



1. Project Data

Project ID
P093765

Project Name
GAS SECT DEVT

Country
Turkiye

Practice Area(Lead)
Energy & Extractives

L/C/TF Number(s)
IBRD-73420,IBRD-83490

Closing Date (Original)
31-Dec-2012

Total Project Cost (USD)
709,693,584.58

Bank Approval Date
29-Nov-2005

Closing Date (Actual)
31-Dec-2021

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	325,000,000.00	0.00
Revised Commitment	709,693,584.58	0.00
Actual	709,693,584.58	0.00

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2. Project Objectives and Components

a. Objectives

The Project Development Objective (PDO) as stated in the Loan Agreement (Schedule 2, page 15) and in the Project Appraisal Document (PAD, page 4) is:

" To increase the reliability and stability of gas supply in Turkiye by implementing critically needed gas storage and network infrastructure, and support BORU HATLARI ILE PETROL TASIMA A.S.



(BOTAS) in strengthening its operations as a financially stable and commercially managed corporation".

The PDO is parsed as follows for this review.

1. To increase the reliability of gas supply
2. To increase the stability of gas supply
3. To support BOTAS in strengthening its operations as a commercially managed corporation
4. To support BOTAS in strengthening its operations as a financially stable corporation.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

There were two components (PAD, pages 5 - 6).

1. Gas storage facility. The estimated cost at appraisal was US\$365.70 million. The actual cost was US\$607.00 million. The actual cost was higher than the appraisal estimate due to the significant cost overruns during implementation.

This component planned to finance construction of a gas storage facility in an underground salt formation located close to Tuz Golu. Activities in this component: (i) construction of surface and sub-surface facilities (including engineering and construction, solution mining, the gas pipelines and the compressor facility); (ii) construction of water and brine discharge pipelines; (iii) cushion gas; and (iv) consultant's services for supervision, monitoring and regulatory aspects.

These changes were made to this component through the project restructurings (discussed below). (i) The original design envisioned financing 12 caverns in three phases of four caverns each. This aspect of design was changed to two phases of six caverns each; (ii) a 42 kilometer (km) high-voltage transmission line for the water pump was added; and (iii) the project no longer financed cushion gas, as this activity was financed by BOTAS (Turkiye's main pipeline company).

2. Network expansion. The estimated cost at appraisal was US\$88.50 million. The actual cost was US\$56.00 million.

This component planned to finance construction of two compressor stations at Erzincan and Corum and other network infrastructure for transmitting the increasing volumes of gas expected to be imported into Turkiye from existing and new sources.



BOTAS completed the compressor station at Corum with its own financing. As a result, this project only financed the Erzincan station.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project cost. The estimated cost at appraisal was US\$538.00 million. The actual cost was US\$938.69 million. The difference between the actual cost and the appraisal estimate was due to the significantly higher actual cost for component activities as compared to their appraisal estimates.

Project financing. The project was financed by an IBRD loan of US\$325.00 million to BOTAS, with the loan guaranteed by the treasury. AF of US\$400.00 million was approved on October 2, 2014. With this, the Bank financing was US\$750.00 million. The amount disbursed was US\$709.69 million.

Borrower contribution. The borrower contribution was estimated at US\$213.00 at appraisal. Their actual contribution was US\$229.00 million.

Dates. The project was approved on November 29, 2005, became effective on March 7, 2006, with a scheduled closing date of December 31, 2012. However, the project closed on December 31, 2021.

Changes. There were four Level 2 restructurings. The changes during implementation are listed in sequential order as follows:

The first restructuring on December 6, 2012, extended the closing by a year from December 31, 2012 to December 31, 2013, for completing the ongoing gas storage activities that were delayed in the initial years.

The second restructuring on May 22, 2014, extended the closing date by six months from December 31, 2013, to June 30, 2014 in response to the delays in finalizing the AF for the project.

The third restructuring on August 2014, extended the closing date by three months from June 30, 2014 to September 30, 2014 for the reason discussed above.

The changes made through the AF approved on October 2, 2014, are as follows.

- The AF was approved to cover the significant cost overruns of component one activities.
- The covenants associated with cushion gas were removed, since this activity was no longer financed by the project.
- The self-financing covenant pertaining to the financial health of BOTAS was removed from the Legal Agreement.
- The tariff filing for gas storage was postponed from January 31, 2009, to May 31, 2015, in view of the implementation delays.
- The safeguards on "Natural Habitats" was triggered, as the Tuz Golu salt lake, the final discharge location for brine solution, was a designated "Specially Protected Environmental Area".
- The closing date for the AF project was December 31, 2020.



Through the fourth project restructuring on December 30, 2020, the closing date was extended by a year from December 31, 2020, to December 31, 2021, for completing the ongoing activities that were delayed in the wake of the COVID - 19 pandemic.

3. Relevance of Objectives

Rationale

Country context. Before appraisal, the energy sector (especially the natural gas sector), was a key driver in Türkiye's economic recovery since 2004. Natural gas consumption had grown rapidly over the past two decades, with average annual growth of 24%. The largest user of natural gas was the electricity generation industry (65%), followed by the residential sector (20%) and the balance by the industrial sector. With growing urbanization and the potential increase in requirements for electricity and heating, the demand for natural gas was expected to grow rapidly in the medium term. Türkiye does not have significant gas reserves and 99% of its gas is imported from the Russian Federation, Iran, Algeria, Nigeria and and recently, Azerbaijan.

Sector context. Despite growing demand for natural gas, Türkiye did not have gas storage capacity. Most developed countries maintain gas storage as some portion of their gas consumption and Türkiye's law required storage to be maintained at 10% of its annual consumption. The lack of storage facilities jeopardized the security and reliability of the gas system, especially in winter. Given the need to improve security of gas supply, Türkiye had diversified its sources for importing gas. Although BOTAS had the potential to operate commercially over the medium term, as a government-controlled entity it faced restrictions on borrowings and investments. The objectives of improving energy security and BOTAS's ability to cover demand peaks in winter and improving the financial viability of BOTAS was important in the sector context.

Government strategy. Before appraisal, the Government had undertaken several energy sector reforms. The Government enacted the Natural Gas Market Law in 2001 for transferring imports of natural gas into private ownership. The Government enacted the public financial management law in 2003 for modernizing public financial management and reporting and the Energy Market Regulatory Authority (EMRA) was entrusted with the responsibility for setting standards for energy companies. Following the Natural Gas Market Law, BOTAS diversified its distribution business into separate companies which were privatized. In 2014 auctions were completed for 65 regions, and EMRA granted distribution licenses for conducting natural gas distribution and retail sales to 69 companies in 71 of 81 Türkiye's provinces.

Bank strategy. The PDO is well-aligned with the Bank strategy. At appraisal, the PDO was consistent with the Country Assistance Strategy (CAS) of October 2, 2003. The CAS identified the delays in developing gas markets as a serious issue in Türkiye. This issue was reiterated in the Country Partnership Strategy (CPS) for 2012- 2017. The Bank's current CPS for 2017 - 2021, articulated the need for Türkiye to move towards a more favorable energy mix (including renewables) and reducing its cost of importing energy by transitioning from oil to natural gas. The CPS also highlighted the need for liberalizing the energy sector.

Previous Bank experience. This project was the first Bank-financed gas storage project. The Bank has however financed many energy sector projects in Türkiye (such as the National Transmission Grid Project, the Renewable Energy Project and the Energy Community of South Eastern Europe project). The Bank was



also advising the Government on gas sector reforms, and in 2004 collaborated with the Government for producing a Gas Sector Strategy Note and a Gas Distribution Strategy Note for restructuring the sector. When this project was being implemented, the Bank also had a technical assistance (TA) project for supporting BOTAS's operations on a commercial basis (including through unbundling of BOTAS and a gas trading platform).

The project activities were output-oriented. However, as discussed in the theory of change (section three), the intended outcomes of increasing the reliability and stability could be imputed from the outputs of the gas storage facility and the compressor stations. Although there were legal covenants, the project did not directly support activities aimed at the commercial orientation or the financial viability of BOTAS. The relevance of objectives is substantial.

Rating

Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To increase the reliability of gas supply.

Rationale

Theory of change. The outputs such as the gas storage facility and related infrastructure (surface and sub-surface facilities and water and brine discharge facilities, solution mining, the gas pipelines and the compressor facility), and the two compression stations at Erzincan and Corum for transmitting the volume of gas imported into Türkiye, were expected to increase the capacity for storing imported gas. These outputs were expected to provide for the back up in case of unexpected supply interruptions and thereby aid in increasing the reliability of gas supply in Türkiye). The links between project activities, outputs and outcomes were logical.

Outputs.

- Ten caverns for storing gas were completed, short of the target of twelve. The remaining two caverns were infeasible due to geological reasons. The storage capacity in each of the ten caverns increased to 0.92 Million cubic meters (bcm), as compared to the target of 0.96 bcm. The ICR (page 20) notes that 0.92 bcm instead of 0.96 is considered by industry norms to be technically reasonable, given the uncertainty with this type of project.
- At project closure on December 31, 2021, the total pipeline capacity for the gas transmission network in Türkiye was 109 bcm/year. Of this, 18 bcm were to come from the compressor stations at Erzincan and Corum. The project contributed to achieving 10 bcm of the pipeline capacity, as the Corum station was completed by BOTAS outside the project.



Outcomes.

The outputs described above was expected to increase reliability of gas supply (reliability defined as meeting demand without interruptions).

- In the absence of baseline and target figures, BOTAS provided information on curtailment data (the difference between actual consumption and demand) from 2017. There was a steady increase in curtailment of gas supply to the industry and energy sectors during the winter months (November to February) during which demand peaks up to 2017, when the first phase of this project was completed. There was however no curtailment during the winter months from 2018 to 2020 when the second phase was completed. The storage facility at Tuz Golu reduced curtailment by almost 5% of gas demand in 2020 - 2022.
- The ICR (paragraph 38) notes that there was curtailment during the 2020 - 2021 winter due to an isolated situation. Iran halted natural gas flow to Turkiye for ten days due to technical failures on a key pipeline. This contributed to the curtailment, since Iran accounts around 10% of Turkiye's gas imports. The ICR notes that the Ministry of Energy and Natural Resources (MENR) and BOTAS had implemented a policy of no interruptions to household customers, with curtailments confined to the industry and energy sectors.

Based on the information discussed above, this review concludes that the project substantially contributed to increasing the reliability of gas supply in Turkiye.

Rating

Substantial

OBJECTIVE 2

Objective

To increase the stability of gas supply.

Rationale

Theory of change. The increase in storage capacity due to the gas storage facility and related infrastructure and the two compression stations were expected to enable BOTAS to inject and withdraw gas during periods of low and high demand and thereby help to stabilize the supply of gas at the wholesale level. The links between project activities, outputs and outcomes were logical.

Outputs.

The outputs described above were relevant to this objective.

Outcomes.

The outputs described above was expected to increase stability of gas supply (with stability defined as the ability to inject and withdraw during periods of low and high demand).



- According to the curtailment data provided by BOTAS, while there was a steady increase in curtailment of gas supply during the winter months (November to February) up to 2017, there was no curtailment during the winter months from 2018 to 2022. As described above, the curtailment during 2020 - 2021 was due to an unusual situation.

Based on the BOTAS curtailment data, this review concludes that the project substantially contributed to increasing the stability of gas supply in Türkiye.

Rating
Substantial

OBJECTIVE 3

Objective

To support BOTAS in strengthening its operations as a commercially managed corporation.

Rationale

Theory of change. The project did not directly support activities aimed at supporting BOTAS as a commercially managed corporation. However, the targets specified in the financial covenants were intended to contribute to the intended outcome. The theory of change explicitly assumes that the financial covenants and the support provided by the Bank under a different technical assistance project would be expected to help in BOTAS's commercial orientation.

Outputs.

- The annual financial audits provided by BOTAS were verified as specified in the AF Loan Agreement.
- When the project closed, BOTAS storage unit was operating as a separate business unit to ensure open access. Storage facilities could also be accessed by third party private operators as required by law.

Outcomes

No specific intervention was included either in the project investments or as conditions in the Loan Agreement, directly supporting the third intended outcome. The main intervention for this was the technical assistance provided by the Bank under a different project for the unbundling of BOTAS and gas trading platform.

Given that the outcome cannot be attributed to the project activities, efficacy of this objective is modest.

Rating
Modest



OBJECTIVE 4

Objective

To support BOTAS in strengthening its operations as a financially stable corporation.

Rationale

Theory of change. The project did not have activities aimed at supporting BOTAS in strengthening its operations as a financially stable corporation. The target specified in the original covenant was intended to lead to the intended outcome. However, the self-financing covenant was dropped with the AF for the project.

Outcomes.

- The debt service coverage ratio when the project closed was 1.20 as targeted. According to the clarification provided by the team, this requirement was also included in the Loan Agreement.
- According to the clarifications provided by the team, BOTAS remained financially viable during the whole period of project implementation (with the Government providing targeted support through tariff increase and deferral of tax payments over time). The team also clarified that there were several tariff adjustments during implementation for transmission, distribution of gas and for storage of gas. The tariff for storage was to be a formula guaranteeing an acceptable rate of return to BOTAS for the storage services.

Efficacy of this PDO is rated as substantial.

Rating

Substantial

OVERALL EFFICACY

Rationale

Of the four intended outcomes, three outcomes (increasing the reliability of gas, increasing the stability of gas supply and financial viability of BOTAS) were realized. However, there is no evidence that the project interventions supported BOTAS in strengthening its operations as a commercially managed corporation). Overall efficacy is substantial.

Overall Efficacy Rating

Substantial

5. Efficiency



Economic analysis. An economic analysis was conducted for the activities of constructing the gas storage facility and related infrastructure. These components accounted for 78% of the appraised cost and 85% of the actual cost. The project benefits were assumed to come from: (i) seasonal storage benefits; (ii) cost avoided due to the availability of seasonal storage; (iii) avoided costs of interruptions from peak shaving; and (iv) avoided cost of unplanned interruptions. The Net Present Value (NPV) at closure was US\$111.00 million, as compared to the NPV of US\$ 236.00 million at appraisal. The ex-post Economic Internal Rate of Return (EIRR) was 15.1%, as compared to the ex-ante EIRR of 17.3%. The reason for the difference between the ex-post EIRR and the ex-ante EIRR was due to the cost escalation due to procurement delays and delay in the start of revenue generation. The EIRR for the compressor station was not calculated at closure.

Administrative and operational shortcomings. A sequence of procurement setbacks, corruption investigations and the debarment of the lowest evaluated bidder for the project components delayed the start of construction by almost five years.

The cost of constructing the gas storage facility was significantly underestimated, with the actual cost almost twice that of the appraisal estimate. This necessitated the AF for the project. The cost escalation was due to a combination of factors including: (i) cost increase to BOTAS from transferring the geological risk allocation cost to the contractor; (ii) cost of constructing a 42 km high-voltage transmission line that was added for the water pumps needed for solution mining; and (iii) incremental cost of operating phase one while phase two was under construction. The cost overruns were exacerbated by factors over which the project had no control such as increased material costs (steel and copper), geological factors which rendered two of the twelve salt caverns to be unusable and in the final years due to the restrictions in the wake of the COVID-19 pandemic.

One shortcoming of the project was that it did not directly support any activities aimed at supporting BOTAS to operate as a commercial corporation or strengthening its financial stability. Finally, despite the AF, the project financed a reduced scope of project activities, with the originally envisioned Corum compression line eventually financed by BOTAS.

In sum, efficiency is rated as modest in view of the administrative and operational shortcomings during project execution.

Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	17.30	78.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	15.10	85.00 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.



6. Outcome

The relevance of the PDO to the Government and the Bank strategy is substantial. Overall efficacy is substantial, with three of the objectives (increasing the reliability and stability of gas supply, and financial viability of BOTAS rated as substantial. Efficiency is modest, due to the administrative and operational shortcomings during implementation. Taking these ratings into account, overall outcome is moderately satisfactory.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

Technical risk. The technical risk to the project development outcome is moderate. The ICR (paragraph 101) notes that: (i) the storage and compressor capacity are likely to be available over the life of investments; and (ii) BOTAS had good operational arrangements to operate and manage the assets created under the project.

Macroeconomic risk. There is substantial macroeconomic risk, given the reluctance of the Government and the regulatory authority to increase tariffs to cover the increased cost of gas in the past, as part of the Government's policy to contain inflation.

8. Assessment of Bank Performance

a. Quality-at-Entry

There was no precedent on the technical aspects, as this was the first Bank-financed gas storage project. Therefore, the Bank prepared this project based on its executing large infrastructure projects, and from the experience of experts in gas storage. The lessons incorporated at design included: (i) focusing attention on examining feasibility; (ii) introducing monitoring equipment for monitoring seismic activity; (iii) attention on safeguards; and (iv) developing a regulatory framework in consultation with BOTAS and the Energy Market Regulatory Authority (EMRA). (PAD, pages 4 - 5). The analytical underpinnings of the project were sound and based on the Bank's Gas Sector Strategy Note, the Gas Distribution Strategy Note, the World Bank Development of Regional Energy Trade in Southeast Europe and the Economic and Regulatory Assessment of the Tuz Golu project.

The Bank identified several risks at appraisal including substantial risk associated with the macroeconomic constraints (The Government in the past had maintained consumer prices for natural gas when gas prices were rising. This had adversely impacted BOTAS profit margins).



The implementation arrangements at appraisal were appropriate. BOTAS was in charge of designing the compressor stations as it had significant experience in operating compressors. A Project Management Unit (PMU) in BOTAS was in charge of project implementation (PAD, pages 8 - 9). The arrangements made at appraisal for safeguards and fiduciary compliance were appropriate (discussed in section 10).

There were moderate shortcomings at Quality-at-Entry. The risks associated procurement delays were underestimated. These delays contributed to the significant cost overruns which necessitated the AF for the project. There was no geological risk assessment at preparation. This contributed to the infeasibility of two caverns. There were M&E design shortcomings (discussed in section 9).

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

Twenty five Implementation Status Results (ISR) reports were filed over the execution period of fifteen years, implying twice a year supervision missions. The continuity of leadership was more or less maintained, with five task team Leaders (TTLs) over the project lifetime of fifteen years. The team was proactive in working with the Government to help BOTAS in meeting the project's financial covenants and motivating BOTAS resolve the outstanding contract issues by project closure. The support provided by the supervision team aided in safeguards and fiduciary compliance (CR, paragraph 76).

There were moderate shortcomings during supervision. The team was not proactive in reducing the initial procurement delays and adjusting either the PDO or the results indicators to ensure their consistency.

In sum, overall Bank performance is moderately satisfactory in view of the moderate shortcomings both at Quality-at-Entry and during supervision.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

BOTAS was in charge of monitoring the performance indicators. The monitoring was to include reporting progress on the financial and operational efficiency of BOTAS with financial and operational ratios and separation of storage into a separate business unit.



However, there were several shortcomings in M&E design. While the project activities aimed at increasing the reliability and stability of gas supply, there was no precise definition of "stability" and "reliability". While curtailment is a good proxy, there was neither a baseline nor targets for this indicator. Since the project did not directly support institutional strengthening activities, only compliance with the financial covenant was used for monitoring activities associated with commercial orientation and financial viability of BOTAS. Furthermore, even though an indicator for beneficiaries and their disaggregation by gender was added to the results framework with the AF for the project, household-level monitoring and gender analysis was not considered to be relevant, as gas storage facilities and compressor stations were assumed to not have direct operational impact on households, or men and women, per se.

b. M&E Implementation

The ICR (paragraph 87) notes data for monitoring project performance was collected regularly and in a timely manner. The financial performance reporting was thorough and this helped the Bank in flagging issues (such as the loss noted in 2012, indicating BOTAS' non compliance with the financial covenants on the loan with regard to the self-financing and debt-coverage ratio). The ICR reports that there were some inaccuracies in the reporting of data with respect to the increase in compressor capacity.

c. M&E Utilization

The M&E data was used for providing guidance during the project restructurings and monitoring performance at project closure.

In sum, M&E is rated as modest in view of the shortcomings at M&E design and implementation.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project was classified as a Category A (full assessment) project under the World Bank safeguard policies: Three safeguard policies were triggered at appraisal: Environmental Assessment (OP/BP 4.01); Involuntary Resettlement (OP/BP 4.12); and Safety of Dams (OP/BP 4.37). (PAD, page 18). With the AF project, the safeguards on Natural Habitats was also triggered, as the brine discharge had some possibility of affecting the habitat of certain bird species (ICR, paragraph 91). The summary reporting below on compliance with Bank safeguards is based on the detailed discussion from pages 35 - 37 of the ICR.

Environmental Assessment and Natural Habitats. BOTAS prepared and publicly-disclosed an Environmental Impact Assessment (EIA) on July 8, 2005, to address the environmental impacts. As the original EIA did not cover access roads and electricity transmission lines that were added with the AF, BOTAS prepared an addendum to the EIA to address these issues. The project's compliance with environmental safeguards was rated as moderately satisfactory, as there were minor unresolved



environmental issues when the project closed. There were no issues with the safeguards on natural habitats.

Involuntary Resettlement. As there was the possibility that landowners (public and private), could be affected by the project activities, BOTAS prepared and publicly-disclosed a Land Acquisition Plan (LAP) in 2005. The 2005 LAP was revised in February 2013 to include the power transmission line and the access roads. There was economic but no displacement of Project Affected Peoples (PAPs) during implementation. Compensation was made to the affected PAP from 2012 - 2015, and to informal residents later. In December 2016, four informal households (consisting of 17 individuals) were notified about physical displacement due to safety concerns. The affected households were compensated by BOTAS in 2018.

Safety of Dams. This safeguards was triggered, as the project was expected to use water from the Hirfali Dam. The State Hydraulic Works (DSI) - the agency in charge of operating dams, conducted a site visit to Hirfali and attested to the soundness of the dam structure. The report was validated by the Bank's dam safety expert. There were no issues with the safeguards on safety of dams during implementation.

b. Fiduciary Compliance

Financial Management. The Bank conducted an assessment of BOTAS's financial arrangements at appraisal. The assessment concluded that the financial arrangements were adequate (PAD, page 15). The financial management was rated as moderately satisfactory during implementation (ICR, paragraph 97). There were some discrepancies in the project's Aide Memoire of 2021. The ICR notes that a time-bound action plan was agreed with the BOTAS and that compliance with the plan would be monitored regularly by the Bank. According to the clarifications provided by the team, the audits were unqualified and the final audit was submitted in October 2022, for the full financial year of 2021.

Procurement. The Bank conducted an assessment of BOTAS procurement arrangements (PAD, page 45). Although BOTAS had experience executing large infrastructure projects, it lacked experience with Bank's procurement guidelines. Therefore, the procurement was rated as high at appraisal. Mitigation measures incorporated at design, included training and monthly procurement meetings. BOTAS developed a procurement plan at appraisal that was acceptable to the Bank. There were significant procurement delays during implementation, due to the Government's investigations of several procurement packages. However, there were no actual procurement irregularities. A potential dispute, regarding two unusable wells was resolved by project closing.

c. Unintended impacts (Positive or Negative)

The ICR (paragraph 65) noted that there were no unintended impacts.

d. Other



11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	Substantial	

12. Lessons

The ICR draws the following main lessons from the experience of implementing this project, with some adaptation of language.

1. It would be useful to consider gas storage as an integral part of the Bank's options, when considering support to a country to ensure energy security. Given that gas demand patterns from end-users typically coincide with gas supply profiles, a buffer capacity would aid in ensuring reliable gas services. This is particularly so in countries like Turkiye which import significant amounts of natural gas.

2. Adequate analysis of the related risks and appropriate mitigation measures are particularly needed in ambitious, Bank-financed projects. This project, which was the first of its kind financed by the Bank identified fiduciary risks as substantial. It did not however make an assessment of the geological risks. This eventually led to the infeasibility of two caverns envisioned in the original design.

3. The overall theory of change needs to be consistent with the activities financed under the project. In this project, a PDO indicator ("storage operates as a separate business unit to ensure independence and open access"), was not attributable to any project interventions. The design implicitly assumed that Bank interventions elsewhere would produce this intended outcome. The key lesson is that such a presumption needs to be formalized, and this link needs to be explicitly recognized as acceptable practice for evaluation purposes.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is well-written. The ICR candidly acknowledges the weak links between some project activities and the chosen key outcome indicators in the theory of change. Given that some words in the PDO like "the reliability



and stability of gas supply" were not properly defined, the ICR does a commendable job of identifying appropriate proxy indicators. The analysis provided in the ICR is adequate for monitoring performance. The ICR draws good lessons from the experience of implementing this project.

One minor shortcoming of the ICR is its length. The main body of the text at about 35 pages is more than the recommended length of 15 pages.

a. Quality of ICR Rating
Substantial