### BASIC INFORMATION

#### A. Basic Project Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Project ID</th>
<th>Project Name</th>
<th>Parent Project ID (if any)</th>
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<tbody>
<tr>
<td>Indonesia</td>
<td>P155047</td>
<td>Indonesia: Geothermal Energy Upstream Development Project</td>
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<td>EAST ASIA AND PACIFIC</td>
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<td>Investment Project Financing</td>
<td>PT Sarana Multi Infrastruktur (Persero)</td>
<td>PT Sarana Multi Infrastruktur (Persero)</td>
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#### Proposed Development Objective(s)

The PDO is to “facilitate investment in geothermal power generation and reduce greenhouse gas emissions.” This would be achieved through supporting a risk mitigation mechanism for geothermal exploration drilling and building capacity of the client to conduct an efficient exploration and tendering program.

#### Components

- Risk Mitigation for Geothermal Exploration Drilling
- Capacity Building on Geothermal Exploration and Environmental and Social Safeguards Management

#### Financing (in USD Million)

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<td>International Bank for Reconstruction and Development</td>
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<tr>
<td><strong>Total Project Cost</strong></td>
<td><strong>104.25</strong></td>
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#### Environmental Assessment Category

A - Full Assessment

#### Decision

The review did authorize the preparation to continue
B. Introduction and Context

A. Country Context

1. Indonesia is the world’s largest archipelagic state, its fourth most populous nation, and the 10th largest economy in terms of purchasing power parity. It is a member of the ASEAN group of countries that have a combined population of 608.4 million and is also a member of the G-20. With more than 17,500 islands, of which 6,000 are inhabited, Indonesia has a population of over 250 million, with 300 distinct ethnic groups and over 700 languages and dialects. It has a gross national income per capita of US$3,524 (2014) and it has more than halved extreme poverty to 11.3 percent in the past fifteen years.

2. Indonesia’s economic planning follows a 20-year development cycle. The current plan spans from 2005 to 2025. The five-year medium-term development plan, i.e. the third phase of the long-term plan runs from 2015 to 2019, and focuses on key development priorities including energy and infrastructure development, and on improving social assistance programs in education and health-care. Recent energy subsidy reforms have enabled shifts in public spending towards programs that directly impact the poor. However more than 28 million Indonesians currently live below the poverty line set at US$24.4 per month and approximately half of all households remain clustered around this poverty line. Employment growth has been slower than population growth, and public services remain inadequate by middle income country standards. Indonesia is also doing poorly on a number of health and infrastructure related indicators.

3. In addition despite rising government spending in recent years, Indonesia’s core infrastructure stock, such as electricity, road networks, ports, and telecommunication facilities, has not kept pace with economic growth. The resultant “infrastructure gap” in terms of both quantity and quality of investment is due to several factors among which the most important are: a complex and non-transparent regulatory framework for implementation of infrastructure projects; an underdeveloped framework for Public-Private Partnerships (PPPs) resulting in insufficient mobilization of private funds for investment; and the inadequate participation of domestic capital markets in channeling funds to infrastructure sectors. The infrastructure gap contributes to undermine productivity, growth, competitiveness and poverty reduction efforts.

4. Going forward, reducing the infrastructure gap would support growth and prosperity through several channels. The spending effect would support short-term growth and the creation of jobs. As the investments translate into infrastructure stock, private investment will be crowded-in and productive capacity, and long-term growth will be supported. As infrastructure services are delivered firms’ competitiveness would increase and so would the population’s access to services.
B. Sectoral and Institutional Context

5. Indonesia’s rapid economic growth has been fueled by an ever-expanding power sector. Sustained increases in electricity consumption (with average annual demand growth of 7.8% during 2009-2013) are linked with economic growth, urbanization and subsidized electricity tariffs. Installed generation capacity was 50.9 GW as of end-2014, excluding captive generation. Nearly 78% of installed capacity is in Java and the remaining capacity is in unconnected grids in major islands, and hundreds of isolated mini-grids in rural, remote areas on Java-Bali and outer islands. PT Perusahaan Listrik Negara (PLN), the national power company, supplies consumers through its own generation and purchases from private Independent Power Producers (IPPs) and Public Private Partnership generation (PPP).

6. Keeping up with high electricity demand growth is a key development challenge. After a period of surplus in power generation caused by the impact of the Asian financial crisis, electricity supply experienced shortages as PLN faced difficulties in mobilizing sufficient power generation investments to catch up with demand growth. Private sector investment came to a halt under the combined effect of capital flight from emerging markets, and the institutional turmoil that followed the repeal of the 2002 Electricity Law by the Constitutional Court in Indonesia. In the recent past, supply barely managed to keep up with increasing demand; brownouts and load shedding have impacted economic growth and affected even ordinary consumers. This continues to be the case, even though demand has slowed down as a result of the global economic crisis.

7. Over the past decade, GoI has made great strides with the national electrification program. In 2008, data from the National Energy Council (NEC) show that the country’s electrification rate was about two-thirds of the overall population. As of 2014, about 84% of the country’s population was electrified. GoI now targets a 99% electrification rate by 2020 as part of its overall vision and social mission for the country’s energy sector. Against this ambitious target, Indonesians enjoy a low electricity consumption per capita at 40% of the 2012 middle-income country (MIC) average. Stark differences in the provincial electrification program exist, with the six Eastern Indonesian provinces exhibiting some of the country’s lowest electricity access rates – and highest poverty rates.

8. In an effort to reconcile the national electrification and economic development plans, GoI has put forward the Electricity Supply Business Plan or Rencana Usaha Penyediaan Tenaga Listrik (RUPTL), 2016-2024, which inter-alia provides for an electrification program in the Eastern islands to close the supply gap. The Plan foresees to bring online over 80 GW of newly installed capacity during 2015-2024, 98% (or about 78 GW) of which has already been allocated to specific generation options. Of this allocated amount, roughly 74% (or about 58 GW) is expected to be fossil fuel-based (coal at 44% and gas at 29%), while hydro- and geothermal-power are expected to receive the lion’s share of investments in clean energy (at about 12% and 8%, respectively).

9. In order to meet growing demand, Indonesia is significantly switching away from oil-fired generation in favor of accelerating the additions of new coal capacity. Indonesia is one of six Asian countries which collectively make up some 80% of the world’s new coal plants under construction between now and 2020. At the rate of coal development identified through RUPTL, Indonesia alone would be adding 7% of all new coal-fired power plants globally in the next four years up to 2020. This, in turn, would have the effect of locking in new streams –several million tonnes– of greenhouse gas (GHG) emissions for the useful life of the local thermal power plants in question. It is a priority for the WB and GoI to identify alternatives to coal, one of the most important of which will be geothermal energy.
10. Geothermal development is a key development priority for GoI\(^1\), which has set a target of 7.2GW of geothermal capacity by 2025. The Ministry of Energy and Mineral Resources (MEMR)’s “Roadmap for Accelerated Development of New and Renewable Energy 2015-2025”\(^2\) sees geothermal contributing 7 percentage points of GoI’s renewable energy (RE) target of 23% by 2025. Geothermal power is expected to contribute to the country’s GHG emission reduction efforts, which target a 29% cut by 2030 compared with a Business-As-Usual (BAU) emissions projection that started in 2010\(^3\).

11. Geothermal power is one of the best options to provide a baseload response to fast-growing energy demand and diversify the energy mix in Indonesia. It is a baseload generation technology not subject to the intermittency and variability associated with most renewable electricity sources. Indonesia’s geothermal power potential is estimated at around 27 GW, roughly 40% of the world’s known reserves. Many of the geothermal resources in Indonesia are also ideally located on islands with major population centers where electricity demand is high and continues to grow, though there are also resources in more remote locations such as Eastern Indonesia offering an opportunity for poverty alleviation through rural electrification, and/or displacing expensive diesel–fueled generation. Furthermore, as an indigenous and non-tradable energy source, it will also enhance the country’s energy security and largely serve as a natural hedge against the volatility of fossil-fuel prices.

12. Despite the geothermal potential and the focus of GoI and development partners, only about 5% of the total resources indigenous to Indonesia are currently developed to produce power. Against a potential of approximately 27 GW, only about 1.3 GW of geothermal capacity has been developed by 2015 and estimates suggest only an additional 85 MW will be added in 2016. Most of the current installed megawatts came on-line before the 2000s from the geothermal fields of Kamojang (1983), Darajat (1994), Gunung Salak (1994) and Wayang Windu (1999), which provide over 1 GW of aggregate capacity. Only a handful of existing geothermal operations expanded production over the past decade (so-called brownfields). In terms of new (greenfield) developments that carry greater risks only one private sector project, Sarulla (320 MW), has achieved financial closure in the last decade. Other recent greenfield developments have all relied on state owned enterprises (SOEs) – They include Ulubelu 1&2 (110 MW – PGE drilled steam field and PLN established power plant) as well as the following projects being progressed by PGE alone: Ulubelu 3&4 (110 MW – with power plant financed by loan from World Bank and CTF), Lahendong 5&6/Tompaso (40 MW – with power plant financed by loan from World Bank and CTF), Lumut Balai (110 MW), Hulu Lais (55 MW) and Kerinci (55 MW). Karaha (30 MW) currently being progressed by PGE is effectively a brownfield development as the field was explored by private developers initially.

13. Low levels of private sector participation have contributed to slower-than-desired geothermal development. This reflects high resource risk, a key barrier to geothermal development which remains unaddressed in Indonesia. Resource risk is exacerbated by exploration drilling costs, which can be up to US$8 million per well plus supporting infrastructure. With a minimum of three exploration wells needed for resource estimation in most cases, this can be

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1 The relevant national policies include: (i) Indonesia’s Second National Climate Change Communication (2009); (ii) the Indonesia Green Paper (2009); (iii) the GOI National Energy Policy (2005); (iv) the Energy Blueprint 2005 – 2025; (v) Indonesia’s National Long-Term Development Plan 2005-2025, and National Medium-Term Development Program for 2010 – 2014 (Rencana Pembangunan Jangka Menengah, or RPJM); (vii) the National Action Plan for Climate Change (2007); (viii) the Development Planning Response to Climate Change (2008); (ix) the Climate Change Roadmap for the National Medium-Term Development Program for 2010 – 2014 (2009); (x) Indonesia’s Technology Needs Assessment on Climate Change Mitigation (2009); and (xi) other relevant sector development policies and programs.

2 The roadmap is dated May 2015

3 Indonesia’s Intended Nationally Determined Contribution, 2015
prohibitive for project developers who are not guaranteed downstream returns on their pre-production investments. Exploration drilling also constitutes the biggest barrier to obtaining financing as its high associated risks increase investors’ equity return requirements.

14. GoI has designed interventions specifically to address resource risk and mobilize private capital. First and foremost, it has taken important steps to resolve institutional, regulatory and tariff constraints. In June 2014, the geothermal tariffs were revised for a second time\textsuperscript{4}, providing some relief to developers willing to take on exploration and development risks – yet leaving issues of tariff adjustment unaddressed. In August 2014, a new Geothermal Law was issued (even though the Implementing Regulation still has not been approved). The Law allows centralizing geothermal concession tenders while securing the interest of local government in geothermal development through a production bonus – a benefit sharing mechanism – levied on top of any applicable taxes. Another important reform is the decategorization of geothermal activities as “mining activities”, thus allowing greater latitude for geothermal development in the country.

15. In 2015, GoI demonstrated continued emphasis on geothermal development. To address the issues of tariff adjustment which have in the past stalled private participation, GoI started exploring options for a new tariff regime. While the details of this new system are yet to be finalized, GoI expects it to play an enabling role for geothermal developments in the advanced markets of Java and Sumatra among those developers and holders of a geothermal license (IPB or Ijin Panas Bumi holders) willing to take on exploration and development risks.

16. GoI is cognizant that a new tariff regime may not be sufficient to mobilize private investment in geothermal power development where private sector interest is low due to inherent site-specific conditions (e.g. the geothermal fields of Eastern Indonesia). Moreover, it is yet to be seen whether such system will be sufficient to compensate for resource risk at the speed desired by GoI. GoI has taken the first step to transfer funds (about IDR 3.1 trillion or US$2.5 million) from what was previously known as the Geothermal Fund Facility (GFF) to a new Geothermal Infrastructure Facility (GIF) in PT Sarana Multi Infrastruktur (PT SMI) for mitigation of geothermal exploration drilling risks, particularly in areas where development prospects are not attractive for pure private sector plays. The original design of GFF was based on collateral-backed loans and failed to adequately address the high exploration risk issues since the GFF loans were to be paid back in full even in the case of unsuccessful drilling. The design of GIF will enable, among other things, government-sponsored drilling, which hinges on a more balanced approach to risk allocation in the overall geothermal development process. In order to enable PT SMI to use the funds made available through GIF, MOF is presently drafting enabling regulation (a so-called PMK) the issuance of which will be a precondition for PT SMI’s involvement in government sponsored drilling. The PMK is therefore a negotiations condition for the CTF and GEF grants.

17. Global experience shows that de-risking geothermal projects by using government funds for exploration has been the key to attracting risk capital and mobilizing private sector expertise towards geothermal drilling. Advanced development of the local geothermal markets in geothermal resource-rich countries such as USA, Japan, and New Zealand is largely attributable to cost-shared or dedicated government exploration drilling programs that increase the investment appeal for investors and developers. Government-sponsored drilling is currently the focus of much of the global push for geothermal development, and cost-shared drilling models are also being pursued in the developing geothermal markets such as Turkey, Armenia (supported by World Bank) and Mexico (supported by Inter-American Development Bank).

\textsuperscript{4} The first geothermal tariff was a ceiling tariff in 2009, which was revised to be feed-in tariff in 2012. In 2014, it was revised the second time to a ceiling tariff.
18. Geothermal energy is a low-pollution and low-cost alternative to expensive oil-fired generation, which Eastern Indonesia has so far been heavily reliant on and which has been holding back the electrification of this, the poorest part of the country. There are therefore huge developmental advantages of introducing geothermal baseload generation in the island grids. However, the risks involved in geothermal development in the Eastern Indonesia, i.e. the six eastern Indonesian provinces, are also higher than in the major power markets in the bigger islands. Based on international experience, the best way to attract private developers to IPB license auctions in the smaller eastern island networks and get these important resources under development is government-sponsored drilling.

19. PT SMI has been given a government mandate to finance and facilitate exploration drilling with a specific focus on the eastern islands. However, it lacks the geothermal expertise needed to implement a pre-license drilling window and can only use a limited share of the GIF funds for this purpose. Limited capacity and limited funds are thus constraining the development of government-sponsored drilling with the consequence that (i) the Eastern Indonesia market risks remaining under-developed and (ii) the feasibility and effectiveness of pre-license drilling remain untested.

20. To date, international development assistance has been focused on assisting GoI in addressing institutional and regulatory shortcomings, and providing support to downstream investment. Asian Development Bank (ADB) and several bilateral development partners such as JICA, and New Zealand Government, have been supporting GoI with institutional, regulatory and tariff reforms. The WBG has assisted GoI with the development of a pricing policy and robust regulatory provisions for geothermal development through the Global Environment Facility (GEF) and the Asia Sustainable Energy Program (ASTAE). However, issues related to pricing, environmental and social regulation, offtake guarantees, among others, still remain to be solved. The World Bank has recently approved an Indonesia Sustainable and Inclusive Energy Development Policy Loan (DPL), which includes strengthening of the regulatory environment, particularly focusing on adoption of the implementing regulation corresponding to geothermal power development for the Geothermal Law. However, to have the full effect this will need to be supplemented through well-coordinated technical assistance from multi- and bi-lateral development partners.

C. Proposed Development Objective(s)

**Note to Task Teams:** The PDO has been pre-populated from the datasheet for the first time for your convenience. Please keep it up to date whenever it is changed in the datasheet.

**Development Objective(s) (From PAD)**

21. The PDO is to “facilitate investment in geothermal power generation and reduce greenhouse gas emissions.” This would be achieved through supporting a risk mitigation mechanism for geothermal exploration drilling and building capacity of the client to conduct an efficient exploration and tendering program.

22. Key result indicators to monitor progress toward achievement of the PDO are:
   - Electric power generation capacity enabled through the issuance of geothermal development licenses (Megawatt)
   - Commercial capital mobilized for investment in geothermal power generation (USD million)
• Estimated GHG emission reduction compared to a business-as-usual baseline (Metric tons)

23. In addition, the following intermediate result indicators will be adopted:
• Generating capacity-equivalent of steam yields from wells drilled (total) (MW)
• Generating capacity-equivalent of steam yields from wells drilled (average) (MW/well) (Megawatt)
• Issuance of geothermal development licenses (Number)
• Estimated increase in the number of connected households for the associated local electricity networks (Number)
• Direct project beneficiaries (Number)
• Of which female beneficiaries (Number)
• Delivery of Inferred Resource Capacity Reports by Exploration Management Team (Number)
• Practice guides for safeguards implementation issued (Number)
• Villages located next to exploration sites with at least one public consultation held (Percentage)
• Share of public consultations segregated by gender (Percentage)

24. The proposed Project is designed to monitor Citizen Engagement through “Villages located next to exploration sites with at least one public consultation held”. Gender is monitored through two indicators, namely: “Share of public consultations segregated by gender” and “Female Beneficiaries”.

D. Project Description

25. The proposed Project consists of two key components:

26. Component 1: Risk Mitigation for Geothermal Exploration Drilling (US$98 million, of which US$49 million is from CTF and US$49 million is from GoI) – the component will finance a program of activities designed to support geothermal exploration drilling in Indonesia, through: (a) drilling of exploration and confirmation wells; and (b) constructing access roads and other associated infrastructure to facilitate the drilling activities, at select geothermal sites. Funding for exploration drilling is expected to be made available in the amount of US$49 million from CTF with a matching contribution from MoF/PT SMI.

27. Sites for exploration drilling will be selected by the Directorate General of New Energy, Renewable and Conservation Energy (EBTKE) under MEMR. A total of 13 sites has been proposed by MEMR and from this list it is expected that size sites will be included for exploration drilling. It is agreed with MEMR that at least half of the sites to be explored will be in the islands of Eastern Indonesia, where geothermal power can serve to increase access to sustainable energy. However, GoM may also wish to demonstrate government-sponsored drilling in sites connected to the larger power markets in Sumatra or Java which allow development of plants with larger capacity. It is therefore expected that one or two of the six sites will be in Sumatra and connected to the major power markets.

28. Based on the typical size of plants observed in Eastern Indonesia, it is estimated that 65 MW will come on-line as a result of the exploration drilling financed under this Project. This is a conservative estimate assuming that all successful site developments will be outside the major power markets. A revolving mechanism, referred to as the Geothermal Exploration Facility, will be set up through which the funds used for exploration drilling will flow back to the facility through the repayment of exploration cost plus a premium from developers that have successfully
secured a license to develop the project. The reflow of funds into the Facility will ensure that funding will be available for future development, thus ensuring sustainability of the risk mitigation scheme.

29. **Component 2: Capacity Building on Geothermal Exploration and Environmental and Social Safeguards Management (US$6.25 million)** – the component will finance a program of capacity building designed to establish an efficient and effective geothermal energy exploration and tendering program including such activities as: (i) advisory support in carrying out geology, geochemistry and geophysics surveys (3G surveys) and topographic mapping for geothermal sites; (ii) advisory support for preparation of drilling, well completion and resource assessment reports (based on 3G surveys) as well as for the bidding process for exploration service companies; (iii) recruitment of an exploration management team; and (iv) just-in-time assistance to MEMR, Badan Geologi, and the Recipient in response to request for international expertise to deal with questions related to, *inter alia*, geothermal tariff setting, benefit-sharing, and data management and sharing. Capacity building on environmental and social safeguards management will include support to PT SMI in preparation of: (i) safeguards instruments and monitoring procedures, (ii) terms of references (TOR) for environmental and social specification for tendering at exploitation phase for public and private developers of the six selected sites for exploitation, and (iii) generic guidelines for industry-wide standards for safeguards management in the exploration and exploitation phases per the applicable World Bank’s safeguards policies.

30. This component will be financed by the Global Environment Facility (GEF) grant but will also benefit from a parallel grant from the Government of New Zealand (GNZ). The GNZ grant, which is equivalent to around $3.25 million, is designed to be complementary to the development objective of this Project, and will focus on supporting the GoI on: (i) establishment of an effective GIS-based database by collating and analyzing existing and new resources data, potentially to be housed within Badan Geologi (BG); (ii) methodology for robust resource and reserve estimation and reporting protocol to an internationally acceptable standard; (iii) methodology for prioritization of potential sites for geothermal development; and (iv) capacity building for EBTKE and PT SMI for tendering and executing an exploration program.

31. The technical support and capacity building will include the building up of an Exploration Management Team (EMT) inside of PT SMI. The Team will consist of various experts coordinated by a geothermal consultancy company. Specifically, the EMT will provide technical assistance to the government-sponsored exploration drilling program, including advisory support in carrying out geology, geochemistry and geophysics surveys (3G surveys) and topographic mapping for candidate sites. Support will also be made available for the preparation of drilling, well completion and resource assessment reports (based on 3G surveys) as well as for the bidding process for exploration drilling services. Capacity building plans will also benefit the Geothermal Directorate under the Ministry of Energy and Mineral Resources and Badan Geologi (Indonesia’s Geological Agency). GNZ has already recruited a consultant to staff the EMT and the core EMT members as well as some short-term specialists will be funded by the GNZ grant during the first three years of the Project. The GEF grant will finance an in-house PT SMI Exploration Project Manager (EPM) throughout the project lifetime, EMT core team members for the last 2.5 years of the project and most of the short-term specialist support for the EMT as well as just-in-time assistance for MEMR, Badan Geologi, and PT SMI in response to request for international expertise to deal with questions related to, *inter alia*, geothermal tariff setting, benefit-sharing, and data management and sharing.

32. Furthermore, GEF resources will fund technical assistance to PT SMI in producing an industry-wide standards, good practice guide for preparing IPDP, LARAP, ESIA and ESMP for exploration and exploitation of geothermal energy beyond the Project. These materials will provide the industry with guidance in the preparation and implementation...
of safeguards instruments for future projects in accordance with Indonesian regulations and safeguards requirements of World Bank and other multilateral development partners and financial institutions such as JICA and ADB for geothermal-based electricity generation projects in Indonesia. The purpose is to provide international standards and approaches to safeguards, and expectations about the technical rigor and quality of the work required. An area of focus will be good practice guidance for the development of geothermal power generation projects in conservation areas and forests. The Indonesian government has recently issued a new regulation to enable geothermal development in Wildlife Reserves, National Parks, Grand Forest Parks and Natural Recreation Parks under a Utilization Permit for Geothermal Environmental Services Region (Ministry of Environment and Forestry Regulation No. P.46/Menlhk/Setjen/Kum.1/5/2016 dated May 23, 2016).

E. Implementation

33. PT SMI is the Project Implementing Agency under the strategic guidance of a Joint Committee. The Joint Committee will be made up of key stakeholders, namely MoF, MEMR, Directorate General for New Energy, Renewable and Conservation Energy (EBTKE), and Badan Geologi (BG). MoF and MEMR will exercise an overall oversight function over PT SMI and play an important role in terms of overall geothermal development coordination, respectively. EBTKE will be responsible for setting the principles for site selection and facilitating the tendering process for the geothermal area (Wilayah Kerja Pertambangan or WKP) after exploration drilling has produced sufficient evidence of the productivity of geothermal resources and viability for further investments. Badan Geologi, the Geological Agency of Indonesia, will support project implementation through supplying geological data on the sub-project candidates.

34. The Joint Committee will make key decisions related to: (i) projects to be included for geoscience and safeguards screenings, (ii) whether to proceed with drilling and (iii) choice of well targets. PT SMI will oversee the implementation of the Project; and in doing so, it will establish a Project Management Unit fully staffed with key roles for fiduciary and safeguards supervision. More importantly, it will be supported by an Exploration Management Team (EMT) of consultants with expertise in geothermal resources and development and experience in management of drilling and civil works\(^5\) contracts.

35. PT SMI’s role in geothermal exploration, including issues related to investing government funds, arranging drilling through properly licensed entities, will be defined in a new regulation (PMK) that is being drafted and will need to be issued by MoF. An adequate institutional arrangement for land acquisition as well as provision for transfer of land title to the private sector entities will also be required. The issuance of the appropriate PMKs is a negotiations condition for the CTF and GEF grants. A Project Implementation Manual (PIM) is being prepared by PT SMI and needs to be agreed with the World Bank and adopted by PT SMI before Grant negotiations. It will outline the project structure and key processes and procedures to be followed, especially those undertaken by the implementing agency.

Note to Task Teams: The following sections are system generated and can only be edited online in the Portal.

\(^5\) Civil works are needed to enable rig access to the sites.
F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

Although the project locations are not yet defined, screening of potential sites indicates that they are likely to be remote areas, potentially with agricultural land uses, forests, surface geothermal features and landscapes, and potentially other types of natural habitats within the project area of influence. Infrastructure such as roads and wharfs may be basic and require upgrading to allow rigs to get to site. Indigenous people may be present in the project area of influence. Geothermal developments may not be well understood by the host communities, and there is the potential that host communities are not connected to an electricity grid or have other basic infrastructure.

G. Environmental and Social Safeguards Specialists on the Team

Thomas E. Walton, Warren Waters, Jeffry Anwar, Krisnan Pitradja Isomartana, Penelope Ruth Ferguson

<table>
<thead>
<tr>
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<td>Environmental Assessment OP/BP 4.01</td>
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multilateral development partners and financial institutions such as JICA and ADB for geothermal-based electricity generation projects in Indonesia. An ESMF has been prepared with detailed procedures for screening risks, requirement to prepare an ESIA and ESMP for every subproject, and detailed arrangements for safeguards implementation and monitoring.

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<td>In Indonesia, some of the geothermal resources are found in terrain that is designated as hutan lindung (HL), to remain in forest cover for watershed protection. While human activities have modified some of the HL, much of it remains as natural habitat. Other natural habitats may be related to geothermal surface features, commonly found in exploration areas. There is a potential for well drilling and testing to affect nearby natural habitats. The direct and indirect impacts of exploration will be assessed in ESIsAs described under OP 4.01 above. The ESIsAs will also screen the key potential impacts of exploitation in order to inform decision-makers about the potential risks of a site and the appropriate methods to avoid or mitigate high risks prior to the decision to explore. Degradation of critical natural habitat will be avoided. The natural habitats policy will be considered in the technical assistance component as explained under OP 4.01 above.</td>
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<td>Forests may be directly affected through the clearance of vegetation for drilling pads and supporting infrastructure, from well testing and indirectly through induced development. Mitigation measures for induced development may change the way forests are managed or accessed in the location. Therefore the policy has been triggered and the potential risks and impacts will be addressed in the ESIA and ESMP. The forests policy will be considered in the technical assistance component as explained under OP 4.01 above.</td>
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exploration projects. In some cases in Indonesia, the manifestations of geothermal energy have themselves been considered sacred by local communities. This policy is also triggered for the technical assistance component as explained under OP 4.01 above.

**Indigenous Peoples OP/BP 4.10**  
Yes

Because the project is national in scope and has a focus on more remote locations in Indonesia, the possibility exists that indigenous people will be present in the project area of influence. Therefore the policy has been triggered. The IPPF defines the procedure to be followed in determining whether indigenous peoples may be affected, and guidelines for preparing IPPs.

The Indigenous Peoples Policy will be considered in the technical assistance component as explained under OP 4.01 above.

**Involuntary Resettlement OP/BP 4.12**  
Yes

The Bank’s experience with geothermal projects in Indonesia indicates that land acquisition can often be carried out by negotiated, market-based, transactions on a voluntary basis and involuntary resettlement does not occur. There may be instances where involuntary resettlement is required due to road alignments or in relation to land users on Government land that will be used for the project. Therefore the policy has been triggered. An RPF has been prepared to establish the principles and procedures for negotiated transactions and, if required, involuntary land acquisition and resettlement under Indonesian laws and safeguard policy OP4.12. The LARP provides guidance for the preparation of LARPs.

The Involuntary Resettlement Policy will be considered in the technical assistance component as explained under OP 4.01 above.

**Safety of Dams OP/BP 4.37**  
Yes

The policy is triggered. It will be a requirement within the design specifications and Contractor’s contract conditions that the storage and settling ponds for drilling fluids and brine storage ponds will be designed by qualified professionals and properly inspected and maintained in accordance with the
The World Bank
Indonesia: Geothermal Energy Upstream Development Project (P155047)

| Projects on International Waterways OP/BP 7.50 | No | Exploration will not affect the quality or quantity of international waterways or groundwater. |
| Projects in Disputed Areas OP/BP 7.60 | No | The project will not operate in disputed areas. |

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:
   Because the sites are unknown, the potential nature and scale of impacts has been screened based on similar projects elsewhere. There is potential for significant risks in remote, forested areas related to induced development. Improved access to forested areas through the provision of roads may encourage or exacerbate land clearance activities. Induced development could lead to land disputes, illegal land uses, impacts on Indigenous Peoples and remote and vulnerable communities, damage or loss of natural habitats and forests, and reduced watershed protection, without adequate mitigation or management. Other direct impacts from exploration drilling, access roads, brine management, drilling muds and working camps etc. can be managed through standard industry methods.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:
   Environmental and social assessment at exploration stage needs to take into account potential impacts related to exploitation activities on a given site. Significant benefits and risks related to geothermal development are related to downstream activities, such as larger footprint required for exploitation drilling and construction of transmission lines to evacuate power. Greater infrastructure development may also be required during the exploitation phase, leading to a wider range and larger scale of potential impacts such as: emissions to air from generation facilities, increased encroachment into remote areas for makeup wells, land requirements for roads, well pads and pipelines and the management of waste steam and waste water. Induced development risks will be more significant in the long term due to the expanded well-field and increased development of remote areas. The risks to remote and vulnerable communities, potentially including Indigenous Peoples, could include encroachment onto forest and customary land, changes to social and cultural circumstances and competition for natural resources. Mitigation on a landscape scale is likely to be required.

   The socio-economic impacts of renewable, reliable, and increased energy supply will be beneficial to local households, communities of Indigenous People, businesses and government agencies.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.
   Alternative exploration sites will be screened early in the project cycle. Social, environmental and land risks and issues will be part of the screening process, so that significant impacts can be avoided or minimized during project selection and through design. This will be documented in the ESIA. During the exploration activity, the assessment of alternative and final drilling sites will be done in the field to further avoid or minimize adverse impacts.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.
PT SMI has extensive experience in managing WB and other donors’ safeguards policies under the Investment Guarantee Fund, Indonesia Infrastructure Facility Fund and the Regional Infrastructure Development Fund. PT SMI has developed a specific Operations Manual and Environmental and Social Management System for use on its programs supporting local government investments through various infrastructure funds. They have a safeguards team in the Environmental Social Safeguard and Business Continuity Management Division under the Risk Management Directorate, with qualified and experienced staff members. This team will be responsible for overseeing the implementation of the ESMF, IPPF, RPF. They have the staff capacity and the capability to undertake this role. They will engage specialist consultants to prepare ESIA, ESMP, IPDP, LARAP. The ESMF provides a process for screening environmental, social, land and Indigenous Peoples risks and issues during project pre-feasibility, and for identifying the specific safeguards instruments (ESIA, ESMP, IPDP, LARAP) for each project. The ESMF requires the safeguards instruments to be prepared with reference to the World Bank Group EHS Guidelines, in particular the Geothermal Industry Sector Guidelines. The RPF outlines the procedures for voluntary land acquisition (willing buyer and willing seller), and for involuntary land acquisition and resettlement in the unlikely event that this is required. The IPPF states that voluntary land acquisition is preferable and should be possible in the majority of cases. The IPPF provides guidance on the consultation requirements and inclusivity of Indigenous Peoples in project design and execution, to minimize impacts and enhance project benefits.

PT SMI does not have experience in managing geothermal exploration projects, and therefore they will be supported by an Exploration Management Team. Key roles of the EMT will be to ensure that safeguards are integrated into the overall project plan and supervised during construction. PT SMI will not own or lease any land, or be responsible for paying entitlements, support and other compensation under the LARAP as it does not have the mandate to own geothermal exploration assets. This will be undertaken by a separate GoI entity (Renewable Energy and Energy Conservation Division). PT SMI will support and supervise the GoI Entity to undertake all land transactions in compliance with the safeguards instruments for GEUDP.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The key stakeholders are the local government (such as district and regency offices, Energy & Mineral Resource office, Planning Agency Office, Environmental and Forestry Office, Public Works, Tourism Office, and Investment/Permit Agency), Non-government organizations and the host communities within the area of influence of the exploration activities. This includes any specific sensitive receptors such as households along access routes or adjacent to facilities, schools, hospitals etc. Stakeholder Engagement Plans will be prepared by PT SMI for each geothermal project and will be integrated into project planning. Consultation will start during feasibility and continue during the ESIA and LARAP processes and throughout the exploration project implementation.

Relevant Government stakeholders are already part of the project architecture (Badan Geologi / Geological Agency of Indonesia, Ministry of Energy and Mineral Resources (MEMR), Directorate General of New Energy, Renewable and Conservation Energy (EBTKE), the State Asset Management Agency (LMAN), and PLN (State Owned Utility Company), and will either contribute governance or technical inputs into the project. Other agencies such as Ministry of Environment and Forestry and Ministry of Public Works will be invited to broader project consultations.

Consultations on the ESMF, RPF and IPPF were held on September 14, 2016 in Jakarta with the government stakeholders listed above. This was an interactive workshop. The same method of stakeholder consultation will be undertaken for industry guidelines and capacity building under Component 2 during project implementation. It was recognized that the consultation approach would be improved for project implementation, particularly to involve relevant civil society representatives; these may contribute both to national level (guidelines, capacity building etc.) and local level (site-specific) interventions.
### B. Disclosure Requirements

#### Environmental Assessment/Audit/Management Plan/Other

<table>
<thead>
<tr>
<th>Date of receipt by the Bank</th>
<th>Date of submission to InfoShop</th>
<th>For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors</th>
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#### Resettlement Action Plan/Framework/Policy Process

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#### Indigenous Peoples Development Plan/Framework

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C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?
Yes
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?
Yes
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?
Yes

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?
No
If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?
NA

OP/BP 4.11 - Physical Cultural Resources

Does the EA include adequate measures related to cultural property?
Yes
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?
Yes

OP/BP 4.10 - Indigenous Peoples

Has a separate Indigenous Peoples Plan/Planning Framework (as appropriate) been prepared in consultation with affected Indigenous Peoples?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes
If the whole project is designed to benefit IP, has the design been reviewed and approved by the Regional Social Development Unit or Practice Manager?
NA

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes
OP/BP 4.36 - Forests

Has the sector-wide analysis of policy and institutional issues and constraints been carried out?
NA

Does the project design include satisfactory measures to overcome these constraints?
NA

Does the project finance commercial harvesting, and if so, does it include provisions for certification system?
NA

OP/BP 4.37 - Safety of Dams

Have dam safety plans been prepared?
NA

Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?
NA

Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?
NA

The World Bank Policy on Disclosure of Information

Have relevant safeguard policies documents been sent to the World Bank's Infoshop?
Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?
Yes
All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?
Yes

Have costs related to safeguard policy measures been included in the project cost?
Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?
Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?
Yes

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APPROVAL

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Approved By

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<tr>
<th>Safeguards Advisor:</th>
<th>Peter Leonard</th>
<th>02-Dec-2016</th>
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<td>Practice Manager/Manager:</td>
<td>Julia M. Fraser</td>
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<td>Country Director:</td>
<td>Rodrigo A. Chaves</td>
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