Subject: SA.34918 (2012/N) – Greece

Exploitation of Erateino Geothermal Field in the Municipality of Nestos

Sir,

I am pleased to inform you that the European Commission has assessed the planned aid to the Exploitation of Erateino Geothermal Field in the Municipality of Nestos and has decided not to raise objections to it on the ground that the measure constitutes State aid which is deemed to be compatible with the internal market within the meaning of Article 107(3)(c) of the Treaty on the Functioning of the European Union (hereinafter, "TFEU").

1. Procedure

   (1) By letter dated 1 June 2012, registered on the same day, the Greek authorities notified the Commission of the above mentioned individual ad hoc aid measure, in accordance with Article 108 (3) of the EC Treaty.

   (2) The Commission asked for additional information by letters of 31 July 2012, on 30 November 2012 and on 07 March 2013. The Greek authorities submitted the requested information by letters, of 2 October 2012, registered on the same day, 7 January 2013, registered on the same day, of 30 April 2013, registered on the same day, and complemented the submitted information with letter on 20 June 2013, registered on the same day.
2. DESCRIPTION OF THE MEASURE

2.1. Objective and description of the project

(3) The project refers to the Exploitation of the Erateino geothermal field in the Municipality of Nestos. The source of energy utilised with the implementation of this project is geothermal energy and more specifically low-enthalpy geothermal energy. The project is a pilot application of utilising a low temperature geothermal field to supply a district heating infrastructure to provide heat for agricultural purposes.

(4) The project "Exploitation of Erateino geothermal field" will be executed under Priority Axis 9 of the Regional Operational Programme1 "Sustainable development and quality of life in Eastern Macedonia and Thrace", thematic priority 42 "Renewable energy sources: hydroelectric, geothermal and other", activity category 42.02 "Promotion of RES systems - geothermal energy". The project will be financed under the framework of the European Fund for Regional Development. The project contributes to the objectives of Priority Axis 9 of the Operational Program of the Region of Eastern Macedonia and Thrace in that it is expected to increase the production of energy from renewable sources, to reduce air pollution and greenhouse gas emissions and to promote sustainable development by using local energy resources.

(5) The total geothermal field of Erateino covers a maximum potential area of 93 km², of which 14 km² are confirmed for suitable exploitation. The proposed project is a small-scale infrastructure project aiming to utilize a limited part of the confirmed geothermal field, as it covers only an area of 1 km² and utilizes 15% - 20% of the capacity of the geothermal field. The project includes the construction and the installation of the necessary infrastructure to extract heat energy from the geothermal field as well as the construction of an associated district heating network in order to supply local farmers with thermal energy for agricultural purposes (among others: cultivation of dynamic crops, operation of greenhouses, grow early-season vegetable and fruits, drying of agriculture products).

(6) Installations to extract the thermal energy of the geothermal field from two production wells will be developed, while a reinjection well will be built at a suitable point, which will be able to accept the cumulative supply of the production wells, in order to meet the requirements of the relevant legislation. The pumped geothermal fluid will be subsequently transferred via heat alternators from the primary circuit (geothermal field - well piping – geothermal field) to the secondary circuit of the system, i.e. a two-pipe district heating distribution network, consisting of pre-insulated pipes installed directly in the ground within the trench, with hot water as heat carrier, to supply agricultural crops.

1 http://www.makedonia-thrace.gr/el/Pages/Default.aspx
The proposed project will be implemented as a pilot. Under the proposed project, thermal energy is supplied via a district heating system in an area of 1 km\(^2\) of agricultural cultivations or to 70,000-90,000 m\(^2\) of greenhouses and serves approx. 30-40 farmers. According to the relevant legislation\(^2\), the license holder of the geothermal field cannot discriminate between consumers, on the terms of connection to the network and has to accept all requests of consumers within the scope and capabilities of the developed network. Therefore, at this pilot stage, all owners of properties within the specific area of 1 km\(^2\) are prospective customers.

The Greek authorities consider that the operation of the project has certain risks, which should be identified and minimized because of the pilot nature of the proposed project. These are risks related to the utilisation of the geothermal field under real conditions and risks related to the viability of the businesses which will connect to it -greenhouses and open field farmers-, as they have to bear the costs of necessary investments related to the use of the infrastructure in their properties and the diversification of their crops.

According to the Greek authorities, the climate conditions in the entire Eastern Macedonia – Thrace Region do not permit extensive greenhouse cultivation. The area growing vegetables under greenhouses in the entire Eastern Macedonia – Thrace Region is around 2% of the national total. Moreover, in the wider area of Kavala, the relevant figure is around 0.5%\(^3\). Indeed, in the wider area of the project (the Nestos Area) there are today 4.65 ha of vegetable crops under roof of which only a few are heated, out of a total of 16,461 ha\(^4\) i.e. it represents 0.028% of the size of the geographical area it relates to.

The Greek authorities mention that there is limited interest at present in operating greenhouses in the area. Indeed, approximately 65% of the greenhouse installations in Greece are located on Crete (43%) and on Peloponnese (22%)\(^5\) i.e. on the south parts of the Member State due to beneficial weather conditions. Actually, the Greek authorities calculated that the heating costs at the project area are 1.72 times higher than the respective average costs on Peloponnese and 2.61 times higher than the ones on Crete\(^6\).

It should also be noted that there are no other technically feasible solutions for the supply of thermal energy in the region with the same or lower environmental impact. Imported heating oil is the only alternative fuel for generating thermal energy, as no other sources of energy or fuel are used or available in the region of Eastern Macedonia.

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\(^3\) Hellenic Statistical Authority, 2007

\(^4\) According to data of the Ministry of Rural Development & Food / Kavala Association of Agricultural Cooperatives.

\(^5\) According to data from the Ministry of Rural Development and Food (2006)

\(^6\) On the basis of comparable data of heating degree-days (HDD, with reference temperature 18 0C – Technical Instructions of the Technical Chamber of Greece 20701-3/2010) for the project area, Peloponnese and Crete.
Accordingly, the Greek authorities claim that public interest to promote geothermal energy distribution remains the only viable and environmentally friendly application and granting aid to the pilot project is the only appropriate and necessary means to achieve the objectives set.

In particular, the implementation of the project on a pilot basis is expected to be the forerunner of the further utilisation, in a subsequent phase, by other new investments in the remaining part of the geothermal field of Eratino or in other geothermal fields in the region based on the know-how acquired and results of this project. In this respect, the Greek authorities mention that there are seven confirmed geothermal fields in the greater area of the Region of Eastern Macedonia and Thrace.

2.2. Legal base

The legal base for the measure at hand in national legislation are:

- Law 3852/2010 on the ‘New structure of local government and decentralized administration: the Kallikratis Plan’
- Presidential Decree 60/2007 (Greek Government Gazette I 64 of 2007) on the ‘Harmonization of Greek law with the provisions of Directive 2004/18/EC’
- Decision No. 11389/3/1993 of the Minister of the Interior on the ‘Standard Procurement Regulation for Local Government Authorities’ (Ε.Κ.Π.Ο.Τ.Α.), as amended and supplemented

2.3. Beneficiary

(15) The project beneficiary is the Municipality of Nestos (formerly Municipality of Chrisoupoli), which manages the geothermal field in Eratino: one of the seven geothermal fields that exist in the region of Eastern Macedonia and Thrace. The Municipality of Nestos acquired the right to manage this geothermal field in 2007 in accordance with Article 4 of Law 3175/2003 on the utilization of geothermal potential, district heating and other provisions.

(16) The assignment of the management of the proven geothermal field followed an open, non-discriminatory and transparent tender of the Region of Eastern Macedonia & Thrace for the lease of its use. The tender was open to any foreign or domestic natural and legal entities or consortia. During the tender, the interested parties were asked to submit feasibility studies of their proposed investments as regards the use and management of the geothermal field. The assessment criteria of the tender provide for the selection of the proposal that ensured the most effective use of the renewable energy. The related lease agreement was signed on 30 November 2007.

(17) For the proposed exploitation of geothermal field in the Eastern Macedonia and Thrace region, the Municipality of Nestos was selected after an open invitation from the Interim Management Authority of the Regional Operational Programme "Eastern Macedonia and Thrace 2007-2013" to all bodies with the right to manage and exploit geothermal fields in the region to submit a documentation folder.

2.4. Budget of the project, form of aid

(18) The budget of the project stands at EUR 10,600,000 including VAT, which forms a non-eligible expenditure for the Municipality of Nestos, standing at EUR 1,982,113.82. The form of the aid is direct grant.

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8 Government Gazette Issue No 207 Series A of 29 August 2003
9 Notice No 2141/2-08-2007 of the Region of Eastern Macedonia & Thrace
10 The procedure was performed pursuant to Ministerial Decision No Δ9Β/Φ166/ΟΙΚ1508/ΓΔΦΠ2374/10 with regard to ‘the characteristics required for the certification of a geothermal field’
The project budget by cost category is shown in the following table:

<table>
<thead>
<tr>
<th>Sub-project</th>
<th>CATEGORIES OF WORKS</th>
<th>Cost before VAT (€)</th>
<th>VAT (23%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ELECTRICAL-MECHANICAL WORKS</td>
<td>3,425,324.25</td>
<td>787,824.58</td>
<td>4,213,148.82</td>
</tr>
<tr>
<td>B</td>
<td>AUTOMATED CONTROL SYSTEMS</td>
<td>359,354.57</td>
<td>82,651.55</td>
<td>442,006.12</td>
</tr>
<tr>
<td>C</td>
<td>PLUMBING/HYDRAULIC WORKS</td>
<td>849,796.36</td>
<td>195,453.16</td>
<td>1,045,249.51</td>
</tr>
<tr>
<td>D</td>
<td>BUILDING WORKS</td>
<td>469,561.42</td>
<td>107,999.13</td>
<td>577,560.54</td>
</tr>
<tr>
<td>E</td>
<td>DRILLING</td>
<td>3,513,849.59</td>
<td>808,185.41</td>
<td>4,322,035.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>8,617,886.18</td>
<td>1,982,113.82</td>
<td>10,600,000.00</td>
</tr>
</tbody>
</table>

2.5. Eligible cost calculations, aid amount and aid intensity

The Greek authorities explained that as regards the aid intensity of the measure and the calculation of the eligible costs, the project has been divided into i) investments related to the extraction (source) of the energy and ii) investments related to the district heating infrastructure.

2.5.1. Investment related to the extraction / (source) of the geothermal energy

Eligible costs

The Greek authorities explained that for the calculation of the eligible costs the provisions set out in the Community guidelines on State aid for environmental protection ("EAG") have been used for the part of the project that relates to power generation. More specifically, as the project refers to the extraction and use of...
geothermal energy\textsuperscript{13} the eligible investment costs have been calculated in line with Section 3.1.6.1 (investment aid for renewable energy sources) of the EAG.

(22) The Greek authorities submitted the calculation of eligible costs for the part of the investment related to the source of energy using the methodology specified in sections 105 and 106 of the EAG i.e. comparing the proposed investment to a reference investment.

(23) In determining the reference investment, the Greek authorities assumed that the thermal energy supplied to consumers is produced by burning heating oil in a conventional boiler-burner system of equivalent 7.85MW installed thermal power. The Greek authorities submitted that this reference investment is a technically comparable investment that could be realised without the aid and is a reliable business alternative to the investment under review.

(24) The differentiation of the proposed project in relation to a conventional system with the same objective (i.e. supplying a district heating network) is that, under the proposed project, the beneficiary is borne with investment expenses arising from drilling works (abstraction and reinjection wells) to obtain thermal energy from the geothermal field.

(25) Based on offers from relevant suppliers, the reference investment cost regarding the part related to the thermal heat generation stands at € 121,951.22 plus VAT. If a conventional heating system to supply the district heating network were used instead of the geothermal fluid, the difference in the investment cost related to the source of energy would be € 3,391,899.16.

(26) The project will be operational in 2016. Operating benefits of the project as compared to the reference investment result mainly from heating oil fuel cost savings. On the other hand, the proposed project will incur higher electricity and maintenance costs, as well as the rent paid for the use of the geothermal field. The Greek authorities explained that for the proposed project and for the reference investment the same pricing policy of the operator was taken into account i.e. that heat would have to be sold under the same conditions. Therefore, only operating costs of the two scenarios differ.

(27) After, computing the respective operating costs during the first five years of the life of the investment concerned (2016-2020), the difference, the total net benefit of the proposed project amounts to € 81,024.14, as shown in the table below:

\textsuperscript{13} Geothermal energy is a renewable energy source under the definition of point 70 (5) of the EAG.
<table>
<thead>
<tr>
<th>YEAR</th>
<th>REFERENCE INVESTMENT (€)</th>
<th>PROPOSED PROJECT (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OPERATING COSTS</td>
<td>OPERATING COSTS</td>
</tr>
<tr>
<td>2016</td>
<td>81.168,00</td>
<td>70.270,44</td>
</tr>
<tr>
<td>2017</td>
<td>108.175,40</td>
<td>131.535,71</td>
</tr>
<tr>
<td>2018</td>
<td>154.452,74</td>
<td>134.194,97</td>
</tr>
<tr>
<td>2019</td>
<td>154.452,74</td>
<td>134.194,97</td>
</tr>
<tr>
<td>2020</td>
<td>189.160,75</td>
<td>136.189,41</td>
</tr>
<tr>
<td>TOTAL</td>
<td>687.409,65</td>
<td>606.385,51</td>
</tr>
</tbody>
</table>

EXTRA OPERATING BENEFITS: 81,024,14

(28) The total eligible costs related to the investment in the source of energy are computed by deducting the additional operating benefits related to the extra investments for environmental protection during the first five years the investment is in operation from the extra investment costs, as shown in the following table:

<table>
<thead>
<tr>
<th>COST CATEGORY</th>
<th>A. Proposed Project</th>
<th>B. Reference investment</th>
<th>C. Difference (C=A-B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT SOURCE (BOREHOLES OR OIL-FUELLED BOILER)</td>
<td>3,513,849,59</td>
<td>121,951,22</td>
<td>3,391,899,16</td>
</tr>
<tr>
<td>OPERATING BENEFITS DURING FIRST FIVE YEARS OF INVESTMENT</td>
<td>606,385,51</td>
<td>687,409,65</td>
<td>81,024,14</td>
</tr>
<tr>
<td>ELIGIBLE EXPENDITURE</td>
<td></td>
<td></td>
<td>3,310,874,23</td>
</tr>
</tbody>
</table>
(29) By comparing the proposed project with the counterfactual situation (reference investment), the extra cost for environmental protection is €3,310,874.23. This amount represents the eligible costs for the part of the project related to the source of energy.

Aid intensity

(30) The Greek authorities submitted that the project for the exploitation of the geothermal field of Erateino was awarded under a genuinely competitive bidding process. The Greek authorities confirmed that the contractor selection procedure for the construction of the project is performed in accordance with Law 3669/2008, Directive 2004/17/EC and the applicable Presidential Decree 59/2007 in an open call for tenders, the lowest bid being the criterion in order to ensure the lowest possible construction costs for the entire project.

(31) Furthermore, the Greek authorities state that Municipality of Nestos acquired in 2007 the right to manage the proven geothermal field at Erateino in accordance with Article 4 of Law 3175/2003 on the utilization of geothermal potential, district heating and other provisions. During the tender the interested parties were obliged to submit feasibility studies of their proposed investments as regards the use and management of the geothermal field. The assessment criteria of the tender provide for the selection of the proposal that ensured the most effective use of the renewable energy.

(32) According to the Greek authorities the above procedures ensure the lowest possible project costs and, therefore, the lowest aid amount for the targeted energy effect from the renewable source.

Funding Source

(33) The eligible costs (€3,310,974.23) are funded according to the provisions of the Operating Programme up to 85% of the eligible expenditure (i.e. €2,814,243.09) from ERDF funds and €496,631.12 (15% of the eligible expenditure) is public national participation financed by the Greek state and the region. The remaining amount €202,975.33 for this part of the project will be financed by beneficiary's resources.

2.5.2. Investment related to the district heating infrastructure.

Eligible costs

(34) As regards the district heating network of the project, the Greek authorities mention that the total cost of €5,104,036.60 are to be considered as eligible expenditure for funding under the ERDF funds as they do represent investments related to the district heating infrastructure.

Aid intensity

(35) The Greek authorities applied the funding gap calculation methodology to determine aid intensity of this part of the project, for all its specific revenues and costs, as portrayed in the Cost Benefit Analysis accompanying the notification.
Given the funding gap rate of 99.21% shown in the table below, the eligible costs for the part of the project related to the district heating infrastructure amount to € 5,063,745,14.

The table below summarizes the funding gap calculation of the total project according to the Cost Benefit Analysis of the project.

<table>
<thead>
<tr>
<th>Main data and parameters</th>
<th>Non-discounted value</th>
<th>Discounted value (Net Present Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Reference period (in years)</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2 Financial discount rate (%)</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>3 Total cost of investment without contingencies (in Euro) = [C]</td>
<td>8,617,886 €</td>
<td>7,799,079 €</td>
</tr>
<tr>
<td>4 Residual value (in €)</td>
<td>0 €</td>
<td>0 €</td>
</tr>
<tr>
<td>5 Revenues (in euro, discounted)</td>
<td>2,439,950 €</td>
<td></td>
</tr>
<tr>
<td>6 Operating expenses (in euro, discounted)</td>
<td>2,378,384 €</td>
<td></td>
</tr>
<tr>
<td>7 Net revenues = revenues + residual value – operating expenses (in euro, discounted) = [R] = (5) +(4) - (6)</td>
<td>61,566 €</td>
<td></td>
</tr>
<tr>
<td>8 Funding gap = Total cost of investment without contingencies – net revenues [FG] = [C]-[R] = (3)-(7)</td>
<td>7,737,513 €</td>
<td></td>
</tr>
<tr>
<td>9 Funding gap rate (%) = [FGR]= (C-R)/C = (8)/(3)</td>
<td>99.21%</td>
<td></td>
</tr>
</tbody>
</table>
Given the funding gap rate shown in the table above, the financing for the district heating network is stated below:

<table>
<thead>
<tr>
<th>Funding gap rate [R]</th>
<th>99.21%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible cost [EC]</td>
<td>5.104.036,60</td>
</tr>
<tr>
<td>Costs after applying funding gap [DA] DA=EC*R</td>
<td>5.063.745,14</td>
</tr>
<tr>
<td>Max. Co-financing Rate [MaxCRpa]</td>
<td>85%</td>
</tr>
<tr>
<td>ERDF funding =DA*MaxCRpa</td>
<td>4.304.183,37</td>
</tr>
<tr>
<td>National contribution</td>
<td>759.561,77</td>
</tr>
<tr>
<td>Own participation</td>
<td>40.291,46</td>
</tr>
</tbody>
</table>

The total public participation for district heating network is € 5,063,745.14 and corresponds to the items presented above.

2.5.3. Total project

Accordingly, by combining the figures for both parts of the project (A and B) the eligible costs of the total project before VAT envisaged by the Greek authorities amount to € 8,414,910,83.

The financing of the project will be provided as stated in the table below:

<table>
<thead>
<tr>
<th>Source of financing</th>
<th>Amount (€)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public expenditure</td>
<td>8,374,619,39</td>
<td>97.18%</td>
</tr>
<tr>
<td>Own contribution</td>
<td>243,266,79</td>
<td>2.82%</td>
</tr>
<tr>
<td>Total project cost</td>
<td>8,617,886,18</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

The above amounts are VAT excluded. VAT amounts to € 1,982,113.82 and is a non-eligible expense.

The aid intensity of the overall project is 97.18% on the total project costs.

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14 The own contribution of the beneficiary (Municipality of Nestos) may also include State resources. In any event, this question does not need to be examined in this case because, as explained below, the maximum permissible aid intensity is 100%.
ERDF financing will amount to € 7,118,426,47 representing a 82.6% of the total project costs before VAT.

2.6. Cumulation

The Greek authorities confirmed that the project is not cumulated with other national or European Union financing for the same eligible expenditure.

2.7. Tender Procedures and Provisions

The Greek authorities also submitted that the implementation of project is carried out according to Directive 2004/17/EC coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors and to the Presidential Decree 59/2007, using open call tendering procedures in competitive conditions, thus securing the minimum possible cost for the execution of the overall project.

First, a tender, by means of an open invitation to bodies with the right to manage and exploit the geothermal fields, was organized by the Interim Management Authority for the selection of the project among the geothermal fields in Eastern Macedonia and Thrace (“project selection tender”)\(^\text{15}\). Second, a tender was organized in 2012 by the Municipality of Nestos for the selection of the contractor for the construction of the project (“contractor tender”). In this respect the Greek authorities mention that the tender notice for the open tender procedure for the geothermal field exploitation in Eastern Macedonia and Thrace was drafted in accordance with the relevant standard form contained in Commission Regulation (EC) No. 1564/2005 and was published in OJ 2012/S128-212157 on 6/7/2012. Furthermore, the tender documents and the tender notice were approved by the Tender and Contracts Monitoring Unit (MOPADIS). A summary of the tender notice was published in accordance with Article 15(7)-(9) of Law 3669/2008 in the Public Contracts Tenders Notices Bulletin of the Government Gazette (Government Gazette 434/6.7.2012). It was also published in the Greek press in accordance with circular No. E.16/2007 of the General Secretariat for Public Works / Ministry of Infrastructure, Transport & Networks.

The construction of the project will not start before approval for the aid is given by the European Commission’s in accordance with document No. 17780/EUS 2434/12.4.2012 on compliance with state aid rules for infrastructure projects when implementing the operational programmes.

The Greek authorities state that on the date for closing the contractor tender (28.8.2012) 3 sealed tenders were submitted out of 29 candidate contractors that requested and obtained copies of the project tender documents.

The Greek authorities confirmed that the aid to be granted and the funding rate for the project will be applied to the initial offer made by the project owner when the outcome of the open tender procedure is confirmed.

2.8. Environmental and socio-economic effects

(51) The Greek authorities allege that the project at hand is expected to provide for significant environmental and socio-economic effects.

(52) As for the environmental effects, the implementation of the project is expected to lead to an increase of the installed power generation from RESs of 7.85 MW and to an avoidance of greenhouse gas emissions of approximately 6,000 tn/annum as a result of utilising renewable (geothermal) energy instead of a conventional heating system of the same capacity that would use fossil fuels.

(53) As for the socio-economic effects, it is expected that the project will lead to an increase of the level of growth and prosperity of the people as well as of the economic and social convergence in the region, as it delivers a number of socio-economic benefits to the region, such as changes and improvement of farming practices and revenues as well as associated research and marketing development opportunities for the products.

2.9. Compatibility arguments put forward by the Greek authorities

(54) The Greek authorities claim that the proposed pilot project pursues an objective of common interest, i.e. environmental protection. The Greek authorities confirm that no construction work has taken place and neither there are plans to start works before the Commission issues its approval decision.

(55) The Greek authorities submitted detailed financial and cost-benefit analysis that, in their view, demonstrate that without the grant at hand such a project would not be feasible, unless considering prices for district heating services substantially higher, which would jeopardise the viability of the pilot development.

(56) The Greek authorities mention that the project did not attract the attention of private sector investors since distributing thermal energy as a service does not entail high yields for businesses which could invest in such an infrastructure, because of the very high cost of creating the boreholes and the transmission and distribution network. To cover those costs, significant direct revenues from the thermal energy usage fees would be required; however consumers would not be able to pay those amounts.

(57) Furthermore, in the light of the mentioned analyses and of the savings achieved via the tendering procedure with respect to the original business plan, the Greek authorities also consider that the aid is limited to the minimum. As the project related to heat distribution to a very limited area at this pilot stage, they conclude that the effect on competition is extremely limited. Eventually, the Greek authorities consider that district heating infrastructure is local by nature and the effects of any state funding in such a local market cannot be deemed to have negative effects on intra-EU trade.

2.10. Sale of heat for agricultural purposes

(58) Under the measure the Municipality of Nestos will supply the heat through the district heating network to farmers in the area for agricultural purposes.
Given the fact that the project is a pilot project and no previous experience exists in Greece, the aim of this pilot project is associated with exploring how the heat of the geothermal field can be utilised under real conditions and whether the commercial proposition to customers that will undertake necessary investments to use the provided heat is viable under real market conditions.

Thermal energy will be billed from the date on which users are connected to the proposed project and a fixed connection fee will apply for each connection to the infrastructure.

According to the Greek authorities the sale price for thermal energy should allow the operating costs of the producer and distributor to be covered, and has to be also suitable for attracting customers who will incur the investments cost required setting up an installation to use it (greenhouse, equipment for early maturing crops etc). End users of the project will be paying the entire operating costs of producing thermal energy from the geothermal field.

According to the Greek authorities the minimum heat price which ensures the financial viability of the investment is € 17/MWhth. The Greek authorities explained that the above price does not lead to preferential treatment of the users of energy i.e. the farmers that have properties in the area of the district heating network. Given the current state of the market and the pilot stage of the project, the Greek authorities consider that this price is an attractive sale price of heat to end consumers that bear the relevant business risk to make additional investments, in order to use the supplied heat.

In addition, the Greek authorities state that under the applicable legislation there is no pre-set price for heat obtained from a confirmed geothermal field. However, to ensure competitive pricing of the produced energy from geothermal fields, article 7 of the relevant Ministerial decision foresees that the thermal energy is supplied at competitive price relative to the variable cost of production with the best available alternative technology of heat production from renewable sources, including geothermal heat pump and biomass boiler. The Greek authorities provided information showing that the price of €17/MWh complies with the requirements of the legislation.

Furthermore, the Greek authorities submitted a cost-benefit analysis on the basis of which the extra cost that the users of the Eratino geothermal field will have to pay in order to connect to the thermal energy distribution network and utilise it, as well as the time required for the amortisation of the their investment, taking into account its operation and maintenance costs, were calculated. This analysis is performed on the extra cost for utilising geothermal energy in an asparagus farm with a surface area of 4.000m² which is the main crop in the area that is expected to utilise thermal energy.

The pilot use of low-enthalpy thermal energy for heating the crop will lead to early-season production of asparagus, which can be sold at higher prices and produce additional revenues to the farmers. The analysis results in infrastructure investment costs for the user standing at €23.300 for a typical asparagus farm with a surface area

16 Using the NSRF standard for co-financed projects and selecting a discount rate of 5%,
of 4,000 m². The extra benefits due to the investment were estimated at € 4,600/year while the operating costs are approximately € 2,700/year. Considering thermal energy selling cost at €17/MWh, the investment would be amortised in more than 11 years.

(66) The Greek authorities take the view that investment cost for the use of the thermal energy in greenhouse operations is higher (approx. 250,000 EUR) and therefore less profitable than the example provided for asparagus farms. Accordingly, the Greek authorities claim that the set price is marginally attractive to farmers, who must fully undertake the risk of financing the construction and operation of the infrastructure for utilising geothermal energy in their properties.

(67) In any event, the Greek authorities have committed to i) reviewing the tariff level after 10 year of operation and, in light of the actual profitability of the project and the commercial viability of a tariff increase, envisage a tariff modification and ii) insert such review clause from the outset in supply contracts.

3. ASSESSMENT OF THE AID

3.1. Presence of State aid within the meaning of Article 107(1) TFEU

(68) A support measure to an undertaking constitutes State aid within the meaning of Article 107(1) of the TFEU if the following conditions are cumulatively fulfilled: the measure (a) confers an economic advantage to the beneficiary; (b) is granted by the State or through State resources; (c) is selective; (d) has an impact on intra-EU trade and is liable to distort competition within the EU.

(69) As for the four abovementioned conditions:

− The measure at hand is co-financed by the ERDF and the budget of the State. The aid is granted by the latter to the Municipality of Nestos; therefore, the aid is deemed to be granted directly through State resources17 and to be imputable to the State18;

− The measure provides for a direct grant thus conferring an economic advantage to the beneficiary. The Municipality of Nestos, for the purposes of exploiting the geothermal field and related infrastructure, is to be considered as an undertaking, in that it provides heating services to customers such as farmers and greenhouses on the market for heating.

− The measure is also selective, since a single beneficiary has been awarded the available resources out of a restricted number of eligible entities;

17 Cf., inter alia, Preussen-Elektra, ibidem, paragraph 58.
The markets for supply of energy in the form of heating are open to competition and to intra-EU trade since, subject to compliance with authorisation and other requirements, undertakings from the Union can freely provide their services in Greece. According to settled case-law, the measure is therefore liable to affect intra-EU trade and to distort competition within the EU;

Therefore, the Commission considers that the notified measure constitutes State aid within the meaning of Article 107(1) of the TFEU.

3.2. Legality of the measure

By notifying the measure before its implementation, the Greek authorities have fulfilled their obligation according to Article 108 (3) TFEU. Any disbursements will only be made after the authorisation of the notified measure by the Commission.

3.3. Compatibility within the internal market pursuant to Article 107(3)(c) TFEU

The Commission has assessed the compatibility of the notified measure according to Article 107(3)(c) TFEU and in light of the Environmental Aid Guidelines.

Given the fact that the notified measure concerns investment aid for energy produced from renewable energy sources, namely geothermal energy and for the associated district heating infrastructure the measure will be assessed in a twofold way.

As regards the investment aid for the source of energy, the compatibility conditions laid down in Section 3.1.6.1 (investment aid for renewable energy sources) of the Environmental Aid Guidelines apply.

As regards to the investment aid for the district heating infrastructure, pursuant to a well-established case-practice, and in the light of the provisions laid down in the European Union Guidelines on State Aid for Environmental Protection, the Commission shall assess the compatibility of aid directly under Article 107(3)(c) of the TFEU.

3.3.1. Aid related to the Source of Energy - Application of the Environmental Aid Guidelines

Given the fact that the notified measure concerns investment aid only for the part of energy produced from renewable energy sources, namely geothermal energy, the compatibility conditions laid down in Section 3.1.6.1 (investment aid for renewable energy sources) of the Environmental Aid Guidelines apply.

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22 See recital 67 and footnote 44 to the EAG.
First, the Commission notes that the Greek authorities have confirmed that the aid is only granted in respect of the part of the production of heat using renewable energy sources as defined in paragraph 70(5) of the Environmental Aid Guidelines.

Second, the lack of existence of mandatory EU standards concerning the share of energy from renewable sources for individual undertakings means that the aid may be justified, as prescribed in paragraph 101 of the Environmental Aid Guidelines.

Paragraph 104 of the Environmental Aid Guidelines prescribes that the investment aid intensity of measures destined to the use of renewable energy sources may amount up to 100% of the eligible investment costs as defined in points 104 and 105 of the EAG if the investment aid is granted in a genuinely competitive bidding process on the basis of clear, transparent and non-discriminatory criteria, effectively ensuring that the aid is limited to the minimum necessary for delivering maximum renewable energy.

The Commission notes that as stated in section 2.7 of this decision, the Greek authorities awarded the project using open call tendering procedures in competitive conditions, thus securing the minimum possible cost for the execution of the overall project. In particular:

- The Municipality of Nestos acquired in 2007 the right to manage the proven geothermal field at Erateino in accordance with Article 4 of Law 3175/2003 on the utilization of geothermal potential, district heating and other provisions after a tender procedure. During the tender the interested parties were obliged to submit feasibility studies of their proposed investments as regards the use and management of the geothermal field. The assessment criteria of the tender provide for the selection of the proposal that ensured the most effective use of the renewable energy.

- The project was selected on the basis of a selection tender, by means of an open invitation sent by the Interim Management Authority to all bodies with the right to manage and exploit geothermal fields in Eastern Macedonia and Thrace.

- The contractor tender notice for the open tender procedure of exploitation of geothermal fields in the Eastern Greece area was drafted in accordance with the relevant standard form contained in Commission Regulation (EC) No. 1564/2005 and was published in OJ 2012/S128-212157 on 6/7/2012.

- On the date for closing the tender (28.8.2012), 3 sealed tenders were submitted out of 29 candidate contractors that requested and obtained copies of the project tender documents.

- The Greek authorities confirmed that the aid to be granted and the funding rate for the project will be applied to the initial offer made by the project owner when the outcome of the open tender procedure is confirmed effectively ensuring that aid amount is kept to the minimum necessary.

In view of the above, the aid amount of the part of the project related to energy source can cover the total amount of the eligible costs.
Paragraph 106 further specifies that eligible costs must be net of any operating benefits and operating costs during the first five years of operations. The Commission notes that the eligible costs are compliant with point 105 of the EAG.

Indeed, the eligible costs as shown in paragraph 2.5.1 above, are limited to the additional costs to bring about the environmental protection over the costs of a conventional facility (counterfactual scenario) producing the same outputs without the additional environmental protection. Moreover, the eligible costs have been calculated net of any operating benefits and operating costs related to the extra investment, as regards to the source of energy, of the project and arising during the first five years of the life of this investment.

The Commission thus considers that the aid amount related to the source of energy (€3,310,874.23) is in line with the criteria laid out in Section 3.1.6.1 of the Environmental Aid Guidelines.

3.3.2. **Aid related to the district heating Infrastructure – Assessment under Article 107(3)(c) of the TFEU.**

Article 107(3)(c) of the TFEU states that "aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest" may be considered to be compatible with the internal market. In this regard, the Commission shall assess whether the aid measure

a) aims at a well-defined objective of common interest;

b) is an appropriate instrument to deliver the objective of common interest;

c) presents an incentive effect (i.e., changes the behaviour of the beneficiary);

d) is proportional (i.e., does not overcompensate the beneficiary);

e) distorts competition and affects intra-EU trade at a limited extent, so that the overall balance is positive.

**Objective of Common Interest**

An objective of common interest is an objective which has been recognised by the EU as being in the common interest of the Member States.


The Programme aims to, *inter alia*, support projects which reduce pollution of the atmospheric environment, improving quality of life of the population and tackling climate change by implementing energy saving projects

Besides, Directive 2009/28/EC of 23 April 2009 calls for Member States to favour investments in the development of district heating from renewable energy sources so
as to ease the fulfilment of the national renewable energy and emission reductions targets. In detail, pursuant to Article 16 (11) of the mentioned Directive, *Member States in their national renewable energy action plans shall assess the necessity to build new infrastructure for district heating and cooling produced from renewable energy sources in order to achieve the 2020 national target referred to in Article 3(1). Subject to that assessment, Member States shall, where relevant, take steps with a view to developing a district heating infrastructure to accommodate the development of heating and cooling production from large biomass, solar and geothermal facilities.*

(90) It can thus be concluded that the scheme at hand aims at a well-defined objective of common interest, namely environmental protection.

**Appropriate instrument**

(91) An instrument is appropriate if there are no other less distortive instruments to achieve the same results.

(92) There is a lack of market investors wishing to invest in heat distribution projects in the area concerned, since due to the relatively high cost of construction and the low potential for covering the entire cost of construction plus a reasonable profit via the connection charge and the tariffs for thermal energy, they would not find customers willing to connect to the network.

(93) The aid allows the Municipality of Nestos to supply local consumers of heat from an environmentally sustainable source of energy at competitive prices, which it would not otherwise be likely to use. The type of investment needed, district heating network, for the pilot project under consideration, i.e. use of geothermal energy of low temperature, and the additional risks, end users have to undertake, being considered, would be unlikely to be undertaken in the absence of *ad hoc* aid measures.

(94) The Commission notes that according to the Greek law, heat from low temperature geothermal fields shall be supplied at competitive prices thus preventing the beneficiary to independently set prices at a level which would cover the investment expenses and a fair remuneration of the own capital injection, should the project be carried out without State aid. In this respect, it is worth recalling that Municipality of Nestos is constrained to providing services to customers at prices lower than the variable production costs of any renewable energy source including the geothermal heat pump and the biomass boiler. It follows that the planned aid is not the only instrument, but is used in combination with price regulation to act as disincentive to decentralised and less environmentally friendly sources of heating.

(95) The Greek authorities submitted a cost-benefit analysis for a typical cultivation of the region regarding the necessary investments to use the heat showing that, with planned tariffs and connection costs, heat purchases become profitable for farmers only after 10 years. Furthermore, the Greek authorities explained that current economic situation in Greece reduces the likelihood of private investments being made.
On the other hand, the project and its commercial operation are conceived to attract a sufficient number of farmers in the area to connect to the heating network, within a reasonable time frame after 2016. Accordingly, the environmental benefits of it are not likely to remain purely theoretical.

On the basis of the information above, no less distortive instrument to achieve these goals can be identified. Accordingly, the envisaged aid constitutes an appropriate instrument to achieve the construction of the project and to obtain the desired effects in terms of primary energy savings and emission reductions.

**Incentive effect and necessity of the aid**

State aid provides an incentive effect if the aid changes the recipients' behaviour towards reaching the objective of common interest.

First, the Greek authorities have confirmed that no construction work has taken place neither there are plans to start works before the Commission issues its approval decision.

Second, the Commission considers that district heating services in the specific circumstances of this case may not provide for attractive returns to companies investing in district heating infrastructure, due to the very high cost of developing transmission and distribution network which are hardly covered by substantial direct revenues.

Moreover, the Commission considers that the detailed profitability calculations submitted by the Greek authorities are consistent with market practices and indicates that the investment at hand has no economic viability per se\(^{23}\). Indeed, the submitted financial analysis of the project taking into account all discounted revenues and costs during 30 years shows that the project without the aid has a negative net present value\(^{24}\) (NPV) and financial rate of return (FRR) (€ -7,737,513 and -8.58\% respectively). If the project receive aid, the net present value (NPV) of the project remains negative (€ -158,578) and the financial rate of return (FRR) is 3.3\%; the Net Present Value is calculated with a 5\% discount rate, which is not incongruent with the rate applied on the basis of relevant Commission Guidelines.

In addition, the Commission notes that heat tariffs aim at overcoming the uncertainty associated with the use for the first time of low temperature geothermal fields for agricultural use in Greece. In the current business plan, the financial viability of the project is constrained by the commercial viability of heat tariffs which have to incentivise users (farmers) to bear the risks of the necessary additional investments to use the heat and connect to the grid. This puts a heavy constrain on the tariff level which, if not taken into account, may render the business proposition totally

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\(^{24}\) The Greek authorities apply this discount rate in accordance with the relevant Commission guidelines ‘Guide of Cost-Benefit Analysis of investment projects’, Final report, 16.6.2008. In fact they follow the EC suggestion of a benchmark real financial discount rate of 5\% (pg.14) and mention that justifications for the discount rate used are only needed in the case where the discount rate is a different rate than 5\%.
unattractive for demand. Accordingly the project being assessed is not financially feasible without aid.

(103) Furthermore, the Commission notes the commitment of the Greek authorities to i) review the tariff level after 10 year of operation and, in light of the actual profitability of the project and the commercial viability of a tariff increase, envisage a tariff modification and ii) insert such review clause from the outset in supply contracts. The review of tariffs in light of the actual technical and commercial success of the project should therefore allow that no undue or excessive benefits from the pilot project are passed-on downstream to future customers.

(104) Therefore the Commission considers that, in the light of the beneficiary's mission and operating constraints, the aid provides the necessary incentive effect for the Municipality of Nestos to invest into the infrastructure at hand.

Proportionality

(105) A State aid measure is proportional if the measure is designed in a way that the aid as such is kept to the minimum and if the beneficiaries are selected in a non-discriminatory and transparent process.

(106) As for investment costs eligibility, the Commission notes that the cost elements allowed according to the detailed list provided by the Greek authorities to clearly separate between those related to the source of energy (production and reinjection wells) and those that those that only refer to the purchase of infrastructure equipment and the related activities (such as engineering, design, civil works).

(107) In this respect, the Commission acknowledges that all investment costs related to the district heating infrastructure might be deemed to be eligible, also according to the mentioned case practice, as no technically comparable investment that provides a lower degree of environmental protection might be defined, as no mandatory or national European Union standards apply and no comparable centralised investment would credibly be realised without aid by an undertaking.

(108) The Commission notes that the project of Municipality of Nestos was selected on the basis of a transparent procedure and non-discriminative procedure. The Interim Management Authority sent an open invitation\textsuperscript{25} to all bodies with the right to manage and exploit geothermal fields to submit a documentation folder, in Eastern Macedonia and Thrace, where seven geothermal fields exist.

(109) The Commission notes that the contractor selection procedure is implemented by public open calls for tender in accordance with Directive 18/2004. The contractor tender complies with transparency requirements, in the context of an international, public open call for tenders, using non-discriminatory criteria, according to EU law on public tenders for the construction of public works and supplies. By doing so, it is ensured that the cost of the total investment and consequently the aid amount will be limited to the minimum necessary.

\textsuperscript{25}Invitation No: 66/12.09.2011. Priority code 42: Renewable Energy Sources (www.eydamth.gr/)
It is also worth noting that, with reference to the mentioned profitability calculations, the expected NPV achieved with the aid remains negative and Municipality of Nestos might be considered to accept to undertake this investment only in the light of the pilot character of the project. It follows that the beneficiary is not likely to obtain excessive profits from the construction and operation of the aided project.

In this regard, taking into account the information provided by the Greek authorities, the Commission considers that the national authorities ensured that the aid is limited to the minimum.

**Distortion of competition and effects on intra-EU trade**

A State aid measure is compatible with the internal market if it does not affect competition and intra-EU trade or if the resulting effects are limited and balanced with regard to the pursued objective of common interest.

The Commission first recalls that Municipality of Nestos is held to be active in the business activity of district heating market, but it is not active in the electric energy market. Furthermore, the project refers to a pilot application for using only a part (15-20%) of the confirmed capacity of the low temperature geothermal field at Eratino in the Municipality of Nestos to supply a limited number of end users.

Moreover, this is the first project of this kind i.e. using geothermal energy to supply a district heating network for agricultural purposes in Greece. The pilot project mainly aims in acquiring know-how and experience for further utilisation, in a subsequent phase, either for the development of the remaining part of the geothermal field of Eratino or of other geothermal fields in the region than in a financial profitable operation.

The Municipality of Nestos will not benefit of any substantial competitive advantage stemming from the project at hand; in particular the remuneration of the Municipality is constrained by tariff regulation and commercial constraints. Furthermore, the Commission also notes that access to the district heating infrastructure is guaranteed on the basis of the provisions of the relevant legislation to all consumers within the scope and capabilities of the developed network.

Eventually, according to the case practice, the Commission considers that the transport of heat is by definition bound to the location of the pipelines and therefore local by nature. Therefore the effect on trade between Member States of the financing of the project at hand is *a priori* limited.

Therefore, the Commission acknowledge that the distortion to competition is limited and to a large extent justified by the pilot character of the project and the associated need in the supply of heat at low prices as well as by safeguards applied by the Greek authorities (e.g., limitations on the price charged, limited area covered, access to all users in the area concerned, tendering procedure for both the grant to Municipality of Nestos and the subsequent execution of the works and tariff review after 10 years of operation).
Conclusion

Accordingly, the Commission considers that the aid at hand can be approved directly under Article 107(3)(c) TFEU.

4. Conclusion

In the light of the foregoing, the Commission concludes that the notified measure for investment aid for heat production from the geothermal field of Erateino and its associated district heating infrastructure is compatible with the internal market in accordance with Article 107(3)(c) TFEU and has therefore decided not to raise objections to it.

The Commission reminds the Greek authorities that, in accordance with Article 108(3) TFEU, plans to refinance, alter or change this scheme have to be notified to the Commission pursuant to provisions of Commission Regulation (EC) No 794/2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 [now 108] of the TFEU.26

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Yours faithfully,
For the Commission

Joaquin ALMUNIA
Vice-President

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