



From energy tradition to university leadership in the transition to a sustainable economy



Sustainability and Green Transition Strategy of the Petroleum-Gas University of Ploiești

Strategic document for the period 2024–2035
*From energy tradition to university leadership
in the transition to a sustainable economy*

1 Preamble: the responsibility of an energy university in an economy in transition

The Petroleum-Gas University of Ploiești operates in a context where climate change, the reduction of greenhouse gas emissions, energy efficiency, the protection of natural resources, and the circular economy have become essential priorities for society and the economy.

UPG Ploiești must contribute both to reducing its own environmental impact and to training the competencies and developing the technological solutions necessary for the energy transition.

Our goal
To become a more energy-efficient, environmentally responsible, climate-resilient institution, more connected to European and national sustainable development goals.

Implementation
The strategy serves as a framework document and must be correlated with strategic and operational plans, budget, investment projects and technical evaluations. Numerical targets will be confirmed or adjusted after the energy audit, emissions inventory and infrastructure analysis.

2 European and National Foundation for the University Green Transition

European Green Deal

- Transforming the EU into a competitive, modern and resource-efficient economy.
- Climate neutrality by 2050.

Fit for 55

- At least 55% reduction in greenhouse gas emissions by 2030 (vs. 1990).
- Implications for higher education: reduce energy consumption, modernize buildings, develop renewables, decrease emissions from transport and procurement.

Circular Economy Action Plan

- Waste prevention, reuse, repair, reduction of raw material consumption.
- Contribution from universities: sustainable procurement, digitalization, responsible consumption models.

UN 2030 Agenda

- Quality education, clean energy, industry & innovation, sustainable communities, responsible consumption, climate action, biodiversity protection.

3 National Framework

Romanian Legislation

- Emergency Ordinance no. 195/2005 – environmental protection
- Law no. 121/2014 – energy efficiency
- Law no. 372/2005 – energy performance of buildings
- GEO no. 92/2021 – waste regime
- Water Law no. 107/1996
- GEO no. 196/2005 – Environmental Fund

Other National Strategies and Programs

- Higher Education Law no. 199/2023
- National Strategy for Sustainable Development 2030
- National Strategy on Circular Economy
- National Integrated Energy and Climate Change Plan
- Energy renovation, renewable energy and digitalization programs

Compliance
All measures will be implemented in line with the applicable authorizations, permits and reporting obligations for university activities, laboratories, buildings, installations and investments.

4 Key Areas of Action

Campus operations
Energy efficiency, renewables, green spaces

Teaching activities
Sustainable curricula, green skills

Scientific research
Innovative solutions for the energy transition

Industry relations
Partnerships for a sustainable economy

Procurement
Responsible and circular procurement

Mobility
Low-emission transport solutions

Resource management
Water, waste, materials

University community involvement
Awareness, participation, behavior change

1. Preamble: the responsibility of an energy university in an economy in transition The Petroleum-Gas University of Ploiești operates in a context where climate change, the reduction of greenhouse gas emissions, energy efficiency, the protection of natural resources, and the circular economy have become essential priorities for society and the economy.

In this context, a university with a technical and energy profile cannot limit sustainability to a series of isolated administrative actions. An integrated approach is necessary, which must include campus operations, teaching activities, scientific research, industry relations, procurement, mobility, resource management, and university community involvement.

The Petroleum-Gas University of Ploiești, hereinafter referred to as UPG Ploiești or the University, has a specific responsibility. Its tradition is linked to the training of specialists for the oil, natural gas, and energy industry—fields undergoing an accelerated transformation process. Therefore, UPG Ploiești must contribute both to reducing its own environmental impact and to training the competencies and developing the technological solutions necessary for the energy transition.

The present strategy proposes the University's framework of action for the period 2024–2035. The document aims to transform UPG Ploiești into a more energy-efficient, environmentally responsible, climate-resilient institution that is more connected to European and national sustainable development goals.

The strategy serves as a framework document and must be correlated with the University's strategic and operational plans, the institutional budget, investment projects, and the results of initial technical evaluations. The proposed numerical targets will be confirmed or adjusted following the energy audit, the emissions inventory, and a detailed analysis of the university infrastructure.



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2. European and National Foundation for the University Green Transition The strategy aligns with European guidelines on climate neutrality, resource efficiency, and circular economy development. At the European Union level, the European Green Deal sets the direction for transforming the economy into a competitive, modern, and resource-efficient model. The Union's strategic goal is to achieve climate neutrality by 2050.

The European legislative package "Fit for 55" aims for a net reduction in greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. For higher education institutions, this goal is reflected in the need to reduce energy consumption, modernize buildings, develop renewable sources, and decrease emissions associated with transport and procurement.

Another relevant reference is the European Circular Economy Action Plan, which promotes waste prevention, product reuse, equipment repair, and the reduction of raw material consumption. Universities can contribute to these objectives through sustainable procurement, digitalization of administrative processes, and the development of responsible consumption models.

The strategy is also correlated with the United Nations 2030 Agenda, especially regarding goals related to quality education, clean energy, industry and innovation, sustainable communities, responsible consumption, climate action, and biodiversity protection.

In Romania, the implementation of the strategy will consider the provisions of Emergency Ordinance no. 195/2005 on environmental protection, Law no. 121/2014 on energy efficiency, Law no. 372/2005 on the energy performance of buildings, GEO no. 92/2021 on the waste regime, Water Law no. 107/1996, and GEO no. 196/2005 on the Environmental Fund.

Additionally, the strategy is aligned with Higher Education Law no. 199/2023, Romania's National Strategy for Sustainable Development 2030, the National Strategy on Circular Economy, the National Integrated Energy and Climate Change Plan, and national programs dedicated to energy renovation, renewable energy, and digitalization.

All provided measures will be implemented in compliance with the authorizations, permits, and reporting obligations applicable to university activities, laboratories, buildings, installations, and investment projects.

- **The European Green Deal**, which aims to transform the European Union into a modern, competitive, and resource-efficient economy;
- **The European Climate Law**, which sets the goal of climate neutrality for the European Union by 2050;
- **The "Fit for 55" legislative package**, through which the European Union aims for a net reduction of greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels;
- **The Energy Efficiency Directive**, including objectives for reducing energy consumption and building renovation;
- **The Energy Performance of Buildings Directive**, which promotes low-energy buildings and, eventually, zero-emission buildings;
- **The European Circular Economy Action Plan**, which aims to reduce resource consumption and increase reuse and recycling;
- **The Waste Framework Directive**, based on the waste hierarchy: prevention, reuse, recycling, recovery, and disposal;
- **The Water Framework Directive**, which sets the goal of protecting and improving the status of water bodies;
- **The EU Taxonomy for sustainable activities**, relevant for guiding investments toward projects that contribute substantially to environmental goals;



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- **European Sustainability Reporting Standards**, relevant especially for the University's economic partners and for research and collaboration projects with industry;
- **The United Nations 2030 Agenda**, especially the Sustainable Development Goals: SDG 4 – Quality Education; SDG 6 – Clean Water and Sanitation; SDG 7 – Affordable and Clean Energy; SDG 9 – Industry, Innovation and Infrastructure; SDG 11 – Sustainable Cities and Communities; SDG 12 – Responsible Consumption and Production; SDG 13 – Climate Action; SDG 15 – Life on Land; SDG 17 – Partnerships for the Goals.
- **The Constitution of Romania**, which enshrines the state's obligation to ensure the rational exploitation of natural resources and environmental protection;
- **Emergency Ordinance no. 195/2005** on environmental protection, with subsequent amendments and completions;
- **Law no. 121/2014** on energy efficiency, with subsequent amendments;
- **Law no. 372/2005** on the energy performance of buildings, republished and modified;
- **GEO no. 92/2021** on the waste regime, with subsequent amendments and completions;
- **Law no. 249/2015** regarding the management of packaging and packaging waste;
- **GEO no. 196/2005** on the Environmental Fund;
- **Water Law no. 107/1996**, with subsequent amendments and completions;
- **Law no. 249/2020** on monitoring ambient air quality, as well as applicable subsequent normative acts;
- **Law no. 319/2006** on occupational safety and health, relevant for laboratories and activities with dangerous substances;
- **Higher Education Law no. 199/2023**, with provisions regarding the mission of universities, research, innovation, public responsibility, and institutional development;
- **National Strategy for Sustainable Development of Romania 2030**;
- **Energy Strategy of Romania**, in its current form;
- **National Integrated Energy and Climate Change Plan**;
- **National Strategy on Circular Economy**;
- **National Recovery and Resilience Plan**, specifically components referring to energy renovation, renewable energy, digitalization, and sustainable development

3. UPG Ploiești – institutional evolution and responsibility toward the energy future The Petroleum-Gas University of Ploiești have its origins in the development of technical higher education intended for the oil and gas industry. The institution was founded in 1948 in Bucharest as the Institute of Petroleum and Gas, with the mission of training specialists for one of the most important sectors of the Romanian economy.

Subsequently, the institution developed in Ploiești, in a region with a significant tradition in the exploitation, processing, and utilization of energy resources. This positioning favored collaboration with refineries, oil service companies, energy operators, public institutions, and research organizations.

Throughout its evolution, UPG Ploiești has diversified its academic fields. In addition to petroleum and gas engineering, the University has developed programs and activities in areas such as environmental engineering, mechanical engineering,



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electrical engineering, chemical engineering, energy technologies, economics, management, informatics, and applied research.

This diversification provides the University with the capacity to approach sustainability interdisciplinarily. Environmental protection can no longer be treated separately from energy, industry, digitalization, transport, economy, and management. Therefore, UPG Ploiești can simultaneously utilize its technical, economic, and managerial competencies to develop solutions applicable to the energy transition.

The University's responsibility is twofold. On the one hand, it must reduce its own impact on the environment by improving building efficiency, reducing consumption, and managing resources responsibly. On the other hand, the University must prepare specialists and develop research that supports the transformation of the energy industry.

4. Strategic Vision for the year 2035 In 2035, UPG Ploiești will be a technical university oriented toward the green transition, with an efficiently managed campus, low emissions, and an institutional culture based on environmental responsibility.

The University will have a functional system for measuring consumption and emissions, will use energy and water more efficiently, will reduce the amount of waste, and will integrate environmental criteria into investment and procurement projects.

At the same time, sustainability will be present in academic activity. Students will have access to courses, projects, and practical activities related to climate change, renewable energy, energy efficiency, circular economy, and environmental protection. Research will be oriented toward solutions for reducing industrial emissions, developing clean technologies, and improving the performance of the energy sector.

The vision is based on the following principles: pollution prevention, resource efficiency, source emission reduction, decision-making transparency, data-driven decisions, university community participation, and directing investments toward measurable results.

5. Scope of the Strategy The strategy applies to all activities and spaces under the administration or coordination of UPG Ploiești. Included are teaching buildings, administrative spaces, laboratories, research centers, dormitories, canteens, technical spaces, green areas, parking lots, and transport infrastructure.

Additionally, the strategy applies to procurement activities, investment projects, renovation works, university events, research activities, and collaborations with economic and institutional partners.

Measures will be introduced progressively. In the first stage, the University will collect data and establish the baseline situation. Subsequently, priority projects will be implemented, followed by the final stage where objectives will be extended across the entire campus and to all relevant activities.

6. Sustainability Governance and Environmental Integration in University Management Implementing the strategy requires a clear institutional structure. Responsibility for sustainability cannot rest with a single person or a single faculty; it must be distributed among the University leadership, administrative structures, faculties, departments, students, and partners.

The establishment of a **Sustainability and Environment Commission** is proposed, under the coordination of the University leadership. The commission will monitor the application of the strategy, analyze performance indicators, and propose annual operational plans.

An **institutional sustainability coordinator** will be appointed, responsible for centralizing data, monitoring deadlines, preparing reports, and maintaining the link between academic and administrative structures.



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By the end of 2024, each faculty and relevant administrative structure will designate a person responsible for transmitting data and applying environmental measures. By the end of 2027, an inventory of buildings, areas, energy and water consumption, waste, and primary emission sources will be completed.

Starting in 2028, the University will publish an annual sustainability report. The report will include at least 20 indicators regarding energy, emissions, water, waste, mobility, procurement, research, and education.

7. Transforming the Campus into an Energy-Efficient and Low-Emission Space Energy efficiency represents the main direction for reducing the campus's environmental impact. Before making investments, the University will conduct an energy audit of the buildings and identify the areas with the highest consumption or losses.

Measurement systems will be improved by installing meters and sub-meters so that consumption can be monitored monthly and compared between buildings. Priority will be given to modernizing lighting, rehabilitating installations, pipe insulation, streamlining heating and cooling systems, and installing automatic control systems.

Depending on the results of technical studies, UPG Ploiești will develop projects for generating energy from renewable sources, especially by installing photovoltaic panels on suitable buildings. In parallel, the University will analyze the possibility of purchasing electricity from renewable sources.

Compared to the baseline year established through the initial audit, the University aims to reduce total final energy consumption by 15% by 2030 and by 30% by 2035. Energy consumption per square meter will be reduced by at least 30% by 2035.

By 2030, at least 80% of interior spaces will use LED lighting, and by 2035 the goal is to achieve 100% coverage. The University aims to install a photovoltaic capacity of at least 500 kW by 2030, subject to confirmation of technical and financial feasibility.

8. Reducing Emissions and Building a Climate-Resilient University UPG Ploiești will develop its first institutional greenhouse gas emissions inventory by the end of 2027. The inventory will include direct emissions from fuel use, emissions associated with electricity and heat consumption, and, to the extent of data availability, emissions from transport, procurement, waste, and business travel.

Based on this inventory, the University will establish an annual reporting methodology and track the evolution of emissions per student, per employee, and per square meter of building.

The objective is to reduce operational emissions by 25% by 2030 and by 45% by 2035 compared to the baseline year. Emissions generated by business travel will be reduced by 25% by 2030 through the use of videoconferencing, efficient travel planning, and the promotion of rail transport when possible.

The University will integrate climate change adaptation measures. By 2029, a plan regarding risks associated with heatwaves, drought, heavy rainfall, and the heat island effect will be developed. Shaded areas, vegetation, permeable surfaces, and rainwater management will be used to increase campus resilience.

9. Water Conservation and Pollution Risk Prevention Responsible Water Management will start with measuring consumption and identifying leaks. By 2028, at least 90% of the main buildings will have functional meters, and consumption will be reported monthly.

The University will gradually replace inefficient sanitary equipment, use timed faucets or sensors, and introduce procedures for rapid leak detection. In laboratories, strict instructions regarding the handling of chemical substances and the prevention of their discharge into the sewage network will be applied.



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Water consumption per person will be reduced by 20% by 2030 and by 30% by 2035. Where technical studies confirm feasibility, rainwater will be collected and used for irrigating green spaces. By 2030, the goal is for at least 10% of irrigation needs to be covered through rainwater reuse.

10. From Waste Management to a Circular Economy Culture Waste management will be reorganized based on the principle of prevention. The University will focus on reducing the amount of waste generated before investing in its collection and treatment.

Separate collections will be introduced in all main buildings by 2028. Collection points will be set up for paper, cardboard, plastic, metal, glass, electrical and electronic equipment, batteries, and other relevant categories.

Laboratory waste, chemical substances, and contaminated packaging will be managed separately, exclusively through authorized operators. Quantity tracking will be improved, and staff and students will receive instructions on their collection and storage.

Paper consumption will be reduced by 40% by 2030 and by 60% by 2035 through the digitalization of administrative workflows and the reduction of printed documents. Single-use plastic products will be reduced by 70% by 2030.

The University aims to recycle or recover at least 50% of non-hazardous waste by 2030 and reach a minimum rate of 65% by 2035. Waste generated per student will be reduced by 20% by 2035.

11. Procurement and Investment as Tools for Green Transformation Procurement decisions will include, as permitted by legislation, criteria regarding energy efficiency, resource consumption, lifespan, repairability, recyclability, and environmental impact.

By 2028, environmental criteria will be introduced in at least 50% of relevant procurements. This share will increase to 75% by 2030 and to 90% by 2035.

For IT equipment, furniture, lighting, climate control systems, cleaning materials, and printed products, life-cycle costs will be analyzed, not just the initial price. Paper used by the University will be certified or contain 100% recycled material by 2028.

All major investment projects will include an analysis of energy efficiency, resource consumption, and environmental impact. By 2030, this analysis will be included in at least 80% of major projects.

12. University Mobility and Reducing Polluting Transport the University will conduct a study on the mobility of students, employees, and visitors by 2027. The study will identify the proportion of trips made by car, public transport, bicycle, and walking.

Based on the results, UPG Ploiești will develop facilities for bicycles and scooters, promote the use of public transport, and encourage carpooling. By 2028, at least 100 bicycle parking spaces will be provided, with the possibility of expansion based on demand.

The University aims for a 15% reduction in individual car trips by 2030 where functional alternatives exist. By 2030, at least two electric vehicle charging stations will be analyzed and, if infrastructure allows, installed.

As part of fleet renewal, at least 50% of vehicles purchased or replaced by 2030 will have low emissions.

13. Green Campus, Biodiversity, and the Quality of University Space the University's green spaces will be managed not just as decorative elements, but as ecological infrastructure. These contribute to temperature reduction, rainwater absorption, carbon sequestration, and the improvement of study and work conditions.



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By 2028, an inventory of trees and green areas will be completed. The University will protect mature trees and plant species adapted to local conditions, avoiding invasive species.

By 2030, at least 500 trees and shrubs will be planted, with a minimum survival rate of 85%. Pesticide use will be reduced by 50% by 2030, and green space maintenance will integrate low-impact methods.

By 2030, the University will set up at least three biodiversity demonstration zones, which can also be used in educational activities.

14. Education, Research, and Innovation for Energy Transition Sustainability must become a visible component of the university experience. By 2030, every study program will include at least one module, course, project, or applied activity related to sustainability, environmental protection, energy efficiency, or climate transition.

Students will be involved in interdisciplinary projects on consumption monitoring, waste reduction, renewable energy use, industrial process efficiency, water treatment, and ecosystem protection.

By 2030, at least 1,000 students will participate annually in environmental education activities, and the University will support at least 20 student sustainability projects per year.

Research will be oriented toward fields such as industrial energy efficiency, emission reduction in the oil and gas sector, hydrogen, carbon capture and utilization, wastewater treatment, waste reduction, fugitive emission monitoring, and the circular economy.

The University aims for a 30% increase in the number of research projects with environmental or energy transition themes by 2030. By 2030, at least five projects applied together with industrial partners will be developed, and by 2035 at least three demonstration projects will be completed on campus.

15. Implementation Stages of the Strategy until 2035 In the 2024–2027 period, the priority will be organization and measurement. The University will approve the strategy, establish the Sustainability Commission, designate responsible parties, perform the energy audit, emissions inventory, water consumption assessment, waste analysis, and mobility study.

Between 2028 and 2030, the emphasis will be on implementing priority investments. Lighting systems and installations will be modernized, smart meters will be introduced, renewable energy projects will be developed, and separate collection and green procurement will be expanded.

In the 2031–2035 period, measures will be consolidated and extended. The University will aim to achieve emission reduction targets, increase renewable energy production capacity, renovate priority buildings, and integrate sustainability into all institutional decisions.

In 2030, an intermediate evaluation will be conducted, and in 2035 the final evaluation and the new strategy for the following period will be prepared.

16. Responsibilities for Strategy Implementation the **University Senate** will approve the strategy, analyze annual reports, and track the integration of sustainability into institutional development.

The **Board of Directors** will ensure the necessary resources, approve operational plans, and prioritize investments with a positive environmental impact.

The **Sustainability and Environment Commission** will coordinate implementation, centralize data, monitor indicators, and propose corrective measures.



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Faculties and departments will integrate sustainability into teaching and research activities and designate responsible parties for data transmission.

Administrative structures will apply measures regarding energy, water, waste, procurement, and building maintenance. Students will be involved through projects, campaigns, monitoring activities, and improvement proposals.

17. Main Performance Indicators and Institutional Targets

Domain	Indicator	2030 Target	2035 Target
Energy	Energy consumption reduction	15%	30%
Emissions	Scope 1 and 2 emission reduction	25%	45%
Renewable Energy	Share of renewable electricity	50%	80%
Photovoltaic	Installed capacity	500 kW	Expansion based on feasibility
Lighting	Spaces with LED	80%	100%
Water	Reduction of consumption per person	20%	30%
Waste	Recycling/recovery of non-hazardous waste	50%	65%
Paper	Consumption reduction	40%	60%
Plastic	Reduction of single-use products	70%	90%
Procurement	Procurements with environmental criteria	75%	90%
Mobility	Reduction of individual car trips	15%	25%
Biodiversity	Trees and shrubs planted	500	Expansion based on space
Education	Students involved annually	1,000	1,500
Research	Increase in sustainability projects	30%	50%

All percentage reductions will be calculated relative to the baseline year established after the completion of the initial evaluation. In case historical data is unavailable, 2027 will be used as the base year for operational indicators.



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18. Monitoring, Reporting, and Continuous Improvement Monitoring will be performed quarterly at the administrative level and annually at the institutional level. Data will be centralized by the sustainability coordinator and analyzed by the Sustainability and Environment Commission. The annual report will present the evolution of energy and water consumption, calculated emissions, waste quantities, green procurement, research projects, educational activities, investments made, and savings achieved.

When targets are not met, the responsible structures will propose corrective measures. These may include modifying the timeline, reallocating resources, changing the technical solution, or revising the indicator, with University leadership approval. To increase credibility, certain data may be verified by external auditors or experts, especially the emissions inventory, energy performance, and renovation project results.

19. Expected Results and Impact on the University Applying the strategy will lead to reduced energy consumption, decreased emissions, lower waste quantities, and more responsible use of water and other resources. From a financial perspective, energy efficiency and reduced consumption can decrease operating costs and protect the University against energy price variations. Simultaneously, the existence of a coherent strategy will facilitate access to European and national funding.

From an academic perspective, the strategy will consolidate UPG Ploiești's position as a relevant institution for the energy transition and environmental protection. Students will acquire competencies better adapted to green economy requirements, and researchers will be able to develop solutions for industry and public administration. From an institutional perspective, implementing the strategy will contribute to forming an organizational culture based on responsibility, efficiency, and transparency. UPG Ploiești will be able to become a regional model for a technical university that leverages its energy tradition to contribute to the development of a cleaner, more efficient, and more resilient economy.

Conclusions The Environmental Sustainability Strategy of the Petroleum-Gas University of Ploiești proposes moving from a fragmented approach to environmental issues to an integrated institutional system that is measurable and results-oriented. For UPG Ploiești, sustainability is not just about reducing energy consumption or separate waste collection. It means transforming how the University teaches, researches, invests, uses resources, and collaborates with society. The academic profile of UPG Ploiești offers an important advantage: the University possesses competencies in fields directly related to energy, engineering, industry, and environmental protection. These competencies must be leveraged both for reducing its own footprint and for developing solutions applicable in the economy.

The proposed targets for 2030 and 2035 offer a concrete framework for action: reducing energy consumption by up to 30%; reducing operational emissions by up to 45%; increasing the share of renewable energy; reducing water consumption; increasing recycling; developing green procurement; creating a greener and more resilient campus; integrating sustainability into education and research.

The adoption and implementation of this strategy will require a formal decision by the University leadership, an initial evaluation based on real data, and the development of annual operational plans. The proposed targets must be confirmed or adjusted after conducting the energy audit, the emissions inventory, and the infrastructure evaluation.

By applying this strategy, UPG Ploiești can become a regional example of a technical university oriented toward the energy transition, environmental protection, and sustainable development.

Rector

Petroleum-Gas University of Ploiești