

Document of
The World Bank

Report No: NCO00003775

NOTE ON CANCELLED OPERATION REPORT
(IBRD-81540 IDA-50990)

ON AN

IBRD LOAN IN THE AMOUNT OF US\$100 MILLION

AND AN IDA CREDIT IN THE AMOUNT OF SDR 64.5 MILLION
(US\$100 MILLION EQUIVALENT)

TO THE

ISLAMIC REPUBLIC OF PAKISTAN

FOR A

NATURAL GAS EFFICIENCY PROJECT

November 30, 2016

Energy and Extractives Global Practice
Pakistan Country Management Unit
South Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective November 28, 2016)

Currency Unit = Pakistan Rupee (PKR)
USD 1.00 = PKR 104.82
USD 1.00 = SDR 0.735985

PAKISTAN - GOVERNMENT FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
bcf	Billion cubic feet
CNG	Compressed Natural Gas
EAD	Economic Affairs Division
ECC	Economic Coordination Committee
ESMF	Environmental and Social Management Framework
GDP	Gross Domestic Product
GOP	Government of Pakistan
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IE	Implementing Entity
LNG	Liquefied Natural Gas
MPNR	Ministry of Petroleum and Natural Resources
NGEP	Natural Gas Efficiency Project
OGRA	Oil and Gas Regulatory Authority
PDO	Project Development Objective
PMO	Project Management Office
PSQCA	Pakistan Standards and Quality Control Authority
QER	Quality Enhancement Review
SNGPL	Sui Northern Gas Pipelines Limited
SOU	Small Operating Unit
SSGC	Sui Southern Gas Company Limited
tcf	Trillion cubic feet
TTL	Task Team Leader
UFG	Unaccounted-for Gas

Vice President: Annette Dixon Country Director: Patchamuthu Illangovan Practice Manager: Demetrios Papathanasiou Project Team Leader: Anjum Ahmad/Michael Stanley NCO Team Leader: Anjum Ahmad
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PAKISTAN

NATURAL GAS EFFICIENCY PROJECT (P120589)

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A. Basic Information			
Country:	Pakistan	Project Name:	Natural Gas Efficiency Project
Project ID:	P120589	L/C/TF Number(s):	IBRD-81540, IDA-50990
NCO Date:	11/30/2016		
Lending Instrument:	Specific Investment Loan (SIL)	Borrower:	GOVERNMENT OF PAKISTAN
Original Total Commitment:	US\$200.00 million	Disbursed Amount:	US\$0.25 million
Revised Amount:	US\$0.68 million		
Environmental Category: B			
Implementing Agencies:			
Sui Southern Gas Company Limited (SSGC)			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	02/22/2010	Effectiveness:	09/03/2012	10/31/2012
Appraisal:	02/14/2011	Closing:	12/31/2017	05/31/2016
Approval:	04/26/2012			

C. Ratings Summary	
Performance Rating by NCO	
Outcomes:	Not Applicable
Risk to Development Outcome:	Not Applicable
Bank Performance:	Unsatisfactory
Borrower Performance:	Unsatisfactory

D. Sector and Theme Codes		
	Original	
Sector Code (as % of total Bank financing)		
Oil and gas	95	
Public administration- Energy and mining	5	
Theme Code (as % of total Bank financing)		
City-wide Infrastructure and Service Delivery	40	

Infrastructure services for private sector development	30	
Rural services and infrastructure	30	

E. Bank Staff

Positions	At NCO	At Approval
Vice President:	Annette Dixon	Isabel M. Guerrero
Country Director:	Patchamuthu Illangovan	Rachid Benmessaoud
Practice Manager/Manager:	Demetrios Papathanasiou	Salman Zaheer
Project Team Leader:	Anjum Ahmad/Michael Stanley	Bjorn Hamso
NCO Team Leader:	Anjum Ahmad	

F. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (US\$, millions)
1	10/07/2012	Satisfactory	Satisfactory	0.00
2	02/27/2013	Moderately Satisfactory	Moderately Satisfactory	0.25
3	09/22/2013	Moderately Unsatisfactory	Moderately Unsatisfactory	0.25
4	12/18/2013	Unsatisfactory	Unsatisfactory	0.25
5	06/17/2014	Unsatisfactory	Unsatisfactory	0.25
6	02/17/2015	Unsatisfactory	Unsatisfactory	0.25
7	07/23/2015	Unsatisfactory	Moderately Unsatisfactory	0.25
8	02/29/2016	Unsatisfactory	Unsatisfactory	0.25

1. Context, Project Development Objectives, and Design

1. **Country and sector background.** Pakistan has important strategic endowments and development potential, but the shortage of electricity and other energy has constrained economic activity in Pakistan. The power sector faced a large supply-demand gap, and load shedding was prevalent. Together with delayed hydropower development, shortage of domestically produced natural gas to fuel thermal power plants was the main cause of the energy crisis.

2. The energy sector in Pakistan was in crisis for a number of reasons. High economic growth in 2002-06 caused a surge in energy demand that planners had not fully anticipated. Fragmented governing structures, weak governance, and an inadequate decision-making process impeded timely development of large domestic energy resources. Many years of inadequate financial incentives for domestic production of natural gas brought production into decline, while at the same time the gas network was expanded to reach new customers. Reduced allocation of gas to power generation caused the power sector to import oil products as fuel, thereby increasing the cost of electricity. Sector performance was further damaged by large cross-subsidies in the natural gas subsector to households and fertilizer industry, distorting consumption and discouraging energy efficiency and conservation measures.

3. **Natural gas is a vital source of energy supply in Pakistan.** In fiscal year 10 (FY10), Pakistan consumed about 1.5 trillion cubic feet (tcf) of gas, all domestically produced and representing 49 percent of the country's total primary energy supply. However, many large gas fields were in decline and the country was at or near its peak production. Natural gas is transmitted and distributed by two companies, namely Sui Southern Gas Company Limited (SSGC), the implementing agency and sub-borrower in this project, with a network covering Karachi, Interior Sindh, and Balochistan, and Sui Northern Gas Pipelines Limited (SNGPL) with network in Punjab and Khyber-Pakhtunkhwa. Both companies are listed on the domestic stock exchanges. As of June 30, 2011, SSGC had approximately 53 percent and SNGPL had 32 percent state ownership.

4. Pakistan's main challenges in the gas sector were related to: (a) scarcity of gas; (b) inadequate allocation of gas; (c) inefficient end-use of gas; and (d) high levels of unaccounted-for gas (UFG). Natural gas scarcity reached crisis proportions because (a) the production did not keep pace with the expansion of the gas network and demand in general; (b) the gas pricing regime was not used effectively as an instrument of demand management; and (c) prices of substitute fuels rose faster than that of gas. The network expansion allowed the gas companies to deploy more capital, earning a financial return on expanded net fixed assets.

5. **Inefficient end use of gas.** In the residential sector, inefficient appliances are estimated to cause gas waste to the magnitude of 30-40 billion cubic feet (bcf) per year, and even higher wastes are estimated in the industrial sector. The household gas appliance industry in Pakistan generally produces low-efficiency appliances that do not meet the Pakistan Standard of 2008. In 2010-11, the Pakistan Standards and Quality Control Authority (PSQCA) set up a certification program for appliance manufacturers. Improvements in appliance certification, energy efficiency labeling, and enforcement of standards were deemed necessary. However, residential gas consumers had limited incentive to shift to more efficient appliances because of low gas prices.

6. **High levels of unaccounted-for gas.** UFG is the difference between the total volume of metered gas received by a gas utility during a period and the volume of gas metered as having been delivered to its consumers, excluding the utility's self-consumption. UFG was recorded at 10.64 percent in FY11; valued at US\$323 million in terms of gas purchased.

7. **A number of factors contribute to the UFG.** Most of the UFG comes from dilapidated/deteriorating pipelines, leaking joints, gas theft in the form of tampered-with meters, and illegal connections; and old, malfunctioning metering equipment. Although pilot projects and various tests were undertaken, the source of UFG could only be well categorized and located by segmenting the pipeline network, meaning that small parts of it are isolated in a way that would allow the gas company to compare gas volumes going into the segment with gas volumes used (invoiced) in the segment.

8. UFG started increasing in FY10 and FY11 by about 1 percentage point each year, for reasons including: (a) central and provincial governments mandated the two gas companies to expand the gas networks to new towns and industrial areas; (b) the gas companies' financial returns were based on a specific return on net fixed assets, which would favor investment in system expansion rather than maintenance and upkeep of the existing system; (c) there was no substantive financial punishment on the gas companies for high UFG until late 2000s; (d) workmanship and quality control in operations were lacking; and (e) rooting out gas theft could have been a more efficient operation if legislation had provided the gas companies with effective tools to prosecute gas theft.

9. Government efforts to improve the downstream gas sector included the following: the Oil and Gas Regulatory Agency (OGRA) put in place a regulatory regime that punished the gas companies financially for excessive UFG and the Criminal Law (Amendment) Act was promulgated in 2011, whereby theft and tampering with gas meters was liable to imprisonment and/or fine.

10. **Improving governance, accountability, and organizational effectiveness.** SSGC's management had a range of plans to improve governance, accountability, and organizational effectiveness that would support a shift to a more commercially oriented, customer-focused business culture. With the renewed focus on UFG reduction, the company initiated segmenting the network into small operating units (SOUs). Typically each SOU would serve 20,000 customers and would have an executive in charge of all functions, including UFG reduction, measurement, system maintenance, cathodic protection, billing, and customer service. This would also allow the Government and regulator better insight into SSGC's UFG problem. SSGC would also seek involvement of civil society in the renovated segments - monthly monitoring data would be put on SSGC's website for disclosure to the public together with the names of the executives in charge of the respective SOUs.

11. **Rationale for World Bank assistance.** SSGC had a new focus on improving operational quality and ensuring that standards from OGRA were met and relevant guidelines were followed. The company planned to implement a quality management system based on ISO 9001:2008. Technical and management training would be boosted. The company initiated online and remote monitoring of industrial and commercial gas meters as part of the effort to reduce gas theft. SSGC would acquire business intelligence software to help extract essential UFG-related

information from its business data warehouse created by the company's Enterprise Resource Planning and Customer Care and Billing System. Customer satisfaction surveys would be undertaken. SSGC supported the new Criminal Law (Amendment) Act, which, among other things, empowered the gas companies to seek effective prosecution of gas theft. The above actions, together with the investments facilitated by the project, would help the gas company improve its financial position and customer service while at the same time better managing Pakistan's scarce gas supplies.

12. Against this backdrop, the Government requested World Bank support for a project to address the UFG problem. The Government believed World Bank support would be suitable because (a) the gas companies had been unable to solve the problem on their own; (b) significant financial resources were necessary; (c) the UFG problem was increasingly intolerable in view of the growing gas and power shortages; and (d) a UFG reduction project would give significant results over 3-5 years. The Government expected the project to support governance in the sector and the project's approach of segmenting the gas network to make the UFG situation and the causes thereof more transparent. The project was also seen as a catalyst for organizational improvement.

13. **The Project Development Objective (PDO)** of the Natural Gas Efficiency Project (NGEP) is to enhance the supply of natural gas in Pakistan by reducing the physical and commercial losses of gas in the pipeline system. The primary PDO-level results indicator is the reduction in the amount of UFG as a result of project interventions. A secondary PDO indicator is the length of pipeline provided with cathodic protection, which is a proxy indicator for the difficult-to-measure prevention of further UFG increase that would occur without such cathodic protection.

14. **Project components, costs, and funding.** The project components are listed here.

Component 1: UFG Reduction (US\$190 million)

15. This component would finance the following subcomponents:

- (a) Segmentation and pressure management
- (b) Pipeline rehabilitation
 - (i) Overhead leak detection
 - (ii) Pipeline replacement or rectification
- (c) Cathodic protection
 - (i) Pipe recoating and road restoration
 - (ii) Installation of cathodic protection equipment
- (d) Advanced metering

16. The UFG reduction components, when fully implemented, were expected to reduce UFG by 22.2 bcf per year as compared to SSGC's overall UFG level of 37 bcf in 2011. The UFG level in 2018 was forecast to reduce to about 28 bcf with the project (and about 50 bcf without the project). That would bring the UFG percentage down from the then 9 percent to 5 percent. Besides the direct UFG reductions, the cathodic protection system financed under the project

would substantially prevent the UFG situation in the un-rehabilitated parts of the pipeline network from growing worse. While the above numbers were considered conservative estimates for a well-executed project, they also indicated the need for sustained investment efforts after the implementation of the project. The project would provide SSGC with tools to better control future UFG levels, notably in the context of SSGC's planned organizational changes to enhance accountability and the company's investments in management information systems that improve oversight of operations and customer behavior.

Segmentation and pressure management (US\$18 million). These were at the core of the project since effectively reducing UFG required the company to know where in the system the UFG was most prevalent. This required elaborate work of the gas company staff to ring-fence smaller parts of the gas network (segments) by installing bulk meters at inlet points and by making sure that customers were coded to the correct segment. Input-output gas measurements (the difference is UFG) would be complemented by pressure testing and leakage surveys to better understand the UFG problem and to rank segments for rehabilitation work and focus on theft investigations. About 400 bulk meters would be procured under the project for placement at town border stations and elsewhere in the grid. In conjunction with segmentation, automatic pressure management and monitoring systems would be procured. These would provide better adaptation of pressure levels in the pipelines to meet the hourly demand. Their main function will be before segments are rehabilitated and in parts of the network that will not be prioritized for rehabilitation. Since higher leakage occurs with higher pressures, the pressure management systems contribute to reducing UFG.

17. **Pipeline rehabilitation (US\$117 million).** This involved replacement of irreparable leaking pipes in addition to rectification of existing, less damaged ones. It was estimated that 5,750 km of pipelines would be replaced and about 18,700 km would undergo some form of rectification/leak repairs under the project. The actual condition of a pipe would not be fully known until it was dug up and/or examined from the surface; hence, the actual lengths of replaced/rectified pipes would shift during project implementation as SSGC would conduct additional field surveys and segmentation work to determine the condition and optimal course of action for the system. The project would finance pipelines of varying types and diameters, mostly polyethylene pipes, but in special cases steel pipes, together with the required connections and fittings. The replacement of distribution network steel pipes with non-corroding polyethylene pipes would be a major shift for the company, and it would be an important factor in suppressing UFG in the future. Operational equipment would also be procured, such as pipe fusion equipment, welding plants, electric generators, air compressors, dewatering pumps, transport and specialized vehicles, leak survey equipment, testing laboratories, and gas chromatography analyzers. Works such as trenching, backfilling, and road restoration was set to be outsourced to contractors.

18. **Cathodic protection (US\$20 million).** This protection would reduce the rate of corrosion in existing underground steel pipes, thus arresting the increase in leakages. This would be achieved through installation of recoating material for approximately 450 km of pipes, installation of power sources, battery backup systems, magnesium anodes, and remote cathodic protection monitoring systems.

19. **Advanced metering systems (US\$35 million).** Such systems would replace old meters that are inaccurate and prone to tampering. Surveillance equipment would also be procured to monitor gas theft at metering stations. About 270 turbine meters would be procured for large industrial customers and about 12,500 ultrasonic meters for industrial and commercial customers. Data acquisition and monitoring systems as well as provers (for testing accuracy of meters) would also be procured.

Component 2: Appliance Efficiency Pilot Project (US\$5 million)

20. The proposed pilot would support the Government and the gas companies' energy conservation efforts. This component would finance the deployment of high-efficiency gas appliances and/or the retrofitting of components in consumers' existing appliances to enhance thermal efficiency. Focus would be on cooking stoves and water heaters. The project would finance goods and services for the pilot as well as consulting services to assist in the detailed design and execution of the pilot project. It was expected to be undertaken in the context of related initiatives by the Government and gas companies, such as energy efficiency awareness campaigns, improved appliances' quality certifications, energy efficiency labeling, and manufacturing industry education.

Component 3: Technical Assistance (US\$5 million)

21. Building on SSGC's heightened focus on customer service and quality in operations, the project would finance technical audits, training of trainers for the company's Gas Training Institute (and equipment for it), and annual customer satisfaction surveys. The surveys would in part be used for gauging service improvements in the rehabilitated network areas. Project implementation would be supported by various consulting services: owner's engineer, lender's engineer (monitoring and evaluation), and support for the consumer appliance efficiency pilot project. The main project consultants would be contracted internationally and also assist in technology transfer, including in the field of trenchless pipe laying.

22. **Project financing.** A Specific Investment Loan (SIL) from the International Bank for Reconstruction and Development (IBRD) and a Credit from the International Development Association (IDA) were designed for this operation. The Loan and the Credit were signed with the Government of Pakistan (GOP). The funds would be on-lent to the implementing agency, SSGC. In addition to the Loan Agreement and the Financing Agreement between IBRD/IDA and the GOP, a Project Agreement was signed between IBRD/IDA and SSGC, the project Implementing Entity (IE), in accordance with the terms of a Subsidiary Agreement signed between the GOP and SSGC. The estimated cost of the project was US\$272 million, of which IBRD and IDA would finance US\$200 million, with the remaining US\$72 million financed by the sub-borrower, SSGC.

Implementation Arrangements

23. The project would be implemented by SSGC in its distribution areas in Karachi, interior Sindh, and Balochistan. The project would be implemented over a period of five (5) years, from late FY12 to FY17. Many of the subcomponents would be broken into four or five annual

procurement tranches (or procured with staggered delivery), to tailor procurement of goods to available implementation resources within and outside the company.

24. SSGC management set up a Project Management Office (PMO) led by a project manager at the senior general manager level. The PMO reported directly to a project director, who reported to the managing director. The PMO was responsible for overall project implementation, including planning activities, monitoring and evaluation, and preparation of quarterly progress reports. The core team of the PMO would work with dedicated personnel in the various line departments so that the project would get integrated into SSGC's organization as much as possible while project management would not have distracting operational duties. Furthermore, SSGC established a UFG oversight committee reporting to the company's board.

25. The activities planned for the pipeline rehabilitation subcomponent were a continuation of ongoing work of SSGC. The project represented a three to four times scale-up of the pipeline replacement activity, but it nevertheless constituted less than half the company's capacity when taking into account the resources in use for network expansion. SSGC management planned to draw on these resources for the project but would nevertheless seek to optimize resource use by some outsourcing. Works involving pipeline trenching, refilling, and road restoration would be outsourced to contractors as agreed in the Procurement Plan.

26. SSGC had implemented a number of large government/company-financed gas network expansion projects and a major project financed by Asian Development Bank (ADB) in the 1990s, demonstrating good project management capabilities. This was in part confirmed by the World Bank project team's assessments of the company's procurement, financial, and environmental management capacity. Furthermore, SSGC intended to utilize technical assistance funds to fill any resource gaps through the provision of an owner's engineer. The owner's engineer would support the PMO with overall project implementation, including, among other things, procurement and contract management, cost control, progress monitoring, and quality assurance/control. The consultant would also introduce the company to new technologies such as trenchless pipe-laying, which might affect how the project was executed. The environmental and social impact work would be carried out by the company's Health, Safety, Environment (HSE) Department in compliance with both Pakistan's and the World Bank's safeguards policies and standards, as laid out in the Environmental and Social Management Framework (ESMF) prepared specifically for the project. SSGC was intent on monitoring direct service impact of the project, including through undertaking customer satisfaction surveys.

27. The project would also finance a lender's engineer, who would focus on results monitoring, including gas accounting to measure UFG reduction, effectiveness of use of the project's financial resources, and progress monitoring, to assist with informing the Government, the regulator, and the World Bank. Risks related to corporate-level governance, fraud, and corruption would be monitored through World Bank oversight of all Bank-financed procurements, and thresholds would be set at appropriate levels that ensured adequate World Bank prior review of contracts, as well as through procurement post reviews and audits. The project would utilize standard World Bank funds flow arrangements, including direct withdrawals, letters of credit, and regular replenishment of two designated accounts for IBRD and IDA funds, respectively, in the name of SSGC.

Risk Analysis: Key Risks and Mitigation Measures

28. A detailed Operational Risk Assessment Framework (ORAF) was prepared. The overall implementation risk of the operation was considered to be Substantial.

- (a) **Implementation Capacity.** Although SSGC had managed large network expansion projects in the 1980s and 1990s, it was more than 10 years since the company had managed a project financed by an international financial institution (ADB). SSGC was familiar with network segmentation, a core activity under the project, but had not undertaken it to a large extent.

Mitigation. Resource gaps were to be filled as necessary, including the provision of an owner's engineer to support SSGC. PMO would focus on the project without having additional operational duties. Procurement thresholds for prior/post review would be set at levels that ensured adherence with World Bank procurement guidelines and overview.

- (b) **Governance.** SSGC had not been able to achieve OGRA's UFG benchmarks in late 2000s, which had reduced the utility's profitability. This lack of compliance resulted in financial loss, which was not sufficient to incentivize the utility's management.

Mitigation. The financial penalty by OGRA for excessive UFG had enhanced SSGC's focus on governance issues associated with UFG and would continue to do so provided that the penalty was maintained on an adequate level (downward trend in allowable UFG). The project would cause SSGC's network to be segmented, which together with new administrative tools would significantly enhance the management's ability to understand its UFG problem and to pursue cases of gas theft while at the same time allowing the Government and regulator better insight into SSGC's UFG problem. World Bank involvement would help ensure that the project gets prepared and executed according to best industry practices and standards.

Quality at Entry

29. **Soundness of background analysis.** The task team performed a thorough background sector analysis as well as technical and financial analysis. The underlying issues causing UFG were discussed in detail with the two gas companies. The team also had detailed discussions with the Ministry of Petroleum and Natural Resources (MPNR) and OGRA and public and private gas consumers. The concept of segmentation of gas network was discussed in detail with SSGC as they were already practicing that on a limited scale in some parts of the distribution network. To design the gas appliances' efficiency component, the World Bank team had detailed discussions with the National Energy Conservation Center (ENERCON) and the PSQCA, in addition to manufacturers and retailers of gas appliances.

30. **Adequacy of Government commitment.** There was commitment from the federal government, which came both from the Ministries of Finance and Petroleum and Natural Resources. However, the two gas companies were not very enthusiastic, as a result of which SNGPL was dropped from the project at an early stage. SSGC showed interest in the project due to the interest of the then managing director.

31. **Quality Enhancement Review (QER).** The project went through all the quality checks and finally the QER in November 2010. Guidance was provided by the peer reviewers and management and was incorporated in the project documentation.

2. Post-Approval Experience and Reasons for Cancellation

32. Project negotiations were held during February 7-10, 2012. A loan in the amount of US\$100 million and a Credit in the amount of SDR 64.5 million (US\$100 million equivalent) was approved by the World Bank's Board of Executive Directors on April 26, 2012. The project was declared effective on October 31, 2012.

33. **Events leading to cancellation.** Successive implementation support missions found progress in project implementation, as measured against the agreed performance indicators, to be unsatisfactory. Many procurement issues remained unresolved. Technical specifications of equipment seemed too restrictive, which resulted in limited competition. The World Bank team and SSGC discussed the option of repairing the leaking pipes versus replacement of pipes. SSGC had corporate preferences around longer time horizons for recurrent investment and external factors and preferred the replacement option. SSGC's analysis supported network replacement over the repair option for: (a) long-term UFG savings benefits; (b) capitalization of departmental cost/interest during construction; (c) return on investment; and (d) other cash inflows from depreciation, tax benefit on depreciation, and financial charges. However, lack of consensus between SSGC and Bank team, on how to approach the technical options for solving the UFG problem, obstructed the implementation of the project.

34. SSGC was not able to procure the services of an owner's engineer, who would guide SSGC on all technical matters and bring in international experience in modern gas distribution, metering, cathodic protection, and project management techniques. The World Bank team had numerous sessions with the SSGC's NGEP team and senior officials and worked closely with them in finalizing the terms of reference for the owner's engineer. A Request for Expression of Interest (REOI) for owner's engineer was floated in July 2013. The World Bank agreed with the proposed short list of firms in November 2013. However, the Request for Proposal was never issued to these firms. The rating was downgraded from Moderately Unsatisfactory to Unsatisfactory and was reported to the World Bank management in March 2014 and September 2014.

35. **Steps taken to resolve problems.** The World Bank team provided extensive hands-on support to the SSGC team, but project implementation remained stalled. SSGC tried to rectify the impasse by changing the project manager with a senior official who had decades of SSGC experience - the deputy managing director was appointed as the project director in June 2013.

36. The World Bank team undertook a strategic review of the project in December 2013. This review identified (a) strong implementation challenges, (b) no progress toward interim indicators supporting the PDO, and (c) no disbursement against project-related activities. On the basis of the strategic review and at the request of the Economic Affairs Division (EAD) of the GOP, the project was restructured to cancel US\$100 million of IDA Credit in April 2014. It was also decided that a deeper restructuring would have to proceed incrementally and be informed by analytical work to be undertaken, with the NGEP's support, to better understand the drivers of

UFG. As part of this deeper restructuring, revision of the monitoring and evaluation system would be undertaken as project components were further adjusted.

37. Despite the first restructuring in April 2014, there was lack of progress mainly due to lack of ownership of the project within SSGC. Moreover, the World Bank team began to observe that some key drivers of UFG, especially theft and law and order issues, were increasingly contributing to the overall UFG rate. Beyond SSGC's exclusive control, upon closer inspection, theft and law and order losses were resulting from a moratorium on new connections announced in 2011, during a time of chronic gas shortages. In effect, the project's interventions on addressing technical losses were being overwhelmed by policy and other enforcement issues not covered by the project. Hence, in the second half of 2014, the World Bank team recommended that the project be closed due to lack of implementation and a continued increase in UFG. This recommendation was based on the fact that the PDO had lost relevance - that there was insufficient understanding of the complete set of drivers of UFG and the appropriate set of varying interventions needed across a large network.

38. However, in December 2014, a new project director/project manager was assigned to the project. In January 2015, a new managing director took charge of the company and requested that the project be continued, based on a commitment to procure the owner's engineer, implement a comprehensive program for rehabilitation and replacement of leaky infrastructure, and a commitment to work with the Gas Courts to address theft and law and order issues. The World Bank team agreed to give the project team additional time to reorganize itself around an improved understanding of the drivers of UFG that were emerging. In April 2015, a Time-bound Action Plan was prepared by SSGC, which proposed that the World Bank funding should be limited to US\$40 million, to be used only for imported equipment and international technical assistance. An important element of the action plan was an agreement on the part of SSGC to start the hiring process for the owner's engineer.

39. The World Bank team found the April 2015 Time-bound Action Plan to be a comprehensive document outlining the activities that were either already under way (using SSGC's own resources) or planned using World Bank funding. After receiving the EAD request for cancellation of US\$60 million dated April 7, 2015 (based on SSGC's request and endorsement by the MPNR), the World Bank restructured the project in June 2015. The project stood at US\$40 million of IBRD funding and it was agreed with SSGC that the Bank financing would be used to import goods and services, while SSGC would use its own resources for local goods and works.

40. For the first time, under the leadership of the new managing director and the new project director, procurement of various imported equipment showed some tangible results. In parallel, SSGC started afresh the process of hiring of the owner's engineer. After the first round of bidding, no objection letters (NOLs) worth US\$2.25 million were issued and SSGC signed contracts for about US\$2.0 million by October 2015. However, this progress was limited compared to the targets in SSGC's Time Bound Action Plan, which had projected to disburse over US\$8 million by November 2015. A revised disbursement estimate, up to the project closing date of December 31, 2017, was much less than US\$40 million. Further, after going through the Expression of Interest and Request for Proposal process for owner's engineer, SSGC recommended that the selection be cancelled, citing weak alignment of the technical skills of the

responding firms with the terms of reference. Without the owner's engineer and with very low estimated disbursements, the World Bank team and client concluded that it would be impossible to meet the PDO.

41. In November 2015, after a careful review of project progress, the World Bank recommended to the Government and the client to “move into an orderly closure of the project” and that the contracts already signed by SSGC would be honored by the World Bank. SSGC agreed to cancellation but requested that for contracts that were already signed, SSGC would use its own financing instead of using World Bank funds. By that time, five special commitments had been issued by the World Bank. Based on a request from SSGC, all five special commitments were cancelled. Therefore, the only disbursement under the project was the IBRD front-end fee. SSGC informed the MPNR of its decision to close the project. The MPNR conveyed to the EAD its agreement with SSGC to close the project through its letter dated March 15, 2016. The EAD requested the World Bank, through its letter dated March 29, 2016, to close the project. The project was closed through mutual agreement with the client, with the closing date of May 31, 2016. The World Bank informed the Government of the project closure through its Notice of Revision of Closing Date and Cancellation of Undisbursed Funds dated May 26, 2016.

42. **Exogenous factors.** There were no factors exogenous to the project, which affected the non-performance of the project.

43. **Identification of causes and responsibility.** Procurement remained a significant issue throughout the project. Details about the World Bank’s procurement modalities were not understood by the SSGC team, which remained thinly staffed and without a full-time procurement professional with good knowledge of World Bank guidelines. Issues such as payment of import duties to a local bidder who quoted on cost-insurance-paid basis and lack of clarity to bidders on some conditions in bidding documents led to slowdown of procurement actions. Technical specifications of equipment being procured seemed restrictive, resulting in limited competition.

44. **Implications of failure.** The failure of the project led to its closure and as a result, the UFG levels remained high and continued to drain the precious natural resource. Also, the whole process of preparing the project was a significant cost for the Bank as well as the client. Moreover, illegal connections, one of the drivers of UFG, was increasing at a rate faster than the countervailing reduction of technical losses.

3. Assessment of Bank Performance

45. **Lending process and ensuring quality at entry.** The World Bank team worked closely with the client in the design of the project. It also had extensive consultations with the Government, the regulator, and other stakeholders. In 2011, a year into project preparation, due to lack of sustained interest from IE, the World Bank team suspended further work on project preparation. Later, as advised by the MPNR and under leadership of a new managing director, SSGC invited the World Bank to resume preparation of the project.

46. The World Bank team, consisting of the task team leader (TTL) and co-TTL, safeguards team, procurement team, and a team of consultants, spent considerable time and effort with SSGC in preparing the project. Special attention was given to preparation of a Procurement Plan, which at one time had more than 150 procurement packages.

47. **Supervision and implementation assistance.** During the implementation phase, the World Bank team had extensive interaction with the SSGC team. Most of the World Bank team was based in Pakistan, including the co-TTL, procurement specialist, financial management and disbursement specialists, and the safeguards team. The Pakistan-based World Bank team members visited SSGC on a monthly or bimonthly basis, to provide support to the client and regularly interacted with SSGC team through phone calls and e-mails. A number of training sessions were held for the client staff on procurement, financial management, and environmental and social safeguards.

48. The World Bank team and management regularly highlighted the lack of progress on the project to the MPNR, including to the Minister, the Secretary, and other officials of the ministry. The team had numerous discussions with the SSGC's chairman and members of the board. During formal missions, the World Bank team met with the managing director, senior/general managers of the company, and the NGEF team. The Bank team also attended various meetings of SSGC's UFG Committee, which used to meet on a weekly basis to discuss the plans and actions to combat UFG. OGRA was also kept informed of the project issues and the lack of progress. Although the World Bank team was pleased to see this high-level, regular attention being accorded to the UFG issue, unfortunately the project could not move forward.

49. **Compliance with World Bank policies.** The project did not require any exceptions from World Bank policies; hence, it followed the Bank policies.

50. **World Bank performance rating.** Unsatisfactory.

51. **Justification for rating.** The World Bank team endeavored to make the project work, regularly meeting with the client during project preparation and implementation. A number of procurement packages were prepared by the client, which were reviewed, and no objections were provided. Meetings with the parent ministry were frequent and all efforts were made to help the client move the project forward. Among the fiduciary functions, the procurement team interacted regularly with the TTL and the client. The World Bank should have exercised caution and not proceeded with a project that did not receive sustained interest from the board and management of SSGC. SSGC procurement capacity was assessed prior to negotiation/appraisal and rated as satisfactory with no major capacity gaps. Allowing a large number of procurement packages was a flaw in the design and led to procurement issues during implementation. Further, the Bank did not have much experience with such projects and thus could not draw on the expertise of others or lessons learned from other projects. The Bank should not have proceeded with project implementation without the owner's engineer hired by IE. Also, the technical design addressed only a part of the UFG problem, i.e., only replacing/repairing leaking pipes and faulty meters. However, the project design did not address adequately the higher level ownership and governance issues, and the lack of management and consumer incentives, to reduce theft and waste. The Bank could have cancelled the project sooner.

4. Assessment of Borrower Performance

52. **Government and implementing agency performance.** The Government and the MPNR were always keen on the reduction of UFG, which was on the increase at the time of project preparation and increased further during the project implementation phase. The regulator, OGRA, had imposed a penalty on the gas companies for UFG beyond the benchmark of 4.5 percent. The MPNR was equally supportive and during a number of meetings, the minister and secretary advised SSGC to implement the project and curtail UFG. When the MPNR took the case of reduction in the on-lending rate to the Economic Coordination Committee of the cabinet, the request had to be routed through the Finance Ministry, which supported it wholeheartedly. As a result of this support, the on-lending rate for SSGC was reduced from the standard 15 percent to 11.8 percent. Similarly, MPNR and OGRA, always provided support to the World Bank team in conveying the message to SSGC on curtailing UFG.

53. SSGC had insufficient ownership in the project. The managing director of SSGC, in the initial days of project preparation, was keen on tackling the UFG problem and his support was crucial for the design of this project. However, most of the second-tier management were not in favor of the project, as they regarded the on-lending rate from the Government to SSGC as high. The board of directors of SSGC was also not in favor of taking a loan at a high on-lending rate. Additionally, the company did not see the value that World Bank involvement would bring in terms of technical expertise and international experience. Hence, at one stage, the World Bank team suspended project preparation. However, with advice from the MPNR and the then minister's commitment in getting the on-lending rate reduced to 11.8 percent, the company resumed project preparation.

54. The NGEF's project team, under various project directors and project managers, was responsive and always took timely action. However, it was lack of ownership within the broader organization as well as the lack of understanding of the World Bank's processes, especially procurement, which contributed to the closure of the project. In addition, the unquantified contribution of theft and law and order issues, which reduced the relevance of the PDO. Although the PMO members were willing to work with the World Bank guidelines, the rest of the organization disagreed on a number of matters, thus delaying decision making within SSGC. It was challenging to build a consensus between the PMO and distribution departments on equipment to be procured by the project. Bureaucratic processes within SSGC also contributed to procurement delays and bid expiration. The SSGC top management attributed the failure of the project to the procurement process.

55. **Compliance with covenants.** The covenants agreed with the client are listed in table 1. The reasons for noncompliance or non-measurement are listed in the Status column.

Table 1. Compliance with Covenants

Agreement	Clause	Description	Due Date	Status
Finance Agreement	Loan Agreement, Schedule 2, B, II (a)	Carry out an early-term review of the project.	May 2, 2014	Complied with
Finance Agreement	Project Agreement, Schedule, I, A, 3	Appoint independent monitoring and evaluation consultant.	February 4, 2013	Not complied with; Reason: This was linked to the hiring of owner's engineer who

Agreement	Clause	Description	Due Date	Status
				was never hired and became a key reason for project cancellation.
Finance Agreement	Project Agreement, Schedule, II, C, 4 (a)	Maintain a current ratio of not less than 1:1.	Yearly	Unknown; Reason: This was never measured, as it would have made sense to measure had the project started disbursing.
Finance Agreement	Project Agreement, Schedule, II, C, 5 (b)	Maintain a debt service coverage ratio of minimum 1.0 in FY13 and FY14; 1.1 in FY15; 1.2 in FY16 and FY17.	Yearly	Unknown; Reason: This was never measured, as it would have made sense to measure had the project started disbursing.
Finance Agreement	Project Agreement, Schedule, Section I.C.1 (a)	Compliance with environmental and social management		Partially complied with

56. **Borrower performance rating.** Unsatisfactory.

57. **Justification for rating.** The client's team worked diligently on the project and provided full cooperation after the client decided to undertake the project. However, there was little progress on the project and that too only in the last few months. One key action that the client had agreed to was the hiring of the owner's engineer, which was not accomplished. An early decision on the hiring of the owner's engineer could have moved the project in a positive direction and resolved the impasse on technical issue of replacing or repairing leaking pipes.

58. Since the project closed with no disbursement (except for the front-end fee on IBRD) and no fieldwork had been done, the project is rated Unsatisfactory.

5. Lessons Learned

59. **General.** The key lesson learned was that the project should not move forward unless there is strong buy-in from the IE. It is the IE that has to implement the project. Hence, despite strong support from higher-level sector stakeholders, a project should not be started unless there is strong buy-in from the IE.

60. The World Bank should be better prepared when undertaking projects in areas where it has limited expertise and experience. For example, the World Bank team could not review the technical specifications of specialized equipment, such as cathodic protection equipment, in a timely manner and without external consultant. The World Bank team should support the engagement of technical experts at IE as well as owner's engineers.

61. **Project-specific lessons.** The client's main issues were (a) challenges in following the World Bank's procurement guidelines and (b) an incomplete understanding of the underlying drivers of UFG. On procurement, it is anticipated that with the new procurement framework, clients will be able to better understand the World Bank's requirements and finalize procurement of goods and services in a timely and efficient manner.

62. The World Bank team tried to address deficiencies and strengthen the PMO by providing continuous support during missions, various non-mission visits, and numerous training sessions on procurement, financial management and disbursement, and safeguards. Although the PMO did get marginally strengthened, the inability of the IE to hire a full-time procurement professional well conversant with World Bank guidelines was a major and persistent deficiency throughout the life of the project. This is a key lesson learned, that the assessment of an IE's procurement capacity as judged from its implementation of its own procurement policies does not fully inform the IE's ability to implement World Bank procurement policies.

Annex 1. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team Members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Bjorn Hamso	Program Manager	GEEEX1	Team Leader
Anjum Ahmad	Senior Energy Specialist	GEE06	Co-Team Leader
Javaid Afzal	Senior Environmental Specialist	GEN06	
Zia Al Jalaly	Senior Social Development Spec	OPSPF	
Asif Ali	Senior Procurement Specialist	GGO06	
Rashid Aziz	Senior Energy Specialist	SASDE - HIS	
Abdulaziz Faghi	Senior Energy Specialist	GEE03	
Shaukat Javed	Program Assistant	GEE06	
Robert Michael Lesnick	Consultant	GEEDR	
Khizra Pervez	Program Assistant	ECSSD - HIS	
Hasan Saqib	Sr Financial Management Specialist	SARFM - HIS	
Anwar Ali Bhatti	Financial Analyst	SACPK	
Raghuveer Y. Sharma	Chief Investment Officer	CNGS5	
Supervision/NCO			
Anjum Ahmad	Senior Energy Specialist	GEE06	Team Leader
Michael Stanley	Lead Mining Specialist	GEEDR	Co-Team Leader
Khalid Bin Anjum	Senior Procurement Specialist	GGO06	
Akmal Minallah	Senior Financial Management Specialist	GGO23	
Salma Omar	Senior Social Development Specialist	GSU06	
Ahmad Imran Aslam	Environmental Specialist	GEN03	
Anwar Ali Bhatti	Financial Analyst	SACPK	
Noora Arfaa	Operations Officer	GEEEX1	
Abid Hussain Chaudhry	Program Assistant	SACPK	
Shaukat Javed	Program Assistant	GEE06	

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of Staff Weeks	US\$, thousands (including travel and consultant costs)
Lending	111	623
Total:	111	623
Supervision/NCO	122	691
Total:	122	691

MAP

