Office for Network Industries	
Average payback period	10 years	Estimated payback period above 10 years		Varying, estimated >10 yrs.	15 years without subsidie and less than 12 with ADEME support.	~8-12 years	N/A	**15 years average**, but it may vary a lot (up to 30) depending on the characteristics of the territory and the distribution of the heat demand: it increases in low thermal load density areas (e.g. countryside) and decreases if productive or commercial activities are connected to the network	Varies per project (capex/opex).	**Depends on the size of GeoDH investments**, capacity, scope and complexity of works, ca. **10 – 20 years**	N/A	10 - 15 yrs	10 years	**Depends on the size of GeoDH investments**, capacity, scope and complexity of works, ca. **10 – 20 years**
Economic **tools to support** GeoDHs	The economic tools are: Operative program Regional development. The subsidy of can be use from municipality. The grant is between 70-100%. The program is available for big cities in Bulgaria, More than 80 000 citizens. Rural program for development - The subsidy of can be use from municipality. The grant is between 70-100%. The program is available for small cities in Bulgaria, Less than 80 000 citizens. Norway program – The subsidy is available for all BG municipality. The grant is 90%. The program is especially for change of fuel base. There are special grant sheme rules by several Bulgarian banks. The grant is 30% for geothermal plants.	Operational programs		N/A	VAT at 5,5% instead of 19,6% if a minimum of 50% of geothermal energy in the DH.	GeoDH project grants exist	None available	**Tools are mainly for end users. National guarantee fund** for investments in DH networks (yet **to be implemented**), **20% tax credit** for investments in DHs, **White Certificates** (noncumulative with other government incentives), other **regional incentives and funds. Fiscal and commercial rebates applied to final users**: up to 0,0258 €/kWh tax credit, 10% VAT on energy consumption and connection works, 20,656 €/kWt contribution for grid connection, 55% refund of grid connection costs as income tax credit (refund in 10 years).	None	As given in pts. 5-6. But **no support for production stage** (i.e. no green certificates, no FiT) and no support for the users	No	Grants and Low-interest loans can be acquired.	Tools provided by banks are very poor	n/a
Specific provisions on the **ownership of GeoDHs plants**	There are "natural monopoly" of existing DH network. The most of DH network is owned by private company. There no obstacles to build up new DH network.	No		No	NA	none	N/a	**Missing**. Usually geoDHs are owned by municipalities and its management is entrusted to public or private utility companies or to municipal management companies	Exclusive right of ownership in Mining Act with the exploration permit	**The nature of DH network ownership may represent a concern since it is a "natural monopoly".** District heating is often owned by those involved in distribution. The owner or co-owner of these companies can be local governments, businesses or individuals. Many companies involved in the production and distribution of thermal energy are among the co-owners of local DHs. In 2010, the owner of shares in the public sector heating had about 51% of the shares (based on the www.pwc.pl available in August 2013).	No specific provisions, but in Romania the DH systems owned by the state were transferred to local authorities together with the DH networks. These networks are exclusively public. At the same time all of them are very old and in a advanced wear. The public-private ownership are not very extended in general and in DH in particular because of the lack of predictability of the legislation. The DH network ownership represent indeed a "natural monopoly" of the state.	No		n/a
Specific provisions on the **kind of service offered** by GeoDHs (private, public, or public service farmed out)	There no specific rules concerning heat delivery.	No		Heat Supply Act	NA	none	n/a	**Missing**, the Competition Authority is carrying out a survey to better understand the kind of the offered service, since DHs are not subject to regulations for the conditions of supply of the Authority for Electricity and Gas. After this survey, the Regulatory Authority for Electricity and Gas should be responsible for the functions of DHC regulation and control, especially as regards competitiveness matters	None	**No**	No specific provisions excepting these described in line 28.	No		n/a
Lack of a **dedicated office** for provision of clear and expert information on permitting process and independent assesment of the project for the benefit of the local granting authorities and to define governetive policy for GT and GeoDHs	There are professional associations of Design engineers, DH companies, and geothermal engineering companies. The associations can help with expert information on permitting process and independent assessment of some project.. The government policy is define only in National plans. The government is support the developing of GeoDH trough operative programs. The obstacles from government is coming from Ministry of environment because the experts from ministry thinking the GeoDH can pollute the geothermal water.	There is a lack of a dedicated office for GeoDH. (except of Czech geothermal Association and Czech Heat Pump Association dealing with geothermal in general)	N/A, Germany has a strong geothermal community and is well organized. There seems no need for a central office. Policy consulting is organised.	DEA provides information on permitting process. Consultants provides assessment of project.	NA. The administation is strongly organised and based on a very clear Mining code. French utilities + organisations of profesionnals are OK. An existing CNG (National Comittee for Geothermal energy) is already existing since september 2010. No special need for other bodies.	no dedicated mechanism	No dedicated mechanism in Ireland or N. Ireland (with the exception of Geothermal Association of Ireland)	**Missing for geoDHs**. The **Italian Association for the Urban Heating (AIRU)** is the most important Italian association in DH sector. However there is still **a need to networking** among different actors involved in DHs field, and consequently in that of geoDHs	No, Ministry of Economic Affairs and Provinces	Such independent office / professional service (at least at regional level) will be v. useful. Also – electronic information / advisory help-desk	No dedicated office. If asked, the Romanian Geoexchange Society (for GSHP applications) and some universities (especially Oradea University) can offer information and consulting. The National Authority for Energy Regulations covers the entire energy domain, including thermal energy, renewable sources, district heating a.s.o.	No dedicated office	Yes, it is true	Yes, a problem (some representation of the sector through the Renewable Energy Agency (REA) - Deep geothermal sector Group)
Availability of data about national low-enthalpy GT potential	Each local Basin directorate have data of GT potential. In Ministry of environment there are a register of GT sources.	- Available thermal data from borehole well logging - Geothermal maps of potential and possibility of geothermal energy use		More detailed maps and webtool are being developed.	BRGM (Geological French Survey) has edited numerous maps covering the main zones of development. Drilling data are available immediately. A corresponding data base organised by the Ministry of Ecology and driven by BRGM allows the consultation on line through a devoted data base (Infoterre) to get all the information registered, including tests, loggings, technical and geological cross section of the well.	Available	Partly available as All-Island geothermal temperature atlas - additional data on low enthalpy resources being compiled for Ireland	Temperature measurements are publically available in databases available on websites of the Ministry of Economic Development and of the National Research Council's Institute of Geosciences and Earth Resources; good coverage of GT potential at national level	Available but sometimes a specific case study	**Regional and general data available** (data bases of the Polish Geological Institute, some other bodies). **Publicly available** in a set of regional atlases of geothermal conditions/resources for ca. **80% of the country territory**. More detailed information existing also for several smaller areas, counties and localities	The values presented in NREAP regarding the geothermal potential (Table 1.2.) are 7*10**6 GJ or 167 Mtoe. These figures occur in different documents in the last 20 years. The reality is that the authorities didn't initiate a sound research in order to clarify these inputs. This is a barrier for new and large investments.	The data is scarce and mostly unverified.	Good, mainly by National Atlas of Geothermal Energy	Extensive datasets availaby through the BGS with regard to subsurface information however not always specific to geothermal resources - more extensive information of shallow geothermal resources available.
Other **regulatory constraints**		In the Czech Republic, there is currently no unified legal/technical regulation dealing with geothermal energy sources and their use in transparent and comprehensive manner.		N/A	Nothing important, the main problem remains the duration to obtain the drilling permit.	_	Unregulated heat market in Ireland. No coherent renewable heat policy, No policy or consideration of Geothermal in RE strategy. No dedicated licensing system for deep GT resources, no support measures directly related to Geo or DH.	**Lack of a specific legislation on DH network** and **need to simplify the existing legislative framework**: too many laws, decrees, resolutions, circulars and procedures (often overlapping) cause confusion in the DH sector. Moreover the stability and growth pact and bureaucracy hinder public investments and tenders. Compulsory purchase procedures may delay works. Contemporary works of sewers renovation are often required for city centres and it may increase the overall construction costs.	Lack of an Act in infrastructure for heating and cooling/strong competition with natural gas	Tariff for heat and electricity must to be agreed with Energy Regulatory Office (no space for creating high incomes / profit for energy / heat producers). For other constraints, please seethe PAS Report from the WP3.1 Workshop in Krakow, march 2013	Lack of specific regulations, laws, standards, methodologies, procedures. High construction and drilling costs; Lack of continuity and predictability in strategies and incentives area; unbalanced spreading of deep geothermal resources on the Romanian territory; low level of market knowledge and demand in shallow geothermal sources; lack of enough experienced specialists, Lack of founds for pre-feasibility studies for promoting purposes; Lack of experience and trust in public – private partnerships; The fact that the price of thermal energy produced in DH systems (using natural gases) is partially covered by local authorities – in Bucharest 50%. In this case, even if the price for population is high, it is yet affordable. The future does not seem to be a serious preoccupation for local and national authorities.	High bureaucracy and decision making based on political reasons and not techno-economical.		Lack of dedicated licensing system for deep geothermal energy resources - Lack of central government policy on district heating - lack of role of definition of local authorities in the development of DH schemes. - N. Ireland current policy leaning to favouring gas in areas where geothermal potential is identified.