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DIRECT USE FOR FOOD PRODUCTION – Learning Lessons in Central America

Foto: Planta geotérmica LaGeo situada en Berlín, Usulután (El Salvador)
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Structure

- Key Benefits of direct uses
- Direct uses for food production in Central America
- Challenges
- Succes factors

Benefits of Direct use for Food production

- Increasing interest in direct uses around the world.
- Environmental benefits, positive impact on climate es the use of fossil fuels.
- Need for examples to promote direct uses.
- The technological advantage allows for reduction in development costs.

Image: Café Royal, web.

Existing Direct Uses in Central America

	Balneology	Greenhouse heating	Aquaculture	Fruit and Vegetables drying and dehydration	Concrete drying
Costa Rica	X				
El Salvador	X	X	X	X	
Guatemala	X			X	X
Honduras	X				
Nicaragua	X				
Panamá	X				

Guatemala: Involving local communities in developing projects in Amatitlán Lake,

Objective: Carbon-free Economic Development in Rural communities

Status: Initial Study is being conducted to determine organized communities with productive activities located near the geothermal resource.
(Ex: Artisanal Candy making, Traditional fabric production agriculture, fish, green houses and crops)

Goal: a methodology and replicable example for other countries of the region

Costa Rica: Hotel Rio Perlas – Geothermal Water Heating

Objective: Carbon free tourism

Status: Project has a pre feasibility study elaborated by ICE, and existing dwell

The Hotel has two thermal springs.

- Brine # 1 is at 65 ° C, has a pH of 9.03 and a flow rate of 38.89 l / min.
- Brine # 2 is at 47 ° C, has a pH of 8.71, the flow is unknown, but the goal is to make a well in the vicinity that produces 79 l / min. Both brines are sulfated.

Costa Rica: Grain Drying in Cascade (Miravalles)

Installation of an agricultural product dryer powered by ***a reinjection pipe*** in Miravalles Geothermal Field.ICE will provide the energy and the space for the plant.

Project will impact producers of beans, onion and corn from the area.

Technical data:
Drying Technology Solano & Coto (2002)

- 350mm reinjection (160 °C)
- 250mm holding
- Entrance pipeline (25 °C a 30 °C)
- Exit pipeline (40°C)

Nicaragua: Geothermal energy aligned with an educational and social purpose

Status: Studies (La Salle Technological University) with two applications for direct uses of geothermal energy
Objective: Research and Education

Geothermal powered dryer

- Drying of agricultural products;
- Handcrafts & other manufacture.

Underground thermal energy storage

- Use of feasible technologies for local implementation;
- Maximize the use of generation structures available in the region;
- Potential impacts on the prices of energy for national and specific consumption (local companies).

In El Salvador, pineapples, apples, bananas and coconuts are dried with geothermal energy at the Berlin field and used for local consumption.

Guatemala has a geothermal-powered fruit drying facility that produces dried pineapples and apples for export.

Image: Planta geotérmica del ICE, situada en Guanacaste (Costa Rica)

Challenges

Cascade-use (Co-generation)

Concerns on decrease of electricity production

Mandate: energy generation vs heat production

Awareness

Complexity & Costs

Capacity & Knowledge

Alone standing direct use projects

Regulatory frameworks

Project readiness

Lack of geological and economic data (Favorability)

Opportunities

- High interest of cooperators in the development of geothermal energy in the region (KfW, JICA, IDB, IRENA).
- Region with organizations with a lot of experience in the development of generation projects and with potential for direct cascade uses. (ICE, La Geo, Polaris, Momotombo, Elcosa)
- On-site resource for many industries and businesses that have an interest in taking advantage of the geothermal resource.
- Knowledge of areas with great potential for direct use and latent opportunity for the development of projects with community participation.
- Region with a lot of geothermal potential and propitious for the development of projects.

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