

## Exploring the Impact of Lender Procurement Guidelines on Geothermal Project Exploration Planning: Indonesia's GREM Perspective

Aryani Amir, Dorman Purba, Desak Inten Nyoman Apriani, Astri Indra Mustika, Ferdino R. Fadhillah

PT Sarana Multi Infrastruktur (Persero), Sahid Sudirman Center 49th floor, Jakarta, Indonesia

aryani.pmugeothermal@ptsmi.co.id; dorman.kons.dpb@ptsmi.co.id; desak@ptsmi.co.id; astri.pmugeothermal@ptsmi.co.id;  
ferdino@ptsmi.co.id

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### ABSTRACT

Geothermal developers in Indonesia face a challenging financing landscape, particularly during the exploration phase of geothermal projects. The availability of financing products specifically designed for geothermal exploration remains limited. However, Geothermal Resource Risk Mitigation (GREM) financing emerges as the pioneering and currently the only available solution to help geothermal developers manage risks during this crucial phase. Understanding the lender's procurement guidelines becomes paramount in harnessing the potential benefits of GREM financing.

This paper aims to provide geothermal developers in Indonesia with valuable insights into the importance of comprehending lender procurement guidelines in the context of limited financing options, highlighting the role of GREM as a risk management solution. By comprehending these guidelines, geothermal developers in Indonesia might gain insights into the specific requirements and procedures set by lenders, enabling them to align their project planning and implementation accordingly. This understanding enhances the developers' ability to navigate the procurement process effectively, increasing their chances of accessing GREM financing. Moreover, familiarity with the lender's procurement guidelines empowers developers to proactively address potential challenges and demonstrate compliance, ultimately improving their project's viability and reducing the risks associated with geothermal exploration.

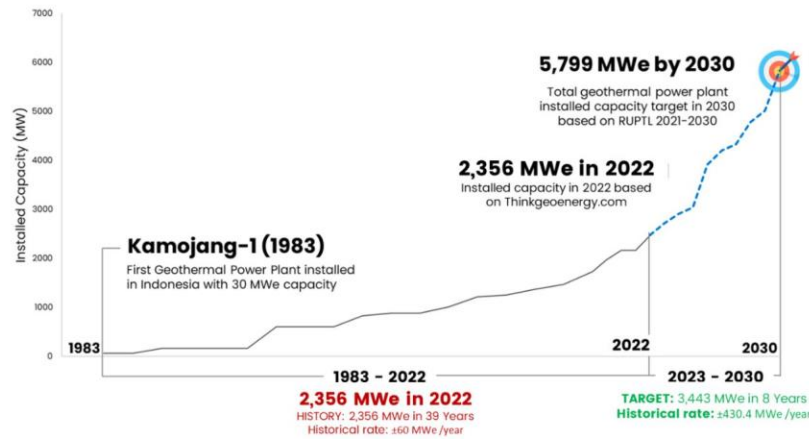
On the other hand, complying with lenders' procurement requirements can present challenges for geothermal project developers as borrowers. These challenges include navigating complex and rigorous procurement procedures, ensuring transparency and accountability throughout the process, meeting stringent eligibility criteria, and managing the administrative burdens associated with documentation and compliance. Additionally, developers may face difficulties in accessing the necessary resources and expertise to meet the specific procurement guidelines set by lenders.

Finally, this paper aims to provide developers with a clear understanding of the benefits of following the lender procurement process and strategies for managing administrative burdens, ultimately yielding positive outcomes for the exploration project.

## 1. INTRODUCTION

### 1.1 Geothermal Energy Development in Indonesia

The utilization of geothermal as green energy becomes a critical component in Indonesia's efforts to achieve 23% renewable energy by 2025 and additional 21% of renewable power generation by 2030 (DEN, 2022a). Indonesia is a nation that has enormous geothermal potential (approx. 23 GWe) and is one of the top two geothermal producers (approx. 2,356 MW) globally (Darma, Imani, Shidqi, Riyanto, & Daud, 2021; ADB, 2018). Unfortunately, the potential is still under-utilized since current utilization is only 8% of the total potential (Fadhillah, et al., 2022). Indonesia is targeting geothermal utilization to reach 5,799 MW in 2030, which equals to 259% addition to the current capacity (PLN, 2021). Figure 1 shows the existing and targeted Indonesia geothermal development.

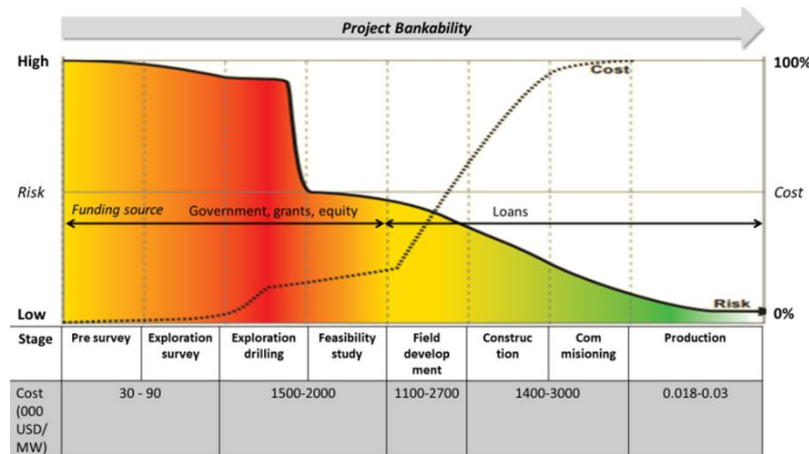


**Figure 1: The historical and projected Indonesia geothermal development (Purba, 2022; PLN, 2021; EBTKE, 2022; ThinkGeoenergy, 2023)**

Currently, Indonesia's geothermal industry operates 16 power plants under either the management of State-Owned Enterprises (SOE) or Independent Power Producers (IPP). Additionally, there are 63 areas designated as "geothermal working areas" in the exploration-development phases and 15 areas classified as "preliminary survey-exploration areas" in the pre-exploration phases (MEMR, 2022). Despite these efforts, the present condition of geothermal development poses significant challenges to achieving the government's targets by 2030. To accelerate geothermal development, it is imperative to focus on promoting exploration activities while also addressing associated exploration risks to enhance investment attractiveness.

### 1.2 Importance of Effective Geothermal Project Exploration Planning

The geothermal sector faces substantial initial financial investment that is accompanied by high risk due to uncertainties related to resources, social-environmental factors, finances, and technical challenges (IRENA, 2022). Research by Geothermex (2010) and Castlerock (2010) emphasizing that the main barrier to geothermal development in Indonesia lies in the significant risk involved during extensive investments, particularly in the preliminary survey and test drilling stages. These stages encounter limited data and rely on interpretations by geoscientists, leading to uncertainties about critical resource conditions, such as reservoir temperature, fluid characteristics, and permeability, which directly affect the development strategy and financial performance. The cost-risk curve and funding source of each phase shown in Figure 2 is modified from IGA (2014) and Purwanto (2019).



**Figure 2: Geothermal Projects' risk, cost, and Funding Source. Modified from IGA (2014) and Purwanto (2019).**

### 1.3 Financing Options for Geothermal Exploration Project in Indonesia

ASEAN Center for Energy (2022) and Yescombe (2014) explained geothermal power plants during their pre-operation period, the financing strategy commonly involves a mix of financing sources. This includes contributions from shareholder equity and external financing options such as loans, government funds, or derisking facilities. Furthermore, the financial institution that provides de-risking facility or loan to geothermal project, employs strict and thorough due diligence for various parameters, including procurement strategy. That due diligence has purpose to ensures that all potential risks are identified and analyzed before funding decision is made.

One of the key highlights of procurement strategy that regulated by financial institutions is the standard regulates the scope of tender as international bidding should be open for suppliers from other countries. This approach has to ensure competitiveness and efficiencies to obtain the best global supplier (Fininda, Agustino, Purba, & Adityatama, 2020; ADB, 2018)

As mentioned earlier, financing the geothermal exploration project is still considered a high-risk business for lenders as the resource uncertainty is still high. The high risk and uncertain condition influence the limited availability of financial institution to fund exploration project. This section will further discuss the funding options for the geothermal exploration project that is currently available in Indonesia.

### 1.3.1 Own Equity

Most developers use their own equity as the financing source for geothermal exploration projects. The cost estimate of a geothermal exploration project in Indonesia is around USD 15-50 million which depends mainly on the drilling strategy and little dependency on the size of the development project. Typically, the developers raise the equity from parent company loans and shareholder loans. The other options are issuing bonds and shares, but they can only do this after the resource is confirmed.

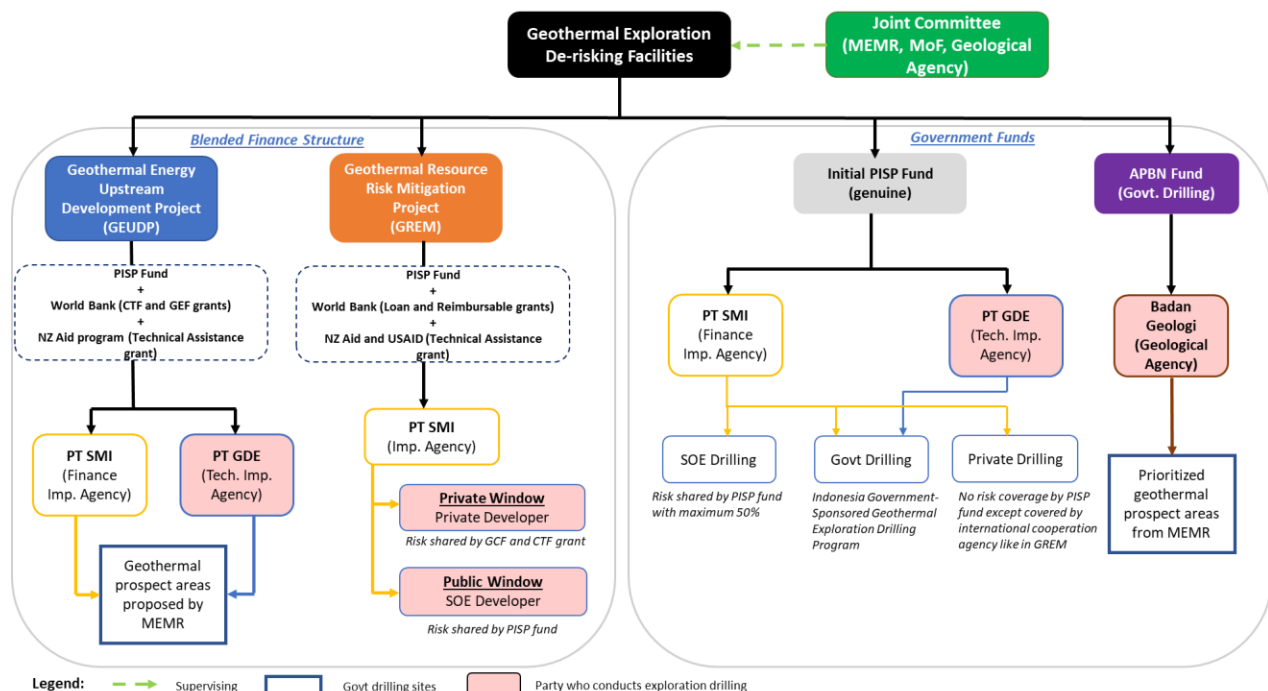
The primary consideration in using developer's own equity is the risk borne solely by the developers. With such a considerable capital cost, there is still a high possibility that the exploration found no economic geothermal resource. Or in some cases, the resource characteristic needs to be more attractive to be developed, which requires the developers to spend more capital to drill more exploration wells. In this stage, the developer has a high risk of losing all the equity spent on exploration activities.

### 1.3.2 Infrastructure Financing for Geothermal Sector (*Pembiayaan Infrastruktur Sektor Panas Bumi*, or PISP) Fund

The government of Indonesia has allocated around IDR 3.1 trillion (equivalent to approximately USD 200 million) from the government budget to support geothermal development in Indonesia. This fund will be leveraged with another funding source from international financial institutions, donors, and other stakeholders to collaborate in the de-risking funding scheme of geothermal exploration. This fiscal incentive is regulated by Ministry of Finance Regulation No.80/PMK.08/2022 Regarding Geothermal Development Support using *Pembiayaan Infrastruktur Sektor Panas Bumi* (PISP) Fund at PT Sarana Multi Infrastruktur ("PT SMI").

PT SMI is a state-owned enterprise (SOE) under the Ministry of Finance (MoF) assigned to manage the PISP fund. Ministry of Energy and Mineral Resources (MEMR) will use this fund to support a geothermal exploration program called Government Drilling. Other than that, the fund will be used as a financing facility for SOE and private developers with the de-risking feature for SOE developers. This feature allows developers to not fully bear the risks and costs of exploration in the event of an exploration failure.

The overview of geothermal exploration de-risking facilities mentioned above is illustrated in Figure 3.



**Figure 3: Overview of Geothermal Exploration De-Risking Facilities in Indonesia (PT SMI, 2022a)**

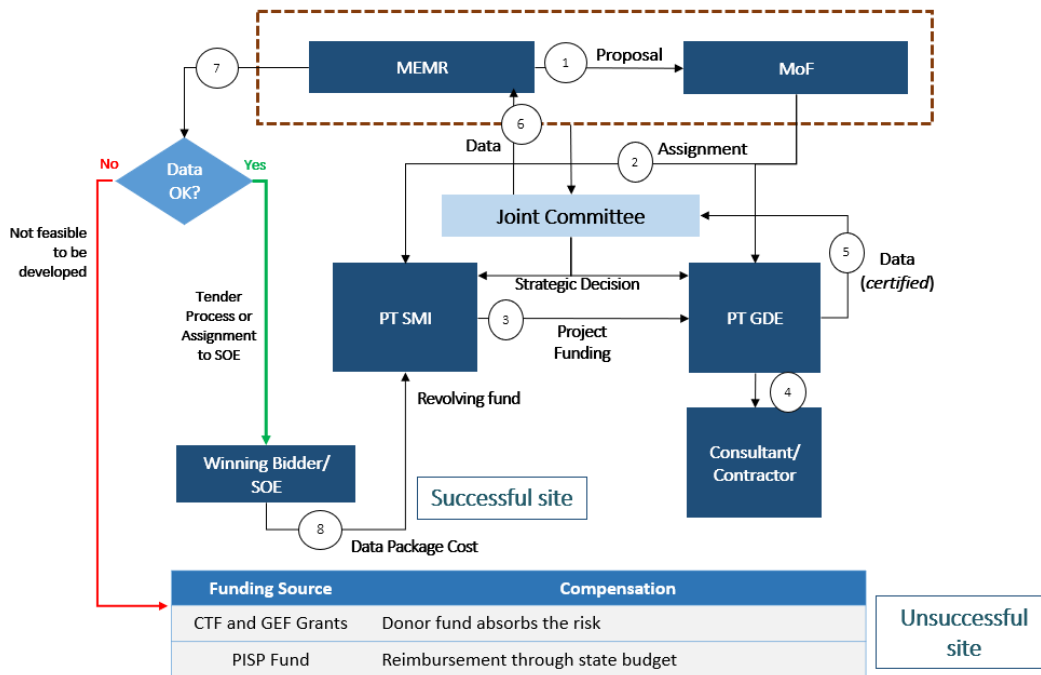
### 1.3.3 Geothermal Energy Upstream Development Project (GEUDP) or Government Drilling

Geothermal Energy Upstream Development Project (GEUDP) is a government-sponsored exploration drilling collaboration program between the Government of Indonesia and the World Bank. The program aims to develop greenfield geothermal areas that have yet to be tendered, especially in eastern Indonesia, where the area's electrification ratio is low compared to the other parts of Indonesia (Apriani et al., 2018). The source of funds for the GEUDP program comes from the PISP Fund of USD 49 million, with matching grants

from the Clean Technology Fund (CTF) of USD 49 million and the Global Environment Facility of USD 6.25 million. The program also received grants from the New Zealand Ministry of Foreign Affairs and Trade (NZ MFAT) in the form of technical assistance that equals the amount of NZD 2.13 million.

MEMR, as the beneficiary of this program, will propose a geothermal prospect area to MoF to seek exploration support under the GEUDP program. Then, the technical implementing agency, PT Geo Dipa Energi ("GDE") will conduct a preliminary assessment to see whether the proposed area is feasible to continue exploration drilling. Suppose the result shows that the proposed prospect area is viable; MoF will issue an assignment letter to GDE as the technical implementing agency and PT SMI as the financial manager to conduct the exploration drilling activities, which is supported under the GEUDP scheme.

The data acquired in the exploration drilling will be assessed by an independent party and discussed in the Joint Committee meeting to decide if the geothermal resource in the prospect area is proven and sufficient to be tendered by MEMR. Assuming that resource is now de-risked, then MEMR will proceed with the tender process of the geothermal working area (*Wilayah Kerja Panas Bumi – WKP*). In this stage, the participation of both public and private sector geothermal developers in the tender process is expected to increase as the geothermal resource risk has significantly reduced. Suppose the drilling exploration result shows that the resource is not economically attractive enough to be further developed; the government funds and donor funds will cover the exploration cost. Figure 4 shows the business model of GEUDP.



**Figure 4: GEUDP Business Model (modified from PT SMI, 2022b)**

However, since most of the geothermal prospect area under GEUDP has yet to be tendered and awarded to the geothermal developers, the beneficiary of this facility is MEMR. MEMR will use the fund to undertake the exploration drilling to improve the quality of information available at the time of tender. The winning geothermal developer will reimburse the exploration costs at the time of the concession award. In other words, GEUDP is designated for something other than a geothermal developer who already holds a geothermal working area license or concession.

Aside from GEUDP, the Geological Agency of Indonesia, under MEMR, also conducted exploration drilling in several geothermal prospect areas in Indonesia, namely Nage, Bittuang, and Cisolok-Cisukarame. The activities include preliminary survey, land acquisition, permits, infrastructure construction work, drilling, well testing, and pre-FS document updating. The source of funds to support these activities comes from the state budget (APBN), and the risks are covered 100% by the government.

#### 1.3.4 Geothermal Resource Risk Mitigation (GREM)

The Geothermal Resource Risk Mitigation (GREM) Project is developed by the Government of Indonesia (GoI) through PT SMI together with the World Bank with the objective to foster the development of geothermal power generation projects in Indonesia. The new facility shall enable early-stage financing of geothermal projects for public and private developers to enable the increase of geothermal power generation capacities in the country. The Facility is envisaged to include three windows:

- 1) Government drilling,
- 2) Public developer window, and

### 3) Private developer window.

The first window has already been explained in the earlier sub section. While the remaining two windows are being established under the GREM Facility, where publicly owned and private developers are provided with financing for resource confirmation drilling with a view to achieve financial close for the exploitation (construction and operation) phase. The funds will be disbursed over two phases, in which the first phase was expected to be started effectively in 2020 and with a Project Closing Date of October 31, 2029.

The two windows are planned to be capitalized with a total of US\$651.25 million in the aggregate towards investments in geothermal exploration drilling. The funds will be disbursed over two overlapping phases, that will start at Year 1 and Year 3 respectively. The overlapping of phases ensures that essential activities in Phase 1 and Phase 2 continue without there being a gap in program roll-out while the next phase is prepared. The first phase will start up the program and introduce the proposed innovative financing mechanism. The second phase will scale up while reflecting the changes and streamlining from the learning.

The design of the future phase(s) will consider developing the capacity of institutions and stakeholders, market response, risk appetite of key stakeholders, and learning from technical challenges. However, both phases are designed to have the same components and outcomes, but with a different scope and targets. Developers under the GREM Facility are to put in equity toward the exploration program for the sub-projects.

The GREM Facility also includes a US\$6.25 million grant from GCF, CTF, and GIF for technical assistance and capacity building for PT SMI and relevant stakeholders. PT SMI will be the executing entity for the GREM Facility in a financial intermediary function. GREM shall facilitate the mobilization of private and public funds with the objective of fostering the development of the geothermal market. In a summary, the main features of GREM are depicted in Figure 5.



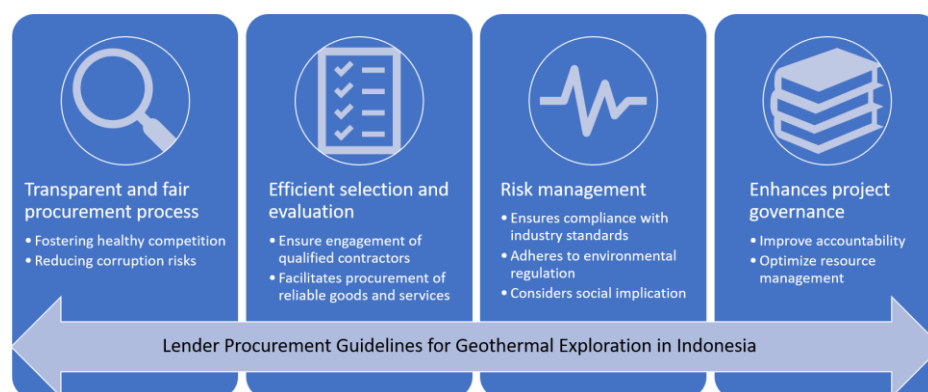
**Figure 5: Key Features of GREM**

Procurement procedures are solely applicable to the public developers and will guide PT SMI's supervision of procurement by public developers. Private sector developers will not have the obligation to comply with the Procurement Regulations.

#### 1.4 Significance of Lender Procurement Guidelines

Lender procurement guidelines for geothermal exploration projects in Indonesia are important for several reasons (Figure 6):

1. These guidelines establish a transparent and fair procurement process, fostering healthy competition and reducing corruption risks.
2. They facilitate the efficient selection and evaluation of goods and services, ensuring the engagement of qualified and reliable contractors.
3. These guidelines effectively manage project risks by ensuring compliance with industry standards, environmental regulations, and social considerations.
4. Furthermore, adherence to these guidelines enhances project governance, accountability, and optimal resource management.



### **Figure 6: The Illustration of the Lender Procurement Guidelines Importance for Geothermal Exploration Project in Indonesia**

Ultimately, lender procurement guidelines are pivotal in driving the efficiency, sustainability, and success of geothermal exploration projects in Indonesia.

On the other hand, the absence of lender procurement guidelines for geothermal exploration projects can have several negative impacts on the project. Firstly, without clear guidelines, the procurement process may lack transparency and fairness, potentially leading to favoritism, inefficiency, and increased corruption risks. This can result in the selection of contractors or suppliers who may not possess the necessary expertise or qualifications, compromising the quality of goods and services provided.

Furthermore, the absence of guidelines can lead to inconsistent evaluation criteria, making it challenging to compare proposals and select the most suitable vendors. This lack of standardization can hinder project progress, delay procurement activities, and increase project costs. Additionally, without guidelines, it becomes difficult to ensure compliance with environmental regulations, social considerations, and industry standards, which can lead to negative environmental and social impacts. In summary, the absence of lender procurement guidelines can impede project efficiency, jeopardize quality, increase corruption risks, and undermine the project's overall success.

In geothermal exploration, goods and services are sourced globally and as such require international level procurement guidelines which can be provided by lenders, especially international financial institutions. They often have their own procurement guidelines that align with international best practices. By following these guidelines, borrowers can ensure that their procurement processes meet internationally recognized standards of transparency, fairness, and efficiency, which in the end resulting in achieving the most appropriate procurement output that leads to fulfillment of value for money principle.

From GREM perspective, the significance of lender procurement guidelines is indispensable. Funds disbursement to GREM could be re-evaluated if lender procurement guidelines is not adhered to. It is crucial to fulfill the loan agreement and maintain a positive relationship with the lender because lenders often impose procurement guidelines as a condition for providing funds or financial assistance. These guidelines often demonstrate commitment to transparency, accountability, and efficient use of funds. By complying with the guidelines, borrowers can increase the chances of securing financing or financial assistance from the lender which will in the end facilitating project implementation. Failing to adhere to lender procurement guidelines will lead to mis-procurement and as such will jeopardize the funds disbursement.

The act of demonstrating a track record of following procurement best practices and meeting lender's requirements can also increase the chances of accessing future funding or assistance from the lender or other financial institutions because it builds trust and confidence in the borrower's ability to manage funds effectively. It also enhances the borrower's reputation and credibility.

Another advantage of adhering to lender procurement guidelines is that they often require borrowers to develop and strengthen their procurement capacities. This can include training of staff, adopting standardized processes, and implementing monitoring and evaluation mechanisms. Compliance with these guidelines helps borrowers build internal capabilities, improve procurement practices, and enhance overall organizational capacity.

### **1.5 Paper Objectives and Method**

The objectives of this paper are to:

1. Understand the significance and benefits of GREM financing as a risk mitigation solution for geothermal developers in the limited financing context of exploration projects.
2. Investigate the impact of lender procurement guidelines on geothermal project exploration planning in Indonesia.
3. Offer insights and recommendations to geothermal developers for understanding and navigating lender procurement guidelines to improve project planning and implementation.
4. Identify the challenges faced by geothermal developers in complying with lender procurement requirements and propose strategies to overcome these challenges.

This paper is the result of a literature study and interviews with relevant stakeholders, including geothermal developers, financial institutions, and industry experts. The literature study involved an extensive review of research articles, publications, and reports on geothermal project exploration planning, lender procurement guidelines, and GREM financing. The stakeholder interviews provided valuable firsthand insights and perspectives on the practical aspects, challenges, and experiences related to lender procurement guidelines and the implementation of GREM financing in geothermal exploration projects.

### **2. GOODS AND SERVICES TO BE PROCURED IN GEOTHERMAL EXPLORATION**

Understanding the goods and services essential for a geothermal exploration project holds pivotal significance for successful project outcomes. Precise comprehension aids in meticulous project planning by accurately assessing required resources for tasks like drilling and geological assessments. This knowledge is crucial for effective budgeting, preventing financial constraints and ensuring optimal allocation of funds for procurement, equipment rental, and specialized services.

Furthermore, understanding necessary goods and services streamlines procurement planning, enabling early supplier engagement and fostering healthy competition among potential providers. This in-depth awareness also promotes seamless communication and collaboration among project teams, ensuring alignment with project goals, reducing misunderstandings, and enhancing overall project coordination. In summary, grasping the specific goods and services needed in geothermal exploration projects is paramount for efficient resource management, transparent procurement processes, and cohesive teamwork, all contributing to the project's ultimate success. The key goods and services required in geothermal exploration include, but are not limited to (Table 1):

**Table 1: The goods and services typically required in the geothermal exploration phase.**

Category	Components
Drilling Infrastructure Construction	<ol style="list-style-type: none"> <li>1. Construction of access roads for transportation of drilling rigs, materials, and labor</li> <li>2. Construction of drilling pads, sumps, and laydown areas</li> <li>3. Provision of water supply for drilling</li> <li>4. Construction of suitable areas for drilling camp</li> <li>5. Provision of site office for site management</li> </ol>
Well Material	<ol style="list-style-type: none"> <li>1. Cementing</li> <li>2. Tubular inspection</li> <li>3. Casing</li> <li>4. Wellheads</li> <li>5. Casing accessories</li> </ol>
Drilling Operation	<ol style="list-style-type: none"> <li>1. Casing</li> <li>2. Surface equipment (wellhead)</li> <li>3. Subsurface equipment (casing accessories, shoes, and liner)</li> <li>4. Bit</li> <li>5. Rig integrated services Rig Integrated Services, including Rig Services (Rig Equipment, Rig Personnel, Cooling Tower, Heavy duty equipment, Light vehicle, VSAT, Mini and base camp, top drive, medic), Mud logging, H2S Services, Waste management, Solid Control equipment, Drill string maintenance &amp; hard banding, Casing running &amp; drive system, Water distribution system</li> <li>6. Cementing</li> <li>7. Directional drilling</li> <li>8. Drilling fluid</li> <li>9. Wireline logging and explosive handling</li> <li>10. Aerated drilling</li> <li>11. Fishing services</li> <li>12. Coring services</li> <li>13. Completion tools</li> <li>14. Rig inspection</li> <li>15. Casing inspection</li> <li>16. Fuel</li> </ol>
Well Testing	<ol style="list-style-type: none"> <li>1. Well testing facilities</li> <li>2. Well testing services</li> <li>3. Welding services</li> <li>4. Geochemistry services</li> <li>5. Brine pump services</li> <li>6. Light vehicle services</li> </ol>
Consultant and Contractors	<ol style="list-style-type: none"> <li>1. Civil infrastructure front-end engineering design (FEED) consultant</li> <li>2. Environmental and social consultant</li> <li>3. Safeguards consultant</li> <li>4. Environment and social safeguard consultant</li> <li>5. Exploration management consultant</li> <li>6. Manpower services consultant</li> <li>7. Site services consultant</li> <li>8. Land appraisal consultant</li> <li>9. Environmental and social impact assessment consultant</li> <li>10. Legal consultant for land</li> <li>11. Leasing consultant</li> <li>12. Engineering design (DED) consultant</li> <li>13. Civil and infrastructure contractor</li> <li>14. Lidar survey consultant</li> <li>15. Geological survey consultant</li> <li>16. Geochemical survey consultant</li> </ol>

### 3. OVERVIEW OF LENDER PROCUREMENT GUIDELINES

#### 3.1 Lender Procurement Guidelines: What and Why

Lender procurement guidelines are a set of standardized instructions and principles established by lending institutions to govern the procurement process for various projects and initiatives. These guidelines aim to ensure transparency, fairness, and efficiency in the selection of suppliers, contractors, and service providers involved in projects funded by the lending institution. The guidelines are designed to cover a wide range of procurement processes that occur on a global scale. Furthermore, the key factors considered by the lenders during the procurement process in geothermal projects are tabulated in Table 2.

**Table 2: Key considerations from the lender's point of view during the procurement process in geothermal projects.**

Consideration Factors	Details
Adherence to Lender Procurement Guidelines	<ol style="list-style-type: none"> <li>1. Compliance with standardized instructions and principles established by lending institutions.</li> <li>2. Ensuring transparency, fairness, and efficiency in the procurement process. Specific focus on geothermal sector requirements such as drilling equipment, geophysical surveys, resource assessment, and environmental considerations.</li> </ol>
Risk Mitigation Strategies	<ol style="list-style-type: none"> <li>1. Addressing geological uncertainties and technical complexities inherent in geothermal exploration projects.</li> <li>2. Conducting background checks on vendors, suppliers, contractors, and other parties to prevent fraud, corruption, or conflicts of interest.</li> <li>3. Implementing penalties, sanctions, or legal actions in case of fraudulent activities.</li> </ol>
Compliance with Global Issues Requirements	<ol style="list-style-type: none"> <li>1. Evaluating borrowers' countries based on global issues such as gender equality, environmental concerns, social impact, and conflict-prone status.</li> <li>2. Disqualification of contractors not meeting lender's global issues requirements, including gender-based violence and discrimination issues.</li> </ol>
Counterterrorism Measures	<ol style="list-style-type: none"> <li>1. Screening contractors and consultants to ensure they are not involved in any terrorism activities.</li> <li>2. Verifying that winning bidders/recommended consultants are not on the lenders' debarred lists before signing contracts.</li> </ol>
Procurement Process Monitoring	<ol style="list-style-type: none"> <li>1. Utilizing online systems for monitoring procurement processes. - Recording every procurement step from needs identification to contract management.</li> <li>2. Uploading relevant procurement documentation for lender review, especially for packages requiring prior approval.</li> </ol>

Lender procurement guidelines can vary depending on the lending institution, the type of project, and the specific sector or industry involved. While there may not be a universally recognized set of guidelines specifically tailored for geothermal exploration projects, certain lending institutions, development organizations, or countries might have guidelines or recommendations that apply to such projects.

The first geothermal financing mechanism is solely funded by international financing institution, such as the International Bank for Reconstruction and Development (IBRD), the Asian Development Bank (ADB), Japan Bank for International Cooperation (JBIC), World Bank (WB) and Japan International Cooperation Agency (JICA) (World Bank & ADB, 2015).

For geothermal exploration projects, procurement guidelines would likely encompass aspects unique to the geothermal sector, such as drilling equipment, geophysical surveys, resource assessment, and environmental considerations. These guidelines could address challenges like geological uncertainties, technical complexities, and the specialized expertise required in geothermal exploration.

Existing Lender procurement guidelines often include provisions for penalties, sanctions, or legal actions in cases of fraud, corruption, or conflicts of interest. These consequences serve as deterrents and can help recover losses incurred due to such activities. Lenders may require background checks on vendors, suppliers, contractors, and other parties involved in the procurement process to ensure they have a clean history and are not associated with fraudulent activities. This helps identify any red flags or potential risks associated with fraudulent activities.

Lenders rate borrowers' countries based on certain requirements which are usually related to global issues such as gender, environment, social, conflict prone countries, etc. Disqualification for contractors not meeting lender's global issues requirements such as gender-based violence, gender biases and discrimination issues can be imposed following a certain examination and necessary assessment.

Lenders also require a screening of contractors and consultants to make sure they do not engage in any terrorism activities. Before signing a contract with a winning bidder, lenders need to make sure that winning bidders/recommended consultants are not on the lenders' debarred lists. Contracts can be postponed or even canceled if the winning bidders/recommended consultants are on their blacklists. Developers as borrowers need to make sure that the winning bidders/recommended consultants are free from debarred lists by finding out the information on lender's website or any other online platforms as provided by lenders.



Lenders often manage several, if not, many projects under their financing mechanism. In order to monitor the procurement process of each borrower, lenders use online systems to properly monitor the procurement process. Borrowers are required to record every procurement step from identification of needs to contract award and contract management and upload relevant procurement documentation such as request for bids, bid evaluation results, signed contracts, etc. For procurement packages requiring lender's prior review, no objections need to be obtained through the system.

### 3.2 Impact of Lender Procurement Guidelines on Geothermal Project Exploration Planning

The lender procurement guidelines are a structured set of protocols that outline the approach for acquiring goods and services for a geothermal project exploration planning, as shown in Table 3. These guidelines cover the project's scope, objectives, and the main requirements of the goods/services to be provided. They address the borrower's ability to manage procurement processes in line with World Bank regulations and assess market risks and procurement complexity. Risk analysis within these guidelines focuses on identifying potential issues such as currency fluctuations and material price variations, as well as strategies to mitigate these risks. Stakeholder analysis is also integral, determining the impact on various parties and defining their roles and responsibilities.

**Table 3: Typical content of lender procurement guideline documents.**

No.	Topic	Content Description
1.	Project Overview	Contains information related to the project, such as: project name, Project Development Objectives, Result Indicators, Main Requirements of the project to be provided by the goods/services provider.
2.	Strategic Assessment of Country, Borrower, and Market Place	<ul style="list-style-type: none"> <li>• <b>Operational Context &amp; Conclusion on Operational Context:</b> The project background and the prospective Borrower as the procurement implementer</li> <li>• <b>Client Capability &amp; Conclusion on Client Capability:</b> Self-assessment by the prospective Borrower regarding its capacity to carry out procurement in accordance with World Bank procurement regulations (e.g., procurement staff numbers, staff experience, etc.), as well as efforts to be made if the prospective Borrower lacks adequate procurement capacity</li> <li>• <b>Market Risk, Technology Aspect &amp; Procurement Complexity and Conclusion:</b> Market analysis related to procurement items, procurement complexity</li> </ul>
3.	Risk Analysis	Risk analysis related to the project is subsequently mitigated through the selection of procurement approaches. Examples of risks include: currency exchange rate risk, fluctuation in raw material prices, variation in raw material quantities, natural disasters, etc.
4.	Stakeholder Analysis	Identification of stakeholders involved/affected by the project and the Responsible – Accountable – Consult – Inform (RACI) categories for each stakeholder.
5.	Procurement Objectives	Based on Strategic Analysis, Risk Analysis, and Stakeholder Analysis, the prospective Borrower presents Key Procurement Objectives that, if achieved, can support the attainment of Project Development Objectives, such as: <ul style="list-style-type: none"> <li>• Target minimum number of bidders</li> <li>• Bidding conditions (qualification requirements, payment terms, insurance requirements) that can be adjusted to actual conditions</li> <li>• Timely implementation of procurement to ensure minimal need for validity extension and re-bidding</li> <li>• Contracts awarded to qualified and experienced bidders to ensure timely completion of contract work</li> <li>• Minimum cost overrun</li> <li>• Use of standard procurement document references</li> </ul>
6.	Recommended Procurement Strategy for the Project	Displaying a table containing procurement strategies for each procurement package related to the Project, including: <ul style="list-style-type: none"> <li>• Contract Title Description &amp; Category</li> <li>• Estimated Cost/Risk Rating</li> <li>• Type of Review (Prior / Post Review)</li> <li>• Procurement Approach (National / International Open / Limited Direct Sole Source)</li> <li>• Selection Method (QCBS/ QBS/ CQS/ Negotiation BAFO)</li> </ul>

Key procurement objectives are set to ensure a fair and effective bidding process, targeting a minimum number of bidders, and setting out clear conditions for bidding. The guidelines stress the importance of awarding contracts to qualified bidders to avoid delays and cost overruns. Finally, the guidelines recommend a procurement strategy that includes a detailed plan, highlighting contract titles, cost estimates, risk assessments, and the chosen procurement approach, ensuring that the procurement aligns with the overall strategy and objectives of the project.

Lender procurement guidelines can have a significant impact on geothermal project exploration planning. Geothermal projects are capital-intensive, and securing financing is a critical step in their development. Lenders, such as banks or financial institutions, often have specific guidelines and requirements that must be met for a project to receive funding. From GREM perspective, these guidelines can influence various aspects of exploration planning for geothermal projects in the following ways:

1. **Project Viability Assessment:** Lenders will typically require a thorough assessment of the project's viability before providing financing. This includes evaluating the geological, technical, and economic feasibility of the project. Exploration planning must align with these assessment requirements to ensure that the project is considered financially sound.
2. **Technical Expertise:** Lenders may require that the project team possesses the necessary technical expertise and experience in geothermal exploration and development. This can impact exploration planning by necessitating the involvement of qualified geologists, engineers, and other experts in the early stages of the project.
3. **Environmental and Regulatory Compliance:** Lenders often have strict environmental and regulatory compliance requirements. Exploration planning must include provisions for conducting environmental impact assessments, obtaining necessary permits, and complying with local, state, and federal regulations. Failure to address these issues can hinder financing approval.
4. **Resource Assessment:** Lenders will want assurance that the geothermal resource is well-defined and sustainable. Exploration planning should include a robust resource assessment that provides data on the resource's size, temperature, and productivity. This assessment should align with industry standards and best practices to meet lender requirements.
5. **Risk Mitigation:** Lenders are risk-averse and will want to see that potential risks associated with the exploration and development phases are adequately mitigated. Exploration planning should incorporate risk assessment and mitigation strategies to address issues such as drilling risk, reservoir performance uncertainty, and equipment reliability.
6. **Cost Estimation:** Accurate cost estimation stands as a cornerstone for lenders in gauging the requisite financing and assessing the economic feasibility of a project. Within exploration planning, meticulous attention must be given to delineating comprehensive cost estimates spanning exploration activities, drilling, equipment procurement, and infrastructure development. These estimates necessitate alignment with lender criteria and industry standards, ensuring congruence with prevailing benchmarks. Moreover, basing cost estimates and timeline projections on thorough market surveys conducted with precision and up-to-date information is imperative to establish a reliable foundation for decision-making.
7. **Project Timeline:** Lenders often have specific timelines for project completion and repayment. Exploration planning should include a realistic timeline for exploration, resource confirmation, and project development. Delays in exploration can impact the project's financing and overall economics.

Providing critical information in a funding proposal is crucial as it helps lenders assess a project's viability and potential success. Accurate and comprehensive information helps to build trust and confidence with the lender and increases the chances of obtaining funding. Critical information includes, but is not limited to, the project's goals and objectives, technical details, expected outcomes, budget and cost estimates, project timeline, procurement plan, data gaps, uncertainties, risk assessment and mitigation plan. Information about the project's management team and their relevant experience, as well as the market demand and competition, is also important to provide.

Additionally, providing all relevant information in a funding proposal can demonstrate the project's ability to deliver on its promises and repay the loan. It also helps to identify potential issues and address them proactively, which can improve the project's overall success. All in all, in order to secure financing, it's essential for project developers to align their exploration planning with these guidelines to increase the likelihood of funding approval and project success.

### 3.3 Requirements and Implications for Project Developers

A set of requirements is often proposed by lenders to the developers as borrowers as a prerequisite of securing fundings and to avoid mis-procurement. Some of the procurement related requirements that should be fulfilled by the developers, among others, are as follows:

**Table 3: Key considerations from the lender's point of view during the procurement process in geothermal projects.**

Requirement	Explanation	Implications
Preparation of a procurement strategy for the project being funded and the plan for procurement activities.	The strategy should detail the developers' analysis to pinpoint the most suitable procurement method. This allows for flexibility in designing an approach that maximizes cost-effectiveness and aligns with project objectives, providing a strong foundation for successful implementation.	<ol style="list-style-type: none"> <li>1. Developers gain insight into the project's procurement needs and potential challenges.</li> <li>2. Allows for tailored procurement strategies that align with project objectives.</li> <li>3. Enhances the likelihood of achieving cost-effectiveness and project success.</li> <li>4. Provides a framework for effective project management and risk mitigation.</li> </ol>
Contractors and consultants to be selected from a procurement process should not be on the lenders' list of debarred firms and consultants.	If any of the contractors or consultants are identified to be on the list, they should be banned from signing a contract or even excluded from the procurement process. This action will free the developers from any consequences that may arise from engaging an incompetent contractor or consultant and opens opportunities for the developers to find the right contractor or consultant for the work to be carried out.	<ol style="list-style-type: none"> <li>1. Mitigates the risk of engaging with unreliable or unethical contractors and consultants.</li> <li>2. Upholds the integrity of the procurement process and maintains trust with lenders.</li> <li>3. Ensures compliance with lender requirements and minimizes potential legal and financial repercussions.</li> <li>4. Facilitates the selection of qualified and competent contractors and consultants for project execution.</li> </ol>

Adherence to lenders' procurement principle of fairness as opposes to government's local content requirement.	Local content requirement necessitates sourcing of goods from local manufacturers. This activity is against lenders' procurement principle of fairness in which favoritism and preferential treatment should not be a part of the procurement process. Local content requirement often prevents developers from importing long lead items from abroad even though some of them are relatively cheaper compared to those manufactured locally. This government requirement has been a challenge in the oil and gas industry and nowadays in geothermal exploration.	<ol style="list-style-type: none"> <li>1. Ensures impartiality and transparency in the procurement process, aligning with lender guidelines.</li> <li>2. May lead to conflicts between government regulations and lender requirements.</li> <li>3. Challenges developers to balance compliance with local regulations and international procurement standards.</li> <li>4. Highlights the importance of addressing regulatory conflicts early in project planning to minimize delays and complications.</li> </ol>
A set of general terms and conditions of contract must be adhered to.	Contracts awarded through International Competitive Bidding (ICB) must be in English, and international arbitration takes precedence over national arbitration. Any documents in other languages must be translated into English. This requirement provides developers with exposure to international procurement and contract management standards, often based on widely recognized templates like the Federation Internationale Des Ingenieurs – Conseils (FIDIC) Yellow Book, enhancing their understanding and practice of global best practices.	<ol style="list-style-type: none"> <li>1. Ensures consistency and clarity in contractual agreements, minimizing misunderstandings and disputes.</li> <li>2. Facilitates international cooperation and trade by standardizing contractual language and arbitration procedures.</li> <li>3. Promotes adherence to internationally recognized procurement and contract management best practices.</li> <li>4. Encourages developers to familiarize themselves with global standards and regulations, enhancing their competitiveness in international markets.</li> </ol>

#### 4. PROCUREMENT PROCESS AND POTENTIAL CHALLENGES

The procurement process involves the systematic and strategic acquisition of goods, services, or works from external suppliers or contractors. It typically includes a series of steps, starting with the identification of procurement needs and specifications, followed by supplier selection, contract negotiation, and contract administration. The process involves activities such as market research, supplier prequalification, issuing requests for proposals or bids, evaluating proposals or bids, negotiating contracts, and managing supplier relationships.

Effective procurement processes aim to ensure transparency, competition, value for money, and adherence to legal and regulatory requirements. The process may vary depending on the organization, industry, and specific project requirements, but the overarching goal is to procure the right goods and services, at the right time, in the right quantities, and at the right cost, while maintaining quality and mitigating risks.

The procurement process entails a series of challenges and risks that organizations often confront. Some major risks and challenges associated with the procurement process:

1. **Identifying Reliable Suppliers:** The task of identifying suppliers who possess the necessary competence to meet quality, quantity, and timing requirements can be intricate. The failure to secure dependable suppliers might lead to project delays, substandard products, and escalated expenses.
2. **Legal and regulatory compliance:** Compliance with various laws, regulations, and procurement policies is crucial to avoid legal issues and potential penalties. Failure to adhere to these requirements can lead to disputes, contract cancellations, and reputational damage.
3. **Procurement timeline:** For procurement packages which require the lender's prior review, an additional number of days for receiving no objections from the lender before continuing the next steps of the procurement process need to be added.
4. **Fraud and Corruption:** The procurement process remains susceptible to fraudulent activities like bid rigging, bribery, and kickbacks. These unethical practices can inflict financial losses and tarnish an organization's reputation, compromising its integrity.
5. **Effective Risk Management:** Navigating risks linked to supplier reliability, delivery delays, quality discrepancies, and unpredictable market dynamics demands proactive measures. Developing comprehensive risk mitigation strategies and well-structured contingency plans is a complex undertaking.
6. **Ethical and Sustainable Procurement:** Balancing ethical considerations, encompassing environmental and social aspects, within the supply chain poses a considerable challenge. Ensuring responsible practices while managing cost-efficiency necessitates a delicate equilibrium.
7. **Navigating Compliance and Regulations:** Complying with intricate legal and regulatory frameworks, both domestically and internationally, constitutes a substantial challenge. Successfully navigating procurement laws, intricate trade agreements, and industry-specific regulations necessitates meticulous attention to detail.
8. **Promoting Transparency and Fairness:** Upholding transparency and impartiality in the procurement process is pivotal to curbing favoritism, bias, and corrupt practices. Striving for consistent, objective evaluations while mitigating conflicts of interest presents a formidable challenge.

Comprehending procurement guidelines holds utmost significance for every project stakeholder, driven by essential factors. These guidelines serve as a framework ensuring adherence to legal and ethical norms, creating an environment of transparency and impartiality during supplier selection. This grasp of guidelines not only expedites efficient decision-making but also fosters seamless communication channels, allowing stakeholders to align their efforts coherently.

Moreover, this understanding becomes a pivotal tool in preemptively addressing potential risks through well-defined risk management strategies. It establishes a system of accountability, aiding stakeholders in carrying out their roles responsibly while optimizing the allocation of resources. This collective comprehension not only cultivates an atmosphere of trust amongst stakeholders but also stands as a cornerstone for the project's triumphant culmination, as it harmonizes efforts towards project objectives, timelines, and overall success.

## 5. SYNERGIES BETWEEN LENDER AND GEOTHERMAL DEVELOPER

### 5.1 Streamlining Procurement Processes and Enhancing Stakeholder Collaboration

Streamlining refers to the process of optimizing and simplifying a system, process, or operation to make it more efficient, effective, and streamlined. It involves eliminating unnecessary steps, reducing redundancies, and enhancing workflow to achieve greater productivity and cost savings. Streamlining aims to remove bottlenecks, minimize delays, and improve overall performance by focusing on essential activities and utilizing resources more efficiently. The goal is to create a streamlined process that is streamlined, agile, and aligned with organizational objectives, resulting in improved outcomes, reduced waste, and enhanced customer satisfaction.

To streamline the procurement process between lenders and borrowers in the context of geothermal exploration financing, several actions can be taken (Table 4):

**Table 4: The procurement process between lenders and borrowers in the context of geothermal exploration financing.**

No.	Action	Example
1.	<b>Clear and Transparent Communication:</b> Establish clear channels of communication between lenders and borrowers to facilitate effective information exchange and prompt decision-making.	This can include regular meetings, progress reports, and dedicated points of contact to address queries and provide updates on procurement activities.
2.	<b>Standardize Procurement Procedures:</b> Develop standardized procurement procedures and guidelines that are aligned with industry best practices and regulatory requirements.	This ensures consistency in the procurement process and reduces the need for unnecessary customization or negotiation for each project.
3.	<b>Prequalified Supplier Database:</b> Create a prequalified supplier database that includes reputable and qualified contractors, suppliers, and service providers with relevant expertise in geothermal exploration.	This database can be regularly updated and shared between lenders and borrowers to expedite the supplier selection process.
4.	<b>Streamlined Bid Evaluation:</b> Implement a streamlined bid evaluation process that incorporates clear evaluation criteria, weightings, and a structured scoring system.	This enables efficient evaluation of bids, reduces subjectivity, and ensures fair and objective supplier selection.
5.	<b>Utilize Technology and Digital Solutions:</b> Leverage digital procurement platforms, electronic document management systems, and online bidding portals to automate and streamline various procurement tasks.	This includes issuing requests for proposals, receiving and evaluating bids, and managing contract documentation.
6.	<b>Risk-Based Approach:</b> Adopt a risk-based approach to procurement, focusing on identifying and mitigating key risks specific to geothermal exploration projects.	This includes assessing the financial stability of suppliers, conducting due diligence on their past performance, and considering risk allocation mechanisms in procurement contracts.
7.	<b>Continuous Improvement and Lessons Learned:</b> Establish a feedback loop and process for continuous improvement by capturing lessons learned from each procurement process.	This includes evaluating performance, identifying areas for enhancement, and implementing corrective actions to optimize future procurement activities.
8.	<b>Collaborative Relationship:</b> Foster a collaborative relationship between lenders and borrowers, promoting open dialogue, trust, and shared goals.	Engage in joint planning, regular progress reviews, and knowledge-sharing to enhance mutual understanding and streamline the procurement process.

### 5.2 Opportunities for Improved Transparency and Accountability in Procurement

Improved transparency and accountability in procurement present significant opportunities for organizations. By enhancing transparency, organizations can provide stakeholders with clear visibility into the procurement process, ensuring fairness, and mitigating

the risk of corruption or unethical practices. Transparency enables stakeholders to assess the legitimacy and integrity of procurement decisions, fostering trust and confidence in the organization's operations.

Accountability in procurement ensures that responsible parties are answerable for their actions, decisions, and the outcomes of the procurement process. It establishes clear lines of responsibility and consequences for non-compliance or misconduct. Accountability promotes adherence to ethical standards, encourages good governance, and helps prevent fraud or misuse of resources.

### 5.3 Maximizing the Benefits of GREM Financing in Geothermal Project Exploration Planning

Maximizing the benefits of GREM financing in geothermal project exploration planning offers significant advantages for geothermal developers. GREM financing, as provided by the World Bank, serves as a valuable risk mitigation solution, particularly in the limited financing context of geothermal exploration projects in Indonesia. By understanding and effectively leveraging GREM financing, geothermal developers can optimize their exploration planning and achieve positive outcomes.

Procurement plays a crucial role in maximizing the benefits of GREM financing in geothermal project exploration planning. Geothermal developers need to strategically align their procurement processes with the lender's procurement guidelines to fully leverage GREM financing and its associated advantages.

By effectively managing the procurement process in line with GREM financing requirements, geothermal developers can optimize the utilization of funds, enhance risk management, attract competitive suppliers, and achieve the desired outcomes of the exploration project. Effective procurement practices not only support the successful implementation of the project but also contribute to the overall sustainability, accountability, and transparency of geothermal development in Indonesia.

## 6. DISCUSSION

Geothermal projects offer relatively clean and consistent production profiles compared to other renewable energy technologies. However, electricity production from geothermal energy in Indonesia still lags far behind the ambitious 2030 target. One of the primary factors contributing to the slow progress in the Indonesian geothermal sector is the high resource risk and upfront investment costs associated with newly tendered or greenfield projects. Uncertainty diminishes after confirming resource availability during the drilling phase.

The procurement aspect plays a crucial role in the geothermal business process. Therefore, geothermal developers must enhance their awareness of procurement-related issues when selecting financial sources, as this decision can significantly impact the procurement process. Failure to understand the procurement requirements of the chosen financing scheme may result in prolonged delays, increased costs, and reduced discounted value of project revenues.

This paper provides a concise discussion of one of the geothermal explorations derisking facilities, the first of its kind in Indonesia due to its forgiveness feature. Despite the facility's objective of accelerating the utilization of geothermal energy in Indonesia, its implementation undoubtedly presents challenges, particularly in the procurement aspect. By addressing procurement within the context of the GREM facility, the authors aim to raise stakeholders' awareness of the challenges associated with implementing procurement guidelines required by donors/IFIs. This effort seeks to facilitate more in-depth discussions to identify the optimal convergence point between Donor Requirements, Indonesian Government Regulations, and Company Internal Policies. Thus, procurement guidelines should not hinder projects but rather enable them to proceed in a more structured and accountable manner.

As this paper is presented in a general manner aimed at triggering further discussion, the authors intend to explore specific challenges identified in subsequent papers. Notably, these forthcoming discussions will address two dominant issues often debated in Indonesian geothermal forums: the implementation of local content requirements (Tingkat Kandungan Dalam Negeri / TKDN) in geothermal project supported by International Donor / IFI and the challenges associated with conducting accurate market surveys for developing reliable procurement plans. By focusing on these specific challenges, the authors aim to provide more insights and practical solutions, contributing to the ongoing dialogue surrounding geothermal development in Indonesia.

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