

FINANCIAL RESOURCES OF HIGHER EDUCATION INSTITUTIONS IN THE TRANSITION TO A GREEN ECONOMY AND THEIR ECONOMIC SUBSTANCE

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Abstract

This paper examines the economic substance of the financial resources of higher education institutions (HEIs) in the context of Uzbekistan's transition to a green economy. It draws a clear distinction between three concepts that are often used interchangeably - financial sources, financial resources, and financial funds - and classifies HEI financial resources into six groups: state-commissioned places (state grants), tuition-contract fees, grants, sponsorship, research projects, and own revenues. For each group, the paper identifies its role in financing the green transformation and the risks it carries. As a contribution to the literature, the paper proposes classifying a set of innovative, repayable and performance-linked financing channels - green bonds, green revolving funds, energy service contracts, international climate grants, "1+1" partnerships with innovation-support funds, crowdfunding, public-private partnerships, and a green-oriented adaptation of the targeted teaching-laboratory fund and HEI-enterprise partnership model proposed by Turobova, Giyazova and Qodirov (2018) - as a distinct "seventh group of resources." The paper also develops indicators for assessing the diversification of financial sources and innovative financing capacity, and offers recommendations for financing the "green" HEI.

Keywords: higher education, financial resources, financial autonomy, tuition contract, state grant, green economy, diversification, sustainable financing.

Annotatsiya

Maqolada O'zbekistonning yashil iqtisodiyotga o'tishi sharoitida oliy ta'lim muassasalari (OTM) moliyaviy resurslarining iqtisodiy mohiyati tadqiq etilgan. Ko'pincha bir ma'noda qo'llanadigan uchta tushuncha - moliyaviy manbalar, moliyaviy resurslar va moliyaviy mablag'lar - aniq farqlab berilgan hamda OTM moliyaviy resurslari olti guruhga tasniflangan: davlat buyurtmasi (davlat granti), to'lov-kontrakt mablag'lari, grantlar, homiylik, ilmiy loyihalar va o'z daromadlari. Har bir guruhning yashil transformatsiyani moliyalashtirishdagi roli va unga xos xatarlar aniqlangan. Adabiyotlarga hissa sifatida innovatsion, qaytariladigan va natijaga bog'langan moliyalashtirish kanallarini - yashil obligatsiyalar, yashil aylanma fondlar, energiya servis shartnomalari, xalqaro iqlim grantlari, innovatsiyalarni qo'llab-quvvatlash fondlari bilan "1+1" hamkorlik, kraudfanding, davlat-xususiy sheriklik hamda Turobova, Giyazova va Qodirov (2018) taklif etgan maqsadli o'quv-laboratoriya fondi va OTM - korxona hamkorligi modelining yashil yo'nalishga moslashtirilgan shaklini - alohida "yettinchi resurslar guruhi" sifatida tasniflash taklif etilgan. Shuningdek, moliyaviy manbalar diversifikatsiyasi va innovatsion moliyalashtirish salohiyatini baholash ko'rsatkichlari ishlab chiqilgan hamda "yashil" OTMni moliyalashtirish bo'yicha tavsiyalar berilgan.

Kalit soʻzlar: oliy taʼlim, moliyaviy resurslar, moliyaviy mustaqillik, toʻlov-kontrakt, davlat granti, yashil iqtisodiyot, diversifikatsiya, barqaror moliyalashtirish.

Аннотация

В статье исследуется экономическая сущность финансовых ресурсов высших образовательных учреждений (вузов) в условиях перехода Узбекистана к зелёной экономике. Проведено чёткое разграничение трёх понятий, которые часто используются как синонимы, - финансовые источники, финансовые ресурсы и финансовые средства, - и финансовые ресурсы вузов классифицированы в шесть групп: государственный заказ (государственный грант), плата по контракту, гранты, спонсорство, научные проекты и собственные доходы. Для каждой группы определены её роль в финансировании зелёной трансформации и присущие ей риски. В качестве вклада в литературу предложено выделить в отдельную «седьмую группу ресурсов» совокупность инновационных, возвратных и ориентированных на результат каналов финансирования - зелёные облигации, зелёные возобновляемые фонды, энергосервисные контракты, международные климатические гранты, партнёрство «1+1» с фондами поддержки инноваций, краудфандинг, государственно-частное партнёрство, а также адаптированную к зелёным направлениям модель целевого фонда учебных лабораторий и партнёрства «вуз - предприятие», предложенную Туробовой, Гиязовой и Кодировым (2018). Разработаны также показатели оценки диверсификации финансовых источников и потенциала инновационного финансирования, даны рекомендации по финансированию «зелёного» вуза.

Ключевые слова: высшее образование, финансовые ресурсы, финансовая автономия, плата по контракту, государственный грант, зелёная экономика, диверсификация, устойчивое финансирование.

INTRODUCTION

Uzbekistan's strategy for transitioning to a green economy for 2019-2030, approved by Presidential Resolution No. PQ-4477 of 4 October 2019, names improving energy efficiency, expanding the use of renewable energy, adapting to climate change, and developing the financial and non-financial mechanisms needed to support the green economy as priority directions [19]; [23]. The strategy also calls for integrating green-economy principles into education and science, including updating the curricula of higher and specialized secondary education in relevant fields [39]. Higher education institutions therefore carry a double responsibility: they train the specialists the green transition needs, while at the same time being economic actors that themselves require “green” infrastructure - energy-efficient buildings, solar installations, modern laboratories.

This responsibility has fallen on a system that has been expanding rapidly. In the 2024/2025 academic year, Uzbekistan had 222 operating HEIs, 99 of them private; student numbers rose from 571,500 in 2020/2021 to 1,432,800. Over the same period the number of academic staff grew from 32,100 to 49,600, so the number of students

per teacher rose from 17.8 to 28.9 [26]. This has intensified the financial pressure on infrastructure and quality.

Financial autonomy has also been extended in stages. From 1 January 2022, HEIs granted financial autonomy dissolved their boards of trustees and replaced them with supervisory boards in which at least 70% of members are drawn from the ministry, employers, the public and sponsors [20]; [32]. Against this backdrop, the composition of HEI financial resources, the balance between different sources, and the scope for using them to support the green transition have become a pressing research question.

The purpose of the study is to clarify the economic substance of HEI financial resources and to develop recommendations for improving how they are formed and used in the context of the transition to a green economy.

Objectives: (1) to distinguish the core concepts; (2) to classify the resources and establish the economic substance of each group; (3) to assess the opportunities and risks each presents from the standpoint of the green transition; (4) to offer practical recommendations.

LITERATURE REVIEW

The topic sits at the intersection of four strands of research: the theory of higher education finance, the financial management of HEIs in Uzbekistan, research on the green economy, and green finance. Each strand has been studied in its own right, but the overlap between them has received far less attention.

The first strand - the theoretical foundations of higher education finance - analyzes financing models through the lens of resource dependence theory and performance-based funding. Resource dependence theory has been applied to Uzbekistan's HEIs by Kholmuminov, Kholmuminov and Wright (2019) [35]. The advantages and risks of performance-based funding have been examined by Dougherty and Natow (2015), Kivistö and Suprun (2024), and Matveeva (2025) [3; 10; 11]. HEI financial sustainability is addressed in an OECD report [14], and university autonomy in the European University Association's scorecard [15].

The second strand - the financial resources of Uzbekistan's HEIs - has attracted considerable attention from domestic authors in recent years:

- a study assessing the capacity of financially autonomous state HEIs for self-financing was published in the journal *Nashrlar* (2024) [29];

- the management of financial-resource formation has been analyzed using Tashkent State University of Economics, the Tashkent Institute of Finance, and the state universities of Andijan, Bukhara, Namangan and Qarshi, covering financial and academic autonomy, budget sources, tuition-contract revenue, and the balance of income and expenditure [28];

- a 2026 article identifies the centralization of financial management, the incomplete rollout of performance-based funding, and the need for greater transparency as the principal problems facing HEIs, and recommends developing endowment funds and strengthening financial autonomy [33];

- Bayuetdinov and Medetbayeva (2025), using Uzbekistan's state universities as their case, identify limited financial sources, imprecise forecasting and weak financial oversight as the core problems, and propose diversifying sources [30];

- a 2026 paper on alternative financing sources argues that HEIs' heavy reliance on tuition-contract revenue heightens financial risk, and reviews the potential of research projects, grants, consulting, start-ups, endowment funds and public-private partnerships [31];

- a 2025 article compares financing models - neoliberal, social-democratic, mixed, corporate, endowment and public-private partnership - drawing on international experience [34];

- a study of the role of the state budget concludes that the budget remains the leading source of financing and that alternative sources are needed [36];

- Abdualimova and co-authors (2026) propose a composite index for assessing the shift from financial autonomy to performance-based funding and pilot it across six HEIs - one of the few studies to examine sustainable-development finance at the level of the individual institution [26].

The third strand - the green economy and higher education - owes much to researchers at Bukhara State University. H.R. Turobova and M. M. Qodirova jointly produced the textbook *Green Economy* (Bukhara, 2025, 96 pp.), which argues for integrating green-economy principles into education and science [39]. Two further papers by Turobova cover related ground: bioeconomy [38], and the priority given to the circular economy and the Sustainable Development Goals in Uzbekistan's national strategic programmes [37].

The work most directly relevant to the present study is the 2018 article by H.R. Turobova, N.B. Giyazova and A.A. Qodirov, which raises the question of how to finance teaching laboratories for training economists and how such financing might be improved [40]. The authors found that, at the time, teaching laboratories existed only in the exact and natural sciences - none had been established for economics, finance or accounting. At Bukhara State University, for instance, there were laboratories in physics (5), soil science and geography (2), chemistry (2), occupational safety (6), ecology (1) and biology (2), but not a single one in economics. The authors cite the Ministry of Finance's Fund for the Development of the Material and Technical Base of Higher Education Institutions, which spent 312 billion soum nationally in 2015 and 355.6 billion soum in 2016, and note that 1,921.5 million soum was earmarked for modernizing Bukhara State University's teaching-laboratory base between 2017 and 2021.

The scientific novelty and proposal of that study was to establish a targeted “teaching-laboratory fund” financed from four sources: (I) state budget funds (the Material and Technical Base Fund); (II) contributions from students or their parents (an additional payment equal to 1-2% of the contract fee); (III) sponsorship; and (IV) state or foreign grants. The authors also proposed an “educational institution - production enterprise” partnership model, under which an enterprise sets aside a room on its premises as a teaching laboratory, students gain hands-on experience in small

groups, and the enterprise pays the salary of the specialist who heads the laboratory - a way of drawing in financial and staffing resources at no additional cost to the HEI.

Abroad, a study based on panel data for 30 Chinese provinces over 2003-2021 assessed the impact of higher-education resources, including budgetary resources, on green economic growth [17]. The degree to which sustainable development has been integrated into universities in Central Asia, the South Caucasus and the European Union has also been compared [2].

The fourth strand - green finance and “green university” financing - includes a study covering the RCEP region for 2000-2020, which found that a one-percentage-point increase in the share of the population with higher education raised sustainable energy development by 0.19% in the short run and 0.29% in the long run, with green finance contributing 0.43% and 0.38% respectively [12]. Research on “green campuses” identifies high upfront investment and financial constraints as the main barriers, and points to green bonds and sustainability-linked loans as possible solutions [1]. Mechanisms for financing “green universities” in emerging economies were examined separately in a 2026 study [4], and a recent edited volume on the role of universities in the green transition stresses the importance of financial incentives and governance readiness [8].

Research gap. Taken together, the literature reviewed shows that: (1) the financial resources of Uzbekistan's HEIs and their diversification have been well studied; (2) the link between the green-economy strategy and education has been addressed from a curricular standpoint; (3) green finance instruments have been studied in the context of HEIs abroad; and (4) Turobova, Giyazova and Qodirov (2018) [40] proposed a targeted financing fund and an HEI-enterprise partnership model in the specific context of teaching economics. What has not yet been done systematically is to classify the six traditional types of HEI financial resource together from the standpoint of the green transition, to link their economic substance to their green-investment potential, to adapt the targeted-fund model proposed by Turobova and co-authors to green (energy and ecology) directions, and to propose corresponding quantitative indicators - a diversification index, a green-investment-intensity indicator, and an innovative-financing-capacity indicator. This paper aims to fill that gap.

METHODOLOGY

The study draws on analysis of legal and regulatory documents, systematic and comparative analysis, and classification. Two indicators proposed by the author are used to assess the diversification of financial sources:

- Source concentration index: $HHI = \sum si^2$, where si is the share of source i in total revenue (from 0 to 1). The smaller the index, the higher the diversification; $1/HHI$ gives the “effective number of sources.”
- Green investment intensity: $G = \text{funds directed to green projects} / \text{total HEI expenditure}$.

The information base of the study comprises the legal acts regulating the financing and financial autonomy of state HEIs and the green-economy strategy of Uzbekistan [19-25], official statistical and open data on the higher education system summarized

in recent studies [26; 32], and domestic and international research on higher education finance, green universities and green finance instruments [1; 3; 12; 14; 17; 35; 40]. The analysis proceeds in three steps. First, the concepts of financial sources, resources and funds are separated by their content and level of analysis. Second, the six traditional sources of HEI financing are classified by origin, purpose, predictability and competitiveness, and each is assessed in terms of its role in the green transition and its main risk; the same sources are then categorized by five green-economy criteria. Third, innovative financing channels are identified and described by implementation mechanism, conditions and risks, and an additional indicator of innovative financing capacity is proposed. The indicators are designed so that they can be calculated from an HEI's annual financial reports.

ANALYSIS AND RESULTS

Interpreting the Concepts

In the economic literature, the terms “financial sources,” “financial resources” and “financial funds” are frequently used interchangeably. For analytical precision, this paper distinguishes between them as set out in Table 1.

Table 1

Distinguishing the Core Concepts¹

Concept	Meaning	What it represents
Financial sources	Where money comes from and from whom	Origin: the state budget, applicants and their parents, donors, business, the HEI's own activities
Financial resources	The pool of funds accumulated from these sources and held by the HEI for designated use	An economic category: the HEI's development potential and financial capacity
Financial funds	The actual money in accounts and in cash on a given date, including balances and flows	An operational category: the level of accounting and treasury execution

In short: a source is “where it comes from,” a resource is “what has been formed and is ready to be used,” and a fund is “what is currently on the books.” Resources are therefore broader than sources, since they also include internal accumulations; a fund is the operational, monetary expression of a resource.

Classification of HEI Financial Resources

The classification can be organized around four criteria: origin (budgetary or extra-budgetary), purpose (earmarked or unrestricted), predictability (stable or variable), and competitiveness (formula-based or competitive). On this basis, Table 2 sets out the six main sources available to HEIs.

Table 2 shows that the six sources differ not only in origin but also in their suitability for green projects. The state commission is the most stable but also the most budget-dependent source; tuition-contract fees and own revenues are the most flexible sources and can be partly earmarked for green development; grants, sponsorship and research projects are the sources most directly suited to financing green equipment,

¹ Source: compiled by the author.

laboratories and research, but they are periodic and depend on external parties. The economic substance of each source is considered in more detail below

Table 2

Classification and Economic Substance of HEI Financial Resources¹

Source	Economic substance	Role in the green transition	Main risk
State-commissioned places (state grant)	Covers the cost of training specialists from the budget on a normative basis; earmarked, stable	Funds core teaching and academic-staff costs; creates scope for expanding the state's commission for green-related fields	Dependence on the budget cycle; weaker incentive to innovate
Tuition-contract fees	Private payment charged for the service on a cost basis; unrestricted, demand-sensitive	The principal extra-budgetary source for building a development fund	Ability to pay, inequality, over-reliance on contract revenue
Grants	Competitive, earmarked financing from international and domestic donors	The best-suited source for green projects, equipment and curricula	Periodicity; dependence on donor conditions
Sponsorship	Voluntary, non-repayable or earmarked donations from individuals and legal entities	Green campus facilities, scholarships, laboratories	Uncertainty; influence of sponsor interests
Research projects	Research income from state science programmes and commissioned contracts	Finances research on green technology, energy and ecology; commercialization	Uncertain outcomes; demands specialist staff
Own revenues	Income from continuing education, consulting, leasing, technology parks, start-ups and other services	A flexible and stable internal source; reinvesting the savings from energy efficiency	Risk of drifting from the core mission

State-commissioned places. In financially autonomous HEIs, the cost of training specialists under the state commission (state grant) is financed from the state budget under the procedure approved by Cabinet of Ministers Resolution No. 419 of 1 August 2022, and formalized through a contract between the commissioning body and the HEI [22]. The admissions system and the procedure for allocating the state commission were further refined by Presidential Decree No. PF-81 of 24 May 2024 [24]. Economically, this is normative financing based on the principle of “number of students $\times$ average cost,” which HEIs use to cover teaching expenses.

Tuition contracts. Within the scope of financial autonomy, HEIs set their own tuition-contract fees, including differentiated fees [27; 32]. This gives an HEI room to manage its revenue, but rising fees can reduce access for prospective students. From the standpoint of the green transition, it would make sense to earmark part of contract revenue for a dedicated “green development fund.”

Grants. The form of grants available to students is also evolving. Under Cabinet of Ministers Resolution No. 149 of 10 March 2025, students may receive one of two types of grant: one that covers tuition fully from the state budget, and one that is covered partly from the funds of financially autonomous universities [25]. Student grants can therefore be both a source of HEI financial resources and an item of

¹ Source: compiled by the author.

expenditure. Beyond this, research and development grants - funded by international organizations and donors - carry particular weight for green projects.

Sponsorship. The presence of sponsor representatives on supervisory boards creates a channel for drawing them into an HEI's strategy [32]. Pooling sponsorship funds in a dedicated fund - for energy-saving projects, for instance - improves transparency.

Research projects and own revenues. Research builds the “knowledge base” of the green economy while also serving as a source of financial resources. Own revenues are an HEI's most flexible and stable source; as they grow, dependence on the budget falls [31].

Categorizing Financial Resources from the Standpoint of the Green Economy

The classification in Table 2 is based on where resources originate - the state commission, contracts, grants, and so on - and applies universally to any HEI activity. But under the transition to a green economy, each of these six sources also needs to be assessed against a further set of criteria - purpose-orientation, environmental effect, time horizon, repayability, and level of management - because these are what determine how far a given resource actually serves the green transformation. Table 3 sets out a multi-dimensional (matrix) classification of HEI financial resources built on these criteria.

Table 3

Categorization of HEI Financial Resources from the Green-Economy Perspective¹

Classification criterion	Categories	Explanation and examples
1. By purpose-orientation	Green (earmarked) resources Neutral (general-purpose) resources	Green resources must be spent solely on ecological/energy projects (e.g. a GCF or GEF grant, a green bond). Neutral resources (the state commission, tuition contracts, own revenues) are directed to general needs, though part may be allocated to green projects.
2. By nature of environmental effect	Direct effect Indirect effect	Direct: a grant for solar panels or an energy audit, where the effect is immediately measurable. Indirect: spending on training specialists or research, where the effect emerges over the long run through human capital.
3. By financing horizon	Short-term (up to 1 year) Medium-term (1-3 years) Long-term (over 3 years)	Short-term: a grant for current energy costs. Medium-term: laboratory modernization (e.g. Bukhara State University's 1,921.5 million soum programme for 2017-2021). Long-term: a green bond, a PPP, campus infrastructure.
4. By repayability	Non-repayable resources Repayable (revolving) resources	Non-repayable: a grant, sponsorship, the state commission - given once and not repaid. Repayable: a green revolving fund, an ESCO contract, a bond - savings or repayments finance new projects.
5. By level of management	Centralized (state-managed) Decentralized (HEI-managed)	Centralized: the state budget, the Ministry of Finance's Material and Technical Base fund. Decentralized: an HEI's own revenues, sponsorship, targeted internal funds (e.g. a “teaching-laboratory fund”).

¹ Source: compiled by the author.

These five criteria are not mutually exclusive - their intersection defines the “green profile” of any given resource. A green bond, for example, can be characterized as purpose-oriented (1) + direct-effect (2) + long-term (3) + repayable (4) + decentralized (5); the state commission, by contrast, is neutral + indirect-effect + +long-term + non-repayable + centralized. This kind of multi-dimensional categorization gives HEI leadership a practical tool for deciding which source suits which green project: unrestricted, non-repayable resources (own revenues, sponsorship) fit short-term, rapid ecological measures, while long-term, repayable resources (green bonds, revolving funds, PPPs) are better suited to major infrastructure projects.

Distinctive Features of Financial Resources under the Green Transition

Green campuses require large upfront investment, with returns accruing only over the long run through energy savings. Research on the “green university” model stresses that it requires integrating energy efficiency, renewable energy, sustainable infrastructure, waste management and environmental education into an institution's development strategy - which in turn calls for long-term planning and new financing mechanisms [4].

An example from Uzbekistani practice: a pilot analysis based on open data from Bukhara State University records a roughly 2-billion-soum solar power installation and campus-wide LED and inverter upgrades [26]. This shows that HEIs can finance green investments from their own resources, but such cases are not yet systematic and have not been confirmed by audited financial data.

There are also risks attached to the exercise of financial autonomy. As the authors of the pilot analysis point out, Tashkent hosts 98 HEIs and 37.6% of all students (539,400), so financing tied to rankings, without an equalization mechanism, could reinforce the dominance of the capital's institutions [26]. The student loan system is under similar pressure: the World Bank has approved a USD 250 million loan under the EduImkon programme, intended to provide study loans to roughly 600,000 young people [18].

A Procedure for Diversifying Financial Sources

To apply the proposed indicators in practice, an HEI can follow this sequence:

11. group annual revenue by the six sources and calculate each share (si);
12. calculate the HHI and the “effective number of sources” (1/HHI): even where all six sources are present, diversification will in practice be low if most revenue is concentrated in a single source, such as contracts;
13. assess green investment intensity (G) and its breakdown by source, to establish which source is financing green projects and to what extent;
14. track the trend over time and compare across groups of HEIs (capital-city, regional, sector-specific).

Scientific Novelty: Innovative Channels for Mobilizing Financial Resources

The novelty of this study lies in bringing together, for the first time in a single framework, a set of innovative channels through which HEIs can mobilize financial

resources for the green transition beyond the traditional six sources - identifying for each its implementation mechanism, its conditions, and its risks (Table 4).

Table 4

Innovative Channels for Mobilizing Financial Resources for HEIs¹

Innovative instrument	Implementation mechanism	Conditions and risks for Uzbekistan's HEIs
Green bonds	An HEI or a consortium issues a bond earmarked for a specific purpose (energy saving, a solar power plant, a “green” building), serviced from tuition-contract and development-fund revenue. Worldwide, HEIs have raised USD 15 billion through green bonds [6]	Uzbekistan has not yet developed a legal framework allowing state HEIs to issue bonds; piloting the approach through a consortium of major universities would be a sensible first step
Green revolving fund	A one-off capital allocation is made to energy-efficiency projects; the savings are returned to the fund and used to finance the next round of projects, turning it into a self-replenishing source [13]	Requires initial capital (from own revenue, sponsorship or a grant); demands transparent management and precise accounting of savings
Energy service contracts (ESCO/EPC)	An external energy service company carries out modernization at its own expense and recovers its costs from the energy savings generated in subsequent years, letting the HEI benefit from green modernization without upfront investment	Institutional experience in contracting and in monitoring realized energy savings is limited; an audit and monitoring system is needed
International climate grants (GCF, GEF, etc.)	Large, competitively awarded grants (the Green Climate Fund, the Global Environment Facility) finance renewable-energy and climate-adaptation projects [5; 7]	Complex application and reporting requirements; needs project-management capacity and an English-proficient team
Innovation-support funds and “1+1” partnerships	A share of the profits of enterprises with more than 50% state ownership is directed to innovation funds; HEIs commercialize green technologies in partnership with industry on a “1+1” basis and set up spin-off companies in technology parks [21]	Requires aligning HEIs' research capacity with business needs and building intellectual-property management systems
Crowdfunding and alumni platforms	Digital platforms mobilize many small donations from donors and alumni, which can evolve into an endowment fund over time	Requires trusted digital infrastructure, transparent reporting, and a system for maintaining long-term ties with alumni
Public-private partnerships (PPPs)	Campus infrastructure (dormitories, laboratories, energy facilities) is built in partnership with a private investor and leased or paid for under a long-term contract	Requires clearly defined mechanisms for sharing legal and financial risk and a settled long-term tariff policy
Targeted teaching-laboratory fund and HEI-enterprise partnership	Following the 2018 proposal by Turobova, Giyazova and Qodirov: a targeted fund financed from four sources (the state budget/Material and Technical Base fund, a 1-2% student/parent contribution, sponsorship, grants); an enterprise sets aside a laboratory room on its premises and pays the salary of the specialist who heads it [40]	Applied to green fields (energy audits, environmental laboratories), it gives an HEI a practical research base at no cost; requires a long-term contract with the enterprise and ongoing monitoring

¹ Source: compiled by the author based on [5; 6; 7; 13; 21; 40].

What these instruments have in common is that, unlike the traditional six sources, all of them rest on repayable or performance-linked financing: funds are not provided once, but are replenished repeatedly through savings or commercialization. This is the defining feature that sets them apart from the six traditional sources described above (Table 2), and is the basis for proposing that they be classified separately as a “seventh - innovative - group of resources.”

To assess the financial potential of these innovative instruments, a third indicator can be added to those introduced in the Methodology section:

Innovative financing capacity: $I = (\text{green bonds} + \text{funds mobilized through ESCO} + \text{grants} + \text{crowdfunding} + \text{PPP share}) / \text{total HEI development expenditure}$. The higher the value of I , the less an HEI's green transformation depends on the budget and tuition-contract revenue.

Major international studies point in the same direction: among the range of financing channels available - green bonds, sustainability-linked loans, revolving funds - revolving funds tend to be the most stable, since they are less exposed to external market conditions and are managed within the HEI itself [9; 16].

CONCLUSION AND SUGGESTIONS

1. “Financial source,” “financial resource” and “financial fund” are related but distinct concepts: a source denotes origin, a resource denotes the economic capacity that has been formed, and a fund denotes the actual money on the books.

2. The six groups of HEI resources differ in their purpose-orientation, stability and flexibility. The state commission provides stability; tuition contracts and own revenues provide flexibility; grants, sponsorship and research projects create additional scope for development and for green projects.

3. The state budget remains the leading source [36], so the green transition should not be confined to the budget alone - extra-budgetary sources, both internal and external, need to be expanded.

4. Unlike the traditional six sources, innovative instruments such as green bonds, green revolving funds, energy service contracts, international climate grants, “1+1” partnerships with innovation funds, crowdfunding and public-private partnerships rest on repayable and performance-linked financing, and have the potential to reduce an HEI's dependence on the budget and on contract revenue.

Based on these conclusions, the following recommendations are proposed:

1. Establish a dedicated “green development fund” in every financially autonomous HEI, financed from contract revenue, own revenues and sponsorship;

2. Adapt the four-source targeted fund and “HEI-enterprise” partnership model proposed by Turobova, Giyazova and Qodirov (2018) [40] to the establishment of energy-audit and environmental laboratories;

3. Redirect the savings generated by energy efficiency back into this fund, on the revolving-fund principle;

4. Examine separately the legal scope for state HEIs to use instruments such as green bonds, sustainability-linked loans and energy service contracts;

5. Disclose annual financial reports together with the HHI and G indicators;

6. Preserve equalization grants for regional HEIs once ranking-based financing begins in 2027 [26].

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