



Geothermal Energy

The guide of European and National financial incentives



October 2008

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The industry share of total energy consumption in general, and electricity consumption in particular, is expected to rise as a result of industry growth and increased outputs. These trends, against a backdrop of continuously rising or uncertain industrial energy costs, have incited industrials to use renewable energies. Although geothermal projects require large initial capital investment, the geothermal energy remains an attractive option due to low operating costs it offers.

Financial incentives are developed to promote geothermal heating and cooling and overcome the economical barrier to their growth. The present document is addressed to Industry managers who wish to undertake studies or develop applications in the geothermal field. This guide aims therefore at helping them find their way to relevant information on European and national funding opportunities (guidelines and conditions).

1. EUROPEAN LEVEL

In order to promote the integration of sustainable development in the industry, a number of Member States of the European Union (EU) provide incentives for development of energy and environmental performing projects and “greening” their procurement practice to foster their uptake. The EU possesses three key funding instruments to support research and innovation: the 7th Research Framework Programme (*FP7*); the Competitiveness and Innovation Framework Programme (*CIP*) and Cohesion policy which is funded through the Structural Funds and Cohesion Fund (*SF*).

1.1. 7th Research Framework Programme (FP7)

FP7 provides funding to co-finance research, technological development and demonstration projects based on competitive calls and independent peer review of project proposals. Support is available for collaborative and individual research projects as well as for the development of research skills and capacity.

The European Community (EC) have allocated a total of € 2.35 billion for funding energy over the duration of FP7 with emphasis given notably to following activities: Renewable electricity generation and fuel production, renewables for heating and cooling, CO₂ capture and Smart energy networks. Three forms of grants are proposed for the Community financial contribution: reimbursement of eligible costs, lump sums, and flat-rate financing (the latter can be based on scale of unit costs but also includes flat rates for indirect costs).

The recommended method to submit a proposal in (FP7) is through online proposal in the section: “Preparation and Submission”.

Contacts and information

National Contact Points have been appointed to give support to researchers and organizations intending to participate.

http://cordis.europa.eu/fp7/ncp_en.html

European Commission DG Research Unit I.5: Environment

Rue de la Loi 200

B-1049 Brussels

Tel: +32 2 296 62 86

Email: fp7@cordis.lu

1.2. Competitiveness and Innovation framework Programme (CIP)

The CIP seeks to foster the competitiveness of European enterprises. It addresses small and medium-sized enterprises (SMEs). Through two of its operational programs, the CIP supports eco-innovation activities, including geothermal applications, provides better access to finance and delivers business support services in several regions.

– *Intelligent Energy for Europe (IEE)*

This pluri-annual program aims at promoting renewable energy sources for electricity production, heating and cooling applications. It encourages the rational use of energy in buildings and industry. The incentive is a financial support from the European Community with a financial aid covering 75% of total eligible costs. To benefit from this help, applicants should reply ONLINE to a call for proposals published annually by the Executive Agency for Competitiveness and Innovation.

Terms and conditions

- Program solely dedicated to actions and projects (no R & D projects)
- At least 3 partner organisations from 3 different eligible countries.
- Maximum funding period 3 years.
- Budget usually between € 0.5 - 2.5 million (mainly staff costs).

Contacts and information

<http://ec.europa.eu/energy/intelligent/>

1.3. Cohesion Policy: Structural Funds and Cohesion Fund (SF)

The purpose of the Cohesion policy is to strengthen economic, social and territorial cohesion by reducing disparities in development level among regions and Member States of the EU. Unlike FP7 and CIP, Structural Funds management is decentralised to regional or national bodies. The funds that contribute to the competitiveness programme of the regional policy are:

- Cohesion Funds (CF)
- European Funds for Regional Development (EFRD)

1.3.1 Cohesion Funds

For the 2007-2013 period, Cohesion Funds contribute to interventions in the field of the environment, use of renewable energy and trans-European transport networks. It addresses Member States with a Gross National Income (GNI) of less than 90% of the Community average: Bulgaria, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. Spain is eligible for the Cohesion Fund on a transitional basis.

Several frameworks are developed under the cohesion policy programmes. The most appropriate in the case of promoting geothermal energy in Industry is **JESSICA**: Joint European Support for Sustainable Investment in City Areas. Managing authorities launch a call expressing interest, addressed to urban development funds.

Submissions would be approved by the Commission based on several criteria: investments and projects to be targeted, terms and conditions under which they would be financed, ownership and contributions of co-financing partners of the fund.

1.3.2 European Regional Development Funds

During the 2007-2013 period, the Cohesion Fund and European Regional Development Fund will together contribute to multi-annual programmes which are managed in a decentralised way, thus avoiding the need for individual project approval by the Commission. EU funding is not paid directly by the European Commission but via the national and regional

authorities of the Member States. These funds will be discussed in details in the national level part.

Contacts and information

http://ec.europa.eu/regional_policy/index_en.htm

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Avenue Père de Decken, 23 – Bâtiment CSM 1 2nd floor

Phone number: 0032 2 296 6943

Fax number: 0032 2 292 0904

regio-financial-engineering@ec.europa.eu

2. NATIONAL LEVEL: FRANCE

2.1. Introduction

On the national level, renewable energy policy is formulated by the Ministry of Industry and implemented through the Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME). Government supports renewable energy in several ways, including direct funding of local and regional projects, joint EDF/ADEME agreements, and financial incentives. In each of the 26 French Regions, a framework agreement has been signed by the Region, State ("Préfet" for the Region) and ADEME in order to set concrete targets for actions to be undertaken and financial funds to be granted. The cumulated amount of financial aids should not exceed 80% of the project overall tax free subsidisable cost in the case of industries and SMEs.

Financial incentives and subsidies apply to:

- Project Feasibility study: Subsidies allocated to industry managers who wish to study the technical and economical feasibility of a geothermal heating/cooling application.
- Project investment costs: Industry managers can benefit from initial investment funds once the feasibility of the proposed project is confirmed.

It is important to note that all of the financial incentives schemes are subject to changes and all funding programmes are subject to implementation.

In collaboration with BRGM (French Geological Survey) and EDF (French Electricity Board), ADEME created **AQUAPAC** a guarantee dedicated to heat pumps using ground water (well depth lower than 100 m). With this Policy, ADEME proposes to the client a double guarantee covering two risks:

- A "seeking guarantee" covering the risk of an unsuccessful drilling, in terms of absence of water or of insufficient flow in the aquifer.
- A "durability guarantee" covering the risk, over 10 years, of a drying up of the well or of accidents on hardware, linked to an evolution of the well.

AQUAPAC is based on a guarantee fund allocated by ADEME and EDF. The client has to pay a guarantee fee proportional to the system cost but this fee is small with regard to a traditional insurance. AQUAPAC guarantees are proposed to public and private project owners, industrialists using water ground heat pumps for heating and cooling applications in the residential, tertiary or industrial sectors

2.2. How to apply to the EU – National – Regional Funds

The European Union, through its National Strategic References Frameworks, set out investment priorities for regional and sectoral programmes to be supported by the EU over the period 2007-2013. These strategies and programmes have been developed in partnership between the Commission and national, regional and local authorities. EU Structural Funds were created to help regions within the EU whose development is lagging behind. They consist of four individual funds supporting different aspects of regional development. Only the **European Regional Development Funds** are of interest for the application of geothermal energy in the French industry.

2.2.1 How to apply to European Regional Development Fund (ERDF)

- **ERDF** offer direct aid to investments in companies to create sustainable jobs, especially in SMEs and to apply sustainable development throughout territories. ERDF can intervene in three objectives of regional policy: Convergence; Regional Competitiveness and Employment; European Territorial Cooperation.

- **ERDF** are primarily dedicated to the environmental fight against pollution by encouraging industries and enterprises to obtain innovating and exemplary technologies environment friendly.
- All regions of metropolitan France and overseas departments (DOM).are eligible to these aids for the period of 2007-2013.
- The financial aid is by co-financing with a maximum rate varying between 50% and 80% of total eligible costs. Funds are granted on a case-by-case basis. ERDF is not paid directly by the European Commission but via French regional authorities.
- For the 2007-2013 period, the European Commission issues annually calls for proposals and provides funding for projects until the end of 2013. Project proposals have to be submitted to the national contact points in each participating country, designated by the EC as responsible for coordination, programme promotion and project preselection.
- Resulting submissions would be appraised based on following criteria: investments and projects to be targeted, terms and conditions under which they would be financed, ownership and contributions of co-financing partners of the fund, the justification and intended utilization of the ERDF contribution.

Eligible costs are defined accordingly with the operation type:

operation type	Financial aid granted
<u>New operation</u>	
U-tube borehole heat exchanger	10 € per MWh/year
Geothermal Heating network	10 € per MWh/year
<u>Renovation</u>	
One well	5 € per MWh/year
two wells	10 € per MWh/year
<u>Extension of existing geothermal network</u> (sub-stations and connexions to existing network)	10€ per MWh/year

2.2.2 Contact points in France

- **Délégation interministérielle à l'aménagement et à la compétitivité des territoires (Équipe politiques européennes)**
1, avenue Charles Floquet
75007 Paris, France
Tel: +33 1 40 65 12 34
www.diact.gouv.fr
- **Ministère de l'Outre-Mer**
27, rue Oudinot
75007 Paris France
Tel: +33 1 53 69 20 00
www.outre-mer.gouv.fr
- For more information about the ERDF :
http://ec.europa.eu/regional_policy/sources/docoffic/official/regulation/pdf/2007/feder

2.2.3 Examples of projects with ERDF

Over the period of 2000-2006, the **Aquitaine** region benefited from the third important allowance of French areas with 392 million euros of subsidies of ERDF. The application file for these funds can be downloaded on the Aquitaine region website

The **PACA** region benefits also from ERDF within POFEDER framework. Interested industry managers should reply ONLINE to a call for proposals published annually by regional authorities.

<http://www.paca.pref.gouv.fr>

2.3. National level

A pluriannual contract is signed between ADEME and the state to foster investments in renewable energy projects. The contract is under ADEME umbrella and several renewable energy schemes have been defined and implemented, and a general agreement has been reached between State and ADEME on objectives to be met and funds to be raised and employed on the 2007-20013 period.

Corresponding subsidies are subject to certain standards such as a minimum annual EER, a minimum installed heating/cooling capacity. It should be noted that for an industrial project to become eligible for incentives, the geothermal installed capacity should exceed 4 MW no matter what geothermal energy is used (shallow or deep).

Public financial aids amounts are evaluated abiding by EU laws. The rate of aids is defined accordingly with the industry size:

- small industry: 80%
- medium industry: 70%
- big industry: 60%

Financial Incentives are classified according to the type of geothermal energy use. They may refer to heat pumps taking heat from aquifer or heat pumps with borehole heat exchanger

2.3.1 Heat pump with heat from aquifer

A first set of financial incentives is dedicated to Investment Decision Support. They concern feasibility studies for the extension of geothermal heating networks for district heating, connection of new dwellings and new geothermal drillings:

- ADEME contributes to a guarantee fund against the long-term geological risks.
- These heat pump systems benefit from the AQUAPAC insurance policy proposed by ADEME
- ADEME contributions are limited to 50% of maximum eligible costs of the feasibility study. The credit limit is fixed at 300 000 €.

On the other hand, there are incentives dedicated to Initial Investment Costs and granted as subsidies and guarantees:

- An insurance covering the drilling phase, accompanied by a 15 year guarantee on the resource.
- ADEME grants a bonus of € 75 per MWh geothermal/year produced limited to 30% of additional costs with respect to a conventional gas boiler investment costs.

However, these subsidies are subject to some conditions:

- A minimum annual EER of 4 is to be guaranteed for systems taking heat from aquifer.
- An energy counting system should be implemented to evaluate the heating system performances
- Reinjection of geothermal fluid in the aquifer should be applied

2.3.2 Heat pump with Borehole Heat Exchanger

A first set of financial incentives is dedicated to feasibility studies to promote ground source heat pump:

- ADEME contributions are limited to 25% of feasibility study costs.

- ADEME grants a bonus of €100 per MWh geothermal/year produced limited to 30% of additional costs with respect to a conventional gas boiler investment costs.

To become eligible to these funds, a project should fulfill the following conditions:

- A minimum annual EER of 3,7 is to be guaranteed.
- An energy counting system should be implemented to evaluate the heating system performances
- A thermal response test should be carried out to study the thermal behavior of soil and size the geothermal system. ADEME covers up to 50% of the test fees estimated at 8000 €.

Contacts and Information

Further information on incentives schemes and policies can be visited at following websites:
www.ademe.fr

2.4. Other levels: Regional level

On the regional level, incentives granted to industrial geothermal studies and applications can differ substantially from one region to another. Regions can therefore be divided into several groups according to incentives eligibility criteria and amounts.

1. A first set of regions benefits from 70 % contribution to geothermal studies: 35% granted by ADEME and the other 35 % is regional contributions. Contributions granted for investment works are limited to 40% of the maximum eligible costs. Among these regions, we cite **Limousin, Centre, and Lorraine**.
2. **Nord Pas de Calais, Midi-Pyrénées** and **Basse-Normandie** regions benefit from lower financial aids granted to geothermal studies and investment works. Contributions granted for feasibility studies are set at 50% whereas subsidies to investment costs are limited to 15% of total initial investment costs.
3. There are regions where geothermal application in industry and SMEs don't benefit from specific incentives. Financial incentives are approved for renewable energy sources applications based on a case-by-case evaluation. Subsidies are granted to industries or SMEs exemplary heating systems. In this category we find: **Alsace, Aquitaine, Auvergne, PACA** and **Rhône-Alpes regions**.
4. In some regions geothermal applications benefit from subsidies and fiscal incentives on an individual basis only, like in **Franche-Comté** and **Haute-Normandie**. Other regions don't benefit from any incentives. However, campaigns to promote the use of renewables energies including geothermal heat are carried out. This is the case of **Bourgogne, Bretagne, Corse, Languedoc Roussillon, Picardie, Pays de la Loire** and **Poitou-Charentes**.

2.5. Focus on Ile-de-France financial incentives

French low enthalpy geothermal resources (over 50°C), with very favourable geological context, are mainly located in the Paris sedimentary basin. The Ile de France region offers a high potential for heat production using geothermal energy. Therefore, it encloses nowadays more than 40 operational geothermal plants. This region offers the most developed financial scheme promoting geothermal applications that is obliging to have a closer look at Ile de France policies and incentives.

2.5.1 For geothermal district heating

1. There are financial incentives dedicated to Investment Decision Support. They concern feasibility studies for the extension of geothermal heating networks for district heating, connection of new dwellings and new geothermal drillings:
 - ADEME contributions are limited to 40% of maximum eligible costs of the feasibility study.
 - The regional council participates to an extent of 40 %.
2. Other incentives are related to Initial Investment Costs and are granted as subsidies and guarantees:
 - An insurance covering the drilling phase, accompanied by a 15 year guarantee on the resource.
 - ADEME grants a bonus of € 250 per tonne of CO₂ emissions avoided.
 - Regional council grants a bonus of € 350 per ton of CO₂ avoided for the connection of new dwellings to existing geothermal heating networks.

2.5.2 For geothermal source heat pump

As mentioned previously, heat pump systems taking heat from aquifer benefit from the AQUAPAC insurance policy proposed by ADEME whereas its contributions are limited to 25% of feasibility study costs. Regarding initial investment costs incurred, regional council grants 30% of initial investment costs whereas ADEME contributes at a limited rate of 20% for exemplary projects.

2.6. Contacts and Information

- 1- To apply for subsidies and funds, you should contact your regional council or regional ADEME bureau. In some regions, general councils may detain detailed information on programmes applicability, updates and eligibility criteria of your region. They could help you in your application process and administrative procedures.
- 2- Further information on incentives schemes and policies can be visited at following websites:
 - ° www.ademe.fr
 - ° Corresponding regional websites, for instance : www.cr-lorraine.fr
 - ° Other interesting websites :
 - i. <http://www.geothermie-perspectives.fr/>
 - ii. www.iledefrance.fr/uploads/tx_base/CR_37-08.pdf
 - iii. http://www.geothermie-perspectives.fr/pdf/Plaquette-Aqua-10.05_.pdf
 - iv. www.geothermie-perspectives.fr/18-regions/pdf/Aides_ADEME_Region_version_de_juin_2007.pdf

3. NATIONAL LEVEL: GERMANY

3.1. Introduction

Financial support for renewable energy use and energy efficiency has a long tradition in Germany. There have been different ways of financial support in the past:

- Direct investment support (direct payments)
- Investment support through low-interest loans and guarantees
- Support through tax reductions
- Support through fixed feed-in tariffs (for electric power production only)
- Accompanying measures like R&D-support, information, promotion, etc.

Most of these programs were aimed at private home owners or similar, and the industry typically was excluded. This was also a result of rules for trade and competition at the EU level, requiring notification and ratification processes with the EU authorities for any financial support scheme in the commercial sector.

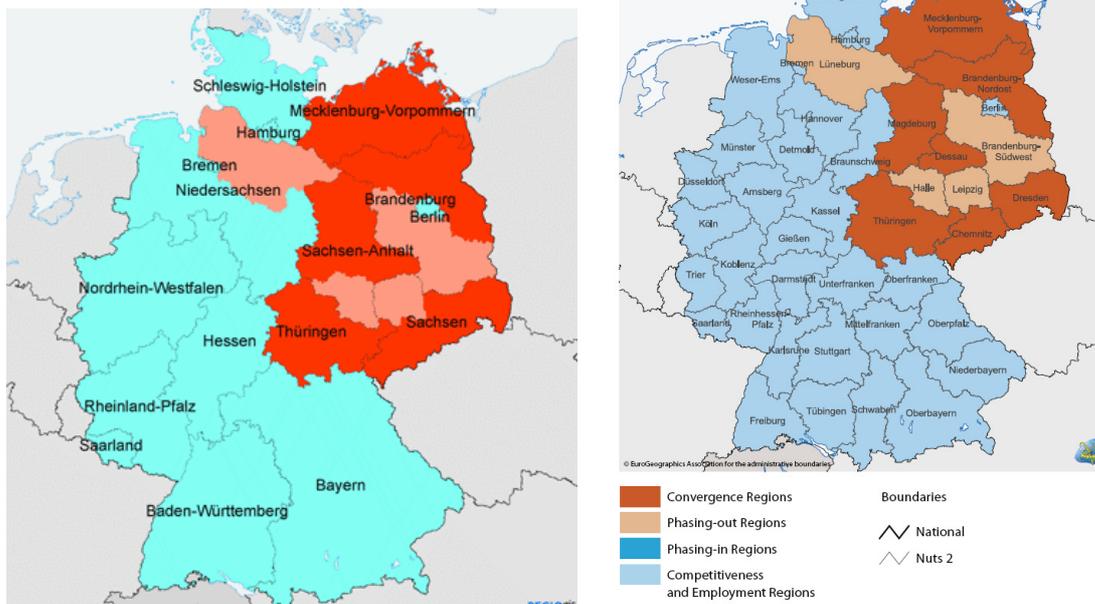
A comprehensive collection and evaluation of financial incentive schemes for renewable energies for heating has been carried out as “Key Issue 4” in IEE-Project “K4RES-H”. The relevant report for geothermal energy is available for download from the K4RES-H website (see “Projects” under www.erec.org). K4RES-H has also established some success criteria for financial incentive schemes (reliable and continuing, enough budget to cover a majority of applications, easy application and transparent selection); alas, not all of these criteria are fulfilled in the existing German schemes.

3.2. How to apply to the EU – National – Regional Funds

The European Union, through its National Strategic References Frameworks, set out investment priorities for regional and sectoral programmes to be supported by the EU over the period 2007-2013. These strategies and programmes have been developed in partnership between the Commission and national, regional and local authorities. EU Structural Funds were created to help regions within the EU whose development is lagging behind.

Due to the different history of West and East Germany, the country is divided in relation to the objectives of the regional funds. The stronger support (convergence objective) is mainly available for the Eastern states, while the more general competitiveness and employment objective is available for the rest (see map below). Some of the Eastern regions meanwhile are in the status of phasing out from the convergence objective, with subsequent changing of the support possible,

The **European Regional Development Funds** (ERDF, or *EFRE in German*) are of interest for the application of geothermal energy in the German industry; in particular in regions rated eligible for convergence objective, support for industrial infrastructure can be granted. For the whole period of 2007-2013, the ERDF contains a total of 16108 Mio €. Of that sum, 11361,1 Mio € are reserved for the convergence objective regions, and 4746,9 Mio € for the rest of Germany. About 3 % of the total sum (ca. 483 Mio €) have been directly earmarked for energy.



Maps showing status eligible for Convergence Objective (red) and Competitiveness and Employment Objective (blue), based on states (Bundesländer, left) and regions (right) (source: EC DG Regio)

The management of the ERDF is done by the German states (Bundesländer), under coordination of the Federal Ministry of Economics and Technology. Applications for support from the funds thus can be somewhat different in the individual states. Links to the relevant state websites are given below:

- Baden-Württemberg www.rwb-efre.baden-wuerttemberg.de/
- Bayern (Bavaria) www.stmwivt.bayern.de/EFRE/
- Berlin www.berlin.de/sen/strukturfonds/zentrale_startseiten/index.html
- Brandenburg www.wirtschaft.brandenburg.de/sixcms/detail.php?id=124317&_siteid=62
- Bremen www.efre-bremen.de/index.php?id=2&languageid=1
- Hamburg www.hamburg.de/efre
- Hessen www.efre-hessen.de/
- Mecklenburg-Vorp. www.europa-mv.de/fonds/europaeischeFonds.htm
- Niedersachsen www.niedersachsen.de/master/C434028_N403313_L20_D0_I198.html
- Nordrhein-Westfalen www.ziel2-nrw.de/docs/website/2007/home/index.html
- Rheinland-Pfalz www.mwvlw.rlp.de/ => Europa => EFRE
- Saarland www.saarland.de/strukturfondsfoerderung.htm
- Sachsen www.smwa.sachsen.de/de/Foerderung/Strukturfonds_in_Sachsen/119002.html
- Sachsen-Anhalt www.sachsen-anhalt.de/LPSA/index.php?id=4846
- Schleswig-Holstein www.schleswig-holstein.de/MWV/DE/Wirtschaft/Wirtschaftsfoerderung/EUFoerderungSH/EFRE/efre.html
- Thüringen <http://www.thueringen.de/de/tmwta/strukturfonds/aktuell/>

- EU Regional Funds contact point in Germany :

The Federal Ministry of Economics and Technology

Referat E A 4 'Koordinierung EU-Kohäsions- und Strukturpolitik, Transeuropäische Netze'

Scharnhorststr. 34-37

10115 Berlin

Tel. 030 18 615 0

Tel. 030 18 615 7010

www.bmwi.de/BMWi/Navigation/Europa/eu-strukturpolitik.html

3.3. National level

There are two financial support tools available for geothermal energy on the national (i.e. federal) level in Germany:

3.3.1 "Marktanreizprogramm"

On the federal level in Germany, the "Marktanreizprogramm Erneuerbare Energien 2008" (Market stimulation program renewable energies, MAP) is the main tool. Beside solar and biomass it covers heat pumps, including geothermal heat pumps (GSHP). Until August 2008 applications from commercial/industrial companies could not be considered, however, after approval by the European Commission, these entities now are also eligible for support from that program.

The support for GSHP has the following form:

- in new buildings, 10 €/m² of used building area, up to 2000 €
- in refurbishment, 20 €/m² of used building area, up to 3000 €
- the maximum amount in non-residential buildings is 10% and 15%, respectively, of the total investment cost of the GSHP.

The maximum amounts (2000 € in new buildings) show clearly that this is a program destined for the private home owner primarily. In the commercial sector, a support of 2000 € would hardly make a difference in the economic considerations, and so this program is only suitable for rather small geothermal projects.

- The relevant contact for the MAP is

Bundesamt für Wirtschaft und Ausfuhrkontrolle

Referate 433/434/435

Frankfurter Straße 29 – 35

65760 Eschborn

Tel.: 06196 908-625

http://www.bafa.de/bafa/de/energie/erneuerbare_energien/waermepumpen/index.html

3.3.2 "KfW-Förderprogramm"

For deep geothermal energy, support for private commercial companies can be achieved through the federally owned German Bank for Reconstruction (KfW). Here the support typically is provided through loans with the following conditions:

- Application has to be routed through the bank the applicant does business with ("house bank")
- Loan can cover up to 100 % of geothermal energy investment, up to 10 Mio €

- Duration up to 20 years, first 3 years no repayment
- 96 % of the loan are paid to the applicant
- The interest rate currently is 3,45 - 6,30 %, after risk analysis of “house bank”; may change

A support to the repayment of the loan can be applied for. It is in form of a grant that is directly lowering the loan amount:

- for thermal use: 200 €/kW, up to 2 Mio. €
- for supporting drilling cost 375-750 €/m, depending on depth
- for covering geological risk (i.e. temperature and yield of well), upon negotiation

➤ The relevant contact for the KfW Program is:

KfW

Palmengartenstraße 5-9
60325 Frankfurt am Main
Tel.: 069 74 31-0
Fax: 069 74 31-28 88
Hotline: 0180 1 33 55 77
www.kfw-foerderbank.de

3.4. Regional level – Bundesländer (states)

Currently only one of the German states, Baden-Württemberg in the Southwest, offers financial incentives specifically for geothermal energy. These are grouped under the “Klimaschutzprogramm” (climate protection program), and cover both deep and shallow geothermal energy (alongside solar and biomass). The program for public institutions and SMEs is based on CO₂-reduction, offering 50 € per ton of CO₂ avoided (up to 200'000 € for deep geothermal and up to 100'000 € for GSHP).

The calculation of avoided CO₂ is done by comparison with a conventional reference installation, in a schematic way, using a table (item 8 in the relevant application form). Specific emission factors for oil, gas, etc. are given in the form.

For industrial applicants, the size of the company is also relevant and has to be given:

- Smallest enterprise (*Kleinstunternehmen*): annual turnover below 2 Mio. € and less than 10 employees
- Small enterprise (*Kleinunternehmen*): annual turnover below 10 Mio. € and less than 50 employees
- Medium enterprise (*Mittleres Unternehmen*): annual turnover below 50 Mio. € and less than 250 employees

The aforementioned program is financed in part by the ERDF (see chapter 1.3.2).

➤ The relevant contact for the “Klimaschutzprogramm” is:

KEA - Klimaschutz- und Energieagentur Baden-Württemberg GmbH

Kaiserstr. 94a
76133 Karlsruhe
Tel. 0721 98471-0
www.um.baden-wuerttemberg.de/servlet/is/37809/

3.5. Summary for Germany

While the support through MAP is only for shallow geothermal (Ground Source Heat Pumps), and with the maximum amounts clearly intended for the residential sector or some

small commercial applications, the KfW-scheme is available for deep geothermal only (>400 m depth). The KfW-scheme in general is a good option for large industrial investments; however, a tool for support of large shallow geothermal systems is missing in the current German support schemes.

The state scheme in Baden-Wuerttemberg offers good conditions for both deep and shallow geothermal. It is limited to public bodies and SMEs, so large industry is not eligible. Other states do not have programs currently (there have been some in the past).

4. NATIONAL LEVEL: SWEDEN

4.1. Introduction

On the national level, renewable energy policy is formulated by the Ministry of Enterprise, Energy and Communications (Näringsdepartementet) and implemented through the Swedish Energy Agency (Energimyndigheten).

The Energy Agency supports research, development and implementation of renewable energy in several ways, including financial incentives and direct funding of local and regional projects, concerning for example bio fuel, wind power and solar energy.

The Swedish Energy Agency has not yet even identified geothermal energy as a renewable energy source (årsredovisning 2007,

<http://www.swedishenergyagency.se/web/bibshop.nsf/frameset.main?ReadForm&Doc=2009>).

Despite this rather parsimonious attitude, there are however, some possible funding opportunities available to Swedish industries.

This deliverable of the IGEIA project (www.saunier-associes.com/igeia) summarizes the different funds and other financial subsidies available to Swedish industries to finance installation of geothermal systems.

It gives furthermore some tangible advice on how to find relevant information about the different available funding opportunities.

4.2. How to apply to the EU – National – Regional Funds

The best opportunity for Swedish industries to get access to EU-funding for geothermal projects is to apply to the *direct* funds of the Seventh Framework Programme (FP7) or the Competitiveness and Innovation Framework Programme (CIP), see chapter 1.

The European Union, through its National Strategic References Frameworks (NSFR), set out investment priorities for regional and sectoral programmes to be supported by the EU over the period 2007-2013. These strategies and programmes have been developed in partnership between the Commission and national, regional and local authorities. EU Structural Funds were created to help regions within the EU whose development is lagging behind. They consist of four individual funds supporting different aspects of regional development. Of these *indirect* funds, only the **European Regional Development Fund – ERDF** is of interest for the application of geothermal energy in the Swedish industry.

In Sweden the programmes financed by ERDF are managed by NUTEK - the Swedish Agency for Economic and Regional Growth (Verket för näringslivsutveckling).

The administration of the fund is broken down geographically in eight regional offices, each with its own operational programme, see table 1.

Table 2.1 Swedish regions for administration of the structural funds

Region	Funding (ERDF) 2007 – 2013, M€
Skåne-Blekinge	70,7
Småland och Öarna	67,4
Västsverige	63,6
Östra Mellansverige	81
Stockholm	37,6
Norra Mellansverige	195
Mellersta Norrland	176,6
Övre Norrland	242,6



Figure 2.1 Map showing the 8 regions (from the NUTEK homepage)

The operational programmes in the regions have slightly different fields of priority, but none of them contain any activity directly aimed towards geothermal energy. There are, however, several activities within the fields of innovation and renewal, or energy and sustainable development where it might be profitable to apply for funds.

Up to now (Dec 2008), there is only one example in Sweden of a project in the field of geothermal energy that has been granted subsidies from the ERDF. It is a feasibility study regarding the prerequisites for a centre for applied science in the field of renewable and sustainable geothermal energy, see <http://www.nutek.se/sb/d/1330/a/8475/>.

A basic requirement for all projects within these programmes is public co-financing. The proportion of this co-financing differs between the regions. For example, the demand of public co-financing is 50 % in the Skåne-Blekinge region.

Contacts in Sweden

Swedish Authority with overall responsibility for the ERDF policy 2007-2013:

Ministry of Enterprise, Energy and Communications

Jakobsgatan 26,

SE-103 33 Stockholm

Sweden

Tel. +46 8 405 10 00

<http://www.regeringen.se/sb/d/1470>

NUTEK Head Office:

NUTEK

Box 4044

102 61 Stockholm

+46 8 681 91 00

nutek@nutek.se

<http://www.nutek.se/sb/d/103>

NUTEK Joint Unit for Regional Structural Fund programmes:

NUTEK

Fyrvallavägen 1

831 43 ÖSTERSUND

strukturfondsenheten@nutek.se

NUTEK Regional Offices (homepages):

Skåne-Blekinge: <http://www.nutek.se/sb/d/1025>

Småland och Öarna: <http://www.nutek.se/sb/d/1024>

Västsverige: <http://www.nutek.se/sb/d/1023>

Östra Mellansverige: <http://www.nutek.se/sb/d/1021>

Stockholm: <http://www.nutek.se/sb/d/1022>

Norra Mellansverige: <http://www.nutek.se/sb/d/1020>

Mellersta Norrland: <http://www.nutek.se/sb/d/1019>

Övre Norrland: <http://www.nutek.se/sb/d/1018>

4.3. National level

4.3.1 Swedish Environmental Protection Agency (Naturvårdsverket)

Until recently the best opportunity to receive subsidies for implementation of geothermal systems was within the Climate Investment Programme (KLIMP, klimatinvesteringsprogrammet), running in 2003-2008. The programme was administrated by the Swedish Environmental Protection Agency (Naturvårdsverket), but has now expired.

4.3.2 Swedish Energy Agency (Energimyndigheten)

The Swedish Energy Agency has a variety of funds, subsidies and programmes for conversion to renewable and sustainable energy sources. Unfortunately none of them aim directly towards the field of geothermal energy.

However the subsidies for *conversion from direct electric heating in apartment blocks* could be applicable to geothermal systems.

Perhaps also the subsidies for *installation of solar heating in commercial buildings and apartment blocks* could be of interest if combined with a system for storage of solar energy into groundwater or bedrock.

The *electricity certificate system* is a market based system to support the expansion of electricity production in Sweden from renewable energy sources and peat. This system could theoretically be of interest, but since the geothermal gradient in Sweden is too low to support electricity production in geothermal plants, it should be considered highly hypothetical.

Contact (the Swedish Energy Administration):

Energimyndigheten

Kungsgatan 43
Box 310
631 04 Eskilstuna
+46 16 544 2000

<http://www.energimyndigheten.se/>

4.3.3 Swedish Agency for Economic and Regional Growth (NUTEK, Verket för näringslivsutveckling).

NUTEK has several national programmes for grants and subsidies aimed towards industries and enterprises.

One of the most interesting is the *Demo Environment Programme*. This programme is managed in cooperation with SWENTEC (Swedish Environmental Technology Council) and is commissioned by the Swedish International Development Cooperation Agency (SIDA, styrelsen för internationellt utvecklingsarbete). The objective of the programme is to support environmental technology efforts to achieve sustainable urban development and renewable energy and it is directly aimed towards small and medium sized companies (SME's). To receive funding in this programme, it is imperative to have a third world partner.

NUTEK has furthermore some interesting programmes under the heading **Profitable Environmental Work**, for example the new *Programme for Growth and Environment*. It is not known if any geothermal project has been granted yet, but it is estimated that the future possibilities for funding are promising within these programmes.

For contact with NUTEK, see above.

4.4. Regional (and local) level

Since the above mentioned programmes in the European Regional Development Fund are co-financed (50 %) by the authorities, the separate development programmes and funds are scarce on the regional and local levels. In general it can be said that the regional programme funding are limited. All regions have not been studied in detail, but in the southernmost region of Sweden, *Skåne*, there are no programmes at all aimed towards geothermal projects.

Instead the regional work is more focused on counselling and network-building. The region of Skåne, has for example an excellent homepage with a hands on guide to the different funds in the EU (see figure 2.1).



Figure 2.1 The region of Skåne homepage, guide to the EU programmes
<http://www.skane.se/default.aspx?id=197748>

Skåne Energy Agency (Skånes energikontor)

The Skåne Energy Agency is a unit within the The Skåne County Association of Local Authorities. Its objective is to promote more effective energy use and increased use of renewable energy sources in the region. The Skåne Energy Agency provides counselling, but has no separate funding.

Contact (The Skåne Energy Agency)

Energikontoret Skåne
 Nordenskiöldsgatan 17
 211 19 Malmö
 +46 46-71 99 54
 info(at)ek-skane.se
<http://www.ek-skane.se/>

5. NATIONAL LEVEL: ESTONIA

5.1. Introduction

The main document presenting major issues of Estonia's energy policy is the second *National Long-term Development Plan for the Fuel and Energy Sector until 2015* which was approved by the Riigikogu (Estonia's Parliament) in December 2004. The Plan defines the current situation in the sector, presents issues set out in the EU accession treaty, prognoses developments of the energy consumption, sets the strategic development objectives for the energy sector, as well as the development principles and the extent of the necessary investments. The document is accompanied with the assessment of the strategic environmental impact of development scenarios proposed in the Plan.

The strategic objectives of the Estonian fuel and energy sector presented in the Plan include the following targets:

- ensure that by 2010 the share of renewable electricity will be 5.1 per cent of the gross consumption;
- ensure that the share of renewable energy sources in primary energy supply will be 13-15% by 2010 (being 10.2% in 2000);
- ensure that by 2020 the share of electricity produced in combined heat and power production stations will be 20% of the gross consumption;
- ensure compliance with the environmental requirements established by the state;
- increase the efficiency in the heat, energy and fuel sector;
- until 2010, maintain the volume of primary energy consumption at the level of the year 2003.

The improvement of energy efficiency can be considered as a goal of increasing priority for the Government. In 2007 a new *National Energy Efficiency Programme for 2007-2013* was adopted, through which investments will be made in energy efficiency, relevant information will be made more widely available and consumers will be informed about the opportunities to conserve energy. The Programme is one of the documents prepared for implementation of the *National Long-term Development Plan for the Fuel and Energy Sector until 2015*. The Energy Efficiency Programme determines areas that need to be prioritised in order to meet fuel and energy saving goals. The Programme also sets strategic aims and objectives for priority areas, as well as measures for achieving these objectives. It also takes into account the task of achieving the indicative energy conservation objective set by the Directive 2006/32/EC, i.e. saving of 9% of final energy consumption during the period of 2008-2016.

The main objectives of the Programme are:

- dissemination of energy efficiency information;
- availability of skills and experts;
- increasing efficiency in the consumption, production and transfer of fuels and energy;
- performing tasks arising from the EU energy efficiency policy.

In the Programme it is estimated that for investments aimed at increasing efficiency in the fields of consumption, production and transfer of fuels and energy a total of 1.5 billion EEK (96.0 mio EUR) is needed during the period up to 2013.

The deployment of renewable energy sources is positively affected by the national obligation to reduce the emission of greenhouse gases. Estonia's second National Allocation Plan (NAP2) for the EU Emission Trading Scheme (EU ETS) for years 2008–2012 included 47 installations. The plan adopted by the Government of Estonia comprises 122.8 million allowances (24.6 mio per year). In May 2007 the European Commission endorsed Estonia's national plan on condition that certain changes are made, including an essential reduction in the total number of emission allowances applied for. The cleared annual allocation is 12.7 million tons of CO₂ allowances, i.e. 47.8% less than Estonia had applied for. Based on the decision of the EC the NAP 2 has been enforced by the Government on 20 December 2007. Nevertheless, the legal action has been initiated in the European Court of Justice against the EC over its decision to reduce substantially the CO₂ emission gap under the phase 2 of the

EU ETS. Nevertheless, all enterprises included in the EU ETS are interested both in increasing energy efficiency as well as in wider use of renewable energy sources.

Development of environment benign technologies has been defined as one of the priority areas for the *Estonian Research and Development and Innovation Strategy for 2007-2013*. In connection with this, the *National Energy Technologies Programme* has been prepared in 2007. The programme is directed at promoting the energy sector and making it more efficient. The major part of programme deals with the development of technologies related to renewable energy sources. The programme supports product development, applied studies as well as fundamental studies. For the development of innovative environmental technologies, the funds allocated to Estonia through the EU structural funds will be used.

5.2. How to apply to the EU – National – Regional Funds

For carrying out measures foreseen in national programmes and plans the financing from state budget is combined with international assistance. Regarding financing possibilities, at present the EU funds can be pointed out as the major source. During the period of 2007-2013, EU funds are available for Estonia to a greater extent than earlier. In Estonia, planning of EU structural assistance for years 2007-2013 was performed within the preparations of the general state budgetary strategy. The current *National Strategic Reference Framework 2007-2013* (NSRF) presents the general strategic objectives and priorities for developing the policy areas and sectors that are eligible for EU structural assistance in the years 2007-2013. At the same time, it enabled to plan jointly both the activities co-financed from EU funds and the activities financed solely from Estonian own budgetary funds.

Joint planning and coherent implementation raised the effectiveness and efficiency of public sector activities. Planning of structural assistance within the framework of preparing the general state budget strategy also helped to align the structural assistance best with the use of other EU financial instruments and external resources.

Based on the strategy, several operational programmes (OP) were prepared to specify the activities that will be co-financed from EU structural assistance, and the volumes of the respective financing. These OPs are implementation documents of the NSRF in the domain of activities co-financed from EU structural assistance. Energy and environment related issues are included mainly in the *Operational programme for the development of the living environment* (OP 2) which includes the following priority axes:

1. development of water and waste management infrastructure;
2. development of infrastructures and support systems for sustainable use of the environment;
3. development of the energy sector.

The planned volume of total financing in frames of these three priority axes is presented in the following table.

Financing of priority axes 1 – 3

Priority axes	Fund	Total financing, mio EUR	incl. EU contribution, mio EUR
1. Development of water and waste management	CF	736.86	626.33
2. Development of infrastructures and support systems for sustainable use of the environment	ERDF	101.78	92.03
3. Development of the energy sector	ERDF	144.70	87.18

CF – Cohesion Fund; ERDF – European Regional Development Fund

Government of the Republic appoints 1st level Intermediate Bodies and 2nd level Intermediate Bodies of structural assistance in frames of OPs. 1st level Intermediate Bodies are generally ministries that are also responsible for the achievement of objectives set in the OPs and the establishment of relevant conditions (including the preparation of field-specific legislation). The task of 2nd level Intermediate Bodies is in general to perform first level

activities related to the use of assistance. Thus, the 1st level Intermediate Bodies and 2nd level Intermediate Bodies are direct implementers of the OPs and there-by the NSRF.

Intermediate bodies for priority axes 1 – 3

Priority axes	Intermediate bodies	
	1 st level	2 nd level
1. Development of water and waste management	Ministry of Environment;	Environmental Investment Centre
2. Development of infrastructures and support systems for sustainable use of the environment	Ministry of Environment; Ministry of the Interior	Environmental Investment Centre
3. Development of the energy sector	Ministry of Environment; Ministry of Economic Affairs and Communication	Environmental Investment Centre; SA KredEx

All potential investors who plan to apply for assistance from the structural funds have to know the legal basis of the system. The legal framework is provided in the 2007-2013 Structural Assistance Act that was passed by the Parliament in December 2006. The Act stipulates the bases of and procedure for the grant, use, reclamation and repayment of structural assistance, and the bases for supervision over the grant and use of structural assistance and the procedure for challenge proceedings.

In January 2007 the Government approved the NSFR and operational programmes which were submitted to the European Commission in order to commence official negotiations with the Commission over the said documents. The NSRF and operational programmes entered into force after approval by the Commission which for the living environment OP took place on 9 October 2007.

The overall planning of the EU's structural funds 2007-2013 is coordinated by the Ministry of Finance in Estonia (thereby the Ministry will be responsible for preparation of the NSRF) and all the relevant ministries and the State Chancellery participate therein based on their areas of activity.

The potential investors have to follow official instructions issued by the first level intermediate bodies, i.e. relevant ministries. Up to now, regarding the priority axes described above, there is issued one only secondary level legal act regulating the procedures of applying and implementation. The only act is the regulation (no. 8 of 13 March 2008) of the Minister of Environment for one measure (*Development of the water management infrastructure*) of the priority axis *Development of water and waste management*.

By now, there are not yet any legal acts issued for regulating the assistance in frames of other measures and other priority axes described above. Therefore, the potential investors who are interested in using structural assistance have to wait for relevant legislation to be issued.

5.3. National level

In Estonia special attention has been paid to the promotion of renewable energy sources for electricity generation. The obligation for electricity network enterprises to purchase renewable based electricity was introduced by the amendment to the *Energy Act* (enforced in 1998). The obligation was continued with the provisions of the new *Electricity Market Act* (enforced in 2003). Later several amendments have been made to enhance the purchase obligation. The amendment to the Act enforced since 1 May 2007 rearranged the incentives for generation of electricity from renewable sources – a producer has the right to sell electricity as fixed supply to a seller designated by the transmission network operator or to receive relevant support from the distribution network operator for the renewable based electricity supplied and sold to the network. Up to 1 May 2007 only the purchase obligation was in use the feed-in tariff being 0.81 EEK/kWh (51.77 EUR/MWh). The new tariff rate related to purchase obligation is 115 EEK/kWh (73.50 EUR/MWh), the support being 0.81 EEK/kWh (51.77 EUR/MWh). A producer cannot receive support for electricity which is sold by applying the purchase obligation. The incentives are in force during first 12 years since commencing the generation.

6. NATIONAL LEVEL: PORTUGAL

6.1. How to apply to the EU – National – Regional Funds

For the 2007-13 programming period, Portugal has been allocated €21.5 billion (current prices) of Structural Fund and Cohesion Fund financing under the Convergence, Regional Competitiveness and Employment, and European Territorial Cooperation objectives. Energy

In the perspective of environmental protection, renewable energy projects will be benefiting of approximately 20% of these allocations through the ERDF. For information concerning the share of geothermal applications, one can contact:

Contact point

Portuguese authority with overall responsibility for Cohesion policy 2007-13:
Ministério do Ambiente, do Ordenamento do Território e do Desenvolvimento Regional
(Ministry for Environment, Spatial Land Planning and Regional Development)

R. de „O Século“, 51
P-1200-433 Lisboa
Portugal

Tel: +351 213 232 500

Fax: +351 213 232 531

Email: relacoes_publicas@sg.maotdr.gov.pt

<http://www.maotdr.gov.pt/CmsPAge.aspx?PageIndex=21>

6.2. National level

In Portugal, financial incentives promoting the use of renewable energy sources in industry are rather scarce. Geothermal low enthalpy applications don't benefit from special incentives, but are rather treated as other renewable energy sources applications.

To benefit from this help, applicants should reply ONLINE to a call for proposals published annually by the Executive Agency for Competitiveness and Innovation.

Currently, the only way to obtain financial aid is by submitting a project proposal to the National Strategic Reference Board (QREN – Quadro de Referência Estratégico Nacional).

This Board has defined 3 frameworks for investments in industry: Incentive Systems to Investment in Industries: Incentive System to Investigation and Technological Development (SI I&DT), Incentive System to Qualification and Internationalization of SME (SI Qualificação PME) and Incentive System to Innovation (SI Inovação).

In the Incentive System to Investigation and Technological Development (SI I&DT) framework, funds are granted to industries and enterprises either to develop new products and processes, or to improve existing ones.

Systems using renewable energy sources correspond to these selection criteria and are therefore eligible for financial incentives.

SI Qualificação PME (The Incentive System to Qualification and Internationalization of SME) aims at strengthening the competitiveness and productivity of companies participating in global markets and promoting sustainable development in enterprise activities.

One of the program lines of action is dedicated to energy diversification and energy efficiency.

The Incentive System to Innovation (SI Inovação) seeks to promote innovation in industrial sector: products, goods and processes production. This Incentive System supports projects of innovation related to the installation of energetic systems and the implementation of novel energy production processes using renewable energy sources.

All of the presented Incentives frameworks are subject to regulations and open competitions in specific dates. All information concerning call for proposals are available at www.incentivos.qren.pt

Contacts and Information

Government - Energy and Geology Department (DGEG - Direcção geral da energia e geologia) - <http://www.dgge.pt/>

Government - Economy and Innovation Department (Ministérios da economia e inovação) - <http://www.portugal.gov.pt/Portal/PT>

Portuguese Energy Agency (ADENE – agencia para a energia) – <http://www.adene.pt/ADENE.Portal>

Renewable Energies Site (Portal das energias renováveis) - <http://www.energiasrenovaveis.com/>