



The World Bank's Program of Support for
Geothermal Renewable Energy Development in Indonesia

PSLO ENERGY SECTOR MISSION

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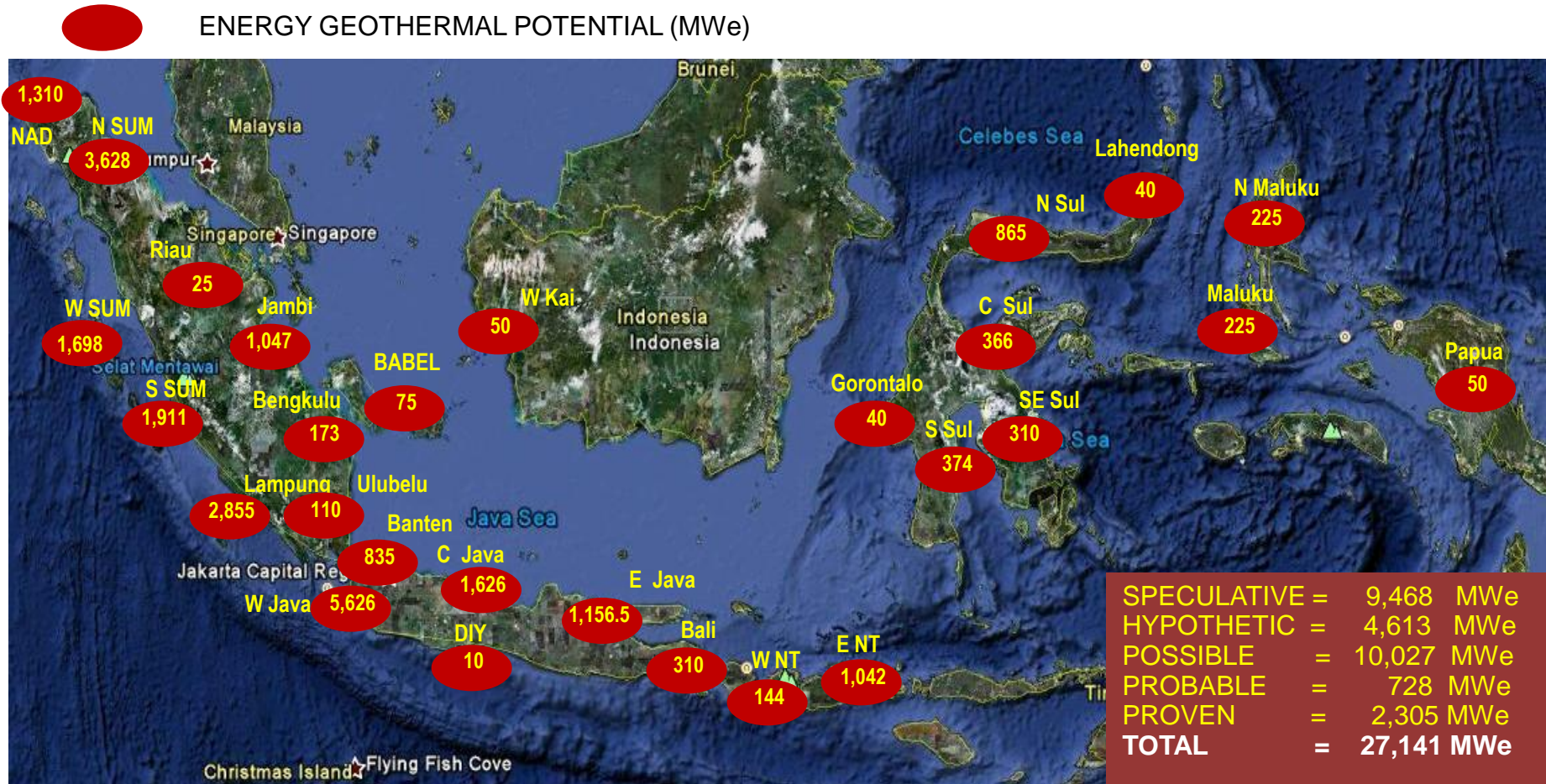
THE WORLD BANK



Sector Background



Indonesia's World Leading Geothermal Prospects



Second 10,000 MW “Crash” Program includes 40% geothermal by 2014/15

Geothermal is ideal Non-Intermittent Renewable Option for Improving Base Load Mix

I. ENVIRONMENT BENEFITS OF UTILIZING CLEAN ENERGY SOURCE

- Reduction in harmful local pollutants (such as TSP, NOx, SO2)
- Reduction in Greenhouse Gases (GHGs)

II. ENERGY SECURITY BY UTILIZING ABUNDANT NATIONAL RESOURCE

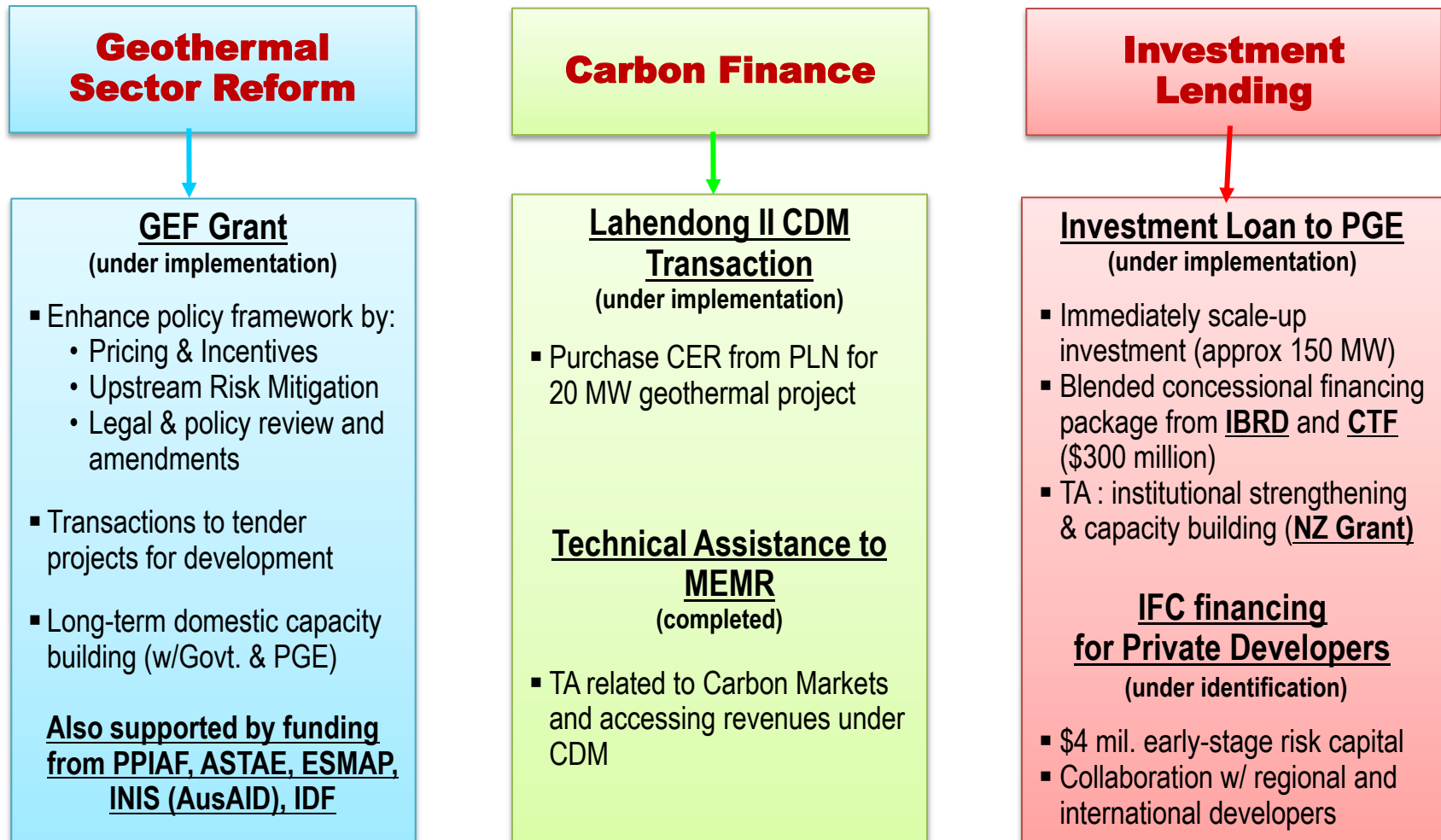
- Enhance energy security by exploiting dependable indigenous (non-tradable) resource

III. HEDGE AGAINST VOLATILE PRICES FOR FOSSIL-FUELS

- Geothermal “fuel” price does not fluctuate (once developed) unlike fossil fuels, providing a natural hedge in managing Indonesia’s energy portfolio

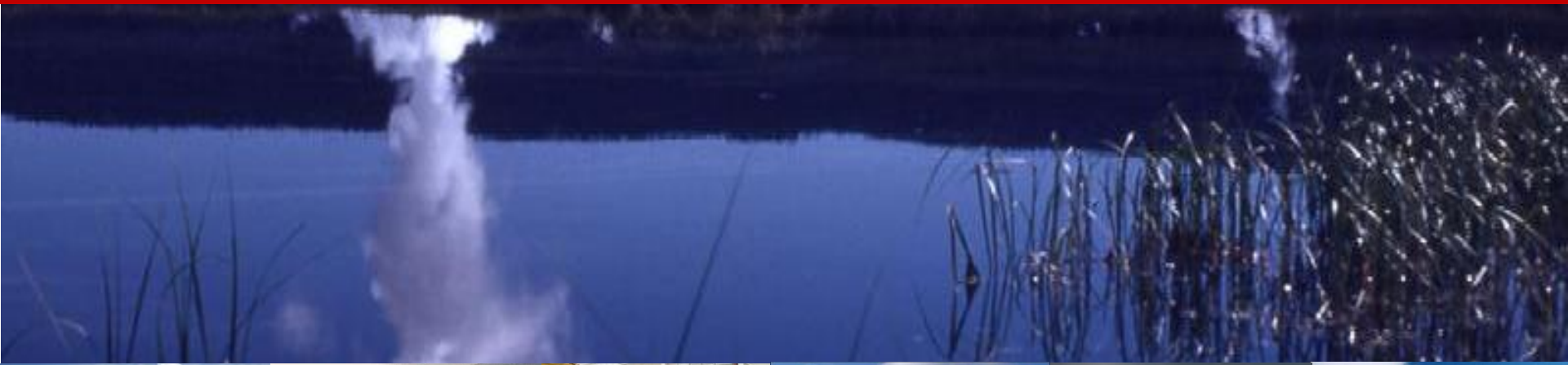
No.	Major Islands	Geothermal Potential (MW)	
		Speculative /Hypothetic	Probable (w/ detailed surveys)
1	Java	9,471	3,086
2	Bali & NT	1,676	871
3	Sumatra	13,258	5,433
4	Kalimantan	45	-
5	Sulawesi	1,907	721
6	Maluku	734	142
7	Papua	50	-
TOTAL		27,141	10,253

World Bank Group Support to Indonesia Geothermal Development Program





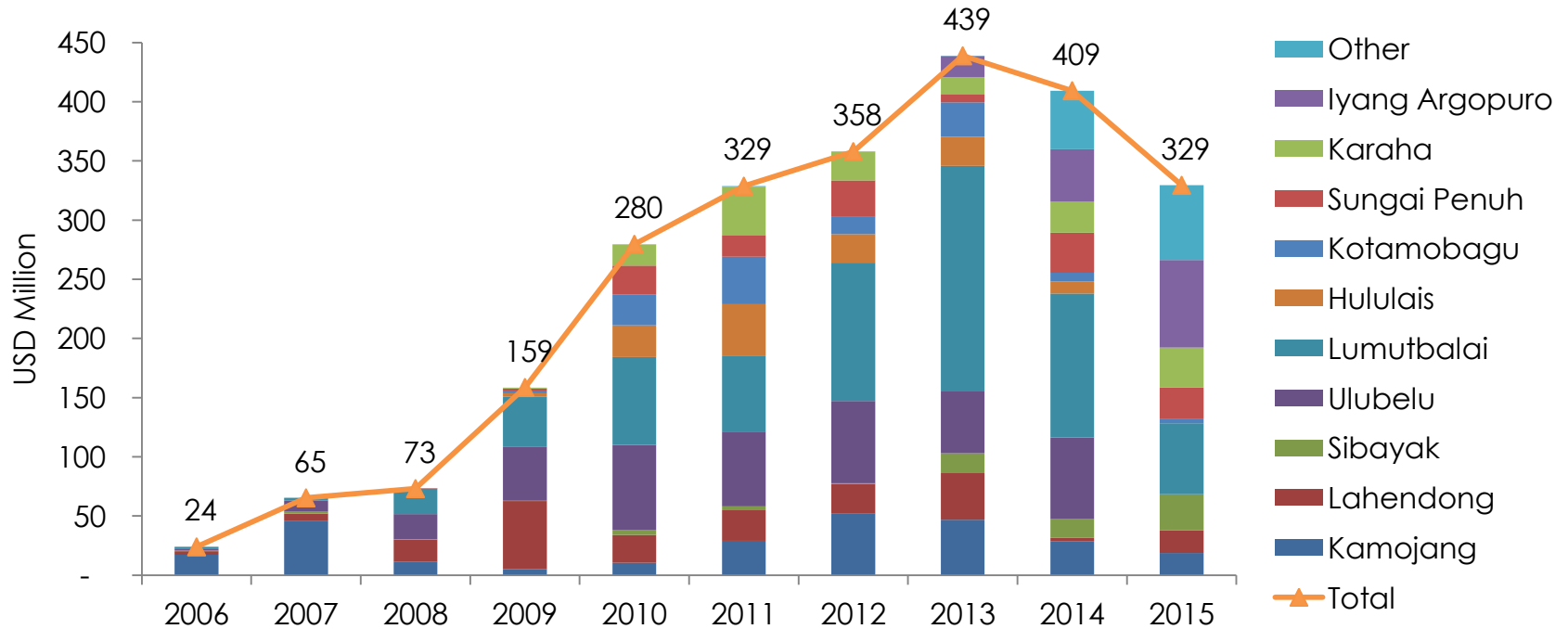
Pertamina Geothermal Energy (PGE): Geothermal Clean Energy Investment Project



PGE Undertaking Globally Unprecedented Scale-Up of 1,000 MW



Capital Expansion Program



Cumulative Capacity (MW)

172	172	252	272	272	292	402	832	1,092	1,322
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Proposed Project Description

IBRD/CTF Loans to PGE

Increase renewable geothermal generation capacity and mitigate impact of local and global pollution

Project Component

**Investment in Geothermal Power Generation Capacity
(US\$574.7 million)**

- Investment in drilling, SAGS, and Power Plants
- Ulubelu (Units 3 & 4) – approximately 110 MW
- Lahendong (Tompasso) (Units 5 & 6) – approximately 40 MW

Financing

- **Pertamina/PGE own funds: \$ 274.7 million, equity return of 14%**
- **IBRD: \$175 million, LIBOR + 0.48%, 9 yr grace, 24.5 year tenor**
- **CTF: \$125 million, 0.25%, 10 year grace, 40 year tenor**

- *Already mobilized \$2.5 million grant from Dutch for project preparation and capacity building (FS, ESIA, FEED, + training)*
- *Finalizing grant from the Government of New Zealand for additional capacity building support*



TA for Capacity Building

Components	Content	Estimated Cost (US\$)
1. Technical Collaboration Partnership	LT/ST Expertise Knowledge transfer	3,100,000
2. Training and Expertise Development	Focus on FX specialized courses	1,250,000
3. Capacity Building of PIU	Meet urgent local staffing needs	255,000
4. Upgrade IT	Acquisition of software for efficient use of resources	370,000
5. Preparation of New Investments	FEED Ulubelu/Lahendong Prep new investment	1,900,000
Total		6,875,000



Project Impact and Transformational Potential

Key Indicators	CTF/IBRD Project	PGE's Scale-Up Program	Government Long-Term Program
New geothermal power generation capacity	150 MW	1,000 MW	9,500 MW
Additional power generation (kWh per year)	1,209 million	8,059 million	76,562 million
Avoided CO ₂ - tonnes per year - lifetime (tonnes/30 years)	1.1 million 33 million	7.3 million; 219 million	69.5 million; 2,085 million
Environmental co-benefits in terms of avoided local pollution (tonnes per year)	NOx - 3,000; SO ₂ - 5,400; TSP - 2,500	NOx - 20,100; SO ₂ - 36,000; TSP - 17,500	NOx - 191,400; SO ₂ - 342,200; TSP - 161,500
Public health benefits from avoided local pollution	US\$45 million	US\$300 million	US\$ 2,850 million

Thank You

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