INTERNATIONAL FINANCING OF GEOTHERMAL PROJECTS

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ABSTRACT

In this presentation the various forms of international financing available in the context of energy projects, in particular renewable energy developments in the Central and Eastern European Countries (CEEC) are touched upon from the viewpoint of an energy consultant with long experience in foreign energy projects.

Contact details are given and Internet locations where more information about project financing may be found. It must be stressed that only you mere outlines are presented - this is a complicated area and the author not a financial expert.

It is also endeavoured to outline the financial arrangements that are gaining preponderance in the financing of large energy projects on the international arena, the financial terms and conditions commonly applicable in international financing, the upper limit of financing and the project criteria that International Financing Institutions (IFI) require are met.

In the case of the Vth Framework Programmes, an outline of the procedures, the "does" and the "don'ts" are moreover detailed. Third investor financing using such schemes as BOT "Build operate transfer" and BOO "Build own operate" is also featured.

1. TYPES OF INTERNATIONAL FINANCING

There are five basic types of international financing available to the energy sector. All except perhaps the last mentioned carry specific conditions other than the strictly commercial ones.

These are:

- Grants
- Special purpose funds
- Soft type loans
- Export import loans
- Commercial loans

In the following it will be endeavoured to outline the specifics of these that are found to be most important.

1.1 Grants

It is possible to obtain partial financing of definitive, well-defined and feasible geothermal development projects in the form of a grant from EU funds provided such a project unequivocally falls under an appropriate key-action specification set by the European Commission. These partial (<40%) funds are available from the Vth Framework Programme (5FP) and other independent EU programmes such as the ALTENER II, SAVE II, CRAFT and run by the EC's DG XVII and the INCO-Copernicus one run by DG XII.

The 5FP programmes applicable in the case of geothermal energy are the SYNERGY (international projects) and ENERGY (Thermie) programmes.

All these programmes have the same principal objectives though they may differ in emphasis, namely:

> *Enhance the quality of life of the citizens of the European Union (the rest of Europe and the World) through an improved environment and more employment. This objective the EC hopes to attain via the 5FP's four pronged activity groups or "key actions" one of which is "Energy and the Environment".*

In addition, the EU operates the other above-mentioned funds, i.e. via the INCO, CRAFT, SAVE and ALTENER programmes.

- INCO emphasises SME participation and co-operation with NIS, CEECs being considered for entrance to the EC, i.e. the so-called accession countries (AC) and the developing countries of the World.

- SAVE emphasises enhanced energy efficiency measures, renewable energy development and the setting up of National Energy Centres, etc.
- ALTENER is non-technical and emphasises training, dissemination and information networking.
- CRAFT is solely intended for SME projects and the effort to help them realise innovative ideas and make them marketable.

All the EU programmes favour active project participation by small to medium sized enterprises (SMEs). The European Union has adopted the following criteria in defining what constitutes an SME:

- Number of employees less than 250
- Annual turnover less than 40.000.000 Euro
- O/a annual budget less than 27.000.000 Euro
- Independence criteria for an SME are that a large company ownership in the entity may not exceed 25%.
- Must not be a research centre or institute or a consulting company.

For further information visit the Internet site http://www.cordis.lu/sme/src/glossary.htm

1.2 Special Purpose Loans

There are a number of possibilities of obtaining partial financing of geothermal energy projects from special purpose financing sources such as the Nordic Environment Finance Corporation (NEFCO), the United Nations Development Programme's Global Environmental Fund (UNDP-GEF) and the various Nordic Development Co-operation Funds (here called Nordic aid), e.g. Sida, Danida, Icida etc.

NEFCO: Participates as a risk capital financier in environmental investment projects, particularly in Central and East European countries with positive effects also for the Nordic region. Projects should be both ecologically and economically sound, i.e. viable investment projects with a positive environmental effect (equity investments 25-35% of total - min 125.000 Euro - max. 3 million Euro per project).

UNDP-GEF: With the WB the UNDP-GEF helps countries to translate global concerns into national action in fighting ozone depletion, global warming, and loss of biodiversity, and pollution of international waters. It provides grants (Small Grants Programme - max. grants up to US$ 50.000) and concessional loans fund agreed incremental costs associated with above 4 focal points.

NORDIC AID: The Nordic Development Co-operation Programmes award bilaterally grants and/or concessional financing for the incremental costs associated with environmental projects. The projects should be environmentally sound and economically viable and be of significant Nordic interest.

1.3 Soft Loans

Soft type loans are available from several International Financing Institutions. I am going to confine my remarks to the ones most applicable to the CEEC/NIS area, which are the Nordic Development Fund (NDF) and the World Bank's International Development Fund (WB-IDA). In both cases only partial financing (<40% of the total) is available.

Co-financing, joint financing, bilateral parallel financing, project financing and syndicate type of financing arrangement is therefore necessary for a given project, depending upon the size of project and wishes of the applicant. An illustrative capitalisation scheme:

- NDF 30%
- Foreign sponsor equity (NEFCO/other) 25%
- Local sponsor 15%
- Syndicated loan (NIB/EBRD/EIB) 25%
- Others 5%

In all cases the project would have to fulfil the specific IFI conditions imposed such as those of technical and economic feasibility, socio-economic and environmental significance, etc.

Typical soft loan terms are:

- Zero interest but 0,75% service charge
- 5 to 10 year grace period and 25-40 year maturity

1.4 Export Import Loans (EIL)

A significant barrier to the development of geothermal energy is to finance the first project approach, viz. the exploration, reconnaissance and feasibility study phases. The IFIs demand that accredited consulting firms carry these out, which may not be so readily available at the location during the initial phases of geothermal development.

Financing of the exploration phase is very difficult and usually only possible through research co-operation programmes, "payment by result" type donations by consulting companies and bilateral aid negotiated assistance/co-operation. There may, however, be funds available that partially finance reconnaissance and feasibility investigations depending upon project and locality specifics. These are available from the Nordic Export Fund (NoPEF), the European Bank of Reconstruction and Development (EBRD), the European Investment Bank (EIB) and the WB-IDA and possibly other local specific sources.

This type of funding is always partial (normally <50%) and generally awarded only to the consulting company carrying out the work on the condition that either the company itself or the recipient country (entity) guarantees the remainder.

The funding is typically all risk funding repayable on reasonable terms if the specified project gets implemented within a given timeframe (5-10 years) after completion of the pre-development study. Otherwise the EIL is written off as a grant to the consulting company that received the loan in the first place.

1.5 Commercial Loans

Commercial loans are normally confined to financing largish energy projects because of the inherent high cost. Such loans may, however, be available from the major financing institutions EIB, NIB, EBRD and the WB at competitive international lending rates, grace periods and maturity periods for financing renewable energy projects such as geothermal energy ones. The terms available vary from project to project depending upon project size, aims and the structure of the capitalisation scenario proposed.

To ensure favourable financial terms and conditions, the projects will have to satisfy the conditions set forth in my next slide. The financing institutions all have high international credit ratings and can therefore through inter-banking borrowing and other financial manoeuvring ensure rents and other conditions favourable to the borrower.

2. COMMON IFI REQUIREMENTS

International Financing Institutions (IFIs) set certain criteria for projects that they offer favourable financing for. Loan applications must be properly reinforced by documentation that is drawn up by accredited consulting companies and drawn up in a certain approved manner. They must contain the following:

2.1 Soft financing

- The project documentation must give clearly defined objectives that reflect the objectives of the IFI as regards, for instance, environmental issues, social and economic significance.
- Project must be discrete and well defined.
- Must show demonstrable social benefits such as more employment and leave behind enhanced know how in the recipient country. SME participation in the project is a decisive plus.
- Expected environmental benefits must be detailed and shown to be significant.
- Must be backed up by a study showing the proposed project to be technically feasible and to have good/fair economic viability.
- A credible project cash flow schedule.
- Up to 50% of needed services and goods purchased from a specified country conditional upon limited bidding.
- Replication potential must be significant.

2.2 Grants/EILs

- All the above except marginal/low viability without grant.

- As much as 50% of needed services and goods must be purchased fron the donor country.
- SME participation.

2.3 Commercial loans

- Same as above in order to gain preferential terms. Requires moreover special emphasis on good economic viability backed by a thorough feasibility study, comprehensive risk analysis and a credible project cash flow schedule.

3. PRE-FINANCING ISSUES

The bureaucratic processes involved in obtaining international financing for energy projects are quite complex and lengthy. To accelerate this process, introduce the project to the financing institutions that you intend to solicit for financing and entities sought as partners, at the earliest possible stage (even before completion of feasibility study) with well prepared albeit preliminary documentation.

- The documentation must present a clear description of the project, its objectives and main characteristics, and an objective preliminary analysis of the technical and financial risks associated with it.
- Details of preparations underway to obtain the financial guarantees normally requested by the IFI(s) should also be included.
- The documentation should also contain a preliminary summary of all the issues that the feasibility study will address and its status. It is moreover important to feature such issues as the environment, social benefits and potential replication, preliminary o/a costs of the project etc.
- It is furthermore of importance to outline the implementation schedule proposed, detailing participation of local SMEs (if applicable) and other features of possible interest to the IFI(s).
- Details regarding the consulting company that has been engaged to assist the proposer must be given. Prior to selecting a consultant appropriate care should be taken to ascertain that said consulting company meets the approval of the IFI(s).

3.1 Risk analysis

A comprehensive analysis of technical, natural and financial risks associated with the proposed project are a basic requirement for finding partners and financing for it.

Risk features also highly in the cost and potential financial gains that may be expected from a given project. The higher the risk the higher becomes the project cost consequently bringing about lesser return on investment.

It is therefore important already at the earliest stages of a development to chart all possible risk parameters and analyse them with respect to the particular project being planned.

Besides charting potential sources of risk, it is no less important to decide the following key-questions:

- What possible effective countermeasures are there
  - ♦ how effective can they be expected to prove
  - ♦ how much do they cost
- Who of the project partners is best able to carry all or a portion of the risk
  - ♦ is he or they prepared to take the risk
  - ♦ how great is going to be the associated cost to the consortium

In the following subchapters are listed some of the risk parameters that should be borne in mind in the risk mapping and analysis.

3.1.1 Locality specific risks

The locality, for which the energy development is proposed, may pose specific risk factors and affect the relative weight of others. The locality will also have a significant impact upon the countermeasures available and needed for a given development. Locality affects moreover greatly the ability and preparedness of entities to shoulder risks. Bear in mind that all commercial entities

demand return on their investment that is commensurate with the risk they take on whether it be in the form of capital, manufactured goods or services carried out.

Country specific risk factors are for instance:

- Political stability, legalistic and judiciary matters
- National economic and financial situation prevailing and the country's international credit rating
- Environmental constraints specific to the country and the specific project locality within the country
- Public and political attitude to the development of a given energy source (f. Ex. Geothermal) and how it is utilised.

All these and many more may pose a significant barrier to the available financing possibilities and the cost of financing.

3.1.2 Economy specific risks

The economic risk factors are many and varied. Below are listed some of the more obvious ones. The risks are generally of three distinct categories, viz.

a) Related to the financing arrangement available to and/or adapted for the development
   - Loan and grace periods
   - Interest rates and loan servicing charges
   - International currency trends

b) Energy facility operation related
   - Reservoir management parameters such as longevity, sustainable capacity etc.
   - Plant maintenance needs, ease and accessibility of spares

c) Energy market related
   - Tariff policy, energy market stability, competitiveness with other available energy sources
   - Energy purchase contracts – length and renewal terms
   - Market forecasting and understanding of market development

3.1.3 Project specific risks

Some of the risks associated with a project, the resource type and the utilisation senario proposed, are in the case of geothermal energy quite specific to said geothermal field in its own right.

a) Specific to the geothermal resource are such aspects as:
   - Reservoir characteristics
   - Physical and chemical properties of the fluid to be utilised
   - Natural hazards associated with the area and the utilisation, e.g. steam cap formation, subsidence, earthquakes (normally not fluid withdrawal induced or enhanced)

b) Specific to the project owners are factors as:
   - Financial status and credibility of the consortium and each of the partners on his own
   - Technical and operating experience available within the consortium
   - Marketing experience of same

c) Risks specific to completion of project and post-implementation stage:
   - Due cost and/or time overruns
   - Due overestimated or not realised profit margins

d) Risks associated with the technological solutions adopted are chiefly due the use of novel technologies, lack of care in the selection of materials, insufficient attention to scaling and corrosion causes and overambitious automatic control features.

e)

4. ORGANISING AND ARRANGING PROJECT FINANCING

One of the foundations of project financing is draw up for it a credible cash flow schedule that is based upon the time and work schedule, cost estimate and operating schedule envisaged for the project.

a.) The source of financing comprises usually one or more of the following:
b.) Grants or low cost financing such as soft loans and/or all risk loans
c.) Equity (owners) capital
d.) External financing from banks, contractors and/or equipment and materials suppliers

The financing of the project is seldom the same for all phases of the development. To illustrate this I have drawn up the following example of how the financing of each phase of a energy development might be arranged.

a) Project preparatory phase:
- Equity capital, municipal or state funding

b) Project implementation phase:
- Turn-key, BOT (build own operate), BOT (build own transfer)

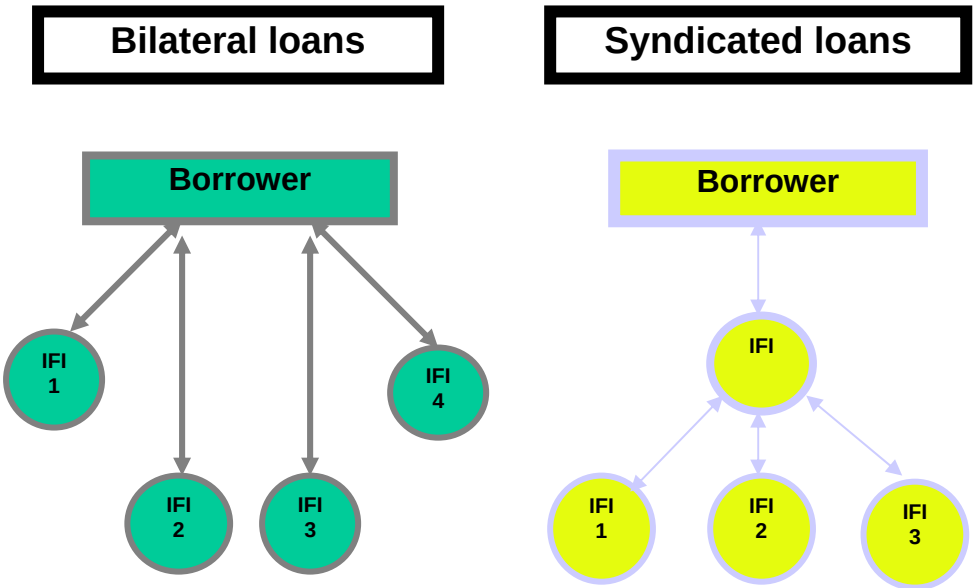
c) Post-implementation or operation phase:
- Equities
- International soft loans
- Local bank loans
- International loans with state guarantees
- Commercial loans

The organisation of such financing is as said before complicated and very time consuming. When such financing is organised, it is important to allow for a tight but facile monitory control mechanism, which should preferably be based upon simple procedures.

This is generally best attained adopting the so called syndicated or project financing arrangement.

It must, however, be clearly understood that such financing arrangements do cost money. They may on the other hand also save more money than corresponds to the added cost, through better project cost control, better lending terms and conditions, by cutting the time needed to draw up necessary documentation and reducing the possibilities of costly errors.

Before adopting such arrangements, however, they must always be carefully considered in the context of the total project cost. The costs associated with organising project financing are not greatly affected by the size of the project. Small project may thus ill afford financing costs that constitute a large portion of the total costs where the effect on the total cost of a large project is insignificant.



The diagrams above show on the one hand typical bilateral financing arrangement and on the other hand a syndicated one.

SYNDICATED LOANS:

a) Organised access to foreign funding
- large amounts of funds available in and processed from one place

b) Flexible financing
- timespan of loan, payback, currency, interests, loan type

c) Simple contracting
- single contract, similar banks, shorter time span

d) Simple loan negotiation
- Less time spent on loan negotiations and controll more efficient

PROJECT FINANCING:

The basic features of the so called project financing arrangement are:

a) Ojective
- Reduce owner's risk
- To finance a clearly defined project and cash flow from start to finish

b) Premisesspecial holding company established around project

c) Lenders decide dept coverage
- interest coverage etc.5.

5. USEFUL CONTACTS/ADDRESSES

The following contact information relating to various financing sources are included here in case they may prove useful. Please bear in mind that the name of the contact persons are likely to have change though the data are relatively recent.

NIB:
Martin Relander, director, CEEC
Internet: www.nib.fi
e-mail: info@nib.fi
Fax: +358 9 1800 210

EBRD:
Alain Pilloux, Director CEEC
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6. OTHER USEFUL INFORMATION

Energy project funding from the EU is solicited by applications in reply to officially issued calls for proposals. The calls for proposals are generally published via the Internet, sent to national contact points (OPET/FEMOPET network) and possibly relevant national ministries.

Application procedures are very strict and at least two entities from the EU (or one from the EU and one from associated states) must propose the project. Project evaluation procedures are also very strict - procedural issues weigh heavily.

All approaches made with the view to obtain financing from Nordic Development Co-operation Programmes (NDCP) must be official through governmental channels, e.g. on a minister-to-minister level.

NDCP financing is always negotiated bilaterally, but the IFI project criteria, already outlined, also apply for this type of financing. Processing of this type of financing may in certain instances takes less time and requires less preparation.

NDCP financing normally requires that much of the specialist work be carried out by donor country entities. It is moreover mandatory that equipment for the project be purchased in the donor country, provided suitable equipment is manufactured there.

6.1 EU Project Finance Contacts

SYNERGY: Is the international co-operation component of the energy portion of the 5FP. It finances international co-operation projects with third countries (max. 100%) that define, formulate and implement energy policy commensurate with the EU's maxim of o/a competitiveness, security of supply and protection of the environment. It also finances industrial co-operation between EU and third countries in the field of energy. Actions supported are:

- Advice and training in energy policy issues
- Analysis and forecasting in energy matters
- Information exchange on energy policy via seminars or conferences
- Support to regional cross-boundary co-operation
- Improvement framework for industrial energy co-operation

Does not fund investment, research, development and demonstration projects.

ENERGY: Is one of two of the sub-programmes under "Energy, environment and sustainable development". Its strategy is to promote energy projects on basis of:

- European added value and subsidiarity principle
- Social objectives
- Economic development and scientific and technological prospects

The programme will be concentrated upon two key actions, i.e. KA5 "Cleaner energy systems including renewables" and KA6 "Economic and efficient energy for a competitive Europe". Synergies with other national and international programmes are foreseen.

ALTENER II: Encourages multi-regional or multinational projects that stimulate the transfer of experience and know-how. Helps promoters to obtain better terms from their suppliers and to take advantage of more efficient financing arrangements such as Third Party Financing. The programme focuses on renewable energy sources that are already viable or approaching viability, such as:

- Biomass - to produce solid, liquid or gaseous biofuels
- Solar energy
- Small-scale hydroelectricity up to 10 MW
- Geothermal energy and Wind power

6.2 Application Procedures for 5FP Proposals

1. A given call for proposals is usually published some three months in advance of its closure date. Call specification and application guidelines are made available at the same time. These must be carefully studied. Get fully familiar with the relevant application procedures.
2. Once a possible niche has been found for the project idea, write a concise project outline - detailed enough to attract the interest of potential partners but no more.
3. Assistance with partner search is available on http://www.cordis.lu, if needed. Partners must be at least two from the EU or one from the EU and the other from associated nations (Iceland, Norway, etc). Number of partners should be kept prudent, not too many not too few. Be careful in choosing partners - significant project contribution (not only monetary) should be guiding light.
4. Decide a detailed work plan for application and select a credible coordinator for both application and project. His/her duty is to co-ordinate the writing of application and ensures that all partners submit each their portion professionally and in good time.
5. In writing the application use short concise and logical sentences. Use graphical illustrations where needed. Remember the EU's key aims and show how your project will fulfil these not with declarations but with examples, calculations and/or results of studies if available. Project should be technically feasible and economically viable if EU financing is achieved, otherwise only marginally so.
6. Submit application/proposal timely and remember letters of intent, CVs etc.

7. 7. FINAL REMARKS

It is clear from the previous comments that to arrange a foreign financing package is both complex and time consuming and often expensive. To side step these complications it is possible

to arrange the so-called “Build Operate Transfer” or “Build Own Operate” financing. Such financing is gaining popularity in the world, particularly in the technically and economically developing areas.

To make such capital investment schemes possible and attractive to foreign investors, the local laws must make inflow and outflow of foreign capital and the energy market conditions attractive for foreign companies, viz.:

- Make possible the transfer of gains
- Provide tax incentives
- Guarantee a market for the produced energy at an economically viable price.

Should existing local laws and regulations not adequately provide for this they might have to be revised and changed to do so.

REFERENCES

1. Sigurdsson, Jón, “Geothermal development in Central and Eastern Europe: Transfer of technology and financial resources”, Proceedings WGC, Florence, Italy, May 1995, pp. 2905-2911.
2. EU Maxi-brochure *“Financing equipment linked to energy”*, ISBN 92-828-5743-3, Office for Official Publications of the European Communities, Luxembourg, 1999, RUE, p. 23.
3. EBRD Guide *“Financing with the EBRD”*, 3215 Financing with the EBRD, (E) – 06/04/98, London March 1998, p. 24.
4. Gudmundsson, Alexander et al *“International Project Financing”* (in Icelandic), Proceedings of Geothermal Association of Iceland Seminar, Reykjavik, Feb 22.2.01.