

Geothermal 2024 Kaleidoscope and 2025 Outlook

December 2024

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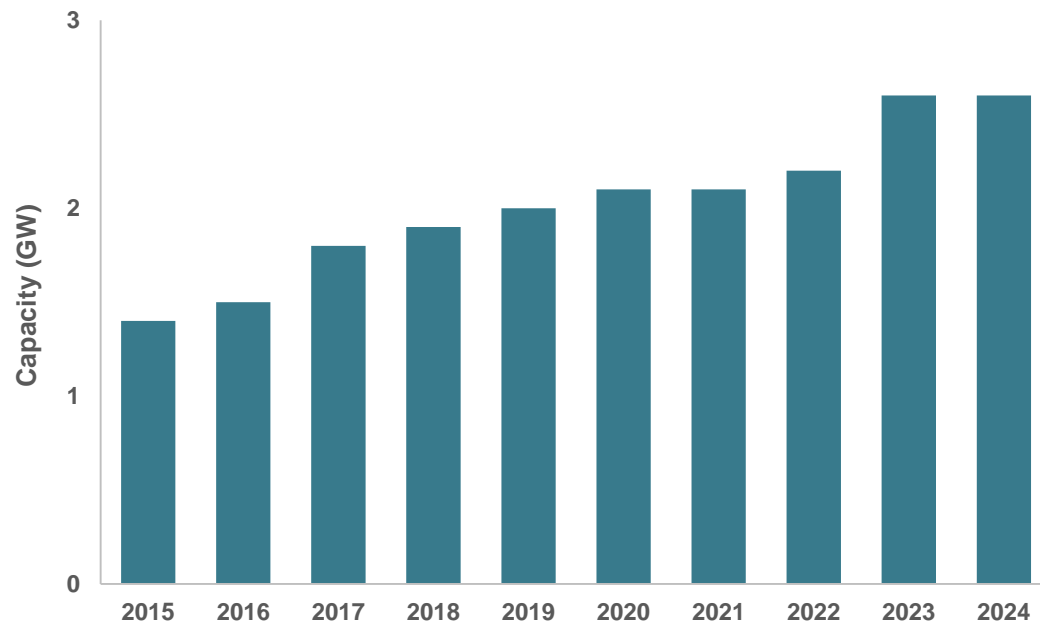


National Geothermal Installed Capacity



As of December 2024

- According to the Ministry of Energy and Mineral Resources, Indonesia's geothermal power installed capacity remains unchanged from last year at 2.59 GW
- There has been no additional geothermal capacity in 2024
- On the global stage, Indonesia continues to hold its position as the world's second-largest geothermal producer, trailing the USA, maintaining the same rank as at the end of the previous year



Geothermal COD in the Last 3 Years

Project	Capacity	Status
Sorik Marapi Unit-2	56.95 MW	July 2021
Rantau Dedap Unit-1	98.4 MW	December 2021
Sokoria Unit-1	6.58 MW	March 2022
Sorik Marapi Unit-3	62 MW	October 2022
Sokoria Unit-2	5 MW	July 2023
Sorik Marapi Unit-4	40 MW	December 2023

Government Misses 2024 Geothermal Target!



The planned 90 MW, which was previously announced, has not come online to date

- In January 2024, the government set a target for an additional 90 MW of geothermal capacity in Indonesia, expected to come from the following: projects
 - **PLTP Salak Binary (15 MW)** by Star Energy
 - **PLTP Ijen Unit-1 (35 MW)** by Medco-Ormat
 - **PLTP Sorik Marapi Unit-5 (40 MW)** by KS Orka
- However, as of the writing of this report, none of these projects have successfully reached the Commercial Operation Date (COD).
- Several factors are believed to hinder the realization of these projects, including misalignment in acceleration mechanisms across ministries.
- Additionally, PLN's readiness to absorb the additional electricity is questionable, particularly since the EPC phases of the Salak Binary and Sorik Marapi projects have already been completed.
- Beyond the 90 MW target, it is important to note that the **RUPTL 2021-2030** outlines a planned additional capacity of at least 147 MW for this year. However, given the current development status of these projects, it appears unlikely that any of them will come online soon.

Planned Geothermal Projects in RUPTL 2021-2030 (COD in 2024)

Project	Capacity	Status
Sorik Marapi Unit-5	50 MW	Waiting operational permit
Cibuni Unit-1	10 MW	No development activity
Ijen Unit-1	55 MW	Mechanical completion process
Sokoria	22 MW	Development process
Atadei	10 MW	Tender process by PLN

Source: PT PLN (Persero)

Key Milestones in 2024



One IPB issued and three PSPE completed

- In September 2024, the Ministry of Energy and Mineral Resources announced that the IPB for the **WKP Way Ratai** had been officially issued, marking the first IPB processed through the OSS system.
- It is worth noting that this IPB was issued more than a year after the concession was awarded to **Cahaya Anagata Energy** (a joint venture between Pertamina and Chevron).
- In addition to the IPB issuance, other notable achievements in 2024 include the completion of exploration drilling by Sumbawa Timur Mining for **WPSPE Hu'u Daha** (West Nusa Tenggara), and by Ormat for **WPSPE Klabat Wineru** (North Sulawesi) and **WPSPE Wapsalit** (Maluku).



2024 Geothermal Tender Results (1)



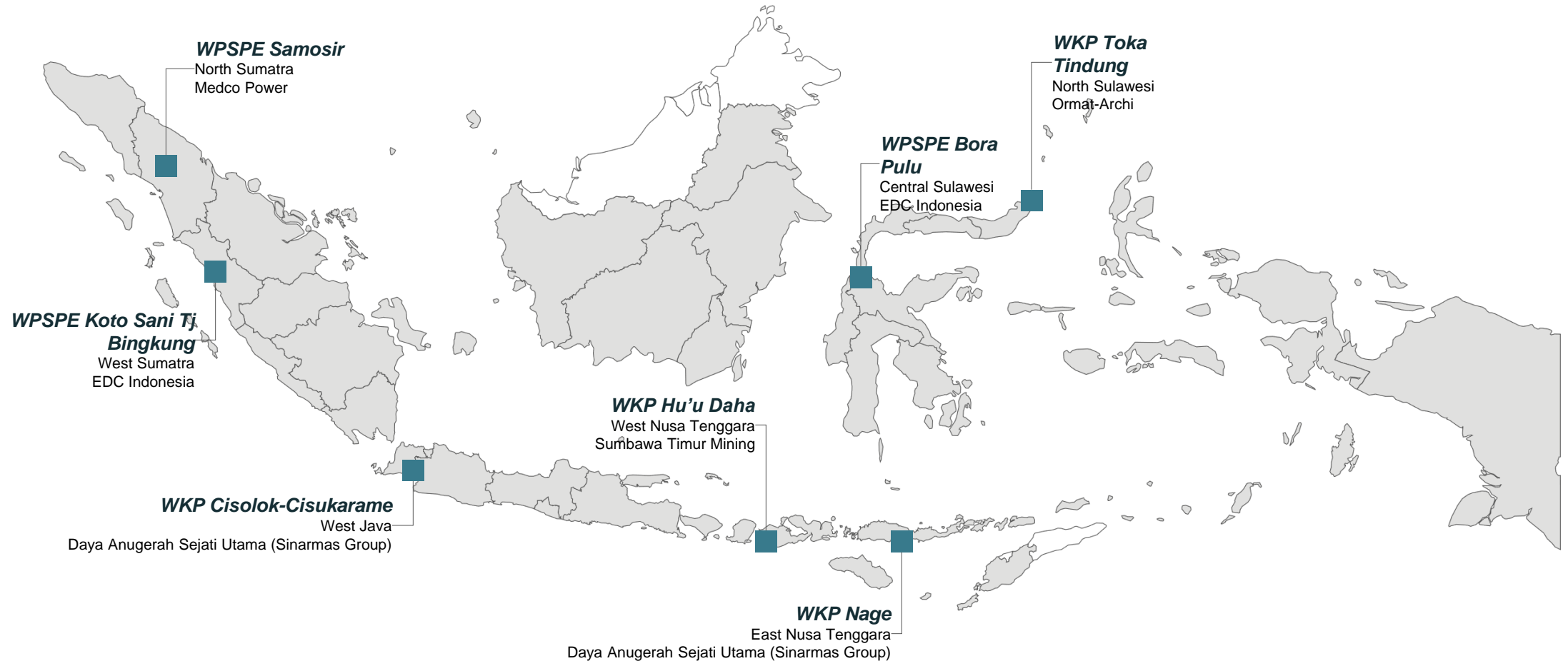
Seven geothermal concessions have been awarded to private companies

- The Ministry of Energy and Mineral Resources recently awarded seven geothermal concessions spanning both western and eastern regions of Indonesia. These awards included:
 - **2 WKPs** offered through an open bidding mechanism
 - **2 WKPs** offered through a limited bidding process, specifically dedicated to PSPE executors and state-owned enterprises (BUMN)
 - **2 WSPes** under an open bidding mechanism
- Notably, the **WKP Cisolok-Cisukarame** and **WKP Nage** are the first fields developed under the government-funded exploration drilling program. Both were awarded to **Daya Anugerah Sejati Utama (Sinarmas Group)**.
- The **WKP Hu'u Daha** and **WKP Toka Tindung** were awarded to **Sumbawa Timur Mining** and **Ormat-Archi**, respectively, following the absence of state-owned enterprise (BUMN) participation in the limited tender process.
- The remaining two blocks, **WSPe Bora Pulu** and **WSPe Koto Sani Tanjung Bingkung**, were awarded to the Philippines-based **EDC** (Energy Development Corporation). EDC is currently the world's largest geothermal operator, with a total capacity of 1.2 GW, excluding non-operating assets.
- Medco concluded the 2024 geothermal tender results by securing the **WSPe Samosir**. The exploration block had previously been explored by **KS Orka** and **Optima Nusantara Energi** but later was relinquished in 2022.

2024 Geothermal Tender Results (2)



Seven geothermal concessions have been awarded to the private sector



PLN Geothermal Tender



GEECA scheme is not attractive enough for geothermal players

- Currently, PLN holds 9 geothermal concessions in Indonesia, obtained through state-owned enterprise (BUMN) assignment schemes.
- Given the utility's lack of experience in geothermal upstream operations, PLN has opted to seek partners responsible for exploration activities through a scheme called the **Geothermal Exploration and Energy Development Agreement (GEECA)**.
- However, this scheme is considered unattractive to the industry, as prospective partners cannot claim ownership of the WKP. Additionally, all exploration risks are borne by the partner, meaning any costs associated with dry exploration wells become sunk costs for the partner.
- Moreover, the 9 WKPs offered by PLN are generally considered medium-to-low quality, except for the **WKP Kepahiang**. This is evidenced by PLN's recent tender, where only this concession attracted interest. However, a winner for the auction has yet to be announced, as **Star Energy**, initially the leading bidder, decided to withdraw from the process.

PLN's Geothermal Concessions

Project	Capacity	Status
Kepahiang	110 MW	Partner selection process
Danau Ranau	20 MW	Tender failed. Will be re-offered
Gn Tangkuban Perahu	40 MW	Tender failed. Will be re-offered
Gn Ungaran	55 MW	Tender failed. Will be re-offered
Oka Ile Ange	10 MW	Tender failed. Will be re-offered
Atadei	10 MW	Partner selection process
Gn Sirung	5 MW	Partner selection process
Songa Wayaua	10 MW	Tender failed. Will be re-offered
Tulehu	20 MW	Tender failed. Will be re-offered

Source: PT PLN (Persero)

Geothermal M&A Update



At least 5 geothermal assets are available on the market

Amidst the intricate dynamics of the energy sector, Petromindo has identified circulating speculation pertaining to potential acquisition plans. These speculations, emanating from both formally disclosed sources and informally discussed insights, have not concretized into actual transactions. Nevertheless, there are at least 5 compelling uncompleted M&As to watch closely as they emerge.

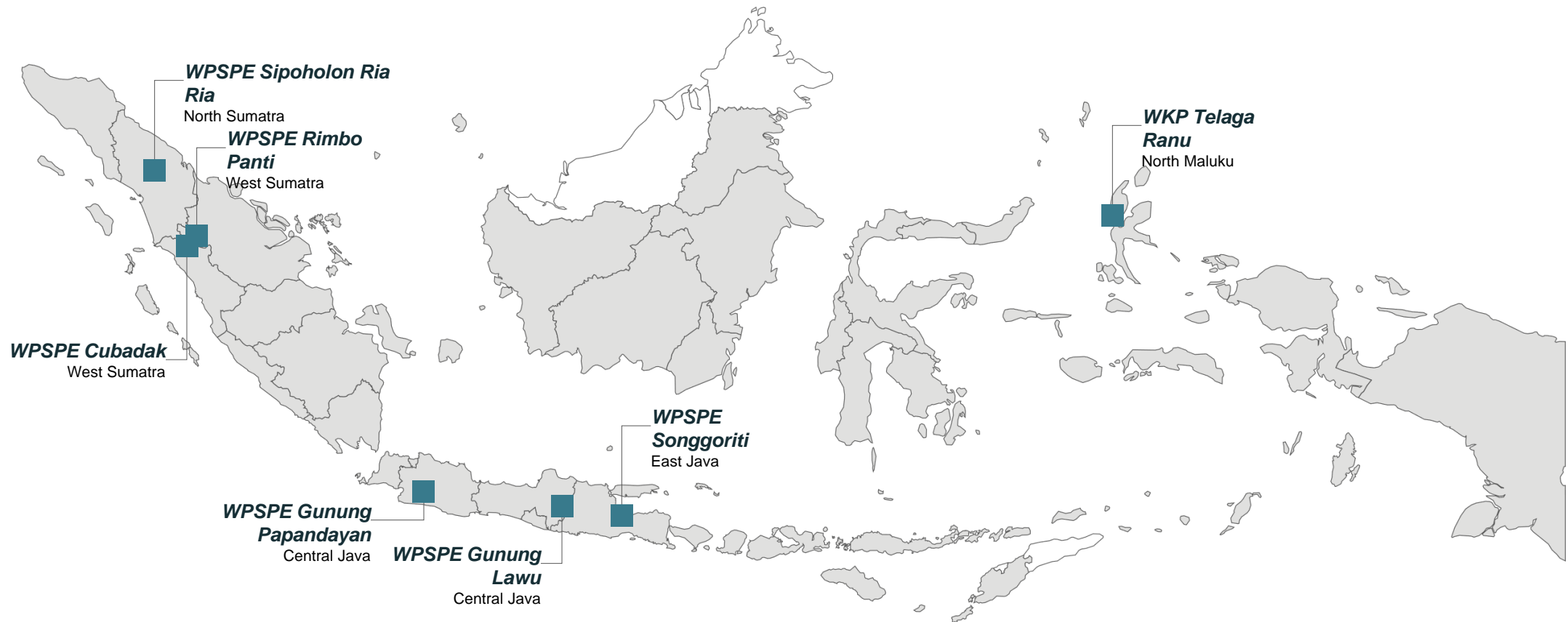
Asset	Seller	Potential Buyer	Status
PLTP Sorik Marapi	KS Orka Renewables (95%)	Pertamina; Medco; Star Energy	Canceled due to mismatched price negotiations
PLTP Sokoria	Bakrie Power (3%)	Undisclosed	Looking for potential buyer
PLTP Cibuni	Satria Group (100%)	Undisclosed	Slow negotiation due to mismatched price
PLTP Muara Laboh	Supreme Energy	Astra Group	Pre-FS and early negotiation
WKP Baturraden	Sejahtera Alam Energy (100%)	Undisclosed	Looking for potential buyer
WPSPE Graho Nyabu	EDC (100%)	Undisclosed	Pre-FS and early negotiation

What to Expect in 2025?



1 WKP and 6 WPSPEs will be offered to investors

Following the resumption of geothermal tender in 2024, the government seems to be entering an aggressive mode to drive geothermal investment in the country. The Ministry of Energy and Mineral Resources plans to offer at least 7 additional blocks to potential investors in 2025, through both the WKP and PSPE mechanisms.



What to Expect in 2025?

More OSS-based IPBs are expected to be issued

- Following the removal of **PKKPR and AMDAL** requirements for submitting an IPB, the process—typically taking 1 to 2 years—can now be shortened to **less than one month**.
- With this change, we estimate that at least five new IPBs will be issued by the Ministry of Energy and Mineral Resources in 2025, namely:
 - WKP Cisolok-Cisukarame
 - WKP Nage
 - WKP Hu'u Daha
 - WKP Toka Tindung
 - WKP Wapsalit
- This accelerated IPB process is expected to lead to faster initiation of exploration activities, including **3G surveys** and **exploration drilling**.





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