

ICELAND – NICARAGUA Geothermal Capacity Building Project



Barbados, March 2008

NICARAGUA SNAPSHOT:

Installed capacity	666 MW
oil and diesel	73% (60% of export earnings used on oil to produce electricity)
Electricity demand	550 MW
Electricity deficit in 2007	100 MW
Total potential	3,000 – 5,000 MW
Geothermal potential	1,000 – 1,500 MW
Installed geothermal	87 MW
Currently available	36.4 MW

GEOHERMAL AREAS



BACKGROUND

- ◆ **2004:** The Government of Nicaragua requests development cooperation with Iceland with a primary focus on the geothermal sub sector.
- ◆ **2005:** Appraisals and early preparations confirm viability.
- ◆ **2006:** The Embassy of Iceland in Managua opens and a General Agreement on Bilateral Development Cooperation is signed.
- ◆ **2006:** A workshop titled "*Future of Geothermal Energy in Nicaragua and Icelandic Cooperation*" and a Project Identification Document outline future activities.
- ◆ **2007:** Project design completed and ICEIDA formally commences operation in Nicaragua.
- ◆ **2008:** Project Document signed and implementation begins.

The Project Document is an Intergovernmental Agreement

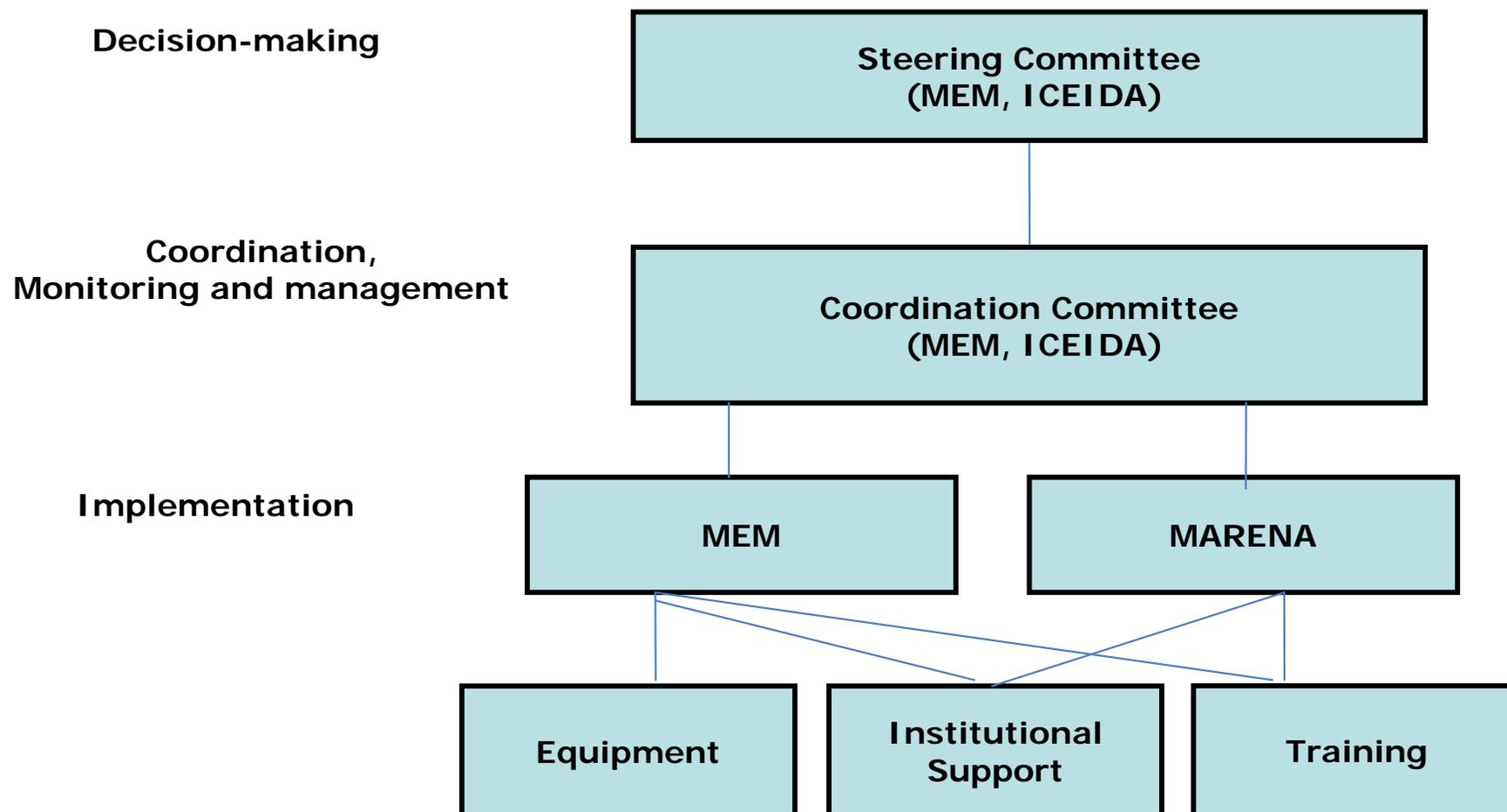
The **Icelandic Government** has the following commitments:

- ◆ To provide funds for technical assistance to the Nicaraguan institutions involved in the development and monitoring of geothermal resources for a 5 years period.
- ◆ To provide technical training to Nicaraguan professionals.
- ◆ To provide the necessary equipment to the Nicaraguan Institution for the achievement of their function in monitoring and development of the geothermal resources.

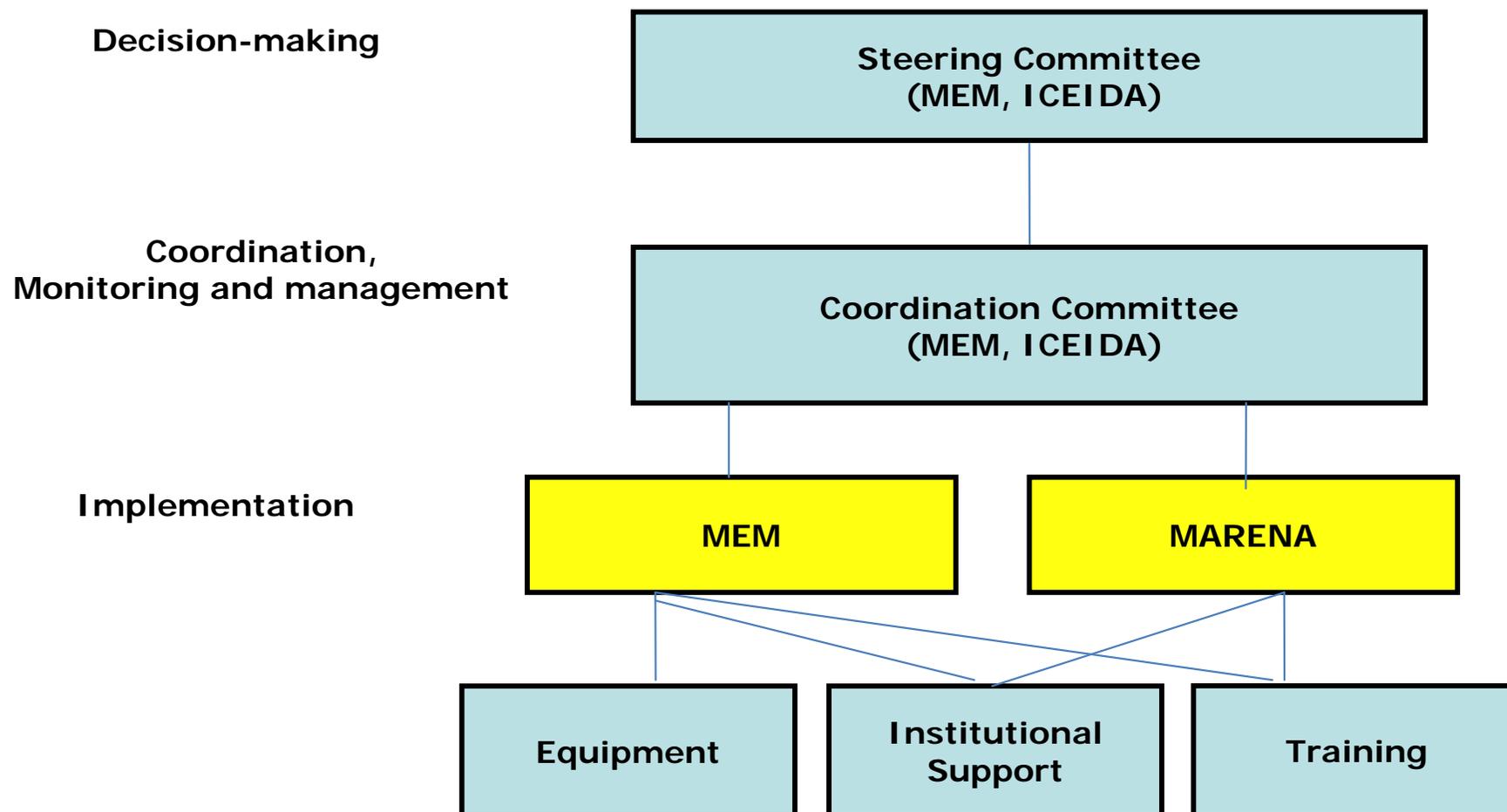
The **Nicaraguan Government** has the following commitments:

- ◆ To implement and follow-up the technical assistance activities
- ◆ To establish a Geothermal Investigation Unit at MEM.
- ◆ To coordinate the reactivation and installation of the geochemical laboratory.
- ◆ To provide financial sustainability for the Geothermal Investigation Unit in the long term.
- ◆ To establish an efficient coordination between MEM and MARENA in the topic of environmental training and environmental monitoring for the activities of the projects.

PROJECT ORGANIZATION



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PROJECT OBJECTIVES

Global Objective:

- ◆ To enhance the utilization of geothermal resources in Nicaragua.

Specific Objective:

- ◆ To Create and strengthen the necessary national capacities, so that government institutions involved in geothermal work are in a position to comply with their responsibilities and facilitate the sustainable development in Nicaragua of existing geothermal resources in the medium and short term.

PROJECT COMPONENTS

- **Training:** Develop a process for sustainable institutional capacity for follow-up, monitoring, supervision, management and environmental oversight of geothermal projects in Nicaragua.
- **Technical Assistance:** To increase the capacity for technical and scientific supervision by the Ministry of Energy and Mines (MEM) and the Ministry of the Environment and Natural Resources (MARENA) to coordinate, supervise, monitor and develop the exploration and exploitation of geothermal resources in Nicaragua.
- **Equipments:** Provide the Investigation Unit at MEM with technical resources, infrastructure and equipment.

Annual Budget in US\$ (five years period)

Components	2008	2009	2010	2011	2012	Gran Total
Technical assistance	692,675.0	594,020.0	362,025.0	345,880.0	288,820.0	2,282,820.0
Other technical assistance	37,000.0	34,000.0	-	-	-	71,000.0
Training	151,274.0	209,234.0	206,941.0	163,589.0	35,907.0	766,945.0
Infrastructure, equipment	183,906.0	73,406.0	2,000.0	2,000.0	2,000.0	263,312.0
Administration	94,160.0	98,516.0	98,307.6	103,578.3	109,376.2	503,938.0
Evaluation	12,000.0	50,000.00	-	-	80,000.0	142,000.0
Subtotal	1,171,015.0	1,059,176.0	669,273.6	616,547.3	517,003.2	4,030,015.0
Contingencies 5 %	58,550.75	52,958.8	33,463.7	30,752.4	25,775.2.2	201,500.8
Grand Total	1,229,565.8	1,112,134.8	702,737.2	647,799.7	541,278.3	4,231,515.8

OUTPUTS - MEM

- ◆ A short and medium-term technical assistance project is developed for the creation of capacities at MEM as regards monitoring, follow-up and evaluation of the management and development of geothermal production in Nicaragua.
- ◆ The MEM Investigation Unit is equipped and strengthened.
- ◆ A geochemical laboratory is rebuilt and conditioned in order to meet the demand regarding development of research in geochemistry and geothermal production in Nicaragua.
- ◆ Technical capacity is strengthened among government sector employees through other training techniques and the study of issues in support of the development of geothermal projects.

OUTPUTS - MARENA

- ◆ Capacity is created at MARENA for the monitoring and evaluation of Environmental Impact Assessments (EIA).
- ◆ Capacity is created at MARENA for the incorporation of the sustainable use of geothermal resources to the management plans for protected areas.
- ◆ Technical capacity is created among public sector technicians and public servants for the supervision, monitoring and environmental oversight of geothermal development projects in Nicaragua.
- ◆ Strengthen the National Clean Development Office (ONDL) at MARENA by applying the Clean Development Mechanism (CDM) to geothermal projects.

