A GLIMPSE of Geothermal Energy in Indonesia

INTRODUCTION

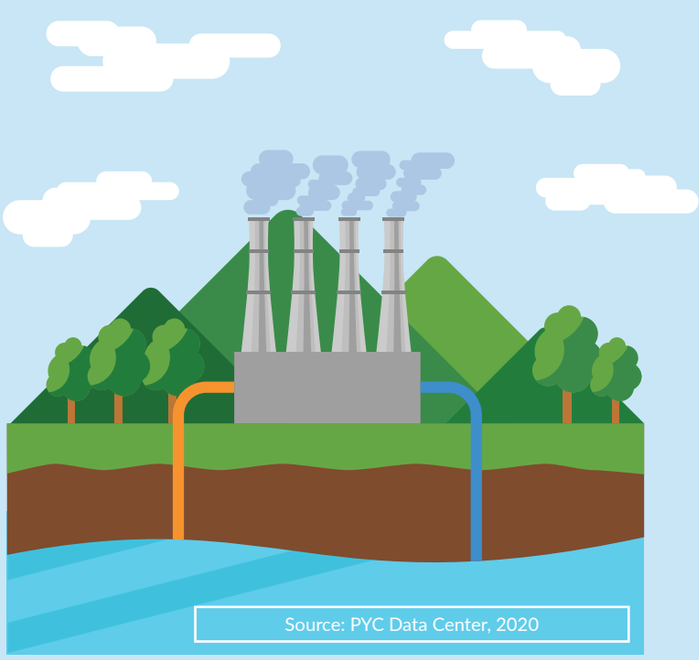
Indonesia has the second-largest geothermal energy resource in the world following the United States, with the potential of 23,965 megawatts (MW) (ThinkGeoEnergy, 2020). In 2020, the installed geothermal power capacity in Indonesia was 2,130.7 MW (MEMR, 2020).

Geothermal energy development will provide massive support in achieving the government's target of 23% renewable energy mix by 2025. It will require contributions from geothermal energy of about 7% or equal to 7,000 MW, with approximately a total investment of USD 35 billion (World Bank, 2019).

This infographic highlights the geothermal energy resources and reserves and its utilization for the electricity sector in Indonesia.

POTENTIAL RESOURCES and RESERVES

Total Geothermal Potential Resources and Reserves

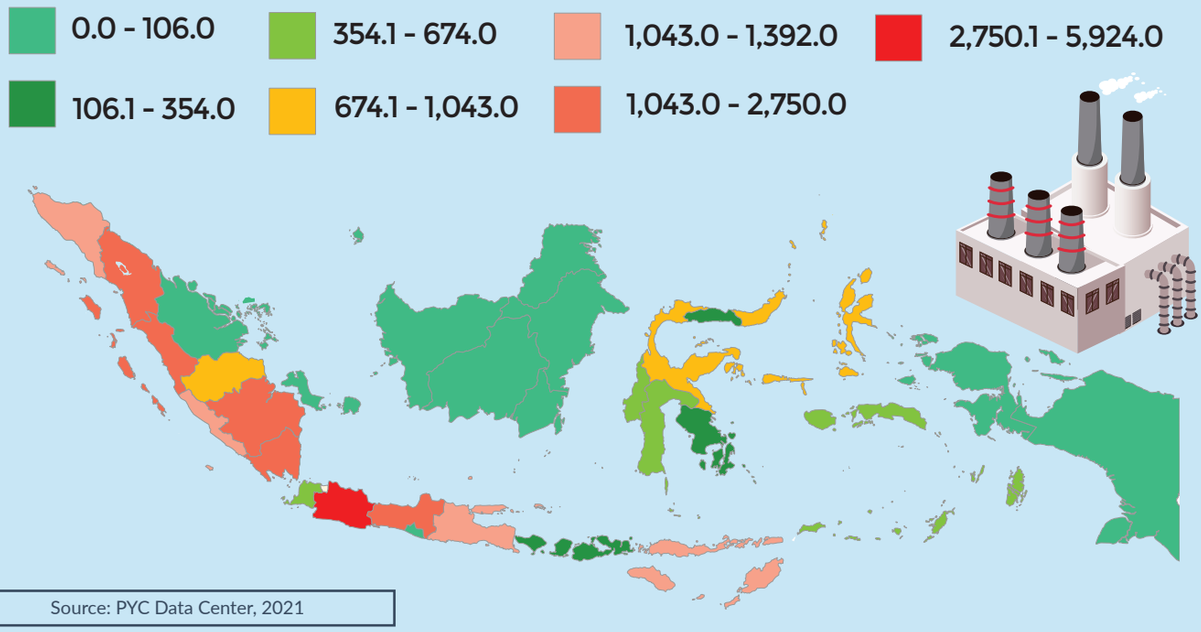


Source: PYC Data Center, 2020

Compiled from various sources by PYC research team.

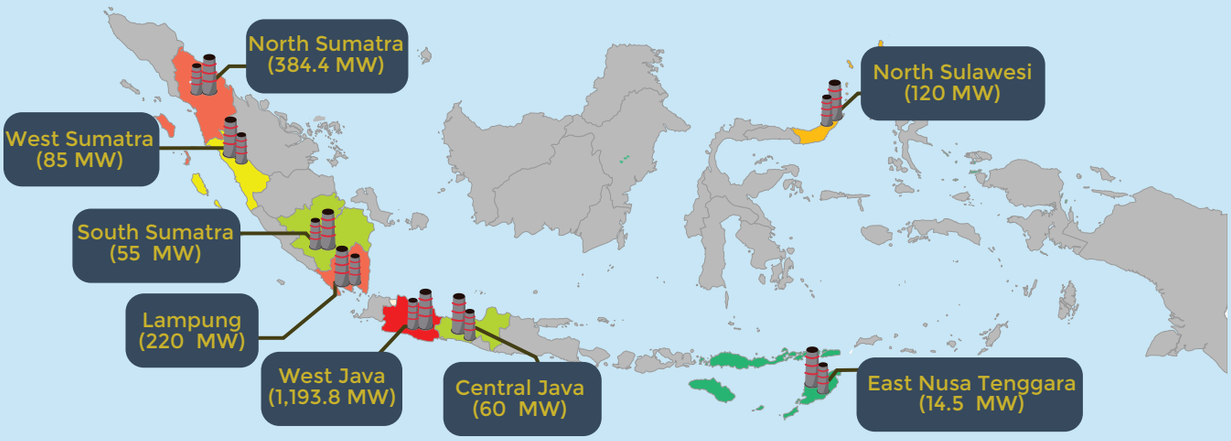
https://www.purnomoyusgiantorocenter.org

GEOTHERMAL POTENTIAL RESOURCES and RESERVES in INDONESIA (MW)



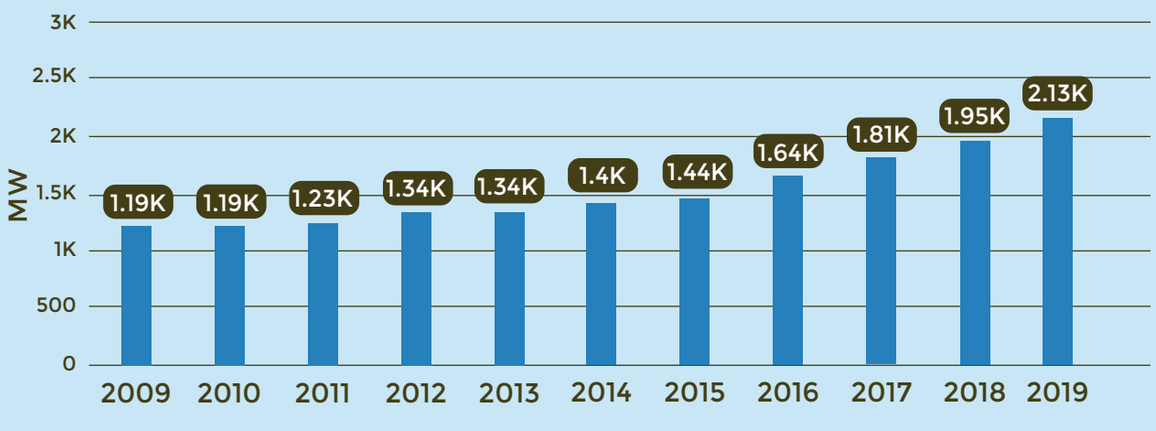
Source: PYC Data Center, 2021

GEOTHERMAL POWER PLANT



Source: PYC Data Center, 2020

GROWTH of GEOTHERMAL POWER PLANT INSTALLED CAPACITY



Source: PYC Data Center, 2020

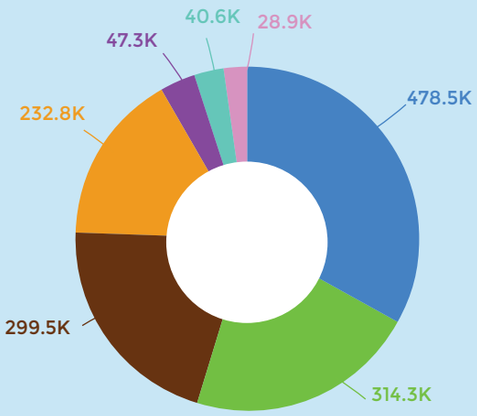
GEOTHERMAL EXPLORATION PROGRAM by GOVERNMENT

Prospect Area	Status	Resource	Planning
Cisolok Cisukarame, West Java	WKP	45 MW	20 MW
Ciremai, West Java	WKP	60 MW	55MW
Gunung Endut, Banten	WKP	180 MW	40 MW
Tampomas, West Java	WKP	100 MW	45 MW
Guci, Central Java	WKP	100 MW	55 MW
Gunung Galunggung, West Java	WKP	289 MW	110 MW
Papandayan, West Java	WT	195 MW	40 MW
Bittuang, South Sulawesi	WT	28 MW	20 MW
Bora Polu, Central Sulawesi	WKP	123 MW	40MW
Marana, North Sulawesi	WKP	70 MW	20 MW
Limbong, South Sulawesi	WT	20 MW	5 MW
Maritaing, East Nusa Tenggara	WT	190 MW	30 MW
Sambulan, West Nusa Tenggara	WKP	100 MW	20MW
Nage, East Nusa Tenggara	WKP	39 MW	20 MW
Banda Baru, Maluku	WT	54 MW	40 MW
Jailolo, North Maluku	WKP	75 MW	30MW
Sipoholon Ria-Ria, North Sumatera	WKP	60 MW	20 MW
Gunung Batur Kintamani, Bali	WT	58 MW	40 MW
Sajau, North Kalimantan	WT	17 MW	13 MW
Lokop, Aceh	WT	41 MW	20 MW

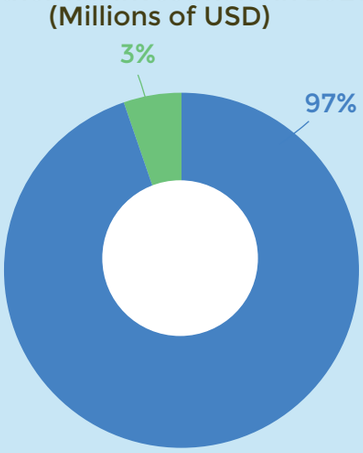
Source: MEMR, 2020

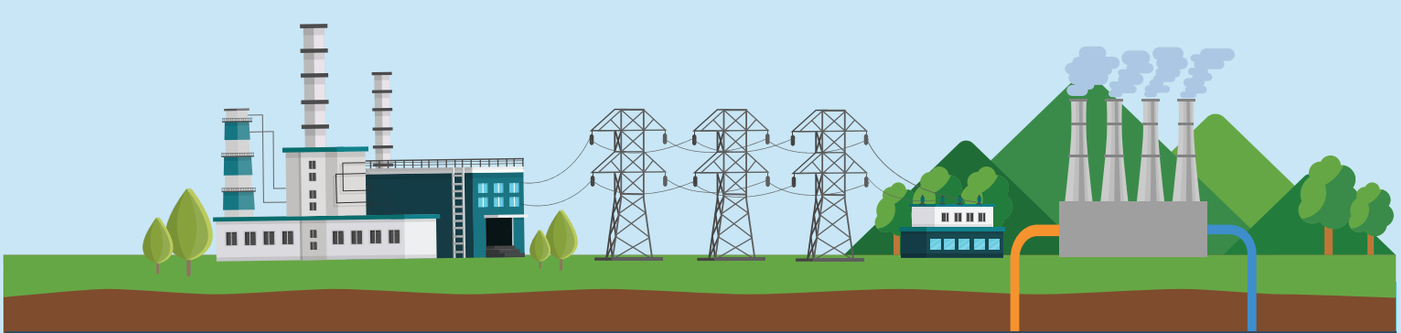
INVESTMENT and REVENUE

Non-Tax Revenue from Geothermal Working Area in 2019 (Millions of USD)



Geothermal Investment in 2020 (Millions of USD)





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Challenges

1. The majority of the geothermal potential is located in a conservation area that could be a major clash with UNESCO state of conservation.
2. Low electricity price. Meanwhile, business individuals expected high IRR off up to 16% (MEMR, 2020).
3. Rejection from the community regarding environmental, customary land or ancestral land, and cultural traditions issues.
4. The majority of geothermal developers have limited funding capacity and funding option for high-cost exploration activities.
5. Geothermal power plant project is categorized as a high-risk nvestment due to the complexities in each development step, especially in survey, exploration and drilling.
6. High cost of supporting infrastructure.

ABBREVIATIONS:

Amend. : Amandemend
GR : Government Regulation
IPB : Izin Panas Bumi / Geothermal License
IDR : Indonesian Rupiah
IRR : Internal Rate of Return
MEMR : Ministry of Energy and MIneral Resources
MEF : Ministry of Environment and Forestry
MW : Megawatt
PD : Presidential Decree
PR : Presidential Regulation
PLTP : Geothermal Power Plant
PSP : Penugasan Survei Pendahuluan / Preliminary Survey Assignment
RUEN : Rencana Umum Energi Nasional / National Energy Plan
USD : United States Dollar
WKP : Wilayah Kerja Panas Bumi/ Geothermal Working Area
WT : Wilayah Terbuka/ Open Area