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Article

Green Financing And Esg Mechanisms In The Modernisation Of Railway Transport: The Experience Of The European Union And Jsc "O'Zbekiston Temir Yo'Llari"

Oraqov Rustam Fayzullayevich*[1]

1. Tashkent State Transport University, Acting Associate Professor, Department of "Accounting and Business"

* Correspondence: -

Abstract: The article examines the use of green finance and ESG mechanisms in financing the modernisation of railway transport, taking JSC "O'zbekiston temir yo'llari" as the object of research. Based on the company's 2026 half-year statements, its IFRS consolidated statements, Uzbekistan's sovereign green bonds and the practice of Deutsche Bahn and Network Rail, the structure of financing sources, the cost of borrowed funds and currency risks are analysed. The results show that long-term bank loans account for 54.1% of assets, while interest expenses and foreign exchange losses exceed net profit. A mechanism is proposed that includes taxonomy-based classification of capital expenditures, green bonds in the national currency, performance-linked green loans, ESG reporting and its independent assurance.

Keywords: green finance, green bonds, green investments, ESG reporting, taxonomy, railway transport, currency risk.

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Introduction

Railway transport is the backbone of a low-carbon transport system, but its modernisation – electrification, new rolling stock, high-speed lines – requires long-term capital that the industry rarely generates on its own. Green finance offers such capital on condition that the funded projects deliver measurable environmental benefits and that the borrower discloses ESG information transparently. Uzbekistan has set the goal of reducing greenhouse gas emissions per unit of GDP by 35% from the 2010 level by 2030 [1], and its Strategy for the transition to a green economy for 2019–2030 provides for green lending and green funds [2]. In 2023 the country placed its first green sovereign Eurobonds worth 4.25 trillion UZS, and rail transport and metro development were among the target uses of the proceeds [3].

JSC "O'zbekiston temir yo'llari" (hereinafter – UTY) is the main candidate for such financing in the transport sector. Its Development Strategy until 2030 combines an ESG direction (energy efficiency, lower environmental impact, "green transport") with a direction on investment and financial stability that envisages private investment, public-private partnership and cooperation with international financial institutions [4]. The question is how to turn these strategic intentions into working financial mechanisms, which defines the relevance of the study.

Literature review

The EU has built the most complete regulatory system of green finance. The Taxonomy Regulation (EU) 2020/852 defines which economic activities are environmentally sustainable, and rail passenger, freight and infrastructure activities are covered by separate technical criteria [5]. The Green Bond Principles of the International Capital Market Association require issuers to define eligible projects, manage proceeds separately and report on allocation and impact [6]. The ISSB standards IFRS S1 and IFRS S2 establish requirements for sustainability-related and climate-related financial disclosures [7]. The OECD notes that since 2021 green bonds have become a central element of Uzbekistan's strategy to close the gap in financing green infrastructure [8]. In the railway context, N.E. Babaxalov shows that depreciation and financial expenses largely determine the cost structure and results of railway enterprises [9], while the role of audit in confirming reported information is reflected in the IAASB standards [10]. However, green financing mechanisms for railway enterprises in Uzbekistan have not yet been studied in detail.

Methods

The information base includes UTY's quarterly report for the first half of 2026 [11], the IFRS consolidated statements for 2020 [12], the analysis of UTY's 2022 performance indicators [13], official data on sovereign bond issues [3; 14], the integrated report of Deutsche Bahn [15] and the annual report of Network Rail [16]. Methods of structural and ratio analysis, comparison and synthesis were used.

Results

The structure of UTY's financing sources and its cost are shown in Table 1.

Table 1. Financing structure and cost indicators of JSC "O'zbekiston temir yo'llari", billion UZS

Indicator	Base period	Reporting period	Change
Total assets*	46 447.0	47 302.5	+1.8%
Equity*	16 644.3	17 771.6	+6.8%
Equity ratio, %*	35.8	37.6	+1.8 p.p.
Long-term bank loans*	24 363.2	25 568.2	+4.9%
Share of long-term bank loans in assets, %*	52.5	54.1	+1.6 p.p.
Capital investments in progress*	7 937.7	6 317.1	–20.4%
Interest expenses (H1)	449.7	587.9	+30.7%
Net foreign exchange result (H1)	+23.1	–636.2	×
Net profit (H1)	658.7	1 008.5	+53.1%

*Source: author's calculations based on [11]. H1 – first half of 2025 and 2026; * – balance sheet items at the beginning and end of the first half of 2026.*

The data show that UTY's modernisation is financed mainly by debt: liabilities account for 62.4% of assets, and long-term bank loans alone for 54.1%. In the first half of 2026 interest expenses grew by 30.7%, and the foreign exchange result changed from a net gain of 23.1 billion UZS to a net loss of 636.2 billion UZS. Together they amounted to 1 224.1 billion UZS, or 121% of net profit. The nominal interest rate on loans is low – about 4.7% per year – but with exchange rate losses the effective cost of borrowing reaches about 9.8% per year. Currency risk is long-standing: in 2019 and 2020 foreign exchange losses under IFRS amounted to 2 364.2 and 1 538.5 billion UZS respectively [12]. At the same time, capital investments in progress decreased by 20.4%, and in 2022 the investment programme was fulfilled by 94.2% [13], which signals a shortage of long-term funding for renewal while 56.4% of the value of fixed assets has already been depreciated [11].

The EU experience shows a different model. In 2024 about 67% of Deutsche Bahn's revenues and about 70% of its capital expenditures were classified as taxonomy-aligned [15]. The company has a net zero target for 2040 in line with the Science Based Targets initiative, prepares its integrated report under GRI standards and obtains limited assurance on its sustainability information [15]. Network Rail discloses climate-related information in line with TCFD recommendations [16]. In Uzbekistan, green finance is so far concentrated at the sovereign level: after the 2023 issue, in February 2025 the country placed 4-year euro-denominated bonds with green status worth 500 million euros at 5.1% [14]. UTY itself does not yet use green instruments directly and does not publish taxonomy or ESG indicators.

Discussion

Based on the analysis, we propose a green financing and ESG mechanism for UTY consisting of five elements.

1. Taxonomy-based classification of investments. By analogy with the EU Taxonomy [5], UTY should introduce analytical accounts in management accounting to classify capital expenditures and revenues as "green" (electrification, electric rolling stock, energy-efficient depots, solar generation at stations) or other. The share of green CAPEX becomes the basic indicator for investors.

2. Green Financing Framework and green bonds in the national currency. A framework drawn up under the ICMA Green Bond Principles [6] would allow UTY to issue corporate green bonds, including in UZS. Although the sum rate is higher, local-currency funding removes the exchange rate risk that in 2026 almost doubled the effective cost of borrowing.

3. Performance-linked green loans. In agreements with international financial institutions, the interest margin can be linked to ESG targets, such as energy intensity per tonne-kilometre or the share of electrified lines, creating a direct financial incentive for resource efficiency.

4. ESG and climate reporting. UTY's annual report should include a sustainability section prepared on the basis of IFRS S1 and IFRS S2 [7] with indicators of energy consumption, emissions, green CAPEX and allocation of green proceeds, following the example of Deutsche Bahn and Network Rail [15; 16].

5. Independent assurance. The allocation of green proceeds should be checked by the internal audit service, and ESG information should receive limited assurance under ISAE 3000 (Revised). The external auditor, in line with ISA 720, reads such information for consistency with the financial statements [10]. This reduces the risk of "greenwashing" and increases investor confidence.

Conclusion

The study shows that UTY finances modernisation mainly with foreign-currency loans, whose interest and exchange rate costs exceeded net profit in the first half of 2026, while the company does not yet use green finance instruments. EU practice proves that taxonomy-based accounting, green bonds and transparent ESG reporting with independent assurance lower the cost of capital and attract long-term investors. Implementing the proposed mechanism will help UTY diversify its funding sources, reduce currency risk and accelerate electrification and fleet renewal in line with its 2030 strategy and Uzbekistan's green economy goals.

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