Global Geothermal Development Plan: An Update
De-Risking Exploration to Scale-up Geothermal Energy
Pierre AUDINET, PhD
Geothermal Resources Council, 39th Annual Meeting, Reno
Scaling up geothermal energy requires a different approach

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<td>73.5 TWh (12.5 GW)</td>
<td>Current Policies</td>
<td>113 (17)</td>
<td>378 (42)</td>
<td>+30</td>
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<tr>
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<td>New Policies</td>
<td>120 (18)</td>
<td>378 (56)</td>
<td>+43</td>
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<td>450 Scenario</td>
<td>121 (18)</td>
<td>557 (81)</td>
<td>+68</td>
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Sources: IEA, World Energy Outlook 2014; R. Bertani, WGC 2015

1950-2015: **+12.5 GW** installed globally, in 65 years
1977-2012: Multilateral Development Banks financed geothermal but focused disproportionately on above the ground infrastructure

$3 billion lending over 1977-2012
94% for above-the-ground geothermal infrastructure
GRC 36th Annual Meeting: we invited geothermal developers to help find ways to stimulate investments in exploration
The GLOBAL GEOTHERMAL DEVELOPMENT PLAN is born

MARCH 2013

World Bank Calls for Global Initiative to Scale Up Geothermal Energy in Developing Countries

March 6, 2013

REYKJAVIK, March 6, 2013 -- The World Bank today announced a major international effort to expand renewable power generation in developing countries by tapping an underutilized resource: geothermal energy.

World Bank Managing Director Sri Mulyani Indrawati called on donors, multilateral banks, governments and the private sector to join a Global Geothermal Development Plan (GGDP) to better manage and reduce risks of exploratory drilling to bring what is now
$250 million raised

Multilateral geothermal financing for exploration

Until 2012

SEPT. 2015

PARTNERSHIPS AND TECHNICAL ASSISTANCE

KNOWLEDGE DISSEMINATION

FINANCING

ARMENIA

CHILE

DJIBOUTI

EASTERN CARIBBEAN

INDONESIA

MEXICO

NICARAGUA

SAINT LUCIA

TURKEY

OTHERS (DOMINICA, ETHIOPIA, FIDJI, TANZANIA,...)
**Project Name:** *Armenia Geothermal Exploratory Drilling*

**Site:** Karkar

**Volume of financing:** US$10.7 million (SREP through World Bank, Government of Armenia)

**Type of intervention:**
- Exploratory drilling
- Transaction support

**Progress/timeline:**
- Effective in Q3 2015
- Preparation of access road and drill site underway
CHILE

**Project Name:** *Chile Technical Assistance for Geothermal Development*

**Site:** Not site specific

**Volume of financing:** US$53 million (IDB, World Bank and CTF)

**Type of intervention:**
- Improvement of policy framework and strengthening of management capabilities for mobilizing investments in geothermal energy
- Enhance geothermal market conditions
- Risk sharing for resource development

**Progress/timeline:**
- Under implementation since Q3 2015
- Call for Expression of Interest from Technical Consultants released by World Bank
- Support underway for community consultation and awareness-raising
Project Name: *Djibouti Geothermal Power Generation*

*Site:* Lake Assal

*Volume of financing:* US$31.2 million (World Bank along with 7 co-financiers)

*Type of intervention:*
  - Exploration drilling of 4 wells
  - Technical Assistance

*Progress/timeline:*
  - Under implementation since Q3 2014
  - Project Director and Geothermal Consultant Company contracted
  - Drilling Service Company to be contracted
INDONESIA

- **Project Name:** *Indonesia Geothermal Energy Upstream Development*
- **Site:** Five sites in Eastern Indonesia
- **Volume of financing:** Plan for US$106 million for Phase 1 (Government of Indonesia through PT Sarana Multi Infrastruktur, GEF, CTF)
- **Type of intervention:**
  - Risk Sharing Tool for Resource Confirmation
  - Technical assistance
- **Progress/timeline:**
  - Under preparation
  - Implementation expected to start in Q3 2016
NICARAGUA

- **Project Name:** Nicaragua Geothermal Resource Risk Mitigation
- **Site:** Casita-San Cristobal
- **Volume of financing:** Plan for US$115.5 million (World Bank and SREP together with private financing)
- **Type of intervention:**
  - Public Support to leverage private risk capital for Exploration Drilling and Resource Confirmation
  - Leverage private financing for Steam Field and Power Plant Development
- **Progress/timeline:**
  - Under preparation
  - Implementation expected to start Q1 2017
ST LUCIA

- **Project Name**: *Saint Lucia Geothermal Resource Development*
- **Site**: Soufriere
- **Volume of financing**: US$3.4 million (GEF, SIDS-DOCK)
- **Type of intervention**:
  - Upstream geothermal development preparation and project management
  - Transaction and regulatory support to Ministry of Sustainable Development, Energy, Science & Technology
- **Progress/timeline**:
  - Under implementation since Q3 2014
  - MT tests completed, LiDAR Survey contract awarded
  - Technical Coordinator contracted; selection of Global Expert underway
  - Transaction support ongoing
**Project Name:** Turkey Geothermal Development Project

**Site:** Not site specific

**Volume of financing:** Plan for US$375 million (CTF and World Bank, along with Turkish Banks)

**Type of intervention:**
- Risk Sharing Mechanism for Resource Confirmation implemented by Ministry of Energy and Natural Resources. Partial cost coverage for failed confirmation wells.
- Loan Facility for Resource Development. Credit lines for two local banks to finance capacity drilling and power plant construction

**Progress/timeline:**
- Under preparation
- Implementation expected to start in first half 2016
Thank You.

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