Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 06-Feb-2020 | Report No: PIDA27592
The project aims to strengthen institutional capacity for climate resilience and market efficiency in the energy and mining sectors.

Components

Component 1 – Technical assistance to increase efficiency, long term infrastructure adequacy and climate resilience in the energy and mining sectors
Component 2 – Institutional strengthening of energy and mining institutions to establish and implement strategies, policies and regulation
Component 3 – Implementation support, Monitoring and Evaluation, and Knowledge Sharing and Dissemination

**PROJECT FINANCING DATA (US$, Millions)**

**SUMMARY**

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**DETAILS**

World Bank Group Financing
B. Sectoral and Institutional Context

1. **The energy and mining sectors are some of the main drivers of the Brazilian economy.** The electricity, oil and gas and mining and mineral processing sectors represent almost 3 percent, 13 percent\(^1\) and 4 percent of Brazil's GDP, respectively, and are fundamental to other important economic sectors. Additionally, in 2018, the mining and mineral processing sector was responsible for 25 percent of the country’s commercial balance, while petroleum and fuel represented around 10 percent.\(^2\) Brazil is the world's ninth-largest country and has rich reserves of important metals such as bauxite (aluminum), iron ore, niobium and nickel, and is also a leading producer of precious metals such as gold.

2. **The power, gas and mining sectors stand at different stages of institutional development.** While the power sector is one of the most sophisticated in Latin America, it is facing a number of challenges to increase its resiliency to climate change; the gas sector development has lagged due to regulatory and governance issues; and the mining sector requires a comprehensive modernization anchored in sustainability. In particular, given the substantial contribution of hydropower to the energy mix, observed and anticipated climate change impacts, are exacerbating the already observed vulnerability of the power sector generation and quality of the supply. Likewise, the mining sector is a significant user of local water and energy resources, both of which are impacted by a changing climate. Furthermore, its operations and supply chains are exposed to extreme weather events which are expected to intensify with climate change.

3. **The modernization of Brazil’s energy and mining sector is critical to accelerate economic growth and job creation in an environmentally sustainable way.** The sectors are in need of regulatory improvements to support increased productivity in Brazil. The gaps can be exemplified as follows: (i) in the power sector - climate volatility increasingly threatens energy security, due to the substantial contribution of hydropower to the energy mix and the lack of effective mechanisms to prevent electricity crises caused by droughts. The diversification of the electricity matrix will contribute to increasing the power system resiliency. However, the inclusion of an anticipated 45 percent of variable renewable generation to the energy mix by 2040 will require a revision of market rules, dispatch, pricing, as well as specific contracting models to increase flexibility in the power system; While access to electricity is universal, the power sectors faces important challenges in terms of affordability. There is a need to rationalize the tariff structure that had led to high tariffs due to charges and levies; (ii) in the natural gas

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sector – the existing legal, regulatory and taxation frameworks do not offer adequate incentives for the emergence of a competitive natural gas market, contributing to the dominance of Petrobras in all gas market segments, underinvestment in infrastructure, concentration in offshore production with high reinjection rates and, significantly high prices; and (iii) in the mining sector - there is a need to strengthen the regulatory capacity and modernize the recently created National Mining Agency (Agência Nacional de Mineração, ANM) to bridge the significant institutional gap that exists for the efficient regulation and supervision of the sector. The National Mining Plan (PNM) must be revised in order to provide a strategy for the sector’s sustainable development.

4. In January 2019, the Ministry of Mines and Energy (MME) launched its program to reform the Energy and Mining Sectors. The program for reform focuses on: (i) Adequate governance, including regarding the distribution competencies and responsibilities among institutions to optimize the management of the sector, and respect for the competencies of the policy maker (MME) and sectoral regulators; (ii) Stability and certainty in the judicial and regulatory front; and (iii) Predictability to help attract private investments, for example with prior disclosure of mining, gas, oil and electricity auctions. The program is continuing a number of reforms initiated under the previous administration.

5. Brazil has ambitious goals in terms of diversifying its energy matrix, including a large increase in the share of variable renewables (variable renewable energy [VRE], solar, and wind) in its energy matrix, from around 10 percent in 2018 now to 40 percent by 2040. Reaching that goal would be key for Brazil to maintain clean energy matrix even as its reliance on hydropower falls over time. From the point of view of greenhouse gas (GHG) emissions, the counterfactual to the development of a strong renewables sector would be a scenario in which fossil fuels substitute for hydroelectricity. However, for Brazil to instead make a large leap in the share of variable renewables in a sustainable manner, Brazil needs to embark on a third wave of power sector reforms.

6. Rapid growth in renewables could become a significant source of skilled jobs and potentially have significant positive effects on the growth of the respective manufacturing industries. In recent years, Brazilian wind energy has been growing on a fast trajectory, particularly in the Northeastern region. IRENA suggests that in Brazil approximately 33,700 people are engaged in the manufacturing of wind turbine components, in tower construction and in the installation, operation, and maintenance of wind farms. Brazil is looking at expanding, not only its on-shore wind industry, but also off-shore. Some recent studies suggest that wind energy not only increases employment in the industry, agriculture and construction, but also increases wages across all sectors in the economy including commerce and services. A rapid solar scale-up could also have a significant impact. ³

7. Similarly, Brazil has very large mineral resources and vast newly discovered reserves of oil and gas, but the hydrocarbons sector growth has lagged due to governance and regulatory issues. Brazil has global leading-edge expertise in the ultra-deep waters offshore technologies necessaries to exploit these reserves, but despite the Government efforts, the latest bidding rounds have not been as successful as anticipated due in part to the need for additional legal, regulatory and governance reforms. In addition to supporting growth and job creation directly, oil and gas can have significant backward and forward links. Realizing these opportunities also requires policy and regulatory reforms, including midstream and

³ http://www.repec.eae.fea.usp.br/documentos/Goncalves_Rodrigues_Chagas_41WP.pdf
downstream.

8. **All the reforms mentioned in power, gas and mining are of a second or third generation reforms.** In other words, in many cases Brazil would be at the forefront of innovation in development policy. Lessons learned would most probably be of large interest to other developing countries with large potential in renewable generation, as well as to those with significant mineral and oil and gas resources. Those reforms would have to accompanied by new methodologies, modernization of processes and new institutional framework in areas in which Brazil is still lagging, particularly in the mining sector.

9. **However, because of their complexity, the design of all these reforms will require substantial analytical studies and investments in new methods and tools associated capacity building activities.** The World Bank has a long track record in supporting previous waves of reforms in EEX sectors, helping provide the analytical underpinnings for Brazil’s previous waves of legal and institutional reforms, which has placed the country at the forefront of development policy innovation at some areas (auction design, hydrothermal operations, etc.). However, even if these areas, there is a need for a new generation of reforms to eliminate barriers for new technologies, ensure long term adequacy in the power sector. Moreover, Brazil still lags considerable in other areas, such climate resilience in the power sector or regulation to drive sustainable mining practices, and this creates an important constraint to the growth acceleration for which Brazil is poised, especially if this is to occur in a sustainable way.

10. **Electricity Sector. Brazil is one of the largest and most developed power markets in Latin America, with a total installed capacity of 168 GW in mid-2019, a relatively clean electricity matrix and significant commitments for further emissions reductions.** The hydropower system is one of the largest in the world, with an installed capacity of over 106 GW that provides between 60 percent and 80 percent of the country’s electricity, while using only one third of its estimated potential. As a result, the carbon intensity of the Brazilian energy mix is half of the world average and one-sixth of the OECD average, and, under its Nationally Determined Contributions (NDCs) pledged at COP-21, Brazil has committed to reduce national GHG emissions by 37 percent below 2005 levels in 2025, and 43 percent by 2030.

11. **However, the limitations of the “new model” that emerged after the reform in 2004 have become evident after recent hydrological crisis and have been exacerbated by the economic crisis.** Climate volatility increasingly threatens power generation predictability and the quality of supply in times of crisis, due to the substantial contribution of hydropower to the energy mix. In order to address the changes which have been affecting the power sector, the current government established a working group in April 2019 to develop an action plan for the modernization of the Electricity Sector. The proposed project aims at informing the definition and implementation of that action plan with focus on the areas where the World Bank can add value by sharing international experiences such as climate resilience, dispatching rules, market design, VRE integration, gas integration and price formation, that are key to reduce the overall electricity costs, and ensure long term sustainability preventing new energy crisis.

12. **Hydrocarbons sector. Brazil’s hydrocarbons sector growth has lagged due to governance and regulatory issues.** Brazil has the world’s 15th largest proven oil reserves and was the world’s 9th largest oil producer in 2018, with about 3 percent of all production, primarily coming from the offshore. Brazil has seen its exports of crude grow from 734,000 barrels per day (bpd) in 2015 to 1.3 million bpd in Q1 of 2019. While Brazil revoked Petrobras’ monopoly on key segments of the supply chain and established an independent regulatory agency, ANP, in the mid-90s, the national oil company (NOC) still plays a dominant
role in the sector. Brazil’s government intends to drive upstream investment in order to monetize its pre-salt oil and natural gas resources, attract midstream investment, and achieve more affordable domestic energy, which it believes will in turn drive downstream industry development. It has done so, among others, by settling a longstanding dispute with Petrobras on the transfer of rights (TOR) blocks and by organizing bid rounds in October and November 2019, opening up significant new areas onshore and offshore for exploration. The rounds were however not as successful as anticipated.

13. **Brazil’s natural gas market has been relatively stagnant in recent decades.** At present, despite increased levels of natural gas production, it represents about 13 percent of Brazil’s primary energy supply, fueling industry and power generation. Gas demand for power generation varies considerably from one year to the next in Brazil because gas is used to balance the annual availability of large-scale hydropower. This means that natural gas producers – mostly offshore - do not have a relatively constant source of demand to justify building additional and costly offshore-to-onshore pipeline capacity to bring gas onshore. Significant storage capacity could potentially provide such a constant source of demand as well as contribute to security of supply, to smooth out intertemporal/seasonal variations in demand, supply, or prices; but justifying these investments requires access to markets. Industry may provide the relatively constant year-round demand, but industrial gas prices are currently unattractive. Natural gas demand is at present met with a combination of domestic production, liquified natural gas (LNG) imports, and piped gas from Bolivia. Gas demand is forecasted to increase in the coming decades. The natural gas market supply in Brazil will grow from 57 million cubic meters a day in 2016 to 95 million m³ in 2026.

14. **Almost ten years since regulatory reforms failed to kickstart greater natural gas market competition, Brazil launched the New Gas Market ("Novo Mercado de Gas") program,** which builds upon the Gas for Growth Initiative ("Iniciativa Gas para Crescer"), and aims to establish an open, dynamic and competitive natural gas market, cut the domestic price of gas by 40 percent and attract greater investment into the sector. After the failed attempts in 2016 and 2018 to change the natural gas law, the GoB has opted to promote change through: (i) approval of Resolution No.16 by the National Council on Energy Policy (CNPE) in June 2019 that provides guidelines for the sector to promote a competitive natural gas market; (ii) the Agreement on the Commitment, which was reached between Petrobras and the Administrative Council of Economic Defense (CADE) in July 2019, whereby Petrobras committed to sell-off several assets and get out of non-core sectors; (iii) new regulations by ANP; (iv) state regulations, incentivized through programs such as Fiscal Balance Program (PEF); (v) submission of legal amendments to the National Congress; and (vi) tax adjustments such as the National Integrated Economic Information System Tax (SINIEF). The reform momentum is currently strong, but its ultimate success will hinge upon diligent oversight at both the federal and the state level.

15. **Mining. Brazil’s growth over the last four years has been driven to a significant extent by the expansion of the mineral sector and related industries.** Production, value added and exports in mining have risen rapidly since 2003. In 2018, the mining and mineral processing sector was responsible for 4 percent of GDP and 25 percent of total the country’s commercial balance. Iron ore alone represented 8.89 percent of total exports in 2018. Currently, Brazil is one of the top three producers in the world of iron ore, gold, manganese, and bauxite. It is also an important producer of nickel, copper, zinc, and gold. Brazil is viewed as a country with an important mining potential based on the country’s vast territorial area and promising geological potential comparable to Canada and Australia. In addition to iron ore, gold, alumina, niobium, nickel, titanium, coating quality kaolin and vanadium, Brazil has a wide choice of targets for strategic minerals such as lithium, rare earth, thorium and uranium. Contrary to common belief, Brazil’s
most important mines (except iron ore and bauxite) are located outside the Amazon Basin, and the majority of the country’s surface area is still regarded as poorly explored for minerals when compared to other leading countries.

16. **While the country is expected to remain a world leader in mineral commodities production, the sector is facing several challenges that are hindering the development of its full potential.** These challenges relate to weak institutional capacity, aggravated by declining budget to fulfill their roles, weak regulatory capacity that has resulted in serious environmental impacts, but also, not less important, a lack of true vision and strategy for the sector that is clearly reflected in a context of absence of adequate and strategic public policies. Brazil has started to address the regulatory, planning and market limitations of the mining sector. As a first step to tackling some of these issues, Congress approved in 2017 a series of measures updating the mining legislation. This included, among other actions, the creation of ANM. In addition, the Brazilian Government approved a new strategic plan for the mining sector – the National Mining Plan 2030 (PNM).

17. **Brazil’s mining sector is at a cross road as its growth will depend on building a stronger focus on more sustainable mining practices.** The lack of regulatory enforcement and oversight has led to a series of catastrophic events in the past two years that have highlighted the urgent need for actions that will modernize the sector and provide the mechanisms for improved management. A new vision and strategy for the sector must be underpinned by sustainability. Minimizing the material and carbon footprints of these mineral supply chains will be critical. The Climate Smart Mining\(^4\) framework, developed by the World Bank, provides the starting point to design a roadmap for more improved mineral supply chains with the adoption of sustainable mining practices that reduce the sector’s carbon and material footprint.

18. **The creation of ANM was a push to promote an overall modernization of the sector’s institutional framework through a more agile and independent institution.** The key objectives to be enforced by the ANM are a series of measures aiming at making the regulation of the sector more efficient such as (i) Impose on current Exploration reports, adherence to international rules of Resource and Reserves Reporting; (ii) Modernize the on-line staking process of first come first served basis; (iii) Develop an exploration database from companies that have lost or relinquished titles, available as open file data within a logical time frame; (iv) Support and coordinate with the relevant environmental institutions to expedite Environmental Licensing for Exploration Permits while maintaining high standards; (v) Create a more modern and efficient management system for the licensing and inspection of tailings (vi) Simplify of the licensing process for construction, agriculture minerals/material. In contrast to the ANM the Brazilian Geological Survey (CPRM) is a state-owned company, under the Ministry of Mines and Energy, which has been performing well.

19. **Tailing dams. The Samarco Dam failure, on November 5, 2015, caused the discharge of 62 million m\(^3\) of iron mine tailings over 230 counties in the states of Minas Gerais and Espirito Santo, Brazil.** The tailings inundated the valley of Rio Doce and its tributaries, all the way to the Atlantic Ocean some 300 km away. Four years later The Brumadinho tailings dam disaster, on January 25, 2019, once again highlighted the fragility and inadequacy of the government’s regulatory capacity and the weaknesses in

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Vale’s operational standards. The accident resulted in the death of over 250 people. The urgency of the situation requires immediate action to ensure that such accidents do not occur again. Several measures need to be put in place and will require coordination between the MME, ANM and CPRM. Although META 2 is not directly supporting any of activities aimed at addressing the framework for the licensing and monitoring of mining tailings dams, the project is supporting improved regulatory capacity of the ANM and an improved information technology (IT) platform for monitoring of mining sector operations that will be critical for a better management of the sector in general. A global coordinated effort is necessary to meet the scale of the tailings challenge. With that objective the International Council on Mining and Metals (ICMM), the United Nations Environment Program and the Principles for Responsible Investment (PRI), are developing new international standards that will be mandatory for all ICMM members and guidance for counties. To support that, the World Bank has commissioned an analytical piece to compare the tailings storage facilities regulation in Brazil with other large mining countries.

C. Proposed Development Objective(s)

Development Objective

20. The project aims to strengthen institutional capacity for climate resilience and market efficiency in the energy and mining sectors.

Key Results

21. The main outcomes expected from the project are climate smart and strengthened institutions, more efficient markets and more effective policy and regulations in both the energy and the mineral sectors to increase the resilience to weather related events aggravated by the climate change, expedite the delivery of regulatory adjustments, planning and the support the modernization of infrastructure. For the Purpose of the project, climate resilience is defined as the ability to anticipate, prepare, and respond to hydrological crisis and/or hazardous events, trends, or disturbances relate to or exacerbated by climate change. For the purpose of the project Market Efficiency is defined as the existence of market arrangements that are fit for purpose and incorporate all the information available, providing agents throughout the value chain with incentives to operate their systems in an economic manner, with an appropriate balance of risk and reward that is in the interests of the end consumer.

22. The main direct beneficiaries are various public institutions, sectoral agencies and departments such as (i) MME, including its Secretariats and the Environmental Issues Advisory Team (AESA); (ii) Energy Planning Company (EPE); (iii) the National Electricity Regulatory Agency (ANEEL); (iv) the National Center for Research in Electricity (CEPEL); (v) CPRM; (vi) ANM; (vii) ANP; and, (viii) the National Grid Operator (ONS). Women working in these institutions are also expected to benefit directly from training and mentoring opportunities to plan for their careers. Improved policies and institutions will enable enhanced energy security hedging the system against climate change risks, higher efficiency, environmental and financial sustainability, enhanced adaptability to changing economic conditions, higher leverage of private capital to fill infrastructure gaps and improved services. The Brazilian population will indirectly benefit from the project through more reliable power at lower prices and from the economic benefits of a growing, more efficient and competitive energy and mining sectors, which can spur industrial growth and create more jobs.
D. Project Description

23. The proposed Project would support sector-wide efficiency and climate resilience through three components.

24. **Component 1 – Technical assistance to increase efficiency, long term infrastructure adequacy and climate resilience in the energy and mining sectors** (US$ 20.07 million). This component will comprise the following sub-components:

   a. **Subcomponent I: Analytical work to inform reforms in the power sector.** This sub-component will provide the inputs, analysis, best practice examples and models for the respective applicable agencies to update the planning, dispatching and pricing methodologies, as well as the market rules to transition from a hydro-thermal generation base, to one incorporating VRE and DER. The activities are specifically designed to help address climate change impacts on the national electric grid.

   b. **Sub-component II: Analytical work to inform reforms in the oil and gas sector.** This sub-component follows the longstanding engagement with the GoB in this sector and is in line with the reforms currently being pursued for the oil and gas sectors. It will advise and provide the necessary underpinnings to key institutions responsible for the oil and gas sector such as ANP and EPE to move towards more efficient, open and competitive natural gas and downstream markets.

   c. **Subcomponent III: Analytical work to implement reforms in the mining sector.** This subcomponent will support the efforts by the Ministry and key mining sector institutions such as ANM and CPRM to allow for a more modern and efficient institutional framework for improved management, transparency and environmental and social management of the mining sector. It will also provide the needed resources for the operationalization of some key attributions of the ANM aimed at modernizing the institution and its ability to carry out its mandate more efficiently. Furthermore, the approach of the project is to ensure that climate smart mining is introduced at the policy/planning level.

25. **Component 2 – Institutional strengthening of energy and mining institutions to establish and implement strategies, policies and regulation** (US$ 17.48 million). This component will comprise capacity building activities, data collection, digitalization and generation of knowledge products aimed to strengthen the capacity of the sector institutions to implement their mission. It will, in addition, also strengthen the capacity of the key institutions to manage the environmental and social aspects of these sectors and increase their awareness on related climate change impacts and effective response measures:

   a. **Subcomponent I: Strengthening the regulatory, planning and operational capacity of the power sector.** This sub-component will finance data gathering, optimization of methodologies and process digitalization aimed at enhancing the regulatory (including monitoring and control capacity), planning, and operational capacity, allowing the Government to take effective policy and regulatory actions.

   b. **Sub-component II: Strengthening the planning, regulatory and monitoring capacity of key oil and gas sector institutions.** This sub-component will finance activities aimed at improving institutional capacity of key oil and gas sector institutions to allow them to assume more active roles in the regulation and monitoring of these sectors. As per the ongoing engagement with the GoB and drawing from international good practices, this sub-component will finance activities and training geared inter alia to improving institutional effectiveness, reducing administrative costs, enhancing transparency and addressing anticompetitive practices.

   c. **Subcomponent III: Strengthening the planning and regulatory capacity of key mining sector institutions.** This sub-component will finance activities aimed at improving the capacity of key mining sector institutions. The
improved capacity will support them in planning, monitoring and managing the mining sector in a more efficient and effective way, including environmental and social aspects. The activities include studies and training aimed at improving the knowledge on key themes essential for improving mining sector management and informing the decision-making processes.

d. Subcomponent IV: Institutional and management capacity building for Ministerial and Agency Staff. This subcomponent will finance the training of public sector staff from the MME and other participating agencies from the oil, gas, mining and power sectors from a business and public sector management perspective, to improve the overall public policy management in the sector including environmental and social aspects.

26. Component 3 – Implementation support, monitoring and Evaluation, and Knowledge Sharing and Dissemination (US$ 0.45 million). This component will provide support to the Government of Brazil to manage and coordinate all project activities financed under the proposed Project. More specifically, it will provide support to the Government’s procurement, financial management, capacity building of environmental and social aspects to the relevant institutions in the energy and mining sector, as well as monitoring and evaluation capacity. This component will also support dissemination and knowledge sharing of the findings of the various reports and studies produced under the project, inter alia, through: workshops and other stakeholder engagement events; publications and translations. Under this component, the project will also provide, as needed, technical assistance services; training, mentoring and coaching services in part designed to build up women’s participation; and finance the acquisition of goods and of operating costs. In addition, the project will support M&E efforts for ex ante economic, social and climate impacts of relevant policy reforms been supported by the project. The project will, under the M&E framework, support the generation of fresh data/databases produced under the project that could be made available to the public “global public goods”. Project activities under this component will also include funding for social and economic modeling of potential impacts of project-supported activities, complemented as relevant by Bank Executed TFs.

27. The proposed TA activities will take into consideration, when relevant, the distributional implications of different reforms.

### Legal Operational Policies

| Projects on International Waterways OP 7.50 | No |
| Projects in Disputed Areas OP 7.60 | No |

### Summary of Assessment of Environmental and Social Risks and Impacts

28. The project comprises, solely, of technical assistance activities, with minor potential to cause direct and adverse environmental risks and impacts. The main requisites, relevant to the project, are the need to assess, manage and monitor the environmental and social risks and impacts of the project throughout the project life cycle. The Project will not finance activities such as the preparation of feasibility studies, technical, engineering design studies and bid documents that may result in the construction of physical infrastructure (which may or may not be financed by the Bank). The project focuses institutional strengthening activities, analytical works and conceptual studies. The institutional
capacity strengthening activities shall bring environmental benefits, improving the agencies' environmental and social management systems, including their capacity to propose and enforce policies that promote sustainable practices in the mineral and energy sectors. These institutional strengthening activities can be implemented in accordance with national legislation, considering the Bank Environmental Health and Safety Guidelines (EHSGs). The subprojects comprising technical studies may lead to downstream implications as their products may be used as inputs for future reforms and changes in policies, plans and the regulatory framework of the highly sensitive energy, gas, oil and mining sectors.

29. **The project involves a series of studies addressing sensitive environmental and social issues, such as national plans and strategies for the mining and energy sectors, underground gas storage and fuel supply infrastructure, that may demand special attention.** The Substantial Risk rating environmental and social is proposed due to a series of reasons, including the potential downstream implications of some proposed regulations, the capacity of some implementing agencies. Subprojects involving formulation of policies, programs, plans, strategies, legal and regulatory frameworks may lead to deferred effects in relation to environmental and social aspects as those related to the mining sector. In the energy sector, the subprojects assessing natural gas underground storage and fuel supply infrastructure have a series of potential environmental and social implications. Another reason for proposing a substantial risk rating is the capacity of some implementing agencies, notably the recently created Mining Agency – ANM.

30. **The Borrower prepared a Scoping Paper to advance the knowledge of the Project’s impacts, aiming to ensure that the Terms of Reference (TORs) for the planned technical assistance (TA) activities will take into consideration a comprehensive view of the Project’s social and environmental impacts, including issues of concern for the potentially affected groups and individuals.** The Borrower has also prepared a Stakeholder Engagement Plan and Labor Management Procedures. The three environmental and social risk management instruments prepared by the Borrower have been disclosed and consulted. Their final versions will incorporate the feedback received through the consultation process. During Project implementation, the Borrower’s Environment and Social Unit will be engaged in the preparation and review of the Terms of Reference (ToR) and TA products, which will be submitted - as relevant according to the environmental and social risk classification of the sub-projects and as per selection criteria established by the social and environmental team (AESS) of the Bank - to a prior review by the Bank Task Team to ensure that they address the proper environmental and social considerations.

31. **The main entity involved with the operation – MME, has a social and environmental advisory unit (AESA) directly subordinated to the Ministry’s Executive Secretariat MME’s responsible for ensuring, monitoring and assessing compliance of project’s activities with social and environmental safeguard policies, including the activities developed by the MME and its subordinated agencies.** The environmental and social management systems of the agencies related to MME are at different development stages. The electricity sector agencies have, commonly, bound environmental and social systems, but the recently created national mining agency, ANM, lacks policies, procedures and instruments to address social and environmental issues Institutional strengthening measures may be required if MME transfer the management of certain subprojects to other implementing agencies.

32. **MME will prepare and submit to the Bank regular monitoring reports (semi-annual) on the environmental, social, health and safety (ESHS) performance of the Project and Characterization and Assessment Study of Social and Environmental Impacts.**
E. Implementation

Institutional and Implementation Arrangements

33. The Project will be coordinated by the MME following similar institutional and implementation arrangements to those defined for META 1. The Project Implementation Unit (PIU) in the MME will be responsible for management, overall coordination and oversight of the project implementation. The PIU was created within the Executive Secretariat, through a Regulation (Portaria) of the Minister of Mines and Energy, and META 2 will be the third World Bank project it implements. The PIU is fully staffed to coordinate and oversee the contributions of the Participating Entities, has an Operations Manual ready, a Monitoring and Evaluation framework, Procurement Plan and will elaborate financial reports to the Bank for the whole Project. The Special Advisory department for the Environment (Assessoria Especial de Meio Ambiente - AESA) located within MME is assigned to provide all the support and expertise needed to the PIU to fulfill ESF requirements.

34. Engagement with GoB for project implementation/effectiveness. The PIU will, additionally, maintain engagements with the Ministry of Economy (MoE), and with the Brazilian Congress, particularly related to the work in the gas sector, for which decisions/actions go beyond the Executive. The coordination is further reflected through two inter-ministerial units – the National Committee for Energy Planning (CNPE) and the Committee for Monitoring the Opening of the Natural Gas Market (CMGN) – both led by the MME, and which the MoE is a member.

Results Monitoring and Evaluation Arrangements

35. The PIU in the MME will be responsible for implementing and executing all M&E activities, providing annual reports on the PDO level and intermediate results indicators. Those indicators will be collected, distilled and agreed with the Participating Entities, before being submitted to the Bank. They will also be used as an instrument of Project performance to be examined by the high-level steering community (PSC). Furthermore, the Participating Entities are well established, competent organizations in the energy and mineral sectors.

Sustainability

36. The sustainability of the objectives of the META 2 Project over the long term will rest upon the Government’s commitment and ability to carry out the necessary energy and mining sector policies. The project will help develop capacity among key Participating Entities, to ascertain sustainability of the long-term results. The topics to be covered by the technical assistance program have been jointly selected by the project participating entities and by the World Bank, and may be revisited as priorities evolve. They will constantly be fine-tuned during implementation to ensure that they respond to the most important and urgent needs and demands of the GOB.

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PROJECT APPRAISAL SUMMARY for Proposed META 2 Project

A. Technical and Economic Analysis

37. The activities financed by the proposed project are highly relevant and necessary to modernize the energy and mining institutions and advance in the formulation and implementation of policies and regulatory reforms leading to more efficient, sustainable and resilient energy and mining sectors. The MME is highly committed to the implementation of the project and the participating sectoral institutions are very interested in the proposed activities.

38. TA projects do not lend themselves to economic evaluation through cost-benefit, cost-effectiveness or other methods because they do not have quantifiable direct and indirect economic benefits to be compared with direct and indirect economic costs (e.g. the economic costs associated with the TA). Therefore, the economic analysis of this TA project included description and summary of main indirect economic benefits that are expected to materialize from implementation of policies and other measures. The proposed project is forecast to have a positive development impact considering projected benefits and costs.

39. Electricity Sector. Project activities will contribute towards climate informed planning and systems operation leading to reduction in the volume of unserved energy (COUE), saving of economic cost of electricity supply, and reduction of CO2 emissions through TA measures aimed at improvement of the sector efficiency. Economic and social benefits could include: (i) reduction in the cost of unserved energy due to improved quality of supply reduction on the number of interruptions and voltage fluctuations, particularly in times of low hydrology; (ii) increased consumer surplus due to anticipated reduction of economic cost of supply from rationalization of the pricing methodology, adjustment of the dispatching and energy market rules, (iii) and demand-side response programs and digitalization of the distribution sector, (iv) reduction of the economic costs from local environmental pollution levels from reduced emission when introducing electric vehicles fueled with clean energy; and (v) reduction of CO2 emissions, which is a global environmental benefit. The mentioned benefits would also accrue to the bottom 40 percent (b40) of consumers. The project will also generate economic benefits through support to assessments on “locational signaling”, which effectively allows the operator to “see” the system, real-time, from an energy costing/financial perspective.

40. Natural Gas. The project will support reforms to make the natural gas market more competitive and, in the process, lower natural gas prices. Currently natural gas is costly in Brazil, at around 3 times
the average world wholesale price ($4.38 per MMBTU). In 2018, Brazil's industrial users were obliged to pay almost $14/MMBTU, compared to an average European price of just over $8.80/MMBTU. Savings would be significant, if prices fell towards average world levels, particularly benefiting the b40. For example, a 1 percent decrease in current price would mean a savings of potentially $7.3 billion/year. The potential of savings is further increased if one considers that gas consumption is expected to nearly double by 2026.

41. **Mining.** Despite favorable geology and an enormous land mass, Brazil is rated low by exploration companies with respect to exploration attractiveness\(^5\) and it hasn’t benefited from the large global upswing in exploration expenditure since 2016; The returns to exploration can be very high, and every US$1 million of government investment to enhance the geoscience knowledge base will likely stimulate US$5 million of private sector exploration expenditures, which, in turn, will result in discovery of new resources with an average in situ value of $125 million. This is based on 13 separate studies across Australia and Canada. Subsequent work generally supports this rule of thumb.” As a simple example, if more and better geological knowledge and a better licensing procedure leads to the discovery of one medium sized gold mine producing 7,000 ounces of gold a year, for 15 years, the direct fiscal return to the GOB would be about $40 million (assuming it captures 25 percent of the value). Geoscience information has many other important uses in addition to exploration. These include land use management, particularly for agriculture, water flow management, land planning related to stability and contamination issues, including areas more susceptible to earthquakes and landslides. The project would also generate economic benefits in form of avoided economic costs from tailings dam failures and contingencies.

42. **Increased verticalization or linkages** is one of the three pillars of the mining sector strategic plan, which this project will help to implement. Mining companies buy tens and even hundreds of millions of dollars of inputs and capital goods. Success in this area would create employment and value added and fiscal revenues. Normally, there are many more jobs in supplying mines than in the mines themselves. Mine supply is one of the biggest industries in many countries since it can also lead to downstream industries, although many of these are very energy intensive, which can cause problems unless there is a power surplus. In 2011 in Chile and Peru there were over 700,000 jobs in firms selling goods and services to the mining industry (McMahon and Moreira, 2014: p.37). Clearly, success of the project in this regard could have a substantial impact on value added, employment and fiscal revenues, increases in all of which are likely to disproportionately benefit the b40.

43. **There would also be other, even more difficult to quantify benefits, particularly for the b40.** Better environmental management in the mining sector would particularly benefit rural people in the region. A better geological survey is important for land planning and disaster mitigation, a tool which can even be used in cities. Removing or reducing cross subsidies in the market for electricity would particularly benefit the poor. A more stable power sector is very important to the B40, as they cannot protect themselves from power shortages or can only do so at high cost.

**B. Fiduciary**

44. **Integrated Fiduciary Risk Rating:** The integrated fiduciary risk rating is Low.

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\(^5\) Fraser Institute, 2019  
\(^6\) Canada, Australia, South Africa inter alia
(i) Financial Management

45. A financial management (FM) assessment of the project was conducted in accordance with OP/BP 10.00 and the Financial Management Manual for World Bank IPF Operations (OPCS5.05-DIR.01, issued February 10, 2017). The scope of the FMA included: (i) an evaluation of existing FM systems to be used for Project monitoring, accounting and reporting; (ii) a review of staffing arrangements; (iii) a review of the flow of funds arrangements and disbursement methods to be used; (iv) a review of internal control mechanisms in place, including internal audit; (v) a discussion with regards to reporting requirements, including the format and content of Unaudited Interim Financial Reports (IFRs); and (vi) a review of the external audit arrangements. The overall conclusion of the FMA is that: (i) the FM arrangements for the proposed Project are considered adequate; (ii) the funds flow, disbursements, monitoring, auditing and supervision arrangements have been designed in a way to respond to the Project’s implementation arrangements; and (iii) the residual FM risk associated with the Project is rated as LOW. There are no FM-related conditions for negotiations, board and/or effectiveness.

(ii) Procurement

46. The procurement risk rating is Low.

47. Procurement will be carried out in accordance with the Bank’s Procurement Regulations for IPF Borrowers dated July 2016, revised August 2018. The Bank is undertaking an assessment of Brazil’s system for national open competitive procurement to check whether it meets the requirement of par. 5.4 of the Procurement Regulations. If the assessment is positive, sample bidding documents for national procurement acceptable to the Bank will be prepared for the Project based on the national procedures. The Procurement policy framework, regulation, and procedures are well documented and publicly available and are designed to meet Core Procurement Principles of value for money, economy, efficiency, effectiveness, integrity, transparency and fairness and accountability.

48. The Bank will carry out procurement post reviews on an annual basis with an initial sampling rate commensurate with the risk rating of the Project. This rate will be adjusted periodically during project implementation based on the agencies’ performance. The Bank will also carry out procurement supervision missions on a semi-annual basis.
C. Legal Operational Policies

49. Not applicable.

GRIEVANCE REDRESS SERVICES

50. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB’s Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB’s independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank’s attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank’s corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.