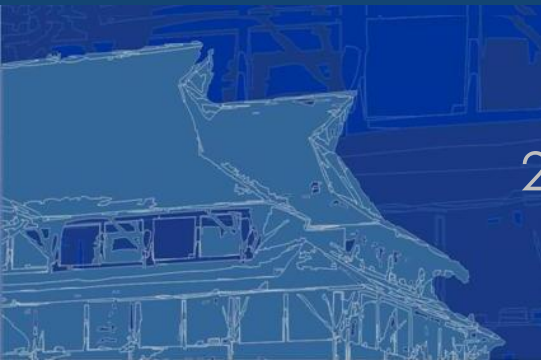




CHALLENGES OF CAPACITY BUILDING IN GEOTHERMAL DEVELOPMENT

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7th BMBF Forum for Sustainability
2 – 4 November 2010, Axica, Berlin



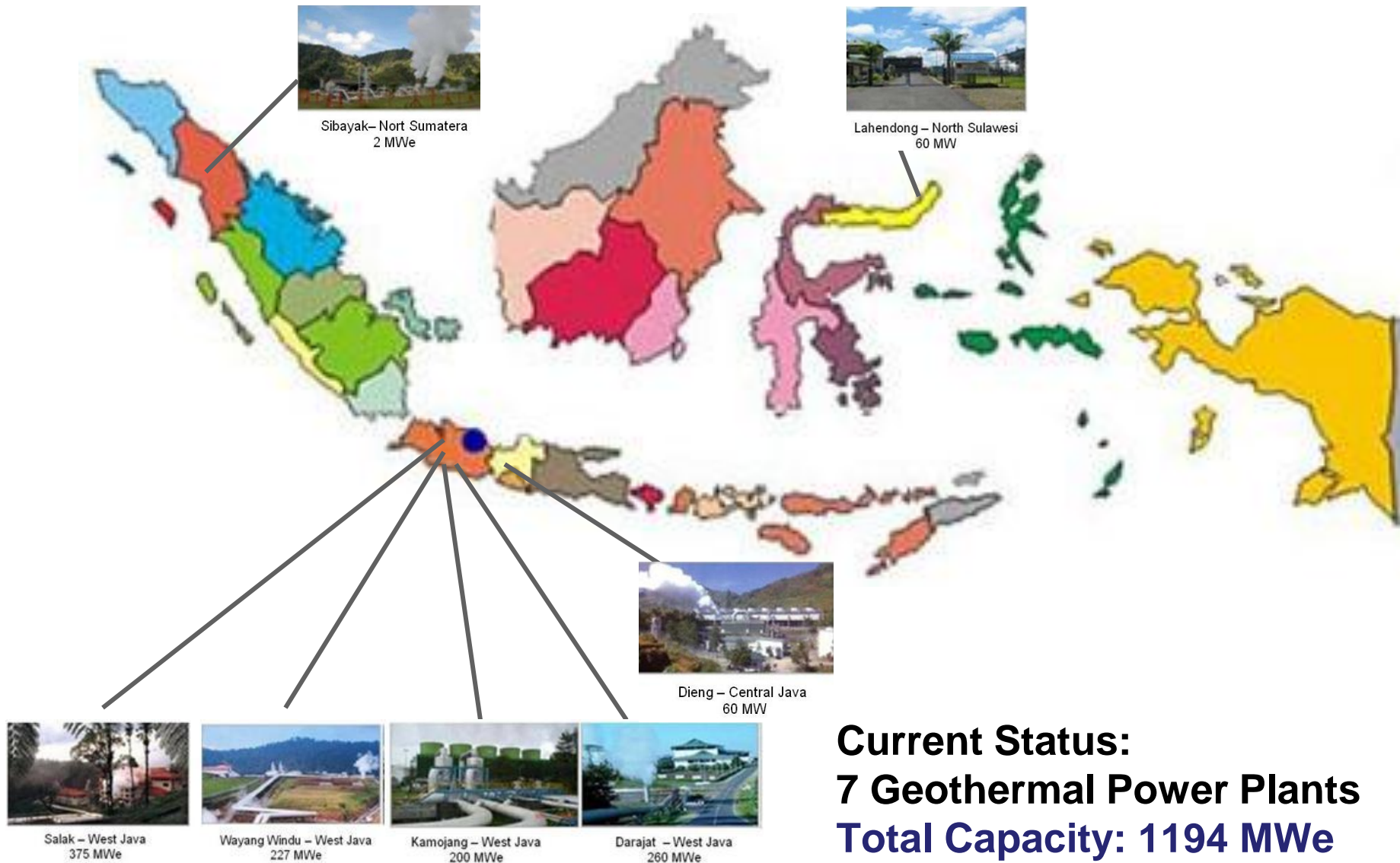
Geothermal Energy in Indonesia

265 geothermal prospects area has been identified in Indonesia

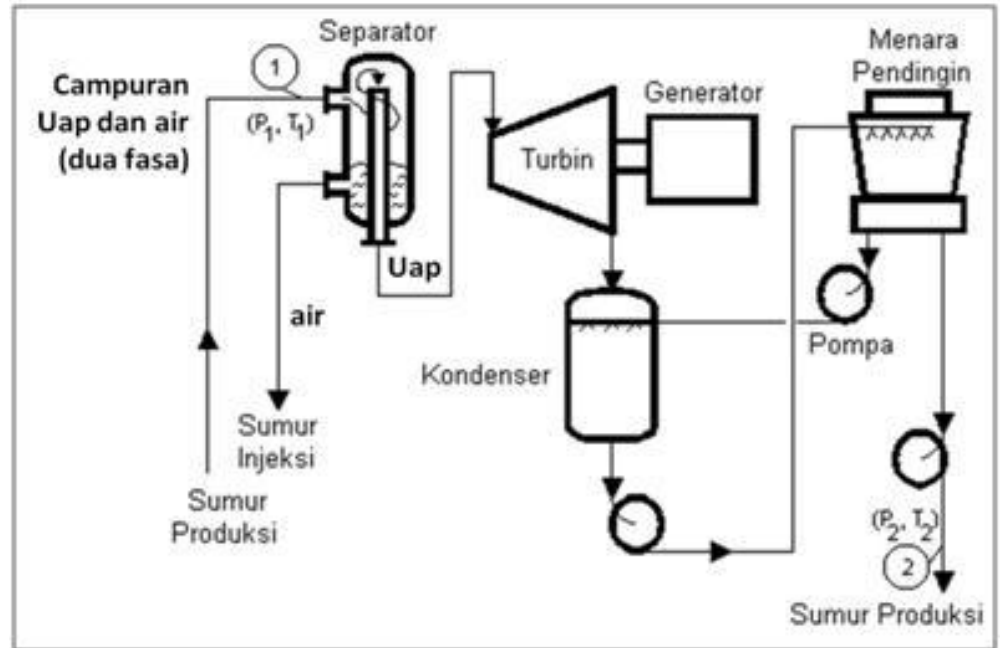
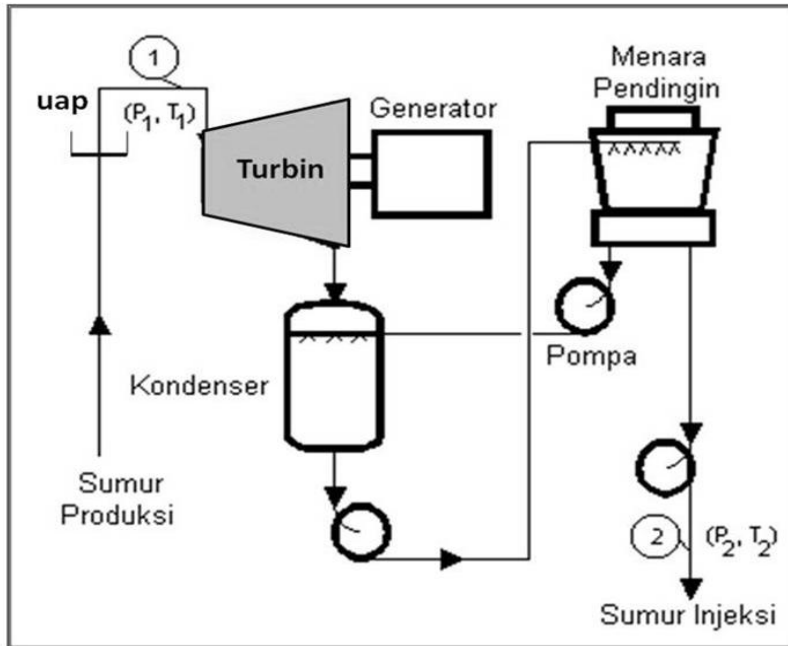


- Mostly hydrothermal system, high temperature ($>225^{\circ}\text{C}$), very suitable for electricity generation,
- Potential of geothermal energy is estimated at 28,170 MW, including 14,730 MW reserve, with proven of 2,288 MW, probable of 1,050 MW and possible of 11,392 MW (Setiawan, 2009).

Geothermal Energy Development in Indonesia



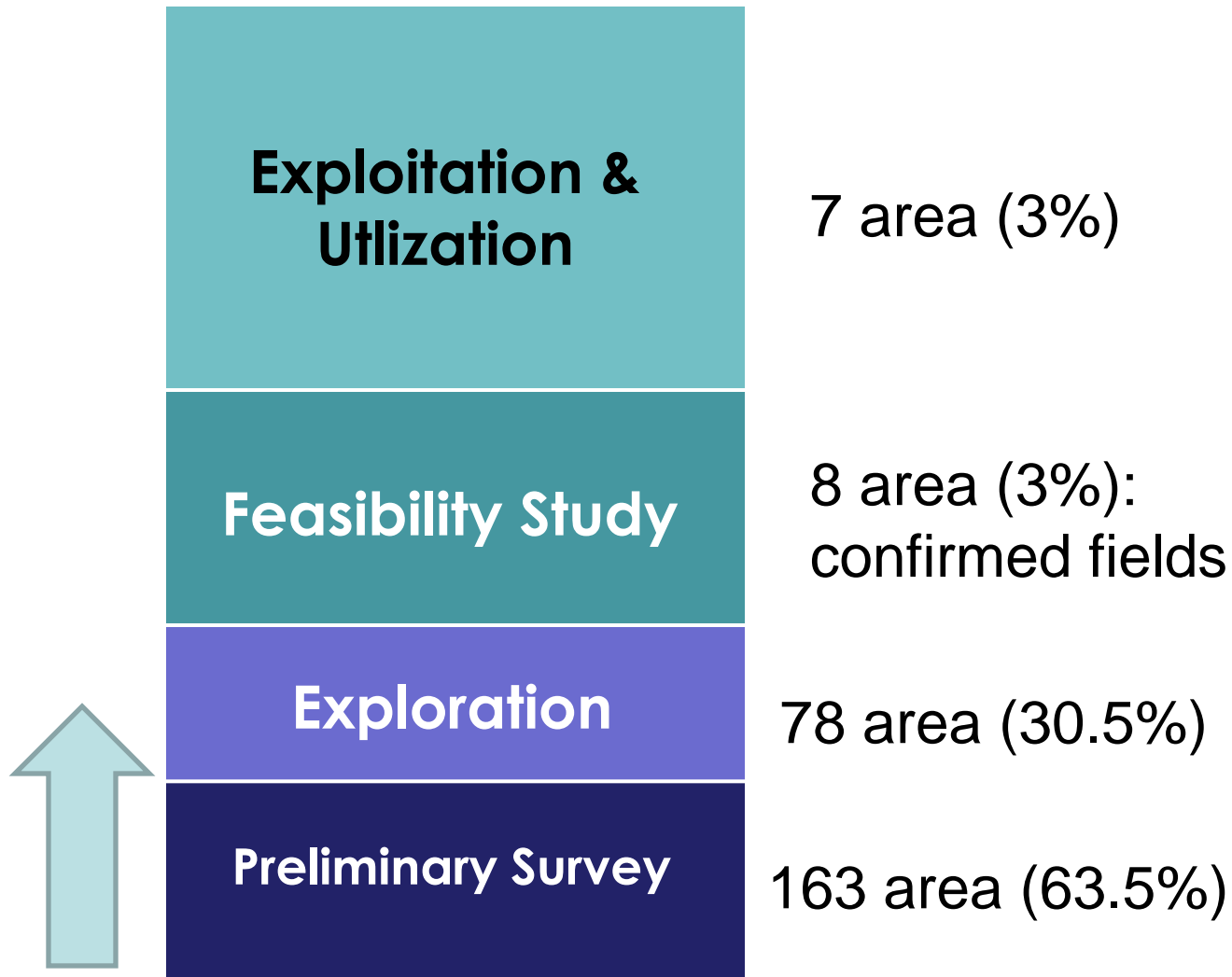
Conversion Technology



Direct Dry Steam Cycle
@ Kamojang and Darajat

Separated Steam Cycle
@ Gn Salak, Wayang Windu,
Lahendong, Dieng, Sibayak

Geothermal Energy Development in Indonesia



Geothermal Development Plan



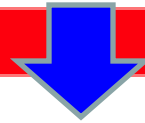
Area	Additional Capacity (MW), Year					Total Additional Capacity (MW), year 2014
	2010	2011	2012	2013	2014	
Jawa Bali	5	-	330	445	1240	2137
Other Islands	65	158	698	295	1380	2596
Indonesia	70	158	1028	740	2620	4733

(Source: Praptono, 2009)

Montty Girianna (BAPPENAS - INDONESIA, 2009):

- The program will reduce CO2 equivalent to 82 million ton annually
- Assuming a plant load factor of 90%, and a cost for coal of US\$55/ton, economic gain to the Government is estimated to be US\$740 million annually

15 Geothermal Working Area



10 Geothermal Projects until 2014,
Additional Capacity 1070.5 MW



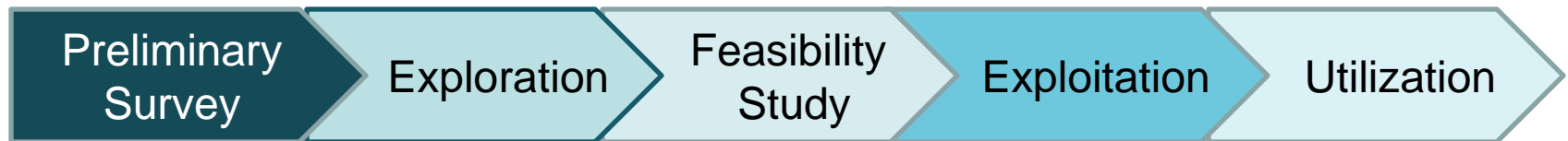
OTHER GEOTHERMAL AREAS WILL BE EXPLORED AND DEVELOPED UNTIL 2014



Additional Capacity (MW), including Pertamina's Project, Year				
2010	2011	2012	2013	2014
70	158	1028	740	2620

Challenges of Capacity Building in Geothermal Development

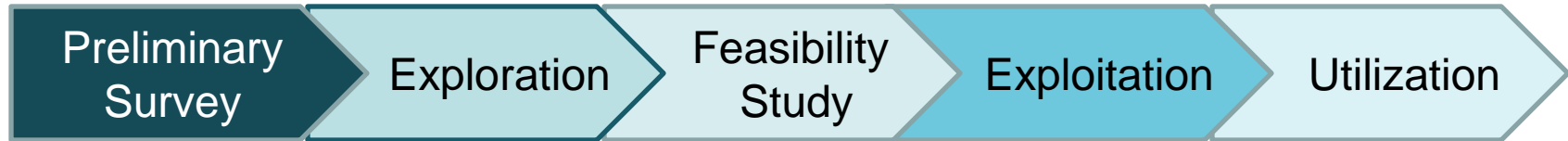
1. Human Resources Development: to increase the capacity of available professional manpower in the geothermal sector in Indonesia



2. Organizational or Institution Development: to enable institutions to enhance their capacities in providing geothermal education, trainings, short courses and researches



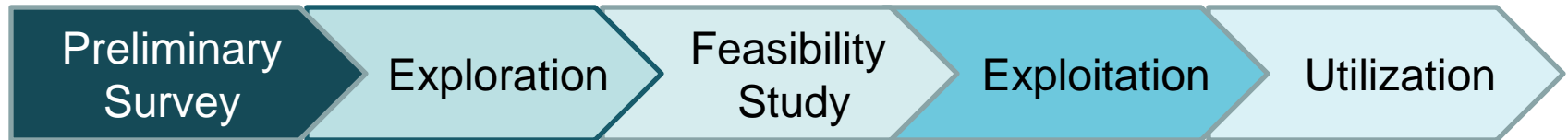
Challenges of Capacity Building in Geothermal Development



3. Researches Program > To sustain current geothermal production, to reduce risk in the development of new fields and to increase efficiency of geothermal fluid utilization
- Exploration Studies
 - Reservoir Engineering Studies
 - Power Plant Utilization Studies



Challenges of Capacity Building in Geothermal Development



4. Forest and Environmental Management
5. Geothermal Disaster Mitigation
6. Geothermal Data System Development





Thank You

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