



ANNEX I

Project Plan

GREEN GEOTHERMAL GROWTH –

Use of geothermal heat for warm water ecoculture

Project ID: **10-03-004**

Coordinator: Sjöfn Sigurgísladóttir, University of Iceland

Start date: February 28th 2011- September 1st 2012

Duration: 18 months

Partners: University of Iceland, Íslensk Matorka, National Energy Authority

1 Project description

General description of the project, clarify what the intended work involves and specify the need or importance for this work in connection with geothermal energy.

The Green Geothermal Growth project focuses on utilizing renewable geothermal energy resources and warm waste water from industries for sustainable food production. The goal of the plan as a whole is to develop a new warm-water aquaculture, that is sustainable, tailored for local environments and using natural circulation of energy, water and nutrition with integrated production methods; polyculture of different warm water species, aquaponics and locally-produced feed ingredients for the whole production chain from the production of raw materials to the processing of fish/food.

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 aim of the project is to implement sustainable warm water aquaculture in Iceland utilizing local resources, building an ecological food park based on integrated systems with polyculture, aquaponics, tailored feed from local raw materials and added value food production with focus on healthy and safe food for export. Natural green production circles optimize the utilization of energy, water, organic waste material, land and other local resources. This will provide conditions favorable for the sustainable growth of Icelandic food production with focus on utilization of geothermal heat, ensuring both adequate supplies of seafood and vegetables and protection of the environment.

The proposal fits well to tasks 5.2 Direct use of geothermal heat for industrial processes in the third call of the Georg program and moreover to other WPs regarding education, dissemination of results, local production, innovation and start-ups.

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 1: Development and design of polyculture with minimum three warm water species – February 2011 – October 2011

Polyculture of warm water species provide healthy ecosystems, but need careful development and design of the system, especially water management, that is how water is re-circulated between different species, for optimal utilization of water, energy and nutrients, without increasing the risk of diseases and dangerous contaminations. Polyculture is providing new opportunities for aquaculture, not least landbased aquaculture with new warm water species.

It has been predicted that landbased polyculture could become the needed solution for European aquaculture development. Utilization of geothermal energy in these systems provides a whole new perspective.

Subtask 2: Integration of aquaponics – July 2011 – December 2011

New technical and environmentally friendly solutions are needed for utilizing the effluents from aquaculture. The effluents have negative impact on the environment if they are released directly to rivers or lakes due to waste materials. These waste materials provide valuable nutrients for production of plants for production of feed raw materials and direct food products for human consumption. Probiotics are needed to regulate the microflora of aquaculture water, control pathogenic microorganisms, to enhance decomposition of the undesirable organic substances in aquaculture water, and improve ecological environment of aquaculture.

Subtask 3: Production of mycoprotein – November 2011 – August 2012

Fermenters for mycoprotein (*fusarium venenatum*) production will be set up. Ammonia, as well as carbon sources and minerals from the aquaculture effluents are used as a nitrogen, carbon and mineral supplies. Gases including carbon dioxides produced by fungal respiration are pumped directly into the aquaponics. Stringent precautions are taken to avoid contamination with unwanted organisms which could ruin the product. Sterilization, as well as drying processes would need steam from geothermal sources. Industrial areas nearby geothermal power plants and other geothermal areas such as at Fludir provide excellent locations. Mycoprotein is a valuable food supply for human consumption and could also be used for aquaculture feed, decreasing feed cost considerably and thus making a huge difference for the economy of aquaculture in general.

3 Project Management

Make a short description of the applicants involved in the project, inform about the resources that will be assigned to the project. Also specify in clear and simple manner who is responsible for what and how that will be managed.

The management structure is simple. Sjöfn Sigurgísladóttir is the project manager and the main supervisor for the student. Stefania K Karlsdóttir is responsible for implementing the results directly at the aquaculture farm at Fellsmuli in cooperation with the student, the employees of Islensk matorka and the cooperation partners. Sjöfn is responsible for the dissemination of results and creating new opportunities for other students and supervisors at the University, not least in cooperation with other universities, research institutes and industries in other countries. Also she is responsible for the dissemination of results to the industry in Iceland, the government, local communities, R&D and other interested. Scientific publications will mainly be written by the student in collaboration with supervisors. An advisory group will be established for the project that will be composed of experts from the main suppliers of geothermal and waste heat from geothermal power plants.

4 Budget overview

Insert the “Costs” spreadsheet from the application documents. Explain the basic cost structure of the project. If it’s assumed informative an additional budget summary can be included here, that, however, should not exclude the standard forms. Please justify, in simple terms, how the criterias of chapter 6, Section I in the „Proposal & Award Policies & Procedures Guide“ are fulfilled.

(Copy and paste (paste special as picture) the budget summary table from the attached excel document)

Cost item		Requested funding		Other financing		Total
2010/2011	Salaries					10.000
	Operational expenses					5.700
	Travel expenses					1.180
	Total 2010/2011:	6.000	36%	10.880	64%	16.880
2011/2012	Salaries					5.800
	Operational expenses					1.300
	Travel expenses					450
	Total 2011/2012:	3.000	40%	4.550	60%	7.550
2012/2013	Salaries					0
	Operational expenses					0
	Travel expenses					0
	Total 2012/2013:	0	N/A	0	N/A	0
Grand Total		9.000	37%	15.430	63%	24.430

4.1.1 Explanation of cost:

The application involves the salaries of the student at the University of Iceland.