The World Bank

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Report No: PAD2601

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$200 MILLION

TO THE

REPUBLIC OF IRAQ

FOR AN

ELECTRICITY SERVICES RECONSTRUCTION AND ENHANCEMENT PROJECT

April 19, 2019

Energy and Extractives Global Practice
Middle East And North Africa Region

Currency Equivalents

Exchange Rate Effective March 31, 2019

Currency Unit =	Iraqi Dinar (ID)
US$1 =	ID 1,182.00
ID1 =	US$0.000864

Government Fiscal Year
January 1–December 31

Regional Vice President:	Ferid Belhaj
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ABBREVIATIONS AND ACRONYMS

ARAP	Abbreviated Resettlement Action Plan
ASA	Advisory Services and Analytics
BAU	Business as Usual
BMIP	Business Management Improvement Plan
BSSF	Business Support Services Firm
CMS	Commercial Management System
CO_2	Carbon Dioxide
COM	Council of Ministers
CPF	Country Partnership Framework
DA	Designated Account
DMS	Distribution Management System
DPF	Development Policy Financing
ECA	Economic Consultants Associates
EODP	Emergency Operation for Development Project
ERP	Enterprise Resource Planning
ESMAP	Energy Sector Management Assistance Program
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FCV	Fragility, Conflict, and Violence
FGD	Focus Group Discussions
FHH	Female-Headed Household
FM	Financial Management
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	German International Agency for Development (*Gesellschaft für Internationale Zusammenarbeit*)
GoI	Government of Iraq
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GSA	Gas Supply Agreement
GW	Gigawatt
GWh	Gigawatt hours
HFO	Heavy Fuel Oil
IA	Implementation Agreement
IBRD	International Bank of Reconstruction and Development
ICA	Investment Climate Assessment
IDMIS	Integrated Distribution Management Information System
IDPs	Internally Displaced Persons
IFC	International Finance Corporation
IFR	Interim Financial Report
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
INES	Integrated National Energy Strategy

IPP	Independent Power Producer
ISIS	Islamic State of Iraq and Syria
KfW	German Development Bank (*Kreditanstalt für Wiederaufbau)*
KPI	Key Performance Indicator
KRI	Kurdistan Region of Iraq
KV	Kilovolt
KVA	Kilovolt Ampere
KW	Kilowatt
KWh	Kilowatt hours
M&E	Monitoring and Evaluation
MENA	Middle East and North Africa
MFD	Maximizing Finance for Development
MIGA	Multilateral Investment Guarantee Agency
MIS	Management Information Systems
MoE	Ministry of Electricity
MVA	Megavolt Ampere
MW	Mega-Watt
NPV	Net Present Value
OE	Owner's Engineer
OHTL	Overhead Transmission Line
OP/BP	Operational Policy/Bank Procedure
OPEC	Organization of Petroleum Exporting Countries
PIM	Project Implementation Manual
PMT	Project Management Team
PP	Procurement Plan
PPA	Power Purchase Agreement
PPSD	Project Procurement Strategy for Development
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RPP	Revenue Protection Program
SBA	Stand By Arrangement
SCADA	System Control and Data Acquisition
SCD	Systematic Country Diagnostic
SEDC	South Electricity Distribution Company
SETC	South Electricity Transmission Company
SME	Small and Medium Enterprise
SOEs	State-Owned Enterprises
STEP	Systematic Tracking of Exchanges in Procurement
T&C	Technical and Commercial
WB	World Bank
VfM	Value for Money

BASIC INFORMATION

Country(ies)	Project Name	
Iraq	Iraq Electricity Services Reconstruction and Enhancement Project	
Project ID	**Financing Instrument**	**Environmental Assessment Category**
P162454	Investment Project Financing	B-Partial Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[✓] Fragile State(s)
[ ] Disbursement-linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[✓] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
02-May-2019	30-Jun-2024

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To improve the reliability and operational and commercial efficiency of electricity services in the selected project areas.

Components

Component Name	Cost (US$, millions)
South Electricity Transmission Network Reinforcement	95.00

South Electricity Distribution Network Reconstruction and Reinforcement and SEDC Electricity Sales Revenue Management Improvement	100.00
Institutional Capacity Strengthening and Project Implementation Support	5.00

Organizations

Borrower:	Republic of Iraq
Implementing Agency:	South Electricity Transmission Company South Electricity Distribution Company

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	200.00
Total Financing	200.00
of which IBRD/IDA	200.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	200.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2019	2020	2021	2022	2023	2024
Annual	0.00	40.00	50.00	75.00	25.00	10.00
Cumulative	0.00	40.00	90.00	165.00	190.00	200.00

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?	
a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF	Yes
b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment	Yes
c. Include Indicators in results framework to monitor outcomes from actions identified in (b)	Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	High
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	High
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	High
9. Other	
10. Overall	High

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36		✓
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11		✓
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

The Project Implementing Entity shall appoint, not later than six (6) months after the Effective Date, and thereafter maintain throughout Project implementation, an Owner's Engineer with qualifications, experience, and terms of reference satisfactory to the Bank.

Sections and Description

SETC and SEDC shall establish a Project Coordinating Committee, not later than three (3) months after the Effective Date, and maintain at all times during Project implementation, said Committee, comprising representatives of SETC and SEDC and with an institutional framework, functions, and resources satisfactory to the Bank for such purpose.

Sections and Description

SETC and SEDC shall each maintain, throughout Project implementation, Project Management Teams with an institutional framework, functions, and resources, including competent personnel in adequate numbers, satisfactory to the Bank for such purpose.

Conditions

Type	Description
Effectiveness	The Borrower, SETC, and SEDC have executed the Subsidiary Agreement in accordance with the provisions of Section I.B.1 of Schedule 2 to this Agreement.
Effectiveness	SEDC has adopted the Project Implementation Manual.
Disbursement	Notwithstanding the provisions of Part A above, no withdrawal shall be made for payments made prior to the Signature Date, except that withdrawals up to an aggregate amount not to exceed $35,000,000 for Category (1), and up to an aggregate amount not to exceed $40,000,000 for Category (2), may be made for payments made prior to this date but on or after July 1, 2018, for Eligible Expenditures under said Categories.

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I. STRATEGIC CONTEXT

A. Country Context

1. **Despite massive economic and human potential, Iraq has suffered from decades of conflict and economic volatility. The government of Iraq (GoI) faces the dual challenge of stabilizing and growing the economy while also ensuring security, jobs, and basic services to Iraqis across the country.** A resource-rich, middle-income country, Iraq has experienced internal and regional struggles seeking to align political institutions with diverse and cross-cutting socioeconomic, ethnic, and religious identities. As highlighted in the Iraq Systematic Country Diagnostic (SCD) report of 2017, the combination of oil wealth and the mismanagement of political and social diversity has led to acute fragility and conflict, exacerbated by long-standing governance problems and the challenge of ensuring a more equitable allocation of national resources.

2. **Economic growth has decelerated sharply over the past few years**. The war against the Islamic State of Iraq and Syria (ISIS) and a protracted reduction in oil prices have resulted in 21.6 percent reduction of the non-oil economy since 2014. Iraq's high dependence on oil implies that overall growth is estimated to have contracted by 0.8 percent in 2017, due to a 3.5 percent reduction in oil production, following an agreement by Organization of Oil Exporting Countries (OPEC) and non-OPEC oil producers to cut oil production by the end of 2018. The 2018 national poverty rate is estimated at 20.0 percent[1] and includes 2.8 million people who fell into poverty as a direct result of the war against ISIS. In the ISIS-affected governorates, the impact of economic, social, and security disruptions is estimated to have increased poverty rates to about 23 percent. Despite liberation from ISIS and the gradual recovery of oil prices, Iraq's country context thus remains fragile and vulnerable to shocks. The successful implementation of a sustainable recovery plan that both accelerates the provision of basic services to all Iraqis and lays the foundation for a more diversified, and resilient, economy is critical.

3. **As part of fiscal consolidation efforts, the GoI has adopted a plan to progressively reduce large energy subsidies, which in 2017 were estimated to have reached US$10.1 billion.** Lack of efficiency and tariffs below costs have made energy production a costly and increasing liability for the government. Investing to scale up generation without improvements to reduce technical losses, revenue collection, and adjustment of tariffs to the cost of production would result in growing fiscal losses for the GoI.

4. **Fiscal consolidation will protect much-needed social spending.** Before the conflict started and the oil price shock in 2014, social spending was insufficient in health and used inefficiently for social protection. This led to poor human development outcomes.[2] Per capita central government health spending is very low (US$90 in Iraq against US$350 in the region and US$700 for upper-middle-income countries). This level of social spending, together with conflict and inefficiencies, has led to a deterioration of health outcomes.[3]

5. **The government recognizes that to increase equitable growth and job opportunities that would help address social instability and poverty, economic diversification is essential.** This will require increased private sector participation, including both foreign investment and strengthening value addition from domestic small

[1] The 2018 estimate is calculated from the Society for Worldwide Interbank Financial Telecommunication (SWIFT) survey.
[2] World Bank, *Iraq Public Expenditure Review* 2014 (Washington, DC: World Bank, 2014); and World Bank Group, *Iraq Systematic Country Diagnostic* 2017 (Washington DC: World Bank Group, 2017).
[3] Life expectancy at birth has decreased from 70.7 years in 2000 to 69.2 in 2015.

and medium enterprises (SMEs) within the leading growth sectors. The government is taking actions toward these objectives with the anticipated passage of a public-private partnership law and efforts to develop SME capacity and access to finance.

6. **Iraq's energy sector is its most significant economic sector—with the oil subsector accounting for over 65 percent of gross domestic product (GDP), more than 90 percent of annual government revenue, and 98 percent of the country's exports**. Iraq has the fifth largest proven crude oil reserve in the world, with 141.4 billion barrels, and the oil and gas sector dominates the economy, even by regional standards. With the rapid increase in production since 2015, the country is now the world's third largest and OPEC's second largest oil exporter. With 130 trillion cubic feet of proven reserves at the end of 2016, Iraq's proven and largely untapped natural gas reserves are the 12th largest in the world.

7. **Despite vast oil and gas reserves, Iraqis do not have access to adequate electricity for basic needs and must resort to using expensive diesel generators.** Inadequate infrastructure to gather, process, and transport natural gas have led to massive gas flaring at over 60 percent of the total gas produced. Due to the inability to utilize the flared gas, Iraq relies on expensive and imported alternative fuel supply sources costing an estimated US$6 billion to US$8 billion per year, with the cost of power shortages exceeding US$40 billion annually.[4] The lack of access to reliable power has a significant impact on household well-being, business growth, and the capacity of the enterprise sector to create sustainable jobs for the growing numbers of youth entering the job market.

8. **Dilapidated infrastructure and poor basic services are depriving Iraq's South region of inclusive economic growth and shared prosperity.** The project area covers the South Electricity Distribution Company's (SEDC) service territory, which includes the governorates of Basra, Al-Muthanna, Thi Qar, and Missan. The region's population is estimated at over 6 million of the country's total of about 39 million, and approximately two-thirds of the country's oil output is produced here. The port of Basra and the port of Um Qasr, Iraq's only deep-water port, are both located here, which makes the region a center for trade, transportation, and storage. Albeit the region's strategic economic importance, the region's vulnerability to poverty estimated at 28.0 percent is much higher than the national average of about 20 percent. In addition to the dilapidated infrastructure, several environmental problems are threatening the region's fresh water supply and agriculture production. The region, however, has been particularly susceptible to social and political unrest and government has been under considerable pressure to improve public services. Lack of adequate access to electricity during the summer months has been a major lightning rod for civic unrest and demonstrations. The provision of basic services like electricity are key to shoring up the legitimacy of the central government as it seeks to reestablish its authority, especially over the areas that see themselves as having been marginalized.

9. **Iraq is extraordinarily vulnerable to the impacts of climate change**. Climate change will affect rainfall patterns and temperatures in Iraq, increasing the country's vulnerability to drought, floods, and heat waves. Energy infrastructure projects in Iraq contend with a unique array of climate challenges. Higher temperatures will simultaneously increase electricity demand, decrease its supply, and impair its delivery. On the demand side, more heat waves will cause load curves to spike; whereas on the supply side, hotter temperatures will reduce the capacity factors of the power generation plants. Prolonged climate-induced drought could also spur greater migration to cities, accelerate urbanization, and intensify pressure on already strained and degraded economic and social infrastructure. To eliminate extreme poverty and promote shared prosperity in a sustainable manner,

[4] Iraq Prime Minister Advisory Commission (IPMAC), *INES*. Baghdad: IPMAC, 2013.

infrastructure investments in the country face an increasingly urgent need to address climate and natural disaster risk.

B. Situations of Urgent Need of Assistance or Capacity Constraints

10. **Lack of adequate access to electricity during the summer months has been a major lightning rod for civic unrest and demonstrations, especially in the project area covering the governorates of Basra, Al-Muthanna, Thi Qar, and Missan.** The region has been particularly susceptible to social and political unrest and government is under considerable pressure to improve public services. The provision of basic services like electricity are key to shoring up the legitimacy of the new government as it seeks to reestablish its authority, especially over the areas that see themselves as having been marginalized. The project area accounts for about 30 percent of the country's total electricity consumption. However, the electricity grid infrastructure in these areas is dilapidated mainly due to years of conflict and unable to deliver adequate levels of electricity supply.

11. **The processing of the project using condensed procedures of the Bank policy on Investment Project Financing (paragraph 12), under which the turnaround times for certain steps, especially project procurement, are reduced, will enable the delivery of early visible results in a context of extreme needs and high expectations before summer 2020 in the targeted project areas.** The project will support improving the reliability and efficiency of electricity supply in these governorates through the construction of new transmission and distribution substations and lines and rehabilitation of existing ones to increase the electricity network capacity. Some of the proposed activities, such as power transformers and medium voltage mobile substations, can be quickly deployed and installation is urgently required by June 2020, before the summer peak demand. The lead time for the supply of this equipment is six to nine months, and thus the urgency to ensure that contracts are signed and effective by the end of August 2019. The urgently required equipment is similar to that procured following World Bank procedures under the ongoing Emergency Operation for Development Project (EODP) (P155732), and thus there are preapproved bidding documents and a long list of suppliers who submitted bids for the contracts under the EODP. This will facilitate further use of streamlined procurement arrangements. Further, to mitigate the potential risk of effectiveness delays, the loan agreement includes a provision to enable the use of financing flexibility with regard to retroactive financing.

C. Sectoral and Institutional Context

12. **Iraq's challenged electricity sector faces a demand growth of over 10 percent per annum.** There are chronic electricity shortages, with grid supply availability at less than 15 hours per day. Iraq's citizens are exasperated with continued poor reliability of the electricity supply, which hampers growth and well-being.

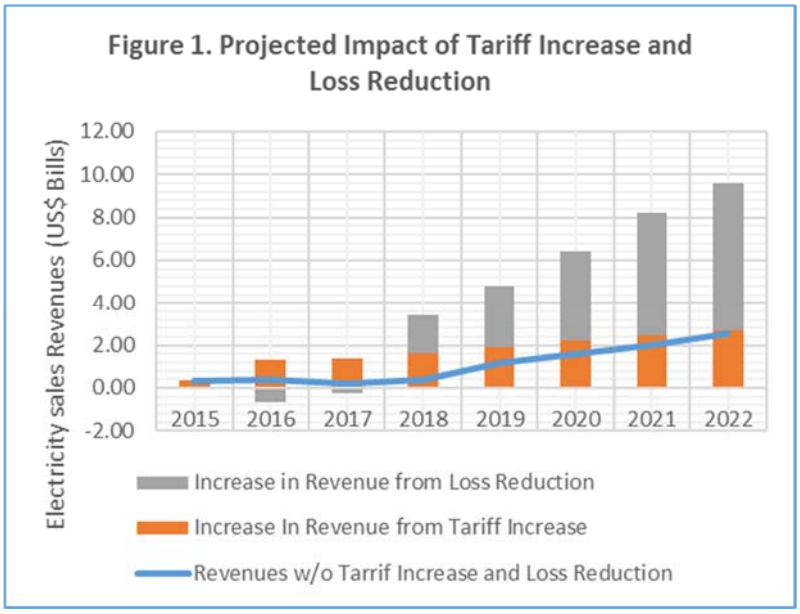
13. **Over 40 percent of Iraq's total electricity generated is lost before it is billed.** Moreover, due to the lack of effective metering, billing, and commercial management systems, only about 50 percent of the energy billed is collected. Electricity paid for is less than 30 percent of the total electricity generated.

14. **Tariffs do not reflect the true cost of service.** Energy paid for represents only about 10 percent of the operational cost, generating a perpetual negative spiral of under-recovery and underinvestment. The GoI's program to address these issues is captured in the Law No. 53 (2017). The law, among others, outlines new key roles for the Ministry of Electricity (MoE), such as focusing on regulatory policies and licensing; whereas the

ministry's 12 directorates (covering generation, transmission, and distribution) were corporatized and will eventually be privatized where feasible. The World Bank Group (WBG) engagement in the sector aims to support these policy objectives through: (i) improving the quality of electricity services, (ii) reestablishing financial sustainability of the electricity and domestic gas sector, and (iii) supporting the decentralization and corporatization of electricity services to improve accountability and the proximity of decisions and resources to the citizens.

15. ***Improving the quality of electricity services:*** The country's transmission and distribution grids are unable to deliver increased levels of electricity supply when they are available. In Iraq's South region, the supply shortage is balanced by Iranian electricity imports, the supply of which can be affected by drought or other factors. Improving the reliability and efficiency of electricity supply in the governorates of Basra, Al-Muthanna, Thi Qar, and Missan would directly address about 30 percent of the country's total electricity consumption.

16. ***Reestablishing financial sustainability of the electricity and domestic gas sector:*** The sector's high losses, lower-than-cost recovery tariffs, and poor revenue collection represent increasing fiscal pressure on Iraq's public resources. In 2017, the electricity subsidies were estimated at US$11.2 billion, including purchase of electricity from independent power producers (IPPs). These subsidies included US$6.7 billion of lost oil exports and US$3.2 billion of budget transfers, or five percent of total government expenditures. Over the medium term, improvements in revenue collections, reduced cost of generation, and improvements in grid reliability would help reduce the investor risk perception, thus improving access to low-cost financing and private sector efficiency and entrepreneurship. However, as long as the high system losses, low revenues, and sizable investment needs prevail, the distribution sector is unable to attract private sector capital (figure 1).



17. **The electricity distribution subsector's operational efficiency is critical, as the financial foundation of the entire electricity sector value chain springs from consumer tariff collections**. Of the 70 percent total system losses in the Iraq electricity sector, about 50 percent is attributed to commercial losses. At the current level of losses, to fully cover costs, the tariff needs to be about US¢22.5 per kilowatt hour (KWh) of units sold, but if technical and commercial losses were reduced to 10 percent and collections increased to 95 percent, the cost

recovery tariff would fall to about US¢10 per KWh. With the increased generation, if the high system losses are not curbed, the sector is expected to require an operating subsidy of about US$10 billion per annum.[5] See further details in annex 1.

18. ***Supporting the decentralization and corporatization of electricity services to improve accountability and proximity of decisions and resources to the citizens:*** Poor electricity services in Iraq result, in part, from weak policy making, governance, and regulation. Improving the sector's performance and market environment to encourage increased private sector participation, including in gas supply, will require improving transparency and accountability and promoting good governance, including decentralization and fostering autonomy. The Electricity Law (2017) outlines Iraq's long-term policy to decentralize electricity services delivery. The proposed project will include support for sector institutional, operational, and performance improvement by strengthening the business processes of the SEDC as a corporate entity and "Island of Excellence." This model could later be scaled up to cover other electricity distribution companies.

19. **The project area, covering the governorates of Basra, Al-Muthanna, Thi Qar, and Missan, has had its economic infrastructure, including electricity services, destroyed by various wars and conflicts during the period 1980 to 2008.** In 2015, more than 80 percent of the households in the region reported power cuts of at least three hours daily, forcing most of the inhabitants to rely on additional sources of power like private or shared generators to cover the failing public network. In addition, the region is a major electricity load center. According to MoE 2017 data, the South Electricity Distribution Directorate (SEDD - now SEDC) was the second largest electricity consumer, totaling about 30 percent of the total energy billed. The proposed project will support the reconstruction and enhancement of the electricity services in the region.

D. Higher Level Objectives to which the Project Contributes

20. **The project supports the Second Iraqi Poverty Reduction Strategy, 2018–22, especially with regard to job creation and improved social services delivery**. The project will result in increased and more reliable supply of electricity, which will in turn support economic diversification and broadly shared prosperity. The project seeks to facilitate increased commercial financing to the sector and directly support the government in addressing four of its political priorities: upgrading service to and the standard of living of citizens, encouraging a shift toward the private sector, implementing administrative and financial reform of government institutions, and improving federal-local relations.

21. **The project will contribute to the WBG twin goals of eliminating extreme poverty and promoting shared prosperity in a sustainable manner**. By improving power supply to the private sector and the poorer residential areas, the project will improve quality of life and enhance the disposable incomes of consumers. Given the breadth and nature of the distribution work involved in the project, it will also create considerable employment opportunities throughout its implementation and incentives for increased private sector participation. The proposed operation is aligned with the WBG's expanded Middle East and North Africa (MENA) Regional Strategy (March 2019) through the focus on renewing the social contract between the Iraqi state and its citizens through the provision of basic services and through the introduction of Maximizing Finance for Development (MFD)-enabling reforms.

[5] Economic Consulting Associates (ECA), *Cost of Service and Tariff Design/Rationalization Study for Electricity Supply in Iraq* (London: ECA, 2017).

22. **The project contributes to the adaptation and mitigation climate change goals contained in Iraq's Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change, First National Communication.** Reducing transmission and distribution losses, increasing supply-side energy efficiency, and improving the operation of electric utilities are central project objectives in Iraq's INDC and First National Communication to the UNFCCC.[6] Avoided emissions resulting from these actions will help Iraq reach its overarching mitigation target of cutting greenhouse gas (GHG) output by 14 percent by 2035.[7]

23. **The operation supports two strategic priorities for the World Bank in Iraq under the upcoming Country Partnership Framework (CPF)**; namely, enhanced service delivery and economic transformation through private sector development and the articulated focus on the improved delivery of basic services to vulnerable areas of Iraq (including those that were indirectly affected by the war against ISIS) as well as through its support to the critical upstream reforms required to enable sustainable private sector participation, a cornerstone of the MFD approach.

24. **The project supports the MFD approach by addressing the sector's fiscal ability to enable crowding-in commercial financing in the electricity value chain, including increased gas-to-power investments**. As part of the WBG Mashreq MFD Strategy,[8] a comprehensive set of policy actions covering macro, governance, financial, and fragility, conflict, and violence (FCV)/political economy dimensions, were identified to address key investment constraints to the energy value chain from gas-to-power through generation, transmission, and distribution (see annex 6). These reform actions need to be carefully sequenced over time to effectively address political economy considerations and ensure their sustainability and the momentum of reform. The project represents some of the key first MFD-enabling reforms in support of the objectives of the energy sector, as set out in the country's recently enacted Integrated National Energy Strategy (INES).

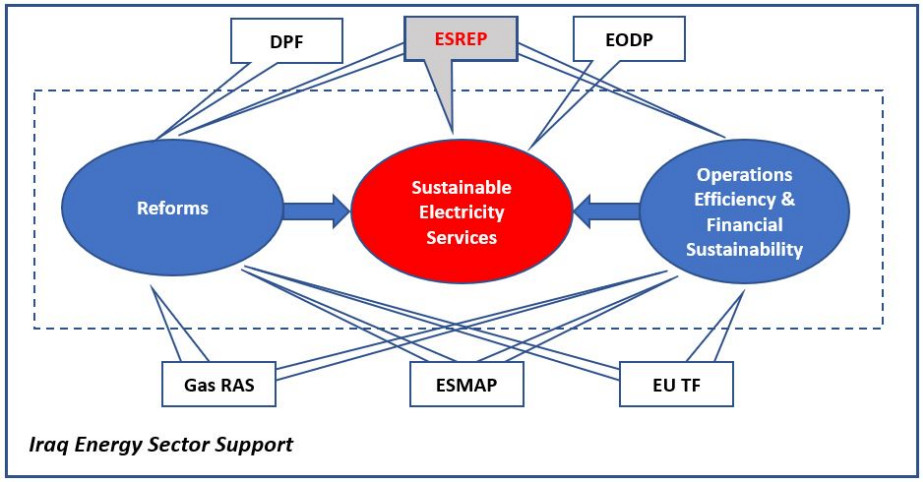
25. **The World Bank's value proposition rests on its ability to support Iraq's long-term efforts to improve electricity services delivery to its people and businesses.** The World Bank does this by creating a framework to pool resources from diverse public and private sources, by customizing global experiences in electricity utility operations and management, and by advising on the design of a fundamental energy sector modernization, drawing on lessons from around the world. The World Bank has been in the forefront of supporting power sector modernization, including promoting efficient commercial operations; it draws on decades of partnerships with governments facing similar challenges in Latin America, Eastern Europe, and South Asia, among others. This project reinforces the World Bank's ability to support not only design but also implementation of programs and processes that allow for efficient and effective delivery of electricity services. This will involve helping to improve the sector's performance in the short and medium terms through the implementation of several integrated business improvement plans, including skilling of personnel and an introduction of performance assessment, which will facilitate more transparent, faster, and cost-effective business processes.

26. **The World Bank has had a long engagement in Iraq's energy sector and the proposed project fosters further the WBG sector engagement.** As depicted by figure 2, the project—which is a Type 2 project as defined

[6] GoI, *Iraq's INDC* (Baghdad: GoI, 2015), 7–9; GoI, *First National Communication to the UNFCCC* (Baghdad: GoI, 2016), 55–56.
[7] GoI, *Iraq's INDC*, 1.
[8] World Bank Group, *Mashreq Maximizing Finance for Development (MFD) Strategy, 2019–21*. (Washington, DC: World Bank, 2018).

in the World Bank Group Mashreq MFD Strategy,[9] - is complemented by: (i) the International Monetary Fund (IMF) Stand-By Arrangement (SBA), previous Development Policy Financing (DPF), and Advisory Services and Analytics (funded by the European Union and the Energy Sector Management Assistance Program) that have supported upstream policy dialogue and assessments to reduce sector subsidies and sector reforms; (ii) International Finance Corporation (IFC) –supported private sector engagements, especially in the upstream generation and reduced gas flaring;[10] (iii) potential Multilateral Investment Guarantee Agency (MIGA) insurance to support private investment; and (iv) the government-led initiatives related to revenue management contract services and proposed legal reforms to address electricity theft and non-payments.

Figure 2. Iraq Energy Sector Support[11]



27. Improved revenue management in the distribution subsector will foster the upstream IPPs, as it would provide predictable revenues required under the off-taker arrangements (Power Purchase Agreements). This, coupled with the proposed reforms in the gas sector and the resultant potential IPP gas supply agreements, provides incentives for further investments in the upstream gas capture and processing, especially noting the emerging technologies regarding onsite gas-to-power conversion. MIGA also stands ready to provide potential insurance coverage as needed. A further summary of the WBG program in Iraq is set out in box 1**.**

[9] A Type 2 Full "Cascade" project engagement is where a "well-defined joint IBRD/IFC/MIGA teams will be established with the full backing of respective managements to undertake a comprehensive engagement in a sector encompassing a broad upstream policy agenda as well as downstream project finance and Public Private Partnership (PPP) opportunities."

[10] These include potential IFC support to the Mass Global Holdings 3,000 MW IPP and the planned support to Basra Gas Company for reduced gas flaring, for which the IFC signed a mandate letter in December 2018.

[11] Electricity Services Reconstruction and Enhancement Project (ESREP); Energy Sector Management Assistance Program (ESMAP), and Reimbursable Advisory Services (RAS).

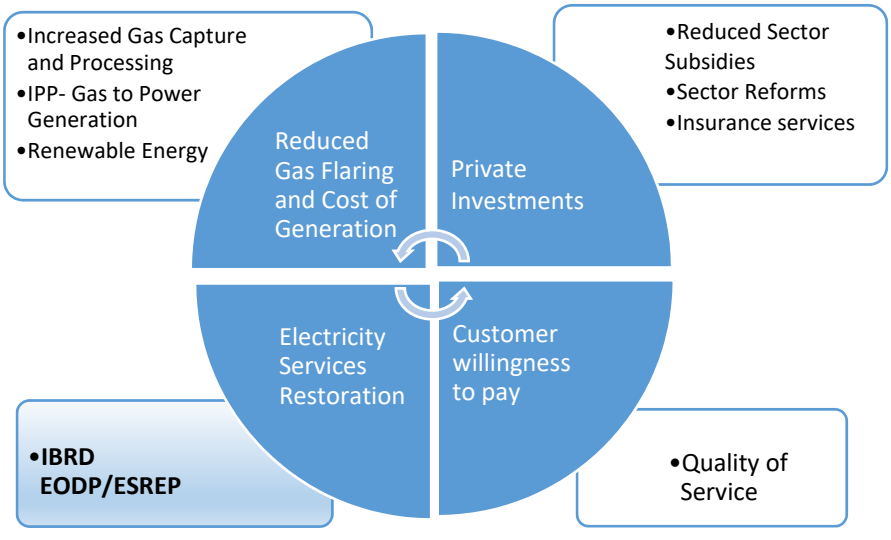
Box 1. *WBG Engagement in the Iraq Energy Sector*

The World Bank Group has had a long engagement in Iraq's energy sector, which included supporting the development of Iraq's Integrated National Energy Strategy. Through Reimbursable Advisory Services, the World Bank has supported improving the commercial performance of the gas sector, restructuring of state-owned enterprises, and increasing incentives for investment in gas. The World Bank, under the earlier DPF, has supported the GoI to have in place appropriate policies related to: (i) increased energy efficiency by reducing gas flaring and increased gas-to-power generation; and (ii) reduced energy subsidies.

The proposed project will directly support investment in, and institutional development of, Iraq's electricity distribution sector, resulting in an increased and more reliable supply of electricity, which will in turn support economic diversification and broadly shared prosperity. The project seeks to further expand the MFD engagement in ongoing structural reform in the electricity sector to facilitate increased commercial financing to the sector and directly provide support to the government in addressing four of its political priorities: upgrading service to and the standard of living of citizens; encouraging a shift toward the private sector; implementing administrative and financial reform of government institutions; and improving federal-local relations. The project will finance complementary investment and technical assistance support to accelerate the core change processes and upgrade of service quality and commercial processes. In addition to the IBRD, the IFC has been engaging in Iraq's energy sector through a programmatic approach to support its development by attracting private financing. This is manifested by the support to the potential Mass Global Energy 3,000 MW IPP outside Baghdad and the planned support to the Basra Gas Company for increased gas capture and processing. The IFC is well positioned for such interventions through its ability to understand, mitigate, and take risks that would appear prohibitive in such an FCV context compared to other providers of capital. Additionally, IFC advisory services, including the PPP team, is working alongside the World Bank by providing technical assistance on sector reforms to further help reshape and address the power and energy challenges in Iraq. MIGA is also ready to support this joint World Bank and IFC investment program with insurance services and is actively participating in the joint World Bank Group energy sector missions that have been launched in FY19 to build the reform dialogue with the new government related to the MFD-enabling reform and investment actions that the WBG can collectively support to foster the development of a dynamic and sustainable energy sector that provides one of the principal platforms for economic transformation to be possible.

As the next step in the implementation of the MFD approach, the World Bank Group will be consulting with the GoI to develop a country-specific MFD program, building on the ongoing World Bank Group consultations in the energy sector as well as the other key sectors that will support the government's equitable growth and job creation objectives.

Figure B1.1. WBG Iraq Sector Energy Engagement.



II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

28. **To improve the reliability and operational and commercial efficiency of electricity services in the selected project areas.**

B. Project Beneficiaries

29. **The key project beneficiaries include the following:**

i. *Electricity sector institutions.* The sector institutions, including the MoE, the South Electricity Transmission Company (SETC), and especially the SEDC, are expected to benefit from the reforms and improved operations efficiency. Improved efficiency, transparency, and accountability of operations will not only improve the sector's performance but also enhance image and credibility with shareholders and electricity customers, gaining support for sustained operations.

ii. *Households.* Households connected to the grid (estimated at about 550,000, which is equivalent to about 2.5 million individuals) will directly benefit from improved electricity services reliability, whereas the general populace in the South region (estimated at about 6 million) will benefit indirectly from the improved social services delivery because of improved electricity availability and reliability.

iii. *Productive enterprises.* Improved electricity supply reliability will contribute to increased productivity and income of productive enterprises, as they will reduce their dependency on expensive diesel generation, whose per-unit cost is more than the grid supply. In addition, increased supply reliability would increase existing firms' profitability from increased labor productivity (reduced idle hours), reduced materials waste, and reduction of high-cost back-up generation.

C. PDO-Level Results Indicators

30. **The following key indicators will be measured to demonstrate the achievements of the PDO:**

i. *Improve the reliability of electricity service delivery.* Percentage increased efficiency of transmission and distribution network infrastructure: 50 percent—baseline = unserved energy 111.0 GWh [2017), target = 42.5 GWh (2024)

ii. *Enhance the operational efficiency of electricity services.* Percentage reduction in technical losses: 15 percent—baseline = 10.9 MW (2017), target = 9.3 MW (2024)

iii. *Improve commercial operations.* Percentage increase in billed-to-supplied energy ratio: baseline = 35 percent (2017), target ≥ 60 percent (2024)

III. PROJECT DESCRIPTION

31. **The project will support improving the reliability and efficiency of electricity services in the governorates of Basra, Al-Muthanna, Thi Qar, and Missan by improving transmission and distribution infrastructure and reducing technical losses of electricity within the transmission and distribution system**. The project also finances an operational and commercial efficiency enhancement program that includes the design, supply, installation, and commission of an Integrated Distribution Management Information System (IDMIS). The IDMIS shall cover core electricity distribution utility business functions, namely, network operations and maintenance, commercial, and management of corporate resources. Finally, the project will support the decentralized electricity services and operationalization of the electricity law with regard to the corporatization of the SEDC.

32. **The project will strengthen the transmission and distribution system through the construction of several transmission and distribution substations and lines.** The project is expected to increase the electricity supply reliability in the project areas by reducing the electricity supply interruptions due to overloads and network technical losses by about 50 percent and 15 percent, respectively. The commercial efficiency enhancement program is expected to increase electricity sales revenues by about 25 percent, with increased billing from 35 percent to over 60 percent. The project will also support sector institutional reforms for improved electricity services delivery, operations improvement, transparency, and accountability by supporting the initial business processes of the SEDC as a corporate entity.

33. **The operational improvement focused on the SEDC is aimed to be a transformative catalyst for reform in the provision of electricity services in Iraq.** Improved electricity distribution operations will go a long way to address chronic distrust among electricity consumers and at the same time will begin to alleviate the burden on government resources by enhancing fiscal performance. The goal of the approach is to help enhance the SEDC's core business operations, to build and reinforce the commercial foundation, and to use that strength to then systematically tackle broader challenges related to the sector's fiscal sustainability. When the activities in SEDC have proven successful, the initiative could be scaled up to include other companies.

34. **Several of the project activities will generate climate change mitigation and adaptation co-benefits.** The transmission and distribution network capacity reinforcement, including reconductoring of existing lines with higher capacity conductors, will result in a reduction in technical losses, estimated at 1.60 Megawatt (MW) power savings annually. The strengthened electricity infrastructure will improve supply reliability and thus contribute to the reduction of GHG emissions by decreasing reliance on small private generators (diesel-based), which are less efficient and cause more GHG emissions compared to the national grid supply and whose use is widespread due the poor reliability of the grid supply. In addition, the transmission substations are expected to facilitate the integration of renewable energy (about 2.0 GW of solar photovoltaic projects) into the grid. The activities under the project will also address climate change vulnerability and hazards as facilities to be installed (transmission lines, substations, and advanced metering infrastructure) will integrate resilient designs that will shield the power sector from the future impacts of extreme weather. Such measures are expected to address the structural stability and impact of high temperature, floods, high winds, sand storms, and earthquakes and will generate climate change adaptation co-benefits. Climate change co-benefits for each of the activities are provided in annex 2. The project will support activities that reduce transmission and distribution network losses. The reduction in transmission and distribution losses will also yield a reduction in carbon dioxide (CO_2) emissions, because most

of the generation comes from fossil fuel–fired power plants. The emissions factor used to calculate the avoided CO_2 emissions from energy savings is 684 gCO_2 per KWh as per World Bank guidance pertaining to the Iraq grid emission factor.[12] Using this factor, the project leads to cumulative CO_2 emissions savings of 80,000 tCO218 over a period of 20 years.

A. Project Components

35. **The project will consist of three main components, estimated at a cost of US$200 million.**

36. ***Component 1. South Electricity Transmission Network Reinforcement (US$95.0 million).*** This component supports a range of activities designed to: (i) address network capacity limitations to meet existing electricity power demand, (ii) meet expected future load growth, (iii) provide operation flexibility and hence improved electricity supply reliability, and (iv) reduce transmission network technical losses. The activities include: (a) 132/33/11 kilovolt (KV) substations rehabilitation and upgrades, including installation of autotransformers, (b) 132KV transmission network reinforcement, including construction of circuit lines and new substations, and reinforcement of existing ones, and (c) supply and installation of 132/33/11KV mobile substations. The scope is expected to increase the transmission network capacity by about 1,720 megavolt amperes (MVA).

37. ***Component 2. South Electricity Distribution Network Reconstruction and Reinforcement and SEDC Electricity Sales Revenue Management Improvement (US$100.0 million).*** This component will support activities related to: (i) distribution network rehabilitation and reinforcement to meet current and future electricity demand, reduce technical losses, and increase operations flexibility, including distribution substations and lines; and (b) the design, supply, installation, and commission of an IDMIS covering electricity distribution core business functions: namely, network planning, operations and maintenance, commercial, and management of corporate resources. The IDMIS will include a revenue protection program (RPP) to improve electricity sales revenue management, including a georeferenced customer and low voltage network database, metering, billing, and revenue collection.

38. **The IDMIS forms a foundation for future operations and business improvement plans of the corporatized SEDC.** It will enhance the company's ability to plan, operate, and monitor performance of the network at the company level. The IDMIS will include but not be limited to: (i) aggregating the electricity received from the national grid to the company, so that the latter becomes more financially and operationally accountable; (ii) enhancing electricity billing and revenue collections, including energy auditing; and (iii) localizing network monitoring and remote control and thus creating faster response to distribution network services.

39. ***Component 3. Institutional Capacity Strengthening and Project Implementation Support (US$5.0 million).*** This will include institutional capacity building aligned with the government reform program for improved accountability, governance, financial sustainability, and increased private sector participation. The component will, among other things, support the following:

i. *SEDC Capacity Building and Institutional Strengthening*. This will support enhancement of SEDC institutional capacity as a corporate entity, for improved accountability, governance, and financial

[12] World Bank, "Guidance Note: GHG Accounting for Energy Investment Operations" (Washington, DC: World Bank, 2013).

sustainability as an "Island of Excellence,"[13] a model that could be scaled up to cover other electricity distribution companies as the sector reforms and corporatization are rolled out. The support will include preparation of the SEDC Business Management Improvement Plan (BMIP) and set key performance indicators. The support includes definition and reengineering of the business and operational processes and practices, including coaching, mentoring, and training of SEDC staff.

ii. *SEDC Corporate Strategic Plan and Performance Management.* This will support the SEDC to prepare its mission statement and corporate vision, develop robust medium-term strategic plan, carry out training aimed at aligning behaviors to corporate values, and provide support to SEDC leadership to align performance and targets to corporate vision.

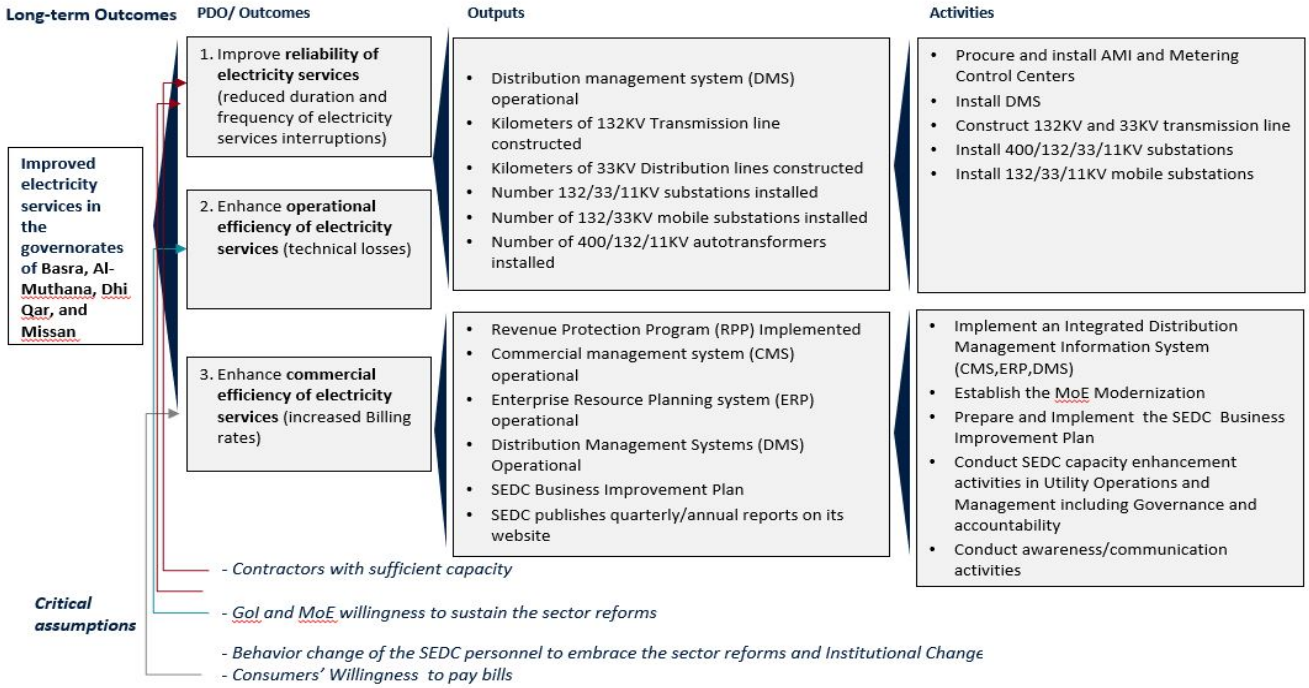
iii. *Feasibility and Diagnostic Studies.* This will support SEDC to carry out studies aimed at addressing sector-performance improvements in medium to long term, particularly in relation to grid supply and reliability and options for sector development.

iv. *Project Implementation Support.* This will help provide support to Ministry of Electricity, SEDC, and SETC in project implementation and sector management, including through engagement of an owner's engineer and a business support services firm.

[13] "Strengthening governance—including addressing transparency, accountability, and public participation—is vital to ensuring that the sector functions efficiently and that energy contributes to equitable economic, social, and environmental development." World Bank, *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector* (Washington, DC: World Bank, 2013).

Box 2 presents the results causal chain "Theory of Change" that the project will follow.

BOX 2. THEORY OF CHANGE IRAQ - ESREP



B. Project Cost and Financing

40. **The Project is funded by the IBRD loan using IPF instrument.** Table 1 presents the project cost and financing.

Project components	Project cost (US$ million)	IBRD financing (US$ million)
1. South Electricity Transmission Network Reinforcement	95	95
2. South Electricity Distribution Network Reconstruction and Reinforcement and SEDC Electricity Sales Revenue Management Improvement	100	100
3. Institutional Capacity Strengthening and Project Implementation Support	5	5
Total financing required	200	200

C. Lessons Learned and Reflected in the Project Design

41. **Resolving energy problems requires massive investments that cannot be accomplished solely by government funding, even with assistance from development partners; the financing gap can be closed only by improving self-financing capacity and by attracting private investments globally.** Simple, early steps are needed to achieve the preconditions for sustainable reform and restructuring within the electricity distribution sector by: (i) strengthening distribution infrastructure to achieve minimum levels of efficiency and reliability of

supply, (ii) improving the financial viability of the sector, and (iii) supporting fundamental legal and regulatory development.

42. **It is important to address key political economy determinants of success.** The domestic private sector—where the future jobs are to be generated—needs to be not only a beneficiary but an active contributor to the sector development.

43. **There is a need to focus on improving operations performance (increased supply reliability and reduced total losses (technical and commercial).** In many utilities worldwide, as few as 1-2 percent of the total customer base is responsible for as much as 50–60 percent of the utility's total revenue. An RPP protects the revenues from the company's high value consumers to ensure its long-term financial viability, and RPPs are being implemented worldwide with successful results.

44. **Experience from similar operations supporting sector institutional strengthening and reform has shown that the best enabler for such activities is the government.** To this end, project preparation was preceded by: (i) a strong sector dialogue to ensure government ownership, and (ii) diagnostic assessments (CPCS 2015),[14] which have informed the government's actions related to the establishment of the new sector agencies and the enactment of the legal framework to ensure operating autonomy and independent corporate governance.

45. **Infusing an efficient and accountable performance culture in an organization depends on three core elements:** (i) an appropriate organizational structure with a clear vision that is supported by a robust strategy that gets executed, (ii) a skilled workforce that understands the corporate strategy and is incentivized to implement it, and (iii) tools and systems to support staff performance and inform decision making. The proposed project includes support to mentor and coach staff. There will be an all-inclusive consultative process in the preparation of the SEDC strategic business plan to ensure ownership.

46. **The lack of transparency in the operation and payment mechanisms makes it difficult to hold the public sector companies accountable for their performance.** To operate as a corporate entity under the recently enacted governance charter, the SEDC will be required to disclose to the public its key performance indicators. The RPP and the IDMIS will enable real-time monitoring of neighborhood-specific losses and prevent overbilling and theft. Better access will foster demand for information and a culture of transparency.

47. **Reconstructing dilapidated infrastructure requires robust designs and a methodical implementation approach to minimize deterioration of service due to increased supply disruptions**. The project design focusses on simplicity, flexibility, and scalability—allowing implementation through a series of contracts. The project activities focus on key priority upstream investments to address transmission and medium-voltage network capacity constraints in tandem with detailed network planning to address the downstream last-mile, low-voltage network infrastructure that interfaces with the consumer connections. This builds in flexibility and the ability to scale up where progress can be accelerated, as part of the lessons derived from the ongoing, World Bank–financed EODP.

48. **The project design recognizes project and contract management capacity weaknesses that could lead to implementation delays.** Therefore, the project's design and implementation arrangements include

[14] Ministry of Electricity, *Development of a Reform Roadmap for the Electricity Distribution Sector in Iraq* (Baghdad: MoE, 2015. Authored by CPCS).

comprehensive technical assistance for participants, including the Owner's Engineer (OE). To ensure fast implementation, the project will use the already approved bidding documents for the supply of goods and services under the ongoing EODP. Further, the current staff of the EODP project management team (PMT) will provide handholding to the newly created PMTs.

49. **It takes time to build sector capacity of the kind envisaged under the project's Component 3 and benchmark performance against performance improvement targets.** The five-year project implementation period allows for: (i) setting up the management information system (MIS) during the first two years, (ii) testing and finetuning business processes using the MIS (benchmarking and understanding the status quo) during the third year, and (iii) using the IDMIS during the fourth and fifth years to track progress toward achieving performance improvement targets and using real-time data to inform decision making.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

50. **The SEDC and the SETC are the designated Project Implementing Entities.** The SEDC and SETC were recently declared corporate entities under the MoE. The SEDC and SETC shall be responsible for the implementation of the distribution and transmission components, respectively. During project implementation, the SETC and SEDC will establish and maintain a Project Coordinating Committee, composed of relevant representatives of the SEDC and SETC, responsible for strategic oversight, guidance, and overall coordination of various activities under the project, including joint discussions of the annual work plans, project reports, and safeguards issues.

51. **The SETC and SEDC shall be responsible for the project-related procurement, safeguards, FM, monitoring and evaluation (M&E), and project management functions.** Each implementing entity has established a PMT that will be responsible for the overall project implementation as well as coordination and reporting to the World Bank. An OE will support overall project implementation and capacity development. As part of the SEDC institutional capacity building and strengthening, a business support services firm (BSSF) with experience in electricity utility management and operations shall be hired to support the SEDC's initial operations as a corporate entity, focusing on business reengineering and preparation of the BMIP. Details of the Project Institution and Implementation Arrangements are provided in annex 3.

B. Results Monitoring and Evaluation

52. **M&E activities will be undertaken by the respective PMTs supported by the OE and the BSSF.** The PMTs will be responsible for collecting, verifying, and collating information, integrating the M&E reports, and submitting the quarterly and annual progress reports to the World Bank. The quarterly and annual progress reports shall be submitted to the World Bank not later than one month after the end of each calendar quarter, covering the calendar quarter and not more than one quarter after the end of each calendar year. The PMTs shall establish a database for each component of the project to periodically monitor the evolution of implementation, outputs, and results, with systems for regular data gathering and processing of information required to monitor the main performance indicators and intermediary indicators as defined in the results framework. The PMTs shall collect and compile data to provide the basis for a compressive mid-term review. The PMTs will also undertake

an end-term review and contribute to the final Implementation and Completion Results Report.

53. **Following the commissioning of the RPP and IDMIS (expected in the third year of project implementation), the SEDC shall prepare a set of key performance indicators (KPIs) covering the key business functions.** This will enable tracking performance because of improved management and information systems and staff capacity building activities envisaged under the project. The KPIs shall include both medium-term performance improvement targets and annual work plan targets. The annual targets will be used to develop and implement a performance dashboard that will be used to track and measure performance and impact of the business reengineering and improvement plans.

54. **As part of the broader Project Impact Monitoring and Assessment, including the gender action plan, a baseline survey shall be undertaken in the initial six months of the project.** This will be followed by annual monitoring surveys, including electricity consumer satisfaction surveys.

55. **In parallel and complementary to the above, the M&E for this project will include arrangements to track business opportunities generated from the availability of reliable power.** It will also track associated private sector-led job creation generated directly and indirectly as a result of the investments from Components 1 and 2 and related institutional changes under Component 3 of this project. Additional trust fund resources are planned to be mobilized for this under a different Advisory Services and Analytics (ASA).

C. Sustainability

56. **Both the electricity law enacted in March 2017 and the sector strategy adopted in 2014 support the project's long-term impact and sector sustainability.** They address: (i) increasing the reliability, efficiency, and accountability of electricity service delivery; (ii) reducing the fiscal burden of the energy sector; (iii) promoting private sector participation; and (iv) improving the sector management and performance.

57. **The multipronged approach of the project, encompassing both investments to improve the quality of electricity services and sector reforms for improved operations and fiscal sustainability, aim to put in place systems, processes, and incentives that will allow electricity services to be provided in a sustainable manner.** By focusing on improving quality, this project will contribute to socioeconomic development, firm competitiveness, and job creation over the long term. Efficient sector operations hinge on the development of management systems to inform decision making and put in place the tools and processes required to operate effectively. The project-supported MIS will help improve: (i) the quality of service by reducing network down times and technical losses, (ii) financial performance by improving billing and revenue collection, and (iii) efficiency by providing management with key information to allow more effective decision making.

58. **A key component of the corporatized sector, performance management improvement is an in-house, all-inclusive, strategic skills redevelopment and performance assessment involving staff at all levels.** It is envisaged that the existing staff will be part of the core team for defining and implementing the business improvement plans, including performance indicators, which will facilitate on-the-job training. Mentoring, coaching, capacity building, technical assistance, and career development opportunities will empower staff, build participation in the change process, and ensure that new skills, practices, and processes are internalized. A BSSF, playing an advisory role, will be recruited to support the initial operations with a clear exit strategy to ensure that a team of well-trained staff is in place to run, manage, and utilize the new IDMIS systems.

V. KEY RISKS AND MITIGATION MEASURES

59. **The overall risk of the project is considered "high."** There are several risks to this project, including a fluid political and security situation, potential vested interests, and economic volatility related to the fluctuation of oil prices. The main risks pertain to: (i) the political and security situations, which remain fragile and are beyond the control of the project, and (ii) citizen discontent with enhanced revenue collections if the quality of supply does not improve.

60. **Political, governance and stakeholders risks are rated high**. The political situation, perception of widespread corruption and vested interests from various stakeholders remain challenging. These challenges could indeed undermine the proposed sector reforms. However, the recently enacted electricity law and Council of Ministers endorsement of the MoE restructuring and corporatization provide the requisite enabling environment to undertake the sector restructuring and reforms. In addition, the current political economy within Iraq is strongly in favor of reform—Iraq's current fiscal crisis, a new and more inclusive reform minded government, and strong preparatory work within the energy sector have laid a sound foundation for reform within Iraq's leadership.

61. **Macroeconomic risks are substantial.** Iraq will continue to face macroeconomic risks related to external shocks such as the reduction in oil prices. These risks could affect the sector sustainability due to federal government reduced funding. These are partially mitigated by the project support focusing on the sector's increased revenue collection and reduced losses, which would in turn reduce the sector's reliance on government subsidies.

62. **Sector strategies and policies risks are high.** Weakness in capacity or commitment of the government to implement reform may also undermine the success of the project. However, to date, the government and the MoE have shown strong commitment to undertake reforms and electricity services delivery support, respectively. Further, the prerequisite enabling legal and policy framework is in place with the 2017 electricity law and the sector strategy.

63. **Fiduciary risk is substantial.** Iraq ranks poorly on international comparisons regarding perception and control of corruption. This is further compounded by the implementing agencies lack of experience in executing Bank's financed projects. Proposed mitigation measures are detailed in the Project procurement and financial management arrangements, which include the mandatory use of World Bank procurement regulations and anti-corruption guidelines.

64. **Environmental and Social risks are substantial.** This is due to the weak capacity of the implementing agency in environmental management and the fragile context of the country. In addition, there could be key social challenges associated with potential land acquisition that could impact the livelihood of informal businesses, relocation of squatters or minorities within the location of any activities, loss of assets, or restrictions to access. These issues will be managed with standard safeguards instruments. For these reasons, the World Bank Policy on Involuntary Resettlement OP 4.12 is applied to the entire project.

65. **Institutional Capacity for Implementation and Sustainability risk is high. Project implementation risks include: (i) lack of interest from international companies or high bids because of perceived country security**

risk, and (ii) weaknesses in project and contract management. The implementation risk is mitigated by the fact that a number of regional and international companies have participated in bidding under the ongoing EODP. Lack of adequate capacity related to implementation is to be mitigated by having a substantial Owner's Engineer/Supervision Consultant contract that will support the project design, procurement, and contracts implementation, including safeguards and FM. The infrastructure investments are to be procured as turnkey to ensure single responsibility, thus further mitigating the risk of lack of in-house or local capacity for ancillary services and counterpart funding. Further, the project encourages the twinning of local partners with major foreign suppliers for implementation and logistic support.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

66. **The deficit of the electricity sector, with all inputs valued at market price, is estimated to reach 5.2 percent of GDP in 2017.**[15] Revenues from electricity sales can cover only about 10 percent of the sector needs due to high losses (technical and nontechnical) and low cost-recovery and collection rates. The project aims to reduce losses, increase supply, and enhance revenues to reduce fiscal burden and improve the sector's financial sustainability. Further, due to lack of adequate network capacity, some areas on average receive only about 15 hours of grid supply per day. The absence of reliable power from the grid has led to the widespread installation of private diesel generators, whose constant operation imposes high generation costs, with households having to pay almost about US¢40.00 per KWh compared to grid supply tariff of about US¢5.16 per KWh. Inadequate and poor electricity services and infrastructure impede private sector development and negatively affect employment and economic growth and constrain attempts to address widespread poverty.

67. **The project is expected to have an economic internal rate of return of 130.2 percent and a net present value (NPV) of US$1.554 billion at a discount rate of 10 percent over a period of 20 years.** The analysis uses the following quantifiable benefits deriving from the project: (i) decrease in supply interruptions, (ii) increased capacity to meet demand, (iii) reduction in system transmission and distribution network technical losses, (iv) reduction in nontechnical losses (increased billing), and (v) reduction in cost of GHG emissions from reduced dependence on higher polluting private generators. The financial performance of the project is also reliable, with a financial rate of return reaching 48.5 percent and the NPV at US$669 million over the 20 years of the forecast period.

B. Technical

68. **The electricity distribution system is very old, in some cases operating well beyond its economic life and below the acceptable operations safety, thus posing a risk of fatality to operations staff.** The sub-transmission (132kV) and distribution (33kV and 11kV) networks are overloaded with high losses and have reached their thermal capacity, resulting in significant bottlenecks in system supply and increased power outages, and raising

[15] IMF, Staff Report (Washington, DC: IMF, 2017).

the possibility of stranded generation assets. The required addition and/or upgrade of network elements were identified to remove the voltage and load flow constraints for reliable and secure electricity supply. Future networks were designed to achieve a steady-state voltage range in accordance with international standards. CYME-DIST software was used to model the distribution system to determine the performance of the distribution network (33kV and 11kV) in terms of reliability improvement and reduction of losses. Current technical losses in the distribution system covered by the project are estimated at about 10.9MW. These will be reduced to about 9.30MW (a reduction of about 15 percent) in the project areas. More significantly, overloading and bottlenecks will be eliminated in the areas covered by the project, allowing substantial increase in reliable electricity supply to these areas. Rehabilitation of the dilapidated substations will enhance operations safety and eliminate the risk of fatality while operating the equipment.

69. **The rehabilitation or upgrade of 132kV sub-transmission and 33kV and 11kV distribution networks will not pose any significant technical concerns.** All the technologies applied in the project, particularly the transmission and distribution network and substation activities, have been widely used in other countries with similar conditions and in Iraq under the ongoing World Bank–funded EODP.

70. **Institutional capacity strengthening, and reforms will support the SEDC to prepare and implement business management improvement plans and the MoE to undertake sector reforms related to corporatization.** Such approach has proven to be effective in improving revenue management, reducing network system losses, and improving supply reliability and efficiency of operations in the use of corporate resources.

C. Financial Management

71. **Assessment of the SEDC and SETC revealed that both institutions do not have prior experience with the World Bank–financed operations**. However, with the implementation of agreed-upon actions, the FM arrangements will satisfy the minimum requirements under the World Bank Policy and Directive for Investment Financing Project. Annex 3 provides detailed information on the FM assessment, key risks, and the recommended mitigation measures.

72. **The project will be implemented by two PMTs established at the SETC and the SEDC to oversee the project implementation with full day-to-day responsibilities while ensuring that all activities are fully coordinated through the Project Coordination Committee.** Qualified financial officers, accountants, and internal controllers will be provided from both companies' staffs and will be dedicated to the project. Each PMT will be responsible for planning and coordinating specific activities, including FM (payment authorization, disbursement, accounting, and reporting), procurement of goods and construction companies, consulting services (and related contract management), and M&E.

73. **To ensure that funds are readily available for project implementation, two Designated Accounts (DAs) in US dollars will be opened at banks acceptable to the World Bank and managed separately by each of the PMTs of the SEDC and SETC.** Each PMT will be responsible for preparing quarterly, unaudited Interim Financial Reports (IFRs) and annual project financial statements in format and content acceptable to the World Bank. The IFRs will be submitted separately by each PMT to the World Bank within 45 days after the end of the related period. Independent external auditors, acceptable to the World Bank, will be engaged to carry out project audits and issue independent opinions on the project's financial statements. The audit reports will be sent to the World Bank no later than six months following the end of the project's fiscal year. Each PMT will be responsible for

preparing the terms of reference for the auditors and submitting them to the World Bank for clearance. The financial audit will include a technical audit of construction work performed for the project.

D. Procurement

74. **Procurement will be carried out in accordance with the World Bank Procurement Regulations for Borrowers under Investment Project Financing, dated July 2016, and revised November 2017, and August 2018 (World Bank Procurement Regulations for IPF Borrowers).** Procurement is being processed under paragraph 12 of the World Bank Policy for Investment Project Financing "Projects in Situations of Urgent Need of Assistance or Capacity Constraints," where "Simplified Procurement Procedures" may apply for investment project financing. This will enable the delivery of early visible results in a context of extreme needs and high expectations in the targeted project areas. As per the requirements of the World Bank's Procurement Framework, a Project Procurement Strategy for Development (PPSD) including a comprehensive, fit-for-purpose Procurement Plan for the first 12 months of the project have been prepared. The provisions of the borrower's Procurement Plan for the project as elaborated under Section IV of the Procurement Regulations will apply, as the same may be updated from time to time in agreement with the World Bank.

75. **Procurement assessments and reviews have been conducted at the two implementing agencies: the SEDC and SETC**. Both agencies have no prior experience in World Bank-financed projects or procurement policy and regulations, with little experience in procurement planning, monitoring, and contract management. The assessment of the implementing agencies for this project, in particular, and generally in Iraq reflects that the major issue facing Iraq public procurement is the uncertainty of public procurement laws and regulations and their enforcement, including outdated practices. Additionally, Iraq's ability to manage public resources is undermined by poor security. Iraq has one of the lowest ranks among the countries in the region in Transparency International's Corruption Perception Index. This is further compounded by limited human capital for procurement management, as commonly evidenced by delays in decision making. In addition, there is a general lack of emphasis on procurement principals in such areas as transparency, conflict of interest, independent complaint mechanism, value for money, or fit for purpose, among others.

76. **The following procurement main risks are identified:** (i) limited capacity of the PMTs in World Bank procurement policy and procedures, procurement planning, and management of large and international contracts; (ii) lack of experience at the SEDC and SETC with World Bank–financed projects; (iii) high perception of fraud and corruption in a high-risk and weak control environment; (iv) a limited local market with only a few interested regional or international suppliers, which may result in lesser competition and higher bid prices; and (v) possible delays in implementation due to the security conditions in Iraq. Specific risks and mitigation measures are outlined in annex 3.

77. **The PMTs will be responsible for overall procurement activities.** The PMTs will be supported by an international consulting firm (OE), acting as the employer's designated project manager to provide project implementation support and capacity development. The borrower, the SEDC, the SETC, and the PMTs shall ensure that the project is carried out in accordance with the provisions of the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011 and as of July 1, 2016.

78. **Measures for implementation readiness include comprehensive technical assistance for project stakeholder staff, including appointing an OE.** Further, already approved bidding documents for the supply of

goods and services under the EODP will be utilized. In addition, the current EODP PMT members will provide handholding and guidance to the project PMTs, as needed.

E. Social (including Safeguards)

79. **Social benefits, risks, and impacts.** The proposed project will have broad social benefits, since it will improve the reliability and efficiency of transmission and distribution infrastructures. The key social challenges would be associated with potential land acquisition for the setup of mobile substations, potential impact on the livelihood of informal businesses, relocation of squatters or minorities within the location of any activities, loss of assets, or restrictions to access. For these reasons, the World Bank Policy on Involuntary Resettlement OP 4.12 is applied to the entire project. Since the location of all subprojects are not known during the preparation stage, a Resettlement Policy Framework (RPF) has been prepared for the project to provide guidelines for handling resettlement requirements and compensation procedures during project implementation. The RPF has been disclosed both in country and on the World Bank website on October 16, 2018, and January 28, 2019, respectively. In addition, during the lifespan of the project, if any site is determined to require physical displacement, land acquisition, or loss of income, then the corresponding Resettlement Action Plan or Abbreviated Resettlement Action Plan will be prepared and disclosed before construction starts. The SEDC and SEDT shall finance exclusively out of their own or other resources, and not out of the proceeds of the loan, and provide, promptly as needed, the resources needed for the following: (i) all land acquisition required for purposes of the project, and (ii) resettlement and rehabilitation payments and other assistance to affected persons in accordance with the provisions of the applicable safeguards instruments.

80. **Stakeholder consultations.** An Environmental and Social Management Framework (ESMF) and RPF preparation included consultative meetings with the stakeholders at the implementing entities (SEDC and SETC). Gender Action Plan preparation included focus group discussions and in-depth interviews.

81. **Grievance redress mechanism (GRM).** The SEDC and SETC will each establish a GRM unit to handle project–related complaints or requests, each with a dedicated focal point person. Multiple access points (telephone, complaint box, website, email, text message, and so forth) shall be provided so that beneficiaries have different ways to voice their concerns. The contact information of the GRM focal points will be posted in local language at the local level. Each PMT manager will have the overall responsibility to address concerns brought to the attention of the focal points regarding any environmental and/or social impacts due to project activities. Complaints received shall be registered, tracked, investigated, and promptly resolved. Copies of complaints shall be recorded in the activity files and the progress reports, including the number and type of complaints and the results of their resolution.

82. **Gender considerations:** To understand the impacts of electricity service unreliability and unavailability on Iraqi women's economic and social well-being, a gender assessment was conducted in April 2018 in the project area. The identified gender gaps derived from the qualitative gender assessment relate to: (i) access to formal electricity services by vulnerable women's groups (who constitute 10 percent of the population), (ii) gaps in participation in economic activities and in income levels between women and men[16], (iii) women's ability to

[16] There are wage and earning gaps between women and men: (i) in the public sector, on average, males earn 20 percent more than women in 2012, and (ii) in the private sector, the wage gap is almost eight times wider than the gap in the public sector. Women in Iraq have been significantly affected by the security situation World Bank. 2017 (Iraq Systematic Country Diagnostic).

engage in educational activities and women's health outcomes, and (iv) women's lack of information on electricity service delivery, user rights and responsibilities, and bill payment options. The gender action plan will be implemented and monitored. It aims to enhance women's ability to engage in income-generating activities and to improve income levels of women engaged in income-generating activities, including women-owned businesses, by improving electricity service delivery. The gender indicators are: (a) Women reported engaging in income-generating activities (IGA) due to improvements in electricity service, and (b) Women-owned businesses reporting increased income due to improved electricity services.[17]

F. Environment (including Safeguards)

83. **The transmission lines will pass across desert lands either vacant or occupied by oil exploration companies, industrial facilities, and warehouses.** Many of the substations are already existing and require only minor civil works to increase capacities of the power transformers and switchgears. However, new substations may be built, and mobile substations will be procured and connected to the grid for the distribution network, which will be rehabilitated mainly inside the urban areas as overhead lines. The construction and rehabilitation of the transmission lines, substations, and distribution networks will result in moderate negative environmental impacts such as air pollution from construction equipment, solid and hazardous waste generation, noise, and exposure of communities to electromagnetic fields. In addition, the occupational health and safety of workers needs to be properly addressed. During operation, the replacement of old electro-mechanical meters with the new smart meters may generate fairly large quantities of solid wastes as well as electrical and electronic wastes and batteries, which may release toxic chemicals to the environment. Therefore, OP 4.01 on Environmental Assessment is triggered. Iraq is known to host sites of historical and cultural significance. An Environmental and Social Management Framework (October 2018) has been prepared by the borrower where environmental concerns were determined and addressed. Other safeguard instruments (for example, Environmental and Social Management Plans, or ESMPs) were identified in the ESMF as needing to be prepared by the implementing agency to address, in detail, environmental concerns. The ESMF has been agreed with the World Bank. The site-specific safeguard instruments, which will be prepared once the exact project sites and routing of cables and towers are known, will undergo World Bank review, and no construction work will commence prior to safeguards instruments disclosure.

84. **The project is assigned a Category B, triggering the safeguard policies OP4.01 and OP4.12.** An ESMF was prepared by the borrower and is the primary safeguards instrument of the project, which will cover the entire scope of potential investment subprojects (transmission lines, substations, and distribution networks). The ESMF has classified typologies along environmental and social criteria and impacts, and for each typology it defines the required specific instruments, such as site-specific ESMPs and checklist ESMPS. The ESMF has been publicly disclosed both in-country and on the World Bank website, on October 16, 2018, and January 28, 2019, respectively.

G. Citizen Engagement

85. **To ensure effectiveness in meeting customers' expectations, the SEDC will undertake customer satisfaction surveys and accountability consultative meetings workshops once a year across its service**

[17] In addition to the indicators included in the results framework, several gender related indicators as detailed in the annex 5 will be monitored.

territory. The objective is to garner customers' and others' concerns, evaluate the level of service delivery, solve problems, and raise awareness of the SEDC's services and improvement plans. The inputs and feedback from the surveys and meetings will be collated and brought to the attention of the SEDC's senior management for consideration in resolving customers' and other stakeholders' concerns. Annual reports on inputs, outputs, and outcomes of the surveys and consultations will be shared with the World Bank and will be considered during project implementation to ensure a feedback loop.

H. World Bank Grievance Redress

86. **Communities and individuals who believe that they are adversely affected by a World Bank–supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank'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 World Bank's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank noncompliance 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 World Bank management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate 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.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

Project Development Objective(s)

To improve the reliability and operational and commercial efficiency of electricity services in the selected project areas.

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
Enhance the operational efficiency of electricity services				
Reduction in Technical Losses (Percentage)		0.00	5.00	15.00
Improve Commercial operations				
Increase in billed to supplied energy ratio (Percentage)		35.00	45.00	60.00
Improve the reliability of electricity service delivery				
Increased efficiency of Transmission and Distribution Network infrastructure (Percentage)		0.00	20.00	50.00

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
South Electricity Transmission Network Reinforcement				
New 132KV Transmission line constructed (Kilometers)		0.00	15.00	40.00
New Substation Capacity (Kilovolt-Amphere(KVA))		0.00	1,000,000.00	1,720,000.00
SED Network Reconstruction and Reinforcement and Electricity Sales Revenue Management Improvement				
Capacity of new substations constructed (Kilovolt-Amphere(KVA))		0.00	400,000.00	750,000.00
Revenue Protection Program (Energy Meters Installed at Industrial and Commercial Consumers) (Number (Thousand))		0.00	50.00	100.00
Customers satisfied with service provided by SEDC (Percentage)		0.00	15.00	25.00
People provided with new or improved electricity service (CRI, Number)		0.00	800,000.00	2,000,000.00
People provided with new or improved electricity service - Female (CRI, Number)		0.00	400,000.00	1,000,000.00
Institutional Capacity Strengthening and Project Implementation Support				
SEDC Business Improvement Plan Prepared and Adopted (Yes/No)		No	Yes	Yes
SEDC publishes quarterly on its website, Quarterly Performance Reports including Energy Supplied, Billed and Revenue Collections (Yes/No)		No	Yes	Yes
SEDC publishes on its websites the Electricity Consumers Satisfaction Survey Report (Yes/No)		No	Yes	Yes
SED Network Reconstruction and Reinforcement and Electricity Sales Revenue Management Improvement				
Women reported engaging in income-generating activities (IGA) due to improvements in electricity service (Percentage)		0.00	10.00	20.00

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
Women-owned businesses reporting increased income due to improved electricity services (percentage) (Percentage)		0.00	10.00	20.00
Increase in business enterprises reporting increased productivity as a result of improved electricty services reliability (Percentage)		0.00	20.00	50.00
Increase in jobs (Percentage)		0.00	10.00	20.00

Indicators to be Mapped	Baseline	End Target
PDO Indicators		
Reduction in technical losses (MWh/year)		
Increase in collections (billed) (Percentage)		

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Reduction in Technical Losses	Reduction of Technical Losses in the project areas. Baseline-10.90MW(2017) (0 percent); Target -9.3(June 2024) (15 percent).	Annual	Network data (demand and network data)	Transmission and Distribution network load flow studies	Operations staff and PMT M&E
Increase in billed to supplied energy ratio	Ratio of billed energy to supplied. SEDC	Monthly	Billing Data Center (Billed	Billing data will be collected from the Billing	Billing Data Center and

	billed/supplied energy (Baseline 35.0percent: Supplied energy-26.60TWh, Billed energy-9.28TWh)(December 2017)		energy) and Bulk Supply metering points (Supplied Energy)	Data Center records and Supplied energy from the Bulk Supply meter readings	SEDC PMT M&E
Increased efficiency of Transmission and Distribution Network infrastructure	Improve reliability of the electricity services delivery as measured by reduced unserved energy in the project areas due to network capacity limitations (target-50 percent). Baseline - unserved energy 111.0 GWh (2017); Target-42.5GWh (June 2024)	Monthly	Operations data from transmission and distribution primary substation's in the project areas	System Operations records of the outage records at the transmission and distributions substations in the project areas.	Operations and PMT M&E

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
New 132KV Transmission line constructed		Annual	Project Progress Reports	Project Progress Reports	SETC PMT M&E officer
New Substation Capacity	Capacity of new substations constructed	Annual	Project Progress Reports	Project Progress Reports	SETC PMT M&E

Capacity of new substations constructed	Capacity of new substations constructed	Annual	Project Progress Reports	Project Progress Reports	SEDC PMT M&E Staff
Revenue Protection Program (Energy Meters Installed at Industrial and Commercial Consumers)	Revenue Protection Program (Energy Meters Installed at Industrial and Commercial Consumers)	Annual	Project Progress Reports	Project Progress Reports	SEDC PMT M&E
Customers satisfied with service provided by SEDC	Increase in the percentage of the customers satisfied with service provided by SEDC	Annual	Annual Electricity Consumer Satisfaction Surveys	Surveys	SEDC Communication and PMT M&E
People provided with new or improved electricity service		Annual	Billing Data Center	Billing Data Center Records	Billing Data Center and PMT M&E
People provided with new or improved electricity service - Female		Annual	Billing Data Center	Billing Data Records	Billing Data Center and PMT M&E
SEDC Business Improvement Plan Prepared and Adopted	SEDC Business Improvement Plan Prepared and Adopted	Once adopted, the performance will be reviewed quarterly against the set KPIs as included in the BMIP	SEDC Operations Data	SEDC Operations Data	SEDC Corporate Planning and SEDC PMT M&E

SEDC publishes quarterly on its website, Quarterly Performance Reports including Energy Supplied, Billed and Revenue Collections	SEDC publishes quarterly on its website, Quarterly Performance Reports including Energy Supplied, Billed and Revenue Collections	Quarterly	Billing Data Center (billing and revenue collections) and Bulk Supply Meter Readings	Billing Data Center and Bulk Supply Metering points	Billing Data Center and PMT M&E
SEDC publishes on its websites the Electricity Consumers Satisfaction Survey Report	SEDC publishes on its websites the Electricity Consumers Satisfaction Survey Report	Annual	Annual Electricity Consumers Satisfaction Survey	Survey	SEDC Communications and PMT M&E
Women reported engaging in income-generating activities (IGA) due to improvements in electricity service	Women reported engaging in income-generating activities due to improvements in electricity service (number). Project target was identified based on information from Iraq's Central Bureau of Statistics, which has sex-disaggregated, region-specific data points from the LFS survey (2008). The share of economically active women is on average 9 percent in the project areas compared to the national average of 18 percent. The project aims	Annual	Socio-economic and Gender monitoring surveys	Surveys	SEDC PMT M&E

	to close this regional gap and identified 20 percent as the target.				
Women-owned businesses reporting increased income due to improved electricity services (percentage)	Women-owned businesses reporting increased income due to improved electricity services (percentage). Project target was identified based on information from the Enterprise Survey in Iraq (2011). Access to electricity is the foremost obstacle among businesses, especially when disaggregating by gender of top managers.	Annual	Socio-Economic and Gender Monitoring Surveys	Surveys	SEDC PMT M&E
Increase in business enterprises reporting increased productivity as a result of improved electricty services reliability	Number of Business/Productive Enterprises reporting increased productivity as captured under the " Improved Electricity Services Impact Measurement Survey" (this survey will be funded by a separate Trust Fund under the Mashreq MFD Strategy). The Baseline and targets will be refined after the initial baseline survey proposed to be conducted	Bi-Annual	Improved Electricity Services Impact Measurement Survey	Surveys	SEDC PMT /Survey Firm

	within the first year of the project (by end June 2020).				
Increase in jobs	New jobs created by the Business/Productive Enterprises reporting increased productivity as captured under the " Improved Electricity Services Impact Measurement Survey" (this survey will be funded by a separate Trust Fund under the Mashreq MFD Strategy). The Baseline and targets will be refined after the initial baseline survey proposed to be conducted within the first year of the project (by end June 2020).	Bi-Annual	Improved Electricity Services Impact Survey	Surveys	SEDC PMT/Survey Firm

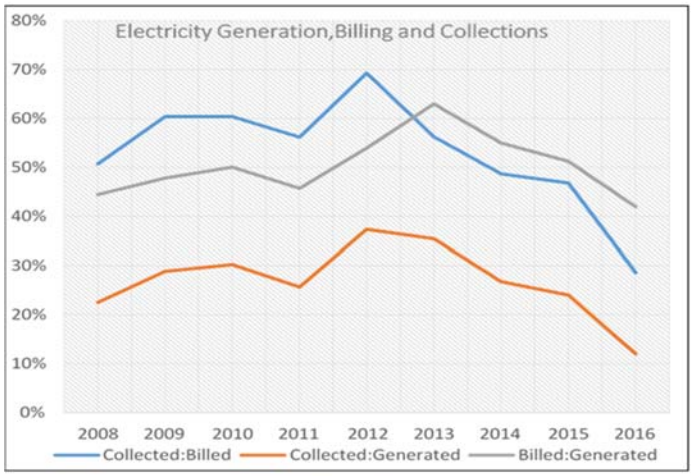
ANNEX 1: IRAQ ELECTRICITY SECTOR CONTEXT

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

1. **Iraq's energy sector has suffered from more than a decade of conflict and sanctions that have left its institutions weakened and have resulted in underinvestment and chronic deterioration in energy infrastructure.** Although Iraq has made significant progress in improving its power generation and increasing oil production, its energy sector continues to face serious issues, including high demand growth of over 10 percent per annum, chronic electricity shortages with grid supply availability of less than 15 hours per day, and an inability to supply natural gas as fuel for power generation,[18] alongside increasing levels of associated gas flaring at over 60 percent of the total associated gas produced in 2016.[19] The electricity sector represents increasing fiscal pressure on Iraq's public resources—particularly due to high losses, lower than cost-recovery tariffs, and poor revenue collection.

2. **Years of neglect have led to a dilapidated grid infrastructure with low operational efficiency and high levels of losses.** Over 50 percent of electricity is lost before it is billed. Adding to this burden, due to a lack of effective metering, billing, and commercial management systems, only about 50 percent of the energy billed is collected, leaving the actual electricity paid for at less than 30 percent of the total electricity generated (figure A1.1).

Figure A1.1. Electricity Operations Data



Source: MoE data 2017.

3. **As tariffs do not reflect true cost of generation,[20] the less than 30 percent of energy paid for represents only about 10 percent of the operational cost.** This generates a perpetual negative spiral

[18] As of 2016, the gas-based generation plants' utilization was about 40 percent of installed 15GW capacity
[19] Approximately 1.7Bscf is flared daily of the 2.8Bcsf natural gas produced.
[20] The 2018 average tariff was about US¢5.20 per KWh compared to a cost of service of about US¢13.0 per KWh intra-agency fuel subsidies inclusive.

of under recovery and underinvestment, deteriorating service levels, and a resulting high perception of risk for investors and commercial finance. According to the *Iraq: Investment Climate Assessment 2012*,[21] 73 percent of the firms operating in Iraq identified the lack of sufficient electricity supply as a "very severe obstacle" to productivity and the most significant issue affecting private sector development and job creation. The government of Ira (GoI) has initiated actions to improve the sector's financial performance and sustainability by implementing a fourfold increase in tariffs effective January 2016. Unfortunately, overall revenue did not improve (figure A1.1) despite the price increase, as collections declined. This underlines the difficulty in addressing the revenue gap through pricing and policy actions alone without addressing the poor service quality and commercial systems that is the direct interface with the clients. The underpricing and poor collection discipline have led to high average consumption of approximately 600 KWh per household compared to an average of less than 250KWh per household in Jordan and Egypt. Demand is also increasing at an unsustainable pace (10 percent per annum), putting great strains on energy subsidy provision and the pace of sector expansion.

4. **Lack of a conducive institutional structure and environment has severely inhibited Iraq's ability to deliver efficient and financially sustainable electricity services and to attract new investments**. The Iraqi electricity sector structure is a state-owned, vertically integrated, ministry-run civil service, which lacks financial and administrative autonomy and provides limited sector management and regulation capacity. The Ministry of Energy (MoE) not only serves as the policymaker and regulator but is responsible for generation, transmission, distribution, and retail supply, as well as for system operation, sector planning, and project development and implementation. This structure sets up a conflict of roles and is characterized by a lack of institutional capacity to undertake effective, integrated planning, policy development, and implementation. The civil service structure, which is based on standardized procedures for all units and departments, is inadequate to deliver commercial services and inhibits innovation and creativity and rewards conformity.

5. **Poor electricity services in Iraq are a result of capacity and infrastructure constraints and due to a deeper crisis in policy making, governance, and regulation**. Improving the sector's performance and market environment to encourage increased private sector participation and commercial operations will require a multi-pronged approach and long-term engagement, because the required reforms are multidimensional and require several years to yield optimal results through cumulative effect on adequate power generation capacity, operations efficiency, and reduced sector subsidies. Key actions that will move Iraq out of its poor electricity services delivery and unsustainability include (i) the strengthening of the sector governance and regulation to foster autonomy, accountability, and transparency; (ii) fiscal sustainability; (iii) operations efficiency; and (iv) investments to improve sector performance, including increasing the network capacity to meet current and future demand.

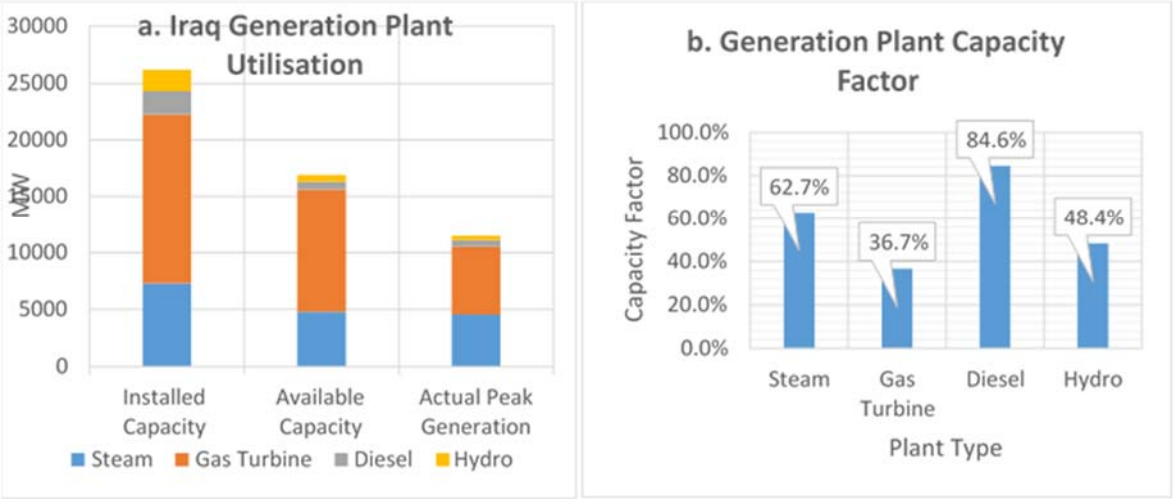
6. **The GoI's vision for the electricity sector is decentralized service delivery along with private sector participation.** The government's immediate and short-term focus is on improving delivery of services in order to gain the trust of citizens and industrial and commercial consumers. To address the dismal technical and commercial performance of the electricity sector, the GoI has initiated actions to restructure tariffs, and progressively move toward achievement of full cost-recovery, while ensuring

[21] World Bank, *Iraq: Investment Climate Assessment 2012* (Washington, DC: World Bank, 2012), http://documents.worldbank.org/curated/en/224621468261277147/Iraq-investment-climate-assessment-2012.

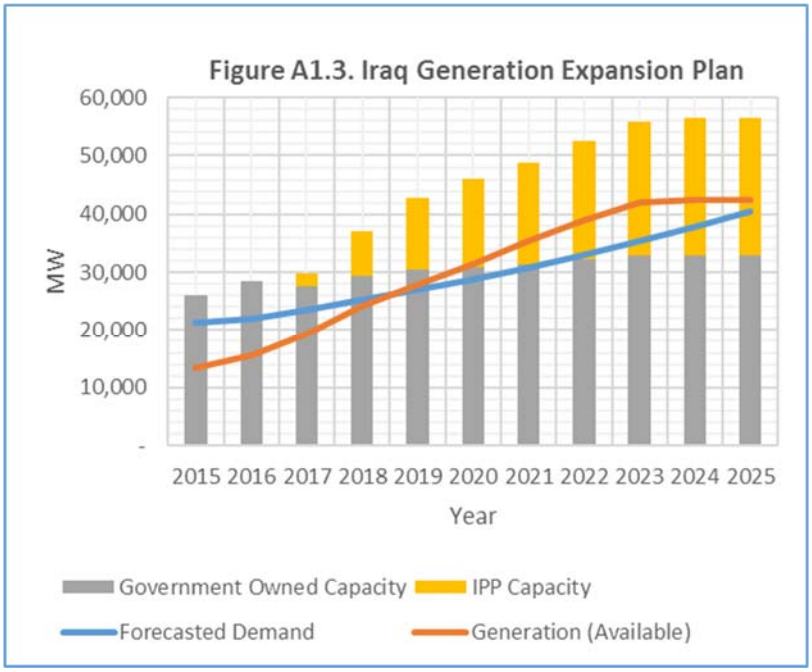
sufficient protection for poor and vulnerable consumers. The policies are founded in the sector strategy, the Iraq Integrated National Energy Strategy (INES) for the period 2013–30, adopted by the Cabinet in 2014 and enshrined in the recently passed law, Electricity Law No. 53 of 2017. The initial steps in the INES operationalization are aimed at (i) increasing the reliability, efficiency, and accountability of electricity service delivery; (ii) reducing the fiscal burden of the energy sector; (iii) promoting private sector participation in electricity generation and distribution to fill investment financing and implementation capacity gaps; and (iv) improving the sector management and performance and restructuring the tariff system to progressively move toward full cost-recovery.

7. **In order to increase private sector participation in the electricity sector, and achieve its reform and restructuring goals, the MoE must initially improve the performance of the sector to meet minimum levels of commercial performance and improve and strengthen electricity infrastructure to the extent that it can attract credible and bankable private sector investment**. Electricity production has grown by nearly 10 percent per year over the past 13 years; from a peak demand supply of 5.7 GW in 2003 to about 14.0 GW in 2016 with an estimated investment of about US$18.0 billion. Despite this high generation-capacity growth and investments, the grid supply is on average available for only about 15 hours per day. New generating units (mainly gas turbines) have been installed, but their operation often suffers because of fuel supply problems, especially the lack of infrastructure to provide natural gas. The physical and operating conditions of the existing power generation stations are such that many units need massive rehabilitation or replacement. Mainly due to lack of efficient coordination among sector stakeholders, the government is often obliged to allocate significant budgetary resources to use expensive fuels (crude, heavy fuel oil, and diesel for power generation). Natural gas-based generation capacity has recently increased to nearly half of the total installed capacity (figure A1.2) but utilized at only about 37 percent. More than 50 percent of the fuel used to operate gas turbines consists of gasoline, crude oil, and heavy fuel oil, which are more expensive and less efficient in addition to degrading the performance and useful life of generation equipment compared to natural gas.

Figure A1.2. Iraq Generation Capacity and Utilization



8. **Iraq is relying on independent power producers (IPPs) for future supply (figure A1.3).** To increase electricity supply, the government is engaging private sector to lead investments in new generation[22] and retrofitting the existing inefficient power plants. Private sector–led investments have already been initiated in the rehabilitation and upgrades of existing inefficient power plants as well as new generation.[23] Of the installed 5,000MW generation capacity in the Kurdistan Region of Iraq (KRI), more than 90 percent is now owned and operated by the private sector. A key concern for most of the IPP plants in Iraq remains the supply of natural gas and the off-taker financial viability. Similarly, several government-owned power plants are underutilized due to inadequate gas supply, a situation that has severely impacted the financial viability of the IPPs that were recently commissioned in the KRI, including payment defaults.



9. **The GoI has started engaging private sector participation in electricity distribution and retail.** This was done initially through services contracts limited to revenue and customer management services that could ultimately be expanded to include privatization of distribution companies (currently de facto state-owned enterprises) once infrastructure has been sufficiently strengthened and minimum levels of commercial performance have been achieved. The GoI has already initiated private sector–led revenue collections and customer management services with pilot contracts in the Baghdad area. However, it is cognizant that these measures will not be sufficient to reduce the subsidy bill and catalyze private sector investments if the weak commercial performance and revenue recovery are not addressed. This has recently been manifested through the Kurdistan Regional Government's

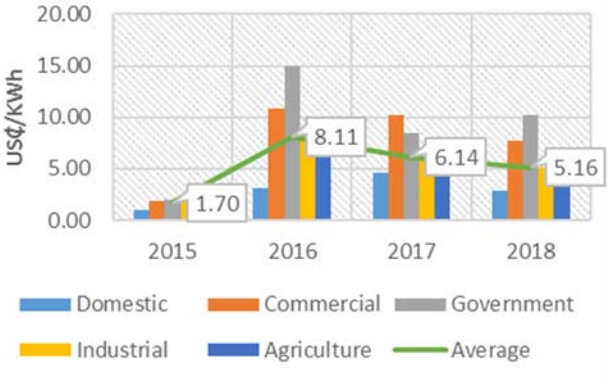
[22] To date, a total IPP capacity of about 8,355MW has been signed, including the IFC-supported Mass Global Energy (Bismaya IPP) transaction of 3,000MW in addition to the recently signed memorandum of understanding to generate 2,000MW of solar-based generation.
[23] Iraq has signed several agreements with GE totaling to about US$ 2.0 billion covering new generation (1,500MW), rehabilitation, and retrofitting exiting power plants to increase capacity by about 700MW and providing maintenance support services.

failure to meet its contractual payment obligations to the IPPs, including the IFC-supported Mass Global Energy's 500MW power plant investment.

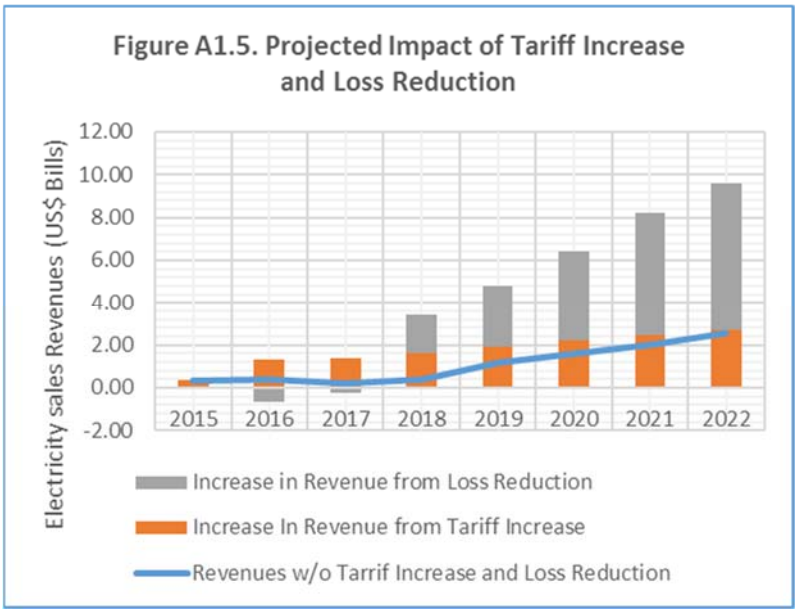
10. **Accelerating the development of a domestic gas market to catalyze private sector investment in all stages of the gas to power value chain is key**. In line with the INES, the GoI has committed to reducing current massive gas flaring to zero by 2030. Measures to attain the government's goals include the introduction and implementation of a contractual and regulatory framework for private investment to (i) reduce natural gas flaring; (ii) allocate captured natural gas for the urgently needed expansion of gas-based power generation (The GoI has formed a Gas-to-Power Committee to enhance coordination among the ministries of electricity, oil, and finance so as to expedite gas-to-power projects, as well as to effectively address bottlenecks in the optimal utilization of existing assets.); and (iii) establish basic conditions and concrete guidance for private investment in natural gas gathering, processing, and transport.

11. **Tariff reforms and sector fiscal sustainability are also essential**. The electricity sector fiscal management remains a key constraint to increased sector investments, including the financial viability of the private sector–led investments and operations. The GoI has initiated actions to increase tariffs toward a cost-recovery level. Compared to years prior to 2015, when tariffs had been frozen for a long time, the overall 2018 tariffs have increased about threefold (figure A1.4). The GoI increased tariffs fourfold effective January 2016, from an average of US¢1.7 per KWh to US¢8.0 per KWh. However, with protests from key commercial consumer groups, led by hoteliers in the holy sites of Karbala and Najaf, the Cabinet decided to lower the commercial and industrial tariffs effective January 2017, resulting in an overall average tariff reduction of 25 percent to about US¢6.0 per KWh. Further, the average electricity collections of 2016 decreased by about 50 percent compared to those of 2015 (figure A1.1), prompting the GoI to reduce the tariff further by about 16 percent to encourage consumers to pay. To reach a cost-reflective level, the tariffs would need to increase to about US¢13 per KWh (MoE 2017 estimate). Raising consumer tariffs in a country experiencing high power outages is extremely challenging and will require citizens to agree to pay higher prices in exchange for a credible promise of improved service delivery.

Figure A1.4. Iraq Electricity Tariffs, 2015/18



12. **The GoI has initiated actions to improve the sector's financial performance and put it on a path toward financial sustainability.** With the support of the World Bank's previous Development Policy Financing, the GoI has adopted the following policy actions to improve the sector's financial performance: (i) tariffs were increased about fivefold effective January 2016; (ii) a Loss Reduction Directive policy was adopted in October 2016; and (iii) revenue management services were contracted to private firms starting with pilot areas in Baghdad. These measures are expected to bear fruit and improve the financial situation of the sector, as highlighted in figure A1.5. Once a publicly acceptable level of supply reliability is established (around 2020 per the current committed plans), tariffs could be increased, aiming toward a gradual alignment of price with cost estimated at about US¢10 per KWh.[24] As tariffs begin to reflect the economics of power production, the GoI plans to introduce demand-side management measures, as customers are then likely to respond.



13. **To accelerate electricity sector reforms, the GoI is moving ahead with substantial structural reforms in the sector as provided for in the recently passed Law 53 (2017).** The electricity law, which had been on the parliament's agenda since 2010, outlines new key roles for the MoE, such as focusing on regulatory policies and licensing; whereas the ministry's 12 companies (covering generation, transmission, and distribution) are to be corporatized and eventually privatized where feasible. Whereas the new law provides for increased private sector participation, there is need for a strategy that combines short-term practical measures to combat the current power supply shortages and long-term policies that plan for a stable, reliable electricity supply that is financially sustainable. The new law provides an opportunity to undertake more significant reform and restructuring within the electricity sector and more comprehensively address the sector's inability to deliver efficient, reliable electricity services in an accountable environment. The Council of Ministers in February 2018 endorsed the MoE's restructuring by approving the ministry's corporatization roadmap, the objective of which is to have the sector operations related to generation, transmission, and distribution managed by corporate entities beginning in 2020. This is expected to enhance autonomy, efficiency,

[24] ECA, *Cost of Service and Tariff Design/Rationalization Study for Electricity Supply in Iraq*.

and financial credit-worthiness of various segments of sector operations, along with increased transparency and governance. Given the criticality of sector credit-worthiness, these measures are integral to increasing sector investments, especially grid-connected generation and including achievement of the country's renewable energy targets.

ANNEX 2: DETAILED PROJECT DESCRIPTION

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

1. **The project supports the government of Iraq's (GoI's) immediate focus on improving electricity services delivery, sector fiscal sustainability, and governance.** Electricity distribution is critical in terms of providing electricity services to end consumers and is the financial foundation of the entire electricity sector value chain springing from consumer tariff collections. Fixing the technical and commercial operating foundation of the distribution segment is a top priority to increase the sector's operations efficiency. Improved electricity services would enhance the consumers acceptance to higher tariffs in exchange.

2. **The project will support improving the reliability, efficiency, and governance of electricity supply in the governorates of Basra, Al-Muthanna, Thi Qar, and Missan by improving transmission and distribution infrastructure and reducing technical loss of electricity within the transmission and distribution system.** The project will directly increase the efficiency and reliability of electricity supply within the project areas by strengthening the transmission and distribution system through the construction of new transmission and distribution substations and lines. The project preparation and appraisal has undertaken simulations of the improved transmission and distribution system in the project areas and estimates a total reduction of about 50 percent in electricity supply interruptions currently due to the transmission and distribution network capacity limitations. According to the Iraq: Investment Climate Assessment 2012,[25] 73 percent of the firms operating in Iraq identified the lack of reliable electricity supply as a "very severe obstacle" to productivity and the most significant issue affecting private sector development and job creation. Thus, the improvement in electricity supply reliability would support, among other things, private sector development, job creation, employment, and economic growth in the project areas. The project will also result in a reduction in technical losses in the project areas of about 15 percent. The project also finances an operational and commercial efficiency-enhancement program that focuses on facility design, supply, and installation, and on the commission of a regimen for integrated management of operations and maintenance, commercial activities, and corporate resources, including a Revenue Protection Program (RPP). The RPP will enhance the South Electricity Distribution Company's (SEDC's) ability to efficiently bill the high value consumers who constitute about 67 percent of the total value of the billed energy. Finally, the project will support the decentralized electricity services and operationalization of the electricity law regarding the corporatization of the SEDC.

Project Components

3. **Component 1: South Electricity Transmission Network Reinforcement (US$95.0 million)**. This component will finance activities aimed at increasing the transmission network capacity in the project areas covering the governorates of Basra, Al-Muthanna, Thi Qar, and Missan, in order to (i) address network capacity limitations to meet existing electricity power demand, (ii) meet expected future load

[25] World Bank, *Iraq: Investment Climate Assessment 2012.*

growth, (iii) provide operation flexibility and hence improved electricity supply reliability, and (iv) reduce transmission network technical losses. The activities include (a) 132/33/11KV substations rehabilitation and upgrades, (b) 132KV transmission network reinforcement, and (c) supply and installation of 132/33/11KV mobile substations. The scope is expected to increase the transmission network substation capacity by about 1.60GW. The new 132KV transmission lines in addition to increasing the network operating reliability and flexibility will increase the region's transmission capacity by about 1,000 megavolt amperes (MVA).

4. ***Installation of autotransformers***. The main transmission 400KV/132/11KV substations at Basra center and Khor al-Zubair are overloaded, without sufficient capacity to transform the available electricity supply from the 400KV network to meet demand of the distribution network. In addition, the lack of spare capacity of autotransformers at these substations results in poor supply reliability in case one of the units is out of service. To increase the primary transmission-substation reticulation capacity, the project will support installation of additional autotransformers of 250 MVA, 400/132/11 KV at these two primary substations. The project will also support the installation of an additional 250 MVA, 11/400KV autotransformer at the Rumaiya generation substation to evacuate the Rumaiya 3.0GW generation capacity to the 400KV transmission network. The additional capacity is required to meet the existing load and to replace the decommissioned generation capacity from the contracted emergency supply barges.

5. ***132KV transmission network capacity reinforcement***. Due to the aging lines and limited thermal loading of the existing lines, new 132KV double circuit lines will be constructed between the Rumaiya-CPS3, Rumalia-Shu'iba, and Qurna-Madna line. The new lines, each with a thermal capacity of 400 MVA, will increase and enable transmission additional capacity from the Rumaiya power station to the 132/33KV primary substations, improve the voltage profile at the 132KV network, and increase the reliability by providing alternative supply routes in the interconnected 132KV serving the project areas.

6. ***132/33KV substation capacity reinforcement***. Several 132/33KV transmission substations are overloaded with no spare capacity to provide alternative supply in case one of the units is out of service, leading to frequent load shedding due to capacity constraints at peak load times, especially during the summer, in addition to poor supply reliability, especially in case of a fault or scheduled maintenance, since there is limited load transfer capacity. The project will support construction of new substations and reinforcement of the existing ones to provide additional capacity and reduce loads at some of the existing substations and reduce 33KV distribution network loading, network losses, and poor voltage profiles. The old and dilapidated substations also pose a significant risk to the safety of operations staff.

7. ***132/33KV mobile substations***. The project will support procurement and installation of several 132/33KV mobile substation units to be located at strategic points in the network and near the major load centers. The key objective is to help to maximize the efficiency, reliability, and security of supply to major load centers whose reliability of supply is currently constrained by the radial and overloaded 33KV distribution network.

8. ***Climate change co-benefits***. All the project activities under this component will generate climate

change mitigation and adaptation co-benefits. The 132KV transmission capacity reinforcement, including reconductoring of existing lines with higher capacity conductors, will result in a reduction in technical losses, estimated at 1.6MW power savings annually. The strengthened transmission network will improve supply reliability and thus contribute to reducing greenhouse gas (GHG) emissions by decreasing reliance on small private generators (diesel based), which are less efficient and cause more GHG emissions compared to the national grid supply and whose use is widespread due the poor reliability of the national grid supply. In addition, the substations are expected to facilitate the integration of renewable energy of significant capacities (about 2.0GW of proposed solar photovoltaic projects) into the grid. The activities under this component will also address climate change vulnerability and hazards, as facilities to be installed (transmission lines and substations) will integrate resilient designs that will shield the power sector from the future impacts of extreme weather. Such measures are expected to address structural stability and impact of high temperatures, floods, high winds, sand storms, and earthquakes and will generate climate change adaptation co-benefits. Moreover, greater transmission capacity and interregional grid connection strengthens the operational flexibility and overall resilience of Iraq's entire power system. If generation in one area goes offline due to extreme weather or heat-induced efficiency losses occur, other generators across the expanded service area can compensate. Mobile substations, which ease the integration of renewable energy into the grid, can also be deployed to cope with to climate-induced storms.

9. **Component 2A: South Electricity Distribution Network Reconstruction and Reinforcement (US$85.0 million).** There is an urgent need to reinforce the distribution (33 and 11KV) system, due to overloading with high technical losses, resulting in poor electricity services with high levels of unplanned supply interruptions. This component will be complemented by component 1's rehabilitation or upgrade of the associated 400KV and 132 KV transmission network to ensure supply to the distribution system that will be strengthened through this project. The investments include activities to (i) rehabilitate and reinforce the distribution network to meet both current and future electricity demand, (ii) reduce technical losses, (iii) increase operations flexibility, and (iv) increase the safety of operations. This subcomponent will support supply and installation of various new 33/11KV substations and supply and rehabilitation (capacity expansion through reconstruction) of additional existing 33/11KV substations and supply and installation of 33/11KV mobile substations. The project will also support supply of materials and installation services for the associated 33KV lines feeding the 33/11kV substations and outgoing 11kV feeders.

10. ***Climate change co-benefits.*** Activities under this component will also generate climate change mitigation and adaptation co-benefits. The 33KV distribution network capacity reinforcement, including reconductoring of existing lines with higher capacity conductors, will result in a reduction in technical losses, estimated at 1.6MW power savings annually. The strengthened network will improve supply reliability and thus contribute to reducing GHG emissions by decreasing reliance on small private generators. Further, the activities under this component will also address climate change vulnerability and hazards as facilities to be installed (distribution lines and substations) will integrate resilient designs that will shield the power sector from the future impacts of extreme weather. Finally, greater distribution capacity strengthens Iraq's ability to integrate distributed renewables into its grid, including through net metering of rooftop solar.

11. ***Modelling of the existing and future distribution network was carried out by the SEDC planning department to identify thermal and voltage constraints in the system and propose required viable technical solutions using the CYME-DIST software***.[26] Contingency analysis (N-1) was also undertaken to determine the optimal number of transformer units at each of the substations. The required addition and/or upgrade of network elements to remove the voltage and power flow constraints for a reliable and secure electricity supply were identified. The results of the analysis have been used to estimate the economic benefits of the project. The analysis will also be used in the scope definition and estimation of the bills of quantities. The substations were selected as a priority investment to reduce the technical losses and improve the reliability of the distribution system. The new and rehabilitated substations shall include features to facilitate tele-control and remote monitoring (system control and data acquisition) as part of the integrated distribution management information system (IDMIS) hardware regarding aspects related to the reliability, dispatch, remote monitoring, and control of the distribution network.

12. **Component 2B: SEDC Electricity Sales Revenue Management Improvement (US$15.0 million).** This subcomponent will support enhancement of the SEDC's electricity sales revenue management. Immediate performance improvements will be achieved through revenue cycle enhancement, improvement in nontechnical losses, and introduction of improved billing and collection procedures within the framework of a commercial management system. Once established, this could be replicated in other distribution companies.

13. ***Effective revenue management depends on many internal factors.*** These include, inter alia, levels of metered and unmetered service provision, appropriate commercial management systems, billing structures and cycles, practices and delivery, staff capacity, involvement, efficiency in billing and collection, and facilities for customer payments. Furthermore, the institutional arrangements under which service providers operate and provide services determine whether such practices will remain sustainable in the long term. Efficient revenue management can set incentives for electricity providers to effectively charge and collect electricity bills while also fulfilling their obligations for service delivery.

14. ***The losses in electricity distribution system are strongly correlated to the following:***

    i. Ineffective metering: Not all consumers are metered and there is only limited use of network level metering to target loss reduction. Many consumer meters are old, deteriorated, and now inaccurate.

    ii. Where sufficient meters exist, consumption readings are inconsistent due to weak billing and collection procedures, security issues, and a general culture of nonpayment, and therefore relaxed billing, that has evolved within the electricity sector over the past decade.

    iii. For most households that have meters that are being regularly checked, nonpayment behavior of consumers has now become the norm. Social disruption and a disruption in service provision through the past several decades have resulted in a deterioration in payment culture. While Iraq once enjoyed high levels of billing and collection for electricity services, these have now

[26] This entailed distribution network system analysis to determine the network loading, power flows, and technical losses based on an annual load growth of 6 percent over the project planning horizon.

deteriorated significantly.

iv. Lack of commercial management systems and inadequate and outdated information technology throughout the entire revenue cycle management means that tracking of billing and payments throughout the revenue cycle is ineffective and inefficient.

v. Weak management and operational practices are also a matter of concern.

15. ***In order to address these issues, the subcomponent will finance activities aimed at having in place systems to support a program to enhance the SEDC's operations and commercial efficiency.*** This includes design, supply, installation, and commission of an IDMIS initially covering (i) a commercial management system, including a georeferenced customer database and revenue cycle management; (ii) a distribution management system; (iii) an enterprise resource planning system covering corporate functions such as finance and accounting, asset register, and procurement to support the SEDC to better plan and manage all of its resources; and (iv) a revenue protection program, initially covering the high value customers.

16. ***Commercial management system (CMS).*** There is an urgent need to introduce a modern CMS comprising billing, account collection, and customer information system sufficient to meet international best practices. This subcomponent will include the design, procurement, and implementation of a new CMS to manage and track all commercial activities. The CMS functionality will include new connections applications, meter reading, billing, revenue collection, and debt management. The objective of the CMS is to assist the SEDC in improving customer service through enhanced billing accuracy and faster resolution of customer complaints and inquiries. At the same time, the CMS will assist the SEDC in improving its revenue collection, enhancing sales, and reducing commercial losses and bad debt.

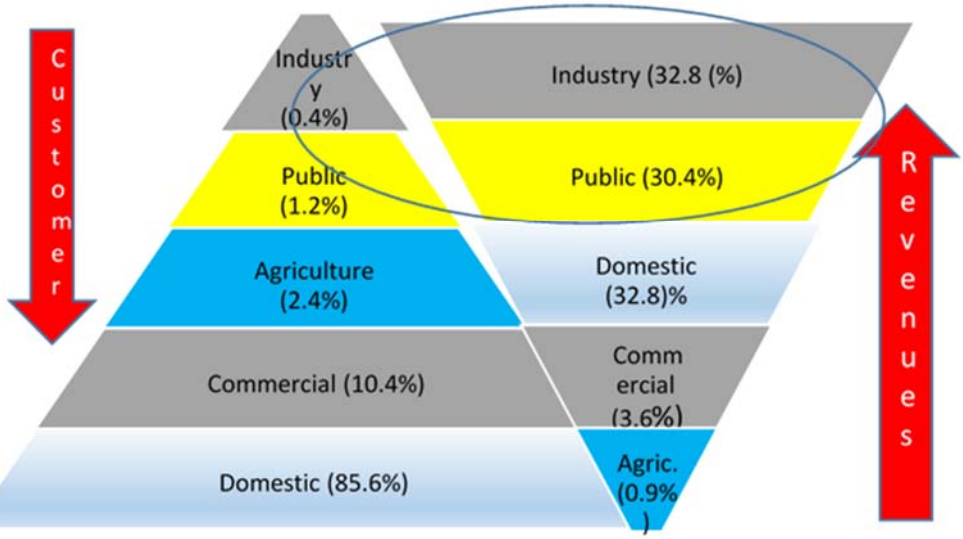
17. ***Distribution management system (DMS).*** This subcomponent will track, among other things, all customer calls, outages, and their respective service. The DMS will include (i) a network geographic information system (GIS); (ii) and outage management system, including an incident recording management system (IRMS); (iii) distribution systems operations and maintenance; and (iv) distribution supervisory control and data acquisition. The DMS will provide a comprehensive network management system for effective operation of distribution system by enhancing routine network monitoring, fault location, and network restoration, which will support the SEDC in achieving one of its key goals of improving supply reliability and operating efficiency. Incorporation of a GIS and linking of customer premises and electricity network assets in the system will be critical during the development and use of the IDMIS. It is expected that with a reliable database, the performance of the SEDC in commercial functions and management and monitoring of supply interruptions will improve significantly.

18. ***Enterprise resource planning (ERP) system.*** This subcomponent includes the design, supply, and implementation of a corporate ERP system covering the modules related to corporate functions such as human resources, finance, procurement, and asset management to support the utility to better plan and manage all of its resources. The objective of the ERP is to provide a platform for a shared database integrating information flow within the SEDC to improve the operational performance and enhance corporate governance of the SEDC. This will provide the company with tools to enable

increased transparency and accountability. The ERP will be integrated with the commercial systems (CMS, RPP, and IRMS) and network operations system (the DMS), which will enable real-time access to corporate data. The holistic real-time view of the SEDC business data will not only enable the SEDC to address concerns proactively and drive improvements based on the agreed performance targets and indicators but also provide a platform to assess performance. The integrated system will also help the SEDC to have in place streamlined processes in the core business areas of corporate resources, commercial and revenue management, and network operations. It will enable the SEDC personnel to have access to the same information for their specific needs and faster decision making.

19. ***Revenue protection program (RPP).*** This subcomponent includes advanced metering infrastructure (AMI) technology and "SMART meters," and creation of one or more metering control centers (MCCs), aimed to optimize the systematic use of the information provided by the metering system and undertake consistent corrective field actions. The RPP is initially targeted to cover the SEDC high value consumers (industrial, commercial, and government/public institutions categories), which make up about 12 percent of consumers (about 92,000 of the 640,0000 total) but which constitute about 67 percent of the total billing (figure A2.1).

Figure A2.1. Revenue Protection Program Target High Value Consumers



20. ***The objective of the RPP is to protect the SEDC's revenues it receives from sales to the high value customers.*** It ensures that all users in that high value segment are systematically billed according to accurately metered consumption. The AMI and SMART meters will facilitate automatic meter reading, which improves accuracy and efficiency in meter reading and billing. These meters will also support a time-of-use tariff structure in the future.

21. ***Relevant experiences in several countries show that the sustainable recovery and protection of the revenues generated by high value customers can be achieved by managing their consumption (metering, reading, and billing) through an AMI system.*** This includes the installation of, at each

customer's premise, consumption metering systems including communication devices that make it possible to periodically transmit their records to remote points, where they are systematically analyzed, processed, and monitored by staff at the MCCs, created for that specific purpose. The MCCs will use meter data management (MDM) software packages to monitor, detect, and correct irregular conditions in electricity use. Thus, the RPP to be developed shall include (i) creation of the MCCs and investments in infrastructure needed to operate them, (ii) incorporation of a state-of-the-art MDM designed for the specific purpose of revenue protection and training of staff of the MCCs in its proper use, (iii) supply and installation of AMI and SMART meters in a climate-resilient fashion, and (iv) incorporation of the high value customers to the respective MCCs.

22. ***Climate change co-benefits.*** The IDMIS activities, including the deployment of AMI and SMART meters, directly support key mitigation and adaptation priorities of supply-side energy efficiency and utility-scale loss reduction. Training to use the new systems, moreover, should be viewed as a form of sectoral reform that will lead to sizable technical loss reduction through improved management. IDMIS will also contribute to the reduction of carbon emissions by supporting resource efficiency utilization through energy efficiency and financial credit worthiness of various segments of sector operations. Given the criticality of sector credit-worthiness, these measures are integral to increasing sector investments, especially grid-connected generation, and achieving the country's renewable energy targets. Improved billing will contribute to demand-side energy conservation; pilots in the Baghdad area have demonstrated that customers practice energy conservation and reduce wasteful consumption if they receive timely bills and are expected to pay. The RPP including deployment of AMI, in addition, will contribute to increased disaster risk resilience, as they will facilitate time monitoring and quick restoration of the electricity services following interruptions such as those from strong winds and sand storms.

23. **Component 3: Institutional Capacity Strengthening and Project Implementation Support (US$ 5.0 million).** This will include development of a regulatory framework and institutional capacity building aligned with the government reform program for improved accountability, governance, financial sustainability, and increased private sector participation.

24. **Component 3A: SEDC Capacity Building and Institutional Strengthening**. This will support enhancing the SEDC's institutional capacity as a corporate entity, for improved accountability, governance, and financial sustainability as an "Island of Excellence,"[27] a model that could be scaled up to cover other electricity distribution companies as the sector reforms and corporatization are rolled out. Based on the lessons learned from utilities that have successfully implemented integrated management information systems, the IDMIS program will include definition and reengineering of the business and operational processes and practices to align them with the corporate strategic objectives of improvement of operational and financial performance and service delivery to customers. The reengineered processes and practices will be supported by the state-of-the-art IDMIS. This will be achieved through the engagement of experienced technical staff in each of the four functions, namely, operations, commercial services, finance, and corporate services, to be provided preferably by one

[27] World Bank, *Toward a Sustainable Energy Future for All: Directions for the WBG Energy Sector* (Washington, DC: World Bank, 2013), 12. "Strengthening governance—including addressing transparency, accountability, and public participation—is vital to ensuring that the sector function efficiently and that energy contribute to equitable economic, social, and environmental development."

firm—a "business support services firm" (BSSF)—with experience in utility operations. The subcomponent will also finance the cost of additional training and capacity building of SEDC staff. The SEDC substantive managers will be accountable for performance results, whereas the BSSF technical staff will, among other things, (i) coach, mentor, and enhance the capacity of their SEDC counterparts in areas of their technical expertise; (ii) assist the SEDC to develop and document the functional processes and operational procedures (business reengineering); (iii) assist the SEDC to implement the IDMIS; and (iv) assist the SEDC to collect and keep record of performance data to be used as baseline data in performance targets' setting.

25. **Component 3B: SEDC Corporate Strategic Plan and Performance Management**. Experience shows that the success of any organization is driven by a clear vision that is supported by a robust strategy and individual staff plans that are aligned to the strategy. Experience also shows that the only good strategy is one that gets executed. The objective of this subcomponent, therefore, is to assist the SEDC to develop the company vision and strategic plan. Specifically, the subcomponent will finance engagement of a strategy development and execution consultant for a period of two to three years to assist the top leadership team of SEDC to (i) define the mission and vision of the corporation and (ii) originate a robust medium-term strategic plan. An integral part of the strategy-execution support will include training focused on aligning people and behaviors to the corporate purpose and values to obtain individual commitment. This is aimed at instilling a value-driven culture of performance and results.

26. ***The BSSF will assist the SEDC leadership in aligning annual performance and targets with the corporate strategy.*** Interdependencies and accountabilities between functions will be identified and addressed, thereby helping to break down organization silos and create an aligned organization. The BSSF will also support the SEDC's top management in tracking and measuring performance on a real-time basis and conducting regular performance reviews that could also include open discussions on performance, conducting root-cause analysis of performance gaps, and formulating agreements on individual actions for urgent attention before the next performance reviews. This will help shape a performance-based culture, transparency, and accountability in the organization.

27. **Component 3C: Feasibility and Diagnostic Studies**. This subcomponent will support studies to address sector performance improvements in the medium to long term, especially those related to grid supply and reliability, as well as options for sector development. For the former, assessments will include (but not be limited to) identification of investments required to (i) increase the electricity distribution network reliability and (ii) reduce network down time and operations costs through automation of the network. In addition, the assessments will include distribution network protection studies (fault calculations and protection grading) that will be required to enable the network automation. For the latter, studies will support required feasibility studies and just-in-time policy advisory notes required to inform decision making regarding emerging sector issues. This subcomponent will also finance technical assistance activities to develop strategies, including assistance to strengthen investment planning that covers such aspects as feasibility studies and project due diligence.

28. **Component 3D: Project Implementation Support**. This subcomponent will finance execution, design, and supervision consultants to assist the MoE, the SEDC, and the SETC in project implementation, sector management, and coordination. This subcomponent will also support key functions of the SEDC

and SETC project management teams: project management, procurement, financial management, safeguards, and monitoring and evaluation for project implementation, capacity building, and operating costs. It will include financing the consultancy support services related to the Owner's Engineer and BSSF. The BSSF services shall include but not be limited to the following: (i) coaching, mentoring, and enhancing the capacity of the SEDC staff; (ii) developing and documenting functional processes and operational procedures; (iii) supporting IDMIS implementation (to be financed under Component 2B); and (iv) supporting baseline data collection and performance benchmarking, including the setting of key performance-improvement targets.

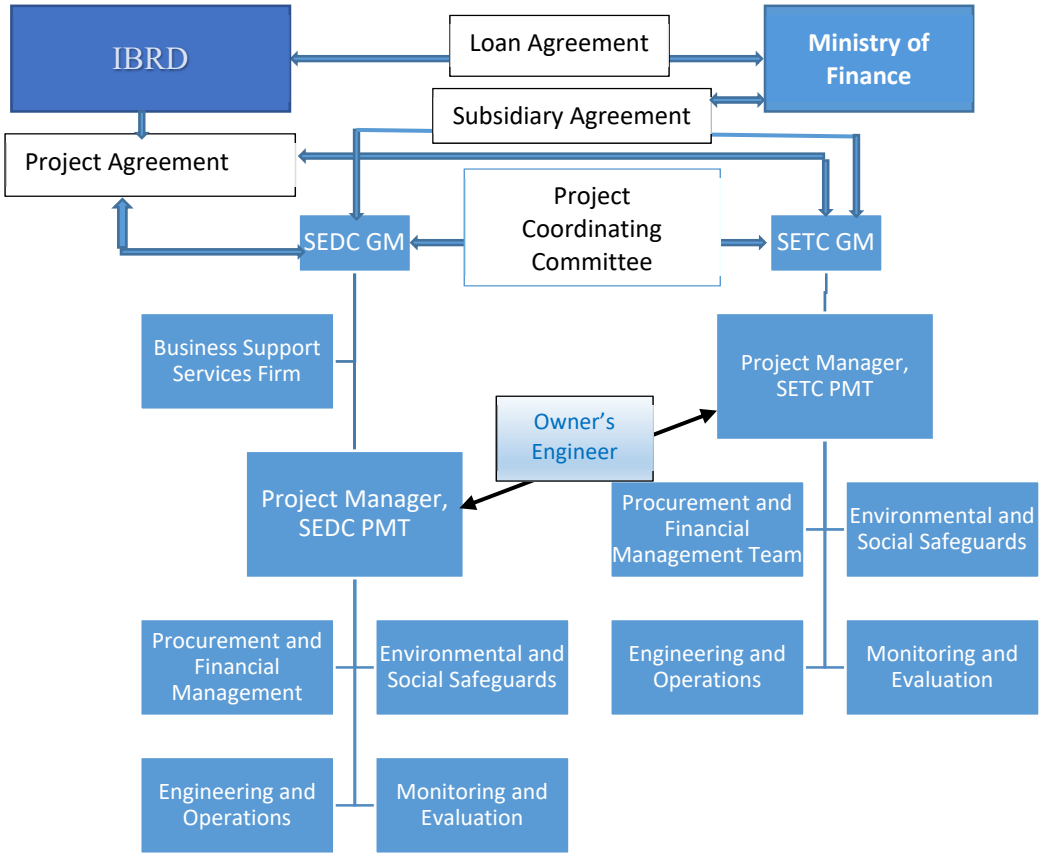
ANNEX 3: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

Project Institutional and Implementation Arrangements

1. **The project area covers the transmission and distribution network serving the governorates of Basra, Al-Muthanna, Thi Qar, and Missan.** The SEDC and SETC are the designated Project Implementing Entities. The project transmission component (Component 1) will be implemented by the SETC, whereas the SEDC shall be responsible for the implementation of the distribution component (Component 2). During the project implementation, the SEDC and SETC will establish and maintain a Project Coordinating Committee, composed of relevant representatives of the SEDC and SETC, responsible for strategic oversight, guidance, and overall coordination of various activities under the project, including joint discussions of the annual work plans, project reports, and safeguards issues.

Figure A3.1. Project Implementation Arrangements



2. **The SETC and SEDC shall be responsible for all the project implementations activities, including procurement, safeguards, financial management, M&E, and project management functions.** Each

implementing entity has established a project management team (PMT) that will be responsible for the overall project implementation as well as coordination and reporting to the World Bank. Each PMT will be headed by a project manager and will comprise the teams responsible for technical assistance, financial management, procurement, environmental and social safeguards, and monitoring and evaluation.

3. **The SEDC shall appoint an Owner's Engineer (OE), with qualifications, experience, and terms of reference satisfactory to the World Bank.** The OE will support overall project implementation and capacity development of the SEDC and SETC PMTs in contract management, financial management, and environmental and social safeguards. The OE shall provide support to the SEDC and SETC PMTs in the design, procurement, and contract management to ensure smooth and efficient implementation of the project, including project-related environmental and social safeguards as well as monitoring and evaluation. In addition to ensuring that procurements of project-related services are undertaken in accordance with the loan's agreed procedures and guidelines, the OE shall support the PMTs with regard to inspection and supervision of the construction works, installation of equipment, and testing, in order to ensure that the goods are supplied and the works are implemented in accordance with the designs, specifications, and terms and conditions of the relevant contracts.

4. **A business support services firm (BSSF), with experience in utility operations, will be hired to support the SEDC in strengthening its institutional capacity in key functions of corporate resources, commercial activities, and network management and operations.** The experts provided by the BSSF will work as managers and/or advisors twinned with SEDC counterparts for a period of two to three years. The experts will, inter alia, (i) assist the SEDC staff in maintaining and over time improving the current level of service; (ii) coach, mentor, and enhance the capacity of their SEDC counterparts in the areas of their technical expertise; (iii) assist the SEDC in developing and documenting organizational guidelines and procedures (operational manuals); (iv) assist the SEDC in implementing the integrated distribution management information system (IDMIS), including the revenue protection program (RPP) systems; (v) assist the SEDC in collecting and keeping record of performance data to be used as baseline data in performance targets setting; and (vi) together with their SEDC counterparts, participate in the preparation and implementation of the corporate strategic plan and annual business plans.

5. **The SEDC is preparing a project implementation manual (PIM), including a financial management (FM) manual as part of project preparation.** The PIM will provide guidance on roles and responsibilities as well as on the technical assistance, administrative, financial and accounting procedures, procurement arrangements, and safeguard procedures. The SEDC shall adopt the PIM, in form and content satisfactory to the World Bank, prior to the project effectiveness.

6. **The PMTs shall prepare and furnish to Ministry of Planning and to the World Bank, as soon as available, but in any case, not later than October 31 of each year, an annual work plan and budget for the project for each subsequent year of project implementation.**

Financial Management

7. **The World Bank undertook an assessment of the FM systems within the SETC and SEDC for this project.** The assessment concluded that, with the implementation of agreed-upon actions, the FM arrangements will satisfy the minimum requirements under the World Bank Policy and Directive for Investment Financing Project.

8. **Staffing**: The project will be implemented by two PMTs, which will be established at the SETC and the SEDC to oversee the project implementation with full day-to-day responsibilities while ensuring that all activities are fully coordinated. Qualified financial officers, accountants, and internal controllers will be provided from both companies' own staff and will be dedicated to the project. The SETC and SEDC do not have prior experience with World Bank–financed operations. Each PMT will be responsible for planning and coordinating specific activities, including FM (payment authorization, disbursement, accounting, and reporting). Due to the lack of experience of both FM teams with the World Bank FM policies and guidelines, the World Bank will provide close support to the FM project staff.

9. **Project FM risk**: Based on the results of the assessment, the overall FM risk is "high." With mitigation measures in place, the project will have acceptable project FM arrangements; its FM residual risk rating will be "substantial." The initial FM risk is assessed as "high" mainly due to the following:

    i. Limited capacity at the implementing agencies to meet the project's financial management requirements
    ii. Security conditions that do not allow visits by the World Bank team to perform physical verification
    iii. Overall weaknesses and shortcomings in the control environment
    iv. Limited accounting and reporting systems in providing timely and comprehensive information
    v. Delays that arise from counterpart financing
    vi. Limited physical existence of the World Bank staff in Al-Basrah and limited independent verification function such as a fiduciary monitoring agent
    vii. Delays in making payments due to the shortfalls in the Iraqi banking sector

    The following measures are to mitigate FM-related risks:

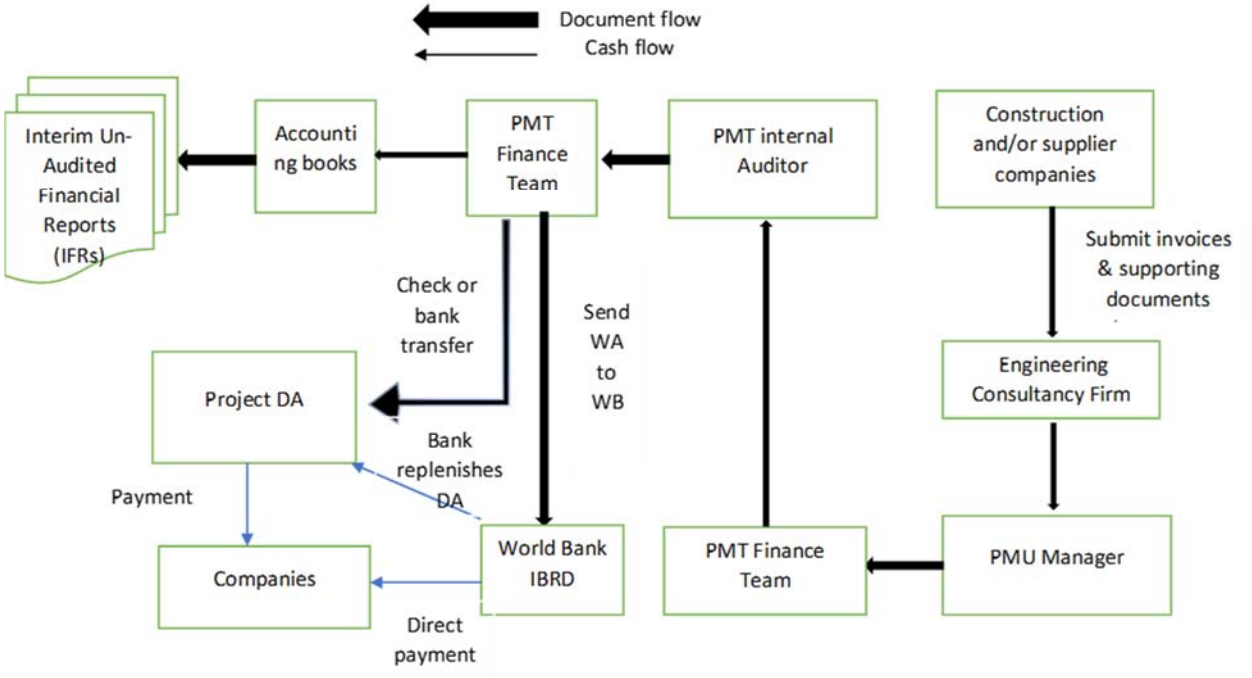
    i. A centralized FM function within the PMTs' authority with an FM team consisting of a financial officer, accountant(s), and an internal controller seconded from the company's own staff who would receive periodic training inside and outside the authority to improve and enforce their knowledge
    ii. Accounting and reporting arrangements to give timely information on the project financial performance and status—Excel spread sheets will be used to record project financial transactions and generate simplified Unaudited Interim Financial Reports (IFRs)
    iii. Financing of 100 percent of activities to avoid delays that arise from counterpart financing
    iv. A Designated Account (DA) in US dollars opened for each PMT with sufficient advance to ensure that funds are readily available for project implementation
    v. Hiring of a consultancy firm (the OE) to monitor the physical progress of each contract and certify payments
    vi. Hiring of an independent external auditor acceptable to the World Bank to provide an independent opinion of the project financial statements, including technical audits along with an annual financial audit
    vii. Geotagging or geomapping to monitor actual implementation
    viii. An FM manual for this project documenting the procedures, inter alia, on internal controls, financial reporting and auditing, responsibilities' and duties, flow of information, and other information based on the Project Implementation Manual.

10. **Budgeting and flow of funds**: Each PMT will maintain a detailed disbursement plan per quarter. This

plan will be developed based on the initial Procurement Plan or on the schedule of outputs as defined in the implementation schedule and estimated payments cycles and revised upon need. It will be used as a monitoring tool to analyze budget variances and manage cash and will feed into the quarterly IFRs. The loan has been included in the Iraq Federal Budget Law of 2018.

11. **The Ministry of Finance shall make the proceeds of the loan, on a grant basis, available to the SEDC under a subsidiary agreement between the Ministry of Finance and the SEDC.** To ensure that funds are readily available for project implementation, a DA will be opened for each PMT of the SETC and the SEDC. Both PMTs will be responsible of managing their own DA, preparing the reconciliations, and submitting monthly replenishment applications with appropriate supporting documentation.
12. **Flow of documentation and flow of funds**: Figure A3.2 depicts the flow of documentation and flow of funds at the PMT.

Figure A3.2. Project Financial Management Arrangements



13. **Accounting and financial reporting:** All government agencies in Iraq follow the Unified Accounting Bylaw issued in 2011 by the Iraq Federal Supreme Audit Institute. This bylaw is an update of the original bylaw issued in 1989. Since the project will follow a centralized FM structure within the PMT, the project will follow its own financial management procedures as detailed in the FM manual. The project will follow the cash basis of accounting and key accounting policies, and procedures will be documented in the FM manual. Both companies use very basic accounting software to capture daily financial transactions. This software, developed by the Ministry of Electricity, is not capable of generating the project's quarterly Unaudited IFRs in accordance with the World Bank FM guidance

and record commitments. Adequate accounting and reporting arrangements will be used to provide timely information on the project's financial performance and status. Manual accounting and Excel sheets will be used to record project financial transactions and generate the quarterly IFRs.

14. **Each PMT will be responsible for preparing the following:**

    (a) *Quarterly Unaudited IFRs and submitting them to the World Bank within 45 days from the preceding quarter.* These reports will consist of: (i) "Statement of Cash Receipts and Payments by Each Category"; (ii) "Statement of Comparison between Actual and Budgeted Cash Payments by Component/Category"; (iii) "Reconciliation Statement" for the balance of the DA; (iv) the list of all signed contracts per category, showing contract amounts committed, paid, and unpaid under each contract, and physical progress against financial progress of each contract; and (v) list of assets (goods and equipment).

    (b) *Annual Project Financial Statements (PFSs), which will be audited by an independent external auditor.* The audit report shall be submitted to the World Bank not later than six months after the end of each fiscal year. The PFS shall at the least include (i) "Statement of Cash Receipts and Payments by Category" and accounting policies and explanatory notes, including a footnote disclosure on schedules; (ii) the list of all signed contracts per category, showing contract amounts committed, paid, and unpaid under each contract; (iii) "Reconciliation Statement" for the balance of the DA; and (iv) a list of assets (good and equipment). A detailed Technical Audit Report shall be annexed to the PFS.

15. **Internal controls**: The project will be implemented through centralized management and disbursement functions within each PMT authority, with specific controls and procedures that will be documented in the FM manual. Each PMT will follow the FM instructions in the FM manual that is due by the loan effectiveness. The manual will document the project's implementation of internal control functions and process and describe the responsibilities of each PMT staff, which are summarized in terms of authorization and execution processes. The expenditure cycle will specify the following steps: (i) technical verification of the deliverables by the OE, (ii) approval by relevant PMT manager, (iii) issuance of payments made upon receipt of supportive documentation and written requests by authorized officials, and (iv) verification by the financial officer of the accuracy and compliance of the payment requests with the loan agreement. Figure A3.2 demonstrates the flow of funds and documentation.

16. **The bulk of the project's expenditures will finance goods and equipment and installation services, with some consultancy service contracts and incremental operating costs.** Equipment supply and installation services will be financed mainly through direct payments. An OE, financed from the loan, will be contracted to perform supervision on the ground. All claims will be verified (technically) by the consultancy firm before being processed further for payment by the PMT. On a monthly basis, the financial officer will reconcile the project account bank statement with the account book balance. Reconciliations should be prepared by the financial officers and checked by an independent person. All reconciling items (if any) should be listed, explained, and followed up on. Copies of the reconciliation together with the account bank statement should be kept in the project files and should be attached to the IFRs.

17. **Geotagging:** Geotagging will be used as a means to improve efficiency and transparency. The use of the geotagging technology will help to facilitate regular monitoring and supervision of subprojects, even in hard-to-reach areas, and will serve as an adjunct for procurement processes. Specific benefits

of geotagging include (i) improved monitoring based on publicly accessible information and images of progress on contract execution for infrastructure, (ii) enhanced quality control with contractors being required to submit geotagged photos to verify that the required works were completed, and (iii) monitoring through the monitoring and evaluation and citizen-engagement programs. The PMTs would be required to take actual photos commensurate to their Statement of Work Accomplished.

18. **Financial audit**: The project's financial statements will be audited annually by an independent auditor acceptable to the World Bank, in accordance with internationally accepted auditing standards and terms of reference cleared by the World Bank. The SEDC PMT will be responsible for preparing the terms of reference for the auditor and will submit them to the World Bank for clearance. The audit scope will cover the activities of the project implemented by both PMTs. The audit report will be sent to the bank no later than six months following the end of the project's fiscal year. The report shall include an opinion on the project's financial statement. The auditor will also be requested to provide an opinion on the effectiveness of the project's internal control system. Finally, a management letter shall accompany the audit report, identifying any deficiencies in the control system the auditor finds pertinent, including recommendations for their improvement.

19. **Retroactive financing**: Payments may be made up to an aggregate amount not to exceed 40 percent of the loan amount of eligible expenditures made one year prior to the signing of the loan agreement.

20. **Technical audit**: The project will be subject to a technical audit. The technical audit shall be part of the financial audit and the Technical Audit Report shall be annexed to the financial audit. The main purpose of the technical audit is to express opinions on whether: (i) equipment, installation services, and consultancy services were carried out in accordance with the specifications as per the signed contracts, and (ii) the activities undertaken were part of an approved expenditure project.

21. **Implementation support**: The project will require close implementation support during the start-up phase to ensure that the PMTs' fiduciary requirements are completed in a timely manner, minimizing project fiduciary risk. This will be conducted on a quarterly basis to ensure compliance with World Bank requirements and to develop internally generated project risk assessment.

Disbursements

22. **Designated account (DA):** To ensure that funds are readily available for project implementation, a DA will be opened for each PMT in US dollars. Authorized signatories, names, and corresponding specimens of signatures shall be submitted to the World Bank prior to the receipt of the first withdrawal application. Each PMT will be responsible for submitting monthly replenishment applications with appropriate supporting documentation. The DA mainly will be used for incremental operating costs, as the bulk of the project's expenditures will finance goods and equipment and installation services, with some consultancy service contracts, which will be paid mainly through direct payments.

23. **Disbursement Letter and Disbursement Guidelines:** The proceeds of the loan will be disbursed in accordance with the World Bank's disbursements guidelines that will be outlined in the Disbursement Letter and in accordance with the World Bank Disbursement Guidelines for Projects. Transaction-based disbursement will be used under this project. Accordingly, requests for payments from the loan will be initiated through the use of Withdrawal Applications (WAs) either for direct payments, reimbursements, or replenishments to the DAs. All WAs will include appropriate supporting documentation, including detailed statements of expenditures for reimbursements and

replenishments to the DA. The category of eligible expenditures that may be financed out of the proceeds of the loan and the percentage of expenditures to be financed for eligible expenditures are set out in table A.3.1.

24. **E-disbursement:** The World Bank has introduced e-disbursement for all projects in Iraq. Under e-disbursement, all transactions will be conducted and associated supporting documents scanned and transmitted online through the World Bank's client connection system. The use of e-disbursement functionality will streamline online payment processing to: (i) avoid common mistakes in filling out WAs, (ii) reduce the time and the cost of sending WAs to the World Bank, and (iii) expedite the World Bank's processing of disbursement requests.

25. **Statements of expenditures (SOEs)**. All reimbursement and DA replenishment applications for withdrawal of proceeds from the loan account will be fully documented, while expenditures (i) under contracts with an estimated value of US$500,000 or less for works, (ii) under contracts with an estimated of US$250,000 or less for goods, (iii) under contracts with an estimated value of US$100,000 or less for consulting firms, and (iv) under contracts with an estimated value or less of US$20,000 for individual consultants, incremental operating costs, training, and workshops will be claimed on the basis of SOEs. The documentation supporting expenditures will be retained at Project Implementation Units and will be readily accessible for review by the external auditors and World Bank implementation support missions.

26. **"Incremental operating costs":** This term means project-related incremental costs incurred by the PMTs for purposes of project management, implementation, and monitoring and evaluation on account of utilities and supplies, bank charges, communications, vehicle operation, maintenance, insurance, office space rental, building and equipment maintenance, public awareness-related media expenses, domestic and international travel and subsistence, and salaries of contractual and temporary staff, but excluding salaries, fees, honoraria, bonuses, and any other salary supplements of members of the borrower's civil service.

Table A3.1. Categories of Eligible Expenditures and percentage of Expenditures to Be Financed by the Loan

Category	Amount of the loan allocated (US$)	Percentage of expenditures to be financed (inclusive of taxes)
1. Works, goods, non-consulting services, consultants' services, and operating costs for Component 1 (Transmission Network Strengthening)	94,750,000	100 percent
2. Works, goods, non-consulting services, consultants' services, and operating costs for Components 2 and 3 (Distribution Network Strengthening and Operations Efficiency, Institutional Capacity Strengthening and Project Implementation Support)	104,750,000	100 percent
3. Front-end fee	500,000	
Total	**200,000,000**	

Procurement

27. **Procurement is being processed under paragraph 12 of the World Bank Policy for Investment Project Financing, "Projects in Situations of Urgent Need of Assistance or Capacity Constraints," where "Simplified Procurement Procedures" may apply for investment project financing**. This will enable delivery of early visible results in a context of extreme needs and high expectations in the targeted project areas.

28. **Assessments and reviews conducted on procurement in Iraq and that of the two implementing agencies—the SEDC and SETC—reflects that the major issue facing public procurement is the current uncertainty of public procurement laws and regulations and their enforcement.** Public procurement in Iraq was governed by the Coalition Provisional Authority order no. 7 of 2004 and the implementing regulations no. 1 of 2008 prepared by the Ministry of Planning. The Council of Ministers issued a resolution dated May 16, 2011, to abolish the existing procurement framework, resulting in a legal void. The Ministry of Planning issued a set of regulations in 2014 to replace the 2008 regulations. In addition, as Iraq has been ranking poorly on Transparency International's Corruption Perception Index over the past eight years and the country suffers from conflict, procurement-associated risks are high and physical supervision of project's implementation remain difficult.

29. **Capability and PMTs' assessment:** The PMT in each company (SEDC and SETC) has been established and will be responsible for overall project procurement. The two PMTs have limited experience in procurement and contract management, and therefore they will be supported by a consulting firm OE, acting as the employer's designated project manager to provide project implementation support and capacity development.

30. **Key procurement risks and mitigation measures are presented in table A3.2.**

Table A3.2. Procurement Risks and Mitigation Measures

Risks	Mitigation measures
The SEDC's and SETC's experience in World Bank Procurement Policy and Procedures, procurement planning, monitoring, and contract management may cause delays in contracting process, preparation of procurement documents, evaluation, and implementation, as well delay in implementation from the bidder's side in addition to time and cost overruns.	Provide comprehensive training to the SEDC and SETC on procurement and contract management. Hire OE, acting as the employer's designated project manager, to expedite and support the implementation. The implementing agencies need to apply the procurement procedures included in the Iraq Project Implementation Manual, which includes step-by-step instructions, standard bidding and proposal documents, evaluation forms, and contract forms, especially for national biddings.
There is a perception of fraud and corruption in high risk and weak control environment.	Close supervision by the World Bank staff will be done for fiduciary compliance. Ensure good record-keeping practices are in place. Use third party procurement/technical audit as needed.
There is limited local market capacity and lack of interest of qualified international firms.	Advertise Procurement Plan, procurement notices, and contracts award even for contracts of small value. To encourage as many bidders as possible, an awareness program needs to be carried out for interested bidders.
Security conditions may deteriorate, making access by contractors to sites and supervision difficult.	Security conditions will be continuously monitored, and mitigation measures undertaken as and when needed, including provisions for force majeure conditions and use of local staff and workforce.
There could be delays in decision making in finalization of specifications, evaluations, award of contracts, and payments.	In addition to their work in capacity building, consultants and advisers need to be hired as required to speed up implementation. Transactions at the PMT for approval of contracts and payments needs to be monitored and streamlined.
Procurement practice in Iraq differ from those as required by World Bank Procurement Regulations.	Application of procurement regulations is a legal obligation for both the SEDC and SETC.

31. **Applicable procurement regulations:** Procurement will be carried out in accordance with the World Bank Procurement Regulations for Borrowers under Investment Project Financing dated July 2016, and revised November 2017, and August 2018. As per the requirements of the World Bank's

Procurement Framework, a Project Procurement Strategy for Development (PPSD), including a comprehensive, fit-for-purpose Procurement Plan have been prepared. The provisions of the recipient's Procurement Plan for the project Procurement Plan provided for under section IV of the Procurement Regulations will apply, and the same may be updated from time to time in agreement with the World Bank. The detailed 12-month Procurement Plan has been agreed upon with the the borrower during negotiations and will be published on the World Bank website. The borrower, the SEDC, the SETC, and the two PMTs shall ensure that the project is carried out in accordance with the provisions of the World Bank Anti-Corruption Guidelines, dated July 1, 2016, and revised November 1, 2017.

32. **Procurement of works, goods, and non-consultancy services:** Procurement of works and goods and non-consultancy services for this project will benefit from possibilities and flexibilities provided by applicable procurement regulations to ensure fit-for-purpose as identified under PPSD. These would include: *(i) Request for Proposals, (ii) Request for Bids, (iii) Request for Quotations, and (iv) Direct Selection (where justified), using appropriate selection arrangements and market approaches as defined in the Procurement Plan*.

33. **Procurement of consultants:** Procurement of consulting services for this project includes: *(i) Quality Cost-based Selection, (ii) Fixed Budget Based Selection, (iii) Least Cost Based Selection, (iv) Quality Based Selection, (v) Consultant's Qualification Based Selection, and (vi) Direct Selection (where justified), using appropriate selection arrangements and market approaches as defined in the Procurement Plan.*

34. **Project Procurement Strategy for Development (PPSD):** This defines how identified procurement arrangements will enable delivery of value-for-money in achieving the Project Development Objective by supporting a fit-for-purpose reconstruction and enhancement of services, where bidding should be done with no substantial delays and no re-biddings, and cost and time overruns should be prevented. Detailed procurement documentation, including assessment and the PPSD, are maintained in the project files. The detailed 12-month Procurement Plan, once agreed with the borrower, was agreed on at Negotiations and will be published on the World Bank website.

35. **Key procurement under the project:** The total project cost is US$200 million, with the following key activities (components): (i) Electricity Transmission Network Reinforcement, (ii) Distribution Network Strengthening and Operations Efficiency, and (iii) Institutional Capacity Strengthening and Project Implementation support.

36. **Systematic tracking of exchanges in procurement (STEP):** The PMTs shall use the World Bank online procurement planning and tracking tool to prepare, clear, and update its Procurement Plans and conduct procurement transactions as referred to in the Procurement Regulations Section V, article 5.9. The Procurement Plan for the life of the project will gradually be developed by the PMTs and uploaded through STEP. The World Bank will organize a training on STEP before project effectiveness to register the PMTs and familiarize them with the STEP system.

37. **Complaints management and dispute resolution systems:** Regulation no. 2 of 2014 of Executing Public Contracting in Iraq establishes the right of bidder to raise a complaint to a centralized

committee at each procuring entity. In addition, civil courts have jurisdiction over civil and commercial matters. However, bidders do not have adequate access to independent administrative review and appeal processes, and access to civil courts is perceived as inadequate. In this regard, the administrative review and court systems are not operating adequately under current circumstances, and it cannot be ascertained that the complaint procedure in Iraq meets the criteria of independence from the officials that are involved in the actions. To enhance the administrative review and appeal processes, the Project Implementation Manual shall include a section on how to handle complaints during the procurement process and any disputes raised during contract implementation. Given the perceived inadequacy of the formal independent complaint mechanism, the procedures for administration and handling of procurement-related complaints stated in the World Bank's procurement regulations will be followed for contracts where the World Bank's Standard Procurement Documents are used.

38. **Advance procurement and retroactive financing:** Advance procurement is key to ensuring timely project implementation. To avoid delays in project implementation, the implementing agencies have been encouraged and supported to proceed with advance procurement, especially preparation of the initial set of bidding documents, prior to project effectiveness. The Bank Policy for Investment Project Financing, paragraph 12, has been triggered for the project, which is thus eligible for the use of streamlined procurement arrangements. To mitigate the potential risk of delayed project effectiveness, the loan agreement will also include a provision to enable the use of financing flexibility with regard to retroactive financing.

39. **Market analysis:** Owing to the fragile security situation of the country, the possibility of attracting big international contractors could be limited and the few that may be interested could submit exceptionally high-priced bids. Thus, directly contacting known potential bidders would be important to receive competitive bids. To encourage as many bidders as possible and to avoid these risks, an awareness program will be carried out for interested bidders. Bringing in local contractors and use of the local workforce, joint ventures with local firms, or subcontracting to local firms are some of the options that could contribute to faster mobilization of materials and labor and easier access to the project sites.

40. **Frequency of supervision:** World Bank Procurement Supervision Implementation Support Missions and the Post-Procurement Reviews shall be undertaken at least twice and once yearly, respectively. The Post-Procurement reviews shall cover a sample of at least 20 percent of contracts eligible for post review.

41. **Procurement thresholds and prior review thresholds:** The Procurement Plan shall set forth those contracts, which shall be subject to the World Bank's prior review for high-risk environments (table A3.3). All other contracts shall be subject to post review by the World Bank.

Table A3.3. Prior Review Thresholds

Type of procurement	Prior review of high risk (US$ million)
Civil works	5.0
Goods, information technology, and non-consulting services	1.5

Consultants: firms	0.5
Consultants: individuals	0.2

Table A3.4. Summary of the Procurement Plan Packages Planned 12 Months after Project Effectiveness

Ref. no.	Contract (description)	Estimated cost (US$ million)	Procurement method	Review by World Bank (prior/post)	Expected start date
Component 1: South Electricity Transmission Network Reinforcement (US$95.0 million)					
Tra.G01	Supply and installation of 250 MVA, 400/132/11 KV autotransformer at the Rumaila Gaz powerplant and Khor al-Zubair Substation	8.0	RFB	Prior	March 2020
Tra.W01	Design, supply, and installation of three (3*90 MVA, 132/33KV) skid mounted substations at Al-Faiyha, Al-Qibla, and Al-Ghadeer	50.5	RFB	Prior	January 2020
Tra.G02	Supply and installation of 132/33KV transformers and associated equipment at the substations Al- Baker (1*63), Al-Petro (1*63), Hartha (1*63), Basra East(1*63), and Al-Shuaiba (1*63)	7.0	RFB/DC	Prior	September 2019
Tra.G03	Supply and installation of 132/33KV transformers and associated equipment at substation Al Najibiya (2*90MVA)	3.5	RFB	Prior	October 2019
Tra.G04	Supply and installation of 132/33KV, 45 MVA mobile substations at the stations 2 Al-Maahad Al-Sinayee , 1 Al-Dair , 1 Al-Toba and Nekhela, 2Al-Medina, and 1Turkish hospital	15.0	RFB	Prior	December 2019
Tra.G05	Supply and installation of 132KV, T.T double CCT transmission line (Rumaila Gaz station-Shuiaba) (new) with 132 KV equipment for lines panels	10.0	RFB	Prior	February 2020
Tra.G06	Office equipment for PMT (several packages)	0.02	SH	Post	June 2020
	Total	**94.02**			
Component 2A: Distribution Network Reconstruction and Reinforcement (US$85.0 million) **Component 2B: Electricity Sales Revenue Management Improvement (US$15.0 million)**					
Dis.W01	Design, supply, and installation of eight substations (33/11 kV, 2x 31.5MVA) for north, south, and center Al-Basra	32.0	RFB	Prior	January 2020
Dis.W02	Design, supply and installation of eight substations (33/11 kV, 2x 31.5MVA) for north, south, and center Al-Basra	32.0	RFB	Prior	June 2020
Dis.G01	Supply and installation of 33/11KV,31.5 MVA 6 mobile substation	8.1	RFB/DC	Prior	September 2019

Ref. no.	Contract (description)	Estimated cost (US$ million)	Procurement method	Review by World Bank (prior/post)	Expected start date
Dis.G02	Supply and installation of 33/11KV,2* 31.5 MVA transformers and equipment for substation	6.0	RFB/DC	Prior	March 2020
Dis.G03	Design, supply, install, test, and commission of advanced metering infrastructure and meter Control center	10.0	RFP	Prior	September 2020
Dis.G04	Non-consultancy services for the SEDC Distribution network GIS mapping	2.0	RFP	Prior	June 2020
Dis.G05	Office equipment for PMT (several packages)	0.02	SH	Post	June 2020
	Total	**90.12**			
Component 3: Institutional Capacity Strengthening and Project Implementation Support (US$4.75 million)					
C01	Consulting services for SEDC Business Support Services Firm	2.25	RFP	Prior	February 2020
C02	Consulting services (Owner's Engineer) to support overall project implementation	2.25	RFP	Prior	January 2020
C03	External auditor	0.10	RFP	Post	June 2020
C04	Procurement specialist for PMT	0.15	INDV	Post	December 2019
	Total	**4.75**			

Environmental and Social (including safeguards)

42. **The key social challenges during implementation would be associated with potential land acquisition for the substations, potential impact on the livelihood of informal businesses, relocation of squatters or minorities within the location of any activities, loss of assets, or restrictions to access**. For these reasons, the World Bank Policy on Involuntary Resettlement OP 4.12 is applied to the entire project. Since the location of all subprojects are not known during the preparation stage, a Resettlement Policy Framework has been prepared for the project to provide guidelines to handle resettlement requirements and compensation procedures during preparation and implementation. In addition, during the lifespan of the project, if any site is determined to require physical displacement, land acquisition, or loss of income, then the corresponding Resettlement Action Plan or Abbreviated Resettlement Action Plan will be prepared and disclosed before construction starts. The SEDC and SEDT shall finance exclusively out of their own or other resources, and not out of the proceeds of the loan, and provide, promptly as needed, the resources needed for the following: (i) all land acquisition required for purposes of the project and (ii) resettlement and rehabilitation payments and other assistance to affected persons in accordance with the provisions of the applicable safeguards instruments.

43. **Grievance redress mechanism (GRM):** The SEDC and SETC will establish GRM units to handle project activity–related complaints or requests, each with a dedicated focal point person. Multiple access points (telephone, complaint box, website, email, text message, and so forth) will be provided so that beneficiaries will have different ways to voice their concerns. The contact information of the GRM

focal points will be posted in local language at the local level. Each PMT manager will have the overall responsibility to address concerns brought to the attention of the focal points regarding any environmental and/or social impacts due to project activities. Complaints received shall be registered, tracked, investigated, and promptly resolved. Copies of complaints shall be recorded in the activity files and the progress reports, including the number and type of complaints and the results of their resolution.

44. **Environmental:** In terms of environmental relevance, the project is assigned a Category B, triggering the safeguard policies OP4.01 and OP4.12. An Environmental and Social Framework (ESMF) was prepared by the borrower, is the primary safeguards instrument of the project, and will cover the entire scope of potential investment subprojects (transmission lines, substations, and distribution networks). The ESMF has classified typologies along environmental and social criteria and impacts, and for each typology defines the required specific instruments, such as site-specific Environmental and Social Management Plans (ESMPs) and checklist ESMPS. The site-specific ESMPs shall be disclosed before commencing site construction activities.

45. **During implementation of the project, the implementing agencies (SEDC and SETC) will assign environmental and social focal point(s) and will hire an independent consultant to prepare the site-specific safeguard instruments.** Monitoring and supervision will be conducted by the agency engineers and focal points, who will receive adequate training and capacity building assistance, so they be able to monitor, supervise, and report on the implementation of safeguards.

Monitoring and Evaluation

46. **The project will be monitored and evaluated on the basis of the indicators and targets set out in the results framework provided in annex 1.** The World Bank will carry out regular implementation support missions during which project progress, outputs, and work plan updates will be reviewed. The PMTs, supported by the OE, will be responsible for monitoring the progress of project implementation and achievement of the performance indicators in annex 1 and accordingly report to the World Bank not later than one month after the end of each calendar quarter, covering the calendar quarter. The PMTs will be required to submit comprehensive progress reports on implementation aspects quarterly, and these would include reporting on procurement, financial management, physical implementation, and environmental aspects among subjects. Further to enable proper monitoring of funds and physical progress, the annual external audit of the project will include a technical audit component as an addition to the financial audit.

ANNEX 4: PROJECT ECONOMIC AND FINANCIAL ANALYSIS

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

1. **Background and project rationale:** The electricity sector in Iraq suffers from a series of simultaneous and compounding challenges, including a dilapidated grid infrastructure with low operational efficiency and high levels of losses, with over 50 percent of electricity lost before it is billed. Furthermore, due to the lack of effective metering, billing, and commercial management systems, only about 50 percent of the energy billed is collected, leaving the actual electricity paid at less than 30 percent of the total electricity generated. In addition, despite a high generation-capacity growth and investment, the grid supply is on average available for only about 15 hours per day. The country's electricity shortage imposes major costs on the economy in the form of lost production time and an inability to carry out normal commercial processes on a reliable schedule; this situation also impacts delivery of basic services such as water supply. The absence of reliable power supply from the grid has led to the widespread installation of private diesel generators, whose constant operation imposes high generation costs, with households having to pay about US¢40.0 per KWh compared to grid supply tariff of about US¢5.16 per KWh**.**

2. The project will directly support increasing the efficiency and reliability of electricity supply within the project areas, by strengthening the transmission and distribution systems through the rehabilitation and construction of several transmission and distribution substations and lines. The project is expected to increase the electricity supply reliability by reducing the power supply interruptions and network technical losses by about 50 percent and 15 percent, respectively. In addition, the commercial efficiency-enhancement program is expected to increase electricity sales billing by about 25 percent, with increased billing from 35 percent to over 60 percent. The project will also support sector institutional reforms for improved electricity services delivery, operations improvement, transparency, and accountability by supporting the initial business processes of the South Electricity Distribution Company (SEDC) as a corporate entity, sector corporatization, and the set-up of a Modernization Unit at the Ministry of Electricity (MoE) to kick-start the sector regulation functions.

3. Reducing losses, increasing supply, and enhancing revenues will reduce fiscal burden and improve the sector's financial sustainability. Further, empirical studies on the relationship between electricity consumption and economic growth have found that a 1 percent increase in electricity consumption is associated with a 0.8 percent increase in economic growth.[28] With improved electricity supply, Iraq can be expected to achieve the higher economic growth rates, and the project cluster approach flagship could be scaled up to the rest of the country.

4. **Economic analysis methodology and assumptions**: The economic analysis of the project is based on a standard cost-benefit analysis, which identifies and compares economic costs and benefits. The transmission network reinforcement, distribution network reconstruction, and operational and commercial efficiency enhancement, which will be funded with a US$200 million loan from the International Bank of Reconstruction and Development (IBRD), will significantly improve electricity system efficiency and service reliability in the SEDC service territory.

5. The analysis focuses on the quantifiable costs and benefits resulting from the project. Two main categories of costs are assessed and estimated: (i) total capital investment cost and (ii) annual operation and maintenance costs. The incremental energy consumed as a result of the project did not, however, impose an incremental cost (hence, not

[28] David J. Stern et al., *The Impact of Electricity Consumption on Economic Growth: A Macroeconomic Perspective* (Oxford, UK: Oxford Policy Management, 2016).

included in the analysis) as the projected take-or-pay generation capacity is in excess of the expected demand. For the benefits, the analysis uses the following quantifiable benefits deriving from the project: (i) decrease in supply interruptions, (ii) increased capacity to meet demand, (iii) reduction in system transmission and distribution network technical losses, (iv) reduction in nontechnical losses (increased billing), (v) reduction in cost of greenhouse gas (GHG) emissions from reduced dependence on higher polluting private generators, and (iv) reduction in unserved energy by decreasing reliance on private generators. The analysis is built over a period of 20 years and uses a discount rate of 10 percent.

6. **Project capital investment costs:** The project will consist of the following three main components, estimated at a cost of US$200 million: (i) transmission network reinforcement, which will finance activities aimed at increasing transmission network capacity at a cost of US$95.0 million; (ii) distribution network reconstruction and operational and commercial efficiency enhancement, which will support activities related to distribution network rehabilitation and reinforcement to meet current and future demand, reduce technical losses and increase operational flexibility, and commission a distribution information management system, at a cost of US$100 million; and (iii) institutional strengthening and project implementation support, which will include supporting institutional reforms, institutional capacity strengthening, and project implementation support, at a cost of US$5.0 million.

7. **Annual operation and maintenance (O&M) costs:** The O&M costs of transmission and distribution are estimated at an annual rate of 2.5 percent of the total capital investment cost.

8. **Reduction in cost of technical losses in the transmission and distribution network:** The technical losses in the project areas are estimated at 57 GWh (baseline 2017) compared with an expected 48.5GWh (15 percent reduction) in losses as a result of the project completion in 2024, which is equivalent to approximately US$0.5 million of savings per year with an average tariff of US¢5.16 per KWh. However, as a result of the load growth, the annual reduction in power losses is expected to decline at an estimated rate of 6 percent per year.

9. **Revenues from increased energy supply (distribution):** With an estimated 0.6 load factor and 0.8 system power factor (SEDC), the increased energy supply in distribution as a result of the project implementation can be manifested in the increased system capacity, increased system reliability, and increase in billed energy. These amount to a total of approximately 2,000 GWh of increased energy supply per year in 2024 (as shown in figure A4.1), which is equivalent to over US$102 million of revenues with an average tariff of US¢5.16 per KWh. Further, at an expected load growth of six percent per year, the estimated increase in energy supply can reach up to 6,800GWh in 2044, amounting to over US$350 million of increased revenues.

10. **Revenues from increased energy supply in transmission:** With an estimated 0.6 load factor and 0.95 system power factor (transmission network), the increased energy supply in transmission as a result of the project implementation can be manifested in the increased system capacity as well as increased system reliability. These amount to a total of approximately 1,885 GWh of increased energy supply per year in 2024, which is equivalent to about US$5.7 million of revenues at a transmission revenue rate of US¢0.3 per KWh.

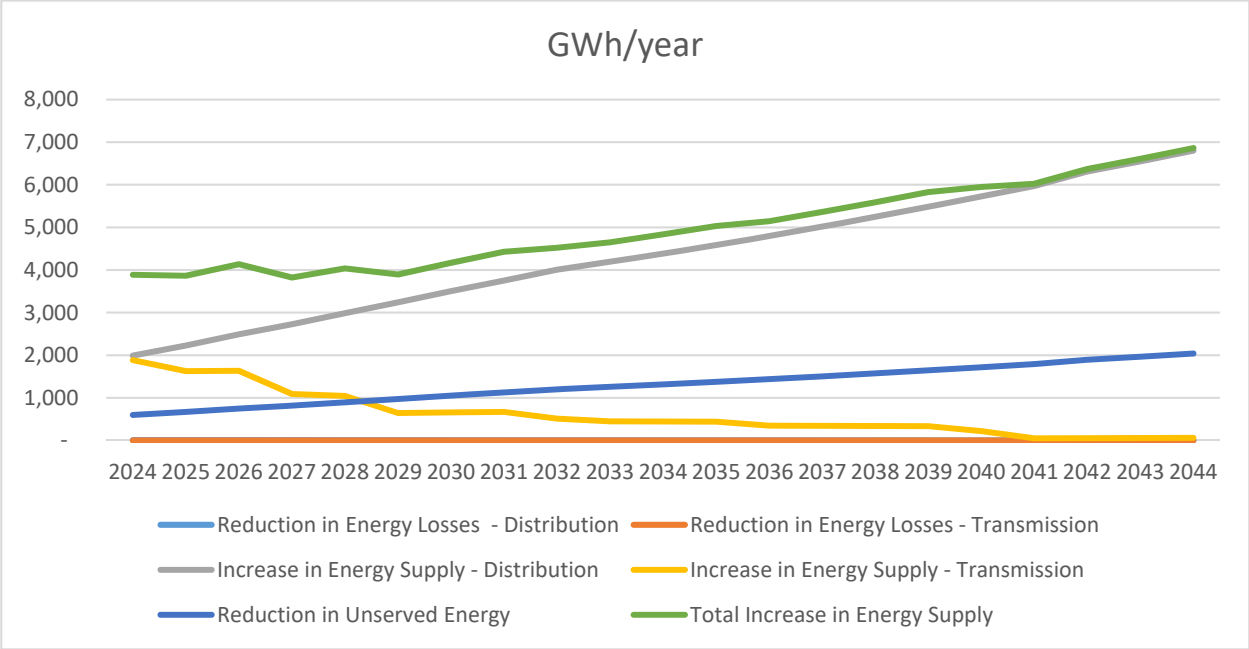
11. **Greenhouse gas emissions:** The reduction in transmission and distribution losses will also yield a reduction in CO_2 emissions since most of the generation comes from fossil fuel–fired power plants. The emissions factor used to calculate the avoided CO_2 emissions from energy savings is 684gCO_2 per KWh, as per a World Bank Guidance Note[29]—

[29] World Bank, “Guidance Note: Greenhouse Gas Accounting for Energy Investment Operations” (Washington, DC: World Bank, 2013).

Iraq grid emission factor. Using this factor, the project leads to a cumulative CO_2 emissions savings of 80,000 tCO_2 over a period of 20 years. These emissions value at US$30 per tCO_2, based on the World Bank Guidance Note.[30]

12. **Reduction in unserved energy:** The increase in energy supply that will be achieved by the project is expected to reduce or eliminate the need for private diesel generators. The amount of energy offset is estimated at 30 percent of the increase in energy supply through the distribution network.[31] This amounts to 598GWh in 2024, which is equivalent to over US$208 million of avoided cost when considering the difference between the cost of unserved energy of US¢40 per KWh and the average tariff of US¢5.16 per KWh.

Figure A4.1. Evolution of Overall Energy Supply and Reduced Losses in the Project Areas



13. **Project net present value and economic rate of return:** Based on the methodology and assumption just described, the estimated IRR of the project at a 10 percent discount rate without accounting for the CO_2 emissions benefit is 130.2 percent with an NPV of US$1.554 billion, and the project reaches the hurdle rate in 2025. The high IRR is attributed mainly to the significant increase in energy supplied and the improved energy billed-supplied ratio from less than 35 percent pre-project to over 60 percent post project completion. Moreover, including CO_2 emissions benefits, the IRR slightly increases to 130.6 and the NPV to US$1.555 billion. However, when the reduction in unserved energy (offsetting private diesel generator units) is considered, the NPV exceeds US$5 billion. This significant increase is due to the major difference between the private generator energy fee and the average national tariff (table A4.1).

14. **Sensitivity analysis:** Sensitivity analysis was conducted to test the robustness of the profitability of the project to key parameters of project costs and benefits. The rates of return were examined for the following cases: (i) increased project cost, (ii) less reduction in power losses, and (iii) less increase in energy supply. These parameters were

[30] Social Value of Carbon in project appraisal: Guidance note to the World Bank Group Staff
[31] The Iraq National Energy Strategy (INES) estimates the energy supplied by private diesel generator units to be equivalent to 30 percent of total electricity output.

changed by the following multiple rates (one at a time—assuming all other parameters remain constant): 10 percent, 25 percent, 50 percent, and 100 percent. As depicted in figure A4.2, the rate of return remains at 66.3 percent even when the capital cost doubles, while it hardly changes when there is no reduction in distribution system power losses or no increase in the transmission system energy supply. However, it can be susceptible to less increase in the distribution system energy supply, reaching down to 47.6 percent if the increase in energy reaches only half what is expected, underlying the key project objective of improved supply reliability.

Table A4.1. Project Economic Costs and Benefits

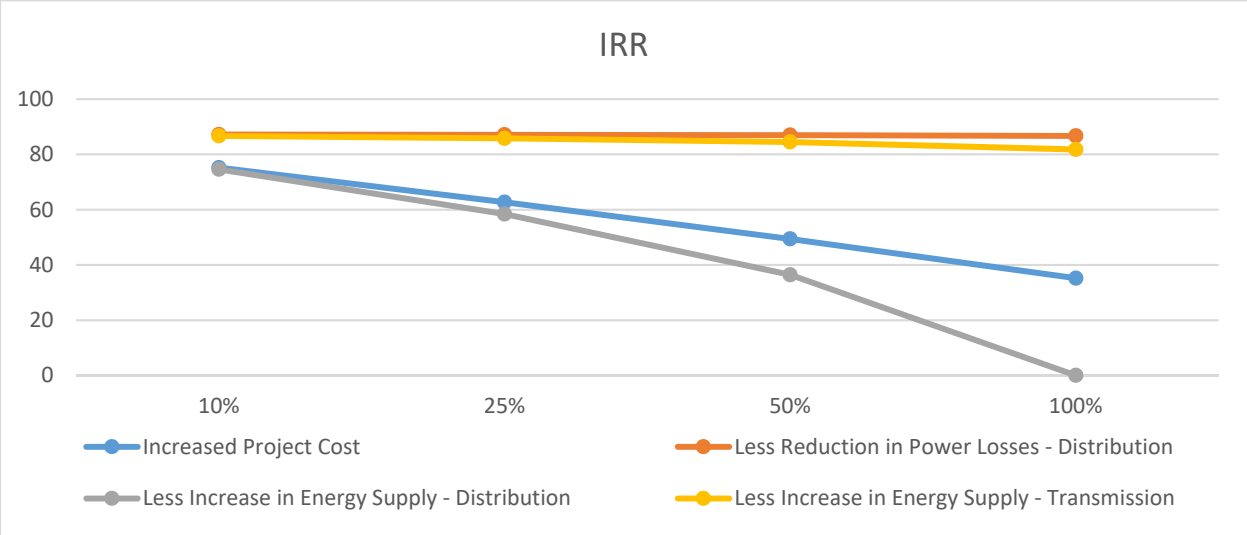
	Costs US$		Benefits US$													
Year	Capital Investment (Substation + Transmission + Commercial)	O&M Cost (2.5% of the Investment Cost Per Year)	Reduction in Losses per year - Distribution	Increase in Energy Supply per year - Distribution	Increase in Energy Supply per year - Transmission	Net Flow (without CO2) - US$	Present Value (without CO2) US$	NPV (without CO2) US$	Total Energy Supply (Loss Reduction and Increased Supply) KWh	Co2 Emission (tons)	Value of Avoided CO2 Emission (US$)	Net Flow (with CO2) - US$	Reduction in Unserved Energy (MWh)	Value of Reduction in Unserved Energy (US$)	Net Flow (with Reduction in Unserved Energy) - US$
2024	200,000,000	5,000,000	496,799	102,789,540	5,654,161	(96,059,500)	(96,059,500)	(96,059,500)	9,627,888	6,585	197,564	(95,861,936)	597,614	208,208,580	112,346,644
2025	-	5,000,000	466,991	114,990,407	4,880,439	115,337,837	104,852,579	8,793,079	9,050,215	6,190	185,710	115,523,548	668,549	232,922,429	348,445,977
2026	-	5,000,000	438,972	128,606,061	4,900,175	128,945,208	106,566,287	115,359,366	8,507,202	5,819	174,568	129,119,775	747,710	260,502,044	389,621,819
2027	-	5,000,000	412,633	140,679,677	3,269,546	139,361,856	104,704,625	220,063,991	7,996,770	5,470	164,094	139,525,949	817,905	284,958,136	424,484,085
2028	-	5,000,000	387,875	154,061,775	3,134,354	152,584,004	104,216,928	324,280,919	7,516,964	5,142	154,248	152,738,252	895,708	312,064,665	464,802,916
2029	-	5,000,000	364,603	167,339,838	1,932,819	164,637,260	102,226,785	426,507,704	7,065,946	4,833	144,993	164,782,253	972,906	338,960,463	503,742,717
2030	-	5,000,000	342,727	180,806,832	1,979,866	178,129,424	100,549,416	527,057,120	6,641,989	4,543	136,294	178,265,718	1,051,203	366,238,955	544,504,673
2031	-	5,000,000	322,163	193,687,453	2,006,672	191,016,288	98,021,559	625,078,680	6,243,470	4,271	128,116	191,144,404	1,126,090	392,329,702	583,474,106
2032	-	5,000,000	302,833	206,725,612	1,531,609	203,560,054	94,962,267	720,040,947	5,868,862	4,014	120,429	203,680,483	1,201,893	418,739,553	622,420,036
2033	-	5,000,000	284,663	216,545,290	1,341,215	213,171,168	90,405,385	810,446,332	5,516,730	3,773	113,203	213,284,371	1,258,984	438,630,110	651,914,481
2034	-	5,000,000	267,583	226,397,866	1,336,544	223,001,993	85,976,922	896,423,254	5,185,726	3,547	106,411	223,108,405	1,316,267	458,587,306	681,695,710
2035	-	5,000,000	251,528	236,716,221	1,320,260	233,288,009	81,766,024	978,189,278	4,874,583	3,334	100,026	233,388,036	1,376,257	479,487,974	712,876,010
2036	-	5,000,000	236,437	247,402,713	1,041,850	243,681,000	77,644,276	1,055,833,554	4,582,108	3,134	94,025	243,775,025	1,438,388	501,134,333	744,909,359
2037	-	5,000,000	222,251	258,730,395	1,030,489	254,983,135	73,859,532	1,129,693,086	4,307,181	2,946	88,383	255,071,518	1,504,246	524,079,474	779,150,992
2038	-	5,000,000	208,916	270,737,737	1,018,447	266,965,099	70,300,254	1,199,993,340	4,048,750	2,769	83,080	267,048,180	1,574,057	548,401,323	815,449,503
2039	-	5,000,000	196,381	283,373,168	1,005,681	279,575,230	66,928,087	1,266,921,427	3,805,825	2,603	78,096	279,653,326	1,647,518	573,995,417	853,648,743
2040	-	5,000,000	184,598	295,513,688	653,430	291,351,715	63,406,622	1,330,328,049	3,577,476	2,447	73,410	291,425,125	1,718,103	598,587,028	890,012,153
2041	-	5,000,000	173,522	308,121,456	151,307	303,446,285	60,035,230	1,390,363,279	3,362,827	2,300	69,005	303,515,291	1,791,404	624,125,089	927,640,380
2042	-	5,000,000	163,111	325,835,605	160,386	321,159,101	57,763,287	1,448,126,567	3,161,058	2,162	64,865	321,223,966	1,894,393	660,006,538	981,230,504
2043	-	5,000,000	153,324	338,068,072	170,009	333,391,405	54,512,159	1,502,638,725	2,971,394	2,032	60,973	333,452,378	1,965,512	684,784,397	1,018,236,775
2044	-	5,000,000	144,125	350,896,229	180,209	346,220,563	51,463,481	1,554,102,206	2,793,110	1,910	57,315	346,277,877	2,040,094	710,768,872	1,057,046,749

Discount Rate	10%
NPV	$1,554,102,206
IRR	130.2%

Discount Rate	10%
NPV	$1,555,410,408
IRR	130.6%

Discount Rate	10%
NPV	$5,146,034,372

Figure A4.2. Project Economic Sensitivity Analysis



15. **Financial analysis:** The financial analysis of the project uses the economic analysis as a starting point but is focused on the financial costs and revenues for the distribution company deriving from project implementation. On the cost side, the capital cost considered, assumed to include any internal taxes, contingencies, and interests on the IBRD loan, totals US$200 million. In addition, an annual O&M cost of 2.5 percent was applied from the year of project completion onward, similar to the economic analysis. On the revenue side, the project gains revenue from one source, namely the increased billed energy. Therefore, it does not consider the increase in the distribution system capacity and reliability, increase in energy supply in transmission, and reduction in power losses, as they are already implied in the increased billed energy. Further, the analysis does not include GHG externalities. The revenues are valued at the weighted average retail tariff of US¢5.16 per KWh.

16. **Financial NPV value and rate of return:** Based on the methodology and assumptions just described, the estimated financial rate of return of the project is 48.5 percent and the financial NPV is US$669 million at the traditional 10 percent discount rate. The financial NPV decreases to US$409 million and US$260 million when considering 15 and 20 discount rates, respectively. However, the financial rate of return remains at 48.5 percent (as shown in table A4.2). Further, when considering the likelihood of different energy billed-supplied ratios (for example, 70 percent, 65 percent, and 55 percent, as opposed to the project target of 60 percent—currently at about 35 percent), the financial rate of return retains robust rates at 59.9 percent, 54 percent, and 43.3 percent, respectively, at a discount rate of 10 percent (as shown in table A4.3). This indicates that the project is viable from a financial viewpoint under different scenarios.

Table A4.2. Project Financial Costs and Benefits

	Costs			Benefits		
Year	Capital Investment (Substation + Transmission + Commercial) - US$	O&M Cost (2.5% of Investment Cost Per Year) - US$	Total (US$)	Increase in Billed Energy per year (Distribution) - MWh	Increase in Billed Energy per year (Distribution) - US$	Netflow - US$
2024	200,000,000	5,000,000	205,000,000	1,194,768	61,650,018	(143,349,982)
2025	-	5,000,000	5,000,000	1,266,454	65,349,019	60,349,019
2026	-	5,000,000	5,000,000	1,342,441	69,269,961	64,269,961
2027	-	5,000,000	5,000,000	1,422,988	73,426,158	68,426,158
2028	-	5,000,000	5,000,000	1,508,367	77,831,728	72,831,728
2029	-	5,000,000	5,000,000	1,598,869	82,501,631	77,501,631
2030	-	5,000,000	5,000,000	1,694,801	87,451,729	82,451,729
2031	-	5,000,000	5,000,000	1,796,489	92,698,833	87,698,833
2032	-	5,000,000	5,000,000	1,904,278	98,260,763	93,260,763
2033	-	5,000,000	5,000,000	2,018,535	104,156,409	99,156,409
2034	-	5,000,000	5,000,000	2,139,647	110,405,793	105,405,793
2035	-	5,000,000	5,000,000	2,268,026	117,030,141	112,030,141
2036	-	5,000,000	5,000,000	2,404,108	124,051,949	119,051,949
2037	-	5,000,000	5,000,000	2,548,354	131,495,066	126,495,066
2038	-	5,000,000	5,000,000	2,701,255	139,384,770	134,384,770
2039	-	5,000,000	5,000,000	2,863,331	147,747,856	142,747,856
2040	-	5,000,000	5,000,000	3,035,130	156,612,728	151,612,728
2041	-	5,000,000	5,000,000	3,217,238	166,009,491	161,009,491
2042	-	5,000,000	5,000,000	3,410,272	175,970,061	170,970,061
2043	-	5,000,000	5,000,000	3,614,889	186,528,265	181,528,265
2044	-	5,000,000	5,000,000	3,831,782	197,719,960	192,719,960

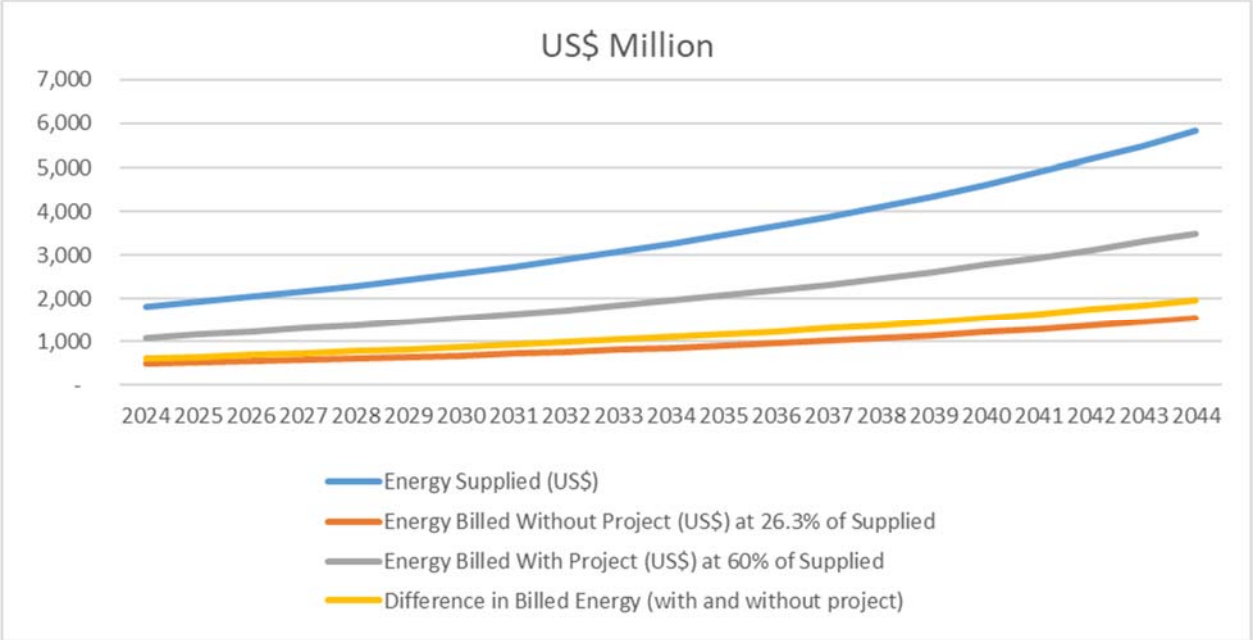
Discount Rate	NPV	IRR
10%	668,977,659	48.5%
15%	409,169,249	48.5%
20%	260,032,413	48.5%

Table A4.3. Effect of Reduced Billed-Supplied Energy Ratio on Project Financial Net Present Value and IRR

	NPV (US$)	IRR
Billed/Supplied Energy Ratio (70%)	821,735,238	59.9%
Billed/Supplied Energy Ratio (65%)	745,356,449	54.0%
Billed/Supplied Energy Ratio (60%)	668,977,659	48.5%
Billed/Supplied Energy Ratio (55%)	592,598,869	43.3%

17. **Increase in billing:** The project positively affects electricity sales billing because of implementing the commercial efficiency enhancement program. This is manifested in increasing the billed-supplied energy ratio from 35 to 60 percent. As depicted by figure A4.3, the project will help increase billed energy to US$1,089 million in the first year of project completion as opposed to US$477 million of status quo projection and will continue to increase reaching US$3.5 billion compared with US$1.5 billion of the existing billed energy value by end of the forecast period.

Figure A4.3. Evolution of Energy Billing



ANNEX 5: GENDER ANALYSIS

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

1. **Background:** Iraq faces significant challenges in closing opportunity and outcome gaps between women/girls and men/boys in human endowments (education and health), economic opportunities, and voice and agency due to various factors, including long-standing political instability and a worsening security situation in the country. The gender gaps are significant in the field of education.[32] One in three girls ages 12 to 14 is not enrolled in school, while one in ten of those in the same age group has never attended school. Gross enrollment rates are much lower for girls than boys at 19, 32, and 15 percentage points in primary, intermediate, and secondary school, respectively.[33] Social constraints as well as distance from schools, particularly in rural areas, make it harder for girls to attend schools. Female labor force participation (percent of female population age 15 and older) in Iraq is at 19 percent in 2018, which is significantly lower than the male labor force participation rate of 74 percent.[34] Women with low levels of education are primarily self-employed and concentrated in the private sector. These jobs are usually informal and low paying with no access to benefits such as health insurance, maternity leave, or pensions.[35] There are wage and earning gaps between women and men: (i) in the public sector, on average, males earn 20 percent more than women in 2012, and (ii) in the private sector, the wage gap is almost eight times wider than the gap in the public sector.[36] Women in Iraq have been significantly affected by the security situation. Women and girls face high risk of violence and a rising trend in the incidence of violence by their intimate partner; other domestic violence is attributed to forced displacement. According to a 2006 study, one in five women in Iraq experienced intimate partner violence, and the rate is likely to have increased due to political instability and armed conflict. Iraqi women made up 10 percent of adult civilian deaths between 2003 and 2013.[37] In 2007, 133 women were victims of moral killings by militia in Basra. Finally, women face the threat of being abducted into the sex slave market due to the presence of terrorist groups in the country.[38]

2. **Gender assessment results:** To understand impacts of electricity service unreliability and unavailability on Iraqi women's economic and social well-being in the Basra Governorate, focus group discussions and in-depth interviews were conducted in April of 2018 in Basra. The key findings of the qualitative research are as follows:

   i. *Lack of access to reliable electricity service negatively affects income levels of women engaged in economic activities and hampers women's ability to engage in income-generating activities.* In

[32] World Bank, *Iraq Systematic Country Diagnostic* 2017 (Washington, DC: World Bank, 2017).
[33] Ibid.
[34] World Bank, World Development Indicators/Gender Statistics (2018)
[35] World Bank, *Iraq Systematic Country Diagnostic* 2017.
[36] Ibid.
[37] Republic of Iraq, "The Iraq Family Health Survey (IFHS) 2006/7" (Baghdad: Government of Iraq, 2008), http://www.who.int/mediacentre/news/releases/2008/pr02/2008_iraq_family_health_.
[38] World Bank, "Middle East and North Africa Regional Gender Action Plan FY18–21 (Draft for Discussion)" (Washington, DC: World Bank, forthcoming).

Iraq, according to the 2011 Enterprise Survey, access to electricity is identified as an obstacle among female businesses: 7.9 percent of firms with a female top manager identified electricity as a major constraint.[39] Qualitative assessment results also confirm this countrywide finding. According to the qualitative assessment results, unreliable electricity service negatively impacts productivity and income of women-owned businesses. Women business owners reported reduced work hours, reduced profits, and loss of customers due to frequent daily electricity outages. Women business owners also stated they incurred additional financial burdens to purchase alternative energy sources, such as generators. The household is often the center of income-generating activities for women in Iraq. Iraqi women engage in sewing, cooking, and handcrafting, and access to reliable electricity services is crucial for performing these activities. Women who engage in these income-generating activities reported loss of income, and in some cases inability to continue performing these activities. Poor electricity service also negatively affects the ability of women to learn new skills and generate income. During the qualitative research, women who are economically inactive expressed interest in learning new skills, such as sewing, but, due to unreliable electricity service, they were unable to complete training courses, as they could not use the necessary electrical equipment. Lack of electrical appliance ownership is also mentioned as a barrier limiting women's ability to engage in income-earning opportunities. However, women participants indicated that even if they could purchase the necessary electrical equipment by borrowing money, they would not be able to make enough income through these activities due to power outages. These women pointed out that they gave up trying to engage in such economic activities. The qualitative assessment also found that women who work outside of the home, such as female public employees, work longer hours as they wait for electricity service to be available to complete their work.

ii. *Female-headed households (FHHs) are found to be particularly vulnerable*. FHHs in Iraq constitute 10 percent of the population, and they include households headed by females who are widowed, divorced, separated, or caring for sick spouses. Owing to political instability and armed conflict, the number of widows and divorced women has increased, reaching nearly 2 million. FHHs who participated in the qualitative assessment indicated that they rely on social assistance payments. FHHs emphasized that unreliable electricity service and lack of ownership of electrical appliances are major barriers in their ability to generate income.

iii. *Poor electricity service also increases women's drudgery and negatively impacts their health outcomes*. Most of the female qualitative research participants emphasized that they are primarily responsible for household work and caregiving activities. Middle-income Iraqi households own various electrical appliances to perform various household tasks. Owing to power outages, this group of women mentioned that they manually perform these tasks, which increases the time they spend on these tasks and impacts their physical well-being. Women participants also mentioned staying up late to have electricity access and use electrical appliances to perform household tasks, which takes a toll on their physical well-being. Low-income Iraqi women emphasized that during summer months they perform household duties, such as cooking using liquefied petroleum gas without air conditioning, and excessive heat negatively impacts their

[39] The computation of the indicator is based on the rating of the obstacle as a potential constraint to the current operations of the establishment.

health. Women respondents reported experiencing skin diseases during summer months due to lack of cooling and daily power outages.

iv. *Electricity service reliability and quality problems also impact women's sense of security and safety and contribute to increased risk of forms of gender-based violence (GBV).* GBV in Iraq is one of the main barriers preventing women's full economic, political, and social participation. According to a 2006 study, one in five women in Iraq experienced intimate partner violence, and the rate is likely to have increased due to political instability and armed conflict. During the qualitative assessment, nearly all women participants expressed an increased sense of insecurity due to unreliable electricity service, particularly in public spaces. Women respondents mentioned increased sexual harassment incidents due to power outages and lack of street lighting. They also emphasized experiencing limited mobility due to lack of street lighting. Even when they stay inside their homes, women also experience increased sense of insecurity during power outages due to housebreak-ins and theft. Women respondents also mentioned that unreliable electricity service and lack of air conditioning cause tensions within the households and increase incidents of domestic violence.

v. *Unreliable electricity affects women's ability to engage in educational activities*. Female university students who participated in the qualitative assessment indicated that unreliable electricity affects their educational activities, such as their ability to use computers to complete their assignments. Different from their male counterparts, female university students also help in household chores, which limits the time they can spend on educational activities. Additionally, female university students experience limited mobility and are unable to travel to places with generators to study in the evenings. Female students emphasized delaying their assignments or using mobile phones for lighting. In addition to prohibiting women from fully engaging in educational activities, unreliable electricity service also limits women's access to information. Women participants mentioned limited ability to use TVs, radios, or mobile phones to access news and information.

vi. *Illegal electricity use is widespread among low-income women*. Despite the sensitivity of the topic, more than half of low-income female research participants conceded that they do not have meters installed at their homes, and therefore, they use illegal electricity. Illegal electricity is particularly common in slums populated mainly by internally displaced persons (IDPs). In slum areas, households have multiple connections from different feeds of the electricity network to ensure continuous electricity access. Research participants indicated that they resorted to illegal electricity due to their inability to afford electricity bills and their dissatisfaction with poor electricity service.

vii. *Women lack information about energy efficiency measures and electricity bill payment options*. Some low-income women participants, including those in FHHs and economically inactive women who rely on social assistance, are granted the option of paying their overdue bills in installments. However, research participants from this group of women lacked information about how this payment system works. Research participants indicated that their overdue bills are purportedly forgiven, and they did not seem to be aware of their responsibility to pay their bills and potential consequences.

3. **Gender actions:** Gender actions will contribute to closing gender gaps identified in the qualitative assessment in the following areas: (i) women's ability to engage in educational activities and their health outcomes; (ii) income levels of women engaged in economic activities, including women-owned businesses; (iii) women's ability to engage in income-generating activities; and (iv) women's voice and agency in the context of women's access to information and their ability to make decisions about their own lives and act on information provided to achieve desired outcomes. The project will close these gaps by:

   i. Providing improved electricity service and regularly monitoring impacts of service improvements on (a) women's ability to engage in economic activities; (b) income levels of women engaged in economic activities, including women-owned businesses; (c) female students' ability to engage in educational activities; and (d) women's health outcomes

   ii. Increasing women's information and awareness on energy efficiency, user rights, and responsibilities concerning electricity service (for example, impacts of nonpayment on service quality, bill payment options) by engaging women groups to conduct communication and awareness raising campaigns

   iii. Addressing electricity affordability concerns of vulnerable women groups, including female-headed households and IDP women while incentivizing legal connections by providing appropriate bill payment options

   iv. As part of skills redevelopment strategy in the SEDC, also exploring opportunities to build capacity on gender by (a) reviewing current training plans and recommending gender-related content and (b) providing training on gender-related issues and relevance in the workplace—and also assessing barriers that limit career progression of women employees and designing mentoring, coaching, and capacity-building activities to support women employees' career development

4. **Gender indicators:**

   i. Number of project beneficiaries reported improvements in electricity service, of which female (percent)

   ii. And of which female-headed households (percent)

   iii. Number of female-headed households provided with incentives (appropriate bill payment options) and who have gained access to formal electricity service

   iv. Number of IDP women provided incentives (appropriate bill payment options) and who have gained access to formal electricity service

   v. Women reported engaging in income-generating activities due to improvements in electricity service

   vi. Women engaged in income-generating activities and reported increased income and productivity due to improvements in electricity service

   vii. And of which women-owned businesses (percent)

viii. Number of women reported improved health outcomes (reduction of skin diseases) due to improvements in electricity service

ix. Number of women employed to conduct communication and awareness raising campaigns with women on energy efficiency, user rights, and responsibilities concerning electricity service, impacts of illegal connections on service quality, and bill payment options

x. Number of women with increased understanding on energy efficiency, user rights and responsibilities concerning electricity service (for example, impacts of nonpayment on service quality, bill payment options)

xi. Number of female employees working in the electricity company reported increased capacity and skills development

Table A5.1. Gender Action and Implementation Plan

Identified gender gaps	Gender actions	Notes	Responsible party
Component 1: Transmission Network Reinforcement			
Gaps in participation in economic activities and in income levels between women and men	• Enhancing women's ability to engage in income-generating activities and improving income levels of women engaged in income-generating activities, including women-owned businesses, by improving electricity service delivery	• Improving electricity service delivery will be implemented under the project. • Socioeconomic and gender-monitoring survey will monito: (i) number of women reported engaging in income-generating activities; (ii) number of women who engaged in income-generating activities reported increased income levels; and (ii) (out of which women-owned businesses). • World Bank will review the terms of reference (ToR) for the firm that will be contracted to conduct socioeconomic and gender-monitoring survey.	• A firm will be hired to conduct baseline and follow-up socioeconomic and gender-monitoring surveys.
Women's health outcomes	• Improving women's health outcomes by improving electricity service delivery	• Improving electricity service delivery will be implemented under the project. • Socioeconomic and gender-monitoring surveys will monitor number of women reporting improved health outcomes due to improvements in electricity service. • World Bank will review ToR for the firm that will be contracted to conduct baseline and follow-up socioeconomic and gender-monitoring survey.	• SEDC (A firm will be hired to conduct baseline and follow-up socioeconomic and gender-monitoring surveys.)
Component 2: Distribution Network Reconstruction and Operational and Commercial Efficiency Enhancement			
Vulnerable women groups' access to formal electricity service	• Address electricity affordability concerns of vulnerable women groups, including FHHs and IDP women, while incentivizing legal connections by providing appropriate bill payment options.	• Collaborate with Social Protection Directorate to identify and target FHHs and IDP women. • Collaborate with the South Electricity Distribution Company and the Social Protection Directorate to determine payment options that could be provided to FHHs and IDP women.	• SEDC (A firm will be hired to conduct baseline and follow-up socioeconomic and gender-monitoring surveys.)

	• Monitor number of FHHs and IDP women provided with incentives (appropriate bill payment options) and who gained access to formal electricity service.	• Socioeconomic and gender-monitoring surveys will monitor the number of FHHs and IDP women accessing formal connections.	
Component 3: Technical Assistance and Advisory Services; Regulatory Reforms; Institutional Capacity Building and Project Implementation			
Gaps in participation in economic activities and in income levels between women and men	• Provide capacity-building and skills-development training to support women employees' career development in the SEDC.	• This action will be part of project's institutional capacity-building activities. • World Bank will support identifying barriers that limit career progression of women employees in the SEDC and design mentoring, coaching, and capacity- building activities to support women employees' career development. • WBG Task Team will develop a ToR for a firm or local consultant to conduct capacity-building and skills-development activities.	• SEDC with support of a local consultant and/or firm
Women's lack of information on electricity service delivery, user rights and responsibilities, and bill payment options	• Conduct communication and awareness-raising campaigns with women on energy efficiency, user rights, and responsibilities concerning electricity service (for example, effects of nonpayment on service quality, bill payment options).	• Collaborate with the SEDC to develop messages around user rights and responsibilities concerning electricity service. • A firm will be hired to conduct communication and awareness-raising campaigns. The firm will hire women employees to conduct the campaigns. This could be integrated under the project's wider communication and awareness-raising activities.	• SEDC with support of a local consultant and/or firm
Gaps in participation in economic activities and in income levels between women and men	• Provide employment opportunities to women in implementing communication and awareness activities on energy efficiency, user rights and responsibilities concerning electricity service (for example, bill payment).	• A firm that will be hired to conduct communication and awareness-raising campaigns will hire women employees to conduct the campaigns	

ANNEX 6: MFD Policy Reforms—Iraq Electricity Sector

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

Table A6.1. Reform Actions			
Policy	**Governance**	**Finance**	**FCV/Politics**
- Approval and implementation of a roadmap for electricity sector which aims at full cost recovery and improved service delivery. - Design of a tariff rationalization process that leads to cost reflective tariff structures. - Develop strategy to frame deregulation process.	- Restructure governance and operation of energy sector across federal/governorate authorities to improve supply delivery in accordance with the Iraq Integrated National Energy Strategy and the 2017 electricity law. - Defined ring-fenced roles of electricity business units (Generation, Transmission and Distribution) for enhanced accountability and eventual unbundling as autonomous commercial entities. - Improve commercial operating foundation of distribution segment (to include a commercial management system) to achieve: • Financial sustainability; • Reduce subsidies towards cost recovery tariffs.	- Deploy additional credit support to improve sector performance (through construction of new capacity and rehabilitation of existing infrastructure). - Develop a viable financing plan and business plan in support to the corporatization of the sector. This will include mitigation of system technical and financial losses to attract private sector investments via improvements to transmission and distribution systems.	- Assess and address social implications of reform actions on marginal groups (poor, women, liberated and disadvantaged regions etc.) on the reform "losers," e.g. public sector/state-owned enterprise employees impacted by reforms

ANNEX 7: Implementation Support Plan

COUNTRY: Iraq
Iraq Electricity Services Reconstruction and Enhancement Project

Strategy and Approach for Implementation Support

1. **The project consists mainly of procurements in two areas.** The first is of (i) works contracts for both construction of new and rehabilitation of substations, including transmission and distribution lines through international competitive bidding, and the second is of (ii) consultancy services related to the Owner's Engineer for technical assistance for works design and supervision and the business support services firm for South Electricity Distribution Company (SEDC) capacity strengthening.

2. **The project involves a framework approach to safeguards, which will require site-specific safeguard documents to be developed during the early stage of project implementation.** These, in turn, will require careful review and subsequent supervision by the World Bank safeguards team. Consequently, the project will require efforts to review technical, procurement, and safeguard documents. This support will be complemented with the Owner's Engineer support once on board.

3. **The strategy for implementation support has been developed.** It is based on the nature of the project and its risk profile. It aims at making implementation support to the client flexible and effective and will focus on implementation of the risk mitigation measures identified.

4. **Risks related to the sector reforms and SEDC institutional strengthening have been identified**. The World Bank will support both the Ministry of Electricity (MoE) and the SEDC in addressing these important issues through its engagement in related ASA activities and policy discussions, especially through the ongoing parallel Iraq Energy Programmatic Advisory Services and Analytics (P155335). The World Bank's project team will maintain a close dialogue with the government of Iraq (GoI) and the SEDC to ensure that proper focus on sector institutional reforms, sector financial sustainability, and project implementation is maintained.

5. **In coordination with the SEDC, the World Bank's project team will closely monitor the installation of the IDMIS and technical assistance activities.** This will be done to (i) coach and mentor the new staff in the aspects of utility operations and management; (ii) set up systems to follow up on the information received through the new integrated distribution management information system (IDMIS), including performance benchmarking; and (iii) prepare and implement a corporate strategic plan, including key business performance indicators.

6. **As part of the implementation process, the project will share with policy and decision makers success stories of how having in place and using the IDMIS and business reengineering has led to gains in and promoted a culture of accountability.** The World Bank team will continuously encourage the top management to actively involve staff at all levels in the implementation of the new systems and preparation of the corporate strategic plan and the annual business plans. This will include

conducting several in-house workshops and retreats to promote a culture of awareness of interdependencies and accountabilities between functions, to help to break down organization silos, and create an aligned organization.

7. **Project management**: The World Bank task team will monitor the capacities of the project management teams in the SEDC and South Electricity Transmission Company (SETC) throughout project implementation to ensure that they are adequate to implement the project. In addition, the Owner's Engineer, designated as the "project manager," shall support the project management teams (PMTs) to strengthen the project management capacity. The World Bank will provide additional training where needed in relation to the World Bank fiduciary and reporting requirements, as well as in the areas of environmental and social safeguards management.

8. **Procurement:** Implementation support will include (i) reviewing of the Procurement Plan and providing suggestions, (ii) reviewing procurement documents and providing timely feedback, and (iii) monitoring procurement progress against the agreed Procurement Plan. More intensive support will be provided during the first 12 months to ensure the timely procurement and contracting of the big packages.

9. **Financial management:** Implementation support of project financial management will be performed on a risk-based approach. Implementation support will review the project's financial management system, including but not limited to accounting, reporting, and internal controls. The World Bank team will assist the SEDC and SETC in improving financial management and reporting. The financial management supervision will be conducted by financial management specialists.

10. **Environmental and social impact management:** The World Bank will provide support through the regular review of the semi-annual environmental monitoring and evaluation reports and will follow up any issues with the PMTs and their consultants.

11. **Implementation progress:** The World Bank will closely monitor the overall progress of project implementation by reviewing the semi-annual progress report, the execution of the Procurement Plan, the actual disbursement, and so forth. The World Bank will provide support by regularly visiting the project, helping to identify arising issues that impede project progress, and discussing and agreeing on actions to resolve critical issues. Further, geotagging of equipment procured under the project will be used as a means improve accountability and transparency.

Implementation Support Plan and Resource Requirements

12. **The project's Co-TTL and World Bank team members for procurement, financial management, and safeguards are based in Iraq country offices (Baghdad).** This will facilitate closer support to the client. Formal implementation support and field visits will be carried out at least semi-annually. Detailed inputs from the World Bank team are outlined as follows (see also tables A7.1 and A7.2):

    i. *Technical inputs.* Inputs of technical specialists will be required to review bid documents and associated technical specifications to ensure that adequate technical standards are observed and that they enable a fair competition. Technical specialists will also be needed to review bid evaluation reports and monitor implementation of the project during construction and

commissioning. Short-term consultants shall be sourced to support the World Bank team with regard to the implementation of the IDMISs, including the revenue protection program.

ii. *Fiduciary requirements and inputs.* The World Bank team will support the PMTs to identify capacity-building needs to strengthen its financial management capacity and to improve procurement management efficiency. Training will be provided by the World Bank's Financial Management and Procurement Specialists before the commencement of, and during, project implementation to the extent needed. Formal supervision of financial management will be carried out semi-annually, while procurement supervision will be carried out as required by the client and project implementation timeline.

iii. *Safeguards.* Inputs from an Environment and Social Safeguards Specialist will be required, though the project's social and environmental impacts are limited. The support will focus on institutional capacity building for environmental and social safeguards at the operations level. Field visits will be based on the project needs and at least semiannual.

iv. *Sector reforms and institutional capacity strengthening.* The World Bank will provide, through its staff and consultants as needed, experts that will engage in the sector institutional reforms and the SEDC institutional strengthening.

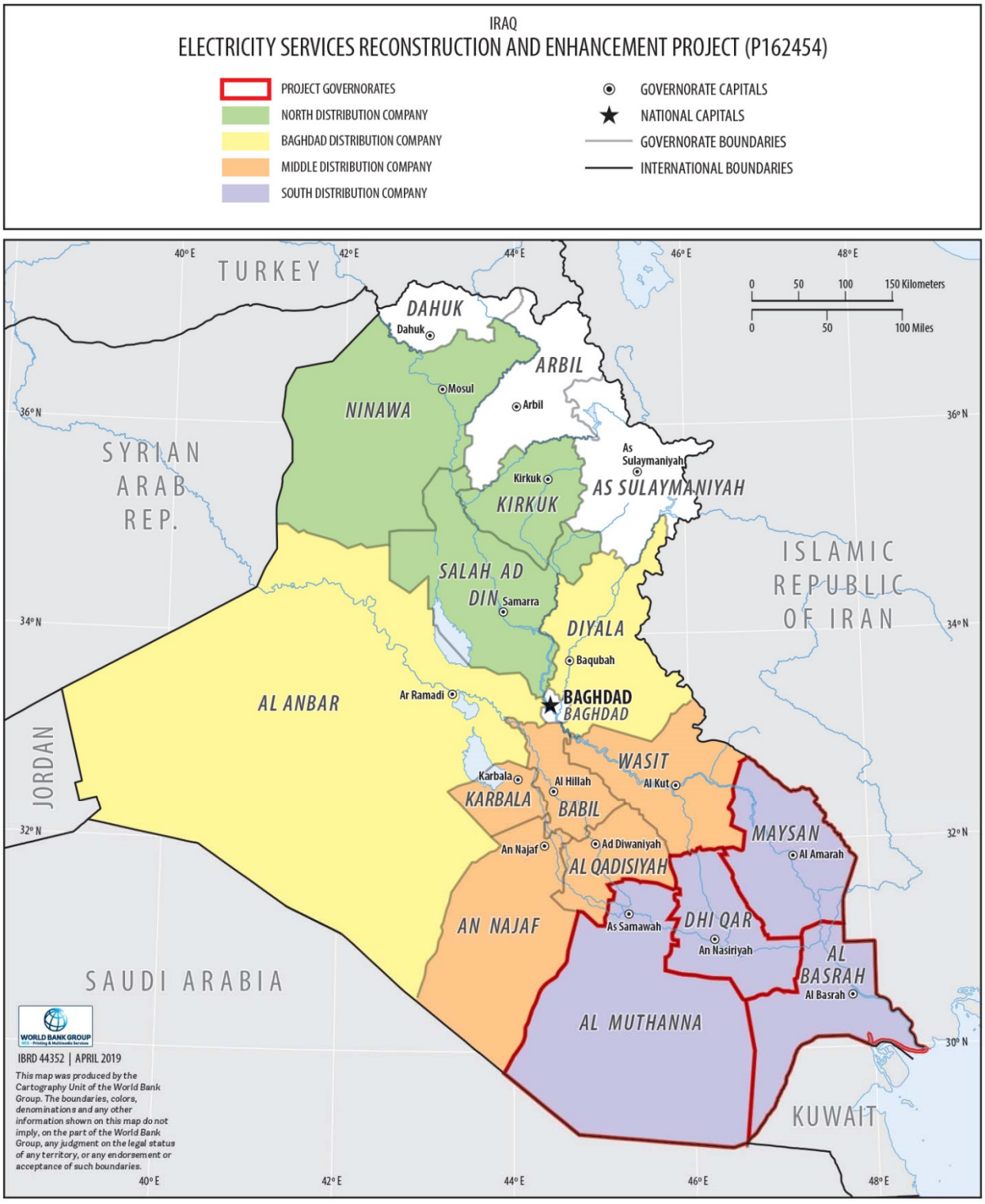
Table A7.1. Implementation Support Focus and Resource Requirements

Time	Focus	Skills needed	Resource estimate
Prior to Board approval up until project closing	Monitor and assist in the procurement of main contracts	Procurement Specialist	2
		Power Engineer	1
		Distribution Engineer/Utility Operations Expert	2
	Monitor financial management (FM) implementation and disbursement	FM Specialist	2
	Support preparation of site-specific safeguards documents and supervise safeguards implementation	Environmental and Social Safeguards Specialists	2
	Monitor project management and supervise project implementation progress	Project Manager	1
		Power Engineer	1
		Gender Specialist	1
		Utility Operations Expert	1
		Gender Specialist	1

Table A7.2. Skills Mix Required

Skills Needed	Number of staff weeks per Year	Number of trips per year	Comments
Team Leader/Power Engineer	15	4	HQ based
Co-Team Leader/Operations Officer	15	0	Field based
Procurement Specialists	8	0	Field based
Financial Manager	6	0	Field based
Technical Specialists	8	4	Field and HQ based
Environmental	6	2	Field and HQ based
Social	6	2	Field and HQ based
Operations Analyst	3	2	Field and HQ based
Utility Operations Expert	6	2	HQ based
Others	6	2	Field and HQ based

ANNEX 8: Map


IRAQ
ELECTRICITY SERVICES RECONSTRUCTION AND ENHANCEMENT PROJECT (P162454)
PROJECT GOVERNORATES
NORTH DISTRIBUTION COMPANY
BAGHDAD DISTRIBUTION COMPANY
MIDDLE DISTRIBUTION COMPANY
SOUTH DISTRIBUTION COMPANY
GOVERNORATE CAPITALS
NATIONAL CAPITALS
GOVERNORATE BOUNDARIES
INTERNATIONAL BOUNDARIES
TURKEY
SYRIAN ARAB REP.
ISLAMIC REPUBLIC OF IRAN
JORDAN
SAUDI ARABIA
KUWAIT
DAHUK
Dahuk
ARBIL
Arbil
NINAWA
Mosul
KIRKUK
Kirkuk
AS SULAYMANIYAH
As Sulaymaniyah
SALAH AD DIN
Samarra
DIYALA
Baqubah
AL ANBAR
Ar Ramadi
BAGHDAD
BAGHDAD
WASIT
Al Kut
KARBALA
Karbala
BABIL
Al Hillah
MAYSAN
Al Amarah
AN NAJAF
An Najaf
AL QADISIYAH
Ad Diwaniyah
DHI QAR
An Nasiriyah
As Samawah
AL BASRAH
Al Basrah
AL MUTHANNA
0 50 100 150 Kilometers
0 50 100 Miles
40° E
42° E
44° E
46° E
48° E
36° N
34° N
32° N
30° N
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