



**Preliminary evaluation of a Geothermal  
Energy Study Proposal submitted to the  
Icelandic International Development Agency  
by the Government of Ethiopia in 1985**

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## 1. General

The high cost of foreign investment capital, the high cost of energy and a precarious balance of payment situation in many of the developing countries of the world, has in recent years caused a marked increase in the interest shown by the governments of these countries in indigenous sources of energy.

The interest is principally directed towards indigenous energy sources, which can be economically used directly or indirectly for electrical power generation and/or industrial uses. Highest on the priority list are applications, which might replace conventional petroleum, coal or gas driven plant where the primary energy source has to be imported.

The renewable energy source receiving ever more attention in this respect, especially in developing countries, is geothermal energy. It has all the normal attributes required of an economical energy source for the above applications plus being benignly polluting. In countries, where the resource exists, it constitutes an excellent alternative source of energy for the above uses.

For nations, who do not possess petroleum resources, utilization of indigenous energy sources like geothermal energy can effect sizable direct savings in the expenditures of foreign currency reserves and thus help the balance of payments. The same applies indirectly to nations having petroleum resources, in that more petroleum becomes available for export where savings can be effected in the own use of it. Shining examples of the former are the Philippines, Kenya and Iceland; whilst Mexico and Indonesia exemplify the latter.

It should be pointed out at this stage, that in this particular proposal the Ethiopian Government plans to utilize already available geothermal resources and explore for others for use in their tobacco and other agro industries. This has the potential of effecting considerable savings in foreign currency expenditure as well as other benefits, provided advantageous funding is made available and the venture is successful.

## 2. Costs of Proposal

In order to quantify the financial commitment involved in this proposal, the author has estimated the costs involved based on the following premises:

- (i) A critical evaluation has neither been made of the proposal's manmonth estimate nor the type of expert advise requested and its specifications thus used unchanged.
- (ii) The unit prices here featured, are the international technical consultancy market lows, i.e. in line with the ORKINT LTD ones.
- (iii) Lack of reliable information and realistic technical premises makes it impossible to estimate costs for the feasibility and design part of the proposal.
- (iv) The cost of training assumes that two (2) Ethiopian geothermalists be enrolled in the UNU Geothermal Training Course in Iceland and wholly financed by the project funds, i.e. the funds used to pay their travel, course fees, sustenance, accommodation etc.

The resulting costs calculated in US\$ are:

### a) Reconnaissance:

Wages and per diems in Ethiopia	52,650
Travel/accommodation/sustenance	33,600
Office costs/reporting	4,000
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total	US\$ 90,250
Vehicles (2 jeeps)	30,000
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total	US\$ 120,250
Cost of training (cf. (iv))	33,400
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Subtotal	US\$ 153,650
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## b) Prefeasibility Study and Reporting:

Wages and per diems in Ethiopia	75,700
Travel/accommodation/sustenance	42,300
Office costs/reporting	8,000

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Subtotal US\$ 126,000

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## 3. Recommendations

The National Energy Authority is currently not in possession of sufficient reliable data either to give a realistic estimate of how far advanced is the necessary exploration of known geothermal resource areas (KGRA), in the specified parts of Ethiopia, or how realistic is the utilization of those for the industrial applications planned.

This can be rectified by sending two (2) of NEA's experts on a two to three (2-3) weeks fact-finding mission to Ethiopia principally to collect all available exploration data on likely KGRA's in the parts of the country specified in the proposal; inspect possible sites and carry out a coarse evaluation of the feasibility of the planned industrial utilization. It would be of advantage also to have a representative of the Icelandic International Development Agency on the mission.

The cost of sending two (2) NEA experts to Ethiopia, based on previously stated premises, is:

Wages and per diems in Ethiopia	4,000- 6,000
Travel/accommodation/sustenance	10,200-13,800
Office costs/reporting	1,000

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Subtotal US\$ 15,200-20,800

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The direct benefits to be derived from such a mission, if properly prepared and organized and with the good cooperation of Ethiopian counterparts, will undoubtedly be an unbiased and realistic evaluation of the proposal, which helps decide its natural continuation without too large a financial commitment at this initial stage.

It should be pointed out that the costs of the fact-finding mission will largely be deductible from the costs of the reconnaissance phase given above, should it be decided to go ahead.

For the National Energy Authority



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