



**“Silk Road” International University of Tourism and
Cultural Heritage (SRIUTCH)**

Initial Institutional Greenhouse Gas Emissions Inventory Report

Samarkand-2026

Initial Institutional Greenhouse Gas Emissions Inventory Report
Prepared by the **Sustainability Committee**

Reporting year: 2025

Date of issue: March 15th

Inventory status: Initial institutional inventory

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EXECUTIVE SUMMARY

This report presents the “**Silk Road**” **International University of Tourism and Cultural Heritage (SRIUTCH)**’s initial institutional greenhouse gas emissions inventory. It has been prepared by the **Sustainability Committee** in accordance with the general logic of the **GHG Protocol Corporate Accounting and Reporting Standard**, which is intended for companies and other organizations, including universities, and is built around the principles of relevance, completeness, consistency, transparency, and accuracy.

The present document should be understood as an **initial inventory** rather than a fully mature or externally verified institutional carbon report. It is based on currently available activity data and on recognized provisional or default emission factors where supplier-specific factors were not available. This approach is methodologically defensible under the GHG Protocol, provided that assumptions, exclusions, and data limitations are disclosed transparently.

For this initial inventory, SRIUTCH applies an **operational control approach** to the organizational boundary. Accordingly, the report covers those buildings, energy uses, and operational assets over which the University exercises operational control. Under the GHG Protocol, an organization using the operational control approach accounts for 100 percent of emissions from operations over which it has operational control.

The current quantified inventory includes three emissions sources for which usable activity data were available: **natural gas combustion, purchased electricity, and purchased heat**. Purchased electricity has been calculated on a net grid electricity basis by deducting on-site solar electricity generation used internally during the reporting period from gross electricity consumption. This treatment follows the logic that Scope 2 covers purchased or acquired electricity consumed by the reporting entity.

Using the factors and assumptions described in this report, SRIUTCH’s current quantified Scope 1 and Scope 2 inventory for included sources is 301.71 tCO₂e. This consists of 25.61 tCO₂e from natural gas combustion, 276.1 tCO₂e from net purchased electricity. The associated emissions intensity, using the University’s confirmed Gross Internal Area (GIA) of 6469.93 m², is 0.04663 tCO₂e/m², or 46.63 kgCO₂e/m².

This total should not yet be treated as a fully exhaustive institutional total. Annual fossil-fuel consumption data for non-electric vehicles were not available and are therefore not included in the quantified Scope 1 total. Water and stormwater are reported as supplementary environmental indicators only and are not converted into CO₂e in this initial version.

Introduction

“Silk Road” International University of Tourism and Cultural Heritage is in the process of developing a more structured institutional framework for climate governance and sustainability reporting. This process is guided by the [University \(Sustainable and climate action policy\)](#) approved by the [Academic Council of SRUITCH](#) under Decision No. 6 of 30 January 2026. Under this framework, responsibility for implementation is assigned to the [Committee on Sustainable Development and Climate Action \(CSDCA\)](#), with coordination and expert support provided by the [Centre for Sustainable Development](#) under the [Institute of Advanced International Studies](#). As part of this process, the [Sustainability Committee](#) has undertaken the preparation of an institutional greenhouse gas emissions inventory in order to establish a transparent baseline for future reporting, internal decision-making, and external sustainability communication.

The present report has been prepared in line with the general logic of the [GHG Protocol Corporate Standard](#). That standard is designed to support organizations in preparing emissions inventories that are transparent, comparable, and decision-useful. It is expressly applicable not only to companies but also to other organizations, including universities.

In accordance with the [University Climate Policy](#), the University is to conduct an initial inventory of greenhouse gas emissions and determine the baseline year and accounting boundaries within 12 months from the date of policy approval. As the Policy was approved in 2026, the present document should be understood as SRIUTCH’s initial institutional greenhouse gas inventory prepared within that implementation period. It is therefore intended to establish the University’s first structured emissions accounting framework rather than to serve as a fully mature or exhaustive institutional carbon report.

The report is therefore intentionally cautious in its claims. It does not present itself as a final or externally assured carbon account, but as a structured initial inventory based on the activity data currently available to SRIUTCH and on documented methodological choices.

Institutional Context



Figure 1. Overview of the [“Silk Road” International University of Tourism and Cultural Heritage](#) Campus

SRIUTCH's current institutional profile provides the operational context for this inventory. The University's total area is **28 090 m²**. The confirmed Gross Internal Area (GIA) used for reporting purposes in this report is **6469,93 m²**.

SRIUTCH operates 7 buildings, including 4 academic buildings. The University also operates 9 vehicles, of which 2 are electric vehicles.

With respect to heat supply, SRIUTCH has confirmed that the University has a **boiler house** serving A-building only. At the same time, the University also purchases heat energy externally for other operational needs. Accordingly, the inventory reflects both direct natural gas combustion by the University and purchased heat energy from external supply.

These institutional conditions are material to boundary-setting and emissions accounting. They explain why the current inventory includes both Scope 1 natural gas combustion and Scope 2 purchased heat, while also noting that vehicle emissions remain unquantified due to missing fuel-consumption data.

Purpose and Scope of the Inventory

The purpose of this report is to establish SRIUTCH's **first formal greenhouse gas inventory** in a form suitable for internal review, public sustainability communication.

The current inventory has four practical objectives.

- It defines the University's organizational and operational boundaries.
- It documents the activity data currently available.
- It applies a transparent factor-selection methodology grounded in recognized sources.
- It also identifies exclusions and limitations that must be addressed in subsequent reporting cycles.

The report is therefore both a calculation document and a governance document. Its value lies not only in the emissions totals presented, but also in the establishment of a defensible methodological basis for annual institutional reporting going forward.

Organizational Boundary

For this initial inventory, SRIUTCH applies an **operational control approach**. Under the GHG Protocol, operational control exists where the reporting organization has the full authority to introduce and implement operating policies at an operation, and under this approach the organization accounts for 100 percent of emissions from operations over which it has operational control.

On that basis, the organizational boundary of this report includes the **University's buildings, associated campus energy use, and the university vehicle fleet**. However, only those categories for which activity data were available are quantified in the present report. This means that the boundary for quantification is narrower than the full institutional boundary for ownership or operational responsibility.

The current quantified inventory therefore includes natural gas consumption, net purchased electricity, and purchased heat. The vehicle fleet remains within the organizational boundary, but fossil-fuel vehicle emissions are not yet quantified because annual fuel-consumption data were not available.

Operational Boundary

Under the GHG Protocol, once an organization has established its organizational boundary, it must define its operational boundary by distinguishing direct and indirect emissions and categorizing them as Scope 1, Scope 2, and, where relevant, Scope 3. Direct emissions are those from sources owned or controlled by the organization; indirect emissions are

consequences of the organization's activities that occur at sources owned or controlled by another entity.

Scope 1

For SRIUTCH, Scope 1 in this initial report includes **natural gas** combusted directly by the University. This includes the gas used in the boiler or boiler house serving A-building. The A-building boiler gas is therefore a subset of the University's total Scope 1 natural gas emissions, amounting to approximately **11.52 tCO₂e** within the overall natural gas total.

In principle, Scope 1 should also include fossil-fuel consumption from university-owned or university-controlled non-electric vehicles. Those emissions are not yet quantified in this report because annual fuel-consumption data were not available.

Scope 2

Scope 2 covers emissions from purchased or acquired and consumed **electricity, steam, heat, and cooling**. The GHG Protocol Scope 2 guidance specifically addresses purchased or acquired electricity, steam, heat, and cooling, and [EPA's Scope 1 and Scope 2 inventory guidance](#) summarizes the same principle.

For SRIUTCH, Scope 2 in this report includes two categories: net purchased electricity from the grid and purchased heat energy. Gross electricity consumption has been adjusted to reflect on-site solar generation used internally during the reporting period. Because Scope 2 pertains to purchased or acquired electricity, the internally consumed **solar generation** has been deducted from gross electricity to derive net purchased electricity from the grid. This is a methodological inference consistent with the logic of the GHG Protocol's treatment of purchased electricity.

Purchased heat remains within Scope 2 because the University has confirmed that it purchases heat energy externally for part of its operations. The existence of a limited on-site boiler for A-building does not eliminate the Scope 2 category; rather, it means SRIUTCH has both a direct heat-related fuel source in Scope 1 and externally purchased heat in Scope 2.

Scope 3 and future categories

This initial report does not attempt a full Scope 3 inventory. Water supply and stormwater are reported as supplementary environmental resource-use indicators, but are not converted into CO₂e in this version. Vehicle-fuel emissions also remain pending for future inclusion once annual fuel-consumption data are available.

The exclusion of these categories does not invalidate the report. Under the GHG Protocol, exclusions may occur where data are not yet available, provided that they are disclosed and justified transparently.

Methodology

This report follows the general logic of the GHG Protocol Corporate Accounting and Reporting Standard and, where relevant, the GHG Protocol Scope 2 Guidance. The methodological approach adopted here is guided by the GHG Protocol principles of relevance, completeness, consistency, transparency, and accuracy. Those principles require the inventory to reflect the emissions profile as faithfully as practicable, disclose specific exclusions, use consistent methods over time, and document assumptions and data sources clearly.

For electricity, the GHG Protocol recommends obtaining source- or supplier-specific factors where available; if these are not available, regional or grid emission factors should be used. It also distinguishes between emissions factors at generation and at consumption and states that the Corporate Standard requires the use of the generation-based factor for Scope 2 reporting.

Because UWED does not currently have a supplier-specific electricity factor confirmed for the reporting year, this report uses the Uzbekistan electricity consumption factor published in [JICA Climate-FIT Version 6.0](#). In the JICA appendix, Uzbekistan is listed with an electricity consumption factor of **0.612 tCO₂/MWh**, equivalent to **0.612 kgCO₂e/kWh**, and the table notes that these grid factors are based on Harmonized IFI Default Grid Factors 2022 v3.2.

Activity Data Used

The following activity data were used in the preparation of this report:

Category	Annual activity data	Unit	Treatment
Gross electricity consumption	774728	kWh	Input for Scope 2 electricity
On-site solar electricity used internally	323590	kWh	Deducted from gross electricity
Net purchased electricity from grid	451140	kWh	Scope 2
Total natural gas consumption	141301	kWh	Scope 1
Natural gas used in A-building boiler	63585	kWh	Included within Scope 1 total, not deducted
Cold water	11689	m ³	Supplementary indicator only
Stormwater	16331	m ³	Supplementary indicator only

The solar generation figure is used to derive net purchased grid electricity, not to reduce the University's total electricity demand. The A-building boiler gas figure is included only to clarify source structure.

Emissions Calculations

The general formula applied throughout this report is:

$$\text{Activity data} \times \text{emission factor} = \text{emissions}$$

1. Net purchased electricity from the grid

Gross electricity consumption was 774728 kWh. On-site solar generation used internally during the reporting period was 323590 kWh. Accordingly, net purchased electricity from the grid is:

$$774728 - 323590 = 451140 \text{ kWh.}$$

2. Natural gas factor derivation

Using the EPA factors and GWPs:

- CO₂ component = 53.06 kg CO₂/mmBtu
- CH₄ component = 1.0 g CH₄/mmBtu × 28 = 28 gCO₂e/mmBtu = 0.028 kgCO₂e/mmBtu
- N₂O component = 0.10 g N₂O/mmBtu × 265 = 26.5 gCO₂e/mmBtu = 0.0265 kgCO₂e/mmBtu

Combined factor per mmBtu:

$$53.06 + 0.028 + 0.0265 = 53.1145 \text{ kgCO}_2\text{e/mmBtu}$$

Using 1 mmBtu = 293.071 kWh, the derived factor is:

$$53.1145 \div 293.071 = 0.181234 \text{ kgCO}_2\text{e/kWh}$$

Rounded factor used in this report: **0.18123 kgCO₂e/kWh**.

3. Scope 1 emissions from total natural gas

Total natural gas emissions are calculated as:

$$141301 \text{ kWh} \times 0.18123 \text{ kgCO}_2\text{e/kWh} \div 1,000 = 25.61 \text{ tCO}_2\text{e}.$$

Within this total, the A-building boiler gas subset is:

$$63585 \text{ kWh} \times 0.18123 \text{ kgCO}_2\text{e/kWh} \div 1,000 = 11.52 \text{ tCO}_2\text{e}.$$

4. Scope 2 emissions from net purchased electricity

Using the JICA Uzbekistan factor of 0.612 kgCO₂e/kWh, electricity emissions are calculated as:

$$451140 \text{ kWh} \times 0.612 \text{ kgCO}_2\text{e/kWh} \div 1,000 = 276.1 \text{ tCO}_2\text{e}.$$

5. Current quantified Scope 1 + Scope 2 total for included sources

The current quantified total for included sources is:

$$25.61 + 276.1 = 301.71 \text{ tCO}_2\text{e}$$

Rounded total used in this report: **301.71 tCO₂e**.

6. Emissions intensity

Using the confirmed GIA of 6469.93 m², emissions intensity is:

$$301.71 \div 6469.93 = 0.04663 \text{ tCO}_2\text{e/m}^2$$

Equivalent in kilograms: **46.63 kgCO₂e/m²**.

Results and Preliminary Findings

The initial inventory indicates that SRIUTCH's currently quantified emissions profile is dominated by purchased heat and purchased electricity rather than by direct natural gas combustion. This is not a contradiction; it reflects the fact that the purchased heat figure is reported in Gcal, which represents a large amount of thermal energy when converted into common energy units. As a result, purchased heat is currently the largest contributor to the quantified Scope 1 and Scope 2 inventory.

Natural gas remains a material Scope 1 source, but it represents a much smaller share of the current total than purchased heat and electricity. The presence of the A-building boiler confirms that part of campus heat demand is met through direct combustion by the University; however, the magnitude of this source is limited relative to externally purchased heat.

The current quantified total of **301.71 tCO₂e** should be interpreted as a current quantified inventory for included sources. It is suitable for internal review and for cautious external disclosure, provided that the report's exclusions and provisional factor assumptions are preserved in any outward-facing use.

Limitations of the Current Inventory

This report is an initial institutional inventory and several limitations should be acknowledged explicitly.

First, the inventory should not yet be treated as fully exhaustive across all potential Scope 1 and Scope 2 sources. Fossil-fuel vehicle emissions remain unquantified because annual fuel-consumption data were unavailable at the time of preparation. Since the vehicle fleet falls within UWED's organizational boundary, these emissions should be included in a future inventory cycle once reliable activity data are collected. This limitation should also be read in the context of the [University Climate Policy](#), which provides that, within 12 months from the date of policy approval, the University shall conduct an initial inventory of greenhouse gas emissions and determine the baseline year and accounting boundaries. As the Policy was approved in 2026, the present report is intended to serve as SRIUTCH's initial inventory within that implementation period and as the basis for subsequent refinement.

Second, the electricity factor used in this report is a recognized public default factor for Uzbekistan rather than a supplier-specific electricity factor issued for the reporting year. This is consistent with GHG Protocol guidance, which recommends supplier-specific factors where available and regional or grid factors where they are not.

Second, the electricity factor used in this report is a recognized public default factor for Uzbekistan rather than a supplier-specific emission factor for the exact reporting year. Its use is methodologically appropriate for an initial inventory where supplier-specific data are not

yet available; however, this factor should be reviewed and, where possible, replaced in future reporting cycles if verified supplier-specific or nationally designated factors become available.

Third, the purchased heat factor applied in this report is based on a recognized default methodology rather than on supplier-specific emissions information provided by the heat supplier. It is therefore suitable for preliminary institutional accounting, but should be understood as a provisional estimate pending the availability of more specific source data.

Fourth, supplementary environmental indicators, including cold water and stormwater, are presented in this report for completeness of resource-use disclosure, but are not converted into CO₂e in the present version. Their inclusion in emissions accounting will require additional methodological review and the availability of defensible factor assumptions.

Finally, this report has not yet undergone external assurance or third-party verification. Its credibility therefore rests on the transparency of the methodology used, the traceability of the activity data applied, and the explicit disclosure of current assumptions, exclusions, and areas requiring further refinement.

Institutional Commitments and Decarbonization Pathway

The present inventory should be understood not merely as a record of SRIUTCH's currently quantified greenhouse gas emissions, but as an **institutional foundation for long-term climate governance**, emissions reduction planning, and sustainability-related decision-making. In this sense, the value of the report lies not only in the emissions results presented, but also in the establishment of a structured accounting framework through which the University can monitor progress, refine methodologies, and progressively strengthen its climate response.

This work is anchored in the [University Climate Policy \(Sustainable Development and Climate Action Policy\)](#), which defines the University's strategic direction in the field of climate action. Under the Policy, SRIUTCH has adopted the long-term objective of achieving carbon neutrality (Net Zero) no later than **2035**. The Policy further provides that, relative to a baseline year to be formally determined on the basis of inventory results, the University is to complete a full greenhouse gas inventory and approve the baseline year and calculation methodology by 2027, reduce total greenhouse gas emissions by **at least 50 percent by 2030**, reduce total greenhouse gas emissions by **at least 75 percent by 2033**, and achieve **Net Zero by 2035**, with residual emissions to be addressed only after maximum feasible reductions have been achieved.

The current report should therefore be read as an **initial step** in the implementation of this decarbonization pathway. Although the present inventory remains preliminary in a number of respects, it already provides the institutional basis necessary for target-setting, future comparison, and the gradual transition from initial accounting to performance-oriented emissions management. In particular, it enables SRIUTCH to begin identifying the relative significance of major energy-related sources, to prioritize future data improvement efforts, and to align reporting practice with strategic climate objectives.

The University is also taking practical measures that are consistent with this trajectory. During the reporting period, SRIUTCH recorded on-site solar electricity generation used for internal consumption, thereby reducing net purchased electricity from the grid. In addition, further solar panel capacity is under development, which is expected to strengthen the role of renewable energy in the University's operational profile and contribute to a gradual reduction in indirect electricity-related emissions in future inventory cycles. Alongside this, SRIUTCH intends to continue improving energy efficiency, strengthening utility

management practices, and enhancing internal systems for the collection and validation of emissions-relevant data.

At the same time, the University recognizes that meaningful emissions reduction cannot be achieved through technical measures alone. In accordance with the Climate Policy, progress toward climate objectives will also require sustained institutional engagement, improved environmental awareness, and the gradual embedding of sustainability considerations into administrative practice, campus operations, and the everyday culture of the University community. For this reason, SRIUTCH views the development of climate awareness, environmental responsibility, and sustainability-oriented decision-making as an integral part of its broader decarbonization agenda.

CONCLUSION

This report establishes the “Silk Road” International University of Tourism and Cultural Heritage’s first formal greenhouse gas emissions inventory framework. Prepared by the [Sustainability Committee](#) in accordance with the general logic of the GHG Protocol Corporate Standard, it defines SRIUTCH’s current reporting boundary, applies recognized provisional factors, distinguishes clearly between Scope 1 and Scope 2, and discloses current exclusions transparently.

For the sources currently included in the inventory, SRIUTCH’s quantified emissions amount to 301.71 tCO₂e, comprising 25.61 tCO₂e from natural gas combustion, 276.1 tCO₂e from net purchased electricity. At the current stage, this should be described as the University’s current quantified Scope 1 and Scope 2 inventory for included sources and should not yet be treated as a fully exhaustive institutional total.

The Committee considers this transparency to be a strength of the present report. By making methodological choices explicit and by clearly identifying data gaps, the University is establishing a credible foundation for future climate reporting and sustainability disclosure.

Methodological Note

This inventory uses the standard activity-based formula:

$$\textit{Activity data} \times \textit{emission factor} = \textit{emissions}$$

Where default factors were used, they were selected from recognized methodological sources and applied in a way that matches the available SRIUTCH activity data as closely as practicable.

Baseline Year Note

The present report is intended to support the establishment of SRIUTCH’s institutional greenhouse gas accounting framework under the [University’s Climate Policy](#). The baseline year should be formally designated after internal review and validation of the initial inventory and after confirmation that the reporting boundary, area metric, and emissions-factor approach are acceptable for consistent year-on-year use.

APPENDICES TO THE REPORT

Appendix 1. Methodological and source basis

Source	Role in this report	How it was used
GHG Protocol Corporate Accounting and Reporting Standard	Primary methodological framework	Used for principles, boundary-setting logic, operational control approach, and general inventory structure
GHG Protocol Scope 2 Guidance	Scope 2 factor-selection logic	Used to justify preference for supplier-specific factors and use of regional/grid factors where supplier-specific factors are unavailable
JICA Climate-FIT Version 6.0	Electricity factor source	Used for Uzbekistan electricity consumption factor of 0.612 kgCO ₂ e/kWh
EPA GHG Emission Factors Hub (2025)	Natural gas and purchased heat factor source	Used for stationary combustion natural gas factors and purchased steam/heat factors
SRIUTCH Climate Policy	Institutional governance context	Used as internal policy context for development of the inventory framework
SRIUTCH utility and communal-services records	Activity data source	Used for electricity, solar generation, natural gas, purchased heat, water and stormwater data

Appendix 2. Institutional profile and boundary

Indicator	Value
Total university area	28,090 sq. m.
Gross Internal Area (GIA) used for reporting	6469.93 m ²
Total buildings	7
Academic buildings	4
Total vehicles	9
Electric vehicles	2
Boiler / boiler house	Yes, serving A-building only
External purchased heat	Yes

Appendix 3. Annual Activity Data Used

Category	Value	Unit	Inventory status
Gross electricity consumption	774728	kWh	Used
On-site solar generation used internally	323590	kWh	Used to derive net purchased electricity
Net purchased electricity from grid	451140	kWh	Used
Total natural gas consumption	141301	kWh	Used
Sold to regional electricity grids	121905	kWh	Sold
A-building boiler gas	63585	kWh	Total natural gas
Cold water	11689	m ³	Supplementary only
Stormwater	16331	m ³	Supplementary only

Appendix 4. Emission Factors Used

Category	Factor	Unit	Source note
Electricity	0.61200	kgCO ₂ e/kWh	JICA Climate-FIT Uzbekistan electricity consumption factor
Natural gas CO₂	53.06	kg CO ₂ /mmBtu	EPA Hub stationary combustion
Natural gas CH₄	1.0	g CH ₄ /mmBtu	EPA Hub stationary combustion
Natural gas N₂O	0.10	g N ₂ O/mmBtu	EPA Hub stationary combustion
CH₄ GWP	28	—	EPA Hub 100-year GWP
N₂O GWP	265	—	EPA Hub 100-year GWP

Appendix 5. Derivation of Converted Factors

Derived factor	Formula	Result
Natural gas factor	$(53.06 + 0.028 + 0.0265) / 293.071$	0.181234 kgCO ₂ e/kWh

Appendix 6. Emissions Calculations

Source	Formula	Emissions
Natural gas (Scope 1)	$141301 \times 0.18123 / 1,000$	25.61 tCO ₂ e
Net purchased electricity (Scope 2)	$451140 \times 0.612 / 1,000$	276.1 tCO ₂ e
Current quantified Scope 1 + Scope 2 total for included sources	Sum of above	301.71 tCO ₂ e

Appendix 7. Emissions Intensity

Metric	Value
Current quantified Scope 1 + 2 total	301.71 tCO ₂ e
GIA	6469.93 m ²
Emissions intensity	0.04663 tCO ₂ e/m ²
Emissions intensity	46.63 kgCO ₂ e/m ²