D.5.5.1. Regulatory frameworks in DARLINGe partner countries

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Contents

1. Introduction

The uptake of the rich, but still untapped deep geothermal resources in the Danube Region, and especially on the territory of the DARLINGe project is largely hampered by non-technical barriers. The fragmented regulatory framework for the exploration and exploitation of geothermal resources, the long and unclear licensing procedures, the non-harmonised water and mining sector requirements often delay projects or demotivate potential investors.

So far many EU-funded projects prepared overviews on regulatory issues (e.g. GTRH, Geo-DH, T-JAM, Transenergy, Geothermal-ERANET) and prepared various recommendations. Learning from these experiences DARLINGe project aim was to provide an insight into the legal frameworks governing exploration, exploitation and production of energy from geothermal resources in DARLING project countries: Bosnia and Herzegovina, Croatia, Hungary, Romania, Serbia and Slovenia. The main objective of this report is to identify common and different regulations in geothermal energy in these countries to make optimal use of energy resources in compliance with the environment, population health and sustainable development.

In addition to providing an in-depth analysis of results of a questionnaire, filled in by all partner countries, this report also provides a summary on the licensing procedures with flow charts, as well as the list and contacts of the relevant authorities involved in the licensing procedures from each country. This information is expected to be of particular value to investors who intend to start geothermal developments in Bosnia and Herzegovina, Croatia, Hungary, Romania, Serbia and Slovenia.

2. Methodology

In order to provide a transparent and easy-to-assess overview of the rules and regulations governing geothermal development, a set of questions were pre-defined, especially focussing on problems of licensing. This questionnaire was largely inspired by the Geothermal Transparency Guide (https://issuu.com/bba3/docs/geothermal-transparency-guide_web):

1. definition of geothermal energy in the national legislation
2. ownership and access to geothermal resources
3. allowed exploitation (without licence)
4. role and voice of landowner in licensing
5. criteria for granting a license
6. duration of licenses and renewal
7. terms/contents of licenses
8. termination and revision of licences
9. regulatory and information obligations
10. heat purchase agreements

11. environmental impact assessment (EIA)

12. other licenses

Some of the questions have been divided in 2 to 5 sub-questions, in order to better understand the various geothermal legislation aspects in the project countries. This questionnaire (Annex 1) was filled in by all partner countries.

3. Summary evaluation of geothermal legislation in project countries

Each country answered the questionnaire (Annexes 2 to 7). The main conclusions are presented below.

1.1. Is there a definition for geothermal energy/thermal water in the national legislation? If yes, what are the criteria?

In most of the countries involved in the project, the notion of geothermal energy is defined in the Geothermal Energy Regulatory Framework Act, namely the Mining Act. In some of the surveyed countries, the notion of geothermal energy is exemplified and detailed in the Water Law, the Law on Water Management and Mining Authority, the Energy Law, the Energy Development Strategy (see Energy Development Strategy of the Republic of Croatia – Annex 3), as well and in the Law on Renewable Energy Sources and Cogeneration.

2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?

In all the surveyed countries geothermal resources (as part of "mineral resources") belong to the State. The use of geothermal waters by private parties or private persons is made in accordance with the provisions of the concession law of that country, by selecting the most favourable bidder in the public tender. In the project countries, the competent authority for the management of concessions for geothermal waters is the Mining Authority or the Water Management Directorate. We have to emphasize that the phrase of "concession" is equivalent of "licensing", except for a special case in Hungary, where concession is valid for exploration and exploitation from a depth below 2500 m, above that production of thermal water is based on a water licence.

In *Serbia*, for example, private entities or private individuals can use geothermal energy by acquiring the necessary permits. The first step is to obtain approval for geological exploration. The applied geological exploitations of mineral resources and other geological resources are made on the basis of the Decision approving the geological explorations issued by the Ministry at the request of the company or other legal entities and entrepreneurs. The second step is to obtain certificates of the determined and classified resources and reserves, and the last step is the approval to determine the area and amount to be tapped.

2.2. Who can grant access to geothermal resources, only State or also landowner?

As seen in all the surveyed countries involved in the project, the geothermal resources belong to the State, and the access to them is done by the State through the authorities empowered in this respect, namely the Water Management Authority in *Hungary*, or the mining authority through the departments under a concession contract. The private individual/entity must have the right to use the land by making a request to the entity authorized by the State to allow the use of geothermal waters.

2.3. Is exploration/exploitation open to foreign investment?

All countries allow exploration and exploitation of geothermal resources in the form of foreign investments under a concession contract and obtaining the right to carry out mining activities. Exploration License and Licensing Agreements shall be granted by the competent authority for geological exploration. To be specified: the Exploration License and Licensing Agreement in *Hungary* must be drafted in Hungarian. In *Slovenia*, a specific condition is that the foreign entity wishing to conduct exploration and exploitation activities must carry out an activity in its own country under the same conditions or under similar conditions.

3.1. Is exploitation of resources subject to licensing/Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?

Exploitation of resources is subject to licensing in all countries. Non-licensed exploitation is possible in *Romania* under some conditions, according to the provisions of art. 29, (1) of the Mining Law no. 85/2003: "rocks usable in construction, peat and mineral waters located on land owned by individuals may only be used by the landowner, if they are not the subject of an existing concession and only for their own needs without the marketing right".

4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?

In all the project countries, there are regulations targeting the landlord's consent when granting a license for exploration, exploitation or heating.

4.3. Is it possible to expropriate a land from private owner for a geothermal project?

The expropriation of a land from a private owner is possible in all the countries involved in the project, mostly for the cause of public utility, in accordance with the legal provisions in force, and obtaining the necessary permits for the expropriation.

5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without groundwater extraction, with or without re-injection, etc.)?

In most countries, there are differences in licensing for different types of geothermal resources.

In *Hungary*, the regulations in place make a distinction between open and closed areas for geothermal resources. Open areas (above 2.5 km deep) are authorized by the Water Management Authority, closed areas (below 2.5 km deep) are mandatory and licensed by the Mining Authority. There are also different licensing steps for open (shallow geothermal energy) and close areas (deep geothermal energy).

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* the same licenses need to be obtained for all geothermal resources regardless of depths, utilization types, technologies, but only the monitoring is different and depends on utilization types of thermal waters that is under Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring (Official Gazette of Federation of B&H, no. 47/11).

In *Bosnia and Herzegovina - Republika Srpska* there is the same licensing procedure that does not depend on depth, usage, technology, re-injection, etc. Some differences are related to geothermal electricity production. But here there is no example/project with this type of use yet (despite the fact that there are prospective areas, for example Semberija).

In *Croatia*, there are two types of licenses: water concession for bottled waters and bathing water (balneology) and mining concession (for heating and electricity production).

There are two different procedures and permits in *Slovenia*: for exploiting geothermal energy in accordance with the Mining Law, a geothermal doublet (a pair of production and re-injection wells) with 100% reinjection is required. If the reinjection is not 100%, the license is also subject to the Water Law. Under the Water Law, licensing is possible without or with a partial reinjection, with the exception of groundwater bodies with poor or undefined yield. For the latter case, for newly licensed quantities, a 100% re-injection is mandatory.

In contrast, in *Romania* and *Serbia*, there are no differences in geothermal licensing.

5.2. What documents need to be submitted and what are the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant?

Regarding the documents and criteria for obtaining a license for exploration, exploitation and heating, it is clear that each country involved in the project has its own rules. The required documents and their contents vary a lot, so no common points could have been identified.

6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew them? If yes, for how long and under which conditions?

In each studied country, there are different regulations regarding the maximum duration of a license for exploration and exploitation.

Both *Romania* and *Slovenia* have in common the maximum duration of exploration license is 5 years. However, in *Romania* the license prolongation is up to 3 years, whereas in *Slovenia*, by the provisions of the Mining Law, the license may be prolonged only in case of major force. Also, by provisions of the Slovenian Water Law, the exploration license may be granted for a period of 2 years with a possible extension.

Also in *Slovenia*, a mining permit for a geothermal doublet according to the Mining Law for a period of up to 50 years or for water concession according to the Water Law may be applied for a period of up to 50 years with a possible extension. Typically, the latter are granted for 30 years.

In *Romania*, the maximum duration for exploitation is 20 years, with the right of extension for successive periods of 5 years. Under this law, the exploitation license holder will pay an operating fee and a mining fee per year. The holder of the operating license is a "financial guarantee for environmental remediation in accordance with the technical instructions issued by the competent authority".

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* for each program and project of geological exploration, the FBiH Ministry of Energy, Mining and Industry sets the deadline for performing geological investigations in Approval for geological investigations. The exploitation period is specified in the Concession contract and cannot be longer than 30 years except in special situations when it can be extended to a maximum of 50 years; the concession contract may be renewed for a period which cannot be longer than half of the first time contractual period. During the contracted concession period, the user must regularly obtain Decision on the verification of reserves every 7 years. A Water permit is issued for a limited period up to 15 years and an Environmental permit for 5 years. The validity date is not defined on spring protection.

In *Bosnia and Herzegovina - Republika Srpska* the start of the exploration is six months after the Ministry approves the exploration under the Geothermal Exploration Project. The duration of the

exploration may not exceed 3 years, but in some cases it may be prolonged for maximum half of the time stipulated in the Ministry's approval. Exploration could be continued after the concession contract has been concluded with the approved exploration field. The duration of the exploitation is defined in the concession contract and is maximum for the period of 30 years.

In *Croatia* the duration of an exploitation license is 40 years.

In *Serbia* the license for exploration of groundwater and geothermal resources has a duration of 2 years, with the possibility of extending the exploration period twice, the length of each extended exploration period being up to one year. For the operation/exploitation license, the period is up to 5 years, and may be extended. The holder of the operating permit for the use of geothermal resources shall be obliged to submit a study project to the Ministry, or to the competent authority of the autonomous province, every five years from the date of registration of the previously registered situation of the identified resources and of the geothermal energy reserves. Regarding the energy permit for the thermal installation, the duration may be for 3 years and its validity may be extended at the request of the holder for a maximum one additional year, by submitting the application for extension at least 30 days before the its expiry date.

Regarding *Hungary*, it was found that there is no maximum duration, but geological exploration must begin within 6 months since receiving the permit. The validity of the legal building permit for water is determined by the Authority and may be extended.

- Deep exploration (at depths greater than 2500 m) implies that the maximum duration of an exploration license within the lifetime of concession may not exceed 4 years and may be extended maximum two times, by half of the initial exploration period.
- Exploitation of shallow resources (above 2500 m depth) implies that the duration of the legal license for construction is determined by the Government Decree no 72/1996. The permit is issued by the water management authority and it may be extended.
- For exploitation of deep resources (below 2500 meters depth) the Concession Contract stipulates a period of maximum 35 years, which can be extended only once, with no more than half of the duration of the concession contract.
- In the case of heating installations, the duration of the permit for the construction of the heating plant is determined by the authority, and it can be extended with the same period as the initial authorization, but not more than 2 years. The duration of the heating authorization for operation is indefinite.

7.1. What are the general terms/contents of the license for: (i) exploration and (ii) exploitation? If different licences are existing (5.1.), then specify separately.

After studying each regulatory framework that targets the terms and general content of exploration and exploitation licenses from the countries in the project, it was noted that there are similar durations of the licenses in *Romania, Hungary, Republika Srpska* and *Serbia*. There are similarities regarding the license identification (name, address, etc.) in *Hungary, Federation of Bosnia and Herzegovina, Croatia* and *Serbia*, to which the internal procedures of the competent authorities for granting the exploration and exploitation licenses are added.

Otherwise, there are different regulations in the countries, which largely reflect the content of exploration and exploitation licenses.

7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses? If so, are there any conditions?

In the surveyed countries, the exploration licenses do not directly turn into exploitation licenses. Every country has its own procedures with different documentation.

8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes, under which conditions? Which actions are needed from the license holder? (e.g. increased amount of production)

In all cases, the license holder may request the review of exploration, exploitation and heating licenses.

In the case of *Romania*, to review the exploration, exploitation and heating licenses, the National Agency for Mineral Resources (ANRM) must agree.

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* licence holder have the right to ask for revision of licenses; they need to submit a request for change of license to the granting authority and provide the documents based on which it is possible to make decisions on acceptability of requested changes.

In the case of *Bosnia and Herzegovina - Republika Srpska*, the exploration license review may operate for a period of up to 3 years.

In the case of *Croatia*, the procedure should be resumed from the beginning.

In the case of *Slovenia*, if a license change is desired, the license holder must officially inform the granting authority and provide the documents on the basis of which it is possible to make decisions on the acceptability of the requested changes.

In *Hungary* it is also possible to request for modifications of any license, the procedure being easier if done before the license is issued.

8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?

In all the countries, the granting authority has the power to revoke or terminate the licenses when it is ascertained that the legal conditions and those stipulated in the license are not met in relation to the fulfilment of the assumed obligations.

In *Hungary*, when the provisions of the license content have been violated, a fine may be applied, the activity may be suspended, the authorization may be withdrawn, or an order to restore the initial state can be issued etc. or the Mining Authority may initiate the termination of the concession contract.

In *Slovenia*, the authority that issued the license together with other authorized entities, such as the Environmental Agency, has the right and the obligation to monitor regularly the fulfilment of the conditions of the concession contract. If these are not met, firstly an official appeal is issued to mitigate the deficiencies. If it fails, an on-site inspection is carried out and financial and other proposed measures are taken. If the conditions are still not fulfilled, the Authority shall have the right to terminate the license either by reducing the amount granted, by adding other terms to the contract, or by terminating the license in full.

8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?

Authorities in the project countries may lay down clauses in licenses that provide for stricter, or more permissive terms and conditions for license holders, unless otherwise provided for by applicable law.

In *Croatia*, the licensed authority cannot lay down any other terms or conditions.

In *Slovenia*, conditions are established on the basis of coordination with several agencies which have the right to adapt the general requirements to local conditions.

8.4. Which actions/tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?

In *Bosnia and Herzegovina - Republika Srpska*, in cases where there is a breach of the conditions stipulated in the license, the competent authorities shall impose the fulfilment of the conditions of the license and a deadline for correction. If the conditions are not respected, the contract could be terminated by the granter. Authorities in the *Federation of Bosnia and Herzegovina* can take the same measures like *Republika Srpska*, and also may apply the penal provisions that are defined in each law. A fine is foreseen for any violation of the law and for non-fulfilment of requirements and conditions defined by license.

In *Croatia*, *Hungary, Romania, Serbia and Slovenia* field inspections are carried out and, if the conditions laid down in the license are found to be non-compliant, application of contraventions, payment of compensations or even the suspension of activities can happen.

8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? Are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?

Concerning the license expiration, there are various regulations regarding the actions of the license holders. All of them must undertake land replanting and restoration measures to ensure the protection of life and human health and the protection of property and preservation of the mining installations, in accordance with the mining project.

In *Romania*, if the license is not prolonged, the resources are preserved according to the Cessation Plan which was negotiated for the license.

In *Slovenia* the rules to be applied after the exploitation permit expires are already included in the application for the license. There are no standards how to liquidate the exploration well, neither for the conversion of an exploration well into an observation one.

In *Croatia* there are no rules after the exploitation permit expires.

In *Serbia*, the license holder has no obligation to liquidate the well after the exploitation ceased. If done, the liquidation must be done according to project documentation.

In *Hungary*, the law provides that if the wells cannot be operated upon the expiration of the concession contract, the mining contractor is obliged to clear the wells and remediate the area.

9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?

In all the project countries on-site inspections are carried out by the inspectors of the Territorial Inspection Department of the licensing authority.

The holders have the obligation to send biannual and final reports on the activity carried out, the amount of exploited resources, the related expenses and other licensing information.

For *Bosnia and Herzegovina - Republika Srpska*, the terms and reporting to the Ministry of Industry, Energy and Mines as regards exploration are included in the exploration approval. For explorations

longer than one year, reporting is annual. Supervision of the exploration by other licensed company is mandatory.

In *Hungary*, the frequency of on-site visits depends on the possible environmental effects of the licensed activity. In general, a log of operations should be written to collect the most relevant data (quantity, quality, water level, etc.) and sent to the authority each year. For deep geothermal resources, supervision is largely based on own control of the mining contractor. The Mining Authority supervises both construction and on-site operation. The technical operating plan will be reviewed annually by the contractor and will be modified if any circumstances have changed.

In *Slovenia*, water concessionaires have to provide several documents to the Environment Agency. It checks the 3-year monitoring programs, annual operational monitoring reports and verifies if the documents are in compliance with the requirements. The mining concessionaire should report to the Mining Authority the amount of water and heat produced.

9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?

Information to be submitted to the competent authorities are different from country to country.

In *Romania* it is required to submit annual documents regarding: the records and the movements of the mineral resources/reserves, the activity carried out, as well as the expenses related to it.

In *Hungary*, annual documents are required to be sent. A summary report on exploration will be submitted to regulatory authorities, except in case of surface exploration. The results of the mandatory tests for exploitation (gas content review, water quality), monitoring data, a copy of the operational log that contains all measurements (flow, temperature etc.) and maintenance data are also required. Information on heat plant consists of data on produced heat produced and maintenance data.

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* the following reports should be submitted:

- for exploration: Report on conducted geological explorations;

- for exploitation: 1) Annual report on the results of the exploration by 15 March of the current year for the previous year, 2) Elaborate on the classification, categorization and calculation of thermal/thermo-mineral water reserves every 7 years; 3) Monthly report on quantity of extracted water from springs/wells.

In *Bosnia and Herzegovina - Republika Srpska*, the documents required to be submitted include:

- for exploration: the type and number of exploration works carried out and the level of performance, compared to those presented in the project;

- for exploitation: the amount of extracted water (or energy) per year and quality (physical, chemical, gas) of the geothermal source. The responsible authority is the Ministry of Industry, Energy and Mining. The monitoring procedure is the task of the Ministry of Agriculture, Forestry and Water Management and the public utility "Vode Srpske".

In *Serbia*, the exploration and exploitation holders are required to keep a record of the state of geothermal resources and reserves and to submit annually (by March 15 of each year), in written or electronic form, data on the state of resources and reserves at 31 December of the previous year, to the Ministry or the competent authority of the Autonomous Province.

In *Slovenia* a hydrogeological study is required for exploration, containing an estimation of the temperature, quantity and chemical composition of the thermal water, as well as the characterization of the reservoirs. Regarding the exploitation, the same parameters are required for reporting, supplemented by the piezometric head in the well, temperature, quantity and chemical parameters of waste thermal water. The annual amount of sold heat (MWht), energy price and availability for distribution are required for reporting the heating plant production.

10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?

The general terms and conditions, such as the duration of the contracts for thermal energy purchase, are regulated in different countries as follows:

In *Bosnia and Herzegovina - Republika Srpska*, the maximum duration of any concession is 30 years, according to the Concessions Law.

In *Croatia* there is a Thermal Energy Market Law which regulates the general terms and conditions of heat purchase agreements, including mandatory parts of these agreements.

In *Serbia*, the general terms and conditions for the production of heat from renewable sources are governed by current legislative documents: the Energy Law, the Public Utilities Act, the Public Private Partnership Act and the Concessions Law of the Company, the Law on Public Companies.

In *Slovenia*, all general terms and conditions, such as the duration of heat purchase agreements, are regulated in the Energy Act.

In *Hungary*, legislation differentiates heat producer from heat provider. Usually, these are separate companies, but it could also be the same. There is no legal requirement for a purchase agreement between the heat supplier and the heat provider. In the case of public heat service, the content of the contract between the heat supplier and consumers is strictly regulated in the Act XIII on the District Heating Service. The price of heat is regulated by legislation and accepted by the relevant authority (Energy Regulatory Office and the Hungarian Public Service).

In *Romania*, there are no regulations in this regard.

10.2. What is the permitted or general duration of Power (heat) Purchase Agreements?

The rules are different from country to country.

In *Romania*, the allowed duration of purchase agreements is governed by commercial contracts.

In *Croatia*, the contract is usually concluded for one year and is automatically extended for each subsequent year if the client does not terminate it.

In *Serbia*, the duration of purchase agreements (heat) is not governed by laws and regulations.

In *Slovenia* the duration is written in the concession contract between the municipality as a user and the geothermal heat distributor. Typically, the duration is 10 years, with the possibility of further prolongation. The Energy Act stipulates that the duration of the distribution concession should not exceed 35 years.

In *Hungary*, the general duration is 1 year, with another period of 2 years as a safety reserve for heat supply.

In *Bosnia and Herzegovina - Republika Srpska*, according to the Concessions Law, the maximum duration of any concession is 30 years.

10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?

The public and/or national regulatory authorities from *Bosnia and Herzegovina - Republika Srpska Croatia, Serbia, Slovenia* are directly involved in formulating the terms of thermal purchasing agreements. In *Hungary*, the institution involved in pricing the centralized heating services is the Hungarian Energy and Public Utility Regulatory Office. This institution is not involved in the agreements between the heat producer and the heat supplier.

In *Romania*, public and/or national regulators are indirectly involved in formulating the terms of thermal purchasing agreements.

11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?

In all project countries there are regulations regarding the environmental impact assessment before exploration and geothermal energy production. The differences refer only to the documentation required for environmental restoration works.

In *Romania*, the environmental rehabilitation works implies environmental consent/authorization obtained at the start of the exploration and exploitation activity. The environmental rehabilitation works are done on the basis of the Technical Projects tendered and negotiated and they constitute financial guarantees for the environment.

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* prior to carrying out geological investigations, it is necessary to obtain an Environmental permit. Urban planning permit required for obtaining Approval for geological investigation cannot be issued without Environmental permit. Environmental impact assessment and Environmental permit are under the Law on Environmental Protection.

In *Bosnia and Herzegovina - Republika Srpska* the estimation of possible impacts is defined in the Environmental Impact Study. The preparation of the study is stipulated in Article 61 (1) of the Environmental Protection Act.

In *Croatia*, the environmental impact assessment is an integral part of a request for environmental impact assessment (the Environmental Impact Assessment Regulation). The application must contain information regarding the applicant, location and operation, compatibility with the current land use documentation, environmental impact assessment and data about authorized expert and administrative fees.

In *Serbia*, the necessary documents are: the Decision on the need to assess the environmental impact; Decision on the scope and content of the environmental impact assessment study; estimation of the impact on the environment; approval of the environmental impact assessment study.

In *Slovenia*, the decree requiring Environmental Impact Assessments refers to geothermal drilling for the exploitation of geothermal energy sources other than shallow geothermal systems. The use of mineral or thermal water that could have significant effects on the environment implies a mandatory environmental impact assessment.

In *Hungary*, the activities that required an environmental permit are listed in Government Decree no. 314/2005 (XII.25) on Environmental Impact Assessment and Integrated Pollution Prevention and Control Annex 1 or Annex 3, for which relevant thresholds are identified. If the volume of planned activities (such as depths, yields, affected water basins, etc.) exceeds the limit value, the preliminary environmental study and/or environmental impact assessment is required. The environmental license is the first step in the development of the project and the granting of a construction license could be initiated only in the possession of the first one. During the impact assessment, all relevant effects should be calculated and evaluated on the environment at each stage of the project (i.e. construction, use and liquidation).

11.2. Is it possible to explore, or produce geothermal energy without environmental impact assessment? If yes, under which conditions?

In *Romania* and *Croatia* there are similar regulations in the sense that exploration or production of geothermal energy is not possible without an environmental impact assessment. In other countries, such as *Bosnia and Herzegovina - Republika Srpska* the environmental impact assessment is mandatory for the extraction or re-injection of groundwater exceeding 10,000,000 m^3 (more than 315 l/s). For any deep geothermal drilling, even if the abstraction is less than 10,000,000 m^3/year, the Ministry of Spatial Planning, Construction and Environment decides on the necessity of the EIA.

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* the Federal Ministry for Environmental Protection determines for each individual case (project) if the environmental impact assessment is necessary.

In *Serbia*, for obtaining a construction permit for installations with a capacity greater than 1 MW, EIA might be required, while for installations with a capacity greater than 50 MW this is mandatory.

In *Slovenia* an environmental impact assessment is not needed if in the preliminary procedure it was established that the operations will not have a significant impact on the environment.

In *Hungary*, by the provisions of Government Decree no. 314/2005 on Environmental Impact Assessment and Integrated Pollution Prevention and Control, there is no obligation to make an EIA before starting the construction of heating installations.

11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes, what rights do they have?

In *Romania* the environmental impact assessment is carried out by the Ministry of Environment, in collaboration with the right holders and with local public authorities. The law does not regulate the rights of other parties (e.g. NGOs).

In *Slovenia* other parties may also be involved, as the Environmental Agency gives them a status of a associated participant during the review procedure after the public announcement.

In *Serbia* there are no provisions in the field that regulate the parity of other parties in the environmental impact assessment process.

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* the environmental impact assessment process involves interested institutions at cantonal and federal level. If Federal Ministry for Environmental Protection estimate that Environmental Impact Study is needed, then this Ministry will annunciate the Study and invite the public to express their opinion (in writing form) about this document within 30 days from the date of the public announcement.

In *Bosnia and Herzegovina - Republika Srpska*, NGOs, in accordance with Law on Free Information Access can request information related to a project of public interest by submitting the request to the authority responsible for the project approval. NGOs can also submit lawsuit to responsible court.

In *Hungary,* all those whose properties are affected by the impact area involved in the licensing process as a client, including NGOs (mainly nature protection organizations) have the right to access the licensing document and to express their views. The Environmental Authority prepares a consultation report, and the results have to be considered in the license.

In the *Federation of Bosnia and Herzegovina* and *Croatia* public consultations are organised.

12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?

There are not similar regulations in the project countries.

In *Romania*, additional documents are needed implying proof of payment of various taxes (mining tax, financial guarantee for the restoration of the environment, tax attestation certificate), agreements (environmental, of the owner of the land regarding access etc.) and opinion of the competent authority for the annual operating program).

In *Bosnia and Herzegovina – Federation of Bosnia and Herzegovina* required licenses for construction of heat/power plants and their use are: 1) Approval for construction of heat/power plant, 2) Approval for use of heat/power plant, 3) Energy permit. The construction of heat or power plant is under the Law on Spatial Planning and Land Use at level of Federation of B&H and the Law on Electricity.

In *Bosnia and Herzegovina - Republika Srpska* the Ministry of Spatial Planning, Construction and Environment releases a Construction Permit on the base of an Ecological Permit. For the Ecological Permit preparation a study on environment impact is requested.

In *Croatia* other needed licenses include construction, location and usage permits.

In *Serbia,* for the construction of geothermal plants, permits should be issued regarding: location, energy, building, technical inspection and operation.

In *Slovenia*, building permits and operating permits are required.

In *Hungary*, if agricultural land is affected, an approval from the Soil and Soil Protection Directorate is required and must be submitted to the Directorate by the licensee. If forested land is affected, the approval from the Forest Directorate is required. For archaeological sites, the approval of the Office for the Protection of Cults and Heritage may be required.

12.2. Is there any conflict among mining, water and energy laws on geothermal topics?

It is not the case for *Romania, Federation of Bosnia and Herzegovina, Republika Srpska* and *Serbia*.

As far as *Croatia* is concerned, there was such a legislative conflict.

In *Slovenia* there is little cooperation between authorities during the granting process and there might be conflicts in the management of legislative documents (different requirements etc.).

In *Hungary* there are some overlaps in exploration activities, but the rules are clear regarding exploitation.

12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance between production and reinjection well(s)? Is the period defined for which cold wave of reinjection well cannot have influence on the production well? If yes, what is the period or other criteria? Is it allowed discharging of used water into other aquifer which is different from the aquifer of production well? Where and in what way is it allowed?)

In *Romania, Croatia, Federation of Bosnia and Herzegovina, Republika Srpska* and *Serbia* there are no regulations related to reinjection.

In *Slovenia* the Mining Act states that the exploitation of the geothermal energy source by re-injection in the same geological structure implies that geothermal water is extracted with a well and afterwards the cooled water is pumped back in a second well located at least 25 m away.

In *Hungary*, there is no direct regulation on re-injection, but on the basis of related legislation (Act LVII. of 1998 on water management, Government Decree 219/2004), practically it is very difficult to use geothermal water without re-injecting it. The cold wave period is not regulated by law. Great attention must be paid in modelling in order not to disturb the production well and the environment.

4. Description of licensing procedures in partner countries

This chapter presents the necessary steps for obtaining an exploration/exploitation license for geothermal water in DARLINGe partner countries.

BOSNIA AND HERZEGOVINA - FEDERATION OF BOSNIA AND HERZEGOVINA

Investigation and exploitation of thermal and thermomineral waters in Bosnia and Herzegovina is under jurisdiction of two entities (Federation of B&H and Republic of Srpska) and one district (District Brčko). Entity ministries responsible for energy and waters give approvals for investigation and use of thermal waters on area Federation of B&H and Republic of Srpska and relevant institution of District Brčko for terrain of this district on the basis of Project of investigation and other documents required by laws.

Concessions for explorations and exploitations all types of groundwaters and geothermal energy in Federation of Bosnia and Herzegovina give relevant ministries of 10 cantons (in some cases the FBiH Ministry of Agriculture, Water Management and Forestry), in Republic of Srpska responsible Ministry of industry, energy and mining and in District Brčko concessions give Office for managing public property.

There is law on concessions on state level (The Law on Concessions of Bosnia and Herzegovina - Official Gazette of Bosnia and Herzegovina, no. 32/02 and 56/04), which regulates the granting of concessions when the resource is extended to the territories of the two entities or the territory of the entity/ies and district but this law has not yet been applied in practice to geothermal reservoirs.

In Federation of Bosnia and Herzegovina, according to current Law on Geological Investigations (Official Gazette of Federation of B&H, no. 9/10 and 14/10), all types of waters are treated as mineral raw materials and they are investigated in accordance with this the Law.

In order to be investigated and used thermal or thermo-mineral waters for any purpose, it is necessary to obtain the following licenses:

- Preliminary water consent,
- Water consent,
- Approval for geological investigation,
- Decision on the verification of reserves,
- Decision on spring protection,
- Concession contract,
- Water permit.

Flow chart of licensing procedures in the Federation of Bosnia and Herzegovina is provided in the Fig 1. License issuing authorities, content of the licenses as well as related legal acts are shown in Table 1.

In order to start with drilling, water catchment or any other activity that may have an impact on water quality and water regime (activity defined in Article 109 of the Water Law), it is necessary to investor obtain Preliminary water consent and Water consent issued by the Sava River Watershed Agency (SRWA) or the Adriatic Sea Watershed Agency (ASWA), depending on the basin in which the research is conducted or the cantonal water authority for objects with water capacity less than 10 l/s. These water acts are issued on the basis of the Water Law and other acts related to this Law (Table 2).

Any investigations on groundwater and geothermal energy (geophysical investigations, drilling, mining works, etc.) cannot be carried out without Approval for geological investigation issued by the Federal Ministry of Energy, Mining and Industry (FMERI). Request for Approval for geological investigation shall be submitted by Investor together with revised Project of geological investigate and other documentation in accordance with Article 27 of the Law on geological Investigations (Official Gazette of the Federation of Bosnia and Herzegovina, no. 9/10 and 14/10).

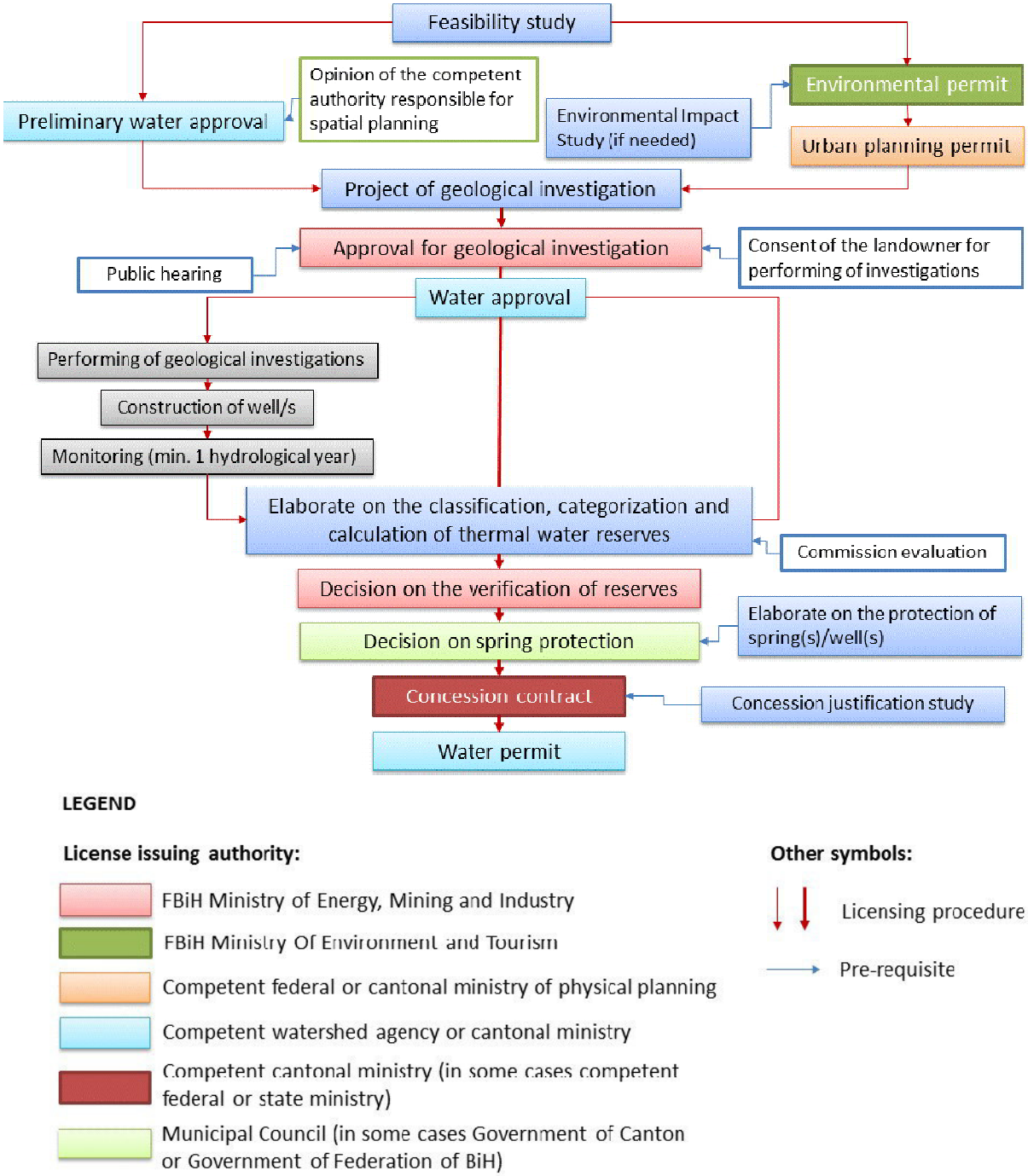

Fig. 1: Licensing procedures for exploration and exploitation of geothermal energy in Federation of Bosnia and Herzegovina - state in June, 2018 (Authors: Natalija Samardžić, Ferid Skopljak, Hamid Begić)

After finishing geological investigations and construction of exploitable objects (drillholes, wells or catchment of springs), it should be accessed to exploitation surveys in duration at least one hydrological year after which follows working out "Elaborate on the classification, categorization and calculation of ground water reserves" on the basis of which FMERI issues Decision on verification of groundwater reserves. The Elaborate and verification of reserves are performing according to procedure of the Law on Geological Investigations and bylaws.

Table 1: Procedures for obtaining licenses for investigation and use of groundwater and geothermal energy in Federation of Bosnia and Herzegovina

Project phases	Name of license	License issuing authority	Content of the license	Related Act
Phase I - Geological investigation	Preliminary water consent* and Water consent	Sava River Watershed Agency (SRWA) or Adriatic Sea Watershed Agency (ASWA) for objects with water capacity greater than 10 l/s. Cantonal ministries responsible for water for objects with water capacity less than 10 l/s.	• type and scope of investigation, • conditions that need to be fulfilled during the performing of investigation, the necessary observations during the work, obligation to keep prescribed records, submission of data to the Water Information System (ISV) • Conditions for preventing or mitigating potential negative impacts on water and environment, etc.	Water Law (Official Gazette of Federation of B&H, no. 70/06); Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15)
	Approval for geological investigation	Federal ministry of energy, mining and industry (FMERI)	• coordinates of the investigation area, • minimum scope and type of research work which must be completed, • conditions and limitations that must be followed by a company which conducts research, • deadlines for starting and completing the works, reporting, recultivation of land, etc.	Law on Geological Investigations (Official Gazette of Federation of B&H, no. 9/10 and 14/10);
Phase II - Investigation during the experimental exploitation	Decision on the verification of reserves	Federal ministry of energy, mining and industry (FMERI)	The decision confirms: • groundwater reserves (exploitation and forecast reserves), • quality of groundwater, • allowed water use, • Minimum scope of monitoring.	Law on Geological Investigations (Official Gazette of Federation of B&H, no. 9/10 and 14/10); Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring (Official Gazette of Federation of B&H, no. 47/11);
	Decision on spring protection	Municipal Council or Government of Canton or Government of Federation of B&H	• a detailed description of the boundaries of the protective zones, • a detailed description of the protection measures per protection zones, • deadlines for the establishment of	Rulebook on determining conditions for establishing the sanitary protection zones and protective measures of water springs for public water supply (Official Gazette

			measures of protections etc.	of Federation of B&H, no. 88/12)
Phase III – Licenses for the use of water	Concession contract	The responsible ministry (federal or cantonal) and water user	• the amount of the concession fee, • concession period, • investment requirements, • obligations of concessionaires in the field of environmental protection, etc.	Law on Concessions of Federation of B&H (Official Gazette of Federation of B&H, no. 40/02); Law on Concessions for each canton in FB&H
	Water permit	SRWA or ASWA for objects with water capacity greater than 10 l/s Cantonal ministries responsible for water for objects with water capacity less than 10 l/s	• conditions of water use, • operating mode of facilities and plants, • the manner and conditions of wastewater discharge, etc.	Water Law (Official Gazette of Federation of B&H, no. 70/06) Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15) Decree on conditions for discharging wastewater into the environment and public sewer systems (Official Gazette of Federation of B&H, no. 101/15 and 1/16)

* Preliminary water approval emphasizes the necessary documentation for issuing of Water approval which needs to be obtained before the beginning of geological investigations.

Protection of water springs/wells is under the Water Law (Official Gazette of Federation of B&H, no. 70/06) and Rulebook on determining conditions for establishing the sanitary protection zones and protective measures of water springs for public water supply (Official Gazette of Federation of B&H, no. 88/12) that require investigation for the purposes of groundwater protection and making of "Elaborate of protection of springs / wells" which defines zones of protection with protective measures. Based on this Elaborate, the Council of Canton or Government of Federation of Bosnia and Herzegovina issues the Decision on spring protection and proclaims the springs/wells protection zones.

Concession on use of groundwater or exploration and use of geothermal energy is given on the basis of public tender procedure announced by the Government of Federation of Bosnia and Herzegovina or on the basis of an independent initiative (request) of the interested user. In the case of an independent user initiative, the request for a concession shall be submitted to the competent cantonal ministry for concessions. Concession Contract is concluded between the water user and competent cantonal ministry in whose territory the spring/well is located. The procedure for awarding the concession is conducted on the basis of the Federal and Cantonal Law on Concessions. Condition for the award of the concession is the previously verified groundwater reserves (Decision on verification of groundwater reserves) and obtained the Preliminary water consent, as well as the Study of the economic feasibility of using water.

Water user obtains Water permit from competent water agency or cantonal ministry responsible for water management (see jurisdiction in Table2) and becomes a legal user of groundwater/geothermal

energy; with obtaining this permit exploitation can start. The Water permit follows after previously obtained Decision on spring protection and Concession Contract.

Table 2: Overview of major documents for obtaining licenses in Federation of Bosnia and Herzegovina

Project phases	Name of license	License issuing authority	Required documentation for license	Related Act
Phase I - Geological investigation	Preliminary water consent and Water consent	Sava River Watershed Agency (SRWA) or Adriatic Sea Watershed Agency (ASWA) for objects with water capacity greater than 10 l/s. Cantonal ministries responsible for water for objects with water capacity less than 10 l/s.	Preliminary water permit: • Study whose content is defined in Article 12 of Rulebook • Urban planning permission • other documents defined in Article 6 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts Water consent: • Project of geological investigation • Other documents mentioned in Preliminary water consent • other documents defined in Article 17 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts	Water Law (Official Gazette of Federation of B&H, no. 70/06); Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15);
	Approval for geological investigation	Federal ministry of energy, mining and industry (FMERI)	• Project of geological investigation • Urban planning permission • other documents defined in Article 27 of the Law on Geological Investigations	Law on Geological Investigations (Official Gazette of Federation of B&H, no. 9/10 and 14/10);
Phase II - Investigation during the experimental exploitation	Decision on the verification of reserves	Federal ministry of energy, mining and industry (FMERI)	• Elaborate on the classification, categorization and calculation of thermal water reserves	Law on Geological Investigations (Official Gazette of Federation of B&H, no. 9/10 and 14/10); Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring (Official Gazette of Federation of B&H, no. 47/11);
	Decision on spring	Municipal Council or Government of	• Elaborate about protection of	Rulebook on determining conditions for establishing the

	protection	Canton or Government of Federation of B&H	springs/wells	sanitary protection zones and protective measures of water springs for public water supply (Official Gazette of Federation of B&H, no. 88/12)
Phase III – Licenses for the use of water	Concession contract	The responsible ministry (federal or cantonal) and water user	• Feasibility study for the use of water • Elaborate on the classification, categorization and calculation of thermal water reserves • Preliminary Water Permit • other documents defined in Law on Concessions (federal or cantonal)	Law on Concessions of Federation of B&H (Official Gazette of Federation of B&H, no. 40/02); Law on Concessions for each canton in FB&H
	Water permit	SRWA or ASWA for objects with water capacity greater than 10 l/s Cantonal ministries responsible for water for objects with water capacity less than 10 l/s	• Elaborate on the classification, categorization and calculation of thermal water reserves • Decision on spring protection • Preliminary water consent • Concession Contract • other documents defined in Article 21 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts	Water Law (Official Gazette of Federation of B&H, no. 70/06) Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15) Decree on conditions for discharging wastewater into the environment and public sewer systems (Official Gazette of Federation of B&H, no. 101/15 and 1/16)

Table 3: Contact lists of relevant authorities in Federation of Bosnia and Herzegovina

Name of the organisation	Address	Organisation e-mail	Website	Contact person	Contact Person E-mail	Cont. Person Phone	Name of license/s	Comment
FBiH Ministry of Energy, Mining and Industry	Alekse Šantića bb, 88104 Mostar	kabinet@fmeri.gov.ba	http://www.fmeri.gov.ba/	Begajeta Habota	begajeta.habota@fmeri.gov.ba	387 61 198 025	Approval for geological investigation	
FBiH Ministry of Environment and	Marka Marulića 2, 71000 Sarajevo	fmoit@fmoit.gov.ba	http://www.fmoit.gov.ba/	Maja Bevanda	maja.bevanda@fmoit.gov.ba	387 33 726 716	Environmental permit	

Tourism								
Sava River Watershed Agency-Sarajevo	Hamdije Ćemerlića 39a, 71000 Sarajevo	info@voda.ba	http://www.voda.ba/	Selma Merdan	merdan@voda.ba	387 33 726 422	Preliminary water approval Water approval Water permit	Competent for objects with water capacity greater than 10 l/s in the territory of the Sava River Basin.*
Adriatic Sea Watershed Agency – Mostar	dr. Ante Starčevića b.b., 88000 Mostar	jsliv@jadran.ba	https://www.jadran.ba/	Tihana Gašević	tgasevic@jadran.ba	387 36 397 881	Preliminary water approval Water approval Water permit	Competent for objects with water capacity greater than 10 l/s in the territory of the Adriatic Sea Basin.*
Council of Ministers of Bosnia and Herzegovina	TRG BiH 1 Sarajevo	info@vijecemistara.gov.ba	http://www.vijeceministara.gov.ba/	Mirjana Micevska	mirjana.micevska@vijeceministara.gov.ba	387 33 282 665	Concession contract	Competent where concession property extends to the two entities or entity/ies and district
FBiH Ministry of Agriculture, Water Management and Forestry	Marka Marulića br. 2, 71000 Sarajevo	info@fmpvs.gov.ba	https://fmpvs.gov.ba/odsjek-za-upravljanje-vodama/	Hazima Hadžović	hazima.hadzovic@fmpvs.gov.ba	387 726 651	Concession contract	This ministry is competent if the resource is divided between two or more cantons
Una – Sana Canton - Ministry of Agriculture, Water Manage	Ulica Alije Đerzeleza br. 2, 77000 Bihać	poljoprivreda@vladausk.ba	www.vladausk.ba	Senad Tutić		387 37 316 039	Concession contract	Competent for licensing procedure and signing contracts on the territory

ment and Forestry								of Una – Sana Canton
Posavina Canton - Ministry of Agriculture, Water Management and Forestry	Jug I 76270 Orašje	poljoprivreda@zupanijaposavska.ba	http://www.zupanijaposavska.ba/	Zrinka Bilušić	zrinka@mpzp.ba	387 31 710 515	Concession contract	Competent for licensing procedure and signing contracts on the territory of Posavina Canton
Tuzla Canton - Ministry of Industry, Energy and Mining	Rudarska 57, 75000 Tuzla		http://www.vladatk.kim.ba/	Mirsada Umihanić	umirsada@tk.kim.ba	387 35 369 327	Concession contract	Competent for licensing procedure and signing contracts on the territory of Tuzla Canton
Zenica-Doboj Canton - Ministry of Agriculture, Forestry and Water Management	Kučukovići 2, 72000 Zenica	min.poljoprivreda@zdk.ba	http://www.zdk.ba/ministarstvo-za-poljoprivredu-sumarstvo-i-vodoprivredu	Senada Malićbegović	senada.malicbegovic@zdk.ba	387 32 460 748	Concession contract	Competent for licensing procedure and signing contracts on the territory of Zenica-Doboj Canton
Bosnian Podrinje -Canton Ministry of Economy	Maršala Tita 13, 73 000 Goražde	privreda@bpkg.gov.ba	http://mp.bpkg.gov.ba/	Emir Hodović		387 38 228 640	Concession contract	Competent for licensing procedure and signing contracts on the territory of Bosnian Podrinje Canton
Central Bosnia Canton - Ministry of Forestry, Agriculture	Ul. Prnjavor 16 A, 72270 Travnik	mpvs@sbk-ksb.gov.ba	https://www.sbk-ksb.gov.ba/bs/ministarstvo-poljopriv	Abdulah Burek	abdulah.burek@sbk-ksb.gov.ba	387 30 511 219	Concession contract	Competent for licensing procedure and signing contracts on the

and Water Management			rede,-vodoprivrede-i-%C5%A1umarstva.html					territory of Central Bosnia Canton
Herzegovina-Neretva Canton - Ministry of Agriculture, Forestry and Water Management	Ulica Hrvatske mladeži bb, 88000 Mostar	ministarstvopoljhn@gmail.com	http://www.vlada-hnz-k.ba/hr/clanovi-vlade/ministarstvo-poljoprivrede-%C5%A1umarstva-i-vodoprivrede	Amra Dervišbegović		387 36 445 936	Concession contract	Competent for licensing procedure and signing contracts on the territory of Herzegovina-Neretva Canton
West Herzegovina Canton-Ministry of Economy	Fra Andrije Kačića Miošića bb, 88240 Posušje	info@mg-zzh.com	https://www.mg-zzh.com/	Jerko Ljubić	jerko.ljubic@mg-zzh.com	387 39 682 162	Concession contract	Competent for licensing procedure and signing contracts on the territory of West Herzegovina Canton
Sarajevo Canton - Ministry of Economy	Reisa Džemaludina Čaušević a 1, 71000 Sarajevo	mp@mp.ks.gov.ba	http://mp.ks.gov.ba/	Nedžad Mekić		387 33 562 120	Concession contract	Competent for licensing procedure and signing contracts on the territory of Sarajevo Canton
Canton 10 - Ministry of Economy	Stjepana II. Kotromanića bb	mg@vladahbz.com	http://www.vladahbz.com/ministarstvo-gospodarstva/	Mate Šiško		387 200 901	Concession contract	Competent for licensing procedure and signing contracts on the territory of Canton 10

* Objects with water capacity less than 10 l/s are under jurisdiction of cantonal ministries responsible for water.

BOSNIA AND HERZEGOVINA – REPUBLIC OF SRPSKA

The first step in this complex procedure (Fig. 2) is preparation of the Project Geological (Geothermal) Explorations, compiled by the licensed company. It means that company prepared this document must be registered in domestic court and pose the Licence for Geological Explorations issued by the Ministry of Industry, Energy and Mining of the Republic of Srpska. The project must be audited by another company than the one who has the Licence.

The project is than sent to the above-mentioned Ministry with request for approval of the exploration field (proposed in the project) and request for releasing of the Decision on approval of the geological explorations in accordance with the project.

All this activities are prescribed in the Law on Geology of RS (Official Gazette of RS 113/10).

After that, the investor can start the exploration. Exploration must be carried out by the licensed company. Also, other company must be engaged for exploration surveillance and confirm that exploration is provided in accordance with the Project and the Decision on approval of the geological explorations.

The company who carries out the exploration must prepare the Elaboration on Reserves, not longer than three months after the exploration is finished. The Elaboration is than sent to the Ministry for auditing. The Commission of the Ministry responsible for the auditing prepares a review of the Elaboration and can request some corrections from the author of the Elaboration. Approved Elaboration by the Commission is the basic document for the preparation of the Decision of approval of the elaborated reserves. It is one of the basic parameters for determination of the concession fee.

When this "geological" procedure is completed the Government announces the Public Call for concession.

The company who provide explorations and prepared the Elaboration on Reserves has 10% advantage in all elements of the Call than other companies. If some other company win the Call, it is obligatory to refund the investment in geological exploration to the company who performed it.

After the company win the concession call, it starts negotiations with the Commission for Concessions of the Republic of Srpska and signs the Contract on Concession with the Government.

For the water abstraction the company must have a Water Licence, issued by the Ministry of Agriculture, Forestry and Water Management. Further, it must obtain the Construction license for district heating system issued by the Ministry of Spatial Planning and Construction, as well as an Operation license for district heating system from the Ministry of Industry, Energy and Mining.

There are also some smaller procedures necessary on the local level.

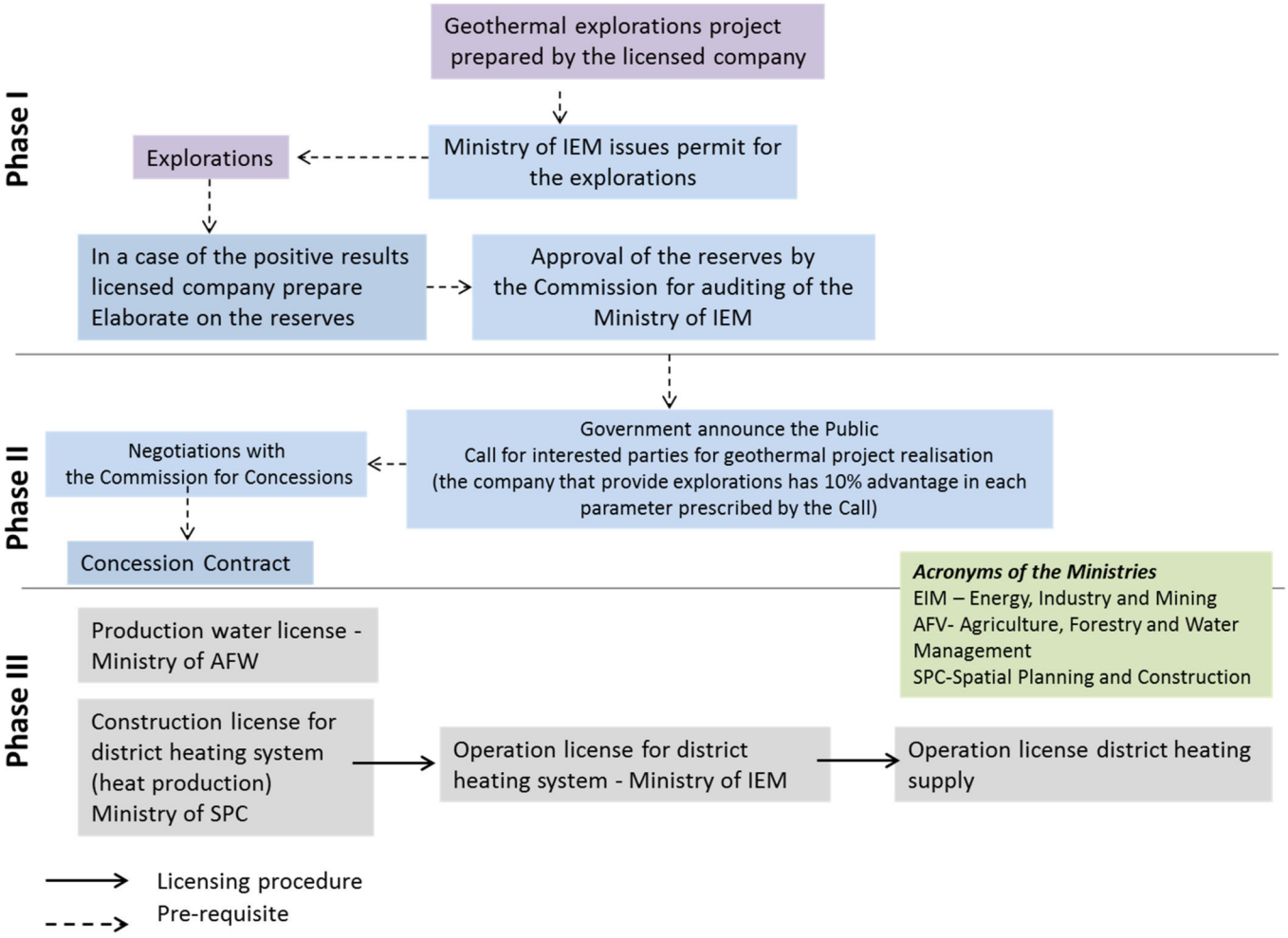

Fig.2 Licensing steps for geothermal water in Bosnia-Herzegovina – Republic of Srpska

Table 4: Contact lists of relevant authorities in Bosnia and Herzegovina, Republic of Srpska

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail
Authorities in charge of the legal policy preparation				
Ministry of Industry, Energy and Mining	Trg Republike Srpske 1 78000 Banja Luka	http://www.vladars.net/eng/vlada/ministries/MIEM/Pages/default.aspx	Esad Salčin, Deputy of the Minister for Mining and Geology	e.salcin@mier.vladars.net
Ministry of Agriculture, Forest and Water Management	Trg Republike Srpske 1 78000 Banja Luka	http://www.vladars.net/eng/vlada/ministries/MAFW/Pages/default.aspx	Aleksandar Macanović, official for public relations	a.macanovic@mps.vladars.net
Ministry of Spatial Planning, Civil Engineering and Ecology	Trg Republike Srpske 1 78000 Banja Luka	http://www.vladars.net/eng/vlada/ministries/MSPCEE/Pages/default.aspx	Gorjana Rosić, official for public relations	g.rosic@mgr.vladars.net
Authorities in charge of control of the legal policy enforcement				
Commission for Concessions of the Republic of Srpska	Save Mrkalja 16 78000 Banja Luka	http://koncesije-rs.org/lat/		komisija@koncesije-rs.org
Inspectorate of the Republic of Srpska	78000 Banja Luka Trg Republike Srpske 8	http://www.inspektorat.vladars.net/		uprava@inspektorat.vladars.net

CROATIA

Geothermal waters belong to the mining resources or mineral resources of the Republic of Croatia and are described in the Mining Act (OG NN 56/13, 14/14) as „geothermal waters" that can be used for the accumulation of heat for energy purposes, geothermal waters that are used for medical, biological and recreational purposes are regulated by the Water Act (OG 153/09, 130/11, 56/13, 14/14).

The basic document for determining the management of mineral resources and for planning economic mining activities is the Mineral Resources Management Strategy.

Exploration of mineral resources, are, according to the Mining Act, work and research that have the goal to determine the possibility to store hydrocarbon and to permanently store gasses in geological

structures and conditions for exploration. According to this Act exploration of mineral resources are not: geological prospecting of the terrain, geological, geochemical, geophysical, egologic and geo-mechanical research that is done for the exploration of minerals or production of complex geological maps, and research of the soil and exploration for scientific purposes etc.

Exploration of hydrocarbon, and mineral and geothermal waters when used for energy purposes, are according to this Act regarded as transport of hydrocarbon and mineral and geothermal waters as pipelines when they are technically linked with approved exploitation fields (Fig. 3).

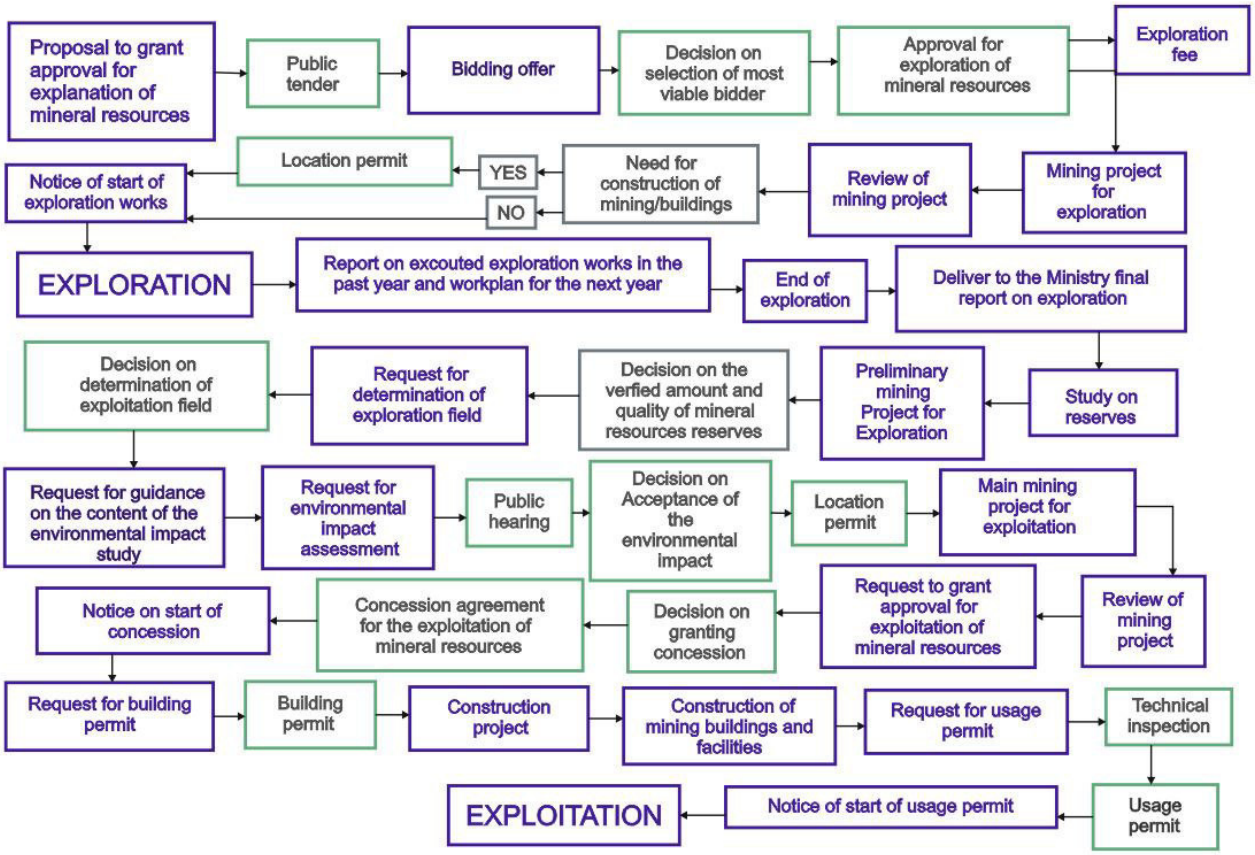

Fig.3: Licensing steps for geothermal water in Croatia

For the exploitation of mineral resources, a concession, or a concession for the exploitation of mineral resources is needed for the economic use of common good according to the Act on Concessions. Concessions for exploitation are given on the basis of a public procurement in a specific procedure that is done in the following phases:

i. Election procedure of the most economical viable bidder for the exploration of mineral resources for given an exploitation concession

ii. Procedure for giving approval for exploration

iii. Procedure for determining the exploitation field

iv. Procedure for giving an exploitation concession

a) **Election Procedure of the Most Economical Viable Bidder for the Exploration of Mineral Resources for Giving an Exploitation Concession**

The competent administrative body for mining publicizes a public bidding for the election of the most economical viable bidder for the exploration of mineral resources for the purpose of giving an exploitation concession.

– if a decision is made that there is a need for determination of specific mineral resources reserves in a certain area or for the determination of their economical use, or for the determination of geological structures that are fit for hydrocarbon storage a permanent gas storage, and

– based on a proposal done by a natural or legal person that is registered for exploration and exploitation of mineral resources.

1. *The ministry competent for the economy* (the Ministry) will submit a proposal for giving a concession for exploration of mineral resources, based on this a public procurement that will be publicized.

2. *A public procurement* will be publicized on the basis of an evaluation of the Ministry for a need to determine specific mineral resources in a region or on the basis of a proposal submitted by a natural or legal person. The public procurement is publicized in the Official Gazette or the Official Gazette of the European Community at least 90 days before the deadline of a certain procurement for submitting offers.

In case the Republic of Croatia is the owner of the land parcels on which the exploration is planned, the Ministry is obliged to inform the central administrative body that is competent for managing state property (Central Administrative Office for Managing State Property).

The public procurement or the submitted proposal of a natural or legal person must contain the following according to the Mining Act:

a) the mineral resources that are to be researched,

b) topographical position, size and name of the exploration field,

c) program of all the exploration works listed by sort and size with the costs, and a detailed plan of works that have to be done in the first year of exploration,

d) the total amount of financial resources for the execution of the planned exploration works and the manner on how that will be secured,

e) an extract from the court or trade register that states that the person that submits the proposal is registered for exploration or exploitation of mineral resources,

f) geological or other documentation on the possibilities of existing mineral resources in the exploration field,

g) a spatial planning document that proves that the execution of mining activities is planned in the specific area.

3. *The public procurement tender has to contain*:

a. name or business name, PIN, address, telephone number, fax number and e-mail address of the renderer, and extract from the competent register that proves that determines the registration for exploration and exploitation of mineral resources;

b. a list of personal, professional, technical and financial conditions that have to be fulfilled by the tenderer according to the public procurement notice, and the documents that prove the fulfilment of those conditions;

c. proof that there are no circumstances mentioned in art. 20 of the Mining Act;

d. information based on which the choice is made for the most economical offer according to the procurement criteria.

The offer has to be accompanied by:

a. program of all the exploration works listed by sort and size with the costs, made in accordance with the procurement documentation,

b. a detailed plan of works that have to be done in the first year of exploration,

c. deadline until when the exploration will be done,

d. the total amount of financial resources for the execution of the planned exploration works and the manner on how that will be secured,

e. deadline until when the exploitation of mineral resources will begin within the exploration field,

f. recovery plan for the exploration area,

g. tender guarantee,

h. offered concession fee,

i. other evidence that is important for the choice of the most economical bidder and that is mentioned in the procurement documentation.

4. *The decision on the selection of the most economical bidder* is made by the Ministry with consent of the ministry competent for regional development.

b*) Procedure for Giving Approval for Exploration*

5. The chosen bidder is obliged to inform the body competent for mining, before the decision on the selection of the most economical bidder, on the appointment of the manager that will be responsible for performing the mining activities, it also has to pay the costs of tendering and deliver a guarantee for the recovery costs of the exploration field.

6. The Decision on the approval of exploration of mineral resources is made for the purpose of giving an exploitation concession based on the final decision on the selection of the most economical bidder for a certain exploration field (certain coordinates that are bordered by a part of land and / or sea, which the body responsible for the mining industry after the tendering decision designated for exploration of mineral resources in order to award a concession for exploitation).

7. In order to start the exploration of mineral resources a simplified mining project is required for the exploration of mineral resources. If the competent institution for mining determines that, on the basis of the proposed scope and sort of mining works, the foreseen works are of that importance that they can only be done on the basis of a simple mining project. Mining projects can only be made by a person registered for writing mining projects (Rulebook on the professional exercise of certain mining works, OG 09/00). The team leader of the mining project (responsible designer) or team leader of the mining part of the project can be a qualified mining engineer or oil mining engineer with a specialization exam and with at least one year of work experience on exploration and exploitation works of mineral resources after passing the specialization exam (Rulebook on the professional exercise of certain mining works, OG 09/00).

8. Mining projects are to be examined by a professional committee for inspection of mining projects at the ministry competent for the economy according to the Rulebook on the Procedure of Inspection of Mining Projects (OG 140/99).

9. If it is necessary to build a mining object or facility for the exploration of mineral resources, the holder of the exploration right is obliged to obtain a location permit. A location permit is obtained according to the regulations regarding spatial planning. (Rulebook on Exploration of Mineral Resources, OG 125/98).

10. The holder of the license for exploration is obliged to appoint a responsible manager for the execution of the exploration works and inform the ministry competent for the economy every six

months through a report on the executed mining works in the exploration field (Mining Act, art. 42). The holder of the license is obliged to pay a fee for the exploration of mineral resources in the amount and manner specified in the Permit. The minimum annual fee for the exploration of mineral and geothermal waters is 3,000.00 HRK/ha (approx. 400 EUR/ha) of the drilling surface for the first year, 4,000.00 HRK/ha (approx. 535 EUR/ha) of the drilling surface for the second year 5,000.00 HRK/ha (approx. 670 EUR/ha) of the drilling surface for the third, fourth and fifth year (Regulation on Fees for Exploration of Mineral Resources, OG 40/2011).

11. The holder of the license for exploration is obliged to report the exploration works to the State Inspectorate, the ministry competent for the economy and the state administrative office, as well as all parties defined in the permit for exploration of mineral resources within a period of 15 days before start of the exploration works. For the exploration of geothermal waters, the holder of the permit has to report in the same period every start and ending of works on every drilling (Mining Act, art. 43).

During exploration, the holder is obliged to take safety measures in order to prevent dangerous situations for people or property, and to take work safety measures and sanitation (Mining Act, art. 44).

The holder of the permit has to submit a report to the ministry competent for the economy on the executed exploration works by February 15th for the past year and a program of works for the next year (Rulebook on Exploration of Mineral Resources, OG 125/98, art. 24).

At the end of the exploration a Final Report on Exploration has to be made (Rulebook on Exploration of

Mineral Resources, (OG 125/98) that has to contain:

– a detailed list of all executed works indicated on a map of a scale 1:5,000 or higher;

– characteristics of the findings of mineral resources and accompanying rocks;

– the quality of the usable mineral resources with chemical, physical and other features, and information on possible technological testing;

– information on the quantity of the collected mineral resources that are used for technological testing and definition of the conditions of the exploitation;

– the amount of the calculated reserves of mineral resources by classes and categories;

– the total amount of funds spent on research;

– a list of procedures and works undertaken for the purpose of rehabilitation of the potentially devastated terrain by research;

– a conclusion that makes clear the further steps and procedures regarding the executed exploration works.

The first calculation of mineral resources and geothermal water reserves are done in the exploration faze when on the exploration field the parameters are defined that are mentioned in the Rulebook on the Procedure for Determining Reserves (OG 48/92, 60/92). Re-calculation of the reserves is done during exploration:

- after realization of the research projects of article 147 point 2 to 5 of the mentioned Rulebook;
- during exploration or preparation of the exploitation fields and when the performed research works show a rather big difference in the reserve quantity, or when there is a need for a new categorization or classification of the reserves.

c) *Procedure for Determining the Exploitation Field*

A Decision on determining the exploitation field is made by the competent body for mining ex officio or on request of the authorized person of the exploitation field in line with the regulations of the Law.

12. Request for determining an exploitation field has to contain:

a. a decision on the appointment of the economically most viable offer for the exploration of mineral resources for giving an exploitation concession,

b. decision on the approval for exploration of mineral resources,

c. decision confirming the quantity and quality of mineral reserves,

d. conceptual mining project,

e. location permit,

f. a map of the requested exploitation field with marked coverage of confirmed balance sheet reserves of mineral resources, or a map of the requested exploitation field marked with the shape and size of geological structures suitable for storage and permanent disposal of hydrocarbon gases, in accordance with the conditions and limits of the location permit,

g. proof that there are no obstacles as stated in article 20 of the Mining Act.

13. The decision on determining the exploitation field is made by the body competent for mining.

Mineral resources can be exploited for the needs of laboratory research, technological experiments and for defining the exploitation conditions, within the quantities that are defined in the decision on approving the research of mineral resources and/or the decision on approving of additional exploratory works on the exploitation field. Mineral resources excavated or obtained by experimental exploitation of mineral resources are the property of the Republic of Croatia. The exploitation of mineral resources is permitted only within the exploitation field specified in the concession agreement and within the limits of certain mining projects.

14. If reserves of mineral resources are identified before submitting a tender for the concession for exploitation of mineral resources, a Study on mineral resources in the exploration area must be made and a decision on the determined quantity and quality of reserves of mineral resources must be obtained (Mining Act, art. 17) according to the Rulebook on the Procedure for Determining and Verification of Mineral Resources Reserves (OG 140/99). Documentation on reserves may be made only by legal persons registered for the production of documents on reserves of mineral resources (Rulebook on the professional exercise of certain mining works, OG 09/00, art. 35, par. 1). Mining companies, or mining businesses that are registered for the exploitation of mineral resources can produce documentation on reserves of mineral resources and mining projects for their own purposes if they employ employees that fulfil the conditions for independent production of documentation on reserves of mineral resources (Rulebook on the professional exercise of certain mining works, OG 09/00).

15. According to the Environmental Protection Act (OG 80/13, 153/13, 78/15) before submitting a Request for Determining Environmental Impact a Request for giving instructions on the content of an environmental impact study is made.

16. An environmental impact study is an integral part of a Request for Determining Environmental Impact (Regulation on determination of environmental impact (OG 64/07, 67/09). The Request must contain the following:

a. Information about the submitter of the Request,

b. Information about the location and operation,

c. Information about the compatibility of the operation with the current spatial planning documentation

d. Information about the authorized person to perform the expert tasks regarding environmental protection – i.e. to make an environmental impact study

e. An Environmental Impact Study

f. Administrative fees

17. When the competent body establishes that the Request contains all required information, an expert advisory commission will be formed in order to perform the procedure for establishing the environmental impact of the operation (Regulation on determination of environmental impact, OG 64/07, 67/09), the competent body will also give an assessment according to the Regulation on determination of environmental impact (OG 64/07, 67/09). After acceptance of the Request the competent body will send the study to public consultation.

18. Obtaining a location permit for the exploitation field in accordance with the Building Act (OG 153/13).

19. Development of the main mining project for the exploitation of mineral resources according to the Mining Act and Rulebook on the professional exercise of certain mining works (OG 9/00).

20. Review of the mining project for exploitation of mineral resources by the expert commission for reviewing mining projects according to the Rulebook on the Procedure of Inspection of Mining Projects (OG 140/99).

d) ***Procedure for Giving an Exploitation Concession***

Concessions are granted by the ministry competent for the economy after prior consent of the ministry competent for water management.

21. Request for a concession is done by a legal person performing mining activities that authorized for an exploitation field and that has been chosen as the most economical bidder.

The request has to contain:

1. Decision on the election of the most economical bidder according to the procedures of the Mining Act,

2. the decision on establishing an exploitation field,

3. the decision establishing the amount and quality of the mineral resources reserves or the decision establishing the manner, form, size and scope of the geological structures that are meant to be used for the storage of hydrocarbon and permanent disposal of gasses,

4. location permit,

5. main mining project and / or amendment to the mining project reviewed by the ministry competent for mining works,

6. written consent or confirmation on the main mining project by the administrative bodies that determine the conditions and limitations for executing the mining works,

7. proof of the right to use the land parcels within the exploitation field, in line with the pace of performing the mining works determined in the mining project for the period that is stated in the concession agreement for the exploitation of mineral resources,

8. map of the exploitation field with marked area of the determined mineral reserves or with the marked area of the geological structures that are suitable for storage of hydrocarbon and permanent disposal of gasses, as well as with land parcels with cadastral data and surfaces within the exploitation field,

9. proof that there are no limitations for obtaining a concession as stated in the Mining Act.

For a concession, it is necessary to:

10. obtain a legally valid location permit from the competent body for spatial planning,

11. obtain a declaration of the ministry competent for mining on the completion of inspection and the acceptance of the project solutions in the main mining project,

12. solve all property issues for the land parcels within the exploitation field.

22. Decision on granting a concession

23. Concession agreement for the exploitation of mineral reserves in an exploitation field with the obligation to pay a fee for the exploitation of mineral reserves.

Concessionaire are obliged to rationally use the mineral reserves fields in line with the concession for the exploitation of mineral reserves.

24. The concessionaire for the exploitation of mineral reserves is obliged to, at least 15 days before the start of performing mining works on the exploitation field, report the start of the mining works to all the subjects mentioned in the decision on granting the concession.

25. The request for a building permit is made by the investor. The request is accompanied by:

– three copies of the main project for building mining objects with a location permit,

– a map with marked borders of the exploitation field on which the land parcels are visible that are subject of the building permit,

–the concession for the exploitation of mineral reserves,

– proof that the right to build mining objects is obtained.

26. A building permit for the construction of mining objects is issued by the ministry competent for the economy.

27. The implementation project of construction of mining objects is a technical solution on the basis of the main project and has to be in line with the main construction project. The implantation project for the construction of mining objects, together with all amendments and changes according to the factual works has to be kept by the investor or his legal successor as long as the mining object exists.

28. Construction of mining objects. During construction, the contractor must have, according to the Ming Act:

– decision on registration on the court register or in the professional association,

– a document on the appointment of the main engineer on the construction site, or works manager,

– a document on the appointment of the main supervising engineer, or main supervising engineer

– building permit for the construction of mining objects with the main project,

– the implementation project for the construction of mining objects,

– construction diary,

– proof on the quality of the preformed works and usability of installed products and equipment,

– other documentation, permits in accordance with special regulations and that the contractor must have on site.

Mining objects can be used or put into function after the ministry competent for mining issues a usage permit.

29. Request for a usage permit is made by the investor. The request is accompanied by:

– a building permit for the construction of mining objects,

– information on the participants in the construction of the mining objects,

– a written declaration of the contractor on the performed works and conditions of maintenance of the mining objects,

– a list of proof of quality of the performed works and the usability of the installed products and equipment,

– a recapitulation of the reviewed and technical documentation,

– a final report of the supervising engineer on the construction of the mining objects,

– final design of the construction.

30. Within 30 days after receiving the request for a usage permits, the competent ministry is obliged to perform a technical inspection of the mining objects.

31. The usage permit is issued by the ministry within 30 days after the performed technical inspection, and is delivered to the regional cadastre office with the goal of evidencing mining objects.

32. Investors to whom is issued a usage permit for mining objects is obliged to, within 15 days after entry into function of the mining objects, give notice to the State Inspectorate and all subjects that are mentioned in the usage permit, that the usage permit has begun to be consumed.

33. Exploitation

The authorized holder of the approval for exploration of mineral resources and concessionaires for exploitation of mineral resources are obliged to possess:

– a location map of the exploration fields, or of the exploitation field for mineral resources,

– an extract of the cadaster with the marked boundaries of the exploration fields, or of the exploitation field for mineral resources,

– a geological map of the exploration fields, or of the exploitation field and its characteristic geological sections.

Concessionaires for the exploitation of mineral reserves are obliged to, at least once a year, with the status of the mining works on 31st of December, draw a map of the situation of the exploitation field for mineral resources.

The holder of the approval for the exploration of mineral resources and concessionaires for the exploitation of mineral resources are obliged to keep measuring records on all executed measurements that are done according to regulations regarding business records. Measurements records can be kept in electronical form.

e) The process of acquiring an exploitation license

34. OVERVIEW OF THERMAL ENERGY REGULATIONS

34.1. OVERVIEW OF THERMAL ENERGY LEGAL FRAMEWORK

This apprehensive overview gives an insight in the regulatory framework of thermal energy use for heating and cooling in the Republic of Croatia. It contains a summary of the most important legal primary and secondary acts and regulations regarding thermal energy.

34.2. LEGAL FRAMEWORK OF DISTRICT HEATING IN THE REPUBLIC OF CROATIA

34.2.1. Energy Development Strategy of the Republic of Croatia (OG no. 130/2009)

The Energy Devolvement Strategy is a document that defines the national energy programs, the necessary investments in energy, the incentives for investing in renewable resources and cogeneration, and the increase of energy efficiency, as well as the development of environmental protection measures.

The Strategy recognizes the development guidelines for central heating systems, they include systems for production and distribution of steam and hot water that is used in industries and systems for the production and distribution of cooling energy.

34.2.2. Energy Act (OG no. 120/12, 14/14, 95/15 and 102/15)

The Energy Act is the general act that regulates the relations in the energy sector and contains general definitions for all energy forms. Specific topics are regulated in specific sectoral acts.

The Act is systemized in 12 chapters.

Energy politics and development of the energy sector

Based on the Energy Development Strategy the Government publicizes a Program for the execution of the Energy Development Strategy that, for a period of 10 years, determines the measures, the participants in activities and dynamics of the realization of energy policies and implementation of national energy programs, the manner of stimulating cooperation between local and regional bodies of government with energy subjects and international organizations.

Based on the mentioned strategic documents energy subjects publicize their own programs and plans for construction, maintenance and usage of energy objects and other necessities for conducting energy activities, bearing in mind all obligations defined in international agreements.

Energy efficiency and renewable energy sources

The Energy Act states that efficient use of energy is of interest to the Republic of Croatia and that efficient use of energy or the use of renewable energy sources will be laid down in special acts. Pursuant to that, adopted are the Act on Energy Efficiency (OG no. 127/14) and the Act on Renewable Energy Sources and Cogeneration (OG no. 100/15).

Energy activities

The law determines energy activities and conditions for their performance – license for conducting energy activities that is handed out by the Croatian Energy Regulatory Agency under the conditions and in the manner that is defined in the Energy Act, special acts for certain energy markets and in accordance with the Rulebook on Licenses for the Performance of Energy Activities and on the Register for License (OG no. 88/15 and 114/15).

Prices of energy and tariff systems

The price of energy for final customers contains a part that is freely agreed, a regulated part that can be determined using a tariff system and fees and other determined charges.

The Tariff System contains a prescribed methodology and amount of the tariff items, they should provide incentives to improve energy efficiency and demand management, including increased use of renewable energy sources and cogeneration. The methodology is determined by the regulatory agency and is based on justified costs of operation, maintenance, replacement, construction or reconstruction of facilities and environmental protection and must provide an adequate return to reasonable investments, and may be based on a method of incentive regulation or other methods of economic regulation. Tariff items are included in the methodology, and are determined by the type of energy services, power / capacity, quantity, quality and other elements related to the supplied energy. The application to determine or change the amount of tariff items are submitted by an energy undertaking to the regulatory agency.

Administrative supervision and inspection

Supervision regarding the application of this act and other energy regulations is executed by the ministry competent for energy and inspectors in accordance with special regulations.

34.2.3. Act on the thermal energy market (OG no. 80/13, 14/14, 102/14 and 95/15)

As the special act for the thermal energy market, this Act regulates measures for the safe and reliable supply of heat, thermal systems for the use of thermal energy for heating and cooling conditions to

obtain concessions for the distribution of heat and concessions for the construction of the distribution network, policies and measures for the safe and reliable production, distribution and supply of heat energy in heating systems and measures to achieve energy efficiency in heating systems.

Interest of the Republic of Croatia

Heating systems are considered an essential element of energy efficiency and of interest to the achievement of the objectives of energy efficiency in Croatia. Encouragement of the development and use of new, innovative and sustainable technologies in the energy sector is in the interest of the Republic of Croatia.

Energy activities

Energy activities that are subject to the Act are production and supply of thermal energy that are performed as market activities and distribution of thermal energy, which is performed as a public service. Production of thermal energy in the Central Heating Systems is considered a public service as long as the share of production is thermal energy is less than 60% of the heat requirement of the Central Heating System, when this share is more than 60 % this energy activity will be performed as a market activity.

Energy activities are carried out based on a license issued by HERA allowing the performance of the activity.

Facilities to produce thermal energy

Facilities to produce thermal energy are being built and used in accordance with the regulations on urban planning and construction, the regulations governing the energy sector, the regulations governing environmental protection and special technical and safety regulations. Producers of thermal energy can use facilities if they have proof of ownership, or right to use, or the right to lease or any other contract with the owner of the building and / or equipment for the performance of such energy activities.

Production of thermal energy

A producer of thermal energy can be any legal or natural person that obtained a license for performing the energy activity of production of thermal energy from the Agency. The license is required to produce thermal energy in a heat system with an installed boiler with output power greater than 2 MW.

The status of an eligible producer of thermal energy and electricity can be acquired by any energy service company that uses a cogeneration unit and uses waste, biodegradable waste or renewable energy sources to produce thermal energy in an economically viable manner, in accordance with the regulations governing environmental protection and waste management. Natural or legal persons who have acquired the status of eligible producer of electricity and heat from cogeneration pursuant to the Electricity Market Act, are obliged to obtain a license to produce thermal energy. For efficient use of energy in cogeneration plants, and at the same time to meet the needs of customers for thermal energy, the planned production of electricity that depends on simultaneous consumption of thermal energy for heating and / or cooling, has priority admission to the electricity network.

Energy approval

Production facilities can be built by legal or natural persons if the manufacturing plants that they intend to build meet the criteria laid down in the procedure for issuing energy in accordance with the Electricity Market Act. The criteria for the procedure for issuing energy approval for the construction of production facilities are public, based on the principles of objectivity, transparency and impartiality, and some of them are based on criteria of energy efficiency and contribution to generating capacity in achieving the overall target share of energy from renewable energy sources and energy efficiency in the gross final energy consumption in 2020 in the European Union, in accordance with fulfilment of international obligations of the Republic of Croatia for the energy sector and in accordance with acquis regulations. When choosing energy solutions, when deciding on the construction of production

facilities, the construction of a production plant for cogeneration and / or renewable energy has an advantage over other production facilities.

The potential of thermal energy for heating and cooling

In order to achieve greater use of national resources of thermal energy for heating and cooling, the Croatian Government committed to a program on the use of the potential for efficiency in heating and cooling in accordance with the Energy Efficiency Directive.

Distribution of thermal energy

Local governments and distributors of thermal energy shall ensure the efficient performance of energy distribution of thermal energy according to the principles of sustainable development, to ensure maintenance of the distribution network and to ensure the transparent operation of thermal energy distributors.

The right of distribution of thermal energy is based on a concession agreement for the distribution of thermal energy or on a concession agreement for the construction of a distribution network and by obtaining a permit for the distribution of thermal energy.

Supply of thermal energy

The energy activity of heat supply is carried out on the basis of a license issued by HERA.

The supplier of thermal energy guarantees the continuity and reliability of the thermal energy supply system together with the energy entity performing the energy activity of thermal energy distribution and is responsible for providing sufficient quantities of thermal energy for end customers and the proper performance of the energy activity of heat supply.

34.2.4. The Act on Renewable Energy Sources and Cogeneration (OG no. 100/15 and 123/2016)

The Act on Renewable Energy Sources and Cogeneration implemented 2009/28/EC on the promotion of use of renewable energy sources and Directive 2012/27 on energy efficiency.

The Act regulates the planning and encourages the production and consumption of electricity produced by generating installations using renewable energy sources and high-efficiency cogeneration (OIEiVUK), defines measures to encourage the production of electricity from OIEiVUK, contains a system for promoting the production of OIEiVUK, encourages building plants to produce electricity from the OIEiVUK on state-owned land, keeps a OIEiVUK registry for projects, project developers and privileged power producers, international cooperation in the field of renewable energy.

This Act established that the use of OIEiVUK is of the interest to the Republic of Croatia in the field of energy. Which was confirmed by the Energy Strategy of Croatia, other acts and regulations governing energy activities, especially in terms of achieving the national goal of using energy from renewable energy sources in connection with the total final energy consumption in Croatia in 2020. This Act also promotes the wider use of its natural energy resources, reducing long-term dependence on imported energy, efficient use of energy and reducing the impact of fossil fuels on the environment, with the goal of job creation and enterprise development in energy and other sectors. This all initiated the development of energy projects with concrete results in the local community, encouraging the development of new and innovative technologies and contributions to the local community and the diversification of energy production and increase security of supply.

Table 5: Contact lists of relevant authorities in Croatia

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail
Ministry of Environment and Energy	Radnička cesta 80, 10 000 Zagreb, Croatia	www.mzoip.hr		glavno.tajnistvo@mzoe.hr
Hrvatske Vode (Croatian waters)	Ulica grada Vukovara 220, 10 000 Zagreb, Croatia	www.voda.hr		voda@voda.hr
Ministry of Construction and Physical Planning	Ulica Republike Austrije 20, 10 000 Zagreb, Croatia	*www.mgipu.hr*		tajnistvo@mgipu.hr

HUNGARY

The procedures of licensing geothermal water in Hungary are presented in Table 6 and Fig. 4.

Table 6: Procedures for obtaining licenses for investigation and use of groundwater and geothermal energy in Hungary

Project phases	Name of license	License issuing authority	Content of the license	Related Act
Phase I. Preparation	Preliminary environmental survey	Regional Governmental Office, Department of Environmental and Nature Protection	Environmental impacts of the planned project – in general	Act LIII. (1995) on the Protection of the Environment, 66.§ Governmental Decree 314/2005. (XII.25.) on Environmental Impact Assessment
	Environmental Impact Assessment	Regional Governmental Office, Department of Environmental and Nature Protection	Environmental aspects of the planned project – in details (if the results of the preliminary survey make this necessary)	Governmental Decree 314/2005. (XII.25.) on Environmental Impact Assessment
	Preliminary Water License	Regional Directorate for Disaster Recovery	General technical plans for the construction and operation of the thermal well (*maximum available amount of water to be produced, quality and quantity threshold values of the used thermal water, ways for its disposal, etc)*	Act LVII. (1993) on Water Management, 28.§.
Phase II. Construction	Construction Water License	Regional Directorate for Disaster Recovery	Construction license for the execution/ drilling/building of production and reinjection wells, water pipelines between the wells *(detailed technical plans for the wells)*	Act LVII. (1993) on Water Management, 28.§.
	Construction license for district heating (heat production)	Hungarian Energy and Public Utility Regulatory Authority	Construction for various parts of the district heating system (e.g. heat exchangers) *(technical parameters for the district heating system, amount of heat to be sold, economic calculations, business plan)*	Act XVIII. (2005) on District Heating Supply, 12.§
	Construction license for pipelines of the district heating system	Regional Governmental Office, Department of Measurements and Technical Safety	Construction of the district heating pipelines *(access to land, protection zones, etc)*	Act XVIII. (2005) on District Heating Supply, 24.§

Project phases	Name of license	License issuing authority	Content of the license	Related Act
	Construction license	Regional Governmental Office, Department of Measurements and Technical Safety	Construction of the heat supply center *(license for the building itself)*	Governmental Decree 31/2014. (II.12.)
Phase III. Production	Production water license	Regional Directorate for Disaster Recovery	Exploitation of thermal water *(results of production tests)*	Act LVII. (1993) on Water Management, 28.§.
	License for operation	Regional Governmental Office, Department of Measurements and Technical Safety	Operation of the heat supply center (building)	Governmental Decree 31/2014. (II.12.)
	Operation licenese district heating production	Hungarian Energy and Public Utility Regulatory Authority	Operation of the district heating infrastructure *(technical parameters, business plan to support long-term operation)*	Act XVIII. (2005) on District Heating Supply
	Operation licenese district heating supply	Hungarian Energy and Public Utility Regulatory Authority	Supply of district heating (selling the heat) *(heat demand analyses, capacity of the system, supporting documents ensuring the continuous supply, technical plans for the distributory system)*	Act XVIII. (2005) on District Heating Supply

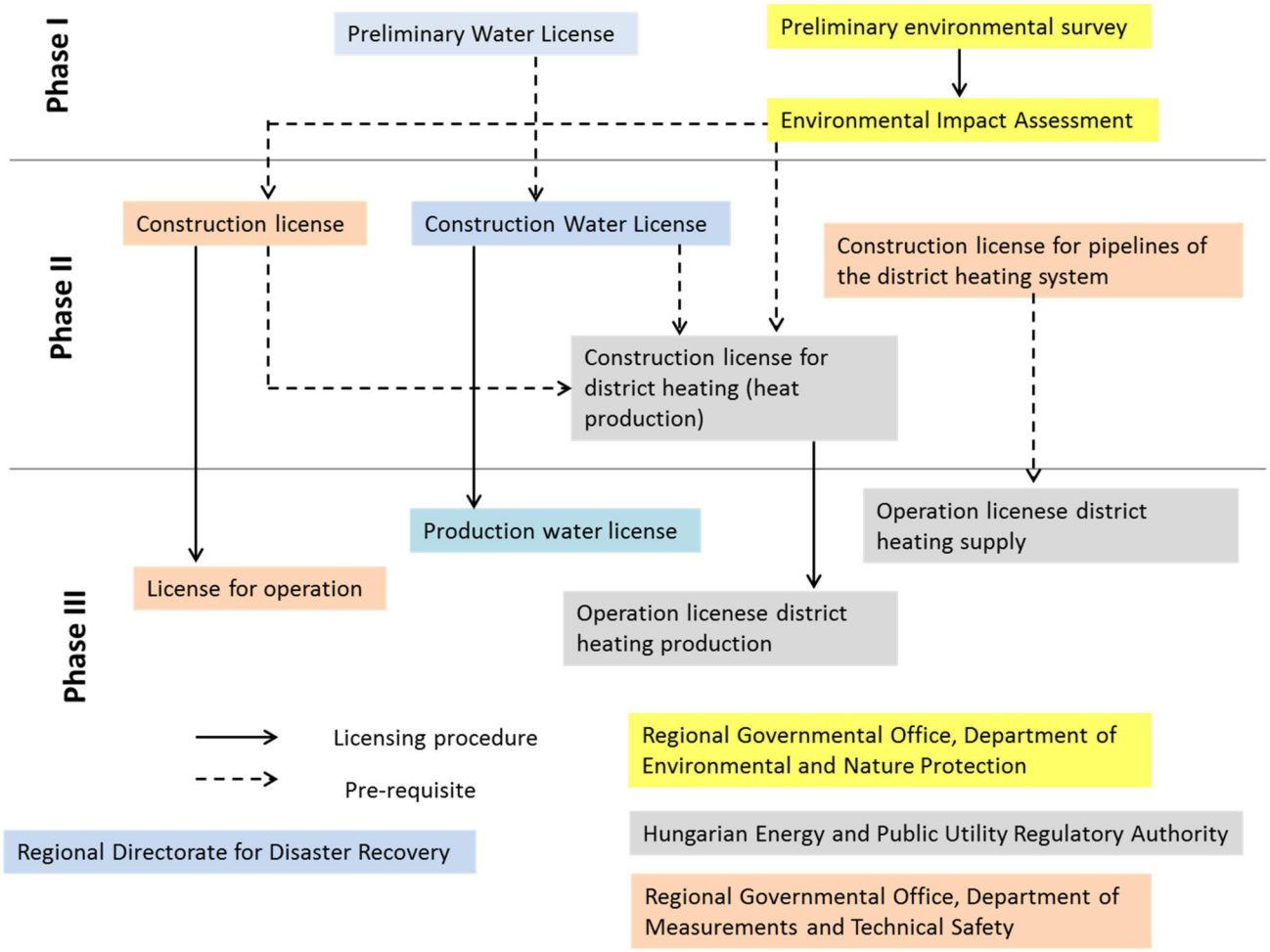

Fig.4: Licensing steps for geothermal water in Hungary

Remarks:

1. The above chart is a general sketch for the licensing of a heat production (geothermal district heating) project targeting reservoirs above -2500 m (typical depth for direct use projects). Below that depth concessional procedure, totally different, applies.

2. Licensing authorities: During the past few years the Hungarian government has significantly reorganised the public administration in order to make the system more efficient and cheap. By the establishment of the so-called "regional governmental offices" (altogether 20, one for each county equivalent of a NUTS-3 region, and one for the capital Budapest) all thematic – previously separate and independent – authorities (e.g. environmental and water protection, construction, mining inspectorates, etc.) were integrated into these regional offices in 2015, in order to realize the "one-stop-shop" concept (i.e. applying and getting all necessary permits at one place). Nevertheless all „groundwater licensing" related issues are under the National Directorate for Disaster Recovery (which also has its regional offices).

3. District heating supply means only those forms of heat supply, where the produced heat reaches the customers via public utilities (Energy Service Companies). If a (private) company produces geothermal energy and sells the heat directly to the customers (i.e. to an industrial park, citizens based on a contract) than it is not considered district heating (and relevant permissions listed above are not required).

Table 7: Contact lists of relevant authorities in Hungary

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail
Disaster Management (powers of water management authority)				
Metropolitan Directorate of Disaster Management	H-1081 Budapest, Dologház u. 1.	fovaros.katasztrofavedelem.hu		fki.ugyfelszolgalat@katved.gov.hu
Disaster Managment Directorate Pest County Directorate	H-1149 Budapest, Mogyoródi u. 43.	pest.katasztrofavedelem.hu		pest.mki@katved.gov.hu
Disaster Managment Directorate of Fejér County	H-8000 Székesfehérvár, Szent Flórián krt. 2.	fejer.katasztrofavedelem.hu		fejer.mki@katved.gov.hu
Disaster Management Directorate of Komárom-Esztergom County	H-2800 Tatabánya, Szent Borbála út 16. II. emelet	komarom.katasztrofavedelem.hu		komarom.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Nógrád County	H-3100 Salgótarján, Szent Flórián tér 1.	nograd.katasztrofavedelm.hu		nograd.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Heves County	H-3300 Eger, Klapka György u. 11.	heves.katasztrofaveddelm.hu		heves.titkarsag@katved.gov.hu
Disaster Management Directorate of Jász-Nagykun-Szolnok County	H-5000 Szolnok, József Attila út 14.	jasz.katasztrofavedelm.hu		jasz.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Bács-Kiskun County	H-6000 Kecskemét, Deák Ferenc tér 3.v	bacs.katasztrofavedelm.hu		bacs.titkarsag@katved.gov.hu
Disaster Management Directorate of Csongrád County	H-6721 Szeged, Berlini körút 16-18.	csongrad.katasztrofavedelm.hu		csongrad.ugyfeszolgalat@katved.gov.hu
Disaster Management Directorate of Békés County	H-5600 Békéscsaba, Kazinczy u. 9.	bekes.katasztrofavedelem.hu		bekes.titkarsag@katved.gov.hu

Disaster Management Directorate of Hajdú-Bihar County	H-4027 Debrecen, Böszörményi út 46-56.	hajdu.katasztrofavedelem.hu		hajdu.titkarsag@katved.gov.hu
Disaster Management Directorate of Szabolcs-Szatmár-Bereg County	H-4400 Nyíregyháza, Erdő sor 5.	szabolcs.katasztrofavedelem.hu		szabolcs.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Borsod-Abaúj-Zemplén County	H-3525 Miskolc, Dózsa György út 15.	baz.katasztrofavedelem.hu		borsod.titkarsag@katved.gov.hu
Disaster Management Directorate of Tolna County	H-7100 Szekszárd, Mikes K. u. 16-22.	tolna.katasztrofavedelem.hu		tolna.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Baranya County	H-7602 Pécs, Pf. 326.	baranya.katasztrofavedelem.hu		baranyatvh.titkarsag@katved.gov.hu
Disaster Management Directorate of Somogy County	H-7400 Kaposvár, Somssich P. u. 7.	somogy.katasztrfavedelem.hu		somogy.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Veszprém County	H-8200 Veszprém, Dózsa György u. 31.	veszprem.katasztrofavedelem.hu		veszprem.ugyfsz@katved.gov.hu
Disaster Management Directorate of Zala County	H-8900 Zalaegerszeg, Mártírok útja 54.	zala.katasztrofavedelem.hu		zala.titkarsag@katved.gov.hu
Disaster Management Directorate of Vas County	H-9700 Szombathely, Ady E. tér 1.	vas.katasztrofavedelem.hu		vas.ugyfelszolgalat@katved.gov.hu
Disaster Management Directorate of Győr-Moson-Sopron County	H-9021 Győr, Munkácsy Mihály u. 4.	gyor.katasztrofavedelem.hu		gyor.titkarsag@katasztrofavedelem.gov.hu
Water Management Directorate				
North-Transdanubian Water Directorate	H-9021 Győr, Árpád út 28-32.	http://www.eduvizig.hu/		titkarsag@eduvizig.hu
Central	H-1088	http://www.kdvvizig.hu		titkarsag@kdvvizig.hu

Danube Valley Water Directorate	Budapest, Rákóczi út 41.			
Lower Danube Valley Water Directorate	H-6500 Baja, Széchenyi utca 2/c	http://www.aduvizig.hu/		titkarsag@aduvizig.hu
Middle-Transdanubian Water Directorate	H-8000 Székesfehérvár, Balatoni út 6.	http://www.kdtvizig.hu/		szfehervar@kdtvizig.hu
South-Transdanubian Water Directorate	H-7623 Pécs, Köztársaság tér 7.	http://www.ddvizig.hu/		titkarsag@ddvizig.hu
West-Transdanubian Water Directorate	H-9700 Szombathely, Vörösmarty utca 2.	http://www.nyuduvizig.hu/		vezetes@nyuduvizig.hu
Upper Tisza Region Water Directorate	H-4400 Nyíregyháza, Széchenyi utca 19.	https://www.fetivizig.hu/		titkarsag@fetivizig.hu
East Hungarian Water Authority	H-4025 Debrecen, Hatvan utca 8-10.	http://www.tivizig.hu/		titkarsag@tivizig.hu
Central Tisza Region Water Directorate	H-5000 Szolnok, Boldog Sándor István körút 4.	http://www.kotivizig.hu/		titkarsag@kotivizig.hu
Lower Tisza Region Water Directorate	H-6720 Szeged, Stefánia utca 4.	http://www.ativizig.hu/		titkarsag@ativizig.hu
Kőrös-provincial Water Directorate	H-5700 Gyula, Városház utca 26.	http://www.kovizig.hu/		kovizig@kovizig.hu
Hungarian Energy and Public Utility Regulatory Authority				
Hungarian Energy and Public Utility Regulatory Authority	H-1054 Budapest, Bajcsy-Zsilinszky út 52.	http://www.mekh.hu/		mekh@mekh.hu
Hungarian Government Offices				
Baranya County Government Office	H-7623 Pécs, József A. u. 10.	http://www.kormanyhivatal.hu/hu/baranya	Dr. Horváth Zoltán	hivatal@baranya.gov.hu
Bács-Kiskun County Government Office	H-6000 Kecskemét, Deák Ferenc tér 3.	http://bkmkh.hu/	Kovács Ernő	kormanyhivatal@bacs.gov.hu
Békés County Government Office	H-5600 Békéscsaba, Derkovits sor 2.	http://www.bekeskh.hu/index.php	dr. Takács Árpád	vezeto@bekes.gov.hu

Borsod-Abaúj-Zemplén County Government Office	H-3525 Miskolc, Városház tér 1.	www.kormanyhivatal.hu/hu/borsod-abauj-zemplen http://borsod.gov.hu/	Demeter Ervin	hivatal@borsod.gov.hu
Budapest Capital Government Office	H-1056 Budapest, Váci utca 62-64.	http://www.kormanyhivatal.hu/hu/budapest	Dr. György István	budapest@bfkh.gov.hu
Csongrád County Government Office	H-6722 Szeged, Rákóczi tér 1.	http://www.csmkh.hu/	Dr. Juhász Tünde	vezeto@csongrad.gov.hu
Fejér County Government Office	H-8000 Székesfehérvár Szent István tér 9.	http://www.kormanyhivatal.hu/hu/fejer		hivatal@fejer.gov.hu
Győr-Moson-Sopron County Government Office	H-9021 Győr, Árpád út 32.	http://www.kormanyhivatal.hu/hu/gyor-moson-sopron	Széles Sándor	hivatal.gyor@gyor.gov.hu
Hajdú-Bihar County Government Office	H-4024 Debrecen, Piac u. 54.	http://www.kormanyhivatal.hu/hu/hajdu-bihar	Rácz Róbert	hivatal@hajdu.gov.hu
Heves County Government Office	H-3300 Eger, Kossuth Lajos út 9.	http://www.kormanyhivatal.hu/hu/heves	Dr. Pajtók Gábor	titkarsag@heves.gov.hu
Jász-Nagykun-Szolnok County Government Office	H-5000 Szolnok, Kossuth Lajos u. 2.	http://www.kormanyhivatal.hu/hu/jasz-nagykun-szolnok	Dr. Kállai Mária	titkarsag@jasz.gov.hu
Komárom-Esztergom County Government Office	H-2800 Tatabánya, Bárdos László u. 2.	http://www.kemkh.hu/	Dr. Kancz Csaba	hivatal@komarom.gov.hu
Nógrád County Government Office	H-3101 Salgótarján, Pf.: 265.	http://www.nmkh.hu/nmkh27/	Dr. Szabó Sándor	hivatal@nograd.gov.hu
Pest County Government Office	H-1052 Budapest, Városház utca 7.	http://www.kormanyhivatal.hu/hu/pest	Dr. Tarnai Richárd	pest@pest.gov.hu
Somogy County Government Office	H-7400, Kaposvár, Nagy Imre Tér 1.,	http://www.kormanyhivatal.hu/hu/somogy	Dr. Neszményi Zsolt	hivatal@kaposvar.gov.hu
Szabolcs-Szatmár-Bereg County Government Office	H-4400 Nyíregyháza, Hősök tere 5.	http://www.kormanyhivatal.hu/hu/szabolcs-szatmar-bereg	Román István	hivatal@szabolcs.gov.hu
Tolna County	H-7100	http://www.kormanyhivatal.h	dr.	hivatal@tolna.gov.hu

Government Office	Szekszárd, Augusz Imre utca 7.	u/hu/tolna	Horváth Kálmán	
Vas County Government Office	H-9700 Szombathely, Hollán Ernő u. 1.	http://www.kormanyhivatal.hu/hu/vas	Harangozó Bertalan	kormanyhivatal@vas.gov.hu
Veszprém County Government Office	H-8200 Veszprém, Megyeház tér. 1.	http://www.kormanyhivatal.hu/hu/veszprem	Takács Szabolcs	vemkh.hivatal@veszprem.gov.hu
Zala County Government Office	H-8900 Zalaegerszeg, Kosztolányi D. u. 10.	http://www.kormanyhivatal.hu/hu/zala/elerhetosegek	Dr. Sifter Rózsa	hivatal@zala.gov.hu

ROMANIA

I. The legal framework regulating geothermal activity in Romania

The main normative acts regulating of licensing for exploration and exploitation of geothermal resources in Romania are:

- Mining Law no. 85/2003, as amended and supplemented;

- Decision of the Romanian Government no. 1208/2003, regarding the approval of the Norms for the application of the Mining Law no. 85/2003, as subsequently amended and supplemented;

- Order of the President of the National Agency for Mineral Resources no. 87/2008, for the approval of the Technical Instructions for classification and assessment of natural mineral water resources / reserves, therapeutic mineral water, geothermal water, the accompanying gases and non-combustible gases;

- Technical Instruction no. 85-03/1998 on the framework content of technical documentation for the delimitation and substantiation of prospecting / exploration perimeters for useful minerals (I 85-03) and Technical Instruction no. 85-04/1998 on the framework content of the technical documentation for the delimitation and substantiation of the development and exploitation perimeters for mineral resources (I 85-04), annexes to the Order of the President of the NAMR no. 93/1998, for the approval of the technical instructions for the unitary application of the provisions of the Mining Law no. 85/2003

- Order of the President of NAMR no.122/2006, with the subsequent amendments and completions, regarding the approval of the methodology for attesting the technical competence of the legal persons that prepare the documentation and perform geological works

- Decision of the Government of Romania no. 930/2005 approving the Special Norms on the character and size of the sanitary and hydrogeological protection areas.

According to Article 1 of Law no 85/2003, as amended and supplemented, "*Mineral resources located in the territory and subsoil of the country and the continental shelf in the economic zone of Romania in the Black Sea, delimited according to the principles of international law and the regulations of international conventions to which Romania is part, they are the sole object of public property and belong to the Romanian state.*

Art. 2. *The mineral resources subject to the present law are: coal, ferrous, non-ferrous, aluminium and aluminiferous rocks, noble and radioactive metals, rare earths and dispersible metals, haloid salts, precious and semiprecious stones, peat, sludge and therapeutic peat, bituminous rocks, non-combustible gases, geothermal waters, accompanying gases, natural mineral waters (gaseous and flat), therapeutic mineral waters and tailings dumps and tailings ponds. "*

II. Exploration of geothermal waters in Romania

In accordance with the provisions of art. 15, paragraph (1) of the Law no.85/2003, the exploration of geothermal waters shall be carried out on the basis of an exclusive license, given for the perimeter, upon request, to interested Romanian or foreign legal persons.

The exploration license is awarded to the winner of a public bidding contest, organized by the National Agency for Mineral Resources under the present law (Fig. 5). The initiative for concession of geothermal exploration activities may belong to the competent authority or to the concerned legal Romanian or foreign entities.

The list of geothermal water exploration perimeters shall be established by the National Agency of Mineral Resources, by order published in the Official Gazette of Romania, Part I.

In order to participate in the tender, the Romanian or foreign legal entities will submit the tenders within a specified term, established by an order of the National Agency for Mineral Resources. Tenders include the proposed exploration program, proof of technical and financial capacity of the bidder, as

well as other documents established by the National Agency for Mineral Resources. The proposed exploration program includes the annual exploration volume and related expenditures that are required to be achieved.

The conditions for organizing and conducting the public tender procedure set out in par. (2), the criteria for selecting and designating the winner, additional scores granted to a prospective license holder, and other issues will be determined by norms of the competent authority.

The exploration license is granted for a period of up to 5 years, with the right to extend it for a maximum of 3 years, within the granted perimeter, on the condition of prepayment, each year, of the tax on the exploration activity and the provision of an adequate financial guarantee for the environmental recovery, as established by the environmental recovery project.

The agreed exploration program is fully executed until the exploration license expires. The area of the perimeter are defined by topographic coordinates in the national geodetic system. The shape and size of the perimeter correspond to the geological formations and structures hosting the mineral resource deposits subject to the exploration license.

The holder of the exploration license is obliged to submit to the National Agency of Mineral Resources reports on the activity carried out and the expenses related to it, at the dates set by norms of the competent authority, and a final report containing the applied methodology, the executed works, within 60 days of the license expiry date.

The license holder shall have the right to reduce the area of the exploration perimeter with the consent of the competent authority, on the basis of sequential documents that prove that all the required restoration works have been carried out on the area to which the license holder renounces, with the obligation to perform the works for the first year contract.

Upon the request of the exploration license holder, he/she is entitled to directly obtain the exploitation license for the discovered geothermal waters.

The holder of the exploration license shall have the right to continue the geothermal exploration, preservation and maintenance of the works carried out in the exploration perimeter, until the date of entry into force of the exploitation license.

III. Exploitation of geothermal waters in Romania

Regarding the exploitation of geothermal waters in Romania, we mention that they are carried out in accordance with the provisions of art. 18 of the Mining Law no.85/2003 on the basis of an exclusive license granted to:

- the holder of the exploration license, directly at his request, for any mineral resource discovered, within 90 days of the date of transmission to the competent authority of the final exploration report and its acceptance;

- the winner of a public bidding contest, organized by the competent authority under the present law, for the mineral resources established by the order provided by art. 19 from Mining Law.

The mining exploitation concession initiative under the conditions stipulated in art. 18 par. (2) Lit. b) may belong to the competent authority or to the concerned legal Romanian or foreign entities.

The list of exploitation perimeters shall be established by the competent authority by an order published in the Official Gazette of Romania, Part I.

In order to participate in the public tender, legal Romanian or foreign entities will submit tenders within a specified term, set by an order of the National Agency for Mineral Resources.

Tenders shall contain the proofs of the tenderer's technical and financial capacity, as well as other documents established by the competent authority through the tendering procedure.

In order to be able to meet the technical conditions necessary for the protection of groundwater, the public tender for the concession of mining exploitation activities takes in consideration only the

perimeters for which an approval from the competent authority in the field of water management has been obtained in advance.

The conditions for organizing and conducting the public tender, the criteria for selecting and designating the winner, as well as other matters, shall be determined by norms by the competent authority.

The operating license is granted through negotiation on the basis of an application accompanied by:

a) Feasibility study on the exploitation of mineral resources and the protection of the reservoir, including the initial cessation plan drawn up in accordance with the rules issued by the competent authority;

b) Development plan for the operation, drawn up in accordance with the technical instructions issued by the competent authority;

c) Environmental impact assessment and environmental balance, as the case may be, prepared according to the law;

d) Environmental recovery plan and technical design, drawn up in accordance with the technical instructions issued by the competent authority;

e) Social impact assessment study and social impact mitigation plan, in accordance with the technical instructions issued by the competent authority in the field of labour and social solidarity in collaboration with the relevant ministry.

The operating license is granted for a maximum of 20 years, with the right of extension for successive periods of 5 years.

The exploitation license holder will pay under this law an operating fee per year and a mining fee. The holder of the operating license is a financial guarantee for environmental remediation in accordance with the technical instructions issued by the competent authority.

The license shall end in written form. The exploitation license comes into force on the date of publication of the order of the President of the National Agency for Mineral Resources in the Official Gazette of Romania, Part I.

The legal provisions existing at the date of entry into force of the license remain valid for the entire duration of the license, except for any legal provisions favourable to the holder.

Modification/completion of the licenses in force is done by additional documents signed by the competent authority and the holder.

The commencement of the mining activities stipulated in the license shall be authorized in writing by the competent authority, within 180 days from the entry into force of the license, after the holder cumulatively presents the following documents:

a) proof of payment of the mining tax;

(b) proof of the provision of the financial guarantee for the restoration of the environment;

c) tax attestation, which shows that the licensee does not register any outstanding obligations towards the state budget;

d) environmental agreement/authorization;

e) for exploration - the opinion of the competent authority for the annual works programme; for exploitation - the opinion of the competent authority for the annual exploitation programme;

f) consent of the owner or manager of the land regarding the access to the surfaces necessary for the execution of the mining activity provided in the annual exploitation program.

The authorization of starting the geothermal activities is carried out by the National Agency for Mineral Resources within 30 days from the submission of the documents.

Foreign legal persons who have obtained the right to carry out mining activities are obliged, within 90 days from the entry into force of the license, to establish and maintain a subsidiary in Romania during the entire duration of the concession.

The holder of a license may transfer to another legal person the rights acquired and the obligations assumed, only with the prior written approval of the competent authority. Any transfer made without written approval is void.

In order to approve the transfer, the competent authority will consider endorsement criteria, which are set by rules. If the license holder changes its status through reorganization, sale or any other reason, the license as negotiated will be granted by additional act to the legal successors of the holder on the basis of the agreement between the parties, or the court decision submitted to the competent authority. The divestiture license is not transferable.

Within the limits of an exploration/exploitation perimeter, the competent authority may, under the law, grant legal persons other than the licensee the right to explore and/or exploit other mineral resources with the consent of the holder.

The right obtained through concession, distinct from the land ownership, cannot in any way be transmitted by the holder to the benefit of a legal entity other than under certain conditions established by the provisions of Law no.85/2003 and of the Romanian Government Decision no.1208/2003 regarding the approval of the Norms for the application of the Mining Law no.85/2003, as subsequently amended and supplemented.

The holder of the exploration/exploitation license may contract bank loans for the execution of mining activities, certifying the existence of the concession by the competent authority.

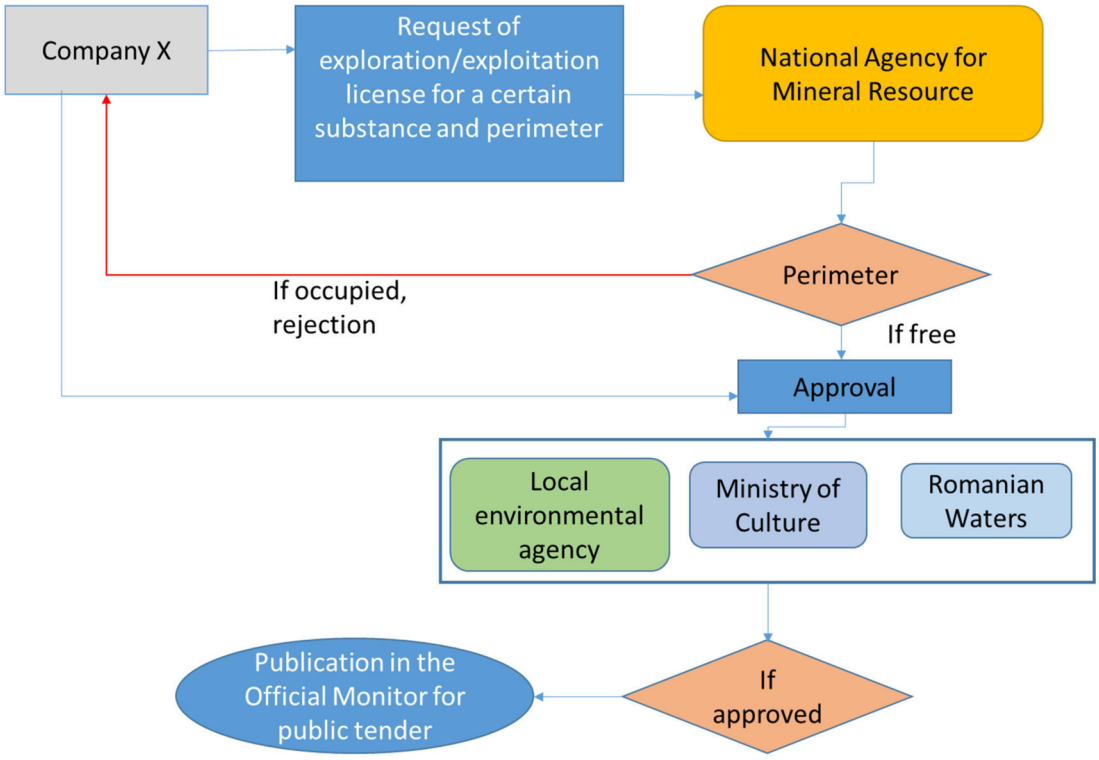

Fig.5: Licensing steps for geothermal water in Romania

Table 8: Contact lists of relevant authorities in Romania

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail
National Agency for Mineral Resources	Bulevardul Dacia, nr. 59, sector 1 010407, Bucuresti Romania	www.namr.ro	**Mihaela Alexandru**	mihaela.alexandru@namr.ro
Romanian Waters	Str. Edgar Quinet nr. 6, Sector 1, C.P. 010018, Bucureşti,	www.rowater.ro		secretariat.general@rowater.ro
The Ministry of Culture and National Identity	Bulevardul Unirii nr. 22, sector 3, Bucureşti, 030833	www.cultura.ro		cabinet.ministru@cultura.ro comunicare@cultura.ro
The Ministry of Environment	Bvd. Libertăţii nr. 12, Sector 5, Bucureşti	www.mmediu.ro		srp@mmediu.ro
The National Agency for Environmental Protection - Timis	B-dul. Liviu Rebreanu nr.18-18A, Timişoara	http://apmtm.anpm.ro/web/apm-timis/contact	**Monica Miculescu**	monica.miculescu@apmtm.anpm.ro
The National Agency for Environmental Protection - Arad	Splaiul Muresului, FN,Arad, Cod 310132, judetul Arad	http://apmar.anpm.ro/		office@apmar.anpm.ro
The National Agency for Environmental Protection - Bihor	Bd.Dacia nr.25/A, Oradea, Cod 410464,jud.Bihor	http://apmbh.anpm.ro/		office@apmbh.anpm.ro

SERBIA

Geothermal resources of the Republic of Serbia are defined in the Law of Mining and Geological Explorations (Official Gazette of RS, No. 101/15) and by-laws adopted under this law. Terms on Geothermal resources used in this Law have following meanings: *geothermal resources shall represent a set of renewable geological resources encompassing ground water and heat from rock masses from which thermal energy extraction is possible. Geotermal resources encompass: subgeotermal resources with the water temperature and the heat of rock masses up to 30 °C, resources of a low enthalpy from which it is possible to extract the thermal energy of temperature from 30 °C to - 100 °C and resources of medium and high enthalpy from which it is possible to extract the heat energy temperature of over 100 °C.*

Geothermal resouces are under the jurisdiction of the Ministry of Mining and Energy, respectively under the jurisdiction of the Provincial Secretariat for Energy, Construction and Transport (incharged for the territory of AP Vojvodina). However utilization of geothermal sources for heat production is very complex and is performed according to a number of regulations of the Republic of Serbia. In case of producing heat from geothermal resources three major domains of permits and other documentations can be distinguished which are regulated by different Laws (Fig. 6).

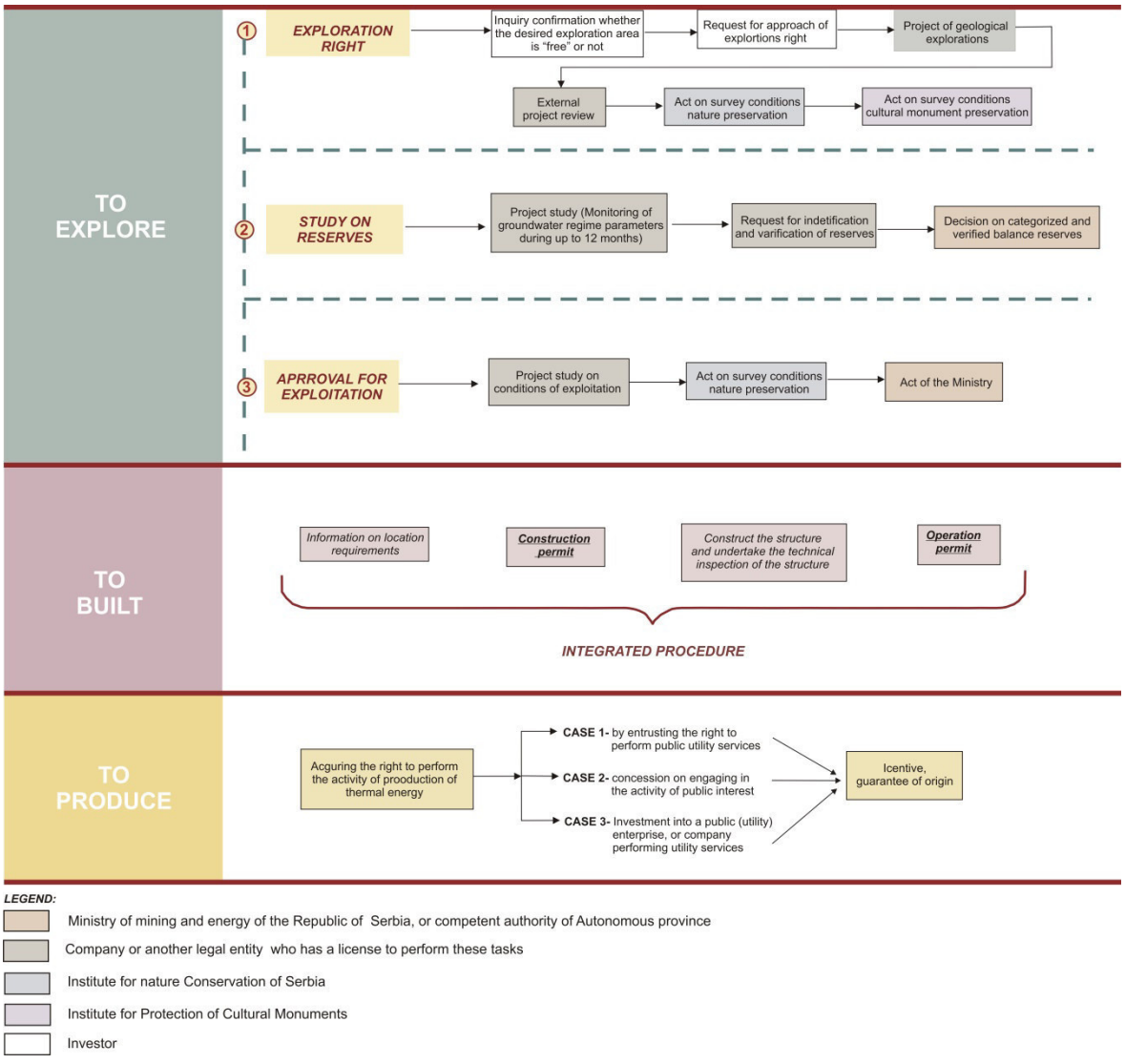

Fig. 6 :. Licensing steps for heat production from geothermal resources in Serbia

TO EXPLORE - EXPLORATION RIGHT

1) Resource exploration

Permit for exploration is issued upon request of the economic entity. The application for the approval of exploration contains data on: exploration entity; type of geological explorations; size of the exploration area; type of exploratory works; duration of geological explorations, and evidence of paid national or provincial administrative tax. The documentation that should be provided is:

1) extract from the register of business entities on registration the applicant;

2) topographic map in a scale 1:25,000 or smaller scale, with marked border and coordinates of exploration area (the maximum surface exploration area is up to 10 km^2);

3) project of geological explorations;

4) report and confirmation of carried out technical control of the project;

5) proof of payment the republic, and provincial administrative fees if the exploration is carried out on the territory of province for issuing the approval;

6) proof of right to use data and exploration results that are the result of geological exploration of another business entity, or are the result of basic and applied geological explorations if they were used in project development;

7) act on conditions for project design and implementation the planned geological explorations, issued by the competent Institute for Nature Protection and the competent institute for protection of cultural heritage or other competent entity.

Approval for the performing the applied geological explorations geothermal energy determines the length of exploration deadline by two years, with the possibility of extending the exploration period twice in continuity, the length of each of the extended exploration periods can be up to a year.

2) Study on reserves

Study on resources and reserves of geothermal resources is a document containing results of geological explorations of a geothermal resources, quantities and quality of resources, their classification, technical capacities and conditions of exploitation, as well as on expected economic benefits. The documentation that should be provided is:

1) Request for identification and verification on reserves

2) The approval for exploration or approval for retention the rights to the exploration area, i.e. the approval for exploitation and/or exploitation field;

3) Study on the reserves (monitoring on groundwater regime parameters during up to 12 months-1 hydrological cycle)

4) Report of a competent person of professional assessment – an audit of the project study on resources and reserves of geothermal resources;

5) Proof of payment of the republic, or the provincial administrative fees for the certification of resources and reserves of geothermal resources;

6) Proof on the right of use the data and results of explorations that are a result of geological explorations of another business entity or a result of the basic and applied geological explorations funded by the budget of the Republic of Serbia, if they are used in the preparation of project studies.

The holder of exploration and holder of exploitation shall be obliged to maintain a book on the state of resources and reserves of geothermal resources on the approved exploration area or exploitation field, and to annually submit the data on the state of resources and reserves to the Ministry or the competent authority of the Autonomous Province by 15th March of the current year according to the state and reserves on 31st December of the previous year in a written or electronic form.

The holder of approval for exploitation area for the use of geothermal energy shall be obliged every five years from the date of previously recorded state of identified resources to submit to the Ministry, i.e. competent authority of autonomous province, a project study drafted on the basis of the newly - modern observations of hydrodynamic regime of geothermal resources and the new control analyses the quality of those waters in order to determine the actual quantities and qualitative characteristics of exploitable geothermal reserves in the deposit, which are the subject of use.

3) Approval for exploitation

Application for the issuing permit for the exploitation field should be consists of the following:

1) Plan in a scale 1: 1,000 or a view topographic map in the appropriate ratio with the drawn-in boundary and coordinates of breaking points exploitation area, as well as drawn and registered numbers of cadastral parcels for which there is a right of ownership or a right of easement on the land;

2) Certificate on resources and reserves of geothermal resources;

3) Project study on conditions of exploitation of the geothermal resources and a certificate on completed technical control of a project study;

4) The act of the competent institution for nature protection on measures and conditions under which the use of geothermal resources can be carried out;

5) the act of the Ministry in charge for sanitary protection of water supply sources, confirming that the applicant did an appropriate project study on the sanitary protection zones of groundwater reservoirs;

6) Proof of the ownership right or the right of easement on the land where there are facilities in the function of use the geothermal resources;

7) Proof of payment the national, or provincial administrative fee, when the exploitation area is located on the territory of the Autonomous province.

TO BUILT - CONSTRUCTION PERMIT AND OPERATION PERMIT

In order to construct and use geothermal energy in purpose of heat generation (heat generation plant), it is necessary to fulfill the following requirements:

1) obtain **the Location conditions**:
    - information on location or location requirements;
    - conceptual Solution
    - other documents (a certificate on payment of the requisite fees, charges, identification).

- If necessary, the competent authority will obtain the following within the framework of a unified procedure:
    - the opinion of the republic organisation in charge of hydrometeorological affairs,
    - the opinion of the public water management company
    - the water conditions (issued by the competent water management authority),
    - other documents that are not relevant for the further procedures described herein or documents specific to some types of facilities.

2) obtain **the Construction permit**:

- project for construction permit;
- evidence of the requisite right over the land along with the consent of co-owner if there is a co-ownership over the respective land or the facility;
- contract between the investor and the financier, if there is one
- contract between the investor and a holder of public authorisation, or another evidence of providing the missing infrastructure, if that is a prerequisite for issuing a construction permit envisaged by the location conditions;
- other documents (certificate of having paid the requisite charges, identification and other forms of evidence upon the request of the competent authority).

3) construct the structure, and undertake the technical inspection of the structure

4) obtain the **operation permit**

- project for carrying out construction works, along with the certificate and seal of the investor, the person conducting official supervision and the contractor, stating that the constructec state (as-built) corresponds to the designed state if there has been no discrepancy from the project for carrying out construction works, or a project of the constructed facility (as-built design) prepared in accordance with the rule book regulating the content of the technical documentation;
- report of the commission for technical inspection establishing that the facility is suitable for usage, proposing that an usage permit should be issued;
- certificate of the energy characteristics of the facility, if the obligation of obtaining such a certificate has been prescribed for this facility;
- survey of geodetic work for the constructed facility and special parts of the facility;
- survey of geodetic work for underground installations;
- other documents (certificate of having paid the requisite charges, identification and other forms of proof based on the request of the competent authority).

TO PRODUCE

There are two ways for acquiring the right to perform the activity of production of thermal energy:

1. Directly
    a. *by entrusting the right to perform public utility services*
    b. *concession on engaging in the activity of public interest*
2. Indirectly

a. *investment into a public (utility) enterprise, or company performing utility services*

- Entrusting of the right to perform public utility activity is regulated by the *Law on Public Utility Services*.
- Concession on engaging in the activity of public interest is regulated by *The Law on Public-Private Partnership and Concessions (Official Gazette of RS, No. 88/11 and 15/16)*
- Investing in a public (utility) company or company performing utility service is carried out in compliance with the *Law on Utility Services, the Law on Public Companies and Engaging in Energy Activities and the Company Law*

List of Laws

- The Law on Mining and Geological Explorations, Official Gazette of RS No. 101/15
- The Energy Law, Official Gazette of RS No. 145/14
- Law on Planning and Construction, Official Gazette of RS No. 72/09, 81/09, 64/10 – decision of the Constitutional Court 24/11, 121/12, 42/13 - decision of the Constitutional Court 50/13 - decision of the Constitutional Court 98/13 - decision of the Constitutional Court 132/14 and 145/14
- The Law on Waters Official Gazette of RS No. 30/10 and 93/12
- The Law on Nature Protection, Official Gazette of RS No. 36/09, 88/10, 91/10 and 14/16
- The Law on Environmental Protection, Official Gazette of RS No. 135/04, 36/09, and 14/16
- The Law on Public Utilities, Official Gazette of RS No. 88/11
- The Law on Public-Private Partnership and Concessions, Official Gazette of RS No. 88/11 and 15/16
- The Law on Public Companies, Official Gazette of RS No. 15/16

Table 9: Contact lists of relevant authorities in Serbia

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail
Ministry of Mining and Energy	Nemanjina 22-26, 11 000 Belgrade	http://www.mre.gov.rs/	Velizar Nikolic	/
The Provincial Secretariat for Energy, Construction and Transport	Bulevar Mihajla Pupina 16 21 000 Novi Sad	http://www.vojvodina.gov.rs	Dragan Budosan	/
Ministry of Agriculture, Forestry and Water Management	Nemanjina 22-26, 11 000 Belgrade	http://www.mpzzs.gov.rs/	/	/
Ministry of Construction, Transport and Infrastructure	Nemanjina 22-26, 11 000 Belgrade	http://www.mgsi.gov.rs/	/	/
Ministry of Health	Nemanjina 22-26, 11 000 Belgrade	http://www.zdravlje.gov.rs/	/	/
Institute for nature Conservation of Serbia	Dr. Ivana Ribara 91 11 000 Belgrade	http://www.zzps.rs	/	/
	Vozda Karadjordja 14 18 000 Nis		/	/
***Institute for Protection of Cultural Monuments Novi Sad**	Bulevar Mihajla Pupina 22 22 000 Novi Sad	http://www.zzskgns.rs/	/	/
Institute for Protection of Cultural Monuments Belgrade	Kalemegdan Gornji grad 14 11 000 Belgrade	http://beogradskonasledje.rs/	/	/

SLOVENIA

1) Introduction to legal and administrative conditions

Renewable energy resources, including geothermal energy, are discussed in the various regulations and Slovene national development strategy documents. The legal basis for exploration and utilization of geothermal energy in Slovenia is under the jurisdiction of the Ministry of the Environment and Spatial Planning and the Ministry of Infrastructure (2017).

To exploit thermal water without or with partial waste thermal water reinjection, an exploration permit and water right for the exploitation must be obtained in accordance with the regulations regarding water (Water Act). The Water concession is granted according to the Water Act which regulates exploitation of thermal water, e.g. groundwater with at least 20 °C at the wellhead. All but one current user operate under this regulation.

For utilisation of geothermal energy with a geothermal energy source, pair of producing and reinjecting wells, an exploration permit and mining right for the exploitation must be obtained in accordance with the regulations regarding the mineral resources (Mining Act). According to the definition in the Mining Act, a geothermal energy resource is a thermal energy which is stored in the geological strata beneath the surface of solid earth and which is being recovered by the heat flow from Earth's interior.

Considering intended method of exploitation of geothermal energy (with or without reinjecton), various administrative and legislative procedures for exploration and exploitation of the resource need to be followed. A detailed description of legal procedures for different purposes is described below, regarding the method of exploitation.

2) Starting a geothermal project

In the first stage, it is necessary to take the basic consideration and decisions regarding the purpose of exploitation of geothermal energy resource (heating/cooling, balneology, power generation). This has to account for energy needs and geothermal energy potential in the planned location (engineers, energy consultants).

There are some prohibitions to be considered at the starting stage of geothermal project:

1) Construction in the first (narrowest) water protection zone is prohibited. In the second (narrower) water protection zone prohibitions of certain construction or drilling may occur, what should be checked by obtaining the official information on conditions for the construction by the competent local authority.

2) Discharge of wastewater into natural lakes, fishponds, waterholes and other natural reservoirs with permanent or periodic inflow or outflow of groundwater is prohibited.

3) Discharge of wastewater originating from the extraction or exploitation of mineral resources into reservoirs and other similar encroachments and which are in contact with groundwater is also prohibited.

4) The temperature of discharge waste water into sewers shall not exceed 40 °C and for discharges into surface waters 30 °C.

5) A general emission decree also lays down the allowed thresholds of the substances in the effluent (e.g. metals, organics…).

Agricultural land and various protected areas are subjected to special limitations and requirements that could affect further steps of the project. These areas are water protection zones, bathing waters areas, nature protection areas, and cultural heritage areas where specific decrees and ordinances should be taken into consideration already in the initial stage of the geothermal project.

Prior to the beginning of acquiring licenses, the initiator who is not himself the land owner has to acquire this land or obtain an approval from the owner to gain/limit his property rights. Agricultural

land is practically not saleable except for the agricultural purpose. To change the land use purpose, a complicated procedure is required and outcome is hardly predictable. It depends on case by case and on local community, policy and, as a rule, the procedure is long lasting.

The exact licensing requirements have to be checked individually for each individual area. The most convenient way to check this is to obtain the "Information of conditions for constructing" by the competent administrative unit.

3) Environmental Impact Assessment and Environmental consent: requirements / procedure

Decree on environmental encroachments that require environmental impact assessments (Official Gazette RS, No 51/14, 57/15 in 26/17) states that for D.III.7 Geothermal drilling and other facilities for the exploitation of a geothermal energy source, other than shallow geothermal systems (in accordance with regulations governing mining), and for E.II.2 Exploitation of mineral or thermal water (according to regulations governing waters) are environmental interventions for which the environmental impact assessment is compulsory if it is established in the preliminary procedure that they could have significant environmental impacts.

If EIA is compulsory, the Initiator has to obtain Environmental consent to be able to proceed with further license procedures.

4) Research (exploration) permit

Research permit for exploration (DZR) of groundwater is granted by the Slovenian Water Agency (DRSV). The content of the application is determined by the Rules on the content of application for acquiring water permit and on the content of application for acquiring groundwater research permit (Official Gazette RS, No. 79/2007). The research permit defines which measurements and samplings are obligatory and what information has to be reported in the resulting Hydrogeological research report.

The research permit:

1) could not be granted in the narrowest (1st) water protection areas of public water supply systems,

2) is always required for:

- boreholes deeper than 30 m,
- boreholes in the narrower (2nd) and wider (3rd) water protection areas of public water supply systems.

Research licence for borehole in the narrower (2nd) and wider (3rd) water protection areas of public water supply systems could be granted only conditionally if the acceptability of the expected impact of drilling works on groundwater quality and quantity is verified (Rules on criteria for the designation of a water protection zone, Official Gazette RS, No. 64/2004, 5/2006, 58/2011).

Boreholes deeper than 300 m (are classified as complex mining works according to Mining Act) require revised mining project as appendix to the research permit application.

5) Reporting the exploration results

When above described licenses and consents are acquired, the drilling may be followed. All the drilling and research results that are required in the research permit must be reported to the licensing authority DRSV immediately after the effectuation of the research (not later than in 3 months after completion of research).

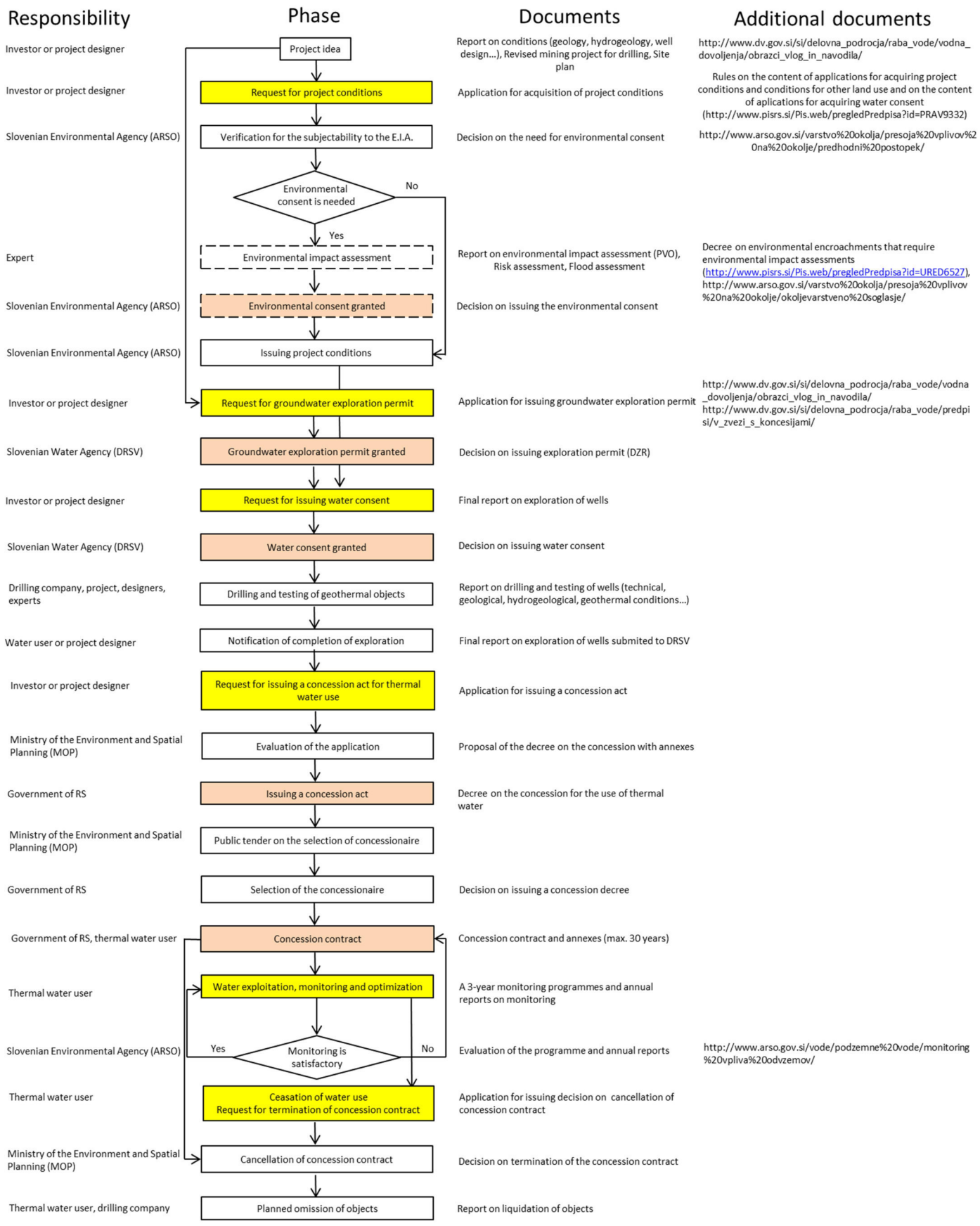

Fig.7: Licensing steps for geothermal water in Slovenia

6) Water consent

Water consent is required for interventions/constructions on waterside and coastal land, on protected areas or natural risk zones, for special uses of water (water exploitation), waste water emissions or where impact on groundwater is possible (aquifer recharge, reinjection) as well as for other interventions/constructions that could have impact on water regime (Water Act).
The discharge of thermal wastewater back into the aquifer cannot be permitted without obtaining water consent first, prior to the mining or water concession. Reinjection must be planned and carried out in such a way that it will not significantly degrade the water regime or disturb the natural balance of aquatic and depended terrestrial ecosystems.

7) Environmental permit

Thermal waste water can be discharged directly or indirectly to surface water bodies or to public sewer. The direct or indirect discharge of thermal wastewater and the emission of heat into surface waters shall only be permitted using the method and under the conditions laid down with general emission decree in Environmental permit. Environmental permit is necessary to obtain also if amount of discharge thermal waste water to public sewer exceeds 12,000 m3/a.

8) Exploitations rights – Water concessions

Direct utilization of geothermal water with no or partial reinjection of waste thermal water is a special use of a water asset and shall only be possible on the basis of a concession for the use of thermal water (for balneology, heating, etc.) for legal or natural persons according to Water Act. The concession application has to be submitted to the ministry responsible for waters (Ministry for Environment and Spatial Planning - MOP). The Decree on concession is granted by the Government of RS and published in the Official Gazette of the RS. A public tender follows and the same body issues the concession act for on-a-tender selected concessionaire. The water concession contract defines quantity of water abstraction, payment to the state and monitoring. In special cases, the concession can be granted without public tender.

9) Exploitations rights – Mining concessions

If the geothermal energy source (100% reinjection) is in place, the concession is granted according to the Mining Act. The concession application has to be submitted to the ministry responsible for mineral resources (Ministry for Infrastructure - MzI). The Decree on concession is granted by the Government of RS and published in the Official Gazette of the RS. A public tender follows and the same body issues the concession act for on-a-tender selected concessionaire. If more than one applicant exists, the winner is selected according to the height of the offered mining fee. In special cases, the concession can be granted without public tender. The mining concession contract defines quantity of mineral resource exploitation, payment to the state and monitoring.

10) Monitoring

The concessionaires according to the Water Act have to perform monitoring of groundwater qualitative and quantitative status. They prepare a 3-years monitoring plan and need to get its approval from the Slovenian Environmental Agency (ARSO). They are obliged to annually report the utilisation of thermal water and status of wells and aquifers to the Environmental Agency. The monitoring requirements contain a range of parameters listed in an individual Decree on the concession for the use of thermal water, e.g. piezometric heads, produced and waste water temperature, produced and waste discharge rates, changes in wells. Environmental agency is reviewing the adequacy and compliance of this reporting with regulations. If the demands are not fulfilled, the water inspectors check the situation in the field.

The user has also to ensure the operational monitoring for wastewater discharges.

In the exploitation of geothermal energy with geothermal energy source the holder of the mining concession has to ensure monitoring of the impacts of its activities on the water environment according to the demands that are listed in the concession permit. Current practice reveals that only the annual produced amount of water is being reported while other parameters do not need to be reported to an authority.

11) Validity of the exploitation right

For all types of exploitation, the concession is granted for a limited period of time. Water and mining concessions are granted for a maximum period of 50 years. In practice, the water right is granted for a period of 30 years, if there is no other reservation.

Environmental agency is reviewing the adequacy and compliance of required monitoring reports and based on these results decides on concession prolongation. If the requirements in the Concession contract are not fulfilled by the concessionaire, both ministries have the possibility to control their fulfilment by on-site inspections and, in the worst case, cancel the agreement.

Ministry of the Environment and Spatial Planning prolongs the concession holding a consultation with Environmental Agency.

Table 10: Contact lists of relevant authorities in Slovenia

Name of the organisation	Address	Website	Contact person name (if known)	Cont. Person / organisation E-mail	Field
Ministry for infrastructure, Energy Directorate (Ministrstvo za infrastrukturo, Direktorat za energijo)	Langusova ulica 4, SI-1535 Ljubljana	http://www.energetika-portal.si/podrocja/energetika/	**Mr. Marko Fajič**	marko.fajic@gov.si	Mining concession for geothermal energy source
Ministry for environment and spatial planning, Water and Investments Directorate, Division for Decisions on the Use of Water and its Protection (Ministrstvo za okolje in prostor, Direktorat za vode in investicije, Sektor za varstvo in odločanje o rabi voda)	Dunajska cesta 48, SI-1000 Ljubljana,			gp.mop@gov.si	Water concession for heat use without 100% reinejction
Slovenian Water Agency (Direkcija RS za	Hajdrihova ulica 28c, SI-1000	http://www.dv.gov.si/si/delovna_podrocja/raba_vode/ko		gp.drsv@gov.si	Water reinbursment for heat

vode)	Ljubljana	ncesije/			use and disposal of used thermal water in natural environment
Slovenian Environment Agency (Agencija RS za okolje)	Vojkova 1b, SI-1000 Ljubljana	http://www.arso.gov.si/vode/podzemne%20vode		gp.arso@gov.si	Monitoring requirements

REGULATIONS

Mining Act (ZRud-1), Official Gazette RS, No. 14/14 and 61/17.

Water Act (ZV-1), Official Gazette RS, No. 67/02, 41/04, 57/08, 57/12, 100/13, 40/14 and 56/15.

Environmental Protection Act (ZVO-1), Official Gazette RS, No. 39/06 – uradno prečiščeno besedilo, 49/06 – ZMetD, 66/06 – odl. US, 33/07 – ZPNačrt, 57/08 – ZFO-1A, 70/08, 108/09, 108/09– ZPNačrt-A, 48/12, 57/12, 92/13, 56/15, 102/15, 30/16 and 61/17.

Decree on the emission of substances and heat in the discharge of wastewater into waters and public sewage system, Official Gazette RS, No. 47/05, 45/07, 79/09, 64/12.

Rules on the content of application for acquiring water permit and on the content of application for acquiring groundwater research permit, Official Gazette RS, No. 79/07.

Decree on environmental encroachments that require environmental impact assessments, Official Gazette RS, No. 51/14, 57/15 and 26/17).

Rules on the content of applications for acquiring project conditions and conditions for other land use and on the content of applications for acquiring water consent, Official Gazette RS, No. 25/09.

Rules on criteria for the designation of a water protection zone, Official Gazette RS, No. 64/2004, 5/06, 58/11 in 15/16.

LINKS

Research permit
http://www.dv.gov.si/fileadmin/dv.gov.si/pageuploads/ObrazciVlog/VodnePravice/RPV.doc
Water consent
http://www.dv.gov.si/fileadmin/dv.gov.si/pageuploads/ObrazciVlog/PravicaGraditi/Vloga-VodnoSoglasje_Priloga1.doc
Water right
http://www.dv.gov.si/si/delovna_podrocja/raba_vode/koncesije/
Mining right
http://www.energetika-portal.si/podrocja/rudarstvo/koncesija-za-izkoriscanje-mineralnih-surovin/

5. Conclusions

The objective of this report was to identify common and different geothermal energy regulations in Bosnia and Herzegovina (Federation of Bosnia and Herzegovina and Republika Srpska), Croatia, Hungary, Romania, Serbia and Slovenia for optimal environment-friendly use of resources, sustainable development and population health.

In these countries, the regulatory framework is based on mining, water, water management, groundwater protection, energy laws, as well as on the Energy Development Strategy (for example Croatia).

1. Common features:

- Mineral resources (including geothermal waters) belong to the State, and the use of geothermal waters by private parties or private persons is made in accordance with the provisions of the concession law of that country, through the bidding procedure. The competent authority for the management of concessions for geothermal water is the mining authority or water management directorate empowered by the government for this purpose.

- In terms of foreign investment for geothermal exploration and exploitation, it is clear that in all these countries there is a regulatory framework that allows this. The difference between the regulations of the countries is represented by a series of aspects related to the specificities imposed by the legislators.

For example, in Slovenia it is a mandatory condition that the foreign entity intending to start geothermal exploration and exploitation activities, must carry out an activity in its own country, under the same conditions or similar conditions as the planned activities in the Republic of Slovenia.

- Exploitation of mineral resources, in particular geothermal waters, is subject to licensing, with the existence of own norms that contain elements of differentiation and particularization regarding the way of granting the license.

- Consent of the land owner is required for exploration, exploitation or heating authorization. Land ownership from a private owner is possible in all countries, mainly for public utility, in accordance with the legal provisions in force, with immediate, complete, unconditional damages and obtaining the necessary authorizations for expropriation.

- License holders may request the review of exploration, exploitation and heating licenses.

- Licensing authority has the power to revoke or terminate the licenses when it is found that the legal and licensing conditions are not met.

In Hungary, when the content of the license has been violated, a fine can be imposed; the Authority may suspend the continuation of the activity, withdraw the authorization or order the restoration of the original state or, where this is not possible, start the cancellation of the contractor's mining rights.

In Slovenia, the Authority that issued the license together with other authorized entities such as the Environmental Agency, has the right and the obligation to monitor on a regular basis the fulfilment of the conditions of the concession contract. An official appeal is issued to mitigate the deficiencies, otherwise an on-the-spot inspection is carried out and financial and other proposed measures are taken. If the conditions are still not met, the Authority may terminate the license in various ways.

- Authorities in the countries involved in the licensing process may lay down clauses that provide for stricter or more permissive terms or conditions, unless otherwise foreseen by the applicable law.

- For the verification of the obligations stipulated in the license agreement, the competent authorities make inspections on the ground and depending on the findings, apply sanctions or not.

- Public and/or national regulatory authorities (from Bosnia and Herzegovina - Republika Srpska, Croatia, Serbia, Slovenia) are directly involved in formulating the purchase contracts. In Hungary, the Office for Regulation of Energy and Public Utilities is implied in charging of centralized heating services, but not in the agreement between the heat producer and the heat supplier. In Romania, the public

and/or national regulators are indirectly involved in formulating the terms of thermal purchasing agreements.

- There are regulations on environmental impact assessment before exploration and geothermal energy production. Lack of correspondence between license documentation and inspections made in the field requires environmental restoration works.

2. Differences in regulations in the countries under study:

- Maximum duration of a license for exploration and exploitation varies from country to country.

- Exploration licenses do not directly translate into exploitation licenses. In all the countries, there are different procedures requiring different documentations.

- In the case of license expiration, there are a variety of regulations on the actions of license holders, but all must undertake land replanting and restoration measures to ensure human life, health and property protection.

- Regulatory rules on documents relating to the licensing period to be submitted to the competent authorities are different from country to country;

- There are no common rules for additional licenses that are necessary to start exploring, exploiting and /or generating geothermal energy;

- There were no legal conflicts between the normative acts in the geothermal field in Romania, Federation of Bosnia and Herzegovina, Republika Srpska and Serbia. In contrast, in Croatia and in Hungary there were overlapping provisions on the exploration side. In Slovenia these conflicts concerned document management, lack of co-operation between authorities during the grant process and different requirements for the licenses.

- There are no obligations regarding reinjection (except for Slovenia, where this is clearly stated). In Hungary, there is no law imposing reinjection, but practically reinjection must be done, in order to avoid conflicts with other legislative acts.

At the end of the above-note differences, it should be added that there are no special administrative authorities in these countries that have competence in the field of geothermal energy, which in some cases determined substantial complications for private parties.

A lack of clarity with regard to the legal framework governing geothermal resources licensing may also be detrimental to public authorities, municipalities and other landowners. It is essential for such parties to maintain adequate control over the use of reservoirs and to ensure that the environmental and administrative requirements are met.

When the terms of a license are not transparent and clear, this determines the financing of geothermal activities to be more time consuming and more costly than necessary.

It is therefore very important to consider the possibility of creating industry standards for licenses and agreements in the field of exploration, production and use of geothermal energy. If such industrial standards are successfully created on an international platform, they could facilitate and enhance the development of geothermal energy in the world, which is of the utmost importance, both from an economic and environmental point of view.

In conclusion, the existing provisions in the legislation of geothermal water are at an early stage if we relate to those existing in some more advanced countries.

Hungary presently has far more extensive regulations, with the existence of two major authorities in the field that through their competencies provide the mining and water management side. Indeed, in Hungary, like in other countries of DARLINGe project, a national authority to regulate the geothermal energy field is missing, even if some of the legal tools of European legislation have been transposed into their national legislation.

In Romania and Serbia, a series of national programs and strategies must be undertaken to allow for the development of new provisions in the geothermal field, like in other countries, to meet the needs and challenges of the society.

Annexes

Annex 1 – Questionnaire

Annex 2a – Bosnia and Herzegovina – Federation of Bosnia and Herzegovina

Annex 2b - Bosnia and Herzegovina – Republika Srpska

Annex 3 – Croatia

Annex 4 – Hungary

Annex 5 – Romania

Annex 6 – Serbia

Annex 7 – Slovenia

COUNTRY	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes ewhat are the criteria?	
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	
2.2. Who can grant access to geothermal resources, only state or also landowner?	
2.3. Is exploration/exploitation open to foreign investment?	
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?	
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?	
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?	

COUNTRY	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	
11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	

BOSNIA and HERZEGOVINA - FEDERATION OF BOSNIA AND HERZEGOVINA	*Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language*
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	The Mining Law (Official Gazette of Federation of B&H, no. 9/10) defines geothermal energy sources in Article 2: "Geothermal energy source is a source of heat caused by earth's heat that is reflected in thermal fluids and thermal effects of rocks". Definitions for thermal and thermomineral water are under the Article 3 of the Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring (Official Gazette of Federation of B&H, no. 47/11): "thermal water" is every groundwater whose temperature is higher than the average annual air temperature of the area where these waters are located and "thermomineral waters" is mineral water whose temperature is higher than the average annual air temperature of the area where these waters are located. Water Law (Official Gazette of Federation of B&H, no. 70/06) has similar definitions of thermal and thermomineral water. The Law on Geological Explorations (Official Gazette of Federation of B&H, no. 9/10 and 14/10) treats thermal and thermomineral waters as a mineral raw. In the Law on Use of Renewable Energy Sources and Efficient Cogeneration ("Official Gazette of the Federation of B&H", no. 70/13 and 5/14) geothermal source is treated as "renewing energy source". Weblinks: 1 - The Mining Law (Official Gazette of Federation of B&H, no. 9/10) in English and in Bosnian: http://www.fmeri.gov.ba/zakon-o-rudarstvu-federacije-bih.aspx ; 2 - The Law on Geological Explorations (Official Gazette of Federation of B&H, no. 9/10 and 14/10) in English and in Bosnian: http://www.fmeri.gov.ba/zakon-o-geoloskim-istrazivanjima-federacije-bih.aspx ; 3 - The Water Law (Official Gazette of Federation of B&H, no. 70/06) in Croatian: http://www.voda.ba/zakoni/47hrv.pdf ; 4 - Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring (Official Gazette of Federation of B&H, no. 47/11) in Bosnian: http://www.fmeri.gov.ba/pravilnik-o-kategorizaciji--klasifikaciji--proracunu-rezervi-podzemnih-voda-i-vodjenju-evidencije-o-njima.aspx ; 5 - The Law on Use of Renewable Energy Sources and Efficient Cogeneration ("Official Gazette of the Federation of B&H", no. 70/13 and 5/14) in Bosnian: http://operatoroieiek.ba/wp-content/uploads/2016/06/Zakon-o-kori%C5%A1tenju-OIEiEK_ba.pdf ; http://operatoroieiek.ba/wp-content/uploads/2014/06/zakon-dopuna-zakona-obnovljivi-0414-hr.pdf
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	Geothermal resource as the public property cannot be in any possession. Private parties or private persons cannot hold ownership of geothermal resources; may only have the right to use geothermal resources in accordance with the Law on Concessions of Bosnia and Herzegovina (Official Gazette of Bosnia and Herzegovina, no. 32/02 and 56/04), the Law on Concessions of Federation of B&H (Official Gazette of Federation of B&H, no. 40/02 and 61/06) and Cantonal laws on concessions (every canton in Federation of B&H has its own Law on Concessions). Which Law on Concession will be applied depends on the territory in which the resource is extended (e.g if the resource is located at the territory of the Federation of Bosnia and Herzegovina and Republic of Srpska, the Law on Concessions of Bosnia and Herzegovina will be applied). Weblinks: 1- The Law on Concessions of Bosnia and Herzegovina (Official Gazette of Bosnia and Herzegovina, no. 32/02 and 56/04) in English: http://www.koncesijebih.ba/home/index.php?option=com_content&task=view&id=17 ; http://mp.ks.gov.ba/sites/mp.ks.gov.ba/files/zakon_o_koncesijama_bih_56_04.pdf ; 2 - The Law on Concessions of Federation of B&H (Official Gazette of Federation of B&H, no. 40/02 and 61/06): http://www.fbihvlada.gov.ba/bosanski/zakoni/2002/zakoni/37_bos.htm ; http://aarhus.ba/sarajevo/images/docs/zakon%20o%20dopunama%20zakona%20o%20koncesijama%20federacije%20bih%2061_06.pdf
2.2. Who can grant access to geothermal resources, only state or also landowner?	Only state of Bosnia and Herzegovina, entities Federation of Bosnia and Herzegovina and Republic of Srpska and Brčko District (depending on the territory where the resource has position) can grant access to geothermal resources with previously solved property - legal relations with the landowner.

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2.3. Is exploration/exploitation open to foreign investment?	Yes. The right to exploit mineral raw materials may be acquired by a domestic or foreign legal entity under the conditions and in the manner defined by the Mining Law. There is also the Law on Foreign Investment (Official Gazette of Federation of B&H, no. 61/01) where are regulated rights, obligations and benefits of foreign investors, forms of foreign investments, procedure of approval of foreign investments and the authorities in charge of approval of foreign investments in the Federation of Bosnia and Herzegovina. Issues not regulated by this Law shall be subject to the provisions of the Law on Policy of Foreign Direct Investments in Bosnia and Herzegovina ("Official Gazette of Bosnia and Herzegovina" no. 17/98, 13/03, 48/10 and 22/15). The Foreign Investment Promotion Agency (FIPA) facilitates and supports foreign direct investment. Weblinks: 1 - The Law on Foreign Investment (Official Gazette of Federation of B&H, no. 61/01) in English: http://www.fipa.gov.ba/publikacije_materijali/zakoni/05.08.2016.Cleansed%20txt%20of%20the%20Law%20on%20Foreign%20Investments%20of%20FBiH_Eng_October%202015.pdf , 2 - Foreign Investment Promotion Agency (FIPA) in English: http://www.fipa.gov.ba/o_fipa/usluge/default.aspx?id=216&langTag=en-US
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	The exploitation of resources is subject to licensing and it is not possible to exploit without Concession contract, Water permit and other required documents.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	Yes, landowners have the roles in granting of licenses: (i) for obtaining the Approval for geological investigation in accordance with Article 27 of the Law on Geological Exploitation applicant (investor) must have consent of the landowner for performing of projected investigations. ii) Along with the application for an exploitation permit, the applicant (investor / user) shall submit the proof of the right of use or easement for the land designated for exploitation of mineral raw materials (Article 38 of the Mining Law);
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	Yes. The applicant (investor) for geological exploration or the use of geothermal energy must have the consent of the landowner to carry out exploration or exploitation or building a plant. Only, if the project has a "general (public) interest", then it is possible to conduct exploration without the consent of the landowner and exploitation with expropriation of the land from owner.
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Yes. Expropriation can be carried out for the purposes of the Federation of Bosnia and Herzegovina, cantons, cities, municipalities, public companies and public institutions with the appropriate compensation to the landowner. Expropriation is under the Law on Expropriation (Official Gazette of Federation of B&H, no. 70/07 and 36/10) Weblinks: The Law on Expropriation (Official Gazette of Federation of B&H, no. 70/07 and 36/10) in Bosnian: http://www.fbihvlada.gov.ba/bosanski/zakoni/2007/zakoni/15bos.htm http://www.parlamentfbih.gov.ba/dom_naroda/bos/parlament/propisi/usvojeni_p_14_18/Zakon%20o%20izmjeni%20i%20dopuni%20zakona%20o%20eksproprijaciji_bos.pdf
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	The same kind of licenses need to be obtained for all geothermal resources, but only the monitoring is different for different types of using thermal and thermomineral waters that need to be defined in Decision on the verification of reserves in accordance with Rulebook on the classification, categorization and calculation of groundwater reserves and the flow of their monitoring.

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5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	Exploration, exploitation and protection of thermal and thermomineral waters and geothermal energy in Federation of B&H are regulated by 6 federal laws: 1) Law on Geological Investigation, 2) Mining Law, 3) Water Law, 4) Law on Concessions, 5) Law on Environmental Protection, 6) Law on Use of Renewable Energy Sources and Efficient Cogeneration and 10 cantonal Laws on Concession (every canton in Federation of B&H has own Law on Concession). **i) Required licence for exploration are:** Preliminary water consent and Water consent (under the Water Law), Approval for geological investigation (under the Law on Geological Investigation) and Environmental permits (under the Law on Environmental Protection). **ii) For exploitation the following licenses are required:** Decision on the verification of reserves (the Law on Geological Exploration), Concession contract (state, federal or cantonal Law on Concession), Decision on exploitation (the Mining Law), Decision on spring protection and Water Permit (Water Law). The documents need to be submitted for: **1) Preliminary water consent** - Urban planning permit, Study whose content is defined in Article 12 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15), and other documents defined in Article 6 this Rulebook; **2) Water consent** - Project of geological investigation, documents required by Preliminary water consent and other documents defined in Article 17 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts, **3) Approval for geological investigation** - Project of geological investigation, Urban planning permit and other documentation in accordance with Article 27 of the Law on geological Investigations, **4) Environmental permit** - dokumentation under Article 69 of the Law on Environmental Protection, **5) Decision on the verification of reserves** - Elaborate on the classification, categorization and calculation of thermal water reserves, **6) Concession contract** - Feasibility study for the use of water, Elaborate on the classification, categorization and calculation of thermal water reserves, Preliminary water consent and other documents undre Law on Concessions (federal or cantonal), **7) Exploitation permit** - concession contract, decision on the verification of reserves, proof of the right of use or easement for the land designated for exploitation of mineral raw materials and other documents under Article 38 of the Mining Law, **8) Decision on spring protection** - Elaborate about protection of springs/wells and **9) Water permit** - Elaborate on the classification, categorization and calculation of thermal water reserves, Decision on spring protection, Preliminary water consent, Concession Contract and other documents defined in Article 21 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15)
	Weblinks: 1 - The Law on Environmental Protection (Official Gazette of Federation of B&H, no. 33/03 and 39/09): http://www.fmoit.gov.ba/images/stories/dokumenti/Zakon%20o%20zastiti%20okolisa%20BOS.pdf ; 2 - The Rulebook on the content, form, conditions, method of issuing and storage of water acts (Official Gazette of Federation of B&H, no. 31/15) in Bosnian: http://www.fzofbih.org.ba/userfiles/file/zakon%20o%20izmjenama%20i%20dopunama%20zakona%20o%20zastiti%20okolisa.pdf ; http://www.vladahbz.com/sadrzaj/dokumenti/ministarstvo-poljoprivrede-vodoprivrede-i-sumarstva/Vodoprivreda/PRAVILNIK%20o%20sadrzaju%20obliku%20uvjetima%20nacinu%20izdavanja%20i%20cuvanja%20vodnih%20akata%20.pdf
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	i) **The maximum duration of explorations** is determined in accordance with the dynamic of the planned geological program or research project (Article 30 of the Law on Geological Exploration). For each project, the Federal ministry of energy, mining and industry in Approval for geological investigations defines the deadline for performing geological investigations. ii) **The exploitation period** is contracted by Concession contract and cannot be longer than 30 years except in special situations when it can be extended to a maximum of 50 years; the concession contract may be renewed for a period which cannot be longer than half of the first time contractual period (Article 29 of the Law on Concessions of Federation of B&H). During the contracted concession period, the user must regularly obtain Decision on the verification of reserves every 7 years (Article 44 of the Law on Geological Exploitation), Water permit (the water permit is issued for a limited period up to 15 years in accordance with Article 117 of the Water Law) and Environmental permit every 5 years (Article 68 of the Law on Environmental Protection-Official Gazette of the Federation of B&H, no 33/03 and 38/09). The validity date is not defined for Decision on spring protection.

BOSNIA and HERZEGOVINA - FEDERATION OF BOSNIA AND HERZEGOVINA	*Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language*
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	i) General terms for obtaining the **Approval for geological investigation** are revised Project of geological investigation, obtained Urban planning permit and other documentation in accordance with Article 27 of the Law on Geological Explorations. Approval for geological investigation should contain: coordinates of the investigated area, minimum scope and type of research work, conditions and limitations that must be followed by a company which conducts exploration, deadlines for starting and completing the works, reporting, recultivation of land, etc. ii) Required documents and conditions for making of the **Concession contract** are: 1) Feasibility study for the use of water, 2) Elaborate on the classification, categorization and calculation of thermal/thermomineral water reserves, 3) Preliminary Water Permit and other documents defined in Law on Concessions (federal or cantonal). Concession contract contains at least: the amount of the concession fee, concession period, investment requirements, obligations of concessionaires in the field of environmental protection, etc. The main requirement for obtaining of the **Decision on the verification of reserves** are realised exploatational investigations and the Elaborate on the classification, categorization and calculation of thermal/thermomineral water reserves. Decision on the verification confirms: 1) groundwater reserves (exploitation and forecast reserves), 2) quality of groundwater, 3) allowed water use and 4) minimum scope of monitoring. The **Decision on spring protection** is based on realised investigations for defining sanitary protection zones and necessary measures for the preservation of quality and quantity that need to be reported by Elaborate about protection of springs/wells and contains: 1) a detailed description of the boundaries of the protective zones, 2) a detailed description of the protection measures per protection zone and 3) deadlines for the establishment of measures of protections etc. The **Water permit** can be issued only after acquired the Decision on the verification of reserves, the Concession Contract and the Decision on spring protection and in accordance with Article 21 of the Rulebook on the content, form, conditions, method of issuing and storage of water acts. The **Environmental permit** is issued by the Federal Ministry for Environmental Protection on the bases documentations needed for identification and assessing the impact of the drillholes and heating or power plant on the environment and consists: 1) the requirement for the protection of air, soil, water, plants and animals, 2) measures to prevent pollution, 3) methodology and frequency of monitoring of polluting substances and other items in accordance with Article 71 of the Law on Environmental Protection.
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	No. After the successful drilling and short-term testing of capacity and quality of water, the Report on drilling and testing of the drillhole/s should be done, then follow investigations in duration at least one hydrological year that will be reported in Elaborate on the classification, categorization and calculation of thermal/thermomineral water reserves. On the bases of revised mentioned Elaborate the Federal Ministry of Energy, Mining and Industry issues the Decision on the verification of reserves without which it is not possible to sign Concession contract or obtain Water permit.
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	Yes, licence holder have the right to request revision of licenses; they need to submit a request for change of license to the granting authority and provide the documents based on which it is possibile to make decisions on acceptability of requested changes.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	Yes. The granting authority have the right and obligation to revoke or terminate licenses if the user does not respect the laws governing the investigation, exploitation and protection of thermal / thermal waters and geothermal energy and does not perform the activities specified in the permits. There are other reasons for termination of a license, for example the Concession contract shall terminate if the Concessionaire is insolvent or bankrupt.
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?	Yes. Based on the estimation of granting authority, expert opinions or conclusions arising from the public hearing can set stricter requirements in licenses (e.g. stricter monitoring, more frequent reporting, etc.), for example in case of the reservoir overexploitation or less strict conditions that are required by law in case of very small use of thermal / thermomineral waters reserves, etc.
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	The license granting authority may apply the penal provisions that are defined in each law. A fine is foreseen for any violation of the law and for non-fulfillment of requirements and conditions defined by licence.

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8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	No. Licence holder have no obligation to liquidate the well after the exploitation permit expires, but it is necessary to obtain the permit for complete and permanent suspension of exploitation (Article 30 of the Mining Law) and shall take security measures to permanently exclude any danger to health and safety of people and to property, as well as any potential causes of environmental pollution or damage to buildings or the environment (Article 59 of the Mining Law). There are no any standards or criteria for liquidation of well or changing it into an observation well.
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	The supervision of the implementation of the **Law on Geological Exploration** and regulations passed according to this Law is conducted by the competent federal inspector. The chapter "XVII. INSPECTION SUPERVISION" of the Law on Geological Exploration (Article 58-75) refers to inspection work, supervision and site visit during geological investigation and using of water/geothermal energy. Supervision of the implementation of the **Mining Law** and regulations adopted pursuant to this Law (falling under the responsibility of the Federation of B&H) shall be performed by the Federal Ministry of Energy, Mining and Indastriy. Inspection shall be performed by the Federal Inspection Authority on the basis of this Law and the Law on Inspections in the Federation of B&H ("Official Gazette of the Federation of B&H", No. 69/05) as it is defined in chapter "VIII - SUPERVISION" , Article 92-108. The Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina performs the administrative supervision over the implementation of the **Water Law** and regulations issued pursuant to this Law, as well as administrative control the work of two Watershed Agencies which are responsible for issuing water licenses on teritory of Federation of B&H (Preliminary water consent, Water consent and Water permit) in accordance with chapter "XIII- SUPERVISION OVER IMPLEMENTATION OF THIS LAW", Article 179-203. Inspection and verification of the work of Concessionaires is under the **Law on Concession** (Article 22). The President of the Concession Commission may designate another person in writing to perform the inspection and verification of the work of Concessionaires. The designated person can visit the Concessionaires at any time and request access to documentation or request the submission of data and documents necessary for the implementation of this Law. Federal or cantonal environmental inspectors follow the implementation of the **Law on Environmental Protection** as it is prescribed by chapter "XII - SUPERVISION", Article 90-92.
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	i) **Report on conducted geological explorations** (Article 40 of the Law on Geological Exploration); ii) **Annual report on the results of the exploration by 15 March of the current year for the previous year** (Article 40 of the Law on Geological Exploration), Elaborate on the classification, categorization and calculation of thermal/thermomineral water reserves every 7 years (Article 41 of the Law on Geological Exploration); **Monthly report on quantity of extracted water from springs/wells** (Article 50 of the Water Law)
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?	Power Purchase Agreements from renewable energy sources are under the Law on Use of Renewable Energy Sources and Efficient Cogeneration ("Official Gazette of the Federation of B&H", no. 70/13 and 5/14). The Agreement must be concluded (signed) between the Operator for Renewable Energy Sources and Efficient Cogeneration and Privileged Producer in accordance with Article 26 of this Law. The Agreement shall necessarily define: the guaranteed purchase price, duration of the contract, technical data about the plant and planned production, the tolerance of the notified production plan and the obligation related to the submission data to the Operator. Weblinks: Operator for Renewable Energy Sources and Efficient Cogeneration: http://operatoroieiek.ba/
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	Power Purchase Agreement for new plant is concluded for a period of 12 years from the start of operation of the plant.
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?	The procedure for granting the status of "privileged" electricity producer from the RES is public (Article 24 of the Law on Use of Renewable Energy Sources and Efficient Cogeneration). The Privileged electricity producer is a qualified producer who has the right to deliver the total amount of electricity produced during a predetermined period with guaranteed price.
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	Urban planning permit required for obtaining Preliminary water permit and Approval for geological investigation cannot be issued without Environmental permit;

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11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	The Federal Ministry for Environmental Protection for each individual case (project) determines is it necessary the environmental impact assessment (Article 5 of the Roolbok on plants and installations for which a mandatory environmental impact assessment is required and on plants and installations that can be start with the process if they only have environmental permits -Official Gazette of the Federation of B&H", no. 19/04). Weblinks: The Rulebook on plants and installations for which a mandatory environmental impact assessment is required and on plants and installations that can be start with the process if they only have environmental permits (Official Gazette of the Federation of B&H", no. 19/04) in Bosnian: http://www.fmoit.gov.ba/images/stories/dokumenti/Pravilnik%20o%20pogonima%20i%20postrojenjima%20bos.pdf.
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	Yes. The environmental impact assessment process will include interested bodies at cantonal and federal level (Article 55 of the Law on Environmental Protection). If Federal Ministry for Environmental Protection estimate that Environmental Impact Study (Article 59) is needed then this Ministry will publish the Stady and invite the public to express their opinion (in writing form) about this document within 30 days from the date of the public announcement (Article 61).
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	1) Approval for construction of heat/power plant, 2) Approval for use of heat/power plant, 3) Energy permit. The construction of heat or power plant is under the Law on Spatial Planning and Land Use at level of Federation of B&H (Official Gazette of the Federation of Bosnia and Herzegovina, no. 2/06, 72/07, 32/08, 4/10 , 13/10, 45/10) and the Law on Electricity (Official Gazette of the Federation of Bosnia and Herzegovina, no. 66/13). Weblinks: 1-The Law on Spatial Planning and Land Use at level of Federation of B&H (Official Gazette of the Federation of Bosnia and Herzegovina, no. 2/06, 72/07, 32/08, 4/10 , 13/10, 45/10) in Bosnian: http://www.fmpu.gov.ba/zakoni ; 2 - The Law on Electricity (Official Gazette of the Federation of Bosnia and Herzegovina, no. 66/13) in Bosnian: http://www.fmeri.gov.ba/zakon-o-elektricnoj-energiji-u-fbih.aspx
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	No.
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	There is no any regulation on re-injection in Federation of Bosnia and Herzegovina. At the state level there is also no any related regulation.

BOSNIA and HERZEGOVINA - REPUBLIKA SRPSKA	*Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language*
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	Yes, geothermal resources are defined in Law on amendment of the Law on geological explorations (Official Gazette RS 91/17), article 1. and paragraph k). Hydro and petrogeothermal resources are split into 3 categories: subgethermal (<30°C), low enthalpy (30-100°C); mid and high enthalpy (>100°C).
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	To be owner of geothermal project the company, first of all, must be registered in the Republic of Srpska. For exploitations of geothermal energy a company must sign concession contract with the Government of the Republic of Srpksa, in accordance with Law on Concessions, Official Gazette RS 59/13. Before concession procedure starts, the geological explorations and definition of the reservesmust be provided and mining documentation (in accordance with Low on Mining, Official Gazette RS, 59/12).
2.2. Who can grant access to geothermal resources, only state or also landowner?	Access to geothermal resource grants the Government by the Concession Contract. The procedure for signing of the Contract is explained above. Of course, the land must be purchased from owner before the exploitation start.
2.3. Is exploration/exploitation open to foreign investment?	Yes, but just if foreign investor has company registered in the Republic of Srpksa, in accordance with domsetic legal policy (Low on Companies, Official Gazzete RS 127/08, 58/09, 100/11, 67/13).
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Yes, it is the subject of licensing (concession), explained in detail in rows above.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	In the stage of exploration investor can sign some a contract with owner about land use and regulate obligation of the contract parties. If results of exploration are positive, for the stage of exploitation and construction plant the investor must purchased the land. Anyhow, the land owner cannot give any kind of the resource access grant, just can sale the land.
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	In that case, the Law on Expropriation define possible solutions (Official Gazette RS 53/95, 23/01 and 20/09).
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Yes, if public interest for the construction exist. Expropriation could be provided for the purpose of the Republic of Srpska or city/municipality. Decision on public interest for facility construction announces the Government of the Republic of Srpska. Before the decision, the Government request opinion of the responsible bodies of the city/municipality in which the facility should be constructed (Law on Expropriation, Official Gazette RS 112/06, 37/07, 110/08).
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	Generally there is the same licensing procedure, not dependant on depth, utilization type, technologies, reinjection etc. Some differences are regarding electricity production from geothermal. But here is not any example/project with this type of utilization yet (despite fact that perspective areas exist, e.g. Semberija).
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	1. For exploration: Project of geological explorations→Provide exploration according to the project→Elaborat on reserves→Approved reserves by the Ministry of Industry, Energy and Mining; 2. For exploitation: Mining Design of exploration of geothermal energy (becouse the any well is considered as mining object).
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	Term for starting of the exploration is six months after the Ministry approves the exploration in accordance with the Project of geothermal explorations. The duration of the exploration cannot be longer than three years, but in some cases it could be extended for maximal 1/2 half of time prescribed in the Ministry approval (Law on Geological Explorations, Official Gazette 113/10). Exploration could be continued after concession contract with the approved exploration field. The duration of exploitation is defined in the concession contract and it is maximal for the period of 30 years.
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	**License for exploration consists of:** 1) Exploration owner; 2) Subject and kind of the explorations; 3) the title of the project of detail geological explorations; 4) the coordinates of the border points of the exploration field; 5) duration of exploration; 6) the value of the tax for geological explorations; 6) type and scope of the geological exploration works; 7) term for starting of geological explorations, maximal is 6 months; 8) terms and way of reporting to the Ministry regarding exploration results; 9) conditions of the land recultivation after explorations; **License for exploration consists of:** 1) name of the concessionaire; 2) type of the mining project, 3) deposit name and type of the mineral resource or geothermal resource and the name of municipality where mineral resource or geothermal reservoir is located; 4) deadline for starting of mining works; 5) obligations regarding obtaining of the ecological permit and water management approval; 6) obligation regarding obtaining of evidence about paid fee for conversion of agriculture land, if the works were performed on agriculture land; 7) obligations regarding obtaining the operation permit for constructed mining facilities; 8) obligations regarding recovery and recultivation of the land, mining waste management, employee of the appropriate professionals for technical management, inspection, safety and health security and reporting to responsible bodies and inspectorate about mining works.

BOSNIA and HERZEGOVINA - REPUBLIKA SRPSKA	*Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language*
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	No. After the exploitations comes concession procedures. The Government anounce Public call for geothermal concession and company who provided explorations has advantage 10% per each call criterium. If some other company win the call, it has obligation to refund the company who performed geological explorations for money spent for explorations.
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	Yes. For the exploration lincense just some elelemtns of the license like duration can be revised, e.g. the license for exploration cannot be longer than three years, but innvestor can request revision and extensionu nder appropriate conditions for maximal 1/2 half of time prescribed in the license, (Article 32., paragraph (1) of the Law on Geological Exploration, Official Gazette 113/10).
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	Yes. **License for exploration could be terminated if:** 1) the exploration is not started in prescribed deadline; 2) explorations are not in line with approved project; 3) explorations are not reported to the responsible authority; 4) if exploration fee is not paid; 5) if license owner do not engage company for exploration supervision; 5) does not preserve core samples; 6) if the explorations disturbed earlier approved explorations of the other mineral resource in some or neighboring exploration field; 7) if the company provide exploration does not apply appropriate protection and safety measures; **Because the exploitation is based on concession contract, the contract could be terminated if:** 1) the subject of concession is totally exploited; 2) after termination of the period of exploitation defined in the contract; 3) after triggering of the concessionaire bankruptcy procedure; 4) one-side termination; 5) by agreement of the concessionaire and grantor; 6) by court decision that the contract is not valid; 7) by repeal of the decision about selection of the best offerer and concession allotment, after concessionaire is already contracted. **One-side termination by grantor could be available in cases of**: 1) concessionariere does not apply neccesery actions before deadlines; 2) if the dinamic of relaisation of the concession activity dosent match defined in the contract; 3) if realisation of the activities endanger environment, human health and protected public goods; 4) if concessionaire does not provide service in accordance with defined quality; 5) if the concessionaire does not pay concession fee three times repeatedly of payment is iregular; 6) if concessionaire transfer of concession right, changer ownership structure or dispose with properties opposite to provisions of the Law on Concessions; 7) in other cases based on the Contract on Concession.
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licenses, when such terms and conditions (whether stricter or more permissive) are not otherwise	The terms and conditions for licenses are in detail given in the Concession Contract, of course strictly based on the provisions of the Law on Concessions and other accompanied laws (Law on Mining, Law on Water etc).
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	In the case the Republic Inspectorate or some other responsible authority (ministries, agencies etc.) finds violation of the conditions prescribed in the license they will enjoin fulfillment of the conditions from the license and prescribed the deadline for the correction. If a concessionaire do not respect correction requested from the authority, a concession contract could be terminated by granter.
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	In the Law on Mining (Official Gazette RS, 59/12) exist just paragraph (1) in article 25 requests: In a case of abandonment of the exploitation, the concessionaire is duty to provide all necessary measures to protect the mining facility (well is defined as mining facility) and land and also protection measures and recovery of the environment with the aim to ensure human life and health protection and protection of the properties, all in accordance with prepared Additional mining project of the abandonment of the exploitation.
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	The terms and way of reporting to the Ministry of the Industry, Energy and Mining, regarding exploration, are prescribed in the approval for the explorations. For the explorations longer than one year reporting is annually, for those shorter than one year reporting is at the end of explorations. Also, the license owner is in duty to provide other licensed company for supervision of the explorations.
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	**(i) During the explorations:** type and number of the performed exploration works and level of their realisation in comparison with those given in the Project of detail geological explorations; **(ii) During the exploitation:** ammount of the extracted water (or energy) per year and analyses of the quailty (phisical, chemical, gas) if the geothermal source is water. Responsible authority is Ministry of Industry Energy and Mining. Monitoring procedure is in charge of the Ministry of Agriculture, Forestry and Water Management and Public Utility "Vode Srpske".
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?	Yes, e.g. duration of the agreement is in the line with provision of the Law on Concessions that maximal duration of any concession in the Republic of Srpksa is 30 years.
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	See the row above.

BOSNIA and HERZEGOVINA - REPUBLIKA SRPSKA	*Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language*
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?	Yes, the concession contract is topic of negotiation with Governement. Here is also inclusion of Ministries related with subject ofconcession, but also the Commission for Concessions.
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	For the projects which could impact on environment, based on their nature, size and location, estimation of possible impacts is defined in the Study of environmental impact. The Study preparation is prescribed by article 61, paragraph 1 of Law on Protection of the Environment (Official Gazette of RS 71/12 and 79/15).
11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	The assesment is mandatory for groundwater extraction or reinjection of more than 10,000,000 m^3 (more than 315 l/s). Taking into account seasonal character of heating (6 months) it is not realistic to expect exploitation of thermal water more than 10,000,000 m^3 for the cities in the Republic of Srpska. But, for any deep boreholes drilling, especially those geothermal, the Ministry of Spatial Planning, Construction and Environment decide about necessity of the assessment (also in the case if abstraction is less than 10,000,000 m^3/year) (The Law on Environment Protection, Official Gazette of RS 71/12 and The Rule on Projects for which it is being implemented estimation on environment impact and criteria for decision and scope of estimation of impact on environment, Official Gazette of RS 124/12.
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	Of course. To define any possible impact it is necessary that Investor pripare the Study of Environment Impact before the project realization. Regarding the property, it is the above-mentioned that all affected owners must be reimbrused in accordance with Law on Expropriation. But anyhow, if they seesms it innapropriate they coould submit a complaint to the responsible court. NGO in accordance with Law on Free Information Access can request information related with a project from public interest by submiting the request to authorityresponsible for the project approval. In that way the NGO sector can consider any action opposite to the legal policy. The deadline to providing information from the authority is 15 days from the moment of request receiving. NGO organisatin also can submit lawsuit to responsible court.
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	Just additional permits for production are requested, in the first order Construction Permit. One of the bases for this permit is Ecological Permit issued. Issuing of both permits is in charge of the Ministry of Spatial Planning, Construction and Environment. For the Ecological Permit preparation of Study on Environment Impact is requested.
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	No.
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	Regulation regarding reinjection does not exist in the legal policy yet. Discharge of used water into surface streams and sewage systems is allowed, but temperature of waste water must be lower than 30°C. This is governing by the Law on Water (Official Gazette of RS 50/06).

CROATIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	Yes, Depending on their usage, geothermal waters are regulated by different Croatian laws, including the Water Act (Official gazette 153/09, 63/11, 130/11, 56/13, 14/14) which applies to Bottled waters and Bathing waters and the Mining Act, (Official gazette 56/13, 14/14), which applies where geothermal waters are used for heating and electricity generation. But also is mentioned in Energy Act (OG 120/12, 14/14, 95/15 and 102/15), Energy Development Strategy of the Republic of Croatia (OG 130/09), the Act on Renewable Energy Sources and Cogeneration (OG 100/15 and 123/2016). web links: https://narodne-novine.nn.hr/clanci/sluzbeni/2013_05_56_1133.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2014_02_14_294.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2009_12_153_3744.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2011_11_130_2612.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2013_05_56_1139.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2014_02_14_279.html;https://narodne-novine.nn.hr/clanci/sluzbeni/2011_06_63_1401.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2012_10_120_2583.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2014_02_14_296.html;https://narodne-novine.nn.hr/clanci/sluzbeni/2015_09_102_1975.html; https://narodne-novine.nn.hr/clanci/sluzbeni/2015_09_100_1937.html;
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	No, state own the geothermal resources but private party owns only right to use it - concession (licence). Thermal water is considered to be a mining treasure and as such is owned by the Republic of Crotia. For the exploitation, concession is required. The concession can be granted to a private person or a legal person (public or private body) which is selected as the most favorable bidder in public bidding.
2.2. Who can grant access to geothermal resources, only state or also landowner?	As noted above, for the exploitation of geothermal resources, concession is needed. According to the Concession law, the concession provider is a body of public authority. Therefore, only the state and state bodies may grant approval for the exploitation of mineral raw materials.
2.3. Is exploration/exploitation open to foreign investment?	The concessionaire, ie the recipient of the concession can be a foreign subject.
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Yes , and by the law it is not possible to exploit without (concession) licence. No, but if you are already in the process of getting it you may …but this is grey area…if you are in process of getting this licence that means that you have exploration, granted explotation filed, granted mining project you are almost at close to finish line.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	If the land for which the concession is intended is not in property of the Republic of Croatia, the future Concessionaire is obliged to regulate property rights with the owner of that land.
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	It can slow down the procedure of getting concessions if the landowner is not satiffied with deal. But it is common firstly to sort out papares
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Yes
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	Yes, two types: water concession for bottled waters and bathing waters (balneology) and mining concession (for heating and electricity production)
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	Have to submit bidding offer for grant approval for exploration of mineral resources which has to contain: 1. program of all the exploration works listed by sort and size with the costs, made in accordance with the procurement documentation, 2. a detailed plan of works that have to be done in the first year of exploration, 3. deadline until when the exploration will be done, 4. the total amount of financial resources for the execution of the planned exploration works and the manner on how that will be secured, 5. deadline when the exploitation of mineral resources will begin within the exploration field, 6. recovery plan for the exploration area, 7. tender guarantee, 8. offered concession fee, 9. other evidence which is relevant for the choice of the most economical bidder and that is mentioned in the procurement documentation. After approval, the chosen bidder have to submit Mining project for exploration, afterwords the request of exploration field then the Request for enviromental assesment and then the main Minning project. After the review of all of these, concession is approved. After that Concessionare have to obtain a bulding permit and afterwards usage permit and then starts explotation.
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	maximun 40 years

CROATIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	The explotation has to contain: 1. Decision on the election of the most economical bidder according to the procedures of the Mining Act, 2. the decision on establishing an exploitation field, 3. the decision establishing the amount and quality of the mineral resources reserves or the decision establishing the manner, form, size and scope of the geological structures that are meant to be used for the storage of hydrocarbon and permanent disposal of gasses, 4. location permit, 5. main mining project and / or amendment to the mining project reviewed by the ministry competent for mining works, 6. written consent or confirmation on the main mining project by the administrative bodies that determine the conditions and limitations for executing the mining works, 7. proof of the right to use the land parcels within the exploitation field, in line with the pace of performing the mining works determined in the mining project for the period that is stated in the concession agreement for the exploitation of mineral resources, 8. map of the exploitation field with marked area of the determined mineral reserves or with the marked area of the geological structures that are suitable for storage of hydrocarbon and permanent disposal of gasses, as well as with land parcels with cadastral data and surfaces within the exploitation field, 9. proof that there are no limitations for obtaining a concession as stated in the Mining Act. For a concession, it is necessary to: 10. obtain a legally valid location permit from the competent body for spatial planning, 11. obtain a declaration of the ministry competent for mining on the completion of inspection and the acceptance of the project solutions in the main mining project, 12. solve all property issues for the land parcels within the exploitation field. And exploration is one part of it.
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	No
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of	Yes, they have to repeat again everything.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	Yes, if the user does not respect rights which are determined by the concession - financial fine and/or lost of the concession rights
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?	No
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	Field inspection
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	No
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	Every year users have to report to the authority how much resources is exploited. For time to time field inspection is done by authority.

CROATIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	see three rows above
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in	Yes, in Republic of Croatia exist the Law on the market of thermal energy which regulates general terms and conditions of Heat Purchase Agreements, ie prescribes mandatory parts of such Agreements
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	The contract is usually concluded for a period of one year and is automatically extended for each subsequent year if the customer does not terminate it
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?	Yes, in CRO several public bodies affect the conditions of the Heat purchase agreement, the most important is the Croatian Energy Regulatory Agency (HERA) which determines the methodology for the calculation of tariff items and provides the general terms for delivering of energy. The terms of the contract must be in accordance with the Law on the market of heat energy and the Law on consumer protection.
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	An environmental impact study is an integral part of a Request for Determining Environmental Impact (Regulation on determination of environmental impact (OG 64/07, 67/09). The Request must contain the following: 1. Information about the submitter of the Request, 2. Information about the location and operation, 3. Information about the compatibility of the operation with the current spatial planning documentation 4. Information about the authorized person to perform the expert tasks regarding environmental protection – i.e. to make an environmental impact study 5. An Environmental Impact Study 6. Administrative fees
11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	No
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	before it is approved each environmental study has to be publicly discussed.
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	Bulding permits, Location permit, Usage permit
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	Yes
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	No

HUNGARY	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	Since the Water Management and the Mining Authority are involved in the Hungarian geothermal licensing, there are separate definitions for geothermal energy/thermal water. In Hungarian legislation, the definitions of “thermal water” and “geothermal energy” are differentiated. While thermal water is a term of water management related rights, the geothermal energy regulated by mining law. The Act LVII. of 1995. on Water Management Annex 1. gives a definition to thermal water, „ all ground water (derived from aquifer) with an outlet temperature (surface temperature) of 30 °C or higher” The definition of geothermal energy is given by the Act XLVIII. of 1993 on Mining 49. §, „ the internal heat energy of the earth crust”. Also, the law gives a definition to geothermal energy sources, „in application of the present Act, the materials in different physical states (eg. subsurface water, vapours) which make possible the utilization of the internal heat energy of the earth crust for different purposes or with the application of other technologies.” Since the Water Management and the Mining Authority are involved in the Hungarian geothermal licensing, there are separate definitions for geothermal energy/thermal water. In Hungarian legislation, the definitions of “thermal water” and “geothermal energy” are differentiated. While thermal water is a term of water management related rights, the geothermal energy regulated by mining law. The Act LVII. of 1995. on Water Management Annex 1. gives a definition to thermal water, „ all ground water (derived from aquifer) with an outlet temperature (surface temperature) of 30 °C or higher” The definition of geothermal energy is given by the Act XLVIII. of 1993 on Mining 49. §, „ the internal heat energy of the earth crust”. Also, the law gives a definition to geothermal energy sources, „in application of the present Act, the materials in different physical states (eg. subsurface water, vapours) which make possible the utilization of the internal heat energy of the earth crust for different purposes or with the application of other technologies.”
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	The Act LVII. of 1995. on Water Management 6. § (6) declares that all the groundwater, and natural aquifers of groundwater are exclusively state-owned. The operator of the groundwaters are the competent territorial Water Management Directorate. In case of thermal water utilization, water legal permit is necessary from the Water Management Authority to which a contribute of the Water Management Directorate is needed. According to the Act XLVIII. of 1993. on Mining 3. § (1), “The […] geothermal energy is state-owned in their natural place of occurrence. The […] geothermal energy obtained for energy purposes shall be the property of the mining entrepreneur with the utilization.”
2.2. Who can grant access to geothermal resources, only state or also landowner?	Access to geothermal resources could be granted only by relevant authorities (state), landowner has no right to grant access for use the geothermal resources. The Hungarian law clearly defines that the geothermal energy and thermal water is state-owned and only the state can give license to access the geothermal energy. In case of open area (above 2.5 km depths) the Water Management Authority might grant license for utilization of thermal water. To obtain a water legal license, a contribute from the competent territorial Water Management Directorate is necessary. In case of closed area (below 2.5 km depths) the Act XLVIII. of 1993. on Mining 5. § (1) defines that “Mining supervision shall license prospecting, […] g) exploitation and utilization of geothermal energy, including the construction and putting to use of the underground and surface facilities – specified in separate legislation – required for this purpose, if the activity isn’t water legal license required.”
2.3. Is exploration/exploitation open to foreign investment?	There is no obstacle for foreign investors to explore or exploit the geothermal resources. The Water Management laws do not limit the foreign investments, but all the licensing process must be prepared in Hungarian language according to the Act CL. of 2016. on General Administrative Order 20. §. The Act XLVIII. of 1993. on Mining 8. § describes the followings: “The minister, through the concession agreement made with domestic or foreign natural people or transparent organization may lease for a specified period a) in closed areas, ab) exploration, recovery and utilization of geothermal energy.” Also, the Mining Law requires to inform the foreign investors by publishing the public call for tender in the Official Journal of the European Union (Act XLVIII. of 1993. on Mining 10. § (3)). However, it is usually prescribed in the public call for tender that the official language is Hungarian for the concession process which can be unfavorable for foreign investors.
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Yes, the exploitation of geothermal resources is subject to a water legal permit in case of open areas or to a concession contract and mining licenses in case of closed areas. The Hungarian regulation distinguish open and closed area for geothermal resources. The open areas (above 2,5 km depths) are licensed by the Water Management Authority, the closed areas (below 2,5 km depths) are under concession obligatory and licensed by the Mining Authority. The Act XLVIII. of 1993. on Mining 49. § defines these definitions: “24. Closed area: the area to be designated for a concession contract [….] With respect to geothermal energy, the layer below 2500m measured from the natural surface shall be considered as a closed area throughout the country.” “20. Open area: every area not considered as a closed area in relation to the defined mineral raw material.” At least the applicants need to conduct an environmental licensing, a water licensing, and district heat production licensing process which may take at least 8 months in case of open areas (<2500 m depth). In addition to those listed above, in case of closed areas, a concession contract and mining facility licensing process needs to be done which may takes at least 16 months. If any additional licensing is necessary e.g. the heating plant will be on agricultural land, the whole licensing process might be longer. Summary, there is no opportunity to exploit geothermal resource without any license.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	The landowner’s contributing statement is necessary to grant construction license. Expropriation is possible, but it will extend the project preparations with years.

HUNGARY	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	Without the landowner's contribution, only the environmental permit can be requested. However, any other licenses for exploration, exploitation or heating plant could not be released by the authorities without a contributing statement. The opposition of a landowner could paralyze the geothermal project, the investors have to come to an agreement with the landowner.
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Yes, the Hungarian law gives a possibility to expropriate a land, but only in justified cases, and the reason of the expropriate must be explained well. The Act V. of 2013 on Civil Code 5:43. § describes the followings: "(1) By expropriation real estate property can be obtained for exceptional, public interest purposes, for immediate, complete and unconditional indemnity. (2) The person who acquires the property on expropriation is obliged to provide compensation." Expropriation is possible if the activity is public interest, other real estate is not suitable for the implementation and the acquisition of ownership of real estate is not possible through sale or exchange. (Act CXXIII. of 2007 on Expropriation 3. § (1))
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	The Hungarian regulation distinguish open and closed area for geothermal resources. The open areas (above 2,5 km depths) are licensed by the Water Management Authority, the closed areas (below 2,5 km depths) are under concession obligatory and licensed by the Mining Authority. Differences of licensing of open (shallow geothermal energy exploitation) and to close areas (deep geothermal energy exploitation) introduced below. 1. Shallow geothermal energy resources exploitation (thermal water above 2.5 km) a. Exploration drilling Usually, if exploration drilling is planned, the most convenient solution is to apply for a water legal permit for construction which is licensed by the Water Management Authority. It allows to make an exploration drill, produce geothermal resources to examine quality and/or quantity. Generally, the examined suitable exploration wells can be transformed to exploitation wells (production wells) and in this case the licensed water legal permit can be usable for the exploitation phase with supplement, more detailed information. Other exploration licensing possibilities are reconnaissance (surface exploration) and geologic exploration which are licensed by Mining Authority. The investors do not typically choose these, because of the followings. With reconnaissance, exploration drilling is not possible, only surface measures. The geologic exploration allows almost the same rights as the water legal permit for construction, but it could not be transformed so easily to water legal permit for exploitation. However, the reconnaissance and the geologic exploration might be requested to closed areas (above 2.5 km) too. b. Drilling well For drilling a geothermal well less than 2500 m depth a water legal permit for construction is necessary. If an exploration drilling was licensed by the Water Management Authority, the previous license request can be completed with more detailed information which can facilitate the licensing process. Before the water legal permit requested, the environmental impact shall be assessed. According to the Governmental decree 314/2005. (XII.25) on Environmental Impact Assessment and on Integrated Pollution Prevention and Control Annexes 1. & 3., an Environmental Impact Assessment (EIA) or an Environmental Preliminary Study (EPS) might be necessary. The decision issued by the Government Office Environmental and Nature Protection Department must be attached to the water legal permits, and the contribution from the Water Management Directorate too. c. Operation For the operation of geothermal well a water legal permit for operation is needed, which is also licensed by the Water Management Authority. d. Ground-source heat pump The ground source heat pumps are commonly used in household sizes, licensed by the Mining Authority. To construct ground source heat pumps with a depth exceeding 20 meters building permit is required (Governmental decree 53/2012. (III.28) on rules of building and construction authority proceedings for some specific edifices belonging to the competence of the Mining Authority, Annex 1., 4.1). For heat exploitation below 20 m without geothermal fluid only a notification is required to the Mining Authority (Governmental decree 53/2012. (III. 28.) on rules of building and construction authority proceedings for some specific edifices belonging to the competence of the Mining Authority, Annex 3., 1.6) 2. Deep geothermal energy resources exploitation (thermal water above 2.5 km)

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	For the exploration and exploitation of geothermal energy below 2.5 km concession agreement is required. The minister of mining rights shall grant concession contract. b. Technical operation plan for exploration After the investor get the right for the “mining activity” by the concession contract, they need a technical operation plan for exploration approved by the Mining Authority. Furthermore, a mining authority building permit is necessary for special buildings (geothermal wells are considered as special buildings) from Mining Authority. c. Technical operation plan The Mining Authority shall authorize the exploitation of the geothermal energy by approving the technical operation plan for operation. For the special buildings occupancy permit is necessary. 3. Utilization of the exploited geothermal energy a. Balneological utilization In case of balneological use, the thermal water is used directly for bathing. Due to the potential contamination of thermal water reinjection is prohibited. To construct and operate a bath water legal permits, building permits, National Public Health and Medical Offices Service permits might be needed. General rules for construction are applicable to these facilities. b. Heat production If the heat producer uses the energy for heating its own facilities, district heating permit is not required, only building permit and occupancy permit is necessary for the heating plant buildings (special buildings) licensed by the Government Office, Technical Security Department. Otherwise, District heating production license approved by the Hungarian Energy and Public Utility Regulatory Authority is necessary. Also, the heat producer can decide to have an agreement with a Heat Supplier, in this case the Heat Supplier will buy the heat, and provide that to the users. If the heat producer would like to supply the heat directly to the users, a district heating supply license is needed from the Hungarian Energy and Public Utility Regulatory Authority. c. Power generation In case of producing electricity, a connection contract is necessary between the Local grid operator and the electricity producer, because the producer has no right to sell electricity on the market. Depending on the produced electricity amount, a small power plant combined permit or power plant permit for construction is necessary from the Hungarian Energy and Public Utility Regulatory Authority, this permit allows to build the power plant technology. Building permit for the power plant building (special building) is needed from the Government Office, Electricity Industry Department. After the construction of the power plant, an electricity producer operating permit shall be granted by the Hungarian Energy and Public Utility Regulatory Authority, and an occupancy permit by the Government Office, Electricity Industry Department for the legal operation.
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	License for exploration Exploration drilling no deeper than 2,5 km could be licensed by Water Management Authority. Content of request document prescribed by BM decree 41/2017. (XII.29.) on the content of the documentation required for the water licensing procedure, generally the followings shall be introduced: • technological description of planned facilities with layouts, designs, • necessary contributions, agreements (landowner, public utility etc.), In case of surface exploration, no license is needed for reconnaissance in open areas, the contributing statement of land owner and a prior notification submitted to Mining Authority is enough. The notification need to contain an exploration plan. Also, for edifices for recovering and utilization of geothermal energy for energetic purpose from depth not exceeding 20 meters without any water production except sanitary facilities, license is not necessary. To conduct exploration activities on closed areas a concession contract and an accepted “Technical Operation Plan for Exploration” is needed. Possessing these the license for establishing exploration objects could be requested from mining authority as construction license. Based on the prescriptions of Governmental decree 53/2012. (III.28.) on rules of building and construction authority proceedings for some specific edifices belonging to the competence of the Mining Authority, the request documentation shall contain the followings: • technological description of planned facility with layouts and designs; • contributions (land owner, utility operators, etc.); • mining map. License for exploitation To utilize the well drilled based on water right a so-called Water Legal License for Utilization is needed. This could be requested from water management authority after the planned facilities constructed. The regulation is similar as for the construction license, request document shall contain: • differences between planned and constructed facilities • “as built” design and layout • handover report • results of test period (if any) Objects built based on mining construction license shall have a mining utilization license for operation. Request shall contain (based on Governmental decree 53/2012. (III.28.) on rules of building and construction authority proceedings for some specific edifices belonging to the competence of the Mining Authority) the following: • technical description • data of edifice concerned in the application • data of real property affected by occupancy

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	License for heating plant Heating plants shall gather the following licenses before construction could be started: • building license • pressure vessel license • district heating production license (if needed) Building license Based on Governmental decree 31/2014 (II.12) on rules of the building administrative procedures for special buildings, the building of a heat production facility considered as a special building and licensed by the territorially competent office of Hungarian Energy and Public Utility Office. Request document shall contain: • technical description • contributions (land owner, utility) • previous regulatory decisions in connection with the subject matter of the application • data of real property affected by the construction Pressure vessel license Pressure vessels above a given pressure and capacity level shall be licensed by Technical Safety Department of territorially competent Government Office. Request document contains mainly technical data: • technical description • data sheets of vessels and safety valves • previous regulatory decisions in connection with the subject matter of the application • general layout plan District heating production license District heating production license is needed only in case the produced heat sold out on free market – if the heat utilized by the licensee itself, this license is useless. District heating production license for construction request document shall contain: • technical data of the heat plant • economical and technical data about the heat production • business plan for 5 years • P&ID of energetic equipment Also, in addition to those listed above, the District heating production license for operation need to contain: • description of quality assurance system, including troubleshooting of breakdowns and maintenance rules • presentation of the availability of the energy sources for the medium-term district heating demand • contract with the Heat supplier

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6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	(i) Exploration Reconnaissance upon notification There is no maximum duration. Geologic exploration The validity is determined by the Authority in the permit according to Governmental decree 203/1998 (XII.19) implementing the Act XLVIII. of 1993. on mining 8/F.§ (6). However, it should be noted that the geological exploration must be commenced within 6 months after receiving the permit. (Act XLVIII. of 1993. on Mining 22/D.§ (6)). Above 2500 m Validity of the Water legal license for construction is determined by the Authority in the permit. (Governmental decree 72/1996. (V.22) on exercising the authority of water management), the permit can be extended. Below 2500 m The maximum duration of a license for exploration within the lifetime of concession shall not be longer than 4 years and it can be extended at most twice, by half of the original exploration period (Act XLVIII. of 1993. on Mining 14. § (1)). (i) Exploitation Above 2500 m Validity of the water legal license for construction is determined by the Authority in the permit. (Governmental decree 72/1996 (V.22) on exercising the authority of water management), the permit can be extended. Below 2500 m "[…] The concession contract may be concluded for a period no longer than 35 (thirty-five) years, which may be extended once, with not more than half of the concession contract duration". (Act of XLVIII. Of 1993. On Mining 12. § (1)). (ii) Heating plant The validity of the district heating production permit for construction is determined by the Authority in the permit, it can be extended once with the same period as the original permit, but with a maximum of 2 years. The validity of district heating permit for operation is indeterminate.
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	Content of licenses prescribed by the relevant regulation of each licensing authorities. The structure of licenses is very similar, the following main chapters shall be appeared: • Identification data about the licensee (e.g. name, address, tax number) • Duration/expiry date of the license • Licensed technical data (e.g. location, authorized quantities, equipment) • Official and Authority requirements (concerning the construction in a permit for construction / concerning the operation in a permit for operation) • Reporting obligation (if any) • Explanation • Final clause (legal basis of procedures and prescriptions, right of appeal)
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	Hungarian legislation does not facilitate the conversion of exploration license to exploitation license, independently from the type of original license (i.e. water legal construction license or mining authority licenses). Exploitation (utilization) licenses shall be requested after exploration activities closed, to start exploitation (utilization).
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	Modification request might be asked for any licenses with an official request documentation if licensee would like to modify any data (including duration of the permit) contained in the permit. Modification of a license is an easier procedure before it become final and binding (notification of licensing authority is enough), after that period the license holder shall submit a request documentation focusing on the modified data considering the relevant legislations.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	The Act LVII. of 1995. on Water Management 30. § (1) claims the following: "The Water Management Authority may modify, suspend or withdraw the water license (including the preliminary license) ex officio or upon request under the conditions specified in other legislation or upon the occurrence of specific events." The Governmental decree 72/1996 (V.22) on exercising the authority of water management 14. § defines the conditions when the water legal license can revoke or must revoke. The license granting authority can revoke or terminate the license if the license holder performs its activity improperly, depending on the severity the authority can impose a fine, suspend or terminate the license. The Act XLVIII. of 1993. on Mining 41. § (2) claims the following on improperly activity: "Should the mining entrepreneur carry out the mining activity improperly, the Mining Authority may impose a fine on the mining entrepreneur, suspend the continuation of the activity, withdraw the permit or order the restoration of the original state, or should this not be possible, the land remediation itself, or cancel the mining entrepreneur's mining right by the application of paragraphs (6)-(7) of Section 26/A. In case of concession, the Mining Authority may initiate the termination of the concession contract."

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1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	Art. 2 let. c) of the NAMR Order no. 87/2008 defines “geothermal water” - the renewable renewable mineral substance, represented by all the groundwater that has the role of heat transfer from the earth's crust, used for energy purposes or as therapeutic mineral waters, with source temperatures higher than 20 degrees C ".
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	Art.1 of the Mining Law no. 85/2003 establishes "mineral resources (including geothermal waters) situated on the territory and in the subsoil of the country and the continental shelf in the economic zone of Romania in the Black Sea, delimited according to the principles of international law and the regulations of the international conventions to which Romania is a party, are the exclusive object of the public property and belong to the Romanian state "- Art. 13 of the Mining Law no. 85/2003 establishes “mineral resources are valued through mining activities (prospecting, exploration and exploitation) that are granted to Romanian or foreign legal persons or given to the public institutions by the competent authority (NAMR), according to the present law".
2.2. Who can grant access to geothermal resources, only state or also landowner?	Only the state through the competent authority Naational Agency Mineral Resorces (NAMR). "Land ownership does not confer the right to pre-emption on the concession / management of mining activities." (art. 12 of the Mining Law no. 85/2003)
2.3. Is exploration/exploitation open to foreign investment?	Yes, see section 2.1, with the addition: Art. 23 of the Mining Law no. 85/2003 establishes "foreign legal persons who have obtained the right to carry out mining activities are obliged, within 90 days from the entry into force of the license, to establish and maintain throughout the concession a subsidiary in Romania."
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Art. 15, (1) of the Mining Law no. 85/2003 establishes "exploration shall be carried out on the basis of an exclusive license granted for any of the mineral resources discovered in the perimeter upon request to the Romanian or foreign legal entities concerned." Exceptions: Art. 29 of the Mining Law no. 85/2003. "(1) Roofs usable in construction, peat and mineral waters located on land owned by individuals may be used by the landowner only if they are not the subject of an existing concession and only for their own needs without the marketing right . Usage is exempt from the payment of legal fees and fees, subject to the competent authority's knowledge through its territorial bodies. (2) The provisions of paragraph (1) shall also benefit children's homes and old-age homes situated on land owned by them. " Also, art. 30, (1) of the Mining Law no. 85/2003 "The recovery of gold from alluviums made outside concessions is made by natural and legal persons on the basis of an operating permit issued by the competent authority."
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	Not on the granting of the license but on the commencement of the mining works (it must begin within 210 days from the granting of the license - article 22).The owner must agree with the owner of the land on the right to servitude in exchange for the payment of an annual rent (Article 7,(1) and(2) of the Mining Act). Art.7, (3) Mining Law no.85/2003: "If the parties do not reach a will agreement within the term stipulated in paragraph (2), the amount of the rent shall be determined by the court, according to the law."
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	Article 6 of the Mining Law no. 85/2003 establishes: "The right to use the land necessary for carrying out the mining activities in the exploration / exploitation perimeter shall be acquired, according to the law, by: (a) the sale and purchase of the land and, where appropriate, of the buildings situated thereon at the price agreed between the parties; b) the land exchange, accompanied by the relocation of the affected owner and the reconstruction of the buildings on the newly granted land, at the expense of the holder of the land granted, according to the agreement concluded between the parties; c) fixed-term lease of land on the basis of contracts between the parties; d) expropriation for a cause of public utility, according to the law; e) land concession; f) the association between the landowner and the licensee; g) other procedures provided by law. " After the realism, the beginning of the activities of the ministry is conditioned by the owner of the property (Article 22, (1) letter f) of the Mining Law no. 85/2003. Disagreements are solved according to art. 8, (2) of the Mining Law no. 85/2003): "any agreement between the proprietors of the activity and the activities of the property owners is settled by the judiciary courts, according to the law. Tackling such cases will be done by the competent authorities as an emergency. "

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4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Article 6 of the Mining Law no. 85/2003, d) “expropriation for a cause of public utility, according to the law”. Also, art. 9 of the Mining Law no. 85/2003: "Expropriation for a public utility interest of national interest is done under the law, under the coordination of the relevant ministry."
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	No
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	For exploration: Art. 15 of the Mining Law no. 85/2003: "(1) Exploration shall be carried out on the basis of an exclusive license granted for any of the mineral resources discovered in the perimeter upon request to the Romanian or foreign legal entities concerned. (2) The exploration license shall be awarded to the winner of a public tender organized by the competent authority under the present law for the mineral resources established by the order provided in paragraph (4). (3) The mining exploration concession initiative may belong to the competent authority or to the Romanian or foreign legal entities concerned. (4) The list of exploration perimeters shall be established by the competent authority by an order published in the Official Gazette of Romania, Part I. (5) In order to participate in the public bidding contest, Romanian or foreign legal persons shall submit tenders within a specified term, determined by the competent authority by the order provided in par. (4). (6) Tenders shall contain the proposed exploration program, the supporting documents regarding the technical and financial capacity of the tenderer, as well as other documents established by the competent authority. (7) The proposed exploration program shall include the annual exploration volume and related expenditures required to be carried out. (8) The conditions for the organization and dissemination of the public tender organized under para. (2), criteria for selecting and designating the winner, additional score granted to a prospective license holder, and other matters will be determined by the competent authority by the rules. "- are included in H.G. no. 1208/2003, chap. 4. For exploitation: Art. 18, alin. (2) of the Mining Law no. 85/2003: "The operating license is granted: (a) directly to the holder of the exploration license, at his request, for any mineral resources discovered, within 90 days of the date of transmission to the competent authority of the final exploration report accepted by it; (b) the winner of a public tender organized by the competent authority under the terms of this law " + Art. 20, (1) of the Mining Law no. 85/2003 "The operating license shall be granted by negotiation on the basis of an application accompanied by: a) the feasibility study on the exploitation of mineral resources and the protection of the deposit, including the initial cessation plan drawn up in accordance with the rules issued by the competent authority;
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	For exploration: Art. 16, (1) of the Mining Law no. 85/2003: "The exploration license shall be granted for a period of up to five years, with the right to extend for up to three years, within the perimeter granted, with the prepayment, each year, of the exploration tax and the provision of an appropriate financial guarantee for restoration of the environment, established by the environmental recovery project." For exploitation: Art. 20, (2) - (4) of the Mining Law no. 85/2003: "(2) The exploitation license shall be granted for a maximum of 20 years, with the right of extension for successive periods of 5 years. (3) The exploitation license holder shall pay an operating fee per year and a mining fee according to this law. (4) The holder of the operating license shall provide a financial guarantee for the recovery of the environment in accordance with the technical instructions issued by the competent authority."

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7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	Art. 29, (1) and art. 31 of H.G. no.1208/2003: "The exploration license shall establish: its duration, the exploration perimeter, the schedule of works, including the environmental protection measures to be applied, the stage and the pace of execution of the works, the necessary documentation, the rights and obligations of the holder, under the law." "The exploitation license shall establish: its duration, the exploitation perimeter, the amount of reserves to be exploited, the types of mining products, the holder's obligations under the exploitation development plan and the environmental recovery plan, as well as other obligations and rights of the holder prescribed by law."
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	Art. 18, (2) lit. a) of the Mining Law no. 85/2003: (1) The mining exploitation shall be performed on the basis of an exclusive license granted under the present law. (2) The exploitation license shall be granted: (a) directly to the holder of the exploration license, at his request, for any mineral resources discovered, within 90 days of the date of transmission to the competent authority of the final exploration report accepted by it;
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	For exploration. Art. 29, (2) of H.G. no. 1208/2003: "adaptation or modification of the works program during exploration mining activities may be made, at the written request of the holder, with the approval of N.A.R.M. within the licensed exploration program." For exploitation - by continuation of geological research within the exploitation perimeter: registration of new resources / reserves for the promotion of resources at the level of reserves.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	YES Article 34 of the Mining Law no. 85/2003: (1)"The competent authority shall cancel the license / permit of the contractor sanctioned within 30 days of receipt of the notification when it finds that: a) the holder fails to fulfill the assumed responsibilities regarding the authorization and the start date of the mining activities; b) the holder continues to terminate the works for more than 60 days without the consent of the competent authority; c) the holder uses exploitation methods and technologies other than those provided for in the development plan without the consent of the competent authority; d) the holder performs mining activities in violation of the provisions of art. 22, (1) lit. e) - ie for exploration - the opinion of the competent authority for the annual works program; for exploitation - the opinion of the competent authority for the annual exploitation program; e) the holder and his / her authorization and / or authorization for environmental protection and / or labor protection have been canceled; f) the holder knowingly provides the competent authority with false information and information about its mining activities or violates the confidentiality clauses in the license; g) the owner fails to pay within six months from the due date the taxes and mines due to the state; h) the holder does not meet the conditions and does not observe the term stipulated in art. 33, (2) on the suspension of the license / permit. "
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?	Depending on the conditions, licenses may be provided for the use of water only with an ISP notice, in the case of radioactive waste water, or limitations of the flows exploited in case of interference with drilling in other perimeters, etc.
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	Sanctions (penal fines or imprisonment) are provided in art. 57, 58 and 59 of the Mining Law no. 85/2003
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	Upon expiration of the period of validity of the exploitation license, if the license is not prolonged, the sources are put into conservation, according to the Cessation Plan of the activity that was negotiated upon obtaining the license.

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9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	On-site inspections are carried out by the inspectors of the Territorial Inspection Department within ANRM. According to art. 17, (1) of the H.G. no. 1208/2003: "Concessionaires / managers of mining activities have the obligation to report annually to ANRM the record and the movement of mineral resources / reserves." Also, according to art. 19alin. (1), art. 20 and art. 21 from H.G. no. 1208/2003: "Holders are required to transmit to A.N.R.M. half-yearly, annual and final reports on the work carried out, as well as the related expenditure." "The half-yearly and annual reports will be transmitted within 30 days of the end of the reporting period. The half-yearly reports shall be transmitted to the territorial inspection compartments, and the annual reports to the territorial inspection compartments and to the headquarters of A.NRR, together with the certificate of observation of the respective territorial inspection compartments. " "The final report shall be transmitted within 60 days of the termination of mining concession / management at the headquarters of ANRM, accompanied by the note of the territorial inspection compartments in which the perimeter to which the reporting relates."
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	See section 9.1
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?	Does not exist
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	It is regulated only by commercial contracts.
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or	Yes, indirect, through the existence of framework contracts regulated by national public authorities
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	At the start of the exploration and exploitation activity, environmental consent /authorization is required. The environmental rehabilitation works are carried out on the basis of the Technical Projects tendered and negotiated and they constitute financial guarantees for the environment according to the Common Order no. 202/2881/2348/2013 issued by the National Agency for Mineral Resources, the Ministry of Environment and Climate Change and the Ministry of Economy. In the set of documentation for obtaining the exploitation of the exploitation is provided the environmental impact study (see Article 20 paragraph (1) letter c) of the Mining Law no. 85/2003)
11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	No
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	According to the provisions of art. 2, point 31 of Emergency Ordinance no.195/2005 on environmental protection, “the environmental impact assessment involves a process meant to identify, describe and establish, according to each case and according to the legislation in force, the direct and indirect, synergic, cumulative, main and secondary effects of a project on human health and the environment”, and the environmental impact assessment is carried out by the Ministry of Environment, according to GD no. 19/2017 in collaboration with the rights holders and with local public authorities. The law cited does not regulate the rights of these parties.

ROMANIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	Only a series of opinions /agreements are required, according to art. 22 of the Mining Law no. 85/2003: (1)"The commencement of mining activities (exploration, exploitation) provided for in the license shall be authorized in writing by the competent authority, within 180 days of the entry into force of the license, after the cumulative presentation by the holder of the following documents: a) proof of payment of the mining tax; b) proof of the provision of the financial guarantee for the restoration of the environment; c) the tax attestation, which shows that the licensee does not register any outstanding obligations towards the state budget; d) environmental agreement / authorization; e) for exploration - the opinion of the competent authority for the annual works program; for exploitation - the opinion of the competent authority for the annual exploitation program; f) consent of the owner or manager of the land regarding the access to the surfaces necessary for the execution of the mining activity provided in the annual exploitation program. (2)Authorization of the commencement of the mining activities shall be made by the competent authority within 30 days from the submission of the documents stipulated in paragraph (1)."
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	No
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	We do not have reinjection legislation.

SERBIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes what are the criteria?	Geothermal energy exploration and exploitation is regulated by the Law on Mining and Geological explorations (official gazette of RS no. 101/2015) and by accompanying by-laws. According to Mining and Geological explorations "Geothermal resources shall represent a set of renewable geological resources encompassing ground water and heat from rock masses from which thermal energy extraction is possible. Geotermal resources encompass: subgeotermal resources with the water temperature and the heat of rock masses up to 30 °C, resources of a low enthalpy from which it is possible to extract the thermal energy of temperature from 30 °C to - 100 °C and resources of medium and high enthalpy from which it is possible to extract the heat energy temperature of over 100 °C".
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	Geothermal energy is owned only by the state. Private parties or private persons can use geothermal energy by acquiring necessary permites. First step is to obtaion the Approval for the applied geological explorations. The applied geological explorations of mineral and other geological resources are carried out on the basis of Decision on approval for geological explorations issued by the Ministry, at the request of the company, or other legal entities and entrepreneurs. Second step is obtaing the Certificates on determined and classified resources and reserves and last step is the Approval for determining the exploitation area and amount of reserves and/or resources of Geothermal Resources.
2.2. Who can grant access to geothermal resources, only state or also landowner?	Access to the geothermal resources can be granted only by the state but entity which is requesting the Approval for determining the exploitation area and amount of reserves and/or resources of Geothermal Resources must have the right of ownership or a right of easement on the land.
2.3. Is exploration/exploitation open to foreign investment?	Yes, exploration license holder shall be a company and/or another legal entity and entrepreneur approved by the competent authority to perform the applied geological explorations;
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Yes, exploitation of geothermal resources is subject to licencing and it is not possible to exploit without the licence.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	Yes, in case when the entity that requires the licencing for the exploration/exploitation is not a landowner in the same time, have obligation to obtain the right of ownership or a right of easement on the land.
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	Yes, it will. It is not possible to do obtain license without landowner authorization/consent in written form.
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	It is possible, with previous state proclamation of the general interest land can be transformed from private property to state property for compensation.
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	No, there is no differences in licensing by geothermal end purpose. However the Approval for exploitation of geothermal resources must include definition of resource utilization.

SERBIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	Requested documentation for granting the **Approval for exploration** in case of company and/or another legal entity and entrepreneur are following: 1) extract from the register of business entities on registration the applicant; 2) topographic map in a scale 1:25,000 or smaller scale, with marked border and coordinates of exploration area; 3) project of geological explorations, in two copies; 4) report and confirmation of carried out technical control of the project; 5) proof of payment the republic, and provincial administrative fees if the exploration is carried out on the territory of province for issuing the approval; 6) proof of right to use data and exploration results that are the result of geological exploration of another business entity, or are the result of basic and applied geological explorations if they were used in project development 7) Act on conditions for project design and implementation the planned geological explorations, issued by the competent Institute for Nature Protection 8) Act on conditions for project design and implementation the planned geological explorations, issued by the competent Institute for protection of cultural heritage or other competent entity. Requested documentation for granting the **Approval for exploitation** in case of company and/or another legal entity and entrepreneur are following: 1) The project study on resources and reserves of geothermal energy (hydrogeothermal resources or petrogeothermal resources) 2) a surveying plan in a scale 1: 1,000 or a view topographic map in the appropriate ratio with the drawn-in boundary and coordinates of breaking points exploitation area, as well as drawn and registered numbers of cadastral parcels for which there is a right of ownership or a right of easement on the land; 3) a certificate on resources and reserves of groundwater or geothermal resources, issued on the basis of project study on resources and reserves of groundwater, or project study on petrogeothermal resources for the needs to obtain the geothermal energy; 4) a project study on conditions of exploitation the ground water or hydrogeothermal resources, or petrogeothermal resources and a certificate on completed technical control of a project study; 5) the act of the competent institution for nature protection on measures and conditions under which the use of groundwater and geothermal resources or petrogeothermal resources can be carried out; 6) the act of the Ministry in charge for sanitary protection of water supply sources, confirming that the applicant did an appropriate project study 7) a proof of the ownership right or the right of easement on the land where there are facilities in the function of use the groundwater or geothermal resources; 8) a proof of payment the national, or provincial administrative fee, when the exploitation area is located on the territory of the Autonomous province. Required licenses in case of **heating plant**: 1) Energy Permit (for heat plants of capacity below 1 MW, issuing of the energy permit has not been envisaged); 2) Construction permit; 3)Operation permit (operation permit for the structure, and the operation permit for the connection of the plant to the transmission and the distribution system).

SERBIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew tham? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	**License for exploration/Approval for exploration**: Approval for exploration the underground water and geothermal resources shall determine the length of exploration deadline by two years, with the possibility of extending the exploration period twice in continuity, wherein the length of each of the extended exploration periods can be up to a year. **License for exploitation/Approval for exploitation**: the period of validity the decision on exploitation area for up to five years, which may be extended. The holder of approval for exploitation area for the use of geothermal resources shall be obliged every five years from the date of previously recorded state of identified resources and reserves of geothermal energy, to submit to the Ministry, i.e. competent authority of autonomous province, a project study. **Energy permit for heat plant:** The energy permit can be issued for a period of three years and its validity may be extended at the request of the holder for maximum one additional year, by filing the application for extension at the latest 30 days before the expiration of its validity. **Construction permit for heat plant**: The construction permit is valid if construction of the structure is not commenced within two years as of the date of legal validity of the decision. If the decision was made by the ministry in charge of construction or the competent authority of the unit of local self-government, this decision will be valid if, within five years of the decision coming into force, no operation permit has been issued. At the request of the investor, the competent authority may issue a decision that the construction permit which is in effect shall remain valid for additional two years, or five years, on certain conditions.
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	**Contents of exploration permit**: 1) name of the holder of exploration with address of its headquarters; 2) subject and type of exploration; 3) surface and coordinates of breaking points of the exploration area; 4) name of the project of geological explorations; 5) length of the exploration period in accordance with the request of exploration holder. **Contents of exploitation permit:** 1) the name of the holder of exploitation area with address of its headquarters;2) the name of the project study, the name of the legal entity that has developed the project study and the legal entity that has done the technical control of the project study; 3) coordinates and surface of exploitation area, which cannot be greater than the exploration area in which the explorations of groundwater and geothermal resources were previously conducted; 4) cadastre number of parcels covered by the exploitation area; 5) approved type and amount of resources and reserves that can be used in accordance with the project study o the resources and reserves for the appropriate category of exploration for which the approval can be issued; 6) the period of validity the decision on exploitation area for up to five years, which may be extended.
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	No, there is certain procedure that must be done as submission of the defined documentation.
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	Yes, it is possible for license holder to initiated administrative dispute/ appealed to the Minister against license within the legal deadline.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	Yes. Authority have power to terminate licenses of exploitation in following cases: 1) the use the exploitation area does not start; 2) it is established that threatens the sustainable use of groundwater reserves and hydrogeothermal resources or the existing uses; 3) it is established that the use is carried with greater capacity than approved; 4) it fails to submit an annual report on the state of groundwater reserves, or hydrogeothermal, or petrogeothernal resources; 5) the use of groundwater or geothermal resources is not done in accordance with the approval for exploitation field, or not to implement the prescribed safety precautions necessary measures, the required measures to secure the property, health and environmental protection. The approval for exploitation area and the amount of groundwater or geothermal resources shall be repealed by: 1) the expiry date of decision; 2) at the request of the holder of exploitation area.
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by law?	Yes. License granting authority can make an exeption in terms of setting the condition for licencing and after the issuing. That kind of exeptions, in most cases, are made for Protected natural areas. Terms and conditions are determineted by Act on conditions for project design and implementation the planned geological explorations, issued by the competent Institute for Nature Protection.
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	The company or another legal entity in case if not respect the requirements for the performance of such activities shall be subject for corporate offense and is liable to pay penalties.

SERBIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	No. Licence holder to not have obligation to liquidate the well after exploitation permits exires. In case of onging exploitation there is obligation for license extension or issuing new licence. Action of well liquidation must be done according to project documentation.
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	Geological inspector shall in performing the inspection supervision have the right and duty to check whether: 1) the activity of geological exploration and conducting the geological explorations works are performed in accordance with prescribed conditions; 2) the design and final report of geological exploration results are prepared in accordance with the law and other regulations, and whether technical control has been performed by the authorized company entered in the court register; 3) the annual report about geological exploration results is prepared and verified in the prescribed manner; 4) geological explorations are performed on the basis of and in compliance with the approval for exploration; 5) geological explorations and geological explorations works are reported to the competent authority; 6) geological explorations works are performed according to the geological exploration design on the basis of which the approval was issued; 7) engineering-geological and hydro-geological works are performed according to the geological exploration design and approval of the competent authority; 8) geological exploration works are performed in accordance with the Law and other regulations; 9) take the security measures of persons, adjacent buildings, traffic and environment, as well as all occupational health and safety measures by the company undertaking the geological explorations; 10) prescribed records are maintained of the quantities of mineral raw materials taken for the purpose of their testing, and of other mineral resources the existence of which was identified in the course of geological prospecting; 11) storage and keeping the cores of exploration drill holes; 12) expert supervision is ensured during geological explorations and mining; 13)prescribed conditions are applied regarded to the fulfillment the conditions of educational background and the authorization for performance of such works for the persons managing the conducting of exploration works and expert supervision over the conducting of such works; 14) the quantity of mineral raw materials taken for testing is larger than the one determined in the approval for exploration; 15) mineral raw material is taken (for different purposes) without the approval for exploration; 16) the book on the state of reserves of mineral resources and geothermal resources is maintained; 17) the geological technical documentation is prepared to cover all exploration activities.
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	The holder of exploration and holder of exploitation shall be obliged to maintain a book on the state of resources and reserves of mineral raw materials and resources and reserves of groundwater, as well as geothermal resources on the approved exploration area or exploitation field, and to annually submit the data on the state of resources and reserves to the Ministry or the competent authority of the Autonomous Province by 15th March of the current year according to the state and reserves on 31st December of the previous year in a written or electronic form.
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft law or general recommendations in place in your jurisdiction?	General terms and conditions regarding to heat generation from renewables are regulated by flowing legislation documents: The Energy Law (Official Gazette of the RS, No. 145/2014); The Law on Public Utilities (Official Gazette of RS No. 88/11); The Law on Public-Private Partnership and Concessions (Official Gazette of RS, No. 88/11 and 15/16); The Company Law (Official Gazette of RS No. 36/11, 99/11, and 5/15); The Law on Public Companies (Official Gazette of RS No. 15/16)
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	Duration of Power (heat) Purchase Agreements is not regulated by the laws and by-laws. In case of PPP minimal agreement duration is five years and maximum is fifty years.
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or indirectly?	Public/national regulatory authorities may be involved if they are have direct involvement.
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	Decision on Necessity of Environmental Impact Estimation; Decision on Scope and Content of the Environmental Impact Estimation Study; Environmental Impact Estimation Study; Approval of the Environmental Impact Estimation Study. Procedure for elaboration of the EIA Study for the plant is regulated by the Law on Environmental Impact Assessment and by the bylaws under this Law.

SERBIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
11.2. Is it possible to explore, or produce geothremal energy without environmental impact assessment? If yes under which conditions?	In the course of obtaining the construction permit for plants of capacity greater than 1 MW the environmental impact assessment (EIA) may be requested, while for plants of capacity greater than 50 MW such an EIA is mandatory. Plants of capacity greater than 50 MW also require the integrated permit to be obtained.
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	No.
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	For Geothermal plant construction the following licenses is need to be issued: 1) Information on location or location requirements; 2) The energy permit; 3) The construction permit; 4) construct the structure, and undertake the technical inspection of the structure 5) The operation permit.
12.2. Is there any conflict among mining, water and energy laws on geothermal topics?	No.
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	No.

SLOVENIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
1.1. Is there a definition for geothermal energy /thermal water in the national legislation? If yes, what are the criteria?	According to the definition in the Mining Act, a geothermal energy resource is thermal energy which is stored in the geological strata beneath the surface of solid Earth and which is being recovered by the heat flow from Earth's interior. According to the Water Act, thermal water is a groundwater from a well, spring or capture that is heated in geothermal processes in the Earth's crust and its temperature at the spring or artificial outlet is at least 20 °C.
2.1. What are the rules on ownership of geothermal resources? Can private parties, or private persons also hold ownership, or right of use of geothermal resources?	Mineral resources including geothermal energy resources and thermal water are owned by the Republic of Slovenia. Private parties or private person could could acquire the exploration and exploitation right on the basis of a granted research permit and utilization concession.
2.2. Who can grant access to geothermal resources, only state or also landowner?	Exploration of geothermal resources is granted only by state. The landowner has to allow acess to the exploration site in a written form.
2.3. Is exploration/exploitation open to foreign investment?	An exploration permit and a mining right for exploitation may be acquired by a legal or natural person in the manner and under the conditions laid down in this Act: - which is established in the Member States of the European Union, the European Economic Area and the Swiss Confederation and in the Member States of the Organization for Economic Cooperation and Development (hereinafter referred to as: the Contracting States) or is a national of a Contracting State, and - which is not from a Contracting State, but from a third country, but only if the condition of material reciprocity is met. This condition shall be deemed to be fulfilled if an interested party who is from a third country has a seat or residence in the Republic of Slovenia and is able to engage in an activity in the same country under the same or similar conditions under which he may pursue an activity in the Republic of Slovenia.
3.1. Is exploitation of resources subject to licensing / Is it possible to exploit without licence? If yes, who (e.g. landowner) and to what extent?	Granted Water or Mining concession is mandatory to exploit geothermal resources.
4.1. Does the landowner have a role in the process of granting a license for: (i) exploration, (ii) exploitation and (iii) heating plant?	Landowner consent is needed for the exploration, exploitation and construction of a power plant. From landowner a signed legal transaction for the acquisition of the right to perform exploration, exploitation or constructing work is needed. The deal between geothermal company and landowner is their mutual agreement.
4.2. Will an opposition of a landowner have a bearing on the process of granting a license for exploration, exploitation or heating plant?	Yes, without the landowner's permit/authorisation, no exploration, exploitation or power plant works can be done on his property.
4.3. Is it possible to expropriate a land from private owner for a geothermal project?	Teoretically yes, by court procedure.
5.1. Are there differences in licensing for various types of geothermal resources? (e.g. according to different depths, utilization types, technologies, e.g. - for energetic use, only for balneology, heat exploitation with or without without groundwater extraction, with or without re-injection, etc.)	There are two different procedures and permits: If one would like to exploit geothermal energy according to the Mining Act, a geothermal doublet (a pair of production and reinjection wells) with 100% re-injection is obligatory. If re-injection is not 100%, the licencing is subjected also to the Water Act. According to the Water Act, the licening is possible without or with partial re-injection except in groundwater bodies with poor or non-defined quantity state. There, 100% re-injection of newly licenced quantitiees is needed.

SLOVENIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
5.2. What documents need to be submitted and what is the criteria for obtaining a license for: (i) exploration, (ii) exploitation, (iii) heating plant? *Focus on exploration and exploitation licences (heat plant licences only if you can collect info on that). If different licences are exisiting (5.1 .) than specify separately*	(i) The exact licensing requirements have to be checked individually for each individual area. The most convenient way to check this is to obtain the "Information of conditions for constructing" by the competent administrative unit. Hydrogeological study should be submitted. Boreholes deeper than 300 m (are classified as complex mining works according to Mining Act) require revised mining project as appendix to the research permit application. Water consent is required for interventions/constructions on waterside and coastal land, on protected areas or natural risk zones, for special uses of water (water exploitation), waste water emissions or where impact on groundwater is possible (aquifer recharge, reinjection) as well as for other interventions/constructions that could have impact on water regime (Water Act). (ii) Hydrogeological study in which geothermal system is outlined and quantity of water abstraction and temperatures of thermal water is defined should be submitted to ministry responsible for waters or minnig. Environmental permit and water consent are needed before concession is granted. (iii) The concession for peforming public utility service for heat distribution is needed if distributor supplies more than a houndred household customers according to Public Utilities Act (Official Gazette RS 30/1998-ZZLPPO, 127/2006-ZJZP, 38/10-ZUKN and 57/2011), the Public Private Partnership Act (Official Gazette RS 127/2006), the Act on Local Self-Government (Official Gazette RS 94/2007-UPB2, 27/2008, 76/2008, 100/2008, 79/2009, 14/2010, 51/2010, 84/2010, 40/2012), the Energy Act (EC-1, Official Gazette RS 17/2014, 81/2015), the Public Procurement Act (ZJN-2-UPB5, Official Gazette RS. 12/2013 and 19/2014) and the Municipality local Decree on activity and concessions for the local economic public service of district heating in the area of the Municipality. Slovenian Energy Agency have to issue a consent to the starting price of heat for the district heating distribution system on the basis of the first paragraph of Article 302 of the Energy Act (EZ-1, Official Gazette RS 17/2014 and 81/2015) and Article 207 of the General Administrative Procedure Act (Official Gazette RS. 24 / 2006- UPB, 105/2006-ZUS-1, 126/2007, 65/2008, 8/2010 and 82/2013).
6.1 What is the maximum duration of a license for: (i) exploration, (ii) exploitation, (iii) heating plant? Is it possible to renew them? If yes for how long and under which conditions? *Focus on exploration and exploitation licences (heat plant licences only if you have info). If different licences are exisiting (5.1.) than specify separately*	(i) Exploration permits according to Minning Act may be issued for a maximum period of five years. The period of validity of exploration permits can not be extended, except in case of force majeure, when the period of validity of the exploration mining permit may be extended for the duration of force majeure. Exploration licence acording to the Water Act (Official gazzete of RS 67/02) may be issued for the period of 2 years with possible prolongation. (ii) One could apply for mining concession for a geothermal doublet according to the Mining Act (Offical gazette of RS 14/14) for a period of maximum 50 years or for water concesion according to the Water Act (Official gazzete of RS 67/02) for the period of maximum 50 years with possible prolongation. Usually, the latter are granted for 30 years. (iii) n.a.
7.1. What are the general terms / contents of the license for: (i) exploration and (ii) exploitation? *If different licences are exisiting (5.1.) than specify separately*	Water licence: i) exploration: 1) application form (applicant, spatial delineation of the site with new geothermal object, expected yield and depth of the well, list of existent users of the same groundwater resource); 2) hydrogeological grounds or programme; 3) well project if planned depth is more than 50 m; 4) revised mining well project if planned depth is above 300 m; 5) copy of the parcel plan with location of the planned object; 6) consensus of the parcel owner (if other); 7) official opinion of the public drinking water provider if drinking water resource is to be exploited; ii) exploitation: 1) application form (applicant, geothermal object, way of utilization; 2) spatial plan of the site; 3) geodetic plan; 4) Land parcel extract; 5) legal and professional documents related to the object; 6) operating permit; 7) official opinion of the Institute of the Republic of Slovenia for Nature Conservation ; 8) official opinion of the public drinking water provider if drinking water resource is to be exploited; 9) hydrogeological report on the geothermal objects. Mining licence for geothermal energy resource: i) exploration: 1) application form (applicant, type of mineral resource, proposed name of research area, cadastral information, geodetic plan with delineation of the exploration area, quantity and type of exploration works, proposal of the permit period) ii) exploitation: 1) application form (applicant, spatial planning document for mining, proposal of name of research area, exploitation area with cadastral information, elevation of the deepest site, resource type, methodology for exploitation, period of the concession, exploited quantity, restoration plan for the site and activitites connected to the exploitation); 2) geodetic plan; 3) consent of the land owner; 4) concent of the existing mining right owner of other than applied for resources.

SLOVENIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
7.2. In case of successful exploration, are the exploration licenses automatically converted into exploitation licenses ? If so, are there any conditions?	No. The concession application has to be submitted to the ministry responsible for waters (Ministry for Environment and Spatial Planning - MOP) or ineral resources (Ministry for Infrastructure - MzI). For the water concession the Decree on concession is granted by the Government of RS and published in the Official Gazette of the RS. A public tender follows and the same body issues the concession act for on-a-tender selected concessionaire. In special cases, the concession can be granted without public tender. If the geothermal energy source (100% reinjection) is in place, the concession is granted according to the Mining Act. The concession application has to be submitted to the ministry responsible for mineral resources (Ministry for Infrastructure - MzI). The Decree on concession is granted by the Government of RS and published in the Official Gazette of the RS. A public tender follows and the same body issues the concession act for on-a-tender selected concessionaire. If more than one applicant exists, the winner is selected according to the height of the offered mining fee. In special cases, the concession can be granted without public tender. The mining concession contract defines quantity of mineral resource exploitation, payment to the state and monitoring.
8.1. Does the licence holder have the right to ask for revision of the exploration-, exploitation- and heating plant licenses? If yes under which conditions? Which actions are needed from the linecne holder? (e.g. increased amount of production)	Yes, if any change of the licence is desires, the licence holder has to offcially inform the granting authority and provide the documents based on which it is possbile to make decisions on acceptability of requested changes.
8.2. Does the license granting authority have the power to revoke or terminate licenses? Under which conditions? What are the consequences?	Yes. The granting authority and other agencies (e.g. Environmental Agency) have the right and duty to regularly monitor fulfilling of the conditions in the concession contract. If they are not reached by the concessionnaire, first an official call is issued to mitigate the shortcomings, if this does not succeed a responsible inspector is noticed and field inspection is performed and possible financial and other measures proposed. If the conditions are still not met, the authority has the right to terminate the licence either by reducing the granted quantity, by adding some other conditions in the contract or by totally terminating the licence. The latest is only seldom happened.
8.3. Can the license granting authority set forth conditions into licenses which provide for (i) stricter terms and conditions for licensees or (ii) more permissive terms and conditions for licensees, when such terms and conditions (whether stricter or more permissive) are not otherwise provided for by Act?	Yes. Conditions are set based on coordination with several agencies and they have the right to adjust the general requirements to local settings/conditions. For example, if strict monitoring is demanded in the Decree but is physically and economically not feasible to perform it, adjustments can be made based on professional justification of needed exceptions. Other example is that if increase in licenced quantity is requested, the authority cannot grant it if the groundwater body is in poor quantity state and therefore other solutions (e.g. reinjection) has to be proposed.
8.4. Which actions / tools does the license granting authority have in order to enforce compliance to the terms and conditions of a license, other than by withdrawing the license?	Penalites woreseen by Acts and specified in Licences and Concession contracts according to inspection and Inspectors decission.
8.5. Is the license holder obliged to liquidate the well after the exploitation permit expires? How – are there any standards or is this evaluated on an individual basis? Which are the (legislative) criteria to liquidate a well or to change it into an observation well?	According to the Mining Act, a termination procedure should be listed already at the time of submitting application for the licence. There are no by-laws or standards how to liquidate the exploration well, also criteria to adjust rthe exploration well into observation well is absent.
9.1. Briefly outline the surveillance carried out by the regulatory authorities during the license period, e.g. with regards to reporting duties and/or on-site visits?	The Water concessioners have to provide several documents to the Environmental Agency. It checks the 3-year monitoring programmes, the annual reports on operational monitoring and notices them if the documents are compliant with the requirements. If they are not (after several calls for improvement), inspectors are assigned to make a site visit. Annual production data have to be reported to DRSV to accrue the concession fee and water reimbursement. The Minnig concessioner have to report just amounth of produced water to the minning authority and the produced heat to DRSV for water reimbursement. No monitoring is obliged for the only one minnig concessioner.
9.2. Which information is required to be submitted to regulatory authorities during the license period for: (i) exploration, (ii) exploitation, (iii) heating plant. What are the monitoring and reporting requirements?	(i) Hydrogeological study with estimation of thermal water temperature and quantity, chemical composition of thermal water, as well as reservoir characterisation. (ii) Temperature, quantity, chemical and isotope composition of of thermal water, Piesometric head in the well, temperature, quantity and chemical paramters of waste thermal water (III) Annual amounth of sold heat (MWh_t), price of sold energy, avaliability of distribution
10.1 Are general terms and conditions, such as duration of Heat Purchase Agreements regulated? If no, is there any soft Act or general recommendations in place in your jurisdiction?	All general terms and conditions, such as duration of Heat Purchase Agreements are regulated in Energy Act (Official Gazette RS 17/2014 and 81/2015).
10.2. What is the permitted or general duration of Power (heat) Purchase Agreements ?	This is written in the concession contract between the Municipality as user and Geothermal heat distributor. Usually the duration is 10 years with possibility of further prolongation. Enegy Act states that duration of distribution concession should not exceed 35 years.

SLOVENIA	Place for your answer. If necessary please consult relavat national authorities. Make a concise summary and for details give weblink even if it is available only in national language
10.3. Are public and/or national regulatory authorities involved in any way in forming the terms of Heat Purchase Agreements, either directly or	Yes, Slovenian Energy Agency have to issue a consent to the starting price of heat for the district heating distribution system on the basis of the first paragraph of Article 302 of the Energy Act (EZ-1, Official Gazette RS 17/2014 and 81/2015) and Article 207 of the General Administrative
11.1. What demands are there regarding environmental impact assessment prior to exploration, and production of geothermal energy?	Decree on environmental encroachments that require environmental impact assessments (Official Gazette RS, No 51/14, 57/15 in 26/17) states that D.III.7 Geothermal drilling and other facilities for the exploitation of a geothermal energy source, other than shallow geothermal systems (in accordance with regulations governing mining), and E.II.2 Exploitation of mineral or thermal water (according to regulations governing waters) are environmental interventions for which the environmental impact assessment is compulsory if it is established in the preliminary procedure that they could have significant environmental impacts. If EIA is compulsory, the Initiator has to obtain Environmental consent to be able to proceed with further license procedures.
11.2. Is it possible to explore, or produce geothermal energy without environmental impact assessment? If yes under which conditions?	Yes, if in the preliminary procedure it is established that they dont have significant environmental impacts.
11.3. Are there other parties to be involved to EIA process (e.g. potentially affected right owners, NGOs, etc.)? If yes what rights do they have?	Other parties may also be involved in the process of obtaining the Environmental permit insofar as the Environmetal Agency gives them a status of a side participant during the review procedure after the public announcement. They are equal participants in the continuation of procedure.
12.1 What other licenses are needed in order to commence exploration, exploitation and/or production of geothermal energy?	Building permit and operating permit for related infrastructure.
12.2. Is there any conflict among mining, water and energy Acts on geothermal topics?	Not in the Acts but in managment of Acts, little cooperation among authorities during the granting process, different control and requirements in licences
12.3. Is there a regulation on re-injection? Please specify all details (e.g. is it compulsory to reinject into the same aquifer, is there a criterion for the distance beetwen production and reinjection well(s)? Is the period defined for which cold wave of reinjection well can not have influence on the production well? If yes, what is the perid or other criteria? Is it alowed dischaging of used water into the other aquifer wich is different that aquifer of production well? Where and in what way is it allowed?)	Only regulation about reinjection is written in Mining Act, where it states that exploiting a geothermal energy source by reinjecting means that the geothermal heat is taken from the geological layers with two wells that are interconnected on surface, and which are in the geological structure at least 25 m away. Groundwater which is pumped from aquifer is used as heat carrier in one well, and after the extraction of heat from it, this water returns to the original geological structure or aquifer through the second well.