Resources and green transformation in European Neighbourhood East countries

Statistics Explained

Data extracted in January 2025. Planned article update: 31 March 2026.

Highlights

In 2022, Azerbaijan was the only net exporter of energy among the European Neighbourhood East countries, with net energy exports of nearly 47 million tonnes of oil equivalent.

Renewable energy accounted for 23.0% of final energy consumption in Moldova in 2023, just below EU average of 24.5%.

In 2022, Georgia generated 283 kg of municipal waste per person, Moldova 281 kg, Azerbaijan 262 kg and Ukraine 181 kg. This was far less than the EU average of 513 kg per person.

This article is part of an online publication . It presents information on five European Neighbourhood Policy-East (ENP-East) countries, namely, Armenia, Azerbaijan, Georgia, the Republic of Moldova and Ukraine, compared with the European Union (EU) . Georgia, Moldova and Ukraine are also candidate countries , with the European Council having granted Moldova and Ukraine candidate status on 22 June 2022 and Georgia on 14 December 2023. This article does not contain any data on Belarus, as statistical cooperation with Belarus has been suspended as of March 2022.

Data shown for Georgia exclude the regions of Abkhazia and South Ossetia over which the government of Georgia does not exercise control. Except for the amount of freshwater used until 2022, the data managed by the National Bureau of Statistics of the Republic of Moldova does not include data from the Transnistrian region over which the government of the Republic of Moldova does not exercise control. Since 2014, data for Ukraine generally exclude the illegally annexed Autonomous Republic of Crimea and the City of Sevastopol and the territories which are not under control of the Ukrainian government. As of 2022, data on Ukraine is limited due to reporting units being exempted from mandatory data submission to the State Statistics Service of Ukraine under the martial law, effective as of 3 March 2022, following Russia's war of aggression against Ukraine.

The article presents a range of resources and green transformation indicators such as greenhouse gas emissions , freshwater use , generation of municipal waste , primary energy production , import of energy, gross inland energy consumption , consumption of renewable energy and energy productivity.

Greenhouse gas emissions

Greenhouse gas emissions refer to the release of gases into the Earth's atmosphere that trap heat, contributing to the greenhouse effect and global warming. The measurement of greenhouse gas emissions encompasses the identification, collection, analysis, and reporting of data on the concentration and the sources of greenhouse gases (GHG) such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases.

Table 1 shows the amount of greenhouse gas emissions generated in the ENP-East countries and the EU, measured in thousand tonnes of CO2equivalent, over the period 2013-2022.

Although Ukraine was by far the largest emitter of GHG among the ENP-East countries, it was the only ENP-East country where GHG emissions had decreased since 2013. Between 2013 and 2021 (more recent data not available), Ukraine's emissions of GHG declined by one fifth (-20.3%), from 428.2 million tonnes of CO2equivalent in 2013, the highest level in this period, to 341.5 million tonnes in 2021. However, this decrease in GHG emissions did not follow a straight line. Significant decreases were recorded in 2014 (-10.6%), 2015 (-11.5%) and 2020

(-11.1%). However, this was partly offset by notable increases in 2016 (+6.8%), 2018 (+8.3%) and 2021 (+7.5%). The lowest level of GHG emissions in Ukraine was reached in 2020, in the midst of the Covid-19 pandemic, at 317.6 million tonnes.

Azerbaijan accounted for the second highest level of GHG emissions among the ENP-East countries. In contrast to Ukraine, it experienced the highest increase in GHG emissions among these countries between 2013 and 2022. However, the increase of 12.8% over the period was only slightly higher than the corresponding increases observed in Moldova and Georgia. The year-on-year growth in GHG emissions in Azerbaijan were generally modest, at less than 1.7%, with slight decreases in 2017 and 2020 (-1.1% and -0.4%, respectively.) The exception was 2020, during the post-pandemic recovery period, where GHG emissions grew by 7.8%. Overall, Azerbaijan's GHG emissions were up from 52.4 million tonnes of CO2equivalent in 2013 to 59.1 million tonnes in 2022, respectively the lowest and highest levels observed in the country over this period.

Data availability for GHG emissions in Georgia is limited, with 2017 the most recent year available. In 2013, Georgia emitted 16.0 million tonnes of CO2equivalent. This had risen to 18.5 million tonnes by 2016. In 2014 and 2015, Georgia's GHG emissions increased rapidly (+5.6% and 8.0%, respectively), with growth slowing in 2016 (+1.8%). In 2017, GHG emissions decreased by -4.1% to 17.8 million tonnes of CO2equivalent. Over the period 2013-2017, this implied an increase in GHG emissions of 11.3%.

GHG emissions in Moldova increased from 13.0 million tonnes of CO2equivalent in 2013 to 14.6 million tonnes in 2021 (more recent data not available), representing an increase of 12.1%, the second highest among the ENP-East countries. Notable emission increases were registered in 2018 (+5.0%) and 2021 (+7.1%), with more moderate fluctuations in the range between -1.9% (2017) and +2.3% (2016) in the other years covered.

Armenia experienced fluctuations in GHG emissions throughout the period 2013-2019 (more recent data not available). Aside from a significant increase of +6.7% in 2019, year-on-year changes in emissions generally varied between -2.2% (2015) and +3.0% (2017). Overall, this corresponded to an increase of 8.3% from 10.3 million tonnes of CO2equivalent in 2013 to 11.2 million tonnes in 2019.

The EU generally saw a decline in GHG emissions between 2013 and 2022, with emissions decreasing by -11.7% in total, from 3.55 billion tonnes of CO2equivalent to 3.14 billion tonnes (-0.42 billion tonnes). Emissions peaked in 2017 at 3.58 billion tonnes, following increased emissions in 2015 (+1.7%) and 2017 (+2.7%) and stable emissions in 2016. The lowest GHG emissions during the period were recorded in 2020, during the Covid-19 pandemic, at 3.05 billion tonnes, a sharp decrease of -8.7% compared with the year before. Although emissions increased again in 2021 (+5.5%) during the post-pandemic economic recovery, GHG emissions remained lower than before the pandemic.

Greenhouse gas emissions, 2013-2022

(thousand tonnes CO_2 equivalent)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
EU	3 553 809	3 427 826	3 486 017	3 486 374	3 579 005	3 492 436	3 343 421	3 052 044	3 220 179	3 138 341
Moldova (¹)	*13 044*	*13 173*	*13 200*	*13 503*	*13 244*	*13 908*	*13 810*	*13 662*	*14 628*	:
Georgia	15 964	16 861	18 214	18 534	17 766	:	:	:	:	:
Ukraine (¹)	*428 230*	*382 823*	*338 909*	*361 958*	*336 726*	*364 731*	*357 450*	*317 632*	*341 489*	:
Armenia (²)	10 298	10 507	10 271	10 291	10 604	10 455	11 151	:	:	:
Azerbaijan	52 400	52 900	53 300	54 000	53 400	53 600	54 100	53 900	58 100	59 100

Note: Data supplied by and under the responsibility of the national statistical authorities.

(:) not available.

(¹) Estimated.

(²) Without emissions from international aviation, land use and forestry removals.

Source: Eurostat (online data codes: env_air_gge and enpe_env_ghg)

eurostat

Table 1: Greenhouse gas emissions, 2013-2022 Source: Eurostat (env_air_gge) and (enpe_env_ghg).

Annual freshwater use

Figure 1 compares annual freshwater use in the ENP-East countries from 2013 to 2023, in million cubic metres (m3). Annual freshwater use measures how much freshwater is used by main categories of end users like households and economic sectors such as services, agriculture and industry.

The use of freshwater in Azerbaijan increased by 15.7% between 2013 and 2023, overall increasing from 7.7 billion m3in 2013 to 8.9 billion m3in 2023. A minor decrease (-1.7%) to 7.6 billion m3was observed in 2014, the lowest level observed for Azerbaijan in the period. The consumption of freshwater increased in the following years, with a substantial increase of 9.1% to a peak at 9.8 billion m3in 2021. Despite a larger decrease (-8.2%) in 2023, at 8.9 billion m3the freshwater use in Azerbaijan was by far the highest among the ENP-East countries in 2023.

In 2013, Ukraine had the highest use of freshwater among the ENP-East countries, with 9.4 billion m3. By 2023, freshwater use had fallen to 3.6 billion m3, a dramatic decrease of -61.8% over the period. In particular, freshwater use dropped by 39.9% to 3.4 billion in 2022 compared to 2021, likely due to disruptions in water supply and usage caused by Russia's war of aggression against Ukraine. Sharp reductions in freshwater use were also recorded in 2014 (-13.3%), 2015 (-19.1%) and 2021 (-16.4%), while substantial growth was seen in 2018 (+8.1%) and 2023 (+5.2%).

Freshwater consumption in Armenia exhibited longer but changing trends throughout the period 2013-2023. Initially, consumption grew from 2.1 billion m3to a high at 2.5 billion in 2015, with most of this increase taking place in 2015 (+19.9%). Freshwater use subsequently fell three years in a row, to a low at 1.9 billion m3in 2018, decreasing particularly strongly in 2017 (-17.4%). This was followed by constant year-on-year increases to 2.4 billion m3in 2022, before dropping to 2.3 billion m3in 2023.

Between 2013 and 2023, freshwater use in Georgia was split into two distinct phases. From 2013 to 2018, freshwater consumption went done rapidly, from 1.6 billion m3to just short of 1.0 billion m3, the lowest in the period. Consumption declined particularly in 2016 (-19.7%). In 2019, the trend changed, with a steep rise of +27.8% followed by further increases to reach 1.5 billion m3in 2021. Despite another large decrease in 2022 (-18.9%), freshwater use resumed the upward trend in 2023 to reach 1.3 billion m3.

Among the ENP-East countries, Moldova had the lowest and most stable freshwater use, with year-on-year changes only ranging between -0.9% (2021) and +1.3% (2020) from 2013 to 2022. This corresponded to annual freshwater consumption of between 0.78 billion m3and 0.79 billion m3during this period. From 2023 on, data from the Transnistrian region is no longer included, leading to a major shift in the level of the freshwater consumption data. Thus, reported consumption in 2023 only amounted to 0.12 billion m3.

Data on freshwater use is not available for the EU.

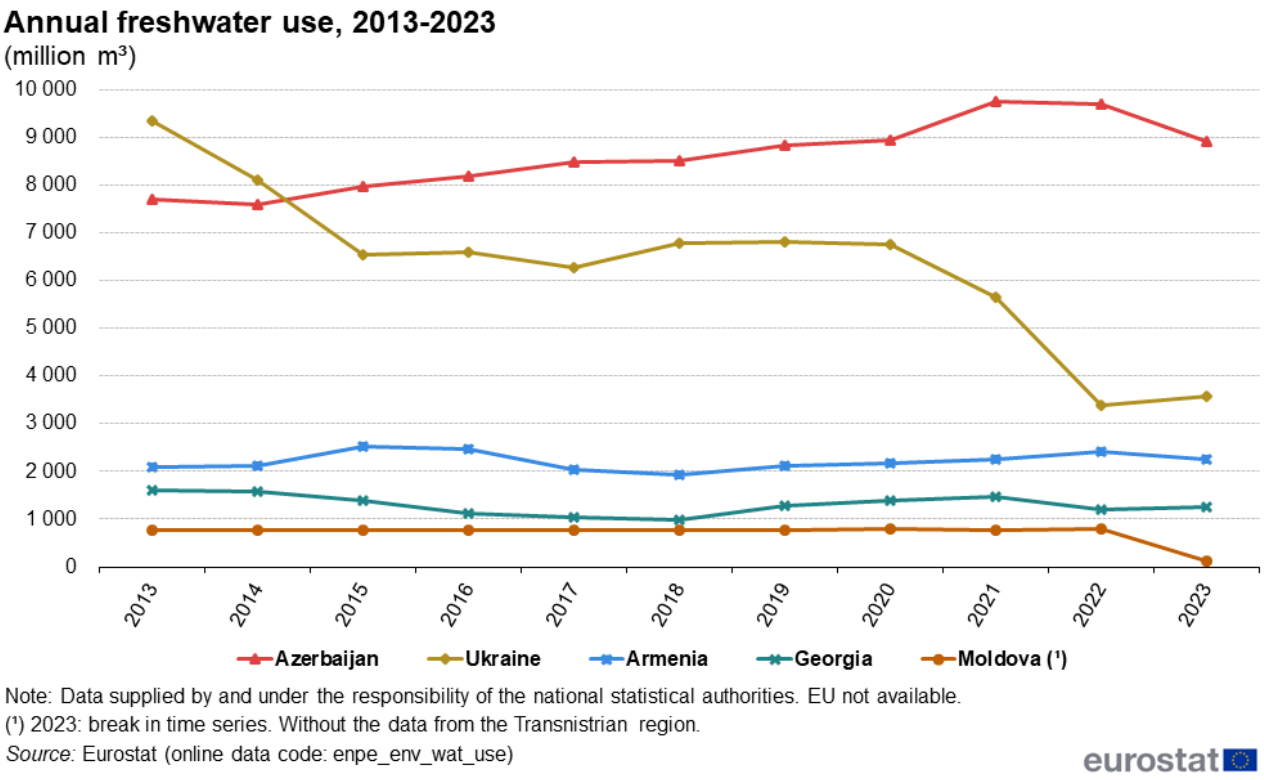


Figure 1: Annual freshwater use, 2013-2023 Source: Eurostat (enpe_env_ghg).

Municipal waste generated

Figure 2 presents the development in quantities of municipal waste generated across the EU, Armenia, Azerbaijan, Georgia, Moldova and Ukraine over the decade 2013-2022, measured in kilogramme per inhabitant (kg/capita).

In Georgia, generation of municipal waste rose continuously from 208 kg/capita in 2015 (earlier data not available) to 283 kg/capita in 2022, with only a minor drop in 2020. This corresponded to an increase of 76 kg/capita (+36.4%) over the period.

Data availability on generation of municipal waste in Moldova is limited, with data only available for the period 2020-2022. The quantity of waste increased from 260 kg/capita in 2020 to 291 kg/capita in 2021, dropping to 281 kg/capita in 2022. Between 2020 and 2022, this constituted an increase of 21 kg/capita (+8.1%).

Following an initial drop from 179 kg/capita in 2013 to 143 kg/capita in 2014, municipal waste in Azerbaijan showed rapid growth to reach 262 kg/capita in 2022. The only exception was a slight dip in 2017. Overall, this corresponded to an increase of 83 kg/capita (+46.6%) over the period, the largest increase among the ENP-East countries.

The generation of municipal waste in Ukraine fluctuated substantially over the reference years 2013-2022. Overall, municipal waste generated decreased by 26 kg/capita (-9.4%) from 279 kg/capita in 2013 to 253 kg/capita in 2021. In this period, year-on-year changes ranged between -23.2% (2014) and +17.5% (2016). In 2022, following the Russian war of aggression against Ukraine, reported generated and collected municipal waste dropped steeply to 181 kg/capita (-72 kg/capita; -28.4%).

In Armenia, data are available only for the period 2015-2021. In both 2015 and 2021, municipal waste generated stood at 164 kg/per capita, indicating relative stability over the period. Indeed, with the exception of an outlier at 194 kg/capita in 2020, municipal waste generation varied little, with quantities ranging between 158 kg/capita (2018) and 167 kg/capita (2016).

For the EU, there was a clear upward trend in waste generation per capita, rising steadily from 479 kg/capita in 2013 to 533 kg/capita by 2021, an increase of 54 kg/capita (+11.3%). However, in 2022 waste generation decreased by 20 kg/capita to 513 kg/capita.

It should be noted that significant growth in generated municipal waste, as in the case of Azerbaijan, could both reflect an increase in consumption and/or improvements in waste collection by municipalities.

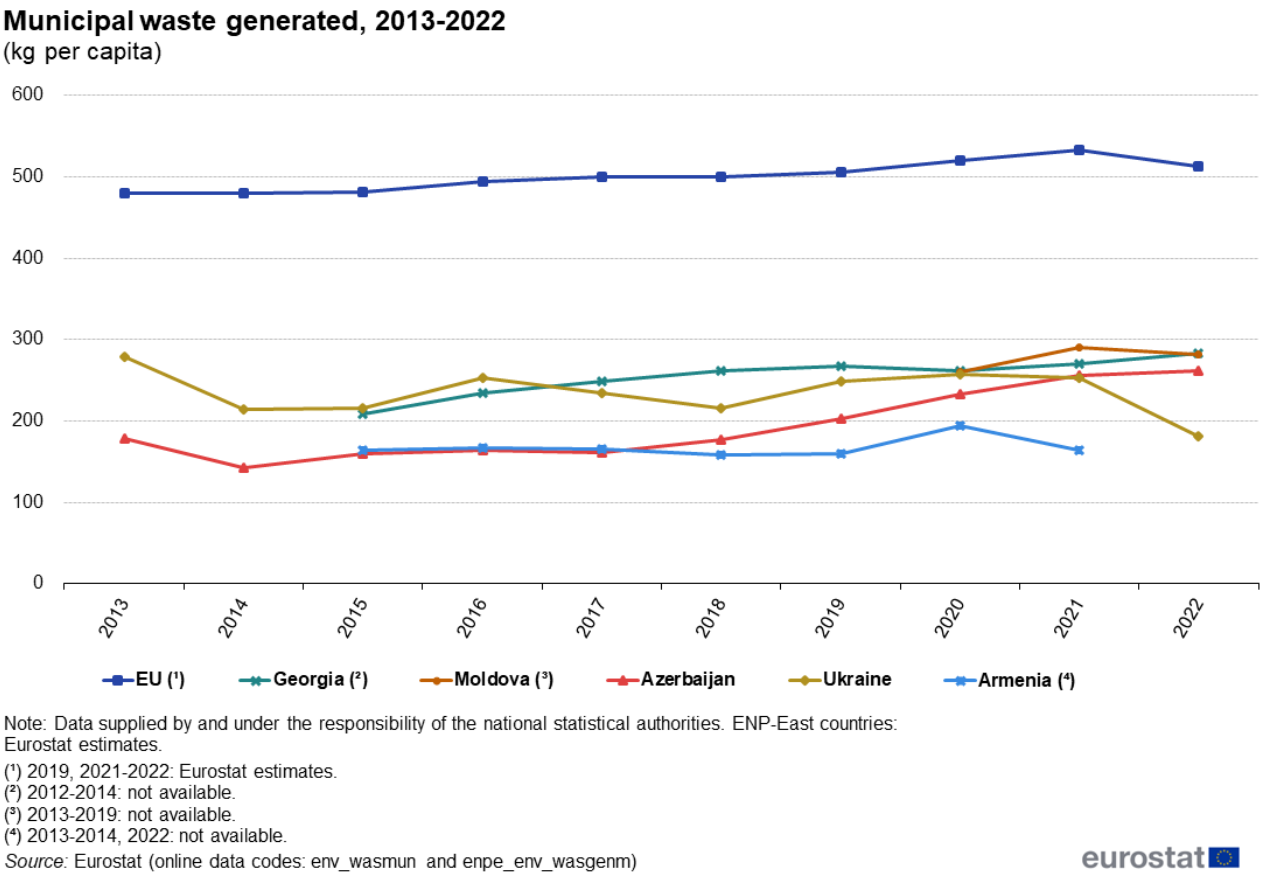


Figure 2: Municipal waste generated, 2013-2022 Source: Eurostat (env_wasmun) and (enpe_env_wasgenm).

Primary energy production by sources

Energy commodities extracted or captured directly from natural resources are called primary production of energy , while energy commodities which are transformed from primary energy sources are called derived products. Primary energy sources cover the extraction of coal and other solid fuels ; exploitation of oil and natural gas fields; production by nuclear and hydroelectric power plants; and renewables . The primary production of crude oil is defined as the quantity of fuel extracted or produced within national boundaries, including offshore production. Primary production of natural gas is defined as the quantity of dry gas, measured after purification and extraction of natural gas liquids and sulphur. Energy transformed from one form to another, such as electricity or heat generation in thermal power plants, is not considered primary production of energy. Energy is often measured in tonnes of oil equivalent (toe) .

The level of primary energy production may fluctuate considerably from one year to the next from changes in demand, reflecting, for example, economic fortunes and the number of heating days; changes in energy prices, which are affected by international market supply and demand; and weather conditions, particularly for hydroelectric power and renewable sources such as wind and solar energy. Developments in primary energy production may also reflect new energy sources and existing energy resources becoming depleted or replaced.

Figure 3 shows that in Azerbaijan, oil and petroleum products (47.5%) and natural gas (52.1%) together provided almost all (99.6%) primary energy production in 2023. This was completely different from the structure in Ukraine, where nuclear energy provided 35.1%, natural gas 27.8% and coal and other solid fuels 22.2% of primary production in 2020 (more recent data not available).

The other three ENP-East countries had limited primary energy production – production shares should be viewed in this context. In Georgia, primary energy production was mainly sourced from renewable sources in the form of hydroelectric power (91.4%; 2022 data). Moldova sourced almost its entire primary energy production from renewables and biofuels in 2023 (99.2%); however, a major part of Moldova's energy supply was based on imports. In Armenia, primary energy production in 2022 (2023 data not available) came from nuclear power (68.6%) and renewables (31.4%).

The structure of primary energy production in the EU is relatively varied, reflecting the availability of fossil fuel deposits and the potential for hydropower, as well as policies concerning the production of nuclear energy and energy from renewable sources. In 2023, the largest sources of primary energy in the EU were renewables and biofuels (46.0%) and nuclear power (28.6%). Solid fuels accounted for 13.7% of primary energy production, natural gas for 5.3% and oil and petroleum products for 3.4%.

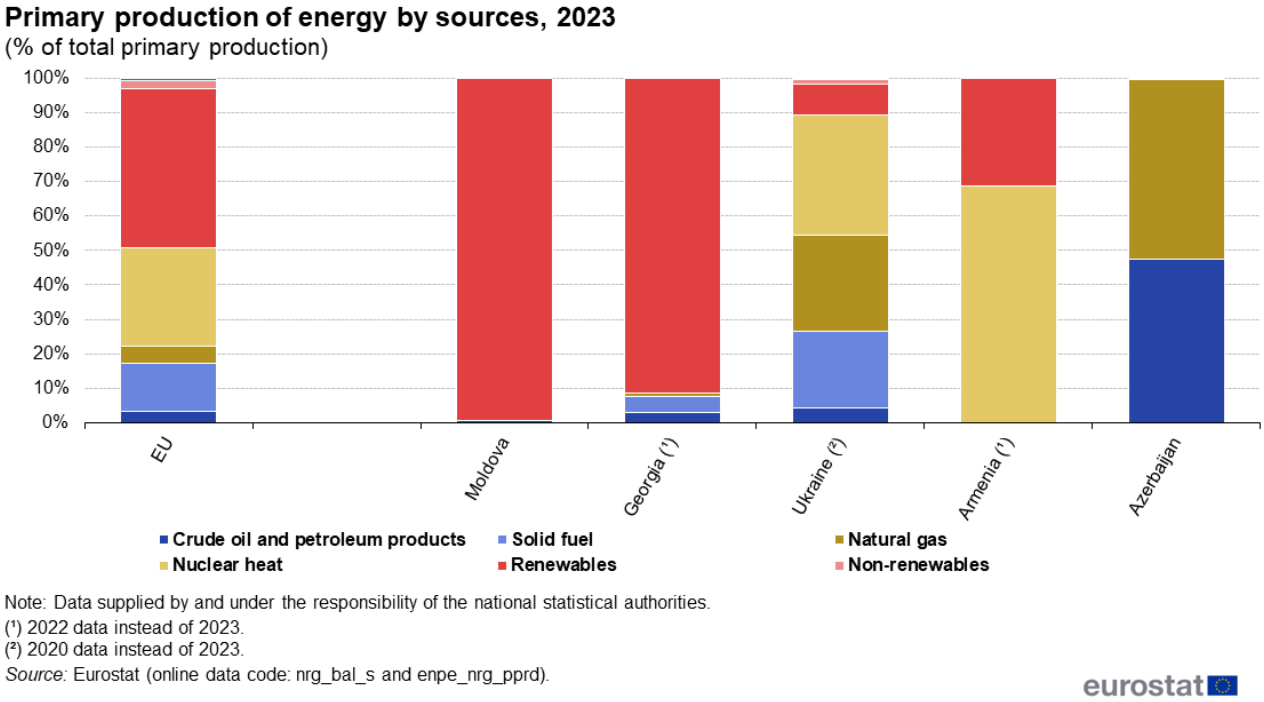


Figure 3: Primary production by sources, 2023 Source: Eurostat (nrg_bal_s) and (enpe_nrg_pprd).

Net import of energy

Net energy imports are calculated as the quantity of energy imports minus the corresponding quantity of exports. Energy imports represent all entries of energy products to a country, except for quantities that merely pass through the national territory as transit (notably via gas and oil pipelines); exports similarly cover all quantities exported from the country. Negative numbers indicate net exports, i.e. that the quantities exported were larger than those imported. Figure 4 presents data on the net import of energy to the ENP-East countries 2013-2022, measured in thousand tonnes of oil equivalent (toe) .

Ukraine's figures indicate a fluctuating level of net energy imports with considerable year-on-year changes. Over the period 2013-2020 (more recent data not available), net energy imports declined by 1 913 thousand toe (-6.1%) from 31 400 thousand toe in 2013 to 29 487 thousand toe in 2020. The strongest increases were observed in 2015 (+9.3%) and 2017 (+19.8%), recording a peak in net imports of 33 167 thousand toe in 2017. In contrast, larger decreases were noted in 2014 (-12.6%), 2016 (-7.7%) and 2020 (-10.6%), falling to its lowest level at 27 438 thousand toe in 2014.

Georgia's net energy imports gradually increased over the years 2013-2022, from 2 824 thousand toe in 2013 to 4 561 thousand toe in 2022, an increase of 61.5%, reflecting a growing energy demand. The only exception to this

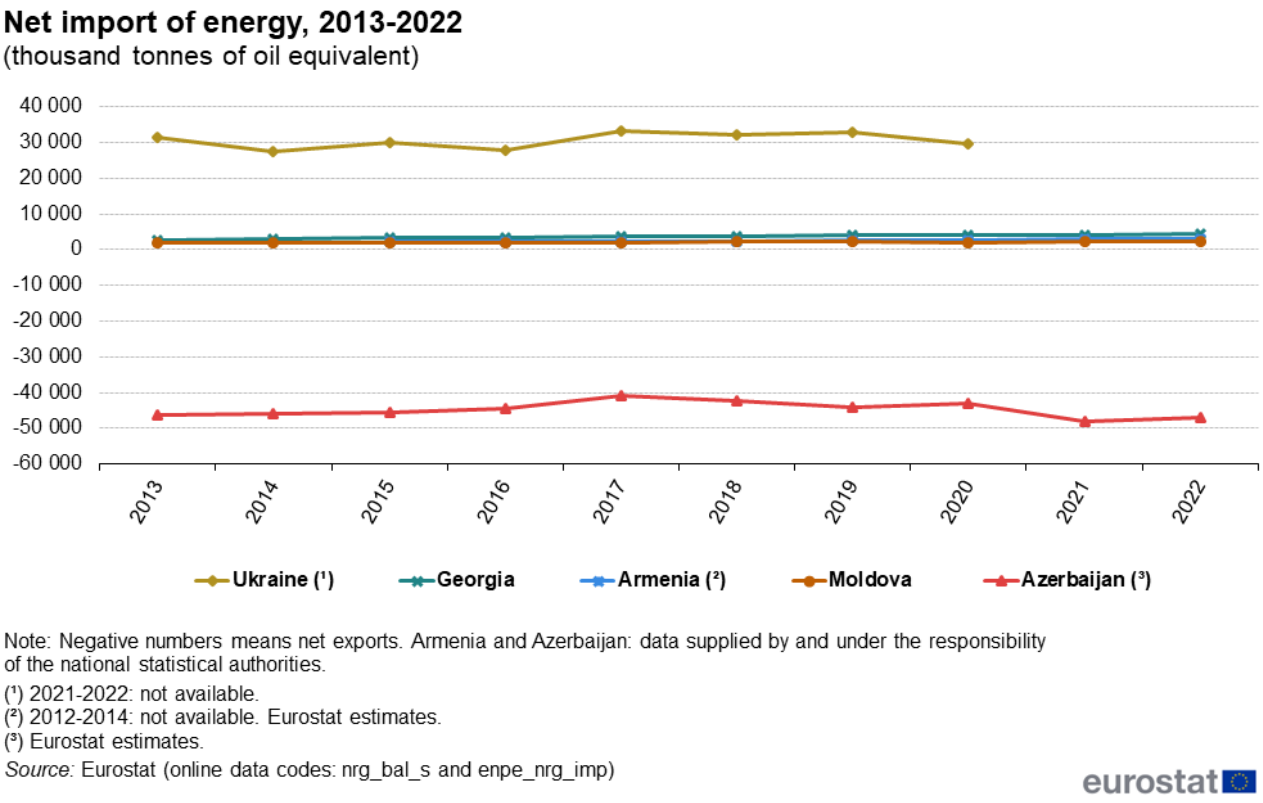
trend was a slight decrease (-3.2%) in 2020 during the Covid-19 pandemic.

Armenia's data on net energy imports are only available from 2015 on. From 2015 to 2022, Armenia saw an upward trend in net energy imports, rising from 2 212 thousand toe in 2015 to 3 078 thousand toe in 2022. Net imports only declined in 2016, by -3.7%, to the lowest level during this period at 2 131 thousand toe.

Following a minor decrease from 1 966 thousand toe in 2013 to 1 920 thousand toe in 2014 (-2.4%), Moldova's net energy imports grew consistently to reach 2 219 thousand toe in 2018, before decreasing in both 2019 and 2020. However, in 2021 net energy imports increased by 9.6% to a peak at 2 306 thousand toe, reflecting the resurgence of economic activity after the Covid-19 pandemic, the same effect as seen in Armenia. Nevertheless, the decline in net energy imports resumed the following year, with figures down to 2 181 thousand toe in 2022.

Azerbaijan stands out with high negative figures, in other words as a net energy exporter, reflecting its role as an important producer and exporter of oil and natural gas. Despite this, net energy exports decreased gradually from 46 316 thousand toe in 2013 to 40 755 thousand toe in 2017, their lowest level during the period 2013-2022. Net energy exports increased again in the subsequent years, to 46 884 thousand toe in 2022, despite minor declines in 2017 and 2020. This was nevertheless down -5.4% from 2021, which saw a peak at 48 246 thousand toe (+11.7%), reflecting the effect of the post Covid-19 pandemic economic recovery.

The EU largely saw an upward trend in its net energy imports over the decade 2013-2022, despite an initial minor decline (-2.6%) to 798 913 thousand toe in 2014. This development reached a high in 2019 at 908 141 thousand toe. However, partially due to a downturn in energy demand during the Covid-19 pandemic, net energy imports decreased sharply (-12.7%) to 792 412 thousand toe in 2020. This was the lowest level observed during the decade. Subsequently, net energy imports resumed their rising trajectory to reach 873 244 thousand toe in 2022, illustrating the EU's reliance on energy imports. The large differences in size between the EU and the ENP-East countries still make it difficult to compare their net energy imports. Within the EU, net energy imports varied considerably across countries, reflecting differences in energy generation, energy intensity and size.



Note: Negative numbers means net exports. Armenia and Azerbaijan: data supplied by and under the responsibility of the national statistical authorities.
(1) 2021-2022: not available.
(2) 2012-2014: not available. Eurostat estimates.
(3) Eurostat estimates.
Source: Eurostat (online data codes: nrg_bal_s and enpe_nrg_imp)

Figure 4: Net import of energy, 2013-2022 Source: Eurostat (nrg_bal_s) and (enpe_nrg_imp).

Gross inland energy consumption

Figure 5 presents energy consumption in the ENP-East countries, measured in kilogrammes of oil equivalent (kgoe) per capita.

Ukraine's energy consumption decreased from 2 565 kgoe/capita in 2013 to 2 075 kgoe/capita in 2020 (more recent data not available), declining each year except 2018 (+5.0%). Larger decreases were observed in 2014 and 2015. However, a significant break in the time series in 2015 should be noted. Between 2015 and 2020, energy consumption decreased by 103 kgoe/capita (-4.7%).

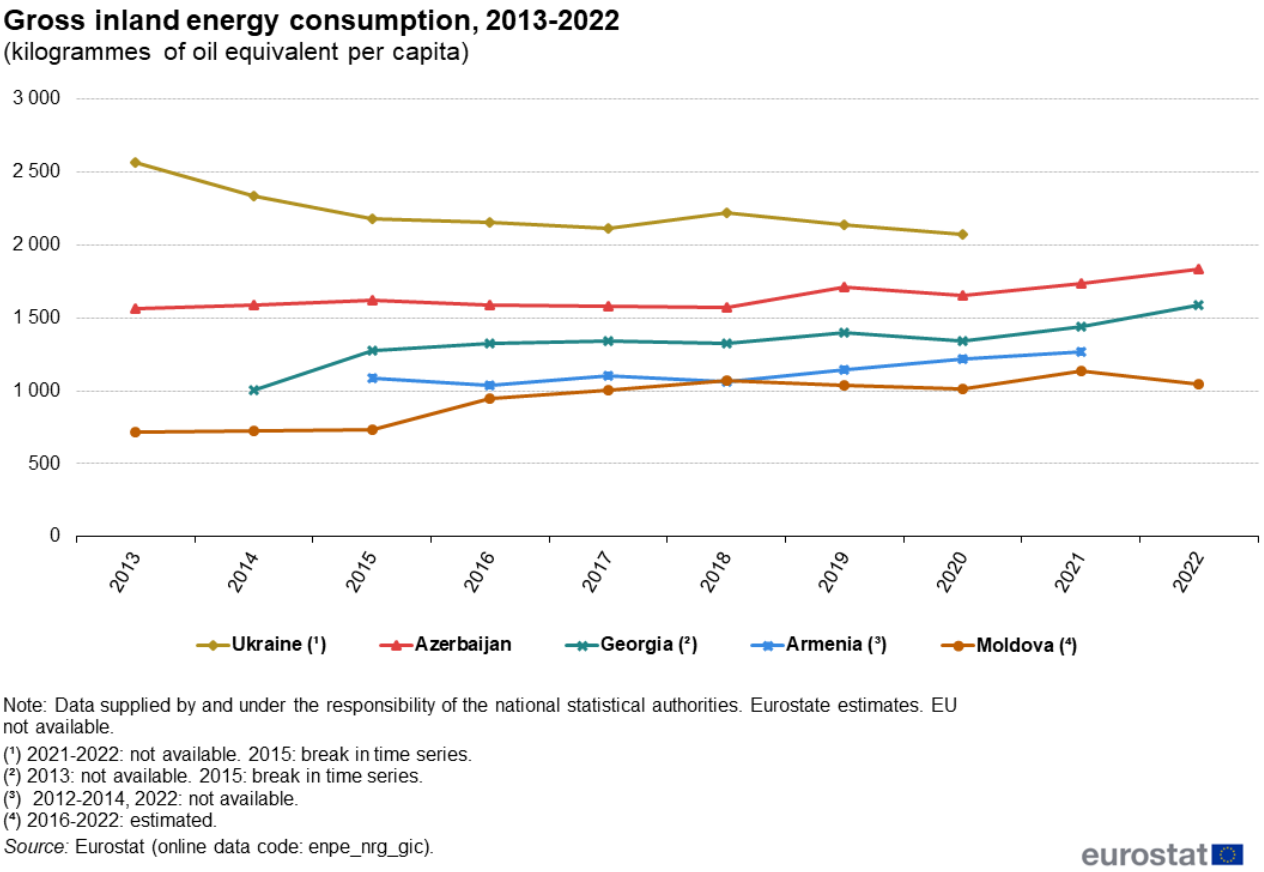
Azerbaijan's energy consumption was relatively stable between 2013 and 2018, growing by just 11 kgoe/capita between these years from 1 564 kgoe/capita in 2013 to 1 575 kgoe/capita in 2018. In 2019, consumption grew strongly (+8.7%), before decreasing again in 2020 (-3.4%). In 2021 and 2022, the upward trend resumed (+5.0% and 5.8%, respectively), with the energy consumption in Azerbaijan reaching 1 837 kgoe/capita in 2022.

Data for Georgia are available from 2014 on. That year, energy consumption stood at 1 007 kgoe/capita. A break in the time series in 2015 accounted for a shift in the level of the data by more than one quarter (+26.8%) to 1 277 kgoe/capita, indicating that data from 2015 onwards should not be directly compared to data for earlier reference years. Between 2015 and 2022, energy consumption in Georgia grew, with exceptions of 2018 (-1.0%) and 2020 (-3.8%). By 2022, consumption had risen to 1 590 kgoe/capita, the highest level of the period in Georgia.

Energy consumption fluctuated in Armenia, from 1 085 kgoe/capita in 2015 (earlier data not available) to 1 272 kgoe/capita in 2021 (2022 data not available). Consumption decreased in 2016 (-4.1%), to the lowest level within the period (1 041 kgoe/capita), and in 2018 (-4.0%). In all other years covered, energy consumption increased, which made Armenia the only ENP-East country reporting an increase during the Covid-19 pandemic in 2020 (+5.8%). Over the period 2015-2021, Armenia's energy consumption grew by 187 kgoe/capita (+17.2%).

Moldova's figures remained relatively unchanged from 719 kgoe/capita in 2013 to 732 kgoe/capita in 2015. Data from 2016 on are estimated, with a shift in the estimated consumption level to 951 kgoe/capita (+30.0%) in 2016. The trend in energy consumption was unstable in the following years, shifting between increases and decreases of between +12.6% (2021) and -7.8% (2022). In 2022, consumption was 1 050 kgoe/capita in 2022, down from the peak at 1 138 kgoe/capita the year before.

Data on gross inland energy consumption are not available for the EU.



Note: Data supplied by and under the responsibility of the national statistical authorities. Eurostate estimates. EU not available.
(1) 2021-2022: not available. 2015: break in time series.
(2) 2013: not available. 2015: break in time series.
(3) 2012-2014, 2022: not available.
(4) 2016-2022: estimated.
Source: Eurostat (online data code: enpe_nrg_gic).

Figure 5: Gross inland energy consumption, 2013-2022 Source: Eurostat (enpe_nrg_gic)

Renewable energy in gross final energy consumption

Figure 6 presents the shares accounted for by renewable energy sources in total energy consumption in the ENP-East countries and the EU.

Among the ENP-East countries, Moldova reported the highest share of renewables in total final energy consumption throughout the period 2013-2023, and even surpassing the share of renewables in the EU for most of the period. However, its share of renewables fluctuated, growing consistently from 24.4% of total energy consumption in 2013 to a peak at 27.8% in 2017, before declining in each year except 2020 to reach 21.5% in 2022. However, the share of renewables picked up slightly in 2023, by +1.5 pp to 23.0%.

Data on the share of renewables in Georgia are limited to 3 years, from 2021 to 2023. Over this period, its share of renewables increased from 18.3% to 19.9%, with a minor dip to 18.1% in 2022. Nevertheless, it should be noted that this was the second highest share among the ENP-East countries, and much closer to the levels seen in Moldova and the EU than to those in the other ENP-East countries.

Ukraine registered a steady increase in the share of renewable energy, from 3.5% in 2013 to 9.2% in 2020 (more recent data not available). Annual increases were moderate, ranging between +0.3 pp (2018) and +1.1 pp (2019, 2020).

Armenia's data are only available from 2015 to 2022, with the share of renewables decreasing through most of this period. The only exceptions were a +2.4 pp increase in 2016, to a peak at 13.2%, and during the post-pandemic recovery in 2021 (+2.9 pp). In contrast, the lowest share was reached in 2020 during the Covid-19 pandemic, at 8.4% (-2.0 pp). In total over the period 2015-2022, the share of renewables decreased from 10.8% in 2015 to 10.3% in 2022 (more recent data not available).

Azerbaijan's consumption of renewable energy was limited throughout 2013-2023, with the share of renewables in final energy consumption significantly lower than in the other ENP-East countries. In 2013, the share of renewables

stood at 2.5%, decreasing to 1.4% in 2023, with a negative trend but only minor year-on-year changes. This low level might reflect Azerbaijan's large fossil fuel reserves and the importance of the petroleum sector to the country.

The EU showed a progressive increase in the share of renewables in final energy consumption, from 16.7% in 2013 to 24.5% in 2023, reflecting a consistent shift towards more sustainable energy sources. With the exception of a marginal decrease (-0.2 pp) in 2021, the share of renewables rose throughout the period.

These figures provide an overview on how the ENP-East countries are progressing with respect to the green transformation and the integration of renewable energy into their total energy mix. The trends reflect national energy policies, resource availability, and commitment to renewable energy targets.

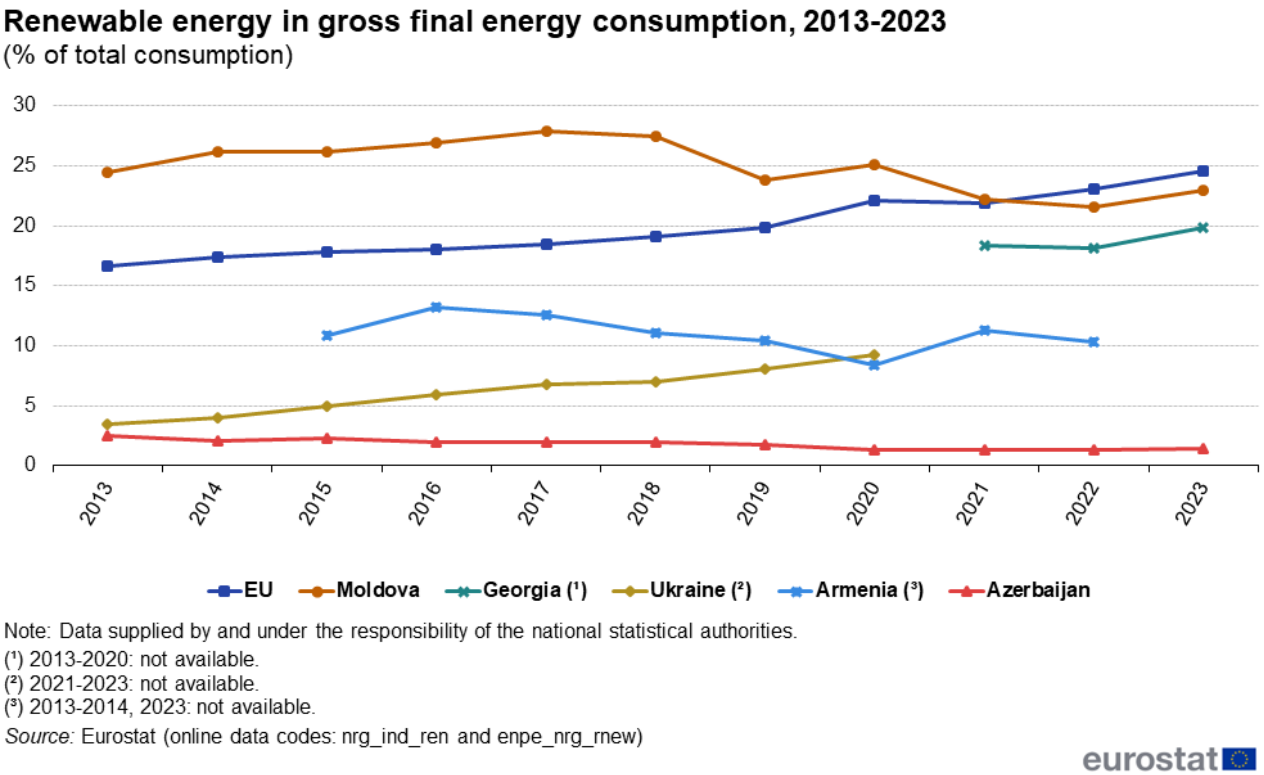


Figure 6: Renewable energy in gross final energy consumption, 2013-2023 Source: Eurostat (nrg_ind_ren) and (enpe_nrg_rnew).

Energy productivity

Figure 7 presents energy productivity, expressed in euros of of gross value added (GVA) per kilogramme of oil equivalent (kgoe), for the EU, Armenia, Azerbaijan and Georgia for the period 2013-2023. Data for Moldova and Ukraine are not available.

Energy productivity is an economic indicator that measures the amount of economic output achieved per unit of energy consumed, with higher values indicating more efficient use of energy in creating economic value.

For Armenia, there was a general upward trend from 2.9 € /kgoe in 2015 to 3.6 € /kgoe in 2019, followed by a consistent figure of 3.1 € /kgoe for 2020 and 2021. In 2022, Armenia's energy productivity rose steeply to 4.6 € /kgoe.

Azerbaijan's energy productivity remained relatively stable, but with a slightly decreasing tendency. No annual change was larger than -0.1 € /kgoe. Overall, there was a slight decrease from 3.0 € /kgoe in 2013 to 2.6 € /kgoe by 2023, indicating only a minor change in the relationship between energy consumption and economic output.

Georgia experienced a decrease in energy productivity from 3.1 € /kgoe in 2013 to 1.8 € /kgoe in 2021, before increasing to 2.3 € /kgoe in 2022 (more recent data not available). The decline could suggest an increase in energy consumption that outpaced economic growth or shifts in the economy towards less energy-efficient sectors.

The EU showed a steady increase in its energy productivity, from 7.3 € /kgoe in 2013 to 9.8 € /kgoe in 2023, suggesting continuous improvements in energy efficiency or a shift towards higher value-added activities that require less energy per unit of output.

The presented data reflects the energy efficiency and economic structures of these economies. It should be kept in mind that changes in productivity levels can
be influenced by many factors, including technological advancements, shifts in the industrial base, and energy policy.

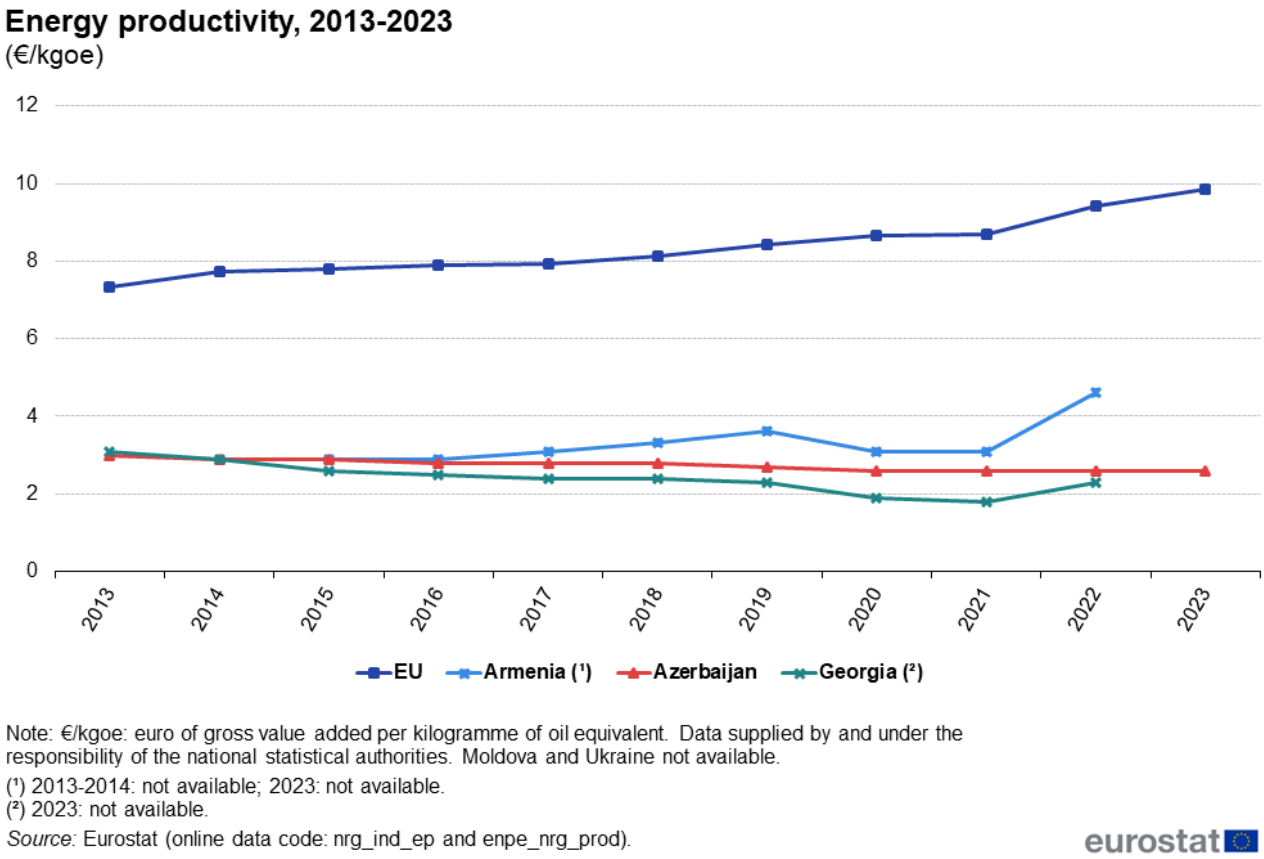


Figure 7: Energy productivity, 2013-2022 Source: Eurostat (nrg_in_ep) and (enpe_nrg_prod).

Source data for tables and graphs

- European Neighbourhood Policy — East countries — Resources and green transformation: tables and figures

Data sources

The data for ENP-East countries are supplied by and under the responsibility of the national statistical authorities of each country on a voluntary basis. The data result from an annual data collection cycle that has been established by Eurostat . These statistics are available free of charge on Eurostat's website, together with a range of additional indicators for ENP-East countries covering most socio-economic topics.

Energy

For EU statistics, the main legislation covering the collection of statistics in relation to energy quantities is

Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics. Since its adoption, it has been amended several times and a consolidated version is available. A summary of the relevant legislation is also available on Eurostat's website, under ' Legislation ' on the dedicated section for Energy statistics .

Environment

Eurostat, in close partnership with the European Environment Agency (EEA) , provides environmental statistics, accounts and indicators supporting the development, implementation, monitoring and evaluation of the EU's environmental policies, strategies and initiatives. Data on greenhouse gas emissions as reported under the United Nations framework convention on climate change (UNFCCC) are collected by the EEA. Eurostat collects official statistics in relation to a broad selection of subject areas, for example, waste, water, material flows and environmental protection expenditure.

The Kyoto Protocol , an environmental agreement adopted by many of the parties to the UNFCCC in 1997 to curb global warming, covers six greenhouse gases: carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O), which are non-fluorinated gases, and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6), which are fluorinated gases. Converting them to carbon dioxide equivalents makes it possible to compare them and to determine their individual and total contributions to global warming. A new agreement on greenhouse gas emissions was reached in Paris in late 2015; this provides the basis for emissions mitigation and adaptation from 2020 onwards.

Eurostat's data on waste is collected from EU Member States on the basis of Regulation (2150/2002/EC) on waste statistics and is published every two years in line with common methodological recommendations. Landfill is the deposit of waste into or onto land; it includes specially engineered landfill sites and temporary storage of over one year on permanent sites. The definition covers both landfill in internal sites, in other words, where a generator of waste is carrying out its own waste disposal at the place of generation and in external sites.

The collection of water statistics within the EU is based on information demands linked to the Directive 2000/60/EC Water Framework Directive (WFD) . Eurostat and the OECD jointly administer a questionnaire on inland waters among EU Member States, candidate countries and potential candidates. Data collection is voluntary although there is an initiative to establish a legal framework for the collection of water statistics.

A large amount of data and other information on water is accessible via WISE , the water information system for Europe, which is hosted by the European Environment Agency (EEA) in Copenhagen.

Context

The EU's long-term strategy for reducing greenhouse gas emissions was laid out in November 2018, with the aim of making Europe the world's first climate-neutral continent by 2050. In December 2019, the European Commission presented the European Green Deal , set out in Communication COM(2019) 640 final . The European Green Deal is a growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient, and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. The Green Deal is an integral part of the Commission's strategy to implement the United Nation's 2030 Agenda and the Sustainable Development Goals .

In June 2021, the European Climate Law , Regulation (EU) 2021/1119 , was adopted. It makes the goal to become climate-neutral by 2050 a legal obligation for the EU and its Member States. It sets the framework for actions to reduce greenhouse gas emissions by at least 55% levels by 2030 and reach climate neutrality in the EU by 2050. The Climate Law is complemented by the European Climate Pact and the 2030 Climate Target Plan .

In order to deliver the European Green Deal , the European Commission proposed the ' Fit for 55 ' package in June 2021. The 'Fit for 55' package is the EU's key plan to turn the climate goals into EU law and comprises a set of proposals for revision of existing legislation and new initiatives in a wide range of areas . By October 2023, the final legislation of the 'Fit for 55' package had been adopted .

On 2 July 2021, the European Commission and the EU High Representative for Foreign Affairs and Security Policy presented the Eastern Partnership: a Renewed Agenda for cooperation with the EU's Eastern partners. This agenda is based on the five long-term objectives, with resilience at its core, as defined for the future of the Eastern

Partnership (EaP) in the Joint Communication Eastern Partnership policy beyond 2020: Reinforcing Resilience – an Eastern Partnership that delivers for all in March 2020. It is further elaborated in the Joint Staff Working Document Recovery, resilience and reform: post 2020 Eastern Partnership priorities , amongst others defining the 'Top Ten Targets for 2025'. The Eastern Partnership's agenda for recovery, resilience and reform is underpinned by an 'Economic and Investment Plan for the Eastern Partnership (EaP): Investing in resilient and competitive economies and societies' (Annex I of the Joint Staff Working Document). More detailed overviews are given in a Factsheet on the Eastern Partnership Joint Communication , presenting the policy objectives and the specific priorities, as well as in a Factsheet on EU-Eastern Neighbourhood flagship projects 2023-2024 .

The Joint Declaration of the Eastern Partnership Summit 'Recovery, Resilience and Reform' of 15 December 2021 reaffirmed the strong commitment to a strategic, ambitious and forward-looking Eastern Partnership.

At the Eastern Partnership Foreign Affairs Ministerial meeting of 11 December 2023 , the EU, member states and partners declared that they will step up their efforts to implement the Eastern Partnership's agenda for recovery, resilience and reform, as well as tackling challenges related to the ongoing consequences of the Russian war of aggression against Ukraine for the entire region.

On 14-15 December 2023, the European Council decided to open accession negotiations with Moldova and Ukraine, and granted the status of candidate country to Georgia .

In cooperation with its ENP partners, Eurostat has the responsibility to promote and implement the use of European and internationally recognised standards and methodology for the production of statistics, necessary for designing and monitoring policies in various areas. Eurostat manages and coordinates EU efforts to increase the capacity of the ENP countries to develop, produce and disseminate good quality data according to European and international standards. Additional information on the policy context of the ENP is provided on the website of Directorate-General Enlargement and Eastern Neighbourhood (ENEST) .

Explore further

Other articles

- All articles on non-EU countries
- European Neighbourhood Policy countries — statistical overview — online publication
- Statistical cooperation — online publication
- All articles on energy statistics
- All articles on climate change
- All articles on waste statistics
- Water_statistics

Database

- Eastern European Neighbourhood Policy Country (ENP-East) (enpe) , see:

Environment and energy (enpe_envnrg)

Environment (enpe_env)

Energy (enpe_nrg)

- Environment (env) , see:

Emissions of greenhouse gases and air pollutants (env_air)

Air emission inventories (env_air_inv)

Waste (env_was)

Waste streams (env_wasst)

Water (env_wat)

Water statistics at national level (env_nwat)

- Energy (enr) , see:

Energy statistics – quantities (nrg_quant)

Energy statistics – quantities, annual data (nrg_quanta)

Energy balances (nrg_bal)
Energy indicators (nrg_ind)
Share of energy from renewable sources (nrg_ind_share)

Thematic section

- European Neighbourhood Policy (ENP)
- Energy
- Climate change
- Environment
- Waste

Publications

Factsheets

- Basic figures on the European Neighbourhood Policy-East countries — 2023 edition
- Basic figures on the European Neighbourhood Policy-East countries — 2022 edition
- Statistics for a green future — factsheets on European Neighbourhood policy-East Countries — 2022 edition
- Basic figures on the European Neighbourhood Policy-East countries — 2021 edition

Leaflets

- Basic figures on the European Neighbourhood Policy — East countries — 2020 edition

Methodology

- Eastern European Neighbourhood Policy countries (ENP-East) (ESMS metadata file — enpe_esms)
- Greenhouse gas emissions by source sector (source: EEA) (ESMS metadata file — env_air_gge)
- Energy statistics — supply, transformation and consumption (ESMS metadata file — nrg_quant)
- Municipal waste by waste management operations (ESMS metadata file — env_wasmun)
- Water statistics on national level (env_nwat) (ESMS metadata file — env_nwat)

External links

- European External Action Service (EEAS): European Neighbourhood Policy (ENP) and Eastern Partnership (EaP)
- Directorate-General for Enlargement and Eastern Neighbourhood (DG ENEST)): European Neighbourhood Policy (ENP) and Eastern Partnership (EaP) .
- Joint Communication JOIN(2020) 7 final: Eastern Partnership policy beyond 2020: Reinforcing Resilience - an Eastern Partnership that delivers for all (18 March 2020)
- Joint Staff Working Document SWD(2021) 186 final: Recovery, resilience and reform: post 2020 Eastern Partnership priorities (2 July 2021)
- Joint Declaration of the Eastern Partnership Summit: 'Recovery, Resilience and Reform' (15 December 2021)
- European Commission: Energy, Climate change, Environment
- European Commission: The European Green Deal
- Directorate-General for Climate Action (DG CLIMA)
- Directorate-General for Environment (DG ENV)
- Directorate-General for Energy (DG ENER)
- European Environment Agency (EEA)
- International Energy Agency (IEA) —World Energy Outlook 2023