



ANNEX I

Project Plan

Sustainability Assessment Protocol for Geothermal Utilization

Project ID: **10-03-012**

Coordinator: Brynhildur Davíðsdóttir/University of Iceland

Start date: 4 / 2011

Duration: 3 years and 5 months

Partners: University of Iceland, ISOR, Orkustofnun, Reykjavik Energy

1 Project description

Sustainable development calls for the use of sustainable energy systems. However the way in which a geothermal resource is utilized will ultimately determine whether or not it is sustainable. Sustainable utilization of geothermal energy means that it is produced and used in such a way that it is compatible with the well-being of current and future generations.

The objective of this project is to develop a Sustainability Assessment Protocol for Geothermal Utilization (GSAP), tailored especially for geothermal energy development projects. This protocol will be tested and implemented for projects in countries at various stages of development, including Iceland.

1.1 Objectives and GEORG WP relevance

Specify the main objectives of the project and explain the relevance it has to GEORG WP. Please also explain how the project will help GEORG achieving its main objectives

The objective of this project is to develop a Sustainability Assessment Protocol for Geothermal Utilization (GSAP) that will aid policy- and decision-making regarding geothermal energy developments. The sustainability assessment protocol will consist of a set of indicators of sustainable development tailored especially for geothermal energy development projects.

The geothermal sustainability assessment protocol (GSAP) is intended for use at any stage in the geothermal development process from the strategic stage through to the operation stage. This means that progress towards sustainable development can be measured at all points in the geothermal development lifecycle. Preferably, projects would be assessed at all stages, but if this is not possible, stages may be assessed separately.

The protocol is intended as a sector standard that may be used by any stakeholders in the development process, including government, developers, NGOs, communities or other affected parties.

The project involves the following general steps:

A) Index development; involves (1) defining the purpose of the index (2) specifying index dimensions (3) selecting subindices for the index (3) selecting the aggregation function (4) selecting weights

B) Index implementation; for several case studies the index is implemented by assessing all sub-indices. Implementation is a necessary step of any index development. If the index does not perform properly, step A is revisited before continuing. As a result, the indicators will be reviewed and used in assessments in an iterative fashion, and modified after each iteration according to deficiencies highlighted by the test assessments.

Relevance

WP3: The Project is relevant to WP3 as it will result in a product for the calculation of indicators as well as add value to geothermal utilization by ensuring that projects are assessed for sustainability according to an accepted protocol.

The project is related to WP6 as it corresponds directly to task 6.4, which is the development and implementation of a geothermal sustainability protocol.

The project is related to WP7 by examining the social and economic issues associated with geothermal development and providing an Icelandic case study that demonstrates sustainable geothermal resource use.

2 Work plan and time schedule:

Provide a short work plan broken down into subtasks which should follow the logical phases of the implementation of the project. A timeline should be presented as well as list of deliverables and milestones. Please keep in mind the submission of progress- and annual reports to GEORG, while planning the deliverables and milestones.

| Subtask | Start | Finish | Deliverable/Milestone |
|---|---------|----------|--|
| <i>Choice of preliminary indicators and first assessment at Krafla energy project</i> | 1/4/11 | 31/12/11 | Krafla assessment |
| <i>Review of indicators for suitability</i> | 1/1/12 | 31/3/12 | First iteration of indicators |
| <i>Assessment of energy project in a developed country</i> | 1/4/12 | 30/6/12 | Assessment and implementation in New Zealand |
| <i>Review of indicators for suitability</i> | 1/7/12 | 30/9/12 | Second iteration of indicators |
| <i>Assessment of energy project in a developing country</i> | 1/10/12 | 31/12/12 | Assessment Kenya, Guadeloupe or another developing country |
| <i>Review of indicators for suitability</i> | 1/1/13 | 31/3/13 | Third iteration of indicators |
| <i>Assessment of energy project in an emerging economy</i> | 1/4/13 | 30/6/13 | Assessment and implementation in an emerging economy |
| <i>Review of indicators for suitability</i> | 1/7/13 | 30/9/13 | Fourth iteration of indicators |
| <i>Final Indicator set produced</i> | 1/10/13 | 31/12/13 | Final set of indicators delivered |
| <i>Development of thesis and software</i> | 1/1/14 | 30/9/14 | Thesis delivered |

3 Project Management

The project will be supervised by Icelandic sustainability and geothermal experts, which include the following individuals:

Dr. Brynhildur Davidsdóttir (Háskóli Íslands)

Dr. Guðni Axelsson (ÍSOR)

Dr. Ladislaus Rybach, Director, IGA

Liasons with Orkustofnun and projects abroad:

Mr. Jónas Ketilsson (Orkustofnun) – chairperson of the working group for sustainable geothermal utilization

Liasons with Reykjavik Energy:

Dr. Einar Gunnlaugsson

The principal supervisor, Dr. Brynhildur Davidsdóttir has supervised the development of the Icelandic national sustainability indicators for energy and carried out extensive research in the field of sustainable energy and energy policy, including the assessment of the ecological footprint of energy production in Iceland, energy security and climate change policies. Brynhildur is responsible for coordinating the project, as well as is responsible for financial management.

Managerial committee

The project a day to day managerial committee, which meets once per month to discuss project progress and other issues that may have come up. Davidsdottir and Ketilsson sit on the managerial committee.

Science committee

The project’s science committee contains individuals from all project partners. It meet once per year to evaluate and ensure the scientific quality of the project.

4 Budget overview

| Cost item | | Requested funding | | Other financing | | Total |
|--------------------|-------------------------|-------------------|------------|-----------------|------------|---------------|
| 2010/2011 | Salaries | | | | | 10,943 |
| | Operational expenses | | | | | 0 |
| | Travel expenses | | | | | 600 |
| | Total 2010/2011: | 5,800 | 50% | 5,743 | 50% | 11,543 |
| 2011/2012 | Salaries | | | | | 12,593 |
| | Operational expenses | | | | | 0 |
| | Travel expenses | | | | | 500 |
| | Total 2011/2012: | 6,350 | 48% | 6,743 | 52% | 13,093 |
| 2012/2013 | Salaries | | | | | 12,593 |
| | Operational expenses | | | | | 0 |
| | Travel expenses | | | | | 500 |
| | Total 2012/2013: | 6,350 | 48% | 6,743 | 52% | 13,093 |
| Grand Total | | 18,500 | 49% | 19,229 | 51% | 37,729 |

4.1.1 Explanation of cost:

Brynhildur Davíðsdóttir (UoI): Project management - complementary contribution

Einar Gunnlaugsson (OR): Expertise input and access to relevant data and geothermal plants - complementary contribution

Jonas Ketilsson (OS): Expertise input and access to relevant data and geothermal plants - complementary contribution

Guðni Axelsson (ÍSOR): Expertise input and access to relevant data and geothermal plants - complementary contribution

Ladislav Rybach, Director, IGA: Expertise input and access to relevant data and geothermal plants - complementary contribution

Ph.D.3 student (UoI): PhD Student sought from the School of Engineering and Natural Sciences.

Funding only sought for a PhD student, and also associated with travel to sites abroad.