

GLOBAL
GEOTHERMAL
ALLIANCE

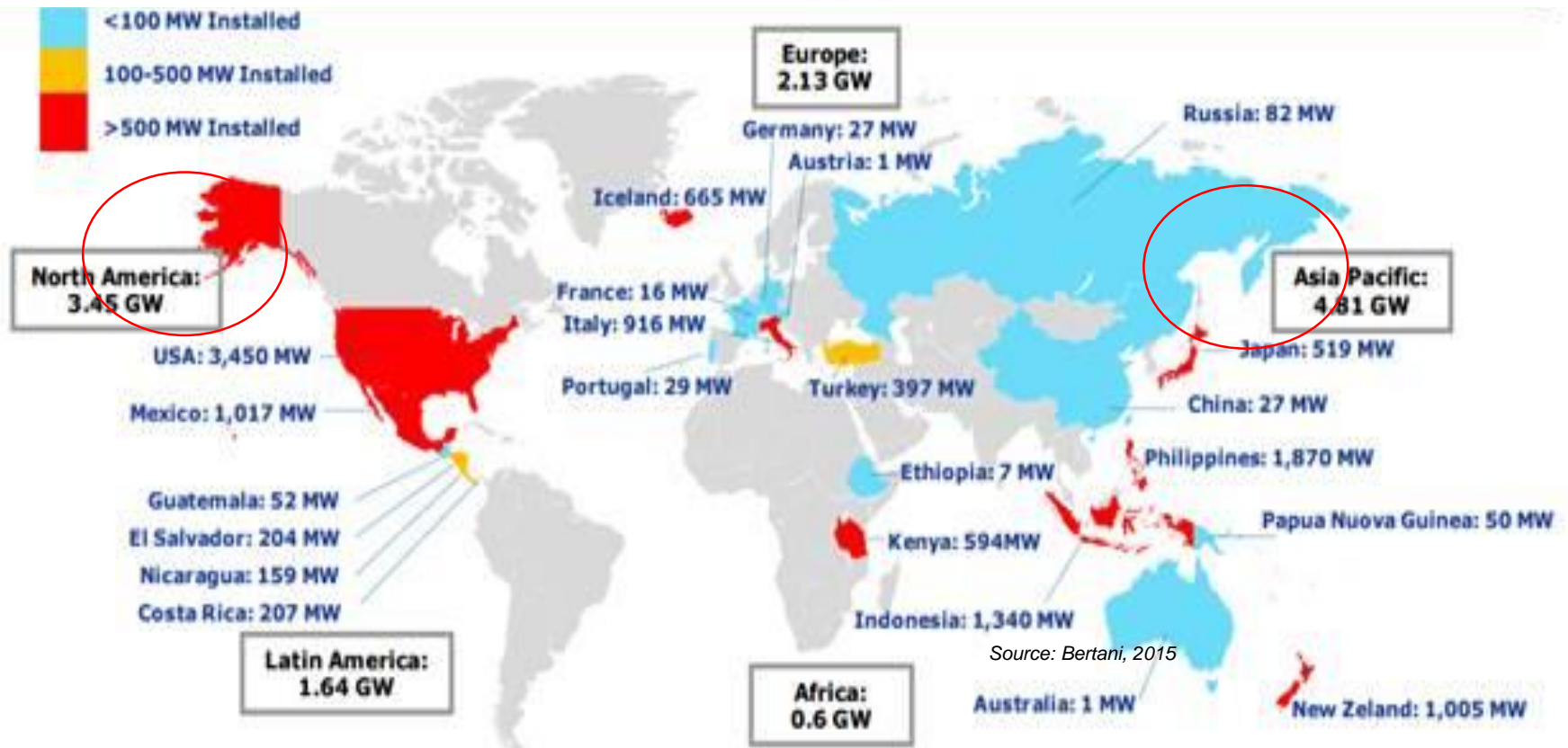


2017 Geothermal Energy International Forum

7 March 2017, Washington DC

Today, only 6% of geothermal technical potential deployed!

- **Geothermal Power:** ~25 countries with a total installed capacity of 12,6 GW
- **Geothermal Heat:** ~80 countries with a total installed capacity of 20.4 GW



Why the modest growth?

HIGH UPFRONT COSTS AND RISKS ASSOCIATED WITH RESOURCE ASSESSMENT

**LACK OF INSTITUTIONAL
CAPACITY**

**SHORTAGE OF SKILLED
PROFESSIONAL**



**POLICY
UNCERTAINTY**

**ENVIRONMENTAL
CONCERNS AND
LICENSING**

**LOW AWARENESS AND LIMITED
INFORMATION IN DECISION MAKERS**

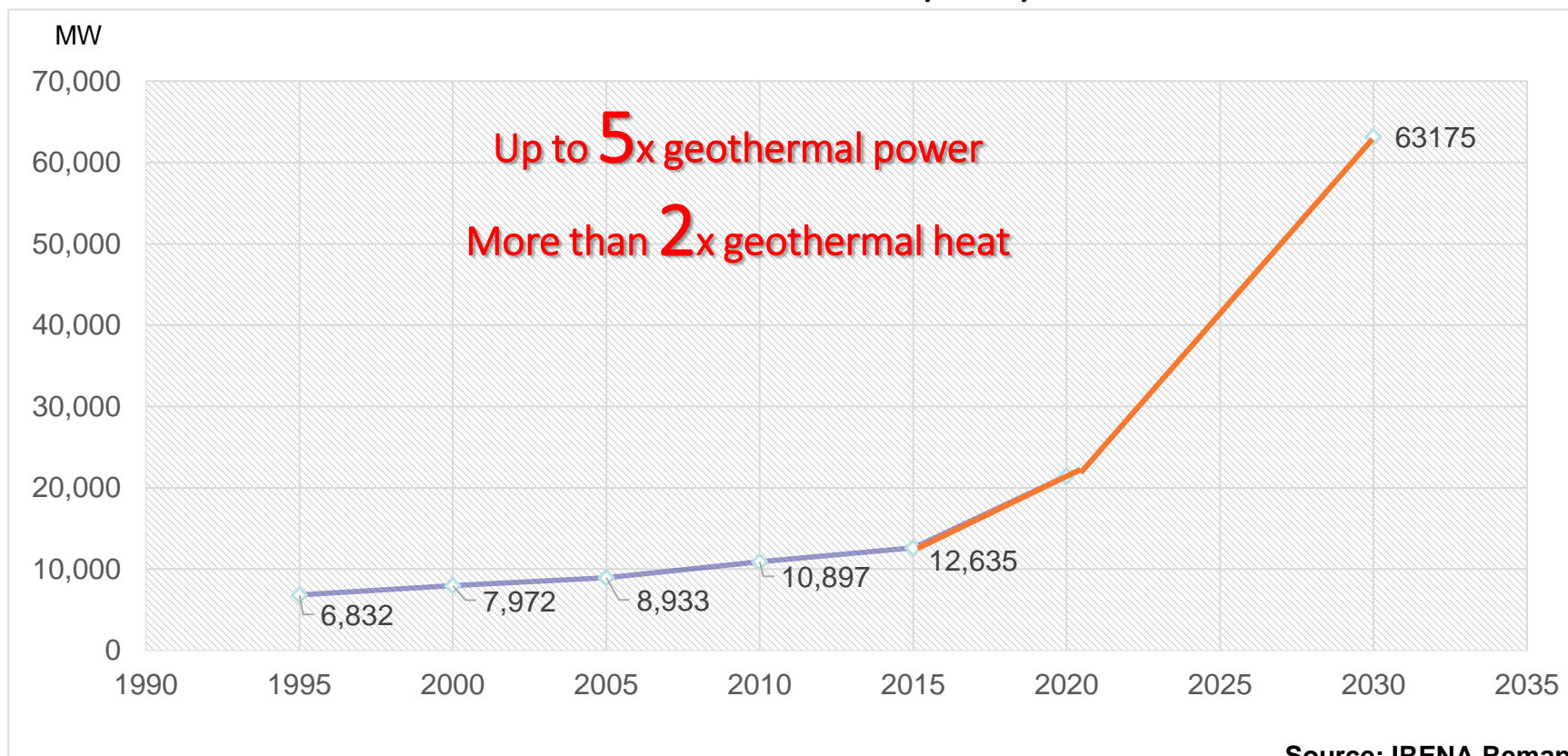
**Can international cooperation and partnerships
help overcome key geothermal challenges?**



GLOBAL GEOTHERMAL ALLIANCE

Launched at COP21 in Paris as a global platform for improved dialogue, cooperation and coordinated action to scale up geothermal deployment

Geothermal Power Installed Capacity Worldwide



Strong Commitment to GGA

GGA MEMBER COUNTRIES - 41 COUNTRIES ACCROSS THE GLOBE

AMERICAS / CARIBBEAN

- Bolivia
- Chile
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Peru
- Saint Vincent & Grenadines
- USA

- IDB
- OAS
- US Geothermal Association
- **Canadian Geothermal Association**

GLOBAL

- IRENA
- International Geothermal Association
- IsDB
- UNEP
- WB ESMAP

EUROPE

- France
- Iceland
- Italy
- Netherlands
- Poland
- Romania
- Switzerland
- Turkey

- Nordic Fund
- European Geothermal Energy Council
- **German Geothermal Cluster**
- **Iceland Geothermal Cluster**
- **French Geothermal Cluster**

AFRICA

- Burundi
- Comoros
- Djibouti
- Egypt
- Kenya
- Tanzania
- Uganda
- Zambia
- Zimbabwe

- AfDB
- AUC
- EAPP
- NEPAD
- RCREEE
- SAPP

ASIA

- **India**
- Indonesia
- Malaysia
- Pakistan
- Philippines

PACIFIC / OCEANIA

- Fiji
- New Zealand
- Papua New Guinea
- Solomon Islands
- Tonga
- Vanuatu

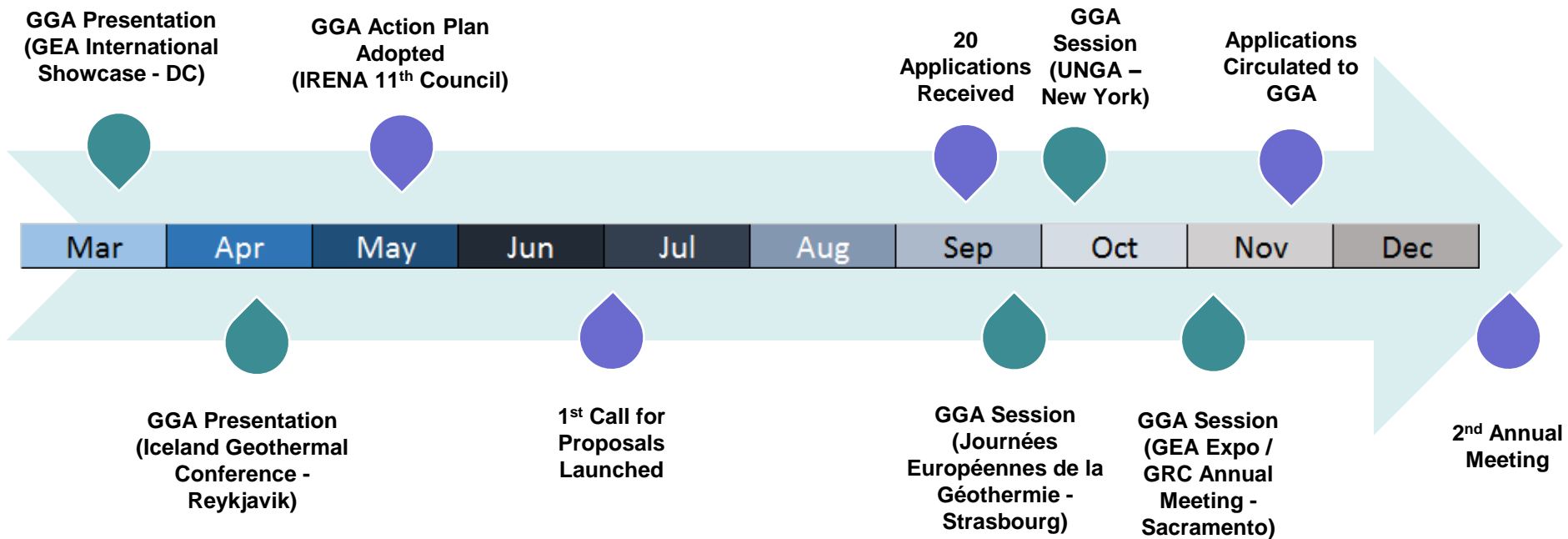
- SPC

GGA PARTNER INSTITUTIONS - 14 REGIONAL & DEVELOPMENT PARTNERS, 8 INDUSTRY PARTNERS, AND 6 RESEARCH INSTITUTIONS AND ACADEMIA

How does GGA Operate?

- ❑ Neutrality and transparency → no preferential treatment for a particular country, technology, scheme
- ❑ Build on structures, programs and facilities on the ground → avoid overlaps, duplicated efforts
- ❑ Unlocking geothermal projects facing policy, legal, regulatory, fiscal, funding, capacity building challenges
- ❑ Enabling most mature projects or countries with transformative potential that would result in high impact
- ❑ No complicated administrative structures, processes
→ avoid bureaucracy, focus on actions

GGA Activities 2016

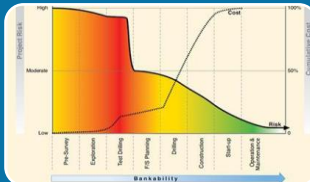




Resource and Market Assessment



Needs and Obstacles Assessment



Enabling Frameworks



Networking and Outreach

Resource & Market

Assessment

Identify and map:

- * Resources for development
- * Existing and potential geothermal market status and near term projects in the pipeline

Needs & Obstacles

Assessment

Scope the needs for assistance w/ focus on:

- * Countries with transformative potential, including, where pilot projects have been identified
- * Removal of obstacles of policy, regulatory, funding or capacity building nature

Enabling Frameworks

- * Assist with creation of enabling frameworks
- * Enhance awareness on and improve risk mitigation funds / financing mechanisms
- * Facilitate access to financing & risk mitigation instruments and support project development tools
- * Capacity building

Global Geothermal Network

- * Establish a global network of geothermal experts building upon existing networks
- * Promote geothermal energy's key role in supporting decarbonisation strategies and support implementation of countries' climate plans (INDCs)

GGA Action Plan

(1) Resource & Market Assessment

Moving forward with “the identification and mapping of resources and projects in the pipeline”

→ Enrichment of the geothermal datasets in the IRENA Global Atlas

FRANCE
Voluntary
Contribution to
IRENA

→ Geothermal market status & near term projects in the pipeline (East Africa)

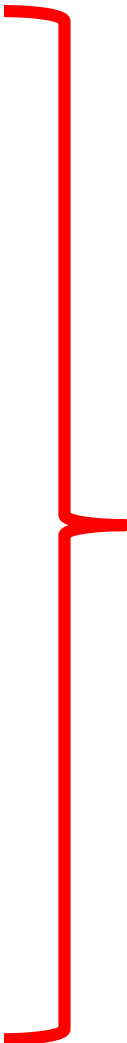
JAPAN
Voluntary
Contribution to
IRENA

GGA Action Plan

Action Areas 2 & 3

Action Area 2:
**Needs and Obstacles
Assessment**

Action Area 3:
Enabling Frameworks

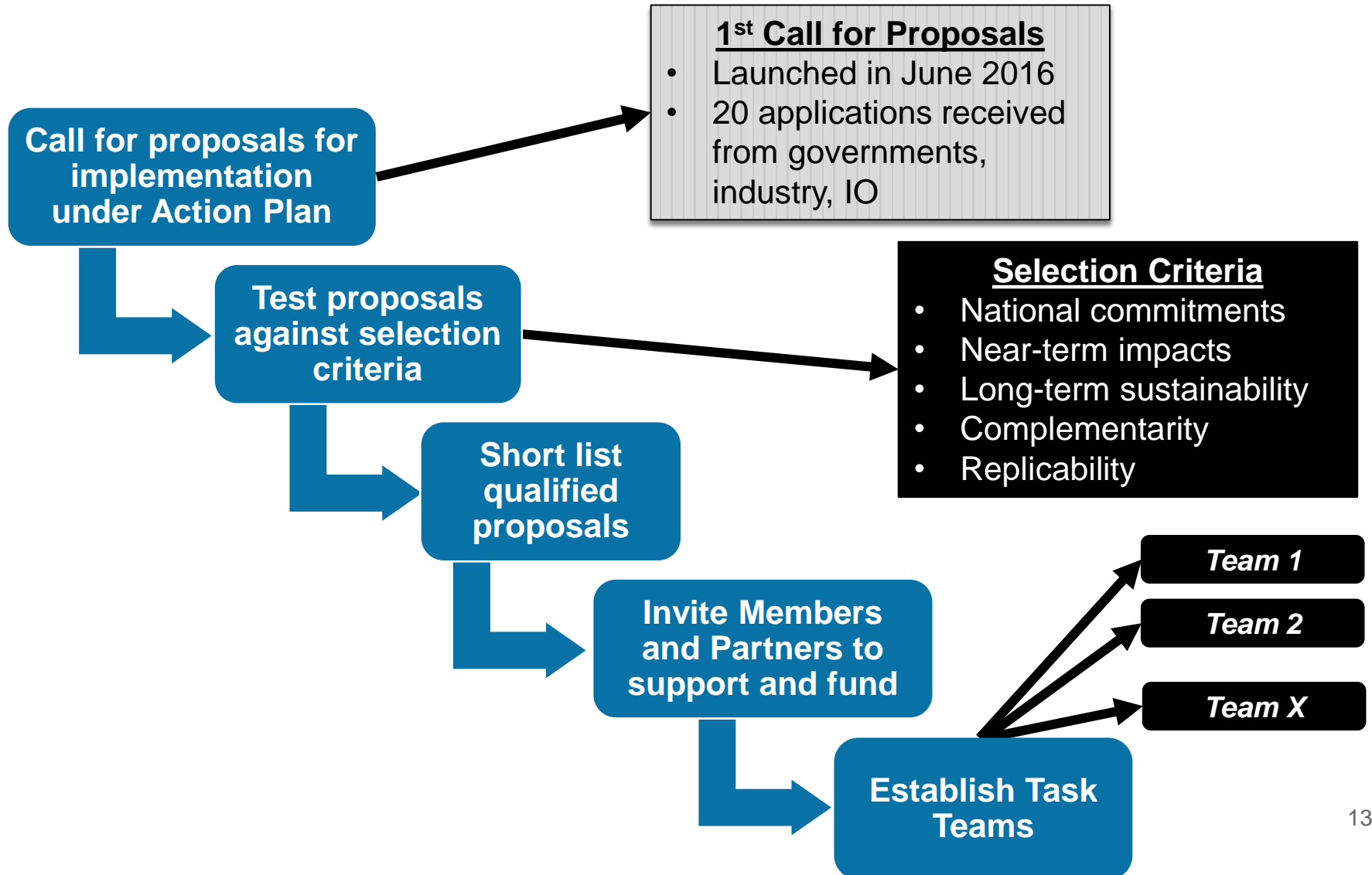


**GGA 1st Call for
Proposals for Activities**

IRENA Tools

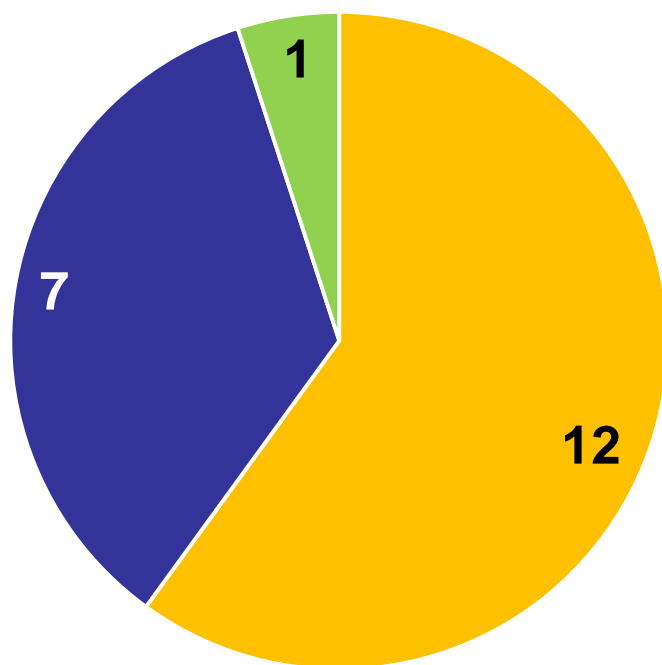
**IRENA Regional
Capacity Building**

Operationalizing the GGA Action Plan



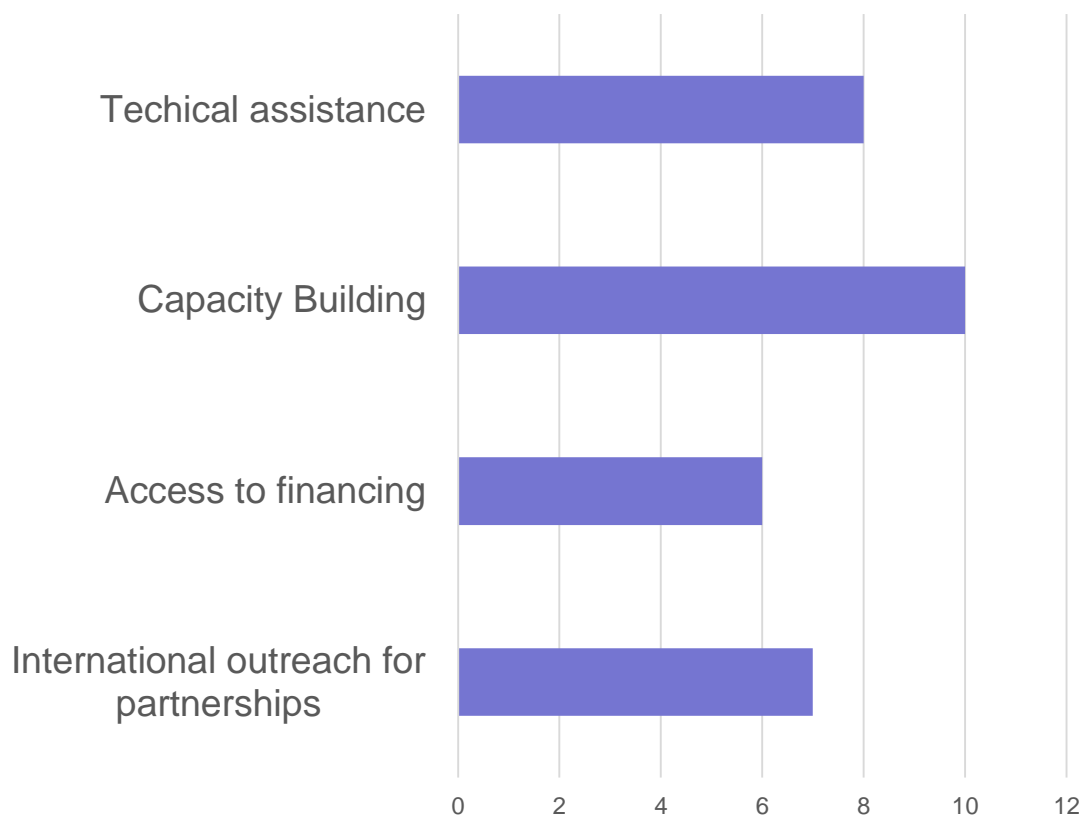
Activity proposals

Types of Applicants



- Governments
- Industry
- International Organizations

Types of Requests



Activity proposals



Global and Regional

Creation of a global guarantee fund to mitigate geothermal exploration risk

Development of a best practices guide for geothermal drilling operations

Development of global best practices for geothermal industry

Organization of a GGA event at the GEA GEOEXPO+ 2016

Caribbean:

Creation of a geothermal Centre of Excellence

North America:

Development of temperature-depth-maps

Europe:

Geothermal energy in agro-industrial sectors

Pacific:

Geothermal energy capacity building programme

Country of Activity	Proposals
Submitted / Supported by the GGA Member Country Governments	
Comoros	Access to financing for exploratory drilling of three wells in the Karthala geothermal prospect
Egypt	TA and CB for legal, financial and technical framework of the geothermal market development and development of a geothermal atlas for Egypt
Indonesia	TA and CB for the development of geothermal direct use applications
Pakistan	TA for resource assessment for geothermal power generation; access to financing for feasibility study for two sites; CB of geothermal related authorities
Papua New Guinea	TA and CB of the Mineral Resources Authority; access to financing for continuation of the geothermal resource mapping programme
Tanzania	TA and CB for a feasibility study for integrated direct use applications in Songwe geothermal prospect; access to financing for subsequent project development
Uganda	TA and CB for the enhancement of technical competence and professional capability of geothermal expertise
Uganda	TA for strengthening enabling frameworks for investment and sustained impact on fostering geothermal deployment
Zimbabwe	TA to evaluate the identified geothermal hot spring sites; access to financing for the early stage resource assessment
Submitted / Supported by the GGA Partner Institutions	
Canada	Access to financing for a pilot project for the conversion of an abandoned oil well to a geothermal well
Kenya	Access to financing for funding the corrective actions required on the two exploratory drilling wells and production wells
Namibia	Access to financing for resource assessment at Ganigobes area and advisory on further project preparations

Enrichment of the geothermal datasets



Global Atlas
FOR RENEWABLE ENERGY



IRENA
SUSTAINABLE
ENERGY MARKETPLACE

Project initiation, development and
access to financing

Project development tools
(geothermal energy component)



IRENA
PROJECT
NAVIGATOR



IRENA ADFD
Supporting energy transition

IRENA-ADFD
RE Project Financing Facility

Geothermal Technical Brief



ETSAP



IRENA

Technology Brief

IRENA Capacity Building



- **Legal and Regulatory Frameworks**
 - Peru workshop (Nov 2013)
 - Geothermal policy & regulation report
- **Technical – Environmental Licensing & Reservoir Modelling**
 - Chile workshop (May 14)
- **Finance and Risk Mitigation**
 - Colombia workshop (Sep 15)
- **Geothermal Skills Needs Assessment Methodology**

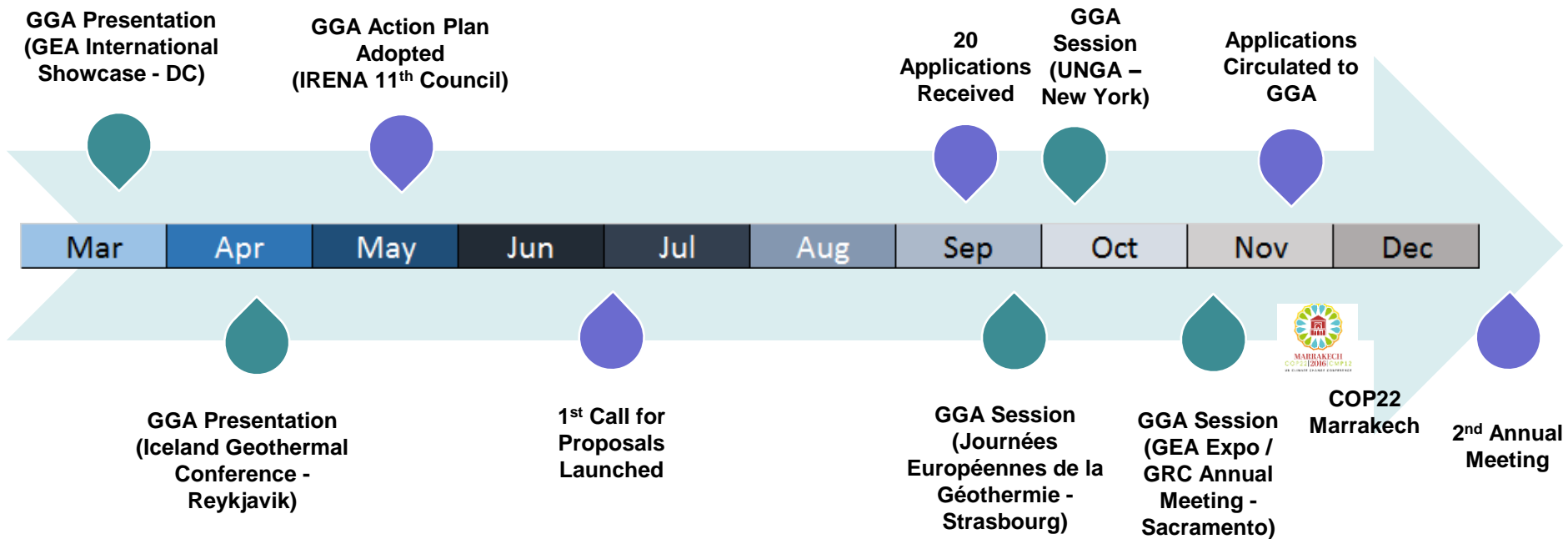
Geothermal capacity building in the Pacific

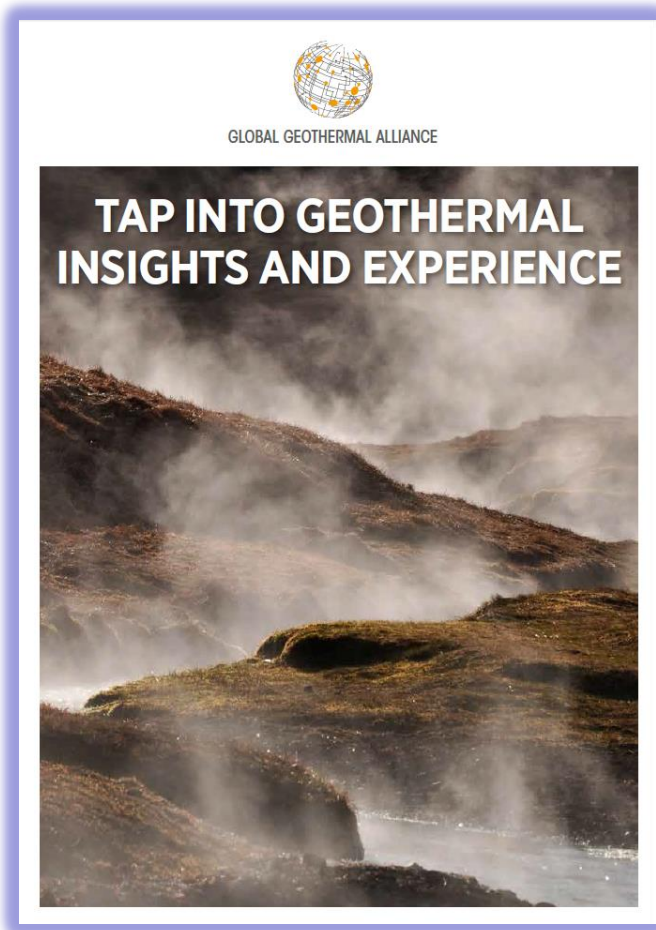
Geothermal capacity building in East Africa

Geothermal capacity building in Central America

GGA Action Plan

Action Area 4: Network and Outreach

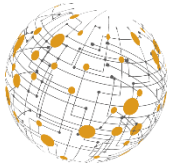




GGA website under development !

Reports Disseminated:

- Comparative Analysis of Approaches to Geothermal Resource Risk Mitigation (WB-ESMAP)
- Unlocking Renewable Energy Investment: The role of risk mitigation and structured finance (IRENA)
- Greenhouse Gases from Geothermal Power Production (WB-ESMAP)



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THANK YOU

Tim Williamson
State Department
United States of America