



1. Project Data

Project ID P132443	Project Name DIST HEAT EFFIC IMPR	
Country Moldova	Practice Area(Lead) Energy & Extractives	
L/C/TF Number(s) IBRD-84510	Closing Date (Original) 30-Jun-2020	Total Project Cost (USD) 40,280,856.05
Bank Approval Date 21-Nov-2014	Closing Date (Actual) 30-Jun-2020	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	40,500,000.00	0.00
Revised Commitment	40,500,000.00	0.00
Actual	40,280,856.05	0.00

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2. Project Objectives and Components

a. Objectives

As per the Loan Agreement (LA, p.6) dated April 15, 2015 and the Project Appraisal Document (PAD, p.6), the Project Development Objective (PDO) was "to contribute to improved operational efficiency and financial viability of the new district heating company and to improve quality and reliability of heating services delivered to the population of Chisinau". The PDO was unchanged throughout project implementation. This review will assess the project performance by parsing the PDO as follows:

- (i) to contribute to improved operational efficiency of the new district heating company,



- (ii) to improve the quality of heating services delivered to the population of Chisinau,
- (iii) to improve the reliability of heating services delivered to the population of Chisinau, and
- (iv) to contribute to improved financial viability of the new district heating company (Termocom, the heating utility at appraisal, was renamed Termoelectrica during project implementation)

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

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1: Investments to District Heating System: (Cost at appraisal of US\$38.50 million and actual cost amounted to US\$33.30 million). Under this component, the following activities were to be financed: (a) modernization of selected pumping stations to reduce electricity consumption and provide for efficient variable flow operation mode of the District Heating (DH) system; (b) rehabilitation of selected segments of the distribution network to ensure continued secure DH service and reduction of losses of heat and hot water; (c) replacement of old and inefficient central heat substations (CHS) with modern fully-automated individual building level heat substations (IHS) for more efficient and secure heat supply to end-users; and (d) reconnection of about 40 public institutions, which were earlier disconnected, to the DH system to improve the usage of the DH system.

Component 2: Support for streamlining operations: (Cost at appraisal of US\$10.1 million, with actual cost of US\$5.50 million). This component intended to finance the following activities related to closure of the Combined Heat and Power Station-1 (CHP-1) plant: (a) the connection of an alternative heat distribution network and construction of new pumping stations to service the area supplied by CHP-1; (b) supporting the design and implementation of the Social Impact Mitigation Plan, which included severance payments, retraining and placement services to provide new employment opportunities, and grievance mechanism; and (c) carrying out an Environmental Audit for the CHP-1 site.

Component 3: Project Management: (Cost at appraisal of US\$2.9 million and actual cost amounted to US\$1.50 million). This component was to fund the following activities: (a) to carry out project audits; (b) to carry out the financial management and procurement requirements under the project; (c) to ensure the monitoring and evaluation of project activities; (d) to provide capacity building and cover project implementation costs of the Moldova Energy Projects Implementation Unit (MEPIU); (e) to fund public awareness campaigns for dissemination of the benefits of energy efficiency improvements and efficiently operating Chisinau's district heating system; and (f) to provide technical assistance to Termoelectrica (the new district heating company).

Revised Component 3: When the project was restructured in February 2019, the item (e) of Component 3 was renamed as "Technical Assistance for developing the Corporate Communication Strategy for TE and Public Awareness Campaigns for dissemination of the benefits of Energy Efficiency improvements and



efficiently operating Chisinau's District Heating system during the first season of Strategy implementation". There was no other revision to the components.

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

Project Cost: At appraisal, the project cost was estimated at US\$61.10 million, including US\$3.00 million for physical contingencies and US\$6.50 million for price contingencies, as well as in-kind contribution from the borrower estimated at US\$20.6 million. At project closing, the actual project cost amounted to US\$40.30 million.

Financing: At appraisal, the project financing was estimated at US\$40.50 million from an International Bank for Reconstruction and Development (IBRD) loan. At project closing, actual disbursements amounted to US\$40.30 million from the IBRD loan window.

Borrower Contribution: At appraisal, the Borrower was to provide in-kind contribution estimated at about US\$20.60 million (PAD, para 17&24). While the ICR did not discuss the extent of borrower contribution, the World Bank Task Team Leader (TTL) indicated that investments amounting to about US\$20.0 million were undertaken by the new heating company but not considered as co-financing or parallel financing, as this was not specified in the loan agreement.

Restructurings: The project went through one Level 2 restructuring in February, 2019. The project restructuring aimed to reallocate funds from Category 2 to Category 1 as set out in the withdrawal of loan proceeds table in the Loan Agreement.

Dates: The project was approved on November 21, 2014 and became effective on August 14, 2015. The Midterm Review was completed on November 15, 2019, and the project closed at due term on June 30, 2020.

3. Relevance of Objectives

Rationale

Overall, the relevance of the objectives was rated **high** because the objectives were consistent with the country's priorities, as their identification was informed by analytical work and previous Bank's engagement in the country, and they were in line with the Bank's partnership agenda in the country.

The project was aligned with the country's context and priorities: The poor quality of district heating (DH) services, combined with the inability of consumers to regulate their heat consumption led to increased disconnections from the centralized DH system by the more affluent residents of Chisinau, who installed individual gas boilers in their own apartments. The poor and vulnerable population could not afford individual boilers, and remained on the DH system, often receiving poor quality of heating and hot water service delivery. This high rate of disconnections reduced Termocom's (TC – the municipality-owned heating utility at appraisal) paying consumer base, leaving the utility with fewer ways of recovering its costs. Failure of the DH system would have meant that about 40 percent of DH clients could have been left with no alternative in a region where space heating during cold winter months is essential for the



population's health and well-being. The design and approval of this project was prompted by the acute needs from the poorest category of the Chisinau city. At project closure, key PDOs were still highly relevant, as the project was supporting the improvement of the district heating efficiency, including the recovery process of TC, a complete corporate restructuring and staff optimization, the reduction of heat losses and electricity consumption, as well as service modernization and client orientation and return to profitability.

The PDOs were consistent with Bank's involvement in the sector: This project was the first initiative in Moldova to improve the operations of a major district heating company in a systematic manner. The World Bank launched this project by drawing from substantial experience in policy, institutional, and investment in the heating sector in other regional countries. At the country level, three initiatives lay the foundation to this project: (i) a World Bank Policy Note helped to prepare an Action Plan for the financial stabilization of the district heating sector in Chisinau in November 2009, (ii) a Chişinău Heat and Electricity Supply Institutional and Financial Restructuring Study in 2011, and (iii) an Energy Sector Reform and Efficiency Improvements (ESREI) Project, which funded investments in rehabilitation of the heating engineering systems in 2014, provided TA to identify near-term priority investments and to implement the support to corporate restructuring of TC, completed in June 2015.[IKH1] The pursuit of identified PDOs was a logic continuation of the previous World Bank's achievements in the areas of heating sector reforms, TA and investments.

The PDOs were in synchrony with the Bank's strategy for Moldova. The Project was fully aligned with the strategic objectives of the current Country Partnership Framework (CPF) for Moldova for FY2018-21[IKH2] . Rehabilitation and upgrade of the heating infrastructure was the key impediment to improving operational efficiency, heating quality and reliability, and financial viability as well. By financing the rehabilitation of the DH infrastructure in Chisinau, the project contributed to achieving the CPF Focus Area 2 (Service Governance), by improving efficiency, quality and inclusive access to public services, and specifically, the financial sustainability of energy utilities. In addition, the project was aligned with the CPF Objective 1B, namely "Strengthened management of public sector assets ", which aimed to achieve effective and independent energy sector regulation and support largest Public Interest Entities (SOEs) to timely issue their financial statements. Moreover, through fuel and energy savings, the project was part of the Moldova's efforts to comply with GHG emission reduction goals and to meet its Nationally Determined Contributions (NDC) under the Paris Agreement. There was a congruence between the four PDOs and the above-described agenda of the Bank in Moldova.

Rating

High

4. Achievement of Objectives (Efficacy)



OBJECTIVE 1

Objective

To contribute to improved operational efficiency of the new district heating company (Termoelectrica)

Rationale

Theory of Change for Objective 1

Toward the first objective, the theory of change detailed in the ICR indicates that activities funded by the project would generate the following outputs: (i) pumping stations were to be retrofitted and installed, (ii) IHSs were to be installed, and (iii) selected segments of the network were to be rehabilitated. The above outputs were to directly result in improved operational efficiency of TE, which was to be reflected in the change in the intermediate outcomes (reduction in heat consumption and surge in individual beneficiaries), and in the final outcomes (reduction of the breakdown rate, the network heat losses, and the lifetime CO2 emissions, and increase in lifetime energy savings). Overall, the causal chain from inputs to outcomes was valid and outcomes were directly derived from the project's intervention. However, the theory of change did not identify the assumptions that were to be met to ensure that the achieved outcomes would be sustainable.

Outputs

- Modernization of three main pumping stations (PS-8, PS-12 and PS-13), against a target of two;
- Replacement of 14.4 km of district heating (DH) pipelines against a target of 20 km;
- Reconnection of public institutions to the DH system was satisfactorily completed, despite initial delays. TE completed the work with its own funds by the project completion date, and 46 public institutions were reconnected to the district heating system against a target of 44;
- 15 residential buildings have benefited from partial rehabilitation works at the collective heating supply system,
- 306 IHSs and associated pipes were installed in residential buildings against a target of 114; and
- The Social Impact Mitigation Plan (SIMP) was developed and implemented, as planned, to enable execution of the staff reduction program with severance payments by TE according to the provisions of legislation in force.

Outcome

- 95,580 people benefited from the installation of IHSs and associated pipes, against a target of 109,000;
- The target for reduction in network heat losses (GCal) was exceeded, reaching a reduction of 55,859 GCal against a target of 30,000 Gcal;
- The target for projected reduction in network heat losses was also exceeded, reaching 17,743,071,570 MJ, against a target of 9,603,288,368 MJ;
- The target for the projected lifetime energy savings (MWh) was exceeded, reaching 5,870,910 MWh, against a target of 2,849,208 MWh; and
- The target for annual reduction of the projected lifetime reduction in CO2 emissions (tons per year) was exceeded, reaching 1,675,500 tons per year, against a target of 685,299.



- The project allowed the heating company to halt and reverse the downward spiral in DH services in Chisinau and to help generate sufficient revenues for maintenance and investment, as reflected by the increased profitability developed under PDO-4;
- A Social Impact Management Plan (SIMP) was prepared with clear action plans on training, job transition and compensation options for the staff who have been subject to retrenchment.
- Overall, project's efficacy in contributing to improved operational efficiency of the new district heating company is rated Substantial. While the four core PDO indicators were exceeded, the final decommissioning of the CHP-1 was postponed until 2023.

Rating

Substantial

OBJECTIVE 2

Objective

To improve the reliability of heating services delivered to the population of Chisinau

Rationale

Theory of Change for Objective 2

Toward the second objective, the theory of change in the ICR assumed that all outputs generated and listed under the first objective will feed into the achievements of the second objective. The listed outputs were to logically contribute to improving the reliability of heating services delivered to the population of Chisinau. The reliability was to be reflected in the change in the final outcomes (reduction of the breakdown rate, the network heat losses, and lifetime CO2 emissions, and increase in lifetime energy savings).

Outputs

- Please see outputs under Objective 1 above.

Outcome

- Breakdown cases fell significantly, as illustrated by sustained dropping, with 422 breakdowns in 2016 in the system, 380 in 2018, 334 in 2019, and 118 breakdowns were registered during the first 6 months of 2020;
- The breakdown rate improved from a baseline of 1.36 breaks per km to 0.62 breaks per km, better than the target of 0.90 breaks per km.



- The achievement of this objective is rated substantial. While the above PDO performance indicator was achieved, the ICR did not provide sufficient evidence portraying the reliability of heating services.

Rating

Substantial

OBJECTIVE 3

Objective

To improve the quality of heating services delivered to the population of Chisinau

Rationale

Theory of Change for Objective 3

The theory of change underlying the third objective drew from inputs that were used to generate the outputs and outcomes listed under the PDO-1 and the PDO-2. Key outputs included (i) the rehabilitation of the main

network and pumping stations, and construction of a new pumping station and a main pipeline; (ii) the modernization of three main pumping stations; (iii) the replacement district heating (DH) pipelines; (iv) the modernization of the heat distribution network, and (v) the installation of IHSs and associated pipes in residential building. Other outputs aimed to increase the public awareness of the new benefits of energy efficiency improvements. The key outcome was to be measured by the “percentage of household that reported improved quality of service in buildings where IHSs were installed”.

Outputs

- Please see outputs under Objective 1 above;
- A Corporate Communication Strategy for Termoelectrica SA was developed and public awareness campaigns for the dissemination of benefits of energy efficiency improvements were conducted;
- Public awareness campaigns comprised the following elements: street publicity through (i) 10 billboards on rented locations and another 19 on the locations owned by TE; (ii) promotional materials placed in municipal transport; (iii) branded trolley bus on municipal route for one year period two e-banners in online and social media; media campaigns with two video spots and three testimonials, and (iv) other local and specific promotional materials.

Outcome

- 95,063 people gained access to more energy-efficient cooking and/or heating facilities, against a target of 109,000, achieving 87 percent of the target;
- The "percentage of household that reported improved quality of service in buildings where IHSs were installed" was measured by a client satisfaction survey. The survey was held after completion of investment contracts for installation of Individual Heat Substations (IHSs) and recorded a 63 percent



rate of respondents who reported improved services. The results were satisfactory, but were lower than the originally planned target of 80 percent;

- Overall satisfaction with the services provided by Termoelectrica SA increased among the company's subscribers, with favorable assessments becoming the majority (53%, compared to 48% in year 2018);
- An interview reaching out an overall participation rate of 26 percent of consumers found progress, as there were improvements in the services referred to 'improved heating and the ability to turn on/off the heating and adjust the temperature at the consumer's wish after the IHSs; and
- An important indication of customer satisfaction was the reduction of erosion in TE's consumer base. The total number of disconnections from the DH system reduced from 1,624 in 2011 to just 93 in 2019. As a result of new connections, TE's consumer base has actually increased by about 5 percent since 2017. This is due to the reduction of heat losses and improved operation of main pumping equipment, which increased service quality. Ability to regulate heat consumption improves consumer comfort, while reducing heating costs for end-users.
- Overall, the access to more energy-efficient cooking and/or heating facilities was close to the target (87 percent), and the TE's consumer base has been increasing since 2017, although the core performance indicator of customer satisfaction reached only 79 percent of the target. While the quality of heating services was not at the desired level, a comparison of the achieved outcome to the heating situation that would have prevailed without the project shows that efficacy toward the third objective was impactful. "Studies showed that the remaining consumers were primarily low-income and vulnerable consumers with no other heating option, for whom a well-functioning district heating service was essential. Failure of the district heating system would have meant that about 40% of consumers of DH services could have been left with no alternative in a region where space heating during cold winter months is essential for the population's health and well-being" (ICR, p.1). The project contributed significantly to meeting these consumers' needs for more reliable heating services and allowing the company to retain its customer base, and paving the way to enhancing its financial viability.

In conclusion, comparing the achieved outcome detailed above to the situation of heating services that would have prevailed for the Chisinau population without the project, the performance toward the third objective is rated as substantial.

Rating

Substantial

OBJECTIVE 4

Objective

To contribute to improved financial viability of the new district heating company (Termoelectrica)

Rationale

Theory of Change for Objective 4



As indicated in the ICR, results under the fourth objective could not be achieved without the achieved outputs and outcome under the other three objectives. Therefore, all outputs and outcomes achieved under the three PDOs fed directly or indirectly into the results achieved under the fourth objective. Below are the specific results in the area of financial management with the project support.

Toward the fourth objective, the theory of change underlying the transformation of funded activities were to generate the following outputs: (i) the completion of the DH Tariff reform, (ii) the strengthening of the corporate procurement and financial management, (iii) the completion of an analysis of asset valuation, depreciation principles, methodologies and procedures, (iii) the reconnection of public buildings, and (iv) the carrying out of a public awareness campaign. The above outputs were expected to result into the following outcomes: (i) increased TC managerial and financial discipline, (ii) increased profitability and viability of the company and (iii) increase of its annual investment. However, the theory of change did not discuss the assumptions underlying the long-term sustainability of achieved outcome under this objective.

Key outputs and outcomes generated by this project under this objective were as detailed below:

Outputs

- The corporate procurement and financial management were enhanced;
- The reconnection of public buildings was completed (see PDO-1);
- The ESMAP-funded TA on District Heating and Electricity Tariff and Affordability Analysis (P151113) was completed in 2015 and informed the DH tariff reform;
- The TA identified areas for improvement in DH tariff methodology and provided the poverty impact analysis needed to support the dialogue;
- Toward the tariff reform effort, a qualified International Consultant was hired, and the latter helped TE and the National Agency for Energy Regulation (ANRE) assess DH losses and review of existing methodologies, and an analysis of asset valuation, depreciation principles, methodologies and procedures was carried out; and
- The DH Tariff reform was completed

Outcome

- TE has significantly improved its operating profitability and financial capacity, and has made significant progress in paying back its historical debts, due efforts to retain consumers and new connections, as well as the adoption of cost-recovery tariff by ANRE;
- Improvement in TE's financial performance is reflected in the following key indicators:
 - Increased profitability (from a net loss of MDL 361 million or 15% of total revenues in 2015 to a net profit after tax of MDL 200 million or 8.5% of total revenues in 2019);
 - Increase in its current ratio (total current assets divided by total current liabilities) from 0.91 in 2015 to 4.82 in 2019;
 - TE has been able to make payments to its suppliers, including Moldovagaz for current year supplies, without recourse to short term borrowings;
 - Key financial indicators which improved were (i) the debt service coverage ratio (DSCR) improved to reach 42, against a target superior to 1.2, and (ii) the self-financing ratio (SFR) reached 67, against a target superior to a ratio of 25;
 - However, as pointed out in the audit report for 2019, the issue in regard to the historical debt owed to Moldovagaz has not been resolved. Satisfactory resolution of this issue, with the



- active involvement of GoM, would be essential for ensuring the future financial sustainability of TE;
- TE was able to significantly increase its annual investment program in the DH network, in large part due to increased cash flow from operations, while paying in advance for current gas supply, and making some payments to Moldovagaz for the historical gas debt (about 18 percent of the historical debt);
- TE’s increased managerial and financial discipline, along with improved sector regulation, have helped consolidate the position of DH in Chisinau and start to reverse the previous trend of erosion of its customer base; and
- The financial viability of the company was measured by the Debt Service Coverage Ratio and the Self-financing Ratio, all of which were exceeded as indicated above.
- In summary, the project performance toward the achievement of the fourth objective is rated substantial, because of increased TC managerial and financial discipline, increased profitability and viability of the company and an increase of its annual investments. However, the historical debt owed to Moldovagaz was not resolved at project closure. Finally, achievement of the outcome is attributable to both this project and the ESMAP support to the tariff reform.

Rating
Substantial

OVERALL EFFICACY

Rationale

The Overall Efficacy Rating of the project in achieving the project objectives is substantial based on the Substantial rating for all four objectives. Toward the first objective, key outcome included the reduction of the network heat losses, the projected reduction in network heat losses, the projected lifetime energy savings (MWh), and the annual reduction of the projected lifetime reduction in CO2 emissions. Toward the second objective, the key result was the significant reduction of the breakdown rate in the heating system, but evidence for reliability of heating services was insufficient. Performance toward the third objective was also substantial; while the client satisfaction survey recorded a lower than the originally planned target, achieved outcome was impactful to the Chisinau population in comparison with “the without the project” case. Finally, toward the fourth objective, the two core indicators were achieved (the debt service coverage ratio and the self-financing ratio), leading to increased TC managerial and financial discipline, increased profitability and viability of the company, but the historical debt owed to Moldovagaz was not resolved at project closure.

Overall Efficacy Rating



Substantial

5. Efficiency

Economic and financial efficiency

The post-completion EIRR and ENPV are substantially lower than the appraisal estimates. The EIRR and the ENPV at appraisal were 21 percent and US\$16.1 million respectively. At project closure, the EIRR stood at 10.6 percent and 9.9 percent, while the ENPV reached US\$15.32 million and 12.95 million, respectively with and without GHG emission reduction benefits. The main reasons for the lower post-completion EIRR and ENPV were a sharp decline in international gas prices that resulted in lower economic benefits from gas savings, and the depreciation of the Moldovan currency that substantially increased the project cost in local currency. Despite being lower than the level expected at appraisal, the post-completion EIRR is higher than the threshold discount rate of 6% to 8% provided under the current Bank guidelines on economic cost-benefit analysis of investment projects.

Administrative and operational efficiency

The project's implementation period was completed according to schedule (61 months). The project's administrative and implementation efficiency was overall satisfactory since the project was completed within the original planned implementation schedule, despite some delays during the early stage of project implementation. For instance, implementation obstacles had to be overcome, including (i) the resistance from the public sector to connect public buildings to the DH network, and (ii) the management of the contract to construct the interconnection pipes and the pumping station between the heating plants circuits. In terms of cost-effectiveness, the ICR indicates that the project substantially achieved the cost-effectiveness results expected at appraisal (ICR, p.15).

Efficiency Rating

Substantial

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	✓	21.00	75.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	10.60	75.00 <input type="checkbox"/> Not Applicable

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



6. Outcome

The relevance of objectives was high, both the overall efficacy of the project, and the efficiency were substantial, resulting in an overall satisfactory rating of the project outcome. Key outcomes include (i) improved operational efficiency of the new district heating company, (ii) sustained reduction of the breakdown cases, (iii) improvement of heating services for the Chisinau population in comparison to a “without the project” case, and (iv) increased TC managerial and financial discipline, and increased profitability and financial viability of the company as well.

a. Outcome Rating

Satisfactory

7. Risk to Development Outcome

Key achieved outcome toward improved operational efficiency includes the reduction in network heat losses, lifetime energy savings, and reduction in CO2 emissions. Toward improving the quality and the reliability of heating services, achieved outcome includes an increased customers' satisfaction level regarding the improved quality of service and a reduction of the DH system breakdown rate. Toward improved financial viability, there was progress in company profitability as well as improvements in the debt service coverage ratio and the self-financing ratio.

Overall, the risk to the above development outcome is low, because of the commitment demonstrated by both the Government of Moldova and the World Bank towards ensuring the sustainability of the efficiency of the Moldovan DH sector through (i) the Second District Heating Efficiency Improvement Project (P172668), which has been effective since March 24, 2021 and is now under implementation, and (ii) the improvement of the capacity of TE's financial and accounting personnel as well as the strength of the company's commitment to build on achieved outcome. The two remaining risks have to do with (i) the firmness of the Government's commitment in sustaining the tariff reform, as several tariff decisions were made by the Government that may pose risks to the financial sustainability of the TE and (ii) the resolution of the historical debt owed to Moldovagaz.

8. Assessment of Bank Performance

a. Quality-at-Entry

The project activities were consistent with the strategic objectives of the Country Partnership Framework (FY 2018-21) as developed under Section 3 of this review. The project initiation drew from the Moldova heating challenges, including the deteriorating situation of the heating sector, and the operational inefficiencies of the district heating system. The project design and implementation arrangements were based on lessons learned from previous projects implemented by the WBG in Moldova and elsewhere.



For instance, it is key to combine institutional capacity building with investment operations in order to strengthen project implementation and sustainability. The goal was to ensure that the required reform actions are completed, including the transfer of responsibilities for DH tariff regulation to the National Agency for Energy Regulation (ANRE), and the establishment of TE as a distinct separate entity with its own accounts.

The project had several components that the District heating system needed at that time, including investments in DH network, the design and implementation of the Social Impact Mitigation Plan (SIMP), the reconnection of public buildings and preparatory work related to the closure of outdated installations. The planned investments were assessed to be technically viable, well tested, and not complicated to put in place. Similarly, the TA component was reasonably broad in its scope and included a public awareness campaigns to reduce the rate of disconnections and a corporate restructuring study. There were key issues that were left out, including (i) the DH tariff reform, and (ii) more targeted studies associated with the impact of closure some of the system's operations and the combined company's financial viability. Finally, it was pointed out that the implementation risk was high due to political uncertainties, and the fragility of the institutional and governance capacity of the newly formed DH company.

As discussed in the M&E section below, the ICR indicated on p.26-27 that PDO level indicators were repetitive and intermediate indicators did not connect investments to final outcome results, and that the results framework for the DH project should have been constructed around heating seasons and not years.

As regards implementing arrangements, there was a good distinction in the implementation responsibilities between the Government and the Moldova Energy Projects Implementation Unit (MEPIU). Most of the staff of the MEPIU had acquired sufficient project implementation experience by working on previous energy projects, which was further enhanced by managing the various grants for the project preparation. For instance, a fiduciary agent of the Ministry of energy, had 14 years of experience in implementing the World Bank and other donors' projects, including the Energy II (P040558). The unit was staffed with highly qualified and experienced professionals, both in technical, financial management and procurement aspects. Throughout the implementation phase, the MEPIU managed the flow of funds on behalf of the TE for the project.

Overall, at appraisal, the project was strategically relevant, key technical, financial and economic aspects were well analyzed. Risk assessment was completed and mitigation measures were considered, and implementation arrangements were adequate. However, a number of issues were left out and M&E arrangements could have been improved. Based on the above preparation efforts at effectiveness, the quality-at-entry is rated as Satisfactory.

Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

The project implementation was supported by a sustained dialogue among key stakeholders. The Bank's team consistently provided sustained supervision support to the project, ensuring a presence of a skill mix of the World Bank staff in the field office in Chisinau, which enabled a constructive working relationship with



the coordinating unit in the Ministry of energy (MEPIU) and the TE company, and promptly addressed any arising implementation issues. Changes in the management at both the DH operator and the MEPIU level were mitigated by the good relationship built by the Bank team with the project's stakeholders. However, the ICR noted on page 27 that the project's progress, the circulation of aide-memoires, the the mid-term review and the project restructuring were not fully documented by the team.

Throughout project implementation, the Bank team had to engage with the GoM, TE, and ANRE and address three key implementation issues: (i) the resistance from the public sector to connect public buildings to the DH network, (ii) the lack of clarity and consistency in the tariff methodology, and (iii) the management of the contract to construct the interconnection pipes and the pumping station between the heating plants circuits. Regarding the resistance from the public sector to connect public buildings to the DH network, TE identified and agreed with the MoEI/MEPIU and the Bank on an alternative list of public institutions which expressed the willingness to get connected/reconnected to DH system or required a proper modernization of their obsolete infrastructure to enable consumption of DHW (new service) and improved heating services. The project supervision focused on making sure that new institutions will replace those opposing DH. Regarding the lack of clarity and consistency in the tariff methodology, the success of the energy tariff reform was crucial to support the financial sustainability of the newly established DH operator and start solving the issues related to historical debt. The Bank team faced resistance from the energy regulator to implement the agreed tariff measures and until 2016 no actions were taken by the GoM and ANRE in this regard. This prompted the Bank to downgrade the Project's rating, and the situation began to resolve in September 2016 when ANRE eventually increased the heat tariff for TE by 8.2 percent. Finally, the Bank team oversaw the design, supply and installation contract for the construction of the interconnection pipes and the pumping station between the heating plants circuits.

The Bank team's supervision of fiduciary and safeguards aspects of the project was adequate. The project was in compliance with fiduciary and safeguard policies. Procurement supervision was regular and no major issues were identified. Audit reports were used to monitor the financial indicators of the project. Procurement challenges at the outset were properly addressed during implementation, including retroactive payments to reflect updated cost estimates.

The Project implementation was also affected by the COVID-19 pandemic which started a few months before the closing date. As some of the activities related to the implementation of the TE corporate communication strategy and the consumer satisfaction survey were supposed to be carried out in-person among general public or required access to transport, radio & TV, TE and the consultant used alternative solutions (telephone interviews instead of in-person meetings) which were finalized right before the closing date. The lockdown also postponed a number of planned activities, including training.

The quality of supervision was overall satisfactory despite the complexity of plant rehabilitation and the tariff reforms completed during project implementation, and the COVID-19 pandemic. While there were implementation challenges, the Bank team remained focused on the key aspects of the project's impact, including the modernization of the DH infrastructure, the expansion and reliability of the heating services, and the financial viability of the restructured company.

Quality of Supervision Rating

Satisfactory



Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

As described under section 4 of this review, the theory of change was generally valid, but it had moderate weaknesses. For instance, while the PDO were clearly defined, some indicators were insufficient in capturing the achievement of the second and third objectives. While the result framework for the first and fourth objectives had relevant baselines, specific and measurable indicators, there were moderate shortcomings in the results framework in capturing the causal link between the project activities and improvement of heating service reliability and quality. Overall, the intermediate indicators were in line with expected outcomes, which in turn were linked to project objectives.

Finally, some indicators were not optimal to measure implementation progress, as they had no baseline measure at the time of project preparation. For instance, toward benchmarking the goal of consumer satisfaction, there was no survey establishing a baseline that would be compared to results arising from the bulk of project investments that were to be completed and commissioned on the basis of project resources. M&E implementation arrangements were overall satisfactory, as the MEPIU was responsible for data collection, analysis and reporting project progress to the Bank team.

b. M&E Implementation

As discussed on page 23 of the ICR, the report on the progress of project's implementation and the performance indicators was provided biannually. The MEPIU monitored the project implementation and submitted timely and well-prepared project progress reports, following the significant experience the MEPIU had in implementing projects financed by international financial institutions, including World Bank-financed ones. Nine ISRs of good quality were prepared during project implementation and reported on the progress of PDO and intermediate indicators. However, while the performance of the majority of core PDO indicators was reported, two of the PDO-level and one intermediate level indicator related to the fuel savings were not reported in the first two years of project implementation because of the delays in project implementation, and the reporting of the indicator measuring the reduction in heat consumption was imprecise. The mid-term review took place in November 2019, but the latter and the project restructuring were not fully documented by the Bank team and inadequate indicators were not revised.

c. M&E Utilization

The ICR provided limited information regarding the use of the M&E instrument. While some intermediate indicators were useful in assessing the project's progress, a more focused and detailed results framework was needed to monitor the progress of the activities financed by the project. It was difficult to keep track of the project progress in terms of tangible results when the project was under implementation. On a positive note, the effectiveness of the Second District Heating Efficiency



Improvement Project (P172668) in March 2021 drew from results achieved and documented in the M&E system of this project.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The Project was assessed as a Category B at appraisal as only moderate negative environmental impact was expected. The project triggered the following safeguard policies: (i) Environmental Assessment (OP/BP 4.01); and (ii) Involuntary Resettlement (OP/BP 4.12).

Environmental safeguards arrangements and implementation remained satisfactory during the course of the project's implementation. An Environmental Management Plan (EMP) was developed in consultation with a broad range of local stakeholders and publicly disclosed. The MEPIU performed a sustained control of all environmental protection aspects during the implementation of construction works at all project sites. In addition, TE implemented a program of environmental pollution control at all its generation sources. Monthly analyses for air emissions and twice a month analyses for wastewater discharged into the city sewerage network proved no overpass of the standard limits at all plants supplying the DH circuit. Overall project environmental management and compliance was rated in the ISRs as Satisfactory. The environmental safeguards' reviews concluded that all works executed complied with WB's environmental safeguards and produced no notable impact to environment during project execution and operational phase. All civil works were performed in compliance with the project EMP requirements and there were no outstanding environmental issues.

Social risk management was rated satisfactory at the project closing. There were no land acquisition or resettlement related impacts under the Project, except for minor and temporary land use and access restrictions. Social assessments were carried out to determine the nature and severity of impacts of the renovation and rehabilitation works, and were fed into mitigation plans such as the Environmental Management Plan (EMP). The social due diligence tasks including public consultations with beneficiaries had been conducted successfully by MEPIU.

The main social risk that warranted careful planning and management was related to the staff retrenchment under the TE staff optimization program. A Social Impact Management Plan (SIMP) was prepared with clear action plans on training, job transition and compensation options for the staff who have been subject to retrenchment. An independent grievance management system analyzed seven staff grievances registered since 2017 with one withdrawn, one addressed anonymously and the remaining five were duly addressed. The grievances were examined and settled as per the approved Grievance Redress Mechanism (GRM). A case lodged by a staff was examined by a designated Commission and a resolution was proposed as per the GRM, the person refused to accept the proposed resolution and filed a claim against TE in court who ruled in favor of the company. Overall, the project complied with the Bank' social safeguards requirements and produced positive social impacts by providing improved and reliable heating systems to customers in both residential and public sector.



b. Fiduciary Compliance

Financial Management

Implementation of the Financial Management (FM) arrangements was assessed as Satisfactory and there was an adequate compliance with the Project financial management covenants and robust internal controls were applied over the project expenditures. The quarterly Interim Financial Reports (IFRs) were timely issued and were assessed to be Satisfactory in the ISRs and annual audits of project financial statements were timely carried out by private auditors who issued unqualified audit opinions. The final project audit covering the period of January-October 30, 2020 was not finalized yet, because of delays in the effectiveness of follow-on project (P172668), which was to provide the needed resources.

The project implementation also required the completion of the annual audits of the financial statements prepared by TE to ensure its compliance with two financial ratios, i.e., the self-financing ratio and debt service coverage ratio. The audit opinion issued for TE each year was modified mainly due to concerns caused by the company's historic debts. There were a number of recommendations made by the auditors on which TE was continuously working on, but the compliance with the financial ratios was satisfactory. Overall, throughout the period of project implementation, there were no major issues affecting the performance of project financial management.

Procurement

The Ministry in charge of energy had the overall responsibility for project implementation, delegating the fiduciary responsibilities to its Project Implementation Unit (MEPIU). The unit was staffed with highly qualified and experienced professionals both in technical and procurement aspects. The MEPIU's ability to effect procurement activities in line with the Bank procurement policies and procedures has been consistently sound and the Procurement Performance Rating has been Satisfactory throughout the project implementation period.

Procurement supervision was regular and included procurement post-reviews of priority investment packages, which were completed as per agreed schedules. The quality of procurement documents submitted to the Bank was satisfactory and evaluations were carried out without delays, except until 2016, whereby the preparation of procurement packages faced delays and rating downgrades. until the hiring of new and experienced technical and procurement consultants. Given the large values of planned contracts and low thresholds, most of the procurement packages initially were subject to Bank's prior review. Post-reviews found that procurement processes were reliable, timely, and transparent; evaluations were carried out without delays and no complaints were received under the reviewed contracts, and publication of contract awards was duly done. There were no disputes under the reviewed contracts, the execution was completed within the agreed timeline, and payments were made without delays.

The MEPIU prepared diligent reports annually, which were sufficiently detailed in providing information on all the ongoing procurement activities, and the Bank team acknowledged that the project procurement was satisfactorily managed.



c. Unintended impacts (Positive or Negative)

None.

d. Other

None.

11. Ratings

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

12. Lessons

The ICR identified a number of appropriate lessons, and this review has taken three of them which are reformulated below.

(i) A business-minded leadership, supported by a committed Government, can steer change that can concomitantly contribute to solving technical and management issues of a failing public heating company. The project succeeded to rehabilitate and modernize a failing district heating system, and to improve the reliability, the quality of heating services, and the financial viability of a public heating company. A critical factor of success was a business-minded leadership which accomplished not only a smooth corporate restructuring program, but also to rapidly shift the company culture from a supply-driven to a consumer-driven orientation. The company new leaders brought together key sector stakeholders, including the Government, and this helped to improve the service quality and to reassure the DH consumers in the long-term viability of the DH system.

(ii) A negotiated and fair tariff system can contribute to a sustainable investment in a regulated heating system. To ensure the sustainability of the investment in a heavily regulated heating sector, it is important that the investment lending be conducted hand in hand with the adoption of a fair tariff system achieved through a regulatory dialogue between the IFI, the utility, the regulator and the Government. The tariff reforms supported by the project were achieved because of negotiation and agreements among the GoM, the regulator (ANRE), the TE management and the international financial institutions. Without this concerted outcome regarding the adoption of a fair tariff system, the project could not have reached the progress toward the expected objectives.



(iii) **A communication campaign targeting the general public of beneficiaries about a new centralized heating system and reconnection to the DH network can contribute to the success of an investment and reform project.** The importance of the communication campaign and public outreach has been underlined by the project's results. Similar to other Bank-funded projects, there was a strong need to increase the level of end-users' awareness and understanding of costs and financing mechanisms associated with the DH supply and the efforts made by the utility to optimize the service delivery and ensure reliable heat and hot water supply. To this end, the project's citizens engagement interventions helped ensure that consumers are aware of the available financing options and interests of the DH customers were fully taken into account.

13. Assessment Recommended?

Yes

Please Explain

This project was innovative and achieved substantive results in an important sector of the country. A follow-on project has been effective and is under implementation. A PPAR covering performance of the series of projects supporting the heating sub-sector would be appropriate to assess the Bank contribution in supporting the heating sub-sector.

14. Comments on Quality of ICR

The ICR is comprehensive and broadly consistent with the Bank's ICR guidelines. It provides a detailed narrative of the project design and context and the achieved results, and it is generally evidence-based. The results orientation and quality of analysis are strong, as the ICR is articulated around the results framework, and complemented by a borrower's ICR, which includes the latest achievements and annexes that cover key areas of the project interventions and performance. Moderate shortcomings of the ICR arose from a weak M&E system, which led to an internal weak consistency in the ratings of the project efficacy performance.

a. Quality of ICR Rating Substantial

