



# The Geothermal Exploration Project

Geothermal Development in the East African Rift Valley Countries

Sub-project of the Compact on Geothermal  
Development in East Africa

Icelandic International Development Agency (ICEIDA)

## Background

- Initial phase of the Geothermal Compact partnership, initiated jointly by Iceland and the World bank
- The preparation of the project was initiated following a visit of a World Bank (WB) Mission to Iceland in 2011
- Iceland and Icelandic agencies will advance their work in order to bring countries towards exploration drilling
- Participation from The Nordic Development Fund (NDF) the joint multilateral development finance institution of Denmark, Finland, Iceland, Norway and Sweden
- NDF's objective is to facilitate climate change investments in low-income countries

## Previous Geothermal Involvement

- Previous support to geothermal explorations, for instance in Uganda and Kenya
- Technical and financial support to the ARGeo project
- IDAG – Inventory Database of African Geothermal, run by ARGeo
  - Designed to provide an overview of geothermal development in Africa by storing information on geothermal projects, their progress and funding, related information on human resources capacity and equipment available or required
- 400+ professionals trained by the UNU Geothermal Training Program in Iceland

## Geothermal Exploration Project

- A sub-project under the Geothermal Compact, with a focus on the earlier stages of geothermal development, jointly financed by ICEIDA and NDF
- Assist EARS countries to complete the exploratory phase of geothermal development and build capacity in the field
- Enhanced geothermal knowledge and capacity enabling further actions on geothermal utilization in EARS countries
- The project will formally start January 2013
- Support could extend to all 13 EARS countries

## Rationale

- Even though a geothermal potential has been demonstrated, and the need for electricity is urgent, experience worldwide shows that severe barriers exist
  - High upfront investment costs
  - Drilling/reservoir risk
  - Long development time
- Accelerate the development and mitigate and distribute the risk of geothermal exploration
- It is estimated that the project could lead to plans for exploration drilling in 4-7 countries, at which stage other parties would enter the stage, including WB

## Objectives

Geothermal Compact - assist the East African Rift Valley countries (EARS countries) increase their energy access through low emissions geothermal energy development



Geothermal Exploration Project - contribute to the objectives of the Geothermal Compact by assisting all EARS countries in completing the exploratory phase of geothermal development and build the required capacity

## Expected Results (Outputs)

- 1. Scientific data and reports on geothermal resources
  - 1.1. Reconnaissance studies conducted in respective EARS countries with recommendations for further action
  - 1.2. Geothermal explorations conducted and reported
  - 1.3. Potential exploration drilling projects enter funding pipelines
- 2. Improved and increased level of knowledge and capacity on geothermal utilization
  - 2.1. Strengthened policy and legal framework for geothermal utilization
  - 2.2. Capacity building in the participating countries, including UNU-GTP
  - 2.3. Strengthened ability of development and financial institutions to engage and support the geothermal development process

# Implementation

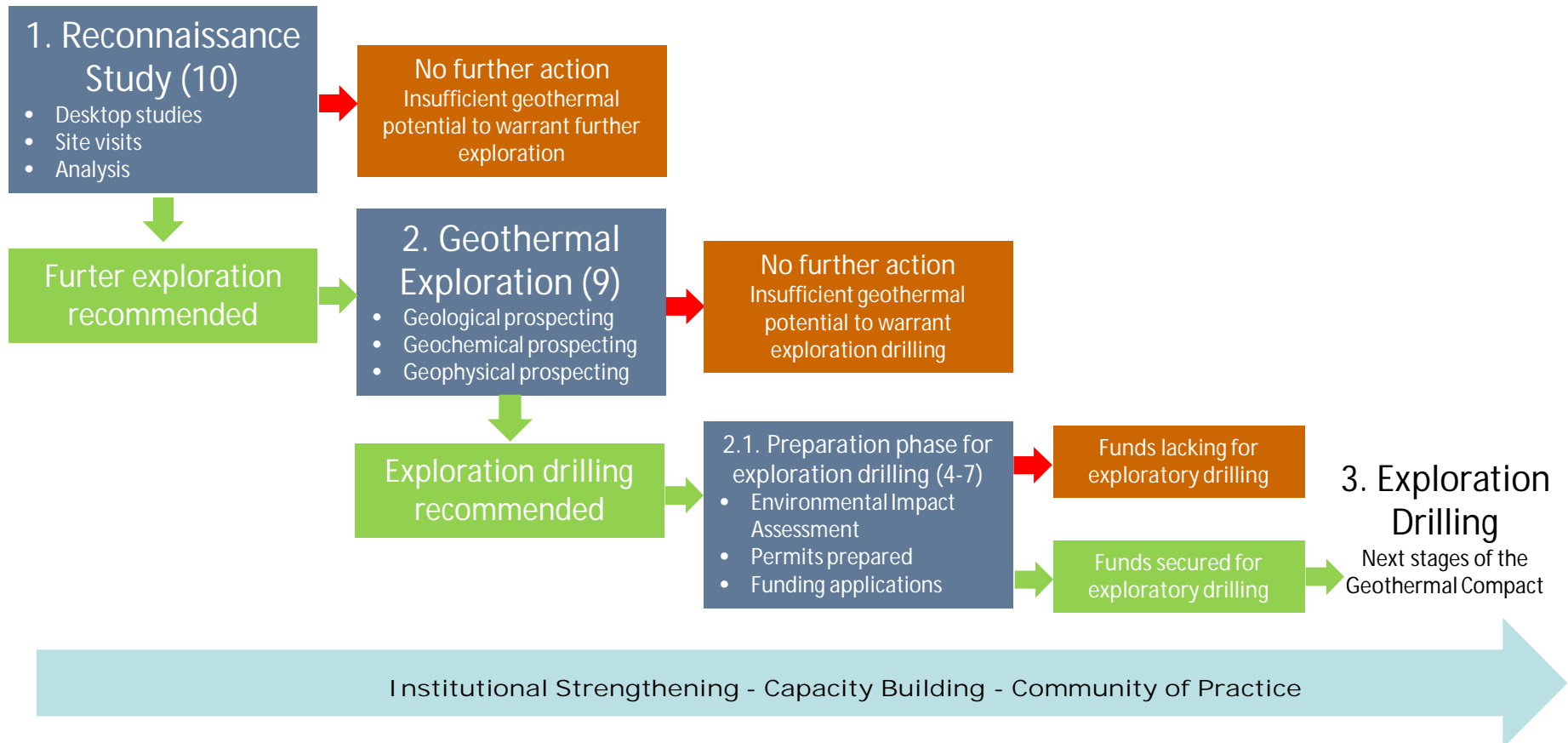
- ICEIDA will be the Lead Agency in the Geothermal Exploration Project
- NDF provides joint co-financing
- Implementing agencies will be identified in each country
- Dialogue and political guidance from the AU
- ICEIDA will continue to engage with and support ARGeo as a platform for geothermal dialogue in East Africa
- Seek cooperation and coordination with other agencies supporting similar and subsequent activities
- Other parties are invited to join the program



# Implementation

- Demand based implementation, responding to requests by governments and appropriate authorities
- ICEIDA will enter into an agreement with the respective governments for the support
- Funding: Reconnaissance and geothermal exploration leading up to exploratory drilling
- Funding: Technical assistance and capacity building, as needed and requested
  - Training through the UNU Geothermal Training Programme
  - Institutional capacity building
  - Increasing the interest and ability of financial institutions to become engaged in geothermal development

# Implementation



# Status of Geothermal Development

| Countries |            | Stages |   |   | 1         | 2      | 3           | 4                    | 5               | 6        | 7           | 8      | 9       |           |
|-----------|------------|--------|---|---|-----------|--------|-------------|----------------------|-----------------|----------|-------------|--------|---------|-----------|
|           |            | A      | B | C | Potential | Recon. | Exploration | Exploration drilling | Pre-feasibility | Drilling | Feasibility | Design | Constr. | Operation |
| 1         | Eritrea    | A      |   |   | High      | X      |             |                      |                 |          |             |        |         |           |
| 2         | Djibouti   | A      |   |   | High      |        |             |                      | X               |          |             |        |         |           |
| 3         | Ethiopia   | A      |   | N | High      | X      | X           |                      |                 |          |             |        | X       | X         |
| 4         | Uganda     | A      | I | N | Med       |        | X           |                      |                 |          |             |        |         |           |
| 5         | Kenya      | A      |   | N | High      |        |             |                      |                 | X        | X           | X      | X       | X         |
| 6         | Rwanda     |        |   | N | Med/ High | X      | X           |                      | X               |          |             |        |         |           |
| 7         | Burundi    |        |   |   | Med       | X      |             |                      |                 |          |             |        |         |           |
| 8         | Tanzania   | A      |   | N | Med       | X      | X           |                      |                 |          |             |        |         |           |
| 9         | Zambia     |        |   | N | Low/ Med  | X      | X           |                      |                 |          |             |        |         |           |
| 10        | Malawi     |        | I | N | Low/ Med  | X      |             |                      |                 |          |             |        |         |           |
| 11        | Mozambique |        | I | N | Low       | X      |             |                      |                 |          |             |        |         |           |
| 12        | Congo      |        |   |   | Unknown   |        |             |                      |                 |          |             |        |         |           |
| 13        | Comoros    |        |   |   | Low/ Med  | X      |             |                      |                 |          |             |        |         |           |

- Based on ISOR report for ARGeo

## Funding

- Proposed budget is USD 13 million over a 5 year period
- Potential funding scenario:
  - Various uncertainties need to be taken into account, for instance requests from countries and results from reconnaissance studies
  - USD 1 million for reconnaissance studies in total (up to 10 countries)
  - USD 1 million for geothermal exploration in each country, (estimated up to 9 countries). Exploration subject to international competitive bidding following the rules and guidelines of ICEIDA and NDF
  - USD 3 million for technical assistance, including institutional strengthening and capacity building
- The funding will not cover exploratory drilling, the project could potentially contribute to subsequent stages of finalizing pre-feasibility studies

## Summary

- The Geothermal Exploration Project, intends to assist with completing the initial phase of the Geothermal Compact program
- Expected to formally start in January 2013
- Following the stage of the Exploration Project, the World Bank is expected to take over as the lead, mobilizing funding for the more resource demanding stages
- The aim is that the outcome of the exploration activities will lead to further geothermal investments in the EARS countries, increasing their use of renewable energy within a time span of 7-15 years