

## GEOTHERMAL ENERGY IN GREECE

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### NOTE FROM THE EDITOR

The Greek Renewable Energy Sources (RES) sector is currently experiencing a revival as the move to a market model and sector stability arising from the introduction of national RES tenders are making it of considerable interest to investors. Recent measures implemented to reform the Greek energy market have led to the establishment of solid frameworks that will allow the exploitation of additional energy sources that have, so far, remained untouched.

This briefing focusses on the newly issued Law 4602/2019 (the “Law”) that sets out the main principles for the exploration, exploitation and management of Greece’s geothermal potential which constitutes an integral part of the National Energy and Climate Plan for 2030 submitted to the European Commission, and sets out the national strategy for the coming years.

Geothermal energy is a resource which has very limited negative environmental impact and can contribute significantly to a nation’s energy autonomy and security. Its potential is particularly significant as, in comparison with other traditional RES sources (such as photovoltaic parks and wind farms), its generation capacity remains unaffected regardless of weather conditions, seasonal differences or the time of day.

Greece, thanks to its geology, has a rich geothermal capacity with both high (mainly in the South Aegean volcanic arc) and low enthalpy -a measurement of energy in a thermodynamic system- geothermal fields, and numerous geothermal locations nationwide that can be exploited. At present, geothermal energy is primarily used for direct needs such as aquaculture facilities, ground-source heat pumps, soil warming and the heating of greenhouses. However, the new Law is intended to create a solid legal framework to pique investor interest in further exploiting geothermal opportunities, particularly for power generation.

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## THE NEW REGULATORY FRAMEWORK

Geothermal energy exploration, exploitation and management rights belong to the Greek State, and can be solely exercised or leased by it. The new Law sets out further specialised parameters in addition to those outlined in the previous regulatory framework, for the purposes of structuring and organising the effective management of these resources.

In light of the above, it is noted that: a) the Ministry of Environment and Energy is responsible for the exploration, exploitation and management rights in geothermal fields of national interest (temperature above 90°C); while b) the Decentralised Administration in those of local interest (temperature 30-90°C) and areas of geothermal interest (in Greek: “Περιοχές Γεωθερμικού Ενδιαφέροντος – ΠΓΘΕ”).

With respect to geothermal fields of national interest the following principles must be taken into account:

- The granting of exploration, exploitation and management rights shall be realised upon the conduct of tenders;
- In respect of the exploration rights lease, the selected candidate shall be decided on the basis of the expenditure in the leased area, the exploration surveys to be performed and the timeline of these, the environmental safeguards to be applied, and experience to fulfil the obligations undertaken;
- In respect of the exploitation or management rights lease, the selected candidate shall be chosen on the basis of the budget, the sustainability of the proposed investment, experience in the management of geothermal fields pursuant to the techno-economic reports submitted, environmental safeguards to be applied, as well as the general experience to fulfil its obligations;
- The term of the exploration rights lease is set at five years (the lessee is entitled to unilaterally extend the term of the lease for up to two years), while the term of the exploitation or management rights lease is set at 30 years (the lessee is entitled to unilaterally extend the term of the lease for up to further 20 years);
- A ministerial decision by the Minister of Environment and Energy shall further regulate the special terms and the procedure of the lease agreement, entailing amongst others, terms with regard to the call for tender, selection criteria, the bid bonds and performance bonds, the rents, reports the interested candidates must submit, and other procedural matters;
- The offers submitted shall be assessed by a five-member Advisory Committee that shall be formed pursuant to a Ministerial Decision of the Minister of Environment and Energy and in which a representative of the Hellenic Survey of Geology and Mineral Exploration (the “HSGME”) shall participate;

- If upon expiry of the exploration stage (as defined in the lease agreement), a geothermal field is certified (by virtue of a Ministerial Decision of the Minister of Environment and Energy), and the lessee submits within three months a techno-economic report for exploitation of this field, then the exploitation rights or the exploitation and management rights can be leased to this lessee, unless the report submitted to the lessor is considered inaccurate, insufficient and unable to fully exploit the potential of the particular field, and in which case other provisions will be triggered;
- The exploration may coexist with the exploitation: if geothermal potential has been identified, a pilot exploitation can take place during the exploration stage (with the payment of the relevant rent);
- The lessees responsible to secure all required licenses and approvals in order to carry out the works; and
- In the event that the lease of management rights is allowed, then the exploitation rights will be leased together. The Greek State is entitled to intervene for public interest purposes in cases where the management rights have been also leased.

## **With respect to geothermal fields of local interest, same principles as above apply with the following differentiations:**

- The granting of exploration, exploitation and management rights shall be realised upon the conduct of tenders, while the exploration and exploitation rights can be also granted by virtue of an open-door invitation (that must be published by the competent administration) upon application by an interested party;
- The term of the exploration rights lease is set at three years (the lessee is entitled to unilaterally extend the term of the lease for up to one year), while the term of the exploitation and management rights lease is set at 30 years (the lessee is entitled to unilaterally extend the term of the lease for up to further 20 years);
- The timeline for submission of expression of interest and offers is set at 30 days from the publication of the invitation on the competent Decentralised Administration's website;
- A Ministerial Decision of the Minister of Environment and Energy shall be published in order to set out the actions the Decentralised Administration must take for the management of the fields (such as management reports per geothermal field), and further regulate the special terms and the procedure of the lease agreement, entailing amongst others, terms with regard to the call for tender and/or the open door invitation, selection criteria, the bid bonds and performance bonds, the rents, reports the interested candidates must submit, and other procedural matters;
- The Decentralised Administration can lease exploration rights in parts of the geothermal fields or areas of geothermal interest for exploitation purposes solely, in which case, however, it retains the management rights; and
- The Decentralised Administration must notify the Ministry of Environment and Energy and the HSGME in the first three months of each year on the activities carried in the previous year with respect to the exploration and exploitation of geothermal capacity in its areas, while it must also submit every five years a Geothermal Capacity Development Plan in order to promote the exploitation of the enormous geothermal dynamic in old and new areas of its jurisdiction.

The initiatives promoted at national and local levels, as well as the commitments of the Greek State and the Decentralised Administrations, are evidence that the main goal of the Law is to favour the creation of a new geothermal regime which would be, above all, investor friendly and reveal the considerable hidden resources not yet being utilised. At the same time, the commitments from the investors-lessees side must also be taken into consideration and especially those concerning its compliance with the terms and conditions of the lease agreement as well as the Geothermal Works Regulation that will be published by the Ministry of Environment and Energy. Regarding the rent, the Law stipulates that the lessee must pay an annual proportionate rent on the basis of the energy consumed since the commencement of the exploitation, and a minimum proportionate rent equal to 30% of the projected consumption under the lease agreement that will be submitted two years after the signing of the agreement. With respect to the exploration stage, no rent shall be payable during that period (unless pilot exploitation takes place, as mentioned above).

## POWER GENERATION

The investment potential of geothermal energy is tremendous, especially as power generation from this source is still in its infancy. Big national players such as PPC Renewables already hold exclusive exploration, exploitation and management rights in specific target areas, and are in search of strategic partners that will assist them in building geothermal power plants, naturally after securing the consensus of local communities.

From a power generation point of view, and in comparison with the RES tenders that have taken place in Greece, the reference tariffs provided for power generation from such sources are significantly high, and are set to i) €139/MWh for geothermal stations with installed capacity equal to or less than 5 MW; and ii) €108/MWh for geothermal stations with installed capacity greater than 5 MW. Subsequently, the projected profits of interested investors seem extremely favourable.

**"RES TENDERS FOR GEOTHERMAL ENERGY POWER GENERATION ARE NOT EXPECTED IN THE NEAR FUTURE DUE TO LACK OF COMPETITION."**

## ESTABLISHMENT OF THE HELLENIC SURVEY OF GEOLOGY AND MINERAL EXPLORATION ("HSGME")

The geothermal exploration in Greece was initiated by the Institute of Geology and Mineral Exploration of Greece in the early 1970s. The institute, after a long and successful contribution in the fields of the geothermal and mineral science, has been dissolved as its tasks will be covered by HSGME. On this basis, new services are created within HSGME in order to facilitate the development of the geothermal initiatives, while concurrently, the organisational structure of the authority together with the sub-branches of each department clearly depicts the crucial role the authority will have in the utilisation of the geothermal energy in the country.

## CONCLUSION

Greece clearly intends to take advantage of its geothermal fields, and promote its new RES sector. Modern technology and the stable legislative frameworks created favour investments in geothermal activities, and act as a tool to enable the transition of the country to clean energy.

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