



# JOGMEC

An IRENA and OLADE event  
“Geothermal Development in the Andean Countries:  
Legal and Regulatory Frameworks”  
Lima PERU, 21 November, 2013

## **Overview of JOGMEC’s Geothermal Activities**

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Planning & Finance Division for Geothermal Resource Development  
Japan Oil, Gas and Metals National Corporation

## 1. Overview of JOGMEC



## 2. Geothermal Development in Japan

## 3. Financial Assistance

## 4. In Conclusion



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# 1. Overview of JOGMEC

## (1) Profile

## Japan Oil, Gas and Metals National Corporation

is a governmental organization . . . ,

Established : 29 February, 2004

Capital : JPN¥502 Billion(As of March 2013)  $\div$  US\$ 5 Billion(US\$1  $\div$  JPN¥100)

President : Hirobumi KAWANO

Employee : 514 (As of 1 April, 2013)

Head Office : Tokyo



**Head Office  
(Tokyo)**



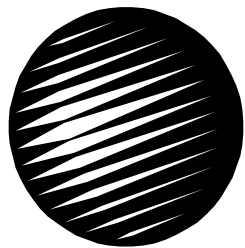
**Technology & Research Center  
(Chiba)**



**Metals Technology Center  
(Akita)**

## (2) Origin

JOGMEC was established in 2004 as a governmental organization, with succeeding functions of predecessors, JNOC and MMAJ.



**JNOC**  
Japan National Oil Corporation

(October, 1967~)



(May, 1963~)



**JOGMEC**

(February, 2004~)

# 1. Overview of JOGMEC

## (3) Mission

Securing Stable Supply of Oil, Gas and Mineral Resources for Japanese Industries and Social Activities



**Russia,  
Sakhalin I Chayvo Oil & Gas Field**



**United Arab Emirates,  
Zakum Oil field**



**Chile,  
Caserones Copper Field  
(Under F/S)**



**Marine Resource Research Vessel  
"HAKUREI"**



**Kamigotou Crude Oil Stockpile Site**



**Rare Metals Stockpile Site**



**Methane Hydrate**



**Peru,  
Pallca Zinc Field**

# 1. Overview of JOGMEC (4) Functions

## JOGMEC's existing functions



Oil & Gas Upstream Business



Oil & Gas Upstream Technology



Stockpile



Metals Strategy & Exploration



Metals Technology and  
Financial Support

## New functions from **Sept, 2012**



Geothermal Resource  
Development



Coal Development



# 1. Overview of JOGMEC

## (5) Integrated Effect



## Oil & Gas

- Knowledge
- Experience
- Relationship with Foreign Countries

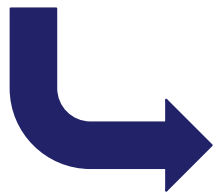
Ex. The technology used in extracting hot steam or water from subsurface is almost the same as one in extracting oil or gas from subsurface.



## Metals

- Knowledge
- Experience
- Relationship with Foreign Countries

Ex. The structure of geothermal reservoir in Japan is the same as one of mineral deposit.



## Geothermal Resource Development





## 1. Overview of JOGMEC



## 2. Geothermal Development in Japan

## 3. Financial Assistance

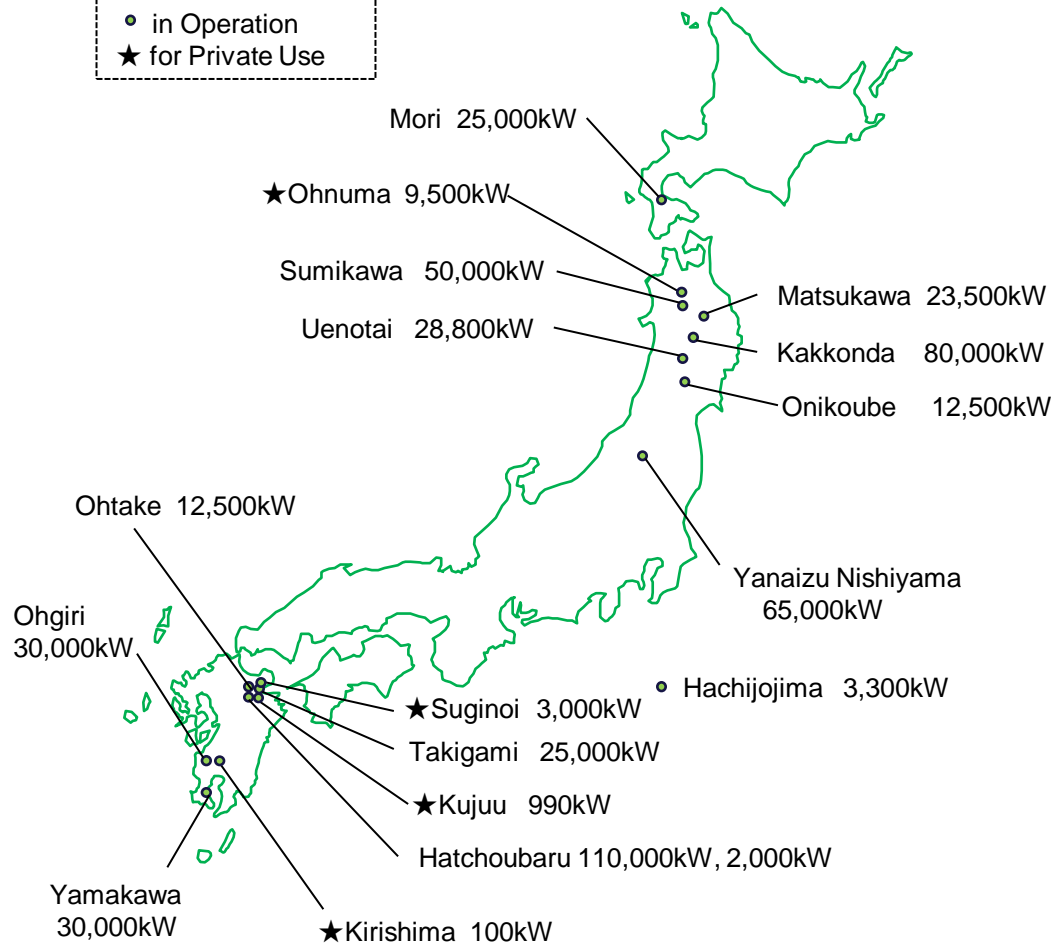
## 4. In Conclusion



# 2. Geothermal Development in Japan

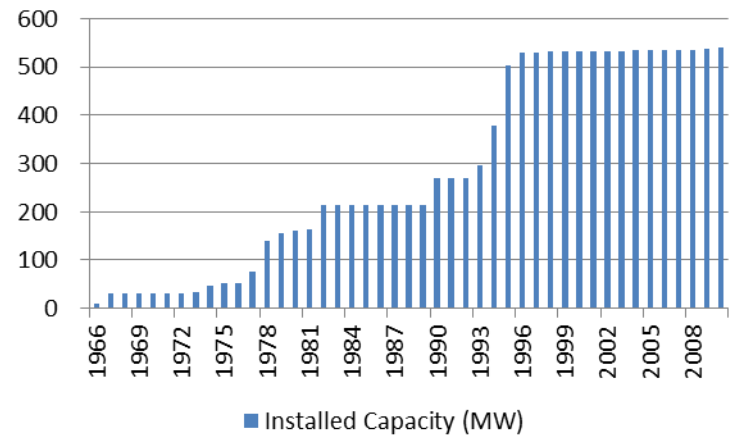
## (1) Current Condition

● in Operation  
★ for Private Use

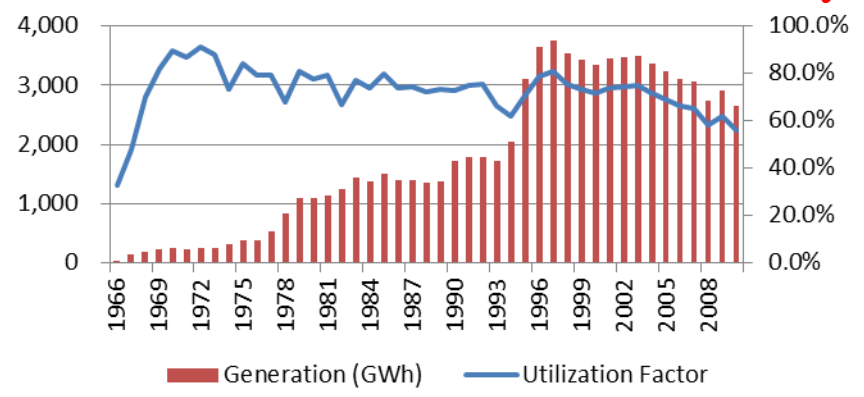


**Total Installed Capacity: 515MW (17 Plants)**

**Installed Capacity** No new addition for more than a decade



**Electricity Generated** Gradually declining over recent years



### Review of the Regulation

Sept 1974

the Environmental Agency (currently Ministry of Environment; MOE) decided **to limit** geothermal development **within the national parks to 6 sites.**

2011-2012

Commission on the impact of geothermal power on natural environment



March 2012

MOE decided **to deregulate** geothermal development **within the national parks\* conditionally.**

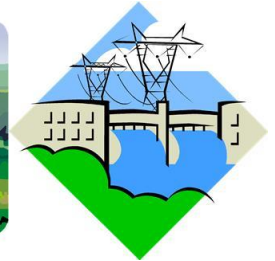
\* Excluding core areas of national parks

### Contents of Deregulation

- Geothermal development **is not allowed within core areas of national parks**. However, **survey of the surface is admitted** if it does not impede the conservation of natural environment and is restorable.

- In **other areas**, the following actions are admitted.

- **Slant drilling** from outside the park
- **Drilling and power plant construction** which is found an “excellent practice” in harmonizing both the conservation of natural environment and the development of geothermal power.
- Construction of geothermal power plants which **are small in scale** and **do not have serious impacts on scenic beauty etc.**, or construction of **binary cycle etc.**, which uses existing hot spring water.



## 1. Overview of JOGMEC



## 2. Geothermal Development in Japan

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## 3. Financial Assistance

- (1) Key Elements of Successful Geothermal Development
- (2) JOGMEC's Program
  - a. Subsidy
  - b. Equity Capital Finance
  - c. Liability Guarantees



## 3. Financial Assistance

(1) Key Elements of Successful Geothermal Development

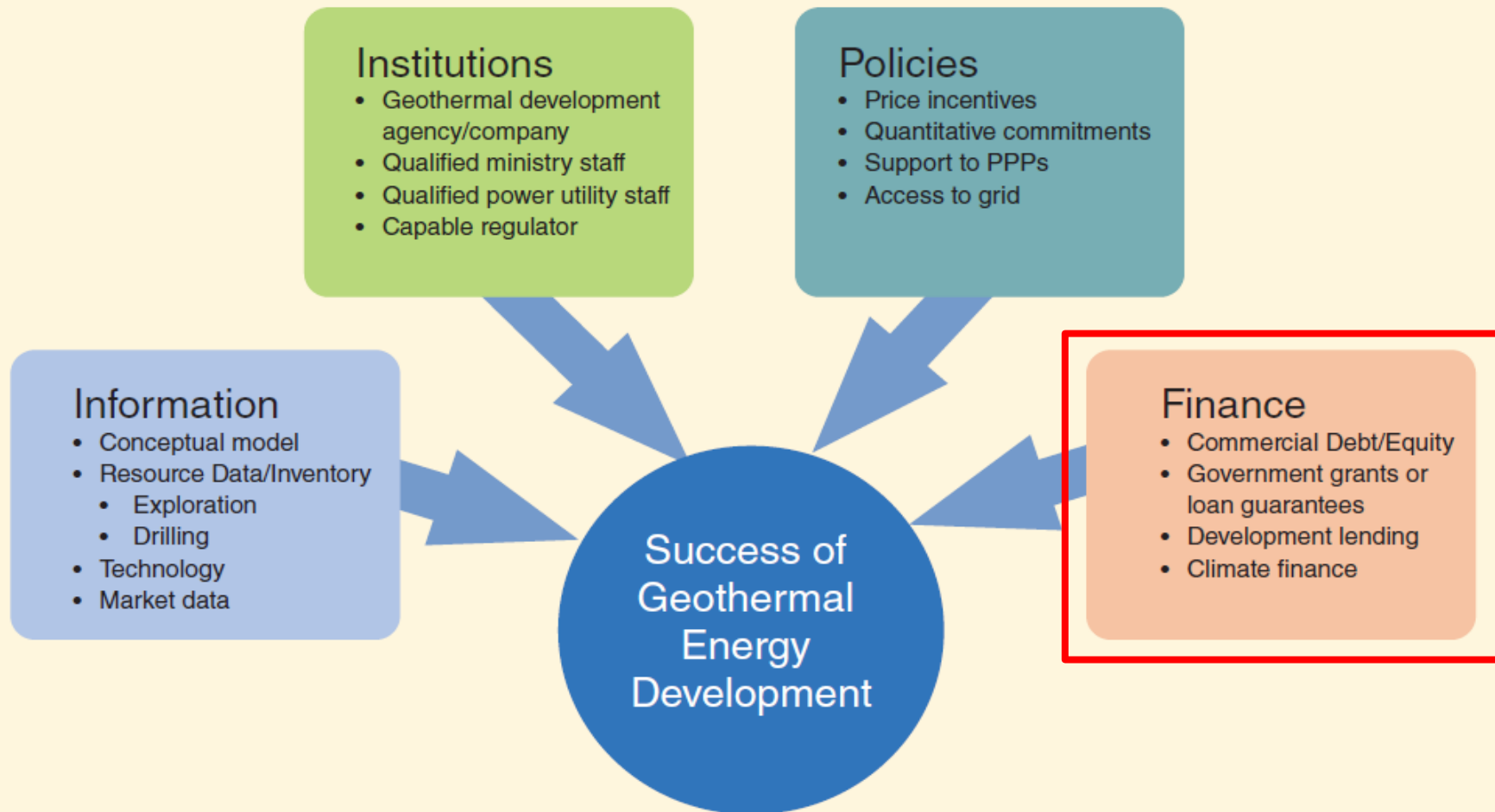
(2) JOGMEC's Program

- a. Subsidy
- b. Equity Capital Finance
- c. Liability Guarantees



# 3. Financial Assistance

## (1) Key Elements of Successful Geothermal Development



Source | Authors.

Quoted from P.75 “ESMAP Geothermal Handbook Planning and Financing Power Generation”



## 3. Financial Assistance

(1) Key Elements of Successful Geothermal Development






(2) JOGMEC's Program

- a. Subsidy
- b. Equity Capital Finance
- c. Liability Guarantees



# 3. Financial Assistance

## (2) JOGMEC's Program - Outline

Potential Survey	Exploration	EIA	Development	Operation
<ul style="list-style-type: none"> <li>- Geological Survey</li> <li>- Geophysical Exploration</li> <li>- Structural Boring</li> </ul> 	<ul style="list-style-type: none"> <li>- Drilling of Investigation Well</li> <li>- Discharge Test</li> </ul> 	<ul style="list-style-type: none"> <li>- Environmental Impact Assessment</li> </ul> 	<ul style="list-style-type: none"> <li>- Drilling of Production Well &amp; Reinjection Well</li> <li>- Construction, Start-up &amp; Commissioning of Power Plant</li> </ul> 	<ul style="list-style-type: none"> <li>- Commercial Operation</li> </ul> <p>Hatchobaru (Oita)</p> 

Resource Risk

### Financial Assistance provided by JOGMEC

<p><b>Subsidy</b></p> <ul style="list-style-type: none"> <li>- Up to 50%~100%* of necessary funds (* depends on terms and conditions)</li> </ul>	<p><b>Equity Capital Finance</b></p> <ul style="list-style-type: none"> <li>- Up to 50% of equity capital (JOGMEC is not allowed to be the largest shareholder.)</li> </ul>	<p><b>Liability Guarantees</b></p> <ul style="list-style-type: none"> <li>- Up to 80% of loan provided by financial institution/s</li> </ul>
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# 3. Financial Assistance

## (2) JOGMEC's Program a. Subsidy

### Potential Survey

- Geological Survey
- Geophysical Exploration
- Structural Boring



### Subsidy

- Up to 50%~100%\* of necessary funds (\* depends on terms and conditions)

Government  
(METI, MOF)

Budget FY2013  
¥7,500 million

JOGMEC

Private Geothermal  
Companies

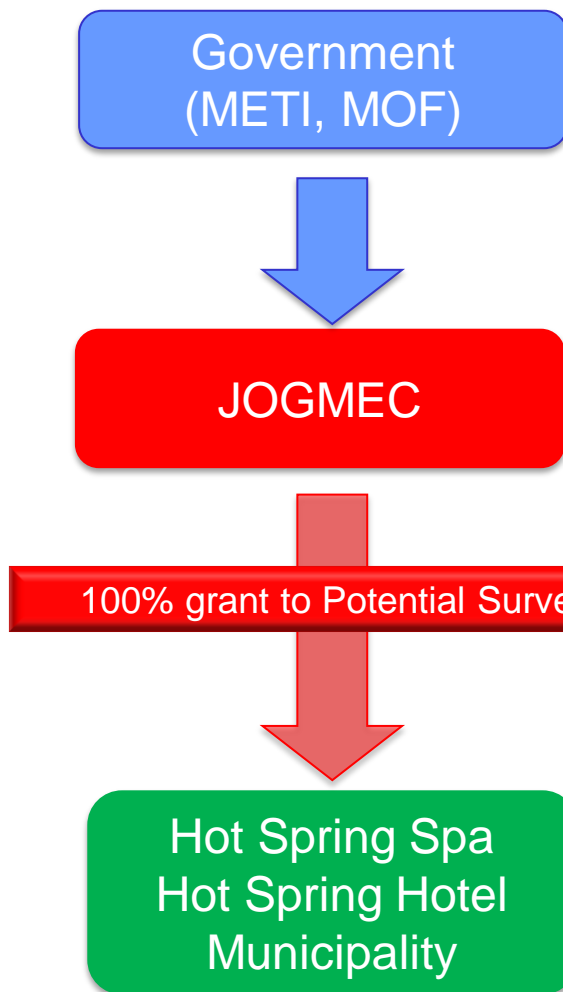
<JOGMEC's Screening>

- Geothermal Potential
- Approval & License
- Harmony with Local Community

# 3. Financial Assistance

## (2) JOGMEC's Program a. Subsidy

### Subsidy for promoting public understanding(Hot Spring Businesses)



Hot Spring Resort

: Objection to Geothermal Developments  
Due to large concern about lack of their hot spring

Try to let them understand what it is like.

⇒ in order to boost large scale of geothermal projects

# 3. Financial Assistance

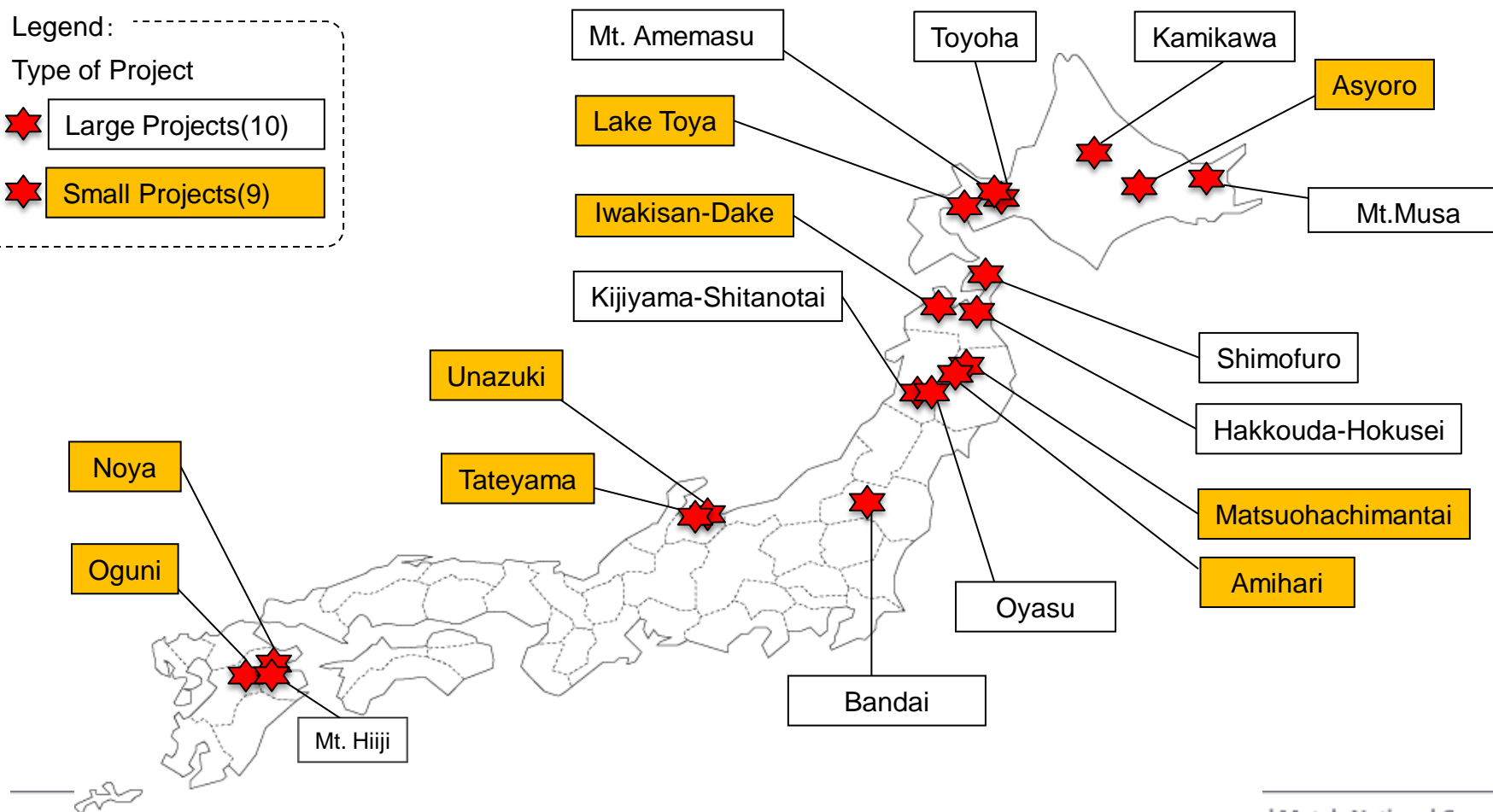
## (2) JOGMEC's Program a. Subsidy

### 19 Projects subsidized by JOGMEC in Fiscal 2013, as of 5 November, 2013

Legend:

Type of Project

- ★ Large Projects(10)
- ★ Small Projects(9)



# 3. Financial Assistance

## (2) JOGMEC's Program b. Equity Capital Finance

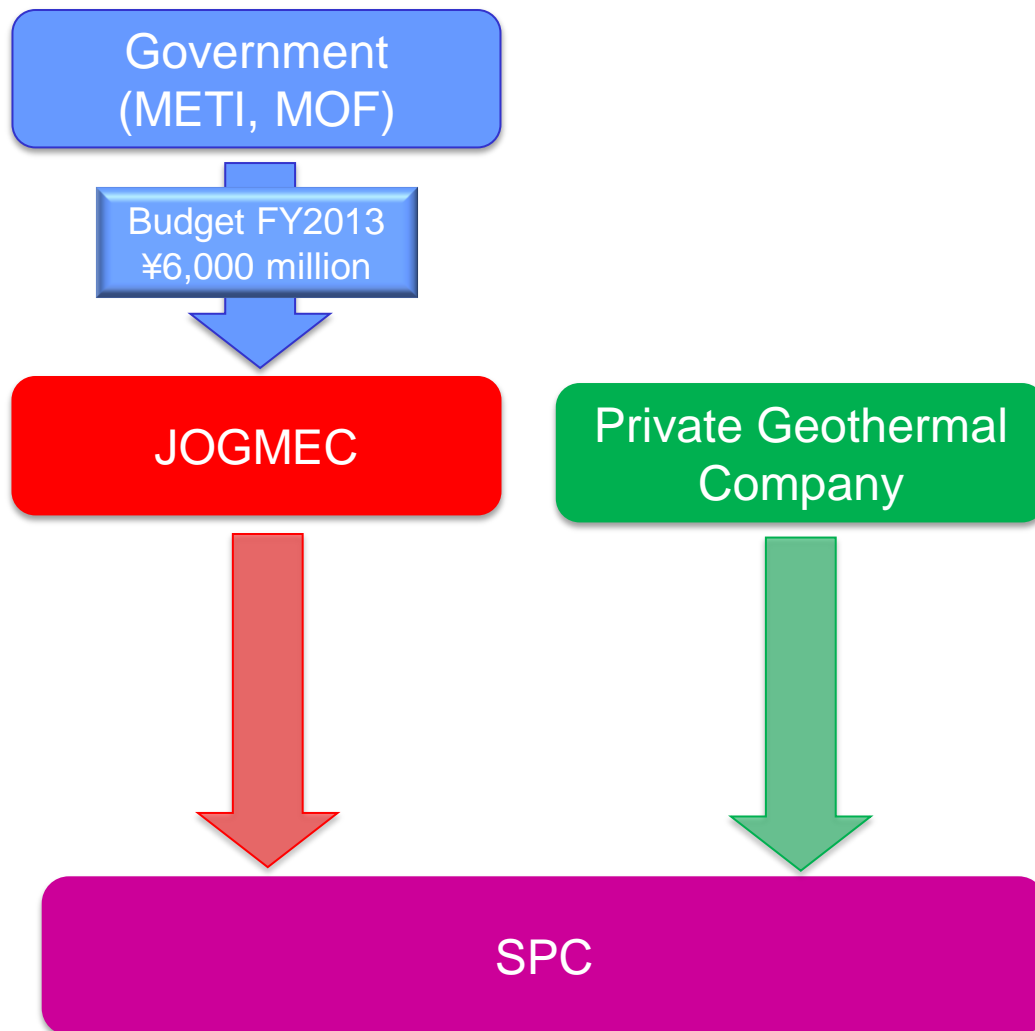
### Exploration

- Drilling of Investigation Well
- Discharge Test



### Equity Capital Finance

- Up to 50% of equity capital
- (JOGMEC is not allowed to be the largest shareholder.)



# 3. Financial Assistance

## (2) JOGMEC's Program

## c. Liability Guarantees



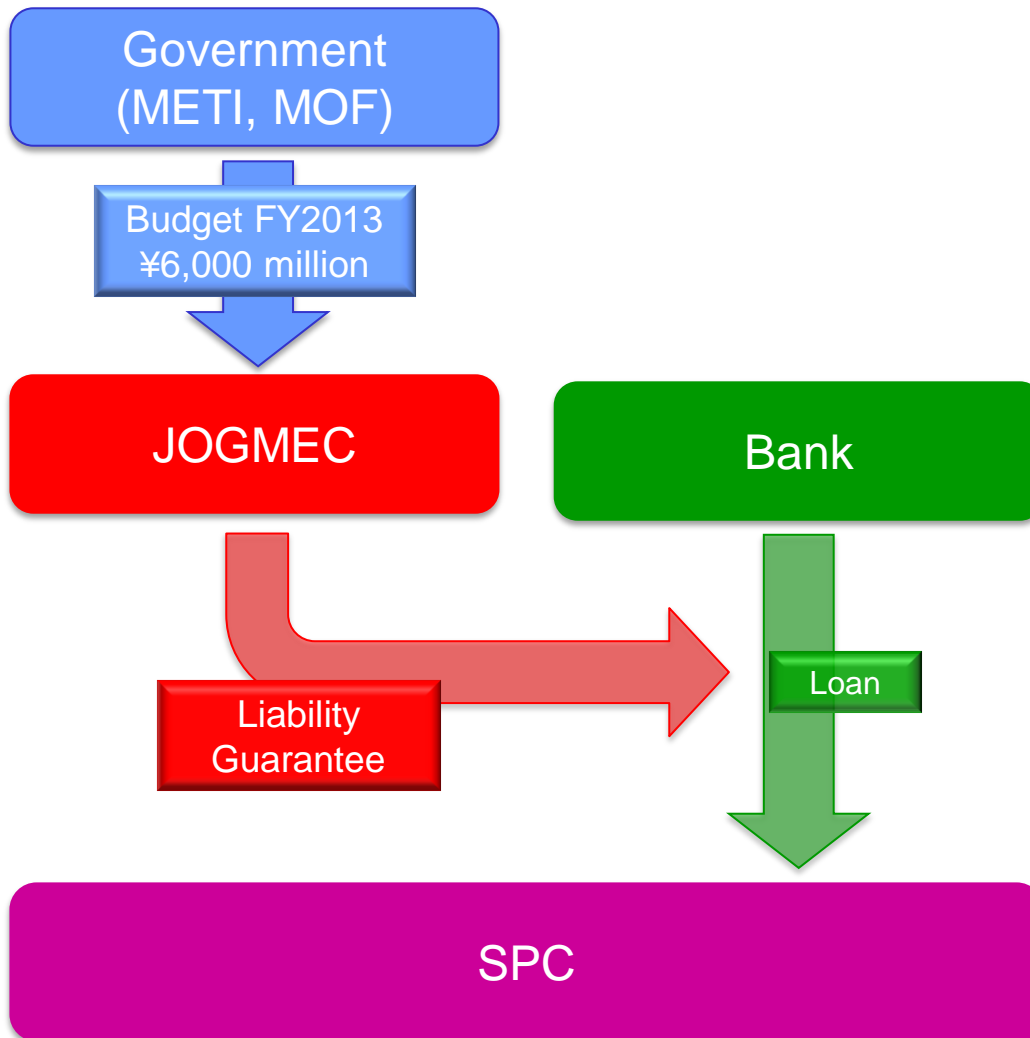
### Development

- Drilling of Production Well & Reinjection Well
- Construction, Start-up & Commissioning of Power Plant



### Liability Guarantees

- Up to 80% of loan provided by financial institution/s



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# 4. In Conclusion

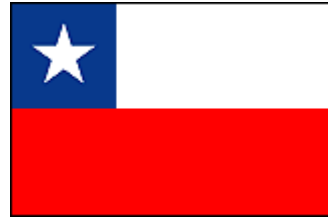
## In case of Geothermal Resource Development in Japan...

Problem to be solved	Solution
<p><b>1. Exploration &amp; Production Businesses</b></p> <p>(1)High Risks in subsurface            (2)Long lead time from initial survey to operation            (3)Investment to supply continuous stable steam            (4)Power Lines to transmit Electricity</p>	<p>(1)Feed-in Tariff</p> <hr/> <p>(2)Subsidy(★)            (3)Equity Capital Finance(★)            (4)Liability Guarantees(★)</p> <p>(5) Technology &amp; Research Development(★)</p>
<p><b>2. Volcanic Region Location</b></p> <p>(1)In the National Parks            (2)Near the Hot Spring Resorts            ...Harmonizing with local communities and the environment</p>	<p>(6)Deregulation, Permission for the construction in the National Parks</p> <hr/> <p>(7)Working to increase public awareness of geothermal resource development(★)</p>

(★)JOGMEC’s support program

## What is your problem and solution to accelerate for the Geothermal Resource Development in the Andean Countries??

# Today's Agenda



**Thank you for your attention.  
Muchas Gracias!!**

