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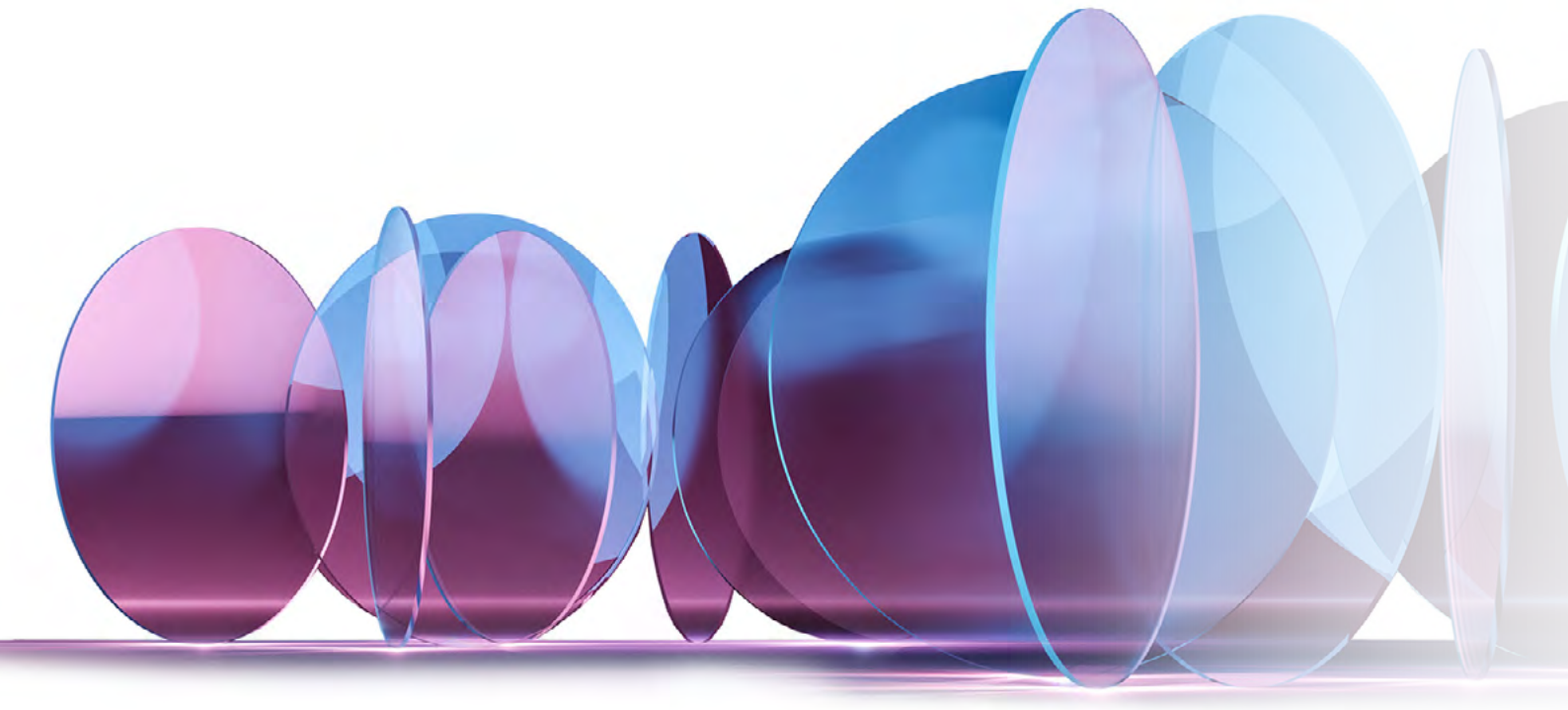
Environmental Statement

Urenco Deutschland GmbH
Gronau Uranium Enrichment Facility

2026
Reporting Year 2025



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Foreword

Dear Readers,

This brochure presents the consolidated Environmental Statement of Urenco Deutschland GmbH (UD) for 2025. It provides a transparent and concise overview of the environmental impacts of all UD activities. Its contents, together with the underlying sources of information, have been reviewed by independent environmental auditors in accordance with the stringent requirements of the European Eco-Management and Audit Scheme (EMAS) Regulation.

The Environmental Statement serves as an independently verified source of information for both the interested public and our employees.

Reducing the use of fossil fuels while ensuring a secure energy supply is crucial in the fight against climate change. The EU Net-Zero Industry Act classifies nuclear fuel cycle technologies, such as uranium enrichment, as net-zero technologies because they contribute to decarbonisation, reindustrialisation, and the energy transition, while generating only low levels of greenhouse gas emissions themselves.

To achieve net-zero emissions as early as 2040, Urenco signed a climate pledge in 2021 and committed to emissions' reporting, in accordance with the Greenhouse Gas Protocol. The company also pledged to reduce its emissions by 2030, compared with 2019 levels, by 90% for Scope 1 and Scope 2 emissions and by 30% for Scope 3 emissions.

In addition to reviewing the environmental performance of the past three years, this Environmental Statement presents the company profile, vision and mission, as well as the company's policies.

The updated environmental aspects are presented in the context of the 17 United Nations Sustainable Development Goals (SDGs), alongside an assessment of the progress made toward environmental objectives and the introduction of ambitious new targets for the coming years.

In 2025, 417 nuclear power reactors operating in 31 countries worldwide avoided approximately 1.2 billion tonnes of CO_2 emissions by generating 2.6 trillion kWh of electricity. UD contributes to this achievement by supplying nuclear fuel, together with its sister companies in the Netherlands, the United Kingdom, and the United States, to more than 50 customers in over 20 countries.

Now in its 30th consecutive year of successful EMAS registration, UD continues to pursue the ongoing improvement of its environmental performance. The most significant environmental aspect remains the consumption of electricity. Reducing annual electricity consumption is challenging due to warmer and longer summers and the associated cooling requirements. Nevertheless, in 2025 UD achieved its lowest electricity consumption since the completion of the most recent expansion phase in 2012, using only 104.7 GWh of electricity.

UD's environmental performance during the reporting year was substantial, and the Environmental Management System has been assessed by the Managing Director as effective, suitable, and adequate.

Dr Joerg Harren
Managing Director
Urenco Deutschland GmbH

Gronau, 22 May 2026

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Company

Figure 1: Entrance to the Gronau Technology Centre

UD is a subsidiary of the British Urenco Enrichment Company (UEC) Limited, which operates uranium enrichment facilities in the United Kingdom, the Netherlands, the United States of America, and Germany to supply fuel for nuclear power plants.

At the end of 2025, Urenco Deutschland GmbH (UD) employed 365 people at its Gronau site, including 19 apprentices. With their outstanding skills and commitment, employees are the key factor in ensuring the safe operation of the facility.

In addition, 63 employees of our sister company, Urenco Technology & Development (UTD), have their permanent office workplace at the Technology Centre site (see Figure 1). The environmental performance of UTD is not within the scope of this Environmental Statement. However, consumption data from shared facilities (such as the staff restaurant and sanitary facilities) also include portions attributable to their use by UTD employees.

Since 1985, UD has used the gas centrifuge process for uranium enrichment. This technology is characterised by extremely low energy consumption and a high level of operational safety. The more electricity-intensive gaseous diffusion process, previously used by competitors, was phased out of the market in 2014 because it required more than 50 times as much electricity.

Site

The Gronau Uranium Enrichment Plant (German: UAG) is located in Germany, in the federal state of North Rhine-Westphalia, within the Münster administrative district, Borken county, and the eastern industrial and commercial area of the City of Gronau. The site is situated close to the German-Dutch border.

The UD site includes enrichment facilities, workshops, administrative offices, and a staff restaurant. The UAG buildings are located on a secured site covering approximately 76 hectares, protected by physical security measures. Outside the secured area, UD operates an Information Centre to provide information to the public.

The site outlined by the black dashed line in Figure 2 is bordered to the east by a 145-hectare protected forest area, through which the Goorbach stream flows. To the north are forestry and agricultural lands as well as an allotment garden area. Industrial and commercial businesses are located to the west and south. A small number of residential buildings are situated near the plant site.

The wider surrounding area is used for commercial activities to the south and west, while the remainder is predominantly devoted to forestry and agriculture, including livestock farming and cereal cultivation.

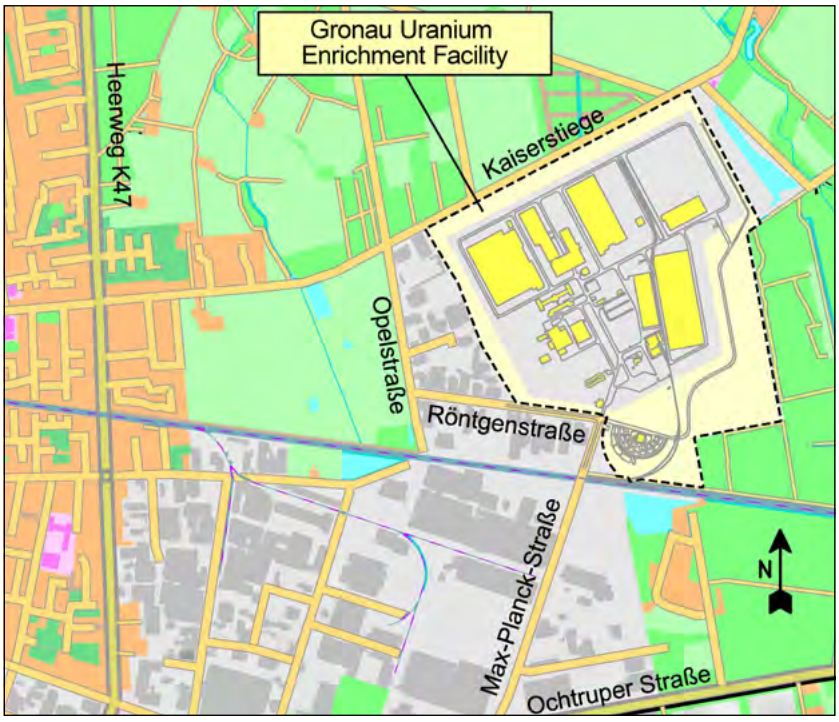


Figure 2: Location of the Gronau Uranium Enrichment Facility

Plant

Since the most recent expansion licence was granted in 2005, the UTA-2 enrichment plant and the TI-2 Technical Infrastructure building, together with associated buildings, outdoor storage areas and infrastructure facilities, have been constructed and commissioned.

Construction of the uranium oxide storage facility has been completed, and nuclear commissioning is expected to begin shortly. The plant is currently operating with a capacity of approximately 3,300 tonnes of separative work (SW) per year. Ongoing centrifuge replacement campaigns, known as refurbishments, together with additional measures and investments, help to maintain this capacity. The application for the nuclear commissioning of the uranium oxide storage facility was submitted at the end of 2025.

The enrichment plants house the centrifuges used for uranium enrichment, along with the additional systems required for operation. The systems of the enrichment facilities are controlled and monitored from the Central Control Room located in UTA-2. The Technical Infrastructure includes facilities for blending and storing enriched uranium, laboratories, workshops, UF_6 cylinder cleaning systems, pumps, valves, and installations for the treatment of wastewater generated during operations.

Since operations commenced in 1985, the enrichment facilities have only been completely shut down and restarted once. This occurred following the severe snowfall and resulting power outage that affected the Münsterland region at the end of November 2005. This exceptional event demonstrated the reliability of the facility. All components functioned without error following restart, and the safety of the plant was never compromised at any time.

Figure 3: Open autoclave lid with connected UF_6 cylinder

From commissioning in 1985 through to the end of 2025, UD produced approximately 84,500 tonnes of separative work (SW). The nuclear fuel material produced from this enrichment output has so far generated approximately 3.7 trillion kWh of electricity via nuclear reactors. This represents an amount of energy more than eight times Germany's total electricity consumption in 2025, while simultaneously avoiding approximately 1.9 billion tonnes of CO_2 emissions.[1]

Comprehensive environmental protection considerations were incorporated into the design of the facility from the outset. As part of the licensing process for the uranium enrichment plant, UD prepared nuclear safety reports and conducted environmental impact assessments. The risks associated with potential incidents were examined in detail and thoroughly evaluated through accident analyses. Appropriate measures to limit the consequences of potential incidents were defined. These analyses were independently reviewed and form the basis of the nuclear operating licences issued for the Gronau Uranium Enrichment Plant (German: UAG) (see chapter Nuclear Regulatory Licences).

Multiple barriers are in place to prevent any potential release of hazardous substances or radioactive materials into the environment.

The first barrier consists of specially qualified, internationally standardised, thick-walled steel transport cylinders designed for uranium hexafluoride (UF_6) service.[2] The cylinders are normally maintained under vacuum relative to atmospheric pressure. If a leak were to occur in this first barrier, pressure equalisation would cause ambient air to enter the cylinder rather than allowing cylinder contents to escape into the environment. Before use, the transport cylinders are pressure-tested at 28 bar, whereas the maximum operating pressure within the UAG is only 3 bar.

Under normal conditions, the process material exists as a solid. The enrichment process requires the material to be in gaseous form under vacuum conditions. The process route therefore passes through a liquid phase. The transport cylinders are placed inside securely sealed pressure vessels known as autoclaves and heated until the cylinder contents liquefy (see Figure 3). The autoclave[3] serves as the second barrier against any potential release.

The occurrence of impermissible overpressure or vacuum conditions in cylinders and equipment is prevented by appropriate measures. All equipment operated under pressure, such as autoclaves, is fitted with safety devices that effectively prevent unacceptable pressure excursions before so-called

[1] Press release " Stromverbrauch und Erzeugung aus erneuerbaren Energien" issued by the Bundesnetzagentur [German Federal Network Agency] on 5 January 2026, Bonn, and Urenco Group Annual Report & Accounts 2025, page 5, section Non-financial Outcomes, third bullet point.

[2] Urenco uses two cylinder types worldwide: the 48Y cylinder for feed and tails material and the 30B cylinder for product material (see chapter The Enrichment Process on page 9). Both cylinder types are manufactured from fine-grain carbon steel that is resistant to UF_6. The nominal wall thickness is 15.9 mm for 48Y cylinders and 12.7 mm for 30B cylinders.

[3] The term autoclave originates from Greek and means "self-closing" or "self-sealing". In everyday life, a pressure cooker is a simple example of an autoclave.

protection or safety limits are reached, for example by automatically shutting down the electrical heating system. Effective technical, organisational and administrative procedures and regulations are documented in the operating manual, which comprises several thousand pages.

Should this second barrier also fail, the building itself constitutes the third barrier. As the air pressure inside these buildings is continuously maintained below the outside atmospheric pressure, the failure of the first two barriers would still not result in a release of uranium hexafluoride (UF_6) into the environment. Buildings in which autoclaves are operated, as well as rooms such as laboratories where small quantities of UF_6 are handled in open systems, are equipped with highly efficient filtration systems. In the event of an incident, these systems retain radioactive substances and ensure that all air is discharged in a controlled manner through the continuously monitored ventilation system (see chapter "Discharges of Radioactive Substances").

Unlike a nuclear power plant, a power outage does not constitute a safety-critical event for a uranium enrichment facility. Owing to the underlying physical characteristics of the process and the safety-oriented design of the isolation systems, the plant automatically returns to a safe condition (the so-called fail-safe principle).

A loss of power to the facilities of the Gronau Uranium Enrichment Plant has no adverse effect on the safe containment of radioactive materials. Even if a simultaneous failure of the emergency power supply is assumed, the affected systems remain in a safe condition. Therefore, no releases would result.

The important measurement, control and regulation systems are supplied with uninterrupted power. Other essential consumers are also reconnected after a short interruption through a redundant emergency power supply in the event of a failure of the public electricity grid.

This arrangement is primarily intended to protect the investment, since the sensitive and capital-intensive high-technology systems could be damaged if the plant were not shut down in a controlled manner.

A brief history of uranium

With the exception of plutonium and neptunium, which occur only in trace amounts, uranium is the heaviest naturally occurring element, not only on Earth but within the entire Solar System. The nucleus of uranium contains 92 protons, which determines its position in the Periodic Table of the Elements, the so-called atomic number, as 92. Figuratively speaking, 92 is the last house number on the street of natural matter.

According to the Big Bang theory, approximately 13.8 billion years ago, after about three minutes, temperature and pressure had decreased sufficiently for matter to decouple from radiation. After 300,000 years, hydrogen and a small percentage of helium had formed. Houses number one and two were occupied. After approximately 80 million years, the first stars formed. Within stars, gravity drives the fusion process towards progressively heavier elements. Elements can be created in this way up to approximately atomic number 26 (iron) or 28 (nickel), but not beyond.

The fusion of heavier elements requires pressures greater than those normally found inside stars. This process depends on the release of enormous amounts of energy, such as occur only at the end of the life of a star at least ten times as massive as our Sun. When such a star has exhausted its nuclear fuel and fusion has progressed approximately to iron, the radiation pressure produced by fusion disappears and no longer counteracts gravity.

As a result, the outer layers of the star collapse inward, causing a dramatic increase in pressure that ultimately leads to a supernova explosion. During this process, all 64 elements between nickel (28) and uranium (92) are produced within a very short period through a mechanism known as rapid neutron capture. These elements include familiar substances such as cobalt, nickel, arsenic, copper, silver, iodine, lead, gold and, of course, uranium.

In August 2017, astronomers detected a gravitational-wave signal and a gamma-ray burst originating from the merger of two neutron stars, a phenomenon known as a kilonova. Analysis of the event also provided evidence of rapid neutron capture, the process responsible for the nucleosynthesis of the heavier elements. Without this process, these elements would not exist, and consequently there would be no planets, no life, no human beings and no uranium.

Uranium occurs naturally in trace quantities throughout the environment, both in soils and rivers, and in more concentrated form within the oceans. In dried-up inland seas, geological processes often result in uranium occurring together with phosphorus, a main-group element with similar chemical behaviour. At approximately 3 grams per tonne of Earth's crust, uranium is about as abundant as silver. Through natural processes it is distributed virtually everywhere in trace or ultra-trace quantities.

Both uranium and its compound uranium hexafluoride (UF_6) are classified under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) as Acute Toxicity Category 2 substances. In terms of acute toxicity, these materials are roughly comparable to lead. Substances such as strychnine, formaldehyde or chronically consumed alcohol, which belong to Acute Toxicity Category 1, are considerably more toxic.

An element may occur in different isotopic forms. Figuratively speaking, different occupants (isotopes) live in the same house. The house of uranium is occupied primarily by the isotopes ^{235}U and ^{238}U, which today occur naturally

[4] At the kilonova event described above, uranium isotopes are produced in roughly equal proportions. Based on their present relative abundances and half-lives, the uranium-lead dating method can be used to determine the time at which the heavy elements from which our Solar System originated were formed. This is estimated to have occurred approximately 6 billion years ago. The oldest solid components of the Solar System formed around 4.56 billion years ago, followed shortly thereafter by the Earth, approximately 4.54 billion years ago (± 50 million years).

throughout our Solar System in the constant proportions of 0.7% and 99.3%, respectively.

The two occupants have different life expectancies, referred to by physicists as half-lives. ^{238}U is extremely long-lived; after 4.5 billion years, only half of its atoms have decayed. By contrast, ^{235}U has a half-life of only 704 million years, meaning that half of its atoms have decayed after that period.

Because of its long half-lives, natural uranium has a relatively low specific activity of 25,400 becquerels per gram (Bq/g). Uranium is therefore only weakly radioactive. All uranium isotopes decay by emitting alpha radiation. Alpha particles are charged helium nuclei and have a range in air of only a few centimetres. They cannot penetrate containers, pipelines or even sheets of paper.

Some decay products of uranium also emit beta and gamma radiation. Beta radiation consists of electrons or positrons ejected from atomic nuclei and has a much smaller interaction cross-section than alpha radiation. Its range in air extends to several metres.

Neutron radiation is generated when alpha particles interact with fluorine atoms in so-called (alpha, n) reactions or through the spontaneous fission of ^{238}U. Gamma radiation is capable of penetrating container walls. Both gamma radiation and neutron radiation are continuously monitored and recorded by means of sensitive measuring instruments located at the site boundary and throughout the plant site (see chapter "Environmental Monitoring").

To initiate and sustain a chain reaction in ordinary water, uranium used as nuclear fuel must contain a ^{235}U concentration greater than 3%. It is now known that the principle of self-sustaining nuclear fission was not first invented by humans, as was long believed. Approximately two billion years ago, fifteen confirmed natural nuclear reactors were active in what is now Gabon in West Africa. After about 500,000 years, their operation ceased because the proportion of ^{235}U had been reduced by fission to below 3%.

If humanity wishes to use the controlled decay of uranium as nuclear fuel in nuclear reactors, the same laws of physics apply as those that governed the natural reactors two billion years ago. A ^{235}U concentration greater than 3% is required. However, since the natural isotope ratio of ^{235}U in uranium today is only about 0.7%, the proportion of this isotope must be increased artificially. This requires a technical separation process known as enrichment. The compound best suited for this purpose is uranium hexafluoride (UF_6), which is produced from uranium ore through a chemical process known as conversion.

The process medium UF_6

Under normal conditions of temperature and pressure, uranium hexafluoride (UF_6) is a white crystalline solid (see Figure 4).

It is neither flammable nor explosive and is chemically stable in dry air. When it comes into contact with water, for example atmospheric moisture, it reacts rapidly to form uranyl fluoride (UO_2F_2) and hydrogen fluoride (HF). When dissolved in water, hydrogen fluoride is known as hydrofluoric acid.

At very low concentrations, well below levels that could pose a health hazard, HF is readily detectable as a greyish-white mist and can be recognised by its pungent odour. At higher concentrations, HF vapours have a corrosive effect. The principal hazard associated with UF_6 does not arise from its radiotoxicity but from the hydrofluoric acid formed when it reacts with water. Like formic acid, hydrofluoric acid is capable of penetrating the skin.

Since UF_6 is solid under normal conditions whereas the enrichment process requires a gas, it must be converted into the gaseous phase. Two different process routes are available for this purpose (see the red arrows in Figure 5), both of which are implemented at the Gronau Uranium Enrichment Plant (UAG).

The first route leads from the solid phase through the liquid phase and then into the gaseous phase. In the second route, UF_6 passes directly from the solid phase to

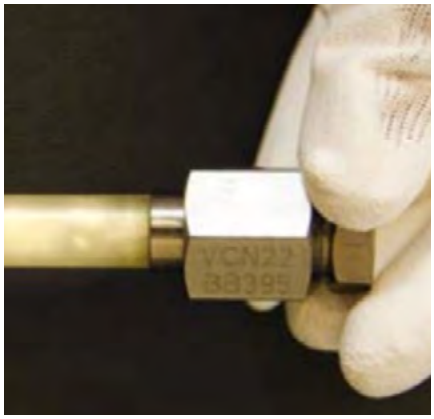


Figure 4: Inside the so-called P10 ampoule, the white hex (UF_6) can be seen

the gaseous phase at a somewhat lower temperature. The first route is comparable to melting ice into liquid water and subsequently boiling it into steam. The second route bypasses the liquid phase and involves a direct transition between the solid and gaseous states, a process known as sublimation.

Sublimation is not unique to UF_6. Water can also pass directly from the solid state to the gaseous state under appropriate conditions, for example when snow evaporates without first melting.

The dependence of these phase transitions on temperature and pressure, as well as the two process routes described above, is illustrated in Figure 5.

The density of solid UF_6 at room temperature is 5.1 g/cm³ and decreases to 3.7 g/cm³ when it liquefies. Physicists refer to this as a density discontinuity (see Figure 6). A comparable effect is known from water, although with the opposite sign. This phenomenon is referred to as the anomaly of water. When water freezes in a closed container, such as a sealed bottle or a closed water pipe, the ice formed has a lower density than the liquid water from which it originated. Since the mass of the water remains constant during this phase transition, its volume expands. As a result, the container may bulge or even rupture.

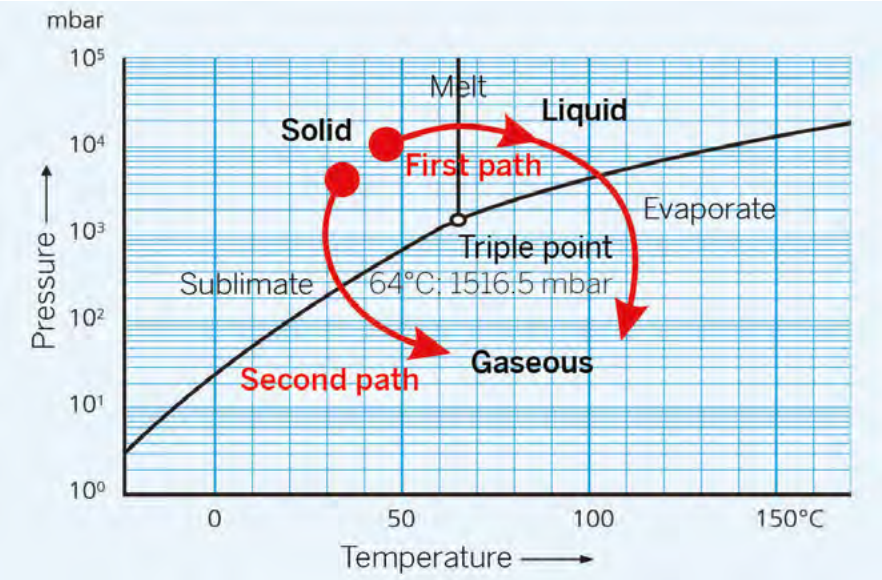


Figure 5: Phase diagram of hex (UF_6)

For several tonnes of UF_6 contained in a cylinder to liquefy unintentionally, the material would have to be exposed to temperatures above 64°C for a very long period of time. Even during the hottest summer, the energy absorbed from solar radiation would not be sufficient to cause liquefaction and the associated density change in a cylinder exposed to direct sunlight throughout the day.

Nevertheless, as an additional precautionary measure, UF_6 cylinders are never filled to more than two-thirds of their maximum capacity. This ensures that rupture of a cylinder due to the increase in volume associated with liquefaction of its contents can be safely excluded.

Applied to water, this would mean that a closed container filled with water or an aqueous solution should not be filled beyond 90% of its capacity. Otherwise, the container could burst if an unplanned density change occurred when the water freezes.

The enrichment process

In UF_6 (uranium hexafluoride), one uranium atom is bonded to six fluorine atoms. Fluorine (F) is a so-called mono-isotopic element, meaning that the "house" of element number 9 has only one resident (isotope) with an atomic mass of 19 units. As a result, UF_6 molecules have a mass of either 349 (= 6 × 19 + 235) or 352 (= 6 × 19 + 238) atomic mass units, depending on which uranium isotope is present.

The fact that only two fractions occur is an advantage. If uranium had a different bonding partner, such as chlorine, which itself consists of two isotopes, the mixture would already contain four fractions.

The enrichment process is an engineering process that exploits the molecular mass difference (349 versus 352), which is slightly less than 1%, to separate the two isotopes from each other.

Purely chemical methods cannot generally be used for this separation because the chemical properties of both fractions are identical. This also means that UF_6 does not undergo any chemical change during the enrichment process.

To better illustrate the enrichment process, a simple ball model can be used. Among 1,000 uranium atoms in natural uranium, only seven are ^{235}U atoms today, around 6 billion years after uranium was formed. However, Urenco's customers require nuclear fuel containing 30 to 50 ^{235}U atoms per 1,000 uranium atoms. To achieve this, the isotopic composition must be altered.

When the proportion of ^{235}U atoms is increased above seven per 1,000, the process is called enrichment, and the resulting material is referred to as enriched uranium. If the proportion falls below seven ^{235}U atoms per 1,000, the process is called depletion, and the resulting material is known as depleted uranium.

Starting from the original mixture, known as the feed (illustrated in yellow in Figure 7), enrichment into a product fraction (shown in red) is always accompanied by the simultaneous production of a tails fraction (shown in green). In this tails fraction, only about two to three ^{235}U atoms per 1,000 uranium atoms remain.

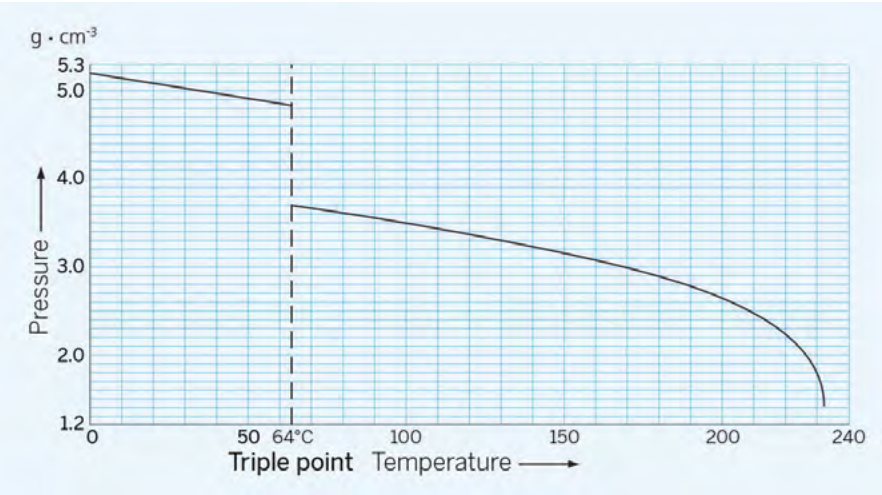


Figure 6: Density diagram of UF_6

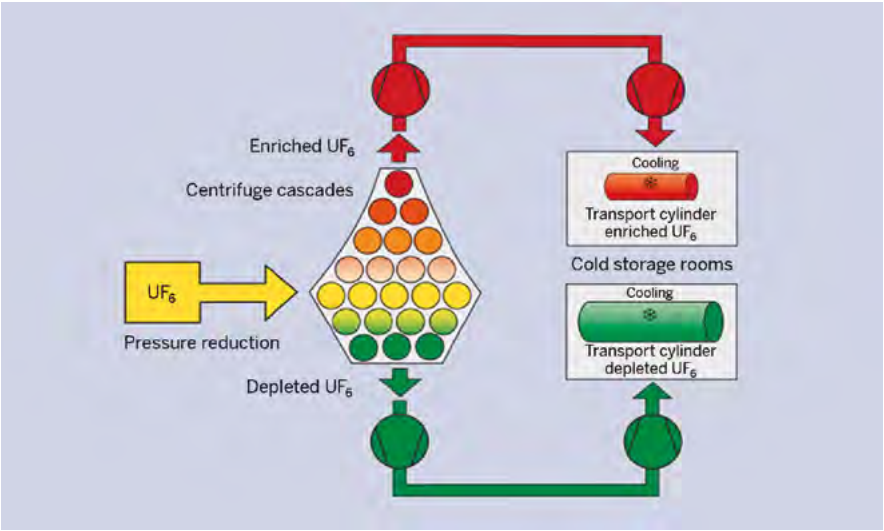


Figure 7: Schematic UF_6 separation process from feed (yellow) to product (red) and tails (green)

For the industrial uranium enrichment process, solid UF_6 (the feed material) is delivered by truck or rail in internationally standardised steel pressure cylinders. Both the cylinders and the associated equipment are inspected for external contamination, damage, and suitability for use. To verify the uranium content, the cylinders are transported by specialised handling vehicles into the enrichment facility, where they are weighed and sampled.

In facilities constructed up to 1998, UF_6 is introduced into the process by heating the transport cylinders. Electrically heated air raises the cylinder temperature to 80-100°C, causing the UF_6 to liquefy completely. The vapor pressure generated above the liquid phase is then reduced through several pressure-reduction stages before the gas is fed to the centrifuges. After enrichment, the UF_6 is collected in deeply cooled receiving vessels known as desublimators, where it is removed from the gas phase by direct solidification at approximately -70°C. Water is used as the cooling medium for tails material, while air is used for the product stream. The filled desublimators are subsequently heated, causing the UF_6 to vaporize. The gas then flows through pipelines into transport cylinders, where it solidifies again upon cooling.

In all plant sections built since 1998, feed is introduced directly from the solid UF_6 phase under vacuum conditions. UF_6 pumps are used, significantly reducing both the UF_6 inventory within the system and overall energy consumption compared with the earlier process. In addition, much smaller quantities of refrigerant are required. Product and tails streams are desublimated directly into refrigerated UF_6 transport and storage cylinders using low-pressure pumps.

The degree of separation achievable in a single centrifuge is limited by physical constraints. Beyond a certain point, no further significant enrichment or depletion occurs. A similar limitation exists in alcohol distillation and crude oil refining, where fractionating columns with multiple stages are required to achieve greater separation and prevent remixing. In centrifuge enrichment, the equivalent solution is to connect many centrifuges into cascades. Within these cascades, UF_6 gas is progressively separated into an enriched product stream (Product) and a depleted stream (Tails) (see Figure 7, centre), enabling the desired concentration of ^{235}U to be achieved.

In the Product Storage located within the technical infrastructure building, product material with different ^{235}U concentrations is blended to achieve precisely the enrichment level specified by the customer for each cylinder. During this process, the UF_6 is reheated and liquefied to ensure complete homogenisation (mixing). Samples are then taken to verify the enrichment level.

Before cylinders filled with either tails or product material are transported to their respective storage areas, they are inspected for external contamination and physical damage. All incoming and outgoing shipments are checked for contamination using wipe tests. The results consistently show contamination levels well below the applicable regulatory limits. These findings are regularly confirmed through independent inspections and measurements conducted by authorised experts.

The enriched material is stored in the Product Storage Facility until shipment to customers. Before loading the cylinders for transport, they undergo another inspection for possible external contamination and damage. Shipments are dispatched either from the Receive & Dispatch Station by truck or rail, or directly from the Product Storage Facility by truck.

The cylinders, manufactured in accordance with international standards, are protected during transport by specially designed protective overpacks. These overpacks are subject to separate certification requirements for use in public road and rail transport. Companies transporting uranium hexafluoride must hold a special authorisation issued by the German Federal Office for Radiation Protection (Bundesamt für Strahlenschutz). Compliance with this authorisation requirement is verified by UD prior to every shipment.

Environmental monitoring

At 14 monitoring locations along the outer perimeter fence of the UD's site, at two monitoring points within the facility, and at reference locations outside the site, both gamma radiation and neutron ambient dose rates are continuously measured by UD and by independent organisations. Figure 8 shows a typical monitoring station used for measuring both gamma and neutron ambient dose rates.

Facility-related gamma and neutron radiation can only be detected at the site boundary with highly sensitive measuring instruments and is measurable to a significant extent only in certain areas, for example near the Tails Storage Area.

The dose limit specified in Section 80 of the German Radiation Protection Act (Strahlenschutzgesetz, StrlSchG) is 1.0 mSv per calendar year.

Figure 8: A radiation protection monitoring point

In 2025, the maximum facility-related total ambient dose from gamma and neutron radiation measured at the outer perimeter fence was 0.29 mSv. This means that the regulatory dose limit of 1.0 mSv per calendar year was clearly complied with and remained well below the permitted level at all monitoring locations along the site boundary.

At greater distances from the Tails Storage Area, for example at the fence near Kaiserstiege, no facility-related radiation can be detected. At these locations, only the natural background radiation that is always present in the environment is measured.

As part of the environmental monitoring program, these findings are confirmed through continuous measurements conducted both by UD and by independent organisations, including the Material Testing Office of North Rhine-Westphalia (Materialprüfungsamt NRW, Dortmund), which performs monitoring on behalf of the nuclear regulatory authority.

The absence of any other harmful impacts from the UD's facility on the surrounding environment is further confirmed by measurements carried out by the Federal Office for Radiation Protection (Bundesamt für Strahlenschutz), the North Rhine-Westphalia State Agency for Nature, Environment and Consumer Protection (LANUV NRW), the State Institute for Work Design (LIA NRW), and the Agricultural Investigation and Research Institute of North Rhine-Westphalia.

The measurement results demonstrate that all applicable regulatory limits are clearly undershot.

For further details, see the chapter "Discharge of Radioactive Substances via Air Emissions", particularly Figure 20.

Use of depleted uranium from Urenco Deutschland GmbH

Depending on the degree of depletion, the depleted material (tails) still contains approximately 30 to 50% of the ^{235}U originally present in natural uranium, representing a considerable economic and environmental value. Depending on market prices for natural uranium (feed) and enrichment services, this tails material can be re-enriched or further depleted by being fed back into the enrichment process as a secondary feed material. Because it contains less ^{235}U than natural uranium, it is referred to as Low Assay Feed (LAF), distinguishing it from natural feed.

The decision regarding how much LAF and natural feed is introduced into the enrichment process, when, and at which site, is determined through Urenco's group-wide production planning. This approach follows the company's "One Company" principle and is designed to maximize the overall performance of the Urenco Group. The use of LAF demonstrably reduces the demand for natural uranium, as illustrated in Figure 16 of the chapter Environmental Performance. To use a vivid comparison, this approach can be likened to squeezing oranges to produce orange juice. The longer you squeeze, the more orange juice is produced. The more expensive or scarce uranium is compared with the squeezing process itself, the more worthwhile it becomes to continue squeezing. This secondary extraction, like the primary enrichment process itself, is a service that is offered and traded on the global market.

Another option is to convert the UF_6 into the chemically very stable uranium oxide (U_3O_8), which is particularly suitable for long-term storage. Uranium oxide is the end product formed when uranium compounds are oxidised by the oxygen in the air. This is also why uranium in nature, unlike gold for example, is never found as a pure metal or as UF_6, but always occurs in oxygen-containing minerals.

Technically produced U_3O_8 has advantages over natural uranium minerals. Because it is depleted uranium, the components primarily responsible for radioactive radiation, namely the isotopes ^{235}U and the even more active ^{234}U (see "Explanation of Key Terms," entry "Isotopes," at the end of this Environmental Statement), have been reduced. In addition, it is chemically pure, whereas uranium in mineral deposits contains highly radioactive decay products such as radium, polonium, and bismuth. Furthermore, unlike UF_6, U_3O_8 poses no chemical hazard. It is neither corrosive nor chemically reactive and is insoluble in water; it behaves much like sand. Without deliberate human intervention, such as treatment with strongly oxidizing acids, it will not undergo any chemical change

even over timescales of billions of years, as demonstrated by naturally occurring uranium oxide mineral deposits.

The latest license also includes the construction of a uranium oxide storage facility (see Figure 9). The acceptance of the completed building structure and infrastructure measures has been finalised, and the application for nuclear commissioning was submitted at the end of 2025.

From a sustainability perspective, U_3O_8 represents an energy resource for future generations. Should the Earth's uranium resources become exhausted, or should uranium prices increase for other reasons, the uranium oxide stored there could be converted back into UF_6 to recover additional ^{235}U.

In theory, U_3O_8 could also be used directly as ^{238}U in alternative nuclear reactors, such as the traveling-wave reactor partly financed by Bill Gates.

The tails produced by UD are not used for any purpose other than refeeding into the enrichment process, blending with enriched material, for example to meet customer requirements, or long-term storage in the form of uranium oxide.

Any other use of the element uranium, such as its use in armor-piercing ammunition during the Second Gulf War or in the India-Pakistan border conflict, relies on depleted uranium originating from other enrichment companies and is entirely outside UD's sphere of influence.

Surveillance by national and international organisations

Through technical, organisational, and administrative measures, it is ensured that material held by UD can neither be stolen nor misused for unintended purposes. The material is subject to both national and international oversight.

The Federal Ministry for Economic Affairs and Climate Action (BMWK) supervises the use of the particularly sensitive technology.

Figure 9: View of the uranium oxide storage facility with the rail connection in the foreground

The Ministry of Economic Affairs, Industry, Climate Protection and Energy (MWIKE) of the State of North Rhine-Westphalia oversees ongoing operations.

The Federal Office for Economic Affairs and Export Control (BAFA) monitors compliance with foreign trade legislation and export control regulations, including the issuance of the necessary permits.

The International Atomic Energy Agency (IAEA) and the European Atomic Energy Community (Euratom) continuously monitor the physical whereabouts, enrichment levels, uranium accounting, and use of the uranium handled at the facility.

In 2025, 28 so-called "safeguards inspections" were carried out at our plant. Of these, 13 inspections were unannounced. Through these inspections, the safe handling and secure accounting of the uranium used are continuously reviewed and confirmed by the supranational authorities.

The objectives of non-proliferation are achieved through security measures, safeguards, and export controls. These measures ensure that neither the isotope separation plant and its components, nor the material produced, nor the operational know-how can be diverted to unauthorised uses.

All requirements arising from international and national regulations were fully complied with in 2025.

Nuclear licensing

The construction and operation of the Gronau Uranium Enrichment plant (UAG) are covered by nuclear licenses issued pursuant to Section 7 of the German Atomic Energy Act (Atomgesetz) (see Table 1). In addition, the facility is subject to the provisions of the Major Accidents Ordinance (Störfall-Verordnung, 12th BImSchV). The licensing and supervisory authority is the Ministry for Economic Affairs, Industry, Climate Protection and Energy (MWIKE) of the State of North Rhine-Westphalia.

As early as the partial license granted in 1981, it was determined that the Gronau site was suitable for a capacity of 5,000 t SWU/year. Since the most recent expansion license issued in 2005, the UTA-2 uranium separation plant and the TI-2 technical infrastructure facility, together with ancillary buildings, outdoor storage areas, and infrastructure installations, have been constructed and commissioned. Construction of the uranium oxide storage facility has been completed, and its nuclear commissioning is imminent.

Numerous analyses regarding the safety and environmental acceptability of the project were prepared by UD and by independent experts. The public was involved from the outset. A summary description of the project, together with the safety reports required under nuclear law and the Major Accidents Ordinance, was made available for public inspection. The nuclear-law safety report also contains the information from the environmental impact assessment.

Individuals and members of the public who could potentially be affected by an incident at the uranium enrichment plant are regularly informed, in accordance with the requirements of the Radiation Protection Ordinance and the Major Accidents Ordinance, about the safety measures in place and the appropriate actions to take in the event of an incident.

The public received its first information package in 1995, and this information has been updated every four years since then. The seventh periodic update was distributed in August and September 2023 by postal delivery in Germany and the neighboring Netherlands.

Table 1: Nuclear Partial Permit (PP), Permit Amendment (PA) and Modification Permit (MP)

Nuclear regulatory permits		Contents
1. PP	(1981)	Site for the 1,000 t SWU/a plant and construction of the building for Phase 1 of the 400 t SWU/a facility
1. PA	(1983)	Construction of the utility and support systems for Phase 1
2. PP	(1984)	Construction of the process systems for Phase 1
3. PP	(1985)	Operation with an enrichment capacity of 400 t SWU/a
4. PP	(1989)	Construction of plant components to increase the enrichment capacity to 1,000 t SWU/a (Phase 2)
3. PA	(1991)	Operation with an enrichment capacity of 530 t SWU/a
5. PP	(1994)	Operation with an enrichment capacity of 1,000 t SWU/a
7/MP1	(1997)	Construction and operation of the expansion to an enrichment capacity of 1,800 t SWU/a
7/MP2	(1998)	Construction and operation of Separation Halls 7/8 while maintaining an enrichment capacity of 1,800 t SWU/a
7/MP3	(2001)	Storage of 2,500 t of feed instead of tails in the outdoor storage area; specification of requirements for the release of materials with negligible radioactivity
7/MP4	(2003)	Construction and operation of a second transfer station (UE-2)
7/6	(2005)	Construction and operation of the expansion to 4,500 t SWU/a (UAG-2), including construction of a uranium oxide storage facility and enrichment up to 6% ^{235}U

[5] Act on the Peaceful Use of Nuclear Energy and Protection against Its Hazards (Atomic Energy Act) [Atomgesetz], in the version promulgated on 15 July 1985 (Federal Law Gazette I, p. 1565), last amended on 2 December 2025 (Federal Law Gazette 2025 I No. 301).

Environmental policy

Figure 10: Signing of the Treaty of Almelo ('Agreement of 4 March 1970 between the Federal Republic of Germany, the Kingdom of the Netherlands and the United Kingdom of Great Britain and Northern Ireland on cooperation in the development and use of the gas centrifuge process for the production of enriched uranium') by the representatives of the three participating countries: the United Kingdom, the Netherlands and Germany

UD aims to achieve a leading position within the UEC Group and across the industry in the fields of safety, health, and environmental protection. The foundation of our actions are the UEC Values, whose high standards are consistently applied in the planning, construction, and operation of our facilities in order to prevent incidents and accidents as effectively as possible. Our integrated Safety, Health, and Environment Management System, including its energy management elements as part of the EMAS framework, is operated to a high standard and continuously developed to minimize risks and sustainably improve environmental performance.

A central element of the company's policy is its clear commitment to non-proliferation and the prevention of the spread of uranium enrichment technology, including security, safeguards, and export controls. These commitments are based on international agreements such as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the 1957 Euratom Treaty, the 1970 Treaty of Almelo, and Euratom Regulation 3227/76 (see Figure 10). They are implemented through an appropriate organisational structure and an effectively established control system.

UD's corporate policy is aligned with the purpose, vision, mission, and UEC's values. Most recently updated in June 2026, it places particular emphasis on a strong safety culture and on the contribution of nuclear energy to combating climate change. The objective of the environmental policy is to keep the impacts of our activities on people and the environment as low as possible through the use of the best available technology, while also taking economic considerations into account. Compliance with all relevant legal requirements, permits, and standards is considered fundamental.

The principles of UEC guide our daily actions. As a reliable front-runner of sustainable energy supply, we contribute substantially to the success of our customers through the expertise of our employees, our technology, and our portfolio of products and services. Our values are Safety, Integrity, Leadership, Innovation, and Sustainability.

In addition, UD establishes environmental objectives and targets (see chapter Action Plan, Environmental Program, and Environmental Objectives).

Principles of action

- During the planning and design of the facility, the requirements of comprehensive environmental and resource protection are taken into account, particularly with regard to climate protection and energy efficiency.
- The operation of the facility is designed to minimize environmental impacts and waste generation, even below established regulatory limits, and to reduce energy consumption. Environmental impacts are continuously monitored and assessed.
- Through preventive emergency preparedness planning and ongoing training, efforts are made to avoid pollutant emissions or, in the event of potential incidents or accidents, to keep them as low as reasonably practicable.
- Procurement activities ensure that suppliers involved in the construction and operation of the facilities comply with the established requirements relating to environmental protection, climate protection, and energy efficiency.
- Employees receive appropriate professional training and motivation for their environmental protection responsibilities. In addition, environmental awareness and responsibility are promoted at all organisational levels.
- Measures implemented to support the environmental policy and improve energy efficiency are regularly reviewed and evaluated for effectiveness. Continuous improvement of environmental protection performance is a declared objective.
- The public is regularly informed about facility operations and environmental protection activities. An open and transparent dialogue is actively encouraged.

Climate neutrality through net-zero emissions

In 2021, UEC joined the Climate Pledge (CP) initiative (see Figure 11).

Figure 11: On 21 April 2021, Urenco joined 'The Climate Pledge'

By signing this climate commitment, the company committed to achieve climate neutrality by 2040, ten years ahead of the scientifically identified deadline associated with limiting global warming to an average increase of 1.5°C. The underlying idea is that governments alone will not be able to accomplish the climate transition; industry must also play an active role in achieving climate objectives.

Through its participation in the Climate Pledge, Urenco commits to regularly reporting its CO_2 emissions and to implementing measures that will lead to carbon neutrality. According to the Greenhouse Gas Protocol (GHG Protocol), a company's greenhouse gas emissions are divided into three categories, referred to as Scopes.

Scope 1 includes the direct release or emission of greenhouse gases from sources owned or controlled by the company itself, such as fuel combustion in company facilities or vehicles..

Scope 2 includes the indirect release of greenhouse gases associated with the generation of purchased electricity supplied by upstream energy providers.

Scope 3 includes the indirect release of greenhouse gases arising from upstream and downstream activities throughout the entire value chain, including suppliers, transportation, product use, and disposal.

Further details can be found in the Explanation of the Key Terms section at the end of this Environmental Statement.

The emission reduction targets first established at Group level in September 2021 were driven by the 2021 United Nations Climate Change Conference in Glasgow (COP26). In response to the increasingly alarming findings of the latest IPCC reports, these targets were strengthened and most recently formalised in July 2023 with the following interim objectives:

- Scope 1 and Scope 2 emissions are to be reduced by at least 90% by 2030 compared with the 2019 baseline year.
- For Scope 3 emissions, a reduction of at least 30% by 2030 compared with the 2019 baseline year has been established.

The published emissions figures must comply with a science-based approach, in accordance with the Science Based Targets initiative (SBTi) Net-Zero Standard.

Any residual emissions remaining in 2030 will be offset through reliable compensation measures, while further efforts will continue to be made to reduce these emissions on an ongoing basis.

Environmental management system

The environmental management system is an essential part of our integrated management system and governs all environmentally relevant internal processes.

Our environmental protection organisation, consisting of designated company officers and representatives, is clearly defined and performs its duties as intended. These representatives receive regular training. An appropriate organisational structure has been established, and operational procedures are formally regulated and documented (for example in the Operations Manual, Inspection Manual, Maintenance Manual, Physical Security Manual, and Integrated Management Manual).

UD's environmental policy is established by the Managing Director, who bear overall responsibility for the environmental management system. He provide sufficient resources to ensure the implementation, operation, and continual maintenance of the system.

The management is also responsible for preparing and publishing the Environmental Statement. It appoints the Environmental Management Representative, who, like other designated officers (for example those responsible for safety management, radiation protection, nuclear safety, export control, dangerous goods, major accident prevention, fire protection, waste management, etc.), possesses the necessary independence and has direct access to senior management.

The identification of relevant environmental aspects and the management of environmental legal requirements are regulated within the Integrated Management System.

Applicable requirements of the nuclear technical regulatory framework used for nuclear power plants have been incorporated into the system.

The company-wide values (Our Values) of the Urenco Enrichment Company are:

- **Safety**
- **Integrity**
- **Leadership**
- **Innovation**
- **Sustainability**

These values provide the framework for our corporate objectives and support the continuous improvement and optimisation of environmental performance.

The system and all provisions relating to the environmental management system are continuously reviewed and revised where necessary.

From 2008 onwards, the UEC Group published an annual Sustainability Report in English. In addition to environmental topics, it covered ethical, economic, and labor-related issues. The corresponding data from UD was also included in these reports.

Since 2023, this reporting has formed part of the Annual Report, which is available for download from the Urenco website.

In the 21st century, the aspects of the biosphere (see Figure 12, SDGs 6, 13, 14, 16), society (see Figure 12, SDGs 1-5, 7, 11, 16), and economic viability (see Figure 12, SDGs 8-10, 12) should no longer be considered separately but rather in combination. This reflects UD's approach of maintaining a single integrated management system that incorporates these various aspects, balances them against one another, and thereby enables well-founded and consistent decision-making. Further details are specified in Procedure 29, "Identification and Evaluation of Relevant

Figure 12: The 17 Sustainable Development Goals (SDGs) of the United Nations

Sustainability Aspects" (German: „Ermittlung und Bewertung der relevanten Nachhaltigkeitsaspekte").

Urenco supports the United Nations' policy objectives through its 17 Sustainable Development Goals (SDGs), which promote sustainable development across the economic, social, and environmental dimensions.

Relationships between the individual goals may result in synergies or trade-offs. Progress toward one goal can support the achievement of another, while in some cases it may create trade-offs with other goals.

Environmental audit

The environmental audit is a continuous process that promotes the ongoing improvement of environmental management at the site. Based on the environmental reviews that have been carried out, the environmental impacts of operations have been continuously assessed since the site's first validation, and the environmental review has been updated whenever significant changes have occurred.

Integrated into the internal audit program, the environmental audit is planned and implemented on a rolling three-year basis and reviewed at least annually. It is conducted regularly and at planned intervals by internal and external auditors and, indirectly, also by expert assessors and government authorities. The audits carried out ensure the continued suitability and effectiveness of the environmental management system. In addition to environmental management, including energy management, the Integrated Management System also encompasses safety management, quality management, occupational health and safety, and health management. The auditors are accountable only to the Environmental Management Representative, who in turn reports directly to senior management.

Compliance with environmental legal obligations forms the audit basis for every audit. Internal audits and site inspections verify adherence to these requirements. Neither these reviews nor any other sources of information have revealed any known violations of environmental legal requirements.

Should such violations nevertheless occur, the causes would be eliminated immediately, all necessary external and internal reporting obligations would be fulfilled, and appropriate training measures would be implemented where required.

During the period 2023 to 2025, a total of 27 internal audits were conducted. Six non-conformities were identified and 84 recommendations were issued, resulting in the initiation and implementation of 90 continuous improvement actions. These actions comprised 47 corrective actions and 43 preventive actions. Neither the external nor the internal audits identified any non-conformities in internal processes with safety-related or environmental significance. Five of these actions were assigned to the Environmental Management function. All actions contribute to the further improvement of the management system.

[6] The official German title is‚Transformation unserer Welt: Die Agenda 2030 für nachhaltige Entwicklung' (kurz: Agenda 2030 oder Globale Nachhaltigkeitsagenda). It entered into force in 2016 with a duration of 15 years (until 2030). Further details and design guidelines are available at: https://17ziele.de

Environmental aspects in the context of sustainability aspects

EMAS defines an environmental aspect as any product, service, or activity of an organisation that has or may have an impact on the environment.

Direct environmental aspects relate to activities that can be fully controlled by UD. Indirect environmental aspects, on the other hand, result in impacts that are only indirectly caused by UD's activities. They arise from interactions with third parties and can, if at all, only be influenced to a limited extent by UD itself.

UD is a service provider whose uranium enrichment services are used by energy utilities worldwide for the generation of low-carbon electricity. The activities required to provide this service have both positive and negative environmental impacts.

The identification and evaluation of the significance of environmental aspects covers all company activities, products, and services and includes both direct and indirect aspects arising from normal and abnormal operating conditions (including start-up and shutdown), incidents, accidents and potential emergencies, as well as past, present, and planned activities.

Aspects are identified for those areas that can be monitored by UD and over which some level of influence can be exercised. An important basis for identifying aspects is the operational balance sheet (input/output analysis) and the associated records and inventories, including raw and auxiliary materials, waste, emissions, resources, and wastewater.

The assessment considers not only the process steps carried out directly by UD, but also upstream and downstream processes. Each aspect is classified according to the degree of influence that can be exercised, namely as directly influenceable, indirectly influenceable, or not influenceable.

The purpose of the evaluation is to determine those aspects that have, or may have, significant environmental impacts (significant aspects).

To ensure transparency and consistency, aspects are assessed according to their impacts using criteria that include statutory limit values, legal requirements, specific consumption indicators, relative comparisons, and hazard potential.

When establishing criteria for assessing significance, the following factors are considered where applicable:

- information on the state of the environment to determine which activities, products, and services may have environmental impacts,
- available data on material and energy consumption, discharges, waste generation,
- emissions with regard to associated environmental risks,
- views of interested parties,
- legally regulated environmental activities,
- procurement activities,
- the design, development, manufacture, distribution, servicing, use, reuse, material recovery, and disposal of products,
- activities involving significant environmental costs, and positive environmental outcomes.

The development of all environmental aspects is monitored and evaluated by UD at regular intervals through a detailed process-based input-output analysis, most recently on 25 March 2026.

Direct environmental aspects

UD's direct environmental aspects are:

- UF_6 throughput (feeding of natural uranium, generation and feeding of low-assay feed)
- Enriched uranium (product)
- Electricity consumption
- Natural gas consumption
- Water withdrawal
- Direct radiation exposure
- Discharges of radioactive substances into the Air
- Discharges of radioactive substances via Water
- Hazardous substances
- Transportation activities commissioned by UD
- Environmentally Relevant Events and incidents
- Radioactive waste
- Conventional waste (hazardous and non-hazardous waste)
- Refrigerant consumption
- Consumption of heating oil, diesel fuel, and gasoline
- Total balance of CO_2 equivalents, including CO_2 equivalents from electricity generation, CO_2 equivalents resulting from refrigerant losses, and CO_2 emissions from the consumption of natural gas, diesel, gasoline, and heating oil
- Land footprint and biodiversity

Indirect environmental aspects

UD's indirect environmental aspects are:

- Uranium exploration (development of uranium deposits)
- Uranium mining and the associated transportation of uranium ore or UF_6 feedstock materials
- Conversion and the associated UF_6 transports (feed)
- UF_6 transports (product)
- Transportation not commissioned by UD
- Fuel fabrication
- Electricity generation from nuclear fuels
- Reprocessing
- Interim storage and final disposal
- Deconversion of UF_6 into U_3O_8

During the period of plant expansion, additional environmental aspects were identified and monitored and were reported in previous Environmental Statements. Following completion of the construction work, these aspects were no longer considered relevant. However, in line with the "One Company" concept, an office building has been constructed in recent years by our sister company Urenco Technology & Development (UTD), which is

used jointly by both UTD and UD.

Over the past three years, electricity consumption, natural gas consumption and refrigerant emissions were classified as significant environmental aspects. Corresponding objectives were established and measures implemented.

Since the underlying assessment takes into account not only the environmental performance of individual aspects over the previous three years, but also the interests of stakeholders and the existence of regulatory obligations, hazardous substances, UF_6 transportation, radioactive and conventional waste, environmentally relevant events and incidents, legal requirements, and employee participation have additionally been classified as significant environmental aspects.

Action plan, environmental programme and environmental objectives

We update our environmental programme and the associated environmental objectives on an annual basis and define suitable measures and implementation deadlines within our action plan.

Wherever possible, environmental objectives are defined together with specified target values. Achievement of these targets is systematically reviewed following the implementation of the corresponding measures.

As a result of the commitments undertaken through the Climate Pledge, the current environmental objectives focus on Sustainable Development Goal (SDG) No. 13, Climate Action. Tables 2, 3 and 4 translate this objective into concrete measures aligned with Scopes 1 to 3, as defined in the chapter Climate Neutrality through Net-Zero Emissions. In addition, Table 5 presents an extract from the environmental programme and environmental objectives for the period 2021-2030 relating to other sustainability goals.

In addition to being assigned to a significant Scope, projects and measures may also generate positive secondary effects for another Scope or contribute to the achievement of a Sustainable Development Goal.

The objectives presented in the following tables represent only a selection of specific projects and initiatives drawn from a broader site investment programme. This programme contains detailed financial information regarding the projects and measures presented and the associated environmental objectives. Owing to the level of detail it contains, the programme as a whole is considered confidential company information, with parts subject to a higher classification level, and is therefore not published.

At least once a year, the measures and projects listed below are subjected to an economic efficiency assessment in accordance with DIN EN 17463 by the Finance Department and independent experts. As part of this process, a review is also carried out to determine whether economically motivated measures and projects result in mandatory environmental benefits under the electricity price compensation scheme or under the Ordinance on Measures to Prevent Carbon Leakage under the National Fuel Emissions Trading System (BECV).

Specific projects should be distinguished from ideas or project requirements. These often initiate relatively simple measures or projects of varying scale but generally require further development and specification before implementation. The relevant category, indicating whether an item is a project, an idea, a project requirement, or a measure, is identified in the first column of Tables 2 to 5 below.

Table 2: Environmental programme and short-term scope 1 net-zero objectives until 2030

Category Start Year	Environmental Objective SDG 13 Climate Action	Target Value Measures / Comments	Due Date	Status and Evaluation
Project 2019	Natural gas savings through electrification of the steam generation system for decontamination operations.	Savings of approximately 143 MWh of natural gas (31 t CO_2e).	2028	As explained in previous Environmental Statements, natural gas consumption varies from year to year due to batch discontinuous evaporation campaigns. Consequently, the associated CO_2 savings also fluctuate.
Project 2023	Natural gas savings through replacement of building heating systems with heat pumps.	Savings of approximately 606 MWh of natural gas (110 t CO_2e).	2028	Demolition of the old office building (BG 1) is making way for a new multifunctional building that will accommodate offices and workshops. BG 1a was disconnected from the natural gas supply in 2025 and is being heated temporarily by a mobile heater during the construction phase.
Project Requirement 2024	Sustainable cooling supply for UTA-1 and TI-1 through implementation of the Net Zero flagship projects.	The prioritized systems contain 795 kg of R-507 (high-temperature stage) and 880 kg of R-23 (low-temperature stage). Another system contains approximately 40,000 t of R-245fa. Potential savings could amount to up to 1,417 t CO_2e per year.	2029	Detailed planning is currently being carried out together with our sister company UTD. A new Cryo-Bar building for ultra-low-temperature cooling with natural refrigerants will be constructed at UTA-1 by 2028. Ammonia, propene and ethane are planned as environmentally friendly refrigerants. The Basic Design is scheduled for completion by the end of 2026.
Implementation of an Idea from 2024	Replacement of fossil fuels (heating oil and diesel) with Hydrotreated Vegetable Oil (HVO) as a drop-in solution.	Potential reduction of up to 90% of the original carbon footprint, corresponding to approximately 394 t CO_2e.	To be determined	A newly purchased forklift truck is already approved for operation with HVO.
Ongoing Measure since 2023	Use of 16 charging points for company vehicles.	Electrification of mobility through investment in electric vehicles and the use of electricity instead of fossil fuels.	2023	The charging stations are in operation. In 2025, 51.3 MWh were charged on site and a further 6.3 MWh at public charging stations, resulting in savings of approximately 32 t CO_2. The calculation is based on the German electricity mix for 2025 (344 g CO_2/kWh) and a benchmark value of 180 g CO_2/km for conventional passenger vehicles. The same assumptions are used for employee commuting (see Table 4, first column). ✓🎯
Ongoing Measure since 2024	Replacement of the remaining diesel-powered vehicles used for internal operations with electric vehicles.		2025	The entire vehicle fleet was converted to electric propulsion in 2024 and 2025. The electric vehicles are primarily charged on the plant site (see above), and all energy consumption, both within and outside the site boundary, has already been accounted for in the figures presented above. ✓🎯

✓ Indicates that the measure(s) has/have been completed.

🎯 Objectives are associated with target values. The dartboard icon shown on the left indicates that the defined target value has been met or exceeded.

* Sequential number of the Continuous Improvement Suggestion (CIS)

Environmental policy

Table 3: Environmental programme and short-term scope 2 net-zero objectives until 2030

Category Start Year	Environmental Objective SDG 13 Climate Action	Target Value Measures / Comments	Due Date	Status and Evaluation
Project 2020	Electricity savings through optimisation of TC21 centrifuges, with potential extension to UEC (implementation of Phase 2 optimisation).	Electricity savings of 6 GWh/a	2026	The optimisation has been implemented for UD to the extent considered reasonable. The energy savings are offset by both a reduction in production output and the associated investment requirements. Comprehensive economic assessments conducted in 2023 and 2024 concluded that, under the current boundary conditions, the optimum level of electricity savings has been achieved. ✓ Nevertheless, modifications continued to be implemented step by step in 2025 wherever operationally feasible.
Project 2023 (operational since the end of 2024)	Generation of renewable electricity through the operation of a 5.925 MWp photovoltaic plant on a 5.7-hectare site, including a 10.38 MWh battery storage system located outside the nuclear-regulated area.	Reduction of external electricity demand through an annual yield of 5.3 GWh and reduction of the Scope 2 carbon footprint.	2024	Installation of the 14,112 solar panels has been completed. Commissioning under the German Renewable Energy Sources Act (EEG) took place on 18 November 2024. In 2025, approximately 435 MWh of electricity were generated by the PV plant and consumed by UD. ✓🎯
Project 2026 Implementation of an Idea (CIS 876)*	Optimisation of the ventilation system in UTA-2, including the change from three-fan to four-fan operation while maintaining the same total airflow rate.	The savings confirmed by testing are expected to amount to 750 MWh.	2026	The project required, among other things, corresponding software modifications and updates to operational documentation. In 2026, tests conducted in one operating unit were successful. Following final confirmation through airflow measurements, the energy-saving mode will be activated.
Measure 2024-2029	Reduction of the carbon footprint through a lower electricity emission factor by purchasing Guarantees of Origin (GoOs), i.e. certificates that verify how, when and where electricity from renewable energy sources was generated. This strictly regulated certification system ensures that the renewable attribute can be sold only once. It is a closed-loop system that ends with the one-time cancellation of the certificate. Registration is administered by the German Environment Agency (Umweltbundesamt).	Procurement of sufficient Guarantees of Origin from Austria and Germany to enable 100% climate-neutral accounting of the electricity expected to be consumed during the period 2025-2029. Specifically, the following quantities have been procured: 108 GWh GoOs for 2024 107 GWh GoOs for 2025 103 GWh GoOs for 2026 102 GWh GoOs for 2027 104 GWh GoOs for 2028 103 GWh GoOs for 2029	2024 - 2029	The originally preferred climate solution, namely the conclusion of a Power Purchase Agreement (PPA), could not be implemented for legal reasons. The Guarantees of Origin have been and will continue to be purchased by UD as indicated in the left-hand column. Cancellation takes place by 30 June of the following year. Electricity consumption of 107 GWh in 2024 and 104.7 GWh in 2025 is fully covered through the purchase and cancellation of a larger volume of Guarantees of Origin (108.0 GWh and 107 GWh, respectively) via the German Environment Agency. This approach is consistent with the currently applicable GHG Protocol. Consequently, the emission factor to be used for Scope 2 is zero (see Table 8, Figure 25 on page 28 and Figure 26 on page 29). ✓🎯
Implementation of an Idea from 2026	Replacement of electromagnetic systems with permanent magnets in failed centrifuges.	The potential savings are currently being quantified in greater detail.	2027	Preliminary results indicate potential energy savings of up to 330 MWh.

✓ Indicates that the measure(s) has/have been completed.

🎯 Objectives are associated with target values. The dartboard icon shown on the left indicates that the defined target value has been met or exceeded.

* Sequential number of the Continuous Improvement Suggestion (CIS)

Table 4: Environmental programme and short-term scope 3 net-zero objectives until 2030

Category Start Year	Environmental Objective SDG 13 Climate Action	Target Value Measures / Comments	Due Date	Status and Evaluation
Project 2022, ongoing measure since July 2024	Reduction of CO_2 emissions from employee commuting and promotion of climate-friendly mobility for employees and visitors.	Installation of a total of 14 charging stations in the visitor and employee parking areas outside the plant site.	2024	Since 1 July 2024, employees have been able to charge their electric and hybrid vehicles at a very favourable rate while at work. In 2025, a total of 119.0 MWh was charged, resulting in the avoidance of approximately 66 t CO_2 emissions. ✓🎯
Ongoing Measure Since 2024	Encouraging bicycle commuting through the Business Bike programme in accordance with the company works agreement.	As of 30 April 2026, 159 bicycles and pedelecs with a total leasing volume exceeding €610,996 had been leased.	Ongoing	The precise CO_2 reduction resulting from changes in commuting behaviour cannot currently be quantified, as no related statistics have been maintained to date.
Ongoing Measure Since 2024	Reduction of the carbon footprint through the deployment of electric vehicles.	Engagement with suppliers and evaluation of potential solutions.	Continu-ing	The underlying data quality is being continuously improved through EcoVadis and SAP Ariba under the lead of the UEC Group and the Procurement depart-ment. Since 2025, two contractors have provided services to UD exclusively using electric vehicles.
Ongoing Measure Since 2021	Achieving climate neutrality for approximately 532.8 t of liquid nitrogen, including production and transporta-tion emissions.	TÜV-certified supplier agreement for CO_2 reduction.	Ongoing	By using 100% renewable electricity and implementing the supplier agreement, 308.5 t CO_2e were offset in 2025, based on an emission factor of 583.0 kg CO_2e/t and a consumption of 529.212 t of liquid nitrogen. ✓🎯
Implemen-tation of an Idea from 2016 (CIS 761)*	Reduction of tails transportation while maintaining compliance with the 40-tonne transport limit.	Optimised loading of 48Y tails cylinders for transport (already published and implemented in the Environmental Statements 2017-2019).	2026-2029	This optimisation results in a reduction of transportation requirements and associated transport distances. According to Google Maps, the transport routes between Gronau and Capenhurst are approximately 1,003 km and 1,056 km, respectively.

Table 5: Environmental programme for additional sustainability goals

Category Start Year	Environmental Objective Various SDGs	Measures / Comments	Due Date	Status and Evaluation
Project 2021	SDG 12 – Sustainable Production. Energy savings and reduced chemical consumption through replacement of ion-selective fluoride electrodes with laser technology.	Elimination of trace heating (150°C) and fluoride solutions.	Since 2024	A device was purchased and installed for testing purposes in order to gain operating experience. Trial operation and an assessment in accordance with DIN EN 17463 demonstrated that the expected energy savings do not justify the required investment. ✓ Nevertheless, the optimisation of instrumentation and the simplification of maintenance activities provide sufficient justification for rolling out the project.
Implemen-tation of an Idea from 2021 (CIS 907)*	SDG 12 – Sustainable Production. Return of P10 cylinders from customers.	Conclusion of an agreement between UD and the customer for the regular return of customer-supplied P10 cylinders.	In implem-entation	As a result, fewer new P10 cylinders need to be manufactured, which would otherwise eventually become radioactive waste somewhere in the world. Between 2016 and 2020, a total of 2,529 P10 cylinders were shipped to customers. By 2031, the average number is expected to be 362 per year. In 2022, 957 empty P10 cylinders had already been returned.
Idea from 2023	SDG 15 – Life on Land. Support of biodiversity on the company's near-natural site.	Implementation of appropriate additional measures to further enhance biodiversity.	2025	Maintenance and upkeep of nesting boxes and the insect hotel. Agricultural use of the PV site through sheep grazing is planned from 2027 onwards. As part of the implementation of the Urenco Group sustainability strategy, additional measures were discussed with Head Office in July 2025.
Ongoing Measure Since 2024	SDGs 12 and 13 – Conservation of resources in the production of copy paper.	Change of supplier for the copy/printing paper used.	Since 2025	Verification of sustainable forest management through an FSC-certified product, a clearly communicated target of reducing CO_2 emissions by 35% by 2030 compared with the 2019 baseline year, and a water consumption reduction target established by the selected supplier. ✓🎯
Ongoing Measure Since 2025	SDG 3 – Good Health and Well-being; SDGs 12 and 13 – Sustainable operation of the company restaurant.	Change of catering provider, annual status reporting, and external certification under a sustainability scheme at the one-star level.	Since July 2025	The menu includes carbon footprint information for meals. Air-freighted products and single-use portion packs have been phased out. Furthermore, only certi-fied fish is served, and preference is given to regional, seasonal and fairly traded food products. ✓🎯

✓ Indicates that the measure(s) has/have been completed.

🎯 Objectives are associated with target values. The dartboard icon shown on the left indicates that the defined target value has been met or exceeded.

* Sequential number of the Continuous Improvement Suggestion (CIS)

Employee participation

The involvement of all employees in addressing environmental protection issues is an essential prerequisite for the effective functioning of an environmental management system. Successful implementation in practice requires that all employees are given the opportunity to further improve working conditions and that a sense of pride is fostered in working for an environmentally conscious organisation.

UD's corresponding suggestion and reward scheme is known as the Idea Management System. All suggestions are documented within the company's intranet in a structured and traceable manner. The annual development of submitted improvement proposals over the last 15 years is shown in Figure 13. In 2025, a total of 18 improvement proposals were submitted, eight of which were aimed at improving environmental or energy-related aspects through their implementation. The Idea Management System continued to operate successfully in 2025. The improvement proposals originated from all areas of the company.

The underlying Works Agreement between the Works Council and the Management rewards not only proposals that save energy, but also those that contribute to the Net Zero objective by reducing CO_2-equivalent emissions.

Figure 14: Sculpture 'The Thinking Human'

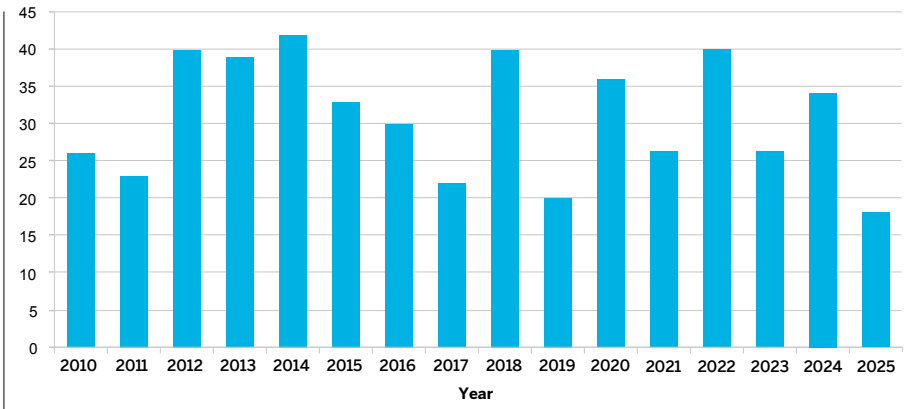


Figure 13: Annual trend of submitted improvement proposals

In 2025, the responsible committee evaluated a total of five proposals, including some that had already been submitted in previous years. Four ideas were successful out of the five submitted. During 2025, bonuses totalling €3,336 were paid out for four ideas. For a proposal involving the installation of protective films on touch displays in production areas, an individual award of €11,649 was granted in tax year 2026, together with the "The Thinking Human" award (see Figure 14), which was presented at the 2025 Christmas celebration.

Particularly relevant examples of improvements in environmental performance resulting from, or potentially resulting from, the implementation of employee ideas can be found in the environmental programme outlined in Tables 2 to 5.

Inspired by an initiative of a health insurance provider, many employees have been replacing car journeys with bicycle travel during the summer months since 2011. In 2025, 51 employees participated in the campaign. For the environment, the initiative resulted in savings of approximately 1.6 tonnes of CO_2, which would otherwise have been burned from fossil fuels in vehicles.[7] Further details are provided in Table 6. The most climate-friendly mode of transport is the human-powered bicycle, which also provides health benefits for its users.

Table 6: Avoided CO_2, distance covered, and number of participants in 'Bike to Work/City Cycling'

Year	CO_2 avoided, kg see UBA Information[7]	Distance travelled, km	Number of participants
2012	2,437	12,361	29
2013	3,758	19,059	47
2014	2,811	14,298	38
2015	2,919	14,806	36
2016	4,770	24,222	40
2017	4,155	21,073	36
2018	4,726	23,968	39
2019	4,378	22,238	36
2020	1,647	8,364	36
2021	1,082	7,361	28
2022	1,471	9,551	27
2023	1,299	8,017	34
2024	3,578	22,225	39
2025	1,644	10,212	51
Σ	40,675	217,755	34*

* Rounded average value of the last ten years

[7] According to the German Environment Agency (Umweltbundesamt), „Vergleich der durchschnittlichen Emissionen einzelner Verkehrsmittel im Personenverkehr" (2023), replacing passenger car travel with a pedelec saves approximately 16.1 kg CO_2 per 100 km, while replacing it with a bicycle saves approximately 16.4 kg CO_2 per 100 km. Average emissions are 164 g CO_2 per passenger-kilometre for passenger cars, 3 g for pedelecs, and 0 g for bicycles. The factors used in the table may vary from year to year.

Environmental performance indicators

Under EMAS, environmental performance refers to the effects of an organisation's management activities in relation to its environmental aspects. The environmental performance indicators are presented graphically in the following sections for the years 2010 to 2025.

Plant capacity and production

The plant's originally licensed capacity of 1,800 t SWU per year was increased to 4,500 t SWU per year in 2005. As successive construction phases were completed, the installed capacity (grey bars) increased accordingly. The actual separative work production (blue bars) then followed this increase gradually, reaching its peak in 2012. The annual decline in capacity and production visible in Figure 15 is attributable to the gradual ageing and retirement of centrifuges ("centrifuge attrition"). This trend is counteracted through refurbishment programmes, involving the phased replacement and renewal of the centrifuge fleet.

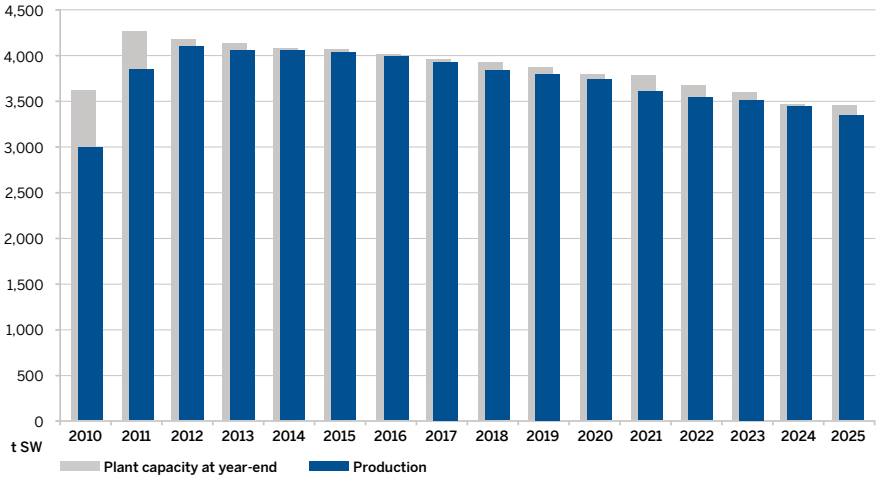


Figure 15: Plant capacity at year-end and production

UF_6 Throughput

UF_6 throughput is generally proportional to production levels. It depends primarily on the enrichment and tails assays applied, as well as on the extent to which previously depleted uranium is recycled and reused. A portion of the low-assay feed withdrawn from the UD facility was subsequently re-fed in its entirety at the Netherlands facility. By integrating additional enrichment capacities, natural uranium can be utilised more sustainably and efficiently overall than would be possible through the optimisation of the operating parameters of a single uranium enrichment plant alone.

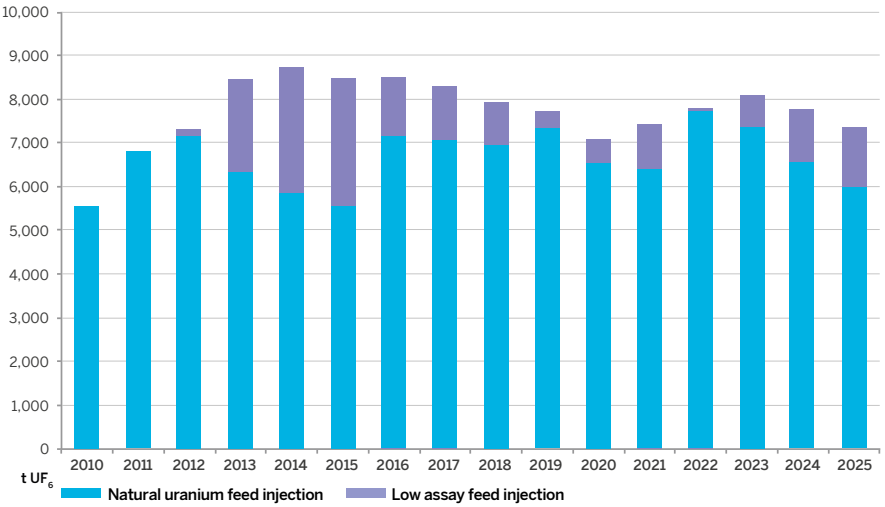


Figure 16: UF_6 Throughput

Electricity consumption

The centrifuges and cooling processes account for the largest share of electricity consumption. Specific electricity consumption decreased until 2012 because the expansion of UTA-2 introduced particularly energy-efficient centrifuges and increased separative work production by more than 125%. The subsequent continuous decline in production ("centrifuge attrition") led to a renewed increase in specific electricity consumption, particularly from 2015 onwards. Electricity-saving projects temporarily counteracted this trend (for example, in 2015 and 2020). In addition, climate change has increased cooling requirements. Total electricity consumption amounted to 104.7 GWh in 2025.[8]

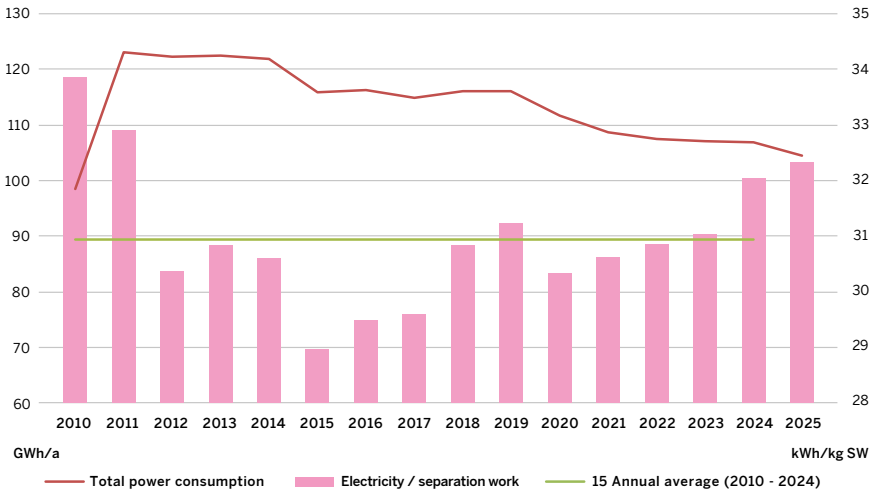


Figure 17: Total power consumption in absolute terms and relative to uranium enrichment work

Natural gas consumption

Natural gas is used to generate heat for plant systems and buildings. Specific natural gas consumption decreased until 2011 as a result of the additional production capacity provided by UTA-2, while total consumption fluctuates depending on weather conditions and demand. In contrast to electricity, natural gas plays only a minor role in the production process.

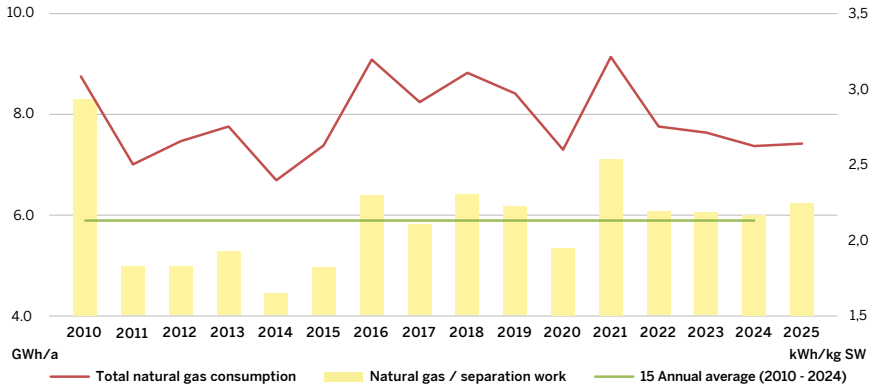


Figure 18: Total natural gas consumption in absolute terms and relative to uranium enrichment work

Water withdrawal

Water is used as sanitary and drinking water for the more than 430 people who are present at the facility on a daily basis. The lowest level of consumption occurred in 2020, primarily as a result of employees working from home. Within plant operations, water is used for decontamination activities and as a cooling medium, with annual fluctuations arising from the filling and replenishment of cooling-water circuits. In 2025, water consumption amounted to 7,676 m³, of which 1,680 m³ was exempt from wastewater charges because it was used for purposes such as fire brigade training exercises.

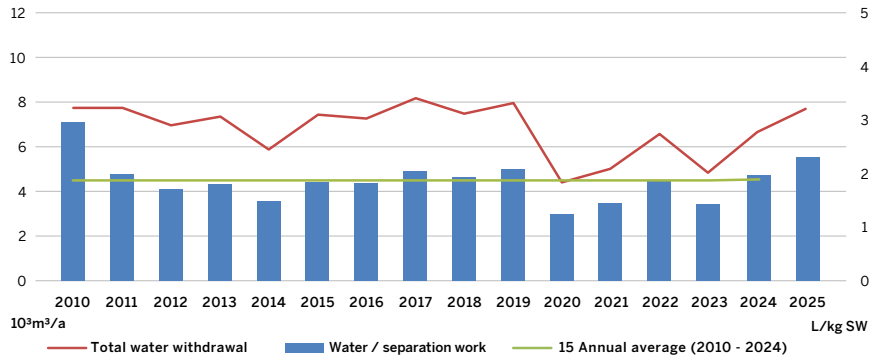


Figure 19: Absolute total water withdrawal and water withdrawal relative to uranium enrichment work

[8] The total electricity consumption of 104.7 GWh is offset by the purchase of 108.0 GWh of Guarantees of Origin, which were cancelled through the German Environment Agency (Umweltbundesamt). Further details can be found on page 20, Table 3, in the last row.

Discharge of radioactive substances into the air

UF_6 is contained within pressure-tight or vacuum-tight vessels and systems. As a result, emissions from these systems are virtually excluded. At most, very small quantities of radioactive substances could be released into the air during connection and disconnection operations or during decontamination activities. All airborne discharges are monitored and measured. It has been demonstrably established that the majority of the recorded discharge values originates from natural radioactivity that previously entered the facility through the incoming ventilation air. Figure 20 shows airborne radioactive discharges in relation to the applicable regulatory limit value.

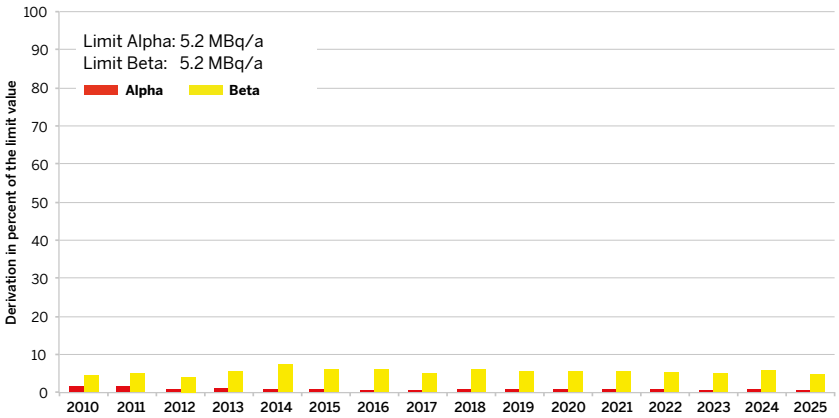


Figure 20: Discharge of Radioactive Substances into the Air

Discharge of radioactive substances via water

Radioactively contaminated water is generated during the cleaning of plant components. This water is collected, treated in the wastewater treatment facility, and tested to verify compliance with the applicable discharge limits. Once compliance with the prescribed limit values has been demonstrated, the treated water is discharged into the public sanitary sewer system. To provide a meaningful graphical representation of the discharge of radioactive substances, which is very low in relation to the applicable limit value, the values for the last three years have additionally been displayed at a tenfold scale in the right-hand section of Figure 21.

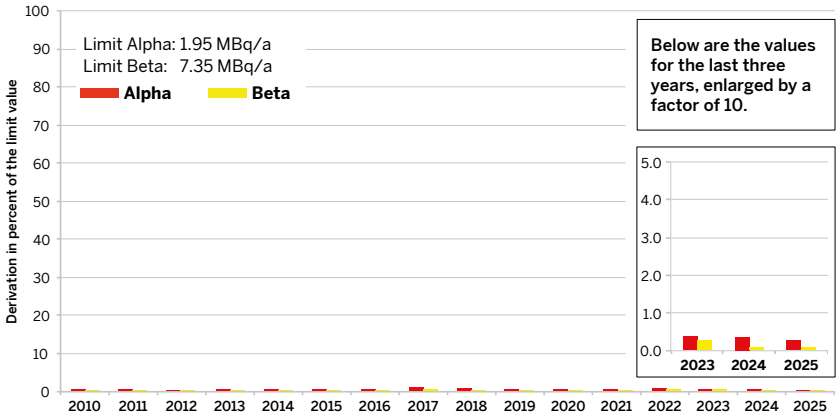


Figure 21: Discharge of Radioactive Substances via Water

Direct radiation

Direct radiation is ionizing radiation emitted directly from plant installations, equipment, or UF_6 cylinders. This radiation is monitored along the site boundary using so-called dosimeters. At reference monitoring locations, such as the municipal horticultural facility in Gronau, the natural background radiation is measured instead. This background radiation is then subtracted from the dose values measured at the site boundary in order to determine the facility-related component of direct radiation.

Under Section 80 of the German Radiation Protection Act (Strahlenschutzgesetz, StrlSchG), the regulatory dose limit for direct radiation and for any radiation exposure resulting from radioactive discharges is 1.0 mSv per calendar year. In 2025, the maximum facility-related total ambient dose equivalent measured at the outer perimeter fence was 0.29 mSv over 8,760 hours, meaning that the regulatory limit was clearly complied with. The measurement results demonstrate that the radiation attributable to the facility is very low compared with natural background radiation, which amounts to approximately 2 mSv per year.

Hazardous substances

The quantities of operating and auxiliary materials required for plant operation, as well as the inventories maintained on site, are very small due to the maintenance-free nature of the centrifuge technology employed. Some of these operating and auxiliary materials are classified as hazardous substances. However, they are present only in very small quantities, for example a few litres of methanol and acetone used on a laboratory scale. These quantities remain well below the threshold values for hazardous substances specified in the Major Accidents Ordinance.

The only hazardous substance present in large quantities is uranium hexafluoride (UF_6). In the theoretical event of an incident involving a release of UF_6, the most significant environmental impact would arise not from its comparatively low level of radioactivity but from the toxic properties of UF_6 itself.

Safe handling and secure storage are ensured through technical, organisational, and administrative measures. The effectiveness of these measures is demonstrated by the facility's incident-free operating record since commissioning in 1985.

Based on increased operational experience, the activated carbon previously used in the adsorption traps of pumping stations is being gradually replaced with sodium fluoride (NaF). This replacement process is being carried out progressively over a period of several years. The quantities of NaF involved remain below the threshold values specified in the Major Accidents Ordinance.

Following the commissioning and filling of the uranium oxide storage facility, uranium oxide (U_3O_8) will also be present on site as an additional hazardous substance.

UF_6 Transportation

Feed and product shipments, as well as some tails returns to customers, are generally arranged not by UD but by the customers themselves. Consequently, these transportation activities (see Figure 23) are classified as indirect environmental aspects.

In contrast, tails transports for deconversion are considered direct environmental aspects, as they are commissioned directly by UD. Only transport companies holding the appropriate transport licenses and approvals are used for shipments originating from Gronau. The transport cylinders comply with international standards and are approved for the worldwide transportation of UF_6.

Figure 22: UF_6 forklift truck in front of UTA-2 facility

Figure 23 provides a graphical overview of all UF_6 quantities received and dispatched as feed, product, and tails over the past fifteen years.

In 2025, feed material was received in 439 truck deliveries and dispatched in two truck shipments. Product was dispatched in 71 truck shipments, while tails were dispatched in 106 truck shipments.

All transports were carried out safely and without incident.

Environmentally relevant events

No reportable event with environmental relevance occurred in 2025.

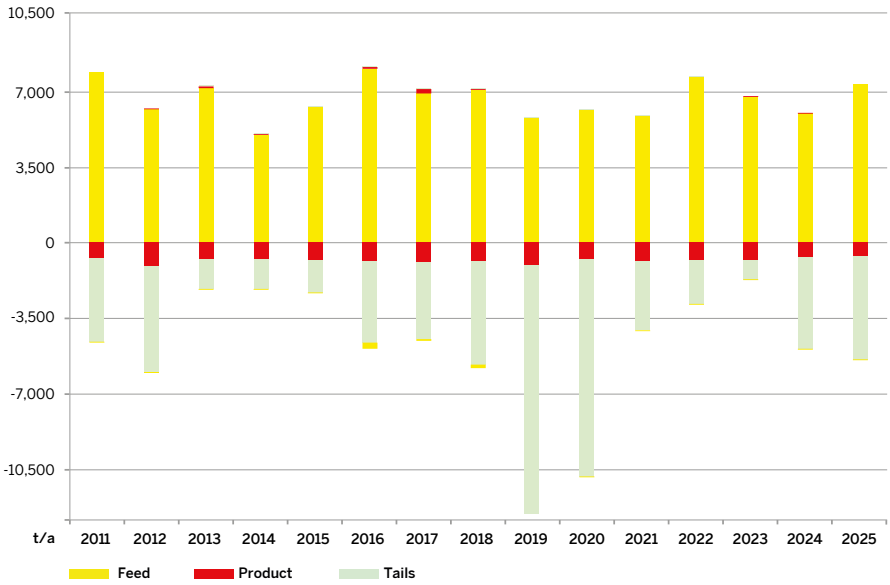


Figure 23: Annual deliveries and shipments of feed, product and tails.
Positive values indicate deliveries, negative values indicate shipments.

Radioactive waste

For both radioactive and conventional waste, the primary objective is waste avoidance.

Radioactive waste arises primarily from the cleaning of contaminated plant components, provided that the residual materials cannot be released from regulatory control in accordance with Chapter 3 of the German Radiation Protection Ordinance (Strahlenschutzverordnung, StrlSchV). Following decontamination and compliance with the prescribed clearance limits, such material may be transferred to the conventional recycling stream or disposed of in accordance with the Circular Economy Act.

Where residual materials cannot be otherwise recovered or recycled, they are conditioned in accordance with the currently applicable waste acceptance criteria for the Konrad repository.

These materials are classified as low-level radioactive waste with negligible heat generation.

With both radioactive and conventional waste, it should be noted that different waste streams are often collected over periods exceeding one year in order to achieve practical volumes for processing, transport, or disposal. This results in fluctuations and gaps in the annual data. Figure 24 shows the quantities of conditioned radioactive waste by conditioning method and date of conditioning. Consequently, relating these quantities directly to annual separative work production is not meaningful.

In 2025, 3.5 tonnes of concentrate and 5.0 tonnes of cement were conditioned into 24 drums of "Cemented final concentrate." In addition, eight drums of compressed waste were conditioned.

Conditioned waste is stored until the opening of a federal final repository in both UD's on-site interim storage facility and the Gorleben waste storage facility. The on-site interim storage facility, located within Product Store PL-2, has been in operation since July 2009 and has a capacity of 48 Type V Konrad containers. Each Konrad container can accommodate up to 26 rolled-rim or corrugated 200-litre drums.

At the end of 2025, 14 filled Konrad containers were being stored in the on-site interim storage facility.

Based on the conditioning methods currently in use, the available storage capacity of the on-site interim storage facility is sufficient for more than 15 years.

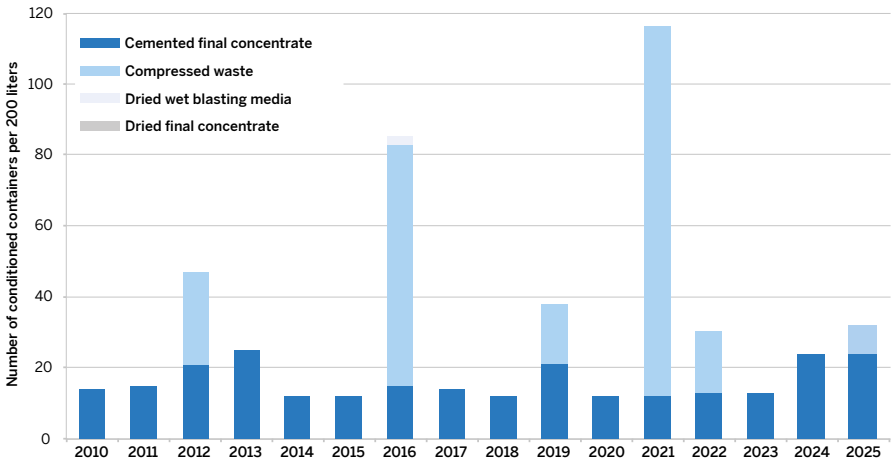


Figure 24: Radioactive waste and selected conditioning method

Conventional waste

Unavoidable conventional waste is recycled or recovered wherever practicable. The routine operation of the facility generates very little waste. Consequently, as with radioactive waste, it is not meaningful to relate conventional waste quantities directly to annual separative work production.

Current construction activities, and in particular the demolition of buildings, are expected to result in substantial amounts of waste and significant fluctuations in waste volumes through to 2032.

The quantities of waste generated in the years 2023-2025 are presented in Table 7.

Among the hazardous wastes sent for recovery in 2025 were 11.2 tonnes of lead-acid batteries from uninterruptible power supply (UPS) systems, 2.0 tonnes of non-chlorinated mineral-based machine, gear and lubricating oils resulting from the decommissioning of tanks ELA 01-06, 0.9 tonnes of absorbent and filtration materials, and 0.1 tonnes of batteries and accumulators. A further 4.5 tonnes arose from the replacement of old transformers in TI-1. In addition, 0.02 tonnes of hazardous substances containing gases in pressure vessels and 0.1 tonnes of fluorescent tubes were generated.

The waste fraction destined for disposal included, among other materials, 6.8 tonnes of mixed wastes from grit chambers and oil/water separators resulting from maintenance of the filling station, 2.0 tonnes of spent activated carbon, 0.6 tonnes of other reaction and distillation residues, and 0.4 tonnes of insulation material.

In 2025, approximately 12.1 tonnes of conventional waste were transported as dangerous goods.

The non-hazardous waste generated in 2025 consisted mainly of 160.5 tonnes of mixtures of concrete, bricks, tiles and mixed demolition waste, 42.0 tonnes of paper and cardboard, 23.3 tonnes of iron and steel, 18.5 tonnes of wood, and 12.2 tonnes of biodegradable waste.

Table 7: Total conventional waste masses in tonnes for the years 2023–2025

Conventional waste in tons	2023	2024	2025
Total volume	171.0	267.3	333.5
Non-hazardous waste	150.0	257.3	303.1
Hazardous waste	21.1	10.0	30.4
- thereof for elimination[9]	4.8	1.6	9.8
- of which for recycling[9]	16.2	8.4	20.6

[9] In accordance with Annex 1 (Disposal Operations) and Annex 2 (Recovery Operations) of the German Circular Economy Act (Kreislaufwirtschaftsgesetz, KrWG).

Achievement of the emission reduction targets committed to under the climate pledge

As part of the Climate Pledge (see chapter Climate Neutrality through Net-Zero Emissions), Urenco is required to reduce its combined Scope 1 and Scope 2 carbon footprint by at least 90% by 2030, compared with the 2019 baseline year.[10] The Scope 3 carbon footprint must be reduced by at least 30% by 2030 relative to the same baseline year. These minimum reductions must be verifiable using a science-based methodology (Science Based Targets initiative, SBTi).

UD reports on progress against the agreed Net Zero project and target roadmap to the parent company at least on a quarterly basis.

As the Climate Pledge commitment applies to Urenco as a whole, the specific emissions data, measures, and projects implemented at the other sites influence the exact Scope 1 target applicable to the Gronau site. The remaining emissions figures presented below should therefore be regarded only as a broad estimate. For Urenco Deutschland GmbH, 10% of the 2019 baseline value corresponds to residual emissions of 3,516 tonnes CO_2 equivalent. This represents the minimum target that must be achieved by 2030 in order to continue claiming that the company remains on track towards climate neutrality by 2040. A more ambitious internal target (IT) of 3% would correspond to a remaining carbon budget of only 1,055 tonnes CO_2 equivalent.

Prior to the procurement of Guarantees of Origin, the carbon footprint of Scope 2 was approximately six to ten times greater than that of Scope 1. This reflects the fact that UD's core business is comparatively electricity-intensive. The historical development of combined Scope 1 and Scope 2 CO_2 emissions is shown in Figure 25.

As can be seen, between 2021 and 2023 the carbon footprint not only exceeded the 10% residual-emissions target by a considerable margin, but also remained above the 2019 baseline value (red line).

Table 8: Scope 1 & 2 Emissions (t CO_2e)

	2019	2020	2021	2022	2023	2024	2025
Electricity	29,470	25,190	33,428	36,295	44,059	0	0
Refrigerant	3,843	8,407	3,451	3,626	2,229	2,071	3,625
Natural gas	1,547	1,288	1,667	1,412	1,390	1,341	1,350
Heating oil	250	55	30	177	395	130	90
Diesel	49	42	52	62	56	55	88
Petrol	1	1	4	6	7	42	32
Sum*	35,159	34,983	38,632	41,578	48,206	3,639	5,185

*The climate guarantee does not account for/take into account the consumption of purge gas in the form of an argon/methane mixture. Its annual footprint can be found in Table 10 of the environmental statement.

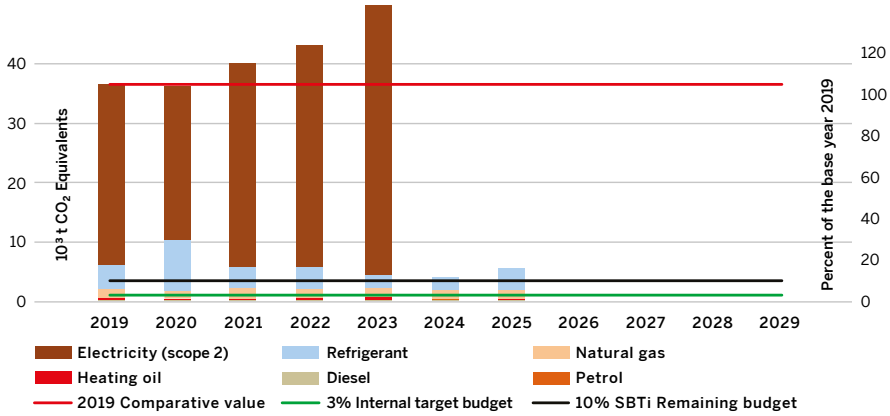


Figure 25: CO_2 Emissions in Scopes 1 and 2

As can be seen from Figure 26, the carbon footprint associated with upstream electricity consumption increased compared with 2019, even though UD's electricity demand has declined year by year since 2019 (red line).

In 2023, electricity consumption was 9.3 GWh (8%) lower than in the reference year 2019. However, instead of resulting in lower emissions, it led to an increase of 49.5% in emissions. This was because the emissions factor associated with electricity generation was higher than in 2019, amounting to 411 g CO_2/kWh[11] (see also Table 13 on page 31).

Germany still generates a significant proportion of its electricity by burning fossil fuels such as lignite, which is highly CO_2-intensive. Following the reduction of nuclear power generation and the replacement of natural gas with more carbon-intensive generation sources after the outbreak of the Russia-Ukraine war in February 2022, this emission factor rose to a new peak. At the beginning of the gas supply crisis, the use of heavy fuel oil-fired generation in Germany was even considered as a substitute measure for the electricity otherwise supplied by the Emsland nuclear power plant, as outlined in the coalition agreement of the federal government at the time. As a result of the complete phase-out of commercial nuclear power generation and the need to replace these electricity volumes with alternative sources, the situation is not expected to improve significantly in the near future, despite the substantial expansion of renewable energy generation capacity.

Although UD's electricity consumption has been declining for years as a result of the cumulative effect of consistently implemented electricity-saving measures

[10] The coefficients established by the Urenco Group in the United Kingdom for the 2019 baseline year are applied. On a quarterly basis, all data relevant to the preparation of the annual Sustainability Report/Annual Report are submitted to the parent company. The data published in previous Environmental Statements may differ slightly from these figures, for example due to updated, generally lower Global Warming Potential (GWP) values for the refrigerants used, reflecting more recent scientific findings, and due to differing national requirements, such as those established by the German Federal Office for Economic Affairs and Export Control (BAFA).

[11] The electricity supplied by the energy providers consisted of 1.9% nuclear energy, 51.8% renewable energy sources (RES), 34.5% coal, 10.7% natural gas, and 1.1% other fossil energy sources (information pursuant to Section 42 of the German Energy Industry Act (Energiewirtschaftsgesetz), published in November 2024 for the 2023 consumption year).

(see also the red curve for the years prior to 2019 in Figure 17 on page 24), the upstream carbon footprint continued to increase (see the brown bars up to 2023 in Figure 25). Despite substantial reductions in UD's electricity consumption, the carbon footprint increased because of the significantly higher emissions factor. It therefore became clear that the Climate Pledge targets could not be achieved through electricity savings alone. Consequently, various approaches to achieving the climate target were evaluated and compared.

The most climate-friendly approach is the low-carbon on-site generation of electricity for direct self-consumption. Consequently, a photovoltaic (PV) system with battery storage was installed in 2024 (see Table 3 on page 20). Despite the implementation of these major capital-intensive projects, a variable electricity supply cannot fully meet UD's consistently high baseload demand. Neither the volume of generation nor the generation profile sufficiently matches the facility's demand profile.

The second-best option from a climate perspective is the conclusion of Power Purchase Agreements (PPAs) directly between low-carbon electricity producers and consumers.

A non-binding declaration of intent by UD to enter into suitable PPAs had been published in earlier Environmental Statements as an initiative within the environmental programme. The objective was to reduce the carbon footprint in Scope 2 (see Figure 25).[12]

In 2023, UD conducted negotiations with an offshore wind farm operator. However, following a detailed analysis of the provisions of Section 30a(2) of the Ordinance on the Register of Guarantees of Origin for Renewable Energy and Gas (HkRNDV), consideration of its long-term procurement strategy, and an assessment of spot market risk reduction, Urenco ultimately decided in 2023 not to achieve climate neutrality for its electricity consumption through PPAs but instead through regional Guarantees of Origin (GoOs).[13]

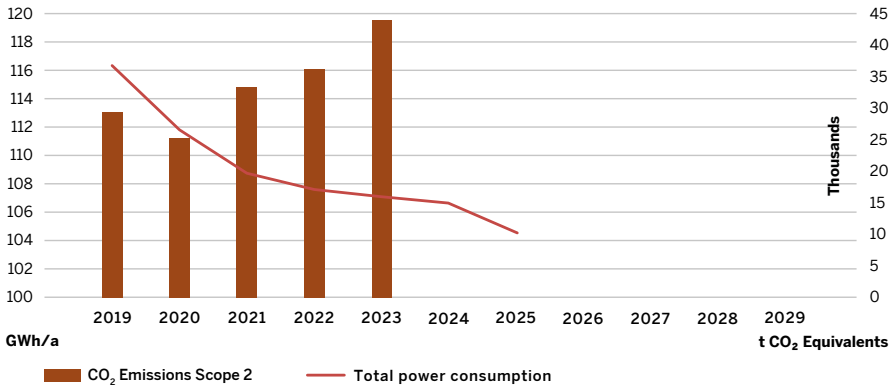


Figure 26: CO_2 Emissions in Scopes 2 and Total Electricity Consumption

Guarantees of Origin constitute an important financing mechanism for renewable energy because the revenues generated from their sale flow directly to the respective plant operators.

They are electronic certificates that function like birth certificates for electricity, verifying how, when, and where electricity from renewable energy sources was generated. In Germany, central registration is administered by the German Environment Agency (Umweltbundesamt), ensuring that the low-carbon attribute of consumed electricity can be cancelled only once. The Guarantees of Origin selected by UD are linked to generation facilities in Germany and Austria and are cancelled within UD's balancing group. Double counting is therefore excluded.[14] Further details regarding the measures and projects selected by UD for the coming years can be found in the action plan presented in Table 3 on page 20.

The largest contribution to the Scope 1 carbon footprint comes from the CO_2-equivalent emissions associated with refrigerant losses, followed by emissions from the combustion of natural gas, heating oil, diesel fuel, and gasoline. Although extensive and effective measures have succeeded in reducing the Scope 1 carbon footprint, the remaining emissions exhibit proportionally greater fluctuations at this comparatively low level, as illustrated in Figure 27.

Additional numerical data on total emissions within Scopes 1 and 2 can be found in Tables 9 to 12 on the following two pages.

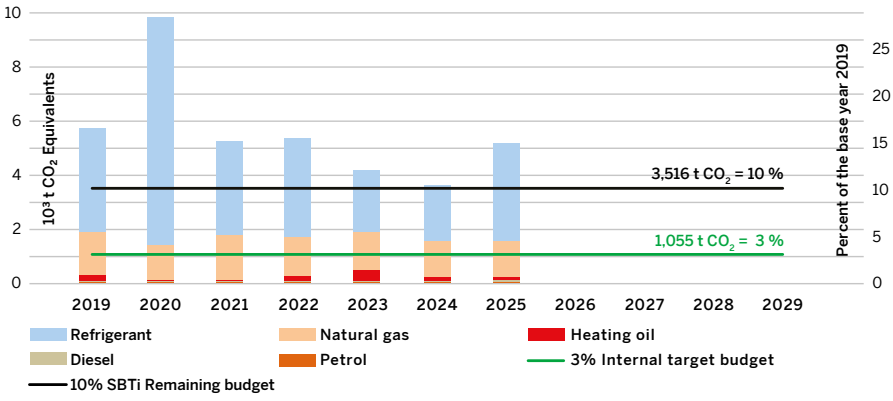


Figure 27: CO_2 Emissions in Scopes 1

[12] As an energy-intensive company, UD benefits from certain regulatory privileges if it can demonstrate so-called environmental counter-performances (ökologische Gegenleistungen). In 2023, it appeared possible to meet these requirements through offshore wind PPAs linked directly to renewable generation.

[13] A more detailed analysis of the applicable Ordinance on Guarantees of Origin and Regional Guarantees of Origin for Electricity from Renewable Energy Sources (Herkunfts- und Regionalnachweis-Durchführungsverordnung, HkRNDV) showed that, pursuant to Section 30a (2), a coupled electricity supply via a maximum of two balancing groups is accepted from a regulatory perspective, provided that the first balancing group is exclusively "green". The offshore wind farm in question constitutes such a purely "green" balancing group and is itself connected to TenneT's control area. Since UD is located within the Amprion transmission system operator's control area, no PPA compliant with the HkRNDV could be concluded. Despite the geographical proximity, the coupled electricity delivery would have extended across more than two balancing groups.

[14] The selected approach is consistent with the applicable German legislation and with the internationally recognized Greenhouse Gas Protocol standards.

Scope 1 emissions

Scope 1 emissions comprise the direct release of climate-relevant refrigerant gases and methane, which is required as a purge gas component for radiation protection instrumentation, as well as CO_2 emissions resulting from the combustion of natural gas, heating oil, diesel fuel, and gasoline. The respective carbon footprints of these sources are presented below.

CO_2 Equivalent emissions from refrigerant consumption

Refrigerants can give rise to two significant environmental hazards. They may contribute to the depletion of the stratospheric ozone layer and, as greenhouse gases, contribute to global warming. The refrigerants used by UD all have an ozone depletion potential of zero, meaning that they do not adversely affect the ozone layer.

However, when released into the atmosphere, they reflect thermal radiation back towards the Earth's surface and thereby contribute to the greenhouse effect. Consequently, they are included in the calculation of the overall carbon dioxide balance.

Apart from the emissions listed in Table 9, no additional emissions from refrigerant consumption occurred in 2025.

Table 9: Refrigerant Consumption, GWP and CO_2 Equivalents

Refrigerant	Consumption, kg	GWP[15]	CO_2-Equivalent, t
R 507A	83.5	3,985	333
R 410A	13.0	1,924	25
R 134a	1.967.0	1,300	2,557
R 245fa	828.0	858	710
Total refrigerant consumption 2025			3,625
Total refrigerant consumption 2024			2,071
Total refrigerant consumption 2023			2,299
Total refrigerant consumption 2022			3,304
Total refrigerant consumption 2021			2,806
Total refrigerant consumption 2020			8,356
Total refrigerant consumption 2019			3,844

CO_2 Equivalent emissions from methane used as a purge gas component

A variety of redundant systems are employed to ensure the continuous radiation protection monitoring of the entire uranium enrichment plant. Among these are so-called alpha-beta monitors, which require a very small but constant supply of a special purge gas mixture for their operation. This gas mixture consists of 90% argon, a noble gas, and 10% methane by volume. Methane has a density of 0.65 kg/m³ and a Global Warming Potential (GWP) of 25.

The consumption of purge gas over the past three years is shown in Table 10.

Table 10: Purge Gas Consumption

Purge Gas Consumption	2019	2020	2021	2022	2023	2024	2025
Cylinder count V=50 L, (V=10 L), p=200 bar, Methane fraction 10 %	334	294	322 (4)	369 (1)	344 (1)	348 (4)	378 (1)
Methane, kg	217	191	210	240	224	226	245
CO_2 equivalent, t	5	5	5	6	6	6	6

The increase in purge gas consumption is attributable to modifications made to the gas supply system in 2021 and to the growing number of refurbishment activities since 2022, during which a temporary controlled area must be monitored separately by the radiation protection organisation.

CO_2 Emissions from the Consumption of Natural Gas, Diesel, Heating Oil and Gasoline

In 2025, natural gas was consumed for heating purposes, while heating oil and diesel were used to operate the emergency power generators. Diesel was also used for on-site transport activities, and both diesel and gasoline were consumed by company vehicles,[16] as shown in Tables 11 and 12. It should be noted, however, that the volumes reported below are based on fuel deliveries and tank refills. Actual short-term consumption may therefore differ from these figures.

As part of its Net Zero efforts, the company is currently evaluating a renewed transition to Hydrotreated Vegetable Oil (HVO) as an alternative fuel.

Table 11: Natural Gas Consumption and CO_2 Equivalents

Natural gas	Energy Equivalent, GWh	Factor[17], g CO_2/kWh	CO_2 Equivalent, t
2025	7.419	182	1,350
2024	7.370		1,341
2023	7.635		1,390
2022	7.761		1,413
2021	9.152		1,666
2020	7.288		1,326
2019	8.415		1,532

[15] The Global Warming Potential (GWP) factors take into account the differing effectiveness of refrigerants as greenhouse gases. For example, refrigerant R 23 reflects thermal radiation from the Earth 12,400 times more strongly than CO_2. As a result, one kilogram of R23 released into the atmosphere has the same impact on the greenhouse effect as 12.4 tonnes of CO_2.

[16] According to the 2024 Guidance Note on Determining Total Energy Consumption issued by the German Federal Office for Economic Affairs and Export Control (BAFA), the fuel consumption of company cars that are also used privately is not included in the direct emissions inventory (Scope 1). However, due to the underlying Net Zero accounting methodology, both gasoline and diesel consumption are nevertheless taken into consideration.

[17] This factor is derived from the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz), which has been applicable since 2021, and is stated on the natural gas invoice.

Table 12: Diesel, Heating Oil and Petrol Consumption and CO_2 Equivalents

Factors[18] g CO_2/L 2,662 for Diesel, 3,175 for Heating Oil and 2,340 for Petrol	Fuel Consumption, L							CO_2 Equivalents, t						
	2019	2020	2021	2022	2023	2024	2025	2019	2020	2021	2022	2023	2024	2025
Total diesel	15,660	13,274	16,420	19,714	17,786	17,545	29,234	49	42	52	62	56	55	78
- Forklift trucks	10,077	9,802	13,017	12,055	11,354	9,889	13,195	32	31	41	38	36	31	35
- Generators	0	0	0	6,848	6,043	5,979	14,314	0	0	0	22	19	19	38
- Company vehicles[16]	5,583	3,472	3,403	811	389	1,677	1,725	18	11	11	3	1	5	5
Heating Oil for emergency generators	80,971	17,895	9,788	57,272	127,652	42,087	28,278	250	55	30	177	395	130	90
Petrol for company vehicles[16]	355	310	1,323	2,196	2,575	14,749	10,186	1	1	4	6	7	42	24

Scope 2 emissions

Scope 2 emissions comprise solely the indirect release of greenhouse gases by upstream electricity suppliers.

The indirect emissions associated with the supply of liquid nitrogen (used for process cooling) arise from transportation by truck and are therefore not allocated to Scope 2 but to Scope 3. The corresponding mitigation measures can be found in the fourth row of Table 4.

CO_2 Emissions from electricity generation

Approximately 104.7 GWh of electricity were consumed in 2025.

Table 13 presents the data from our electricity invoices for the past fifteen years.

If the last two years are disregarded, it is striking that the lowest level of CO_2 emissions, despite the energy transition, was not recorded in the most recent reporting year but rather in 2020, when only 225 g of carbon dioxide per kilowatt-hour were released into the atmosphere in connection with the generation of the electricity consumed by UD. This apparently paradoxical relationship is attributable to two factors.

First, the share of low-carbon nuclear energy declined from 47.1% in 2008 to 10.5% in 2021, following the German Federal Government's 2012 decision, based on the recommendation of the Ethics Commission, to phase out nuclear power plants.

Second, particularly after the outbreak of the Ukraine war, the low-carbon electricity generation capacity lost through the shutdown of nuclear power plants, together with part of the electricity previously generated from natural gas, was and continues to be replaced by highly carbon-intensive fossil fuels such as lignite. These sources are used especially during periods when solar and wind generation are unavailable because the sun is not shining and the wind is not blowing.

Table 13: Total Electricity Consumption and CO_2 Equivalents

Electricity consumption	Energy Equivalent, GWh	Factor, g CO_2/ kWh	CO_2 Equivalents, t
2025	104.7	0*	0
2024	107.0	0*	0
2023	107.2	411	44,059
2022	107.7	337	36,295
2021	108.9	307	33,432
2020	112.0	225	25,200
2019	116.5	253	29,475
2018	116.4	381	44,348
2017	115.0	368	42,320
2016	116.6	457	53,286
2015	116.2	474	55,079
2014	122.3	572	69,956
2013	123.1	620	76,322
2012	123.0	643	79,089
2011	123.7	503	62,221

*Due to the sufficient procurement and cancellation of the GoOs, this value has been zero by definition since the 2024 reporting year.

[18] From the 2025 reporting year onward, the emission factors applied are those specified by Urenco Limited for the purposes of climate neutrality reporting.

Scope 3 emissions

Scope 3 emissions comprise the indirect release of greenhouse gases arising from upstream and downstream processes throughout the entire value chain.

These include, for example, the supply of liquid nitrogen and other gases required for operations, as well as commuting by employees, expert consultants, regulatory inspectors and government officials, and business travel.

In addition, all upstream suppliers contribute to Scope 3 emissions. A systematic assessment of upstream service providers was initiated in 2023 using the international EcoVadis platform.

Further information is available on the Urenco website.

Land use in relation to biodiversity

The total site area of UD remains unchanged at approximately 76.2 hectares. As of 31 December 2025, the sealed surface area also remained unchanged at 237,661 m². Future changes are expected to result from the pending surveying of several newly constructed buildings.

The majority of the site is designed as a near-natural, park-like landscape and includes extensive lawn areas as well as numerous mature trees and shrubs (see Figure 28). Vegetation along roadsides on undeveloped areas consists primarily of tree species such as silver birch, downy birch, wild cherry, pedunculate oak, rowan (mountain ash), and white willow.

The shrub and undergrowth layer consists predominantly of alder buckthorn, blackberry, and goat willow. The areas on both sides of the construction road in the eastern part of the site comprise uncultivated grassland.

The vegetation covering the earth bunds surrounding the Feed and Tails storage areas, as well as the noise-protection embankment, consists mainly of dogwood, hazel, eared willow, purple willow, and elder, together with grassland interspersed with yarrow. These embankment plantings were established as industrial landscaping.

The area west and southwest of Building 3 (formerly the pipe fabrication facility) comprises wetlands populated with grasses and reed species such as common reed, sedge, reed cane, cattail, and rushes. Trees and shrubs in this area consist mainly of European aspen and various willow species.

The site's firewater retention pond is also located within this area.

Figure 28: The company premises are spacious and park-like

As part of the environmental impact assessment conducted for the plant expansion project, expert studies confirmed that no adverse environmental impacts are to be expected.

In the southeast of the property, outside the plant security fence, there are four small ponds, two of which were created in connection with the construction of the railway siding and one in connection with the removal of drainage ditches. These ponds were established as amphibian breeding habitats for species originating from the Goorbach-Fürstentannen Nature Reserve (now the Goorbach and Hornebecke Nature Reserve). The habitat created in this way covers approximately 1,800 m².

Also located in the southwest of the site is a ground-mounted photovoltaic installation (see Figure 29), including an energy storage system with a capacity exceeding 10 MWh, which has been in operation since the end of 2024.

The industrial site features a network of generously dimensioned access roads connecting the various buildings (see Figure 30).

Figure 29: The approximately 6 MW_{peak} solar panel site is located on a 5.7 ha area next to the nuclear licensed area.

Figure 30: Service road between TI-2 and UTA-2

Allocation table according to Annex IV of the eco-audit regulation

Table 14: Allocation Table According to Annex IV of the EMAS Regulation

	Environmental Reporting, B. Environmental Statement	Page(s)
a)	Summary of the organisation's activities, products and services, its relationship with any parent organisation(s), and a description of the scope of the EMAS registration.	5
b)	Environmental policy and a brief description of the management structure supporting the organisation's environmental management system.	14-22
c)	Description of all significant direct and indirect environmental aspects giving rise to the organisation's significant environmental impacts, a brief description of the methodology used to determine their significance, and an explanation of the nature of the impacts associated with these environmental aspects.	17-18
d)	Description of environmental objectives and targets relating to the significant environmental aspects and impacts.	18-21
e)	Description of measures implemented and planned to improve environmental performance, achieve objectives and targets, and ensure compliance with environmental legal requirements.	18-21, 11-13
f)	Summary of available data on the organisation's environmental performance related to its significant environmental impacts. Reporting shall include both the core environmental performance indicators and the specific environmental performance indicators in accordance with Section C. Where environmental objectives and targets exist, the corresponding data shall be provided.	23-33
g)	Reference to the principal legal requirements that the organisation must take into account to ensure compliance with environmental legislation, together with confirmation of legal compliance.	11-13 und 35
h)	Confirmation regarding the requirements of Article 25(8), together with the name and accreditation or licence number of the environmental verifier and the date of validation. The Environmental Statement shall be clearly identified.	35

Table 15: Key indicators, type of key indicator and page reference

Core indicators	Type of core indicator	Page(s)
i) Energy	Electricity, natural gas, heating oil, diesel and petrol	24, 31
ii) Materials	Uranium hexafluoride (UF_6) as feed, Low Assay Feed (LAF), product and depleted uranium (tails).	23 11-12
iii) Water	Water.	24
iv) Waste	Radioactive and conventional waste (hazardous and non-hazardous).	27
v) Land Use in Relation to Biodiversity	Total site area, sealed surfaces, description of the near-natural operational areas and the resident flora and wetlands, as well as adjacent nature conservation areas.	32-33
vi) Emissions	Refrigerants, methane, CO_2, alpha and beta emissions to air and water, as well as direct radiation	30 28-31 25

Declaration of the environmental verifier on verification and validation activities

The undersigned,

Dr. Jan Schrübbers, EMAS Environmental Verifier, registration number DE-V-0364, accredited or licensed for NACE Code 24.46.0 - Processing of nuclear fuel, and

Dr. Hans Schrübbers, EMAS Environmental Verifier, registration number DE-V-0077, accredited or licensed for NACE Code 20.13.0 - Manufacture of other inorganic basic chemicals,

declare to have verified whether the site in Gronau, as indicated in the Environmental Statement of Urenco Deutschland GmbH, Röntgenstraße 4, 48599 Gronau, Germany, with registration number DE-156-00013, meets all requirements of Regulation (EC) No. 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

By signing this declaration, it is confirmed that:

- the verification and revalidation have been carried out in full compliance with the requirements of Regulation (EC) No. 1221/2009, Commission Regulation (EU) 2017/1505 and Commission Regulation (EU) 2018/2026;
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable environmental legislation;
- the data and information contained in the Environmental Statement provide a reliable, credible and truthful representation of all activities of Urenco Deutschland GmbH in Gronau within the scope indicated in the Environmental Statement.

This declaration shall not be deemed equivalent to EMAS registration. EMAS registration can only be granted by a Competent Body under Regulation (EC) No. 1221/2009. This declaration shall not be used as a stand-alone basis for informing the public.

Bremen, 26.10.2026

*

Dr Jan Schrübbers

EMAS Environmental Verifier DE-V-0364
Environmental Verifier Organisation DE-V-0106

Dr Hans Schrübbers

EMAS Environmental Verifier DE-V-0077
Environmental Verifier Organisation DE-V-0106

*This English version is a translation of the original German declaration signed by the environmental verifiers on 31 July 2026 and has been signed by the same environmental verifiers. However, only the German version is legally binding. In the event of any discrepancy or inconsistency between the two versions, the German version shall prevail.

Niederrheinische Industrie- und Handelskammer
Duisburg . Wesel . Kleve zu Duisburg

als gemeinsame registerführende Stelle von Industrie- und Handelskammern
in Nordrhein-Westfalen nach Umweltauditgesetz - Registrierungsstelle -

CERTIFICATE

EMAS
VERIFIED ENVIRONMENTAL MANAGEMENT

URENCO Deutschland GmbH

Site
Urananreicherungsanlage Gronau
Röntgenstraße 4
48599 Gronau

Registration-No.: DE-156-00013
Date of first registration 23rd September 1996

This certificate is valid until 31st August 2029

This organisation has established an environmental management system according to Regulation (EC) No 1221/2009 and EN ISO 14001:2015 sections 4 to 10 to promote the continual improvement of environmental performance, regularly publishes an environmental statement, has let the environmental management system be verified and the environmental statement be validated by an independent and accredited verifier, is registered under EMAS (www.emas-register.de) and therefore entitled to use the EMAS-Logo.

IHK

Duisburg, 2nd September 2026

Dr. Stefan Dietzfelbinger

General Manager

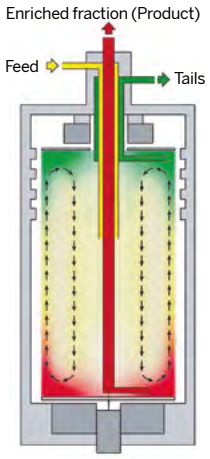
Explanation of key terms

Centrifuge cascades

A single centrifuge cannot produce the required ^{235}U concentration of 3% to 5% in a single step. To increase material throughput, centrifuges in an industrial facility are connected and operated both in parallel and in series. The arrangement of centrifuges connected in parallel and in sequence is referred to as a cascade. In the separation halls of a uranium enrichment plant, multiple centrifuge cascades are operated simultaneously.

Centrifuge process

The centrifuge process exploits the small difference in mass between the two uranium isotopes to separate them. Inside the evacuated housing of the centrifuge, known as the casing, a cylindrical rotor spins at very high speed. Natural uranium is fed into the centrifuge as gaseous UF_6, where it is entrained by the rotating rotor. Due to centrifugal force, the heavier isotope ^{238}U becomes more highly concentrated near the rotor wall than the lighter isotope ^{235}U. As a result, the gas near the wall contains less ^{235}U, while the gas closer to the rotor axis becomes enriched in ^{235}U. The depleted UF_6 flows upward along the rotor wall toward the upper end of the centrifuge, while the enriched UF_6 flows downward near the rotor axis toward the lower end, where each fraction is withdrawn through hook-shaped tubes. This gas circulation can be enhanced by establishing a temperature gradient along the length of the centrifuge.



Schematic of a gas centrifuge

Environmental aspect

An environmental aspect is an element of an organisation's activities, products, or services that has, or may have, an impact on the environment.

Notes:

- A significant environmental aspect is an environmental aspect that has, or may have, a significant environmental impact.
- Environmental aspects are classified as either direct or indirect.
- Direct environmental aspects arise from activities that are under UD's direct operational control.
- Indirect environmental aspects arise from activities that may not be fully controlled by UD and are the result of interactions with third parties.

Environmental impact

An environmental impact is any change to the environment, whether beneficial or adverse, that results wholly or partly from an organisation's activities, products, or services. The relationship between an environmental aspect and an environmental impact is one of cause and effect.

Isotope

Isotopes are atoms that represent the same chemical element but have different masses. One million naturally occurring uranium atoms consist of approximately 992,745 atoms of ^{238}U, 7,200 atoms of ^{235}U, and 55 atoms of ^{234}U.

Materiality of an environmental aspect

The significance of environmental aspects is determined on the basis of comprehensive, independently verifiable and reproducible criteria.

Radioactivity, Becquerel (Bq)

Radioactivity is the property of atomic nuclei to decay spontaneously while emitting radiation. The unit of measurement is the becquerel (Bq).

1 Bq corresponds to one nuclear decay per second.

Scope 1 to 3 Greenhouse Gas (GHG) Emissions

- **Scope 1** comprises the direct release of greenhouse gases or emissions resulting from fuel combustion within the company itself.
- **Scope 2** comprises the indirect release of greenhouse gases associated with the supply of purchased electricity and process cooling by upstream energy providers.
- **Scope 3** comprises the indirect release of greenhouse gases arising from upstream and downstream processes throughout the entire value chain.

Separative Work (SW)

The effort required to separate uranium isotopes is measured using the unit kilogram separative work (kg SW). A larger unit, the tonne of separative work (t SW), is also commonly used. The capacity of uranium enrichment plants is likewise expressed in tonnes of separative work per year (t SW/a).

Sustainability aspect

A sustainability aspect is that element of an organisation's activities, products, or services that has, or may have, an impact on sustainability. In this context, the three dimensions of sustainability, namely economic viability, social equity, and environmental responsibility, must be considered. To preserve global resources, sustainability must form the basis of all economic and political decision-making.

Sustainability

As early as the 16th century, the Palatinate forestry regulations required that no more trees be felled than could grow back, in order to ensure sufficient timber yields for future generations. In 1713, Hans Carl von Carlowitz coined the term "sustainable use", which was extended to the economy as a whole in 1952 and was recognised at the 1992 Rio Earth Summit as a normative international guiding principle for governments and the global economy.

Sustainability Development Goals (SDGs)

The 17 Sustainable Development Goals (SDGs) are policy objectives established by the United Nations to promote sustainable development at the economic, social, and environmental levels worldwide. They entered into force in 2016 with a duration of 15 years, extending to 2030 (see Figure 12).

SDG trade-off

A goal conflict exists when the achievement of one target prevents or negatively affects the achievement of another target. For example, converting to cooling tower-based cooling may reduce refrigerant emissions as a climate protection measure, but it also substantially increases the consumption of drinking water.

SDG synergy

A goal synergy exists when achieving one target simultaneously contributes to the achievement of another. For example, the peaceful use of nuclear energy supports the goal of Affordable and Clean Energy (SDG 7) while also contributing to Climate Action (SDG 13).

Uranium enrichment

Naturally occurring uranium contains only about 0.7% of the isotope ^{235}U, which is the fissile isotope used in nuclear power plants to generate the heat required for electricity production. The vast majority of natural uranium consists of ^{238}U, which is not fissile. For today's light-water reactors, the proportion of ^{235}U in natural uranium is insufficient. Therefore, the concentration of ^{235}U must be increased to approximately 3% to 5%. This process is known as uranium enrichment.

Uranium hexafluoride (UF_6)

All industrial uranium enrichment processes require gaseous uranium hexafluoride (UF_6) as the process medium. At room temperature, UF_6 is a solid white substance that increasingly transitions into the gaseous state as its temperature rises.

Urenco Deutschland GmbH - *the energy to succeed*

Imagine a world in which sustainable energy is not just a possibility, but a reality.

We strive to make this vision of a CO_2-neutral future a reality by delivering innovative and sustainable solutions for our global partners.

Urenco is a global leader in uranium enrichment. We are proud to play a crucial role in providing clean, reliable, and low-carbon electricity. With more than 50 years of experience in the nuclear industry, we have a deep understanding of the challenges facing the energy sector and the related issues of energy security and climate change.

Our advanced centrifuge technology enables us to enrich uranium safely and efficiently, making a significant contribution to reducing global CO_2 emissions.

However, our commitment goes beyond pure energy generation. At Urenco, sustainability is part of our responsibility to society and the environment. That is why we continuously strive to improve our environmental footprint, minimize our fuel consumption, and at the same time create a positive social impact. Further details can be found on our website, our social media channels, and in the relevant sections of this Environmental Statement.

Together, we can shape the future in which sustainable energy becomes the norm rather than the exception. Join us on our mission toward a CO_2-neutral future and follow us on our social media channels.

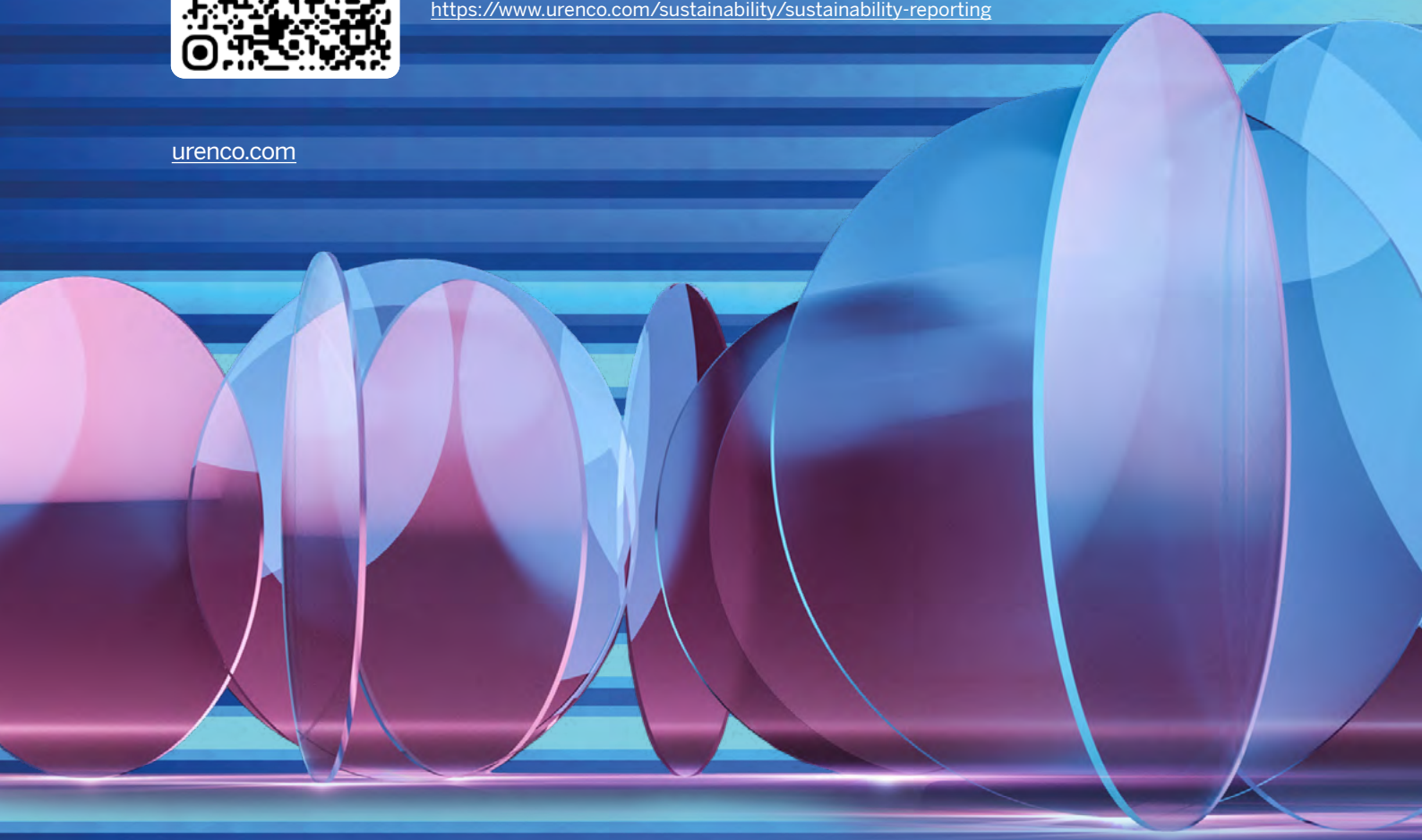
We hope you enjoy reading the new Environmental Statement of Urenco Deutschland GmbH.

SCAN ME

info@urenco.com - www.urenco.com

Urenco Deutschland GmbH
Röntgenstrasse 4
48599 Gronau
Germany

If you are looking for environmental statements from previous years or wish to learn more about the Urenco Group's sustainability efforts, please follow the link.

https://www.urenco.com/sustainability/sustainability-reporting

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