



**ANNUAL REPORT**  
**YEAR 2**  
**Sustainability Assessment Protocol for Geothermal  
Utilization**

Project ID: 10-03-012

Coordinator: Brynhildur Davíðsdóttir

Start date: September 1 2011

Duration: 3 years and 4 months

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

## 1 General status of the project

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 GEOVISAR 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 Project progress/time schedule:

Time schedule is shown below. The structure of the project has slightly changed since the project was designed due to delay in student arriving in Iceland and beginning her work. The student arrived in late August and began work on September 1 2011. As a result there is a 4 month delay in the initial work plan. In addition, as the result of a very interesting stakeholder meeting held in December 2011, the project committee has decided to add one iteration in Iceland. As a result the New Zealand iteration was performed in the fall in New Zealand, instead of in the spring of 2012. In addition the iteration intended for Kenya was delayed until Fall of 2013 (begins on September 18 2013), due to the possibility of political and economic instability linked to elections in Kenya held in the spring of 2013. The management committee decided to respond to this delay by adding two additional iterations in Iceland in the meantime using the same methods (Delphi surveys) as were tested in New Zealand. The first one was conducted with Geothermal specialists in Iceland, and the other one with UNU fellows in the Icelandic Geothermal Training Programme. Those two additional iterations are considered to replace one of the planned iterations in another developing country.

Subtask	Start (original plan)	Finish (original plan)	Deliverable/Milestone	Progress
<i>Choice of preliminary indicators and first assessment at Krafla energy project</i>	1/4/11	31/12/11	Krafla assessment	Completed
<i>Review of indicators for suitability</i>	1/1/12	31/3/12	First iteration of indicators	Completed
<i>Assessment in Nesjavellir</i>	1/4/12	31/5/12	Nesjavellir assessment	completed
<i>Review of indicators for suitability</i>	1/6/2012	30/6/2012	Second iteration of indicators	completed
<i>Assessment of energy project in a developed country</i>	1/4/12	30/6/12	Assessment and implementation in New Zealand – using the Delphi method	completed
<i>Review of</i>	1/7/12	31/2/2013	Third iteration of	completed

<i>indicators for suitability</i>			indicators	
<i>Assessment of indicators in Iceland with stakeholders as well as UNU specialists</i>	1/3/2013	15/9/2013	Re-assessment of indicators in Iceland using Delphi method	Completed
			Iteration of indicators in Iceland with UNU fellows using Delphi method	Ongoing
<i>Assessment of energy project in a developing country</i>	16/9/2013	31/11/2013	Assessment and implementation in Kenya; Using Delphi method	Expected

Despite those various delays the project is expected to be completed on time, early 2015.

## 2 Management

The project is 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

### Managerial committee

The project an overall managerial committee, with consists of Axelsson and Davidsdottir. The managerial committee meets formally every 2 months when the PhD student is in Iceland. Day-to-day management is in the hands of Dr. Davidsdottir, who meets with the employee involved in the project every week, discussing progress, issues that have come up and the like.

### 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. Last meeting was held in March 2013.

## 3 Student involvement

One PhD student works full time on the project, Ms. Ruth Shortall. She is expected to graduate in the spring of 2015 with a PhD in Environment and Natural Resources, from the faculty of Life and Environmental Sciences at the University of Iceland. The student is on track with this timeline with no issues foreseen.

## 4 Publications and dissemination

The dissemination strategy of this project contains formal academic publications, participation in academic meetings such as the Geothermal PhD day, publication on websites as well as a formal website that belongs to the project.

In 2012 dissemination consisted of:

1. Participation in the Geothermal PhD Day and EERA workshop in March 2012. R. Shortall gave a poster as well give a short presentation on the project.
2. Completion of website. Please see: <http://gsap.is/>
3. Publication on the indicator set in Encyclopedia of Earth (see [eearth.org](http://eearth.org)).
4. Publication in “Comprehensive Renewable Energy” which is published by Elsevier in 2012. B. Davidsdottir, 2012, Sustainable Energy Development: The Role of Geothermal Power, Comprehensive Renewable Energy.

In 2013 dissemination (until end of March) consisted of:

5. Revision of the Publication Sustainable Energy Development: The Role of Geothermal Power republished by Elsevier in 2013 in open access.
6. Completion of a manuscript of the sustainability issues linked to the use of geothermal energy; will be submitted by Ruth Shortall to Renewable and Sustainable Energy Reviews

## 5 Cost statement

	April 1 2012 – December 31 2012 (kr.)	January 1 2013 – March 31 2013 (kr.)
Salary	2901427	979366
Salary and salary connected payments (launatengd gjöld) for Ruth Shortall (full time employment)		
Travel and accommodation	158062	1313957
Travel and accommodation cost for Ruth Shortall while in New Zealand from July 2012 to February 2013		
Workshop costs (cost with Delphi surveys)	13307	28426
<b>Total Cost</b>	<b>3072796</b>	<b>2321749</b>

