FINANCIAL ANALYSIS FOR TRANCHE 3

1. The financial analysis was conducted in accordance with the Asian Development Bank's (ADB) *Guidelines on Financial Management and Analysis of Projects.*[1] The financial analysis included assessments of the financial viability of the revenue-generating subprojects implemented by ADB and fiscal impact of the non-revenue generating subprojects. In addition, fiscal impact analysis was used to assess the capacity of the Municipality of Ulaanbaatar (MUB) to finance the capital investment cost as well as the operation and maintenance (O&M) costs of the subprojects.

A. Methodology and Assumptions of Revenue-Generating Components

2. The financial viability assessment was carried out based on the financial internal rate of return (FIRR), exceeding the weighted average cost of capital (WACC). The WACC is calculated based on the ratio of debt and equity in financing the total investment costs of the heating subprojects. The heating tariff was projected during the life of the project and this was used to forecast the expected revenue streams. Sensitivity analysis was also undertaken to test the robustness of the subprojects, given the underlying parameters.

B. Financial Analysis of Heating Services Expansion Subprojects

3. For the purposes of calculating the WACC, the cost of equity was assumed to be 10% and the tax rate at 8% (Table 1). The computation of the nominal borrowing cost includes the Ministry of Finance onlending rate of 2%.

Table 1: Weighted Average Cost of Capital

Item	ADB OCR Loan	MUB	Total
Amount ($ million)	8.11	4.45	12.56
Weight	65.00%	35.00%	100.00%
Nominal cost	4.11%	10.00%	
Tax rate	8.00%	0.00%	
Tax adjusted nominal rate	3.78%	10.00%	
Inflation rate	1.50%	8.50%	
Real cost	2.25%	1.38%	
WACC	**1.94%**		

ADB = Asian Development Bank, MUB = Municipality of Ulaanbaatar, OCR = ordinary capital resources, WACC = weighted average cost of capital.
Source: ADB estimates.

4. The total costs of the heating subprojects in Sharkhad and Tolgoit heating services include the heating supply network and substations, the secondary connections. The assumed tariffs are $4.61 per megawatt for residential and $9.81 per megawatt for commercial. The tariff is assumed to increase by 30% every 5 years.[2]

5. The results of the financial evaluation of the combined heating subprojects indicate that the subprojects are financially viable with a FIRR of 8.95% which is higher than the WACC of

[1] ADB. 2015. *Financial Management Technical Guidance Note: Financial Management Assessment.* Manila; ADB. 2005. *Financial Management and Analysis of Projects.* Manila; and ADB. 2009. *Financial Due Diligence: A Methodology Note.* Manila.

[2] Assumption is the same as the assumptions in the feasibility study for Tranche 2 under the Ulaanbaatar Urban Services and *Ger* Areas Development Investment Program.

1.94%. Sensitivity analysis shows that the combined heating subprojects component is financially viable under all scenarios (Table 2). The sensitivity analysis indicates that the combined heating subprojects' FIRR is most sensitive to the delay in project implementation by one year, and the combination of the 10% increase in capital cost and 10% decrease in revenue.

Table 2: Combined Financial Evaluation of Heating Services Expansion in Sharkhad and Tolgoit

Item	FIRR
Base Case Scenario	**8.95%**
Sensitivity Tests	
Case 1: 10% increase in capital cost	7.96%
Case 2: 10% increase in O&M	8.33%
Case 3: 10% decrease in revenue	7.43%
Case 4: Delay in project implementation by 1 year	6.40%
Case 5: 10% increase in capital cost + O&M; 10% decrease in revenue	6.14%
Weighted average cost of capital	**1.94%**

FIRR = financial internal rate of return, O&M = operation and maintenance.
Source: Asian Development Bank estimates.

6. The two heating subprojects were also analyzed separately to check their respective financial viability. Both subprojects are financially viable, with a FIRR exceeding the WACC (Table 3). However, in the sensitivity analysis, it can be noted that the heating subproject in Sharkhad is viable in all scenarios; while, for the heating subproject in Tolgoit, it is only viable in the case 1 scenario because of its higher investment cost.

Table 3: Individual Evaluation of Heating Services Expansion in Sharkhad and Tolgoit

Item	Sharkhad	Tolgoit
Base Case FIRR (%)	**9.43%**	**2.90%**
Sensitivity Tests		
Case 1: 10 % increase in capital cost	7.19%	1.97%
Case 2: 10 % increase in O&M	7.60%	1.90%
Case 3: 10 % decrease in benefits	6.61%	0.99%
Case 4: 10 % increase in capital cost + O&M; 10 % decrease in benefits	5.20%	-0.81%
Case 5: Delay in project benefits by 1 year	5.78%	0.14%

FIRR = financial internal rate of return, O&M = operation and maintenance.
Source: Asian Development Bank estimates.

C. Financial Sustainability Analysis

7. Financial sustainability analysis was conducted for nonrevenue-generating subprojects like urban roads and socioeconomic facilities. The historical fiscal budget of MUB was analyzed to determine whether it can provide the required counterpart funding requirements during the construction period, and debt service and O&M costs during the operating period.

8. As shown in Table 4, the urban roads and socioeconomic facilities subprojects to be implemented in Sharkhad and Tolgoit will have minimal impact on MUB's budget. The budgetary requirements for the subprojects are about 0.60%–0.86% of the annual operating expenditure requirements of MUB. The additional budgetary requirement for loan repayments from MUB for the ADB loans (regular and concessional) from 2024 to 2041 would represent about 0.89% (at the maximum) of the total annual operating expenditure. Hence, the fiscal impact analysis

indicates that MUB has adequate counterpart funding during implementation and debt servicing during the operation period.

Table 4: Fiscal Projections for the Municipality of Ulaanbaatar (2020–2024)[a]

Item	Actual (MNT billion)		Projection (MNT billion)				
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Recurrent/operating expenditure	619.9	742.7	681.8	722.7	766.1	812.0	860.8
Total operating revenues	872.3	1,031.9	1,001.2	1,081.3	1,167.8	1,261.2	1,362.1
Government fund required for urban roads subprojects[b]	–	–	3.2	4.3	3.2	–	–
Government fund required for socioeconomic facilities	–	–	1.4	1.9	1.4	–	–
Project government fund/operating expenditure	–	–	0.68%	0.86%	0.60%	–	–

MNT = Mongolian togrog.

[a] Data from MUB.

[b] Figures shown for 2020–2024 are the capital investment share of the Municipality of Ulaanbaatar for the Sharkhad and Tolgoit subprojects (44.6% of capital investments). Operation and maintenance costs will be MNT0.56 million per year (2023–2040).

Source: Asian Development Bank estimates.

D. Conclusion

9. Based on the analysis above, (i) the revenue-generating component is financially viable with FIRR exceeding the WACC, and (ii) the financial sustainability analysis shows that the fiscal burden of the non-revenue generating subprojects in relation to the government budget is negligible. The project team, however, noted that MUB is implementing several foreign-funded projects, including ADB. Thus, it's financing priority if not budgeted, will be affected. Therefore, considering that this project is one of the priority plans of the government, it is suggested that the project counterpart funding requirement is budgeted, and a covenant relating to this matter will be included in the legal agreement.