European Commission

JRC WORKING PAPER

The Annual Regional Database of the European Commission (ARDECO)

Methodological Note

JRC Working Papers on
Territorial Modelling and Analysis
No 02/2024

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2024

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JRC138212

Ispra: European Commission, 2024

How to cite this report: European Commission, Joint Research Centre, Auteri, D., Attardo, C., Berzi, M., Dorati, C., Albinola, F., Baggio, L., Bucciarelli, G., Bussolari, I. and Dijkstra, L., *The Annual Regional Database of the European Commission (ARDECO) - Methodological Note*, European Commission, Ispra, 2024, JRC138212.

The **JRC Working Papers on Territorial Modelling and Analysis** are published under the supervision of Simone Salotti, Andrea Conte, and Anabela M. Santos of JRC Seville, European Commission. This series mainly addresses the economic analysis related to the regional and territorial policies carried out in the European Union. The Working Papers of the series are mainly targeted to policy analysts and to the academic community and are to be considered as early-stage scientific papers containing relevant policy implications. They are meant to communicate to a broad audience preliminary research findings and to generate a debate and attract feedback for further improvements.

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1 Introduction

Quantitative indicators at the regional level play an increasingly important role in formulating and evaluating regional policies. While regional statistical indicators are available from various sources, their comparability over time is often affected by boundary changes (such as region splits or mergers) that alter the shape of the relevant areas.

The Annual Regional Database of the European Commission (ARDECO) is maintained by the Joint Research Centre in close coordination with the Directorate General for Regional and Urban Policy. Its purpose is to provide consistent and harmonised time-series data on demographic and socio-economic variables at the regional and sub-regional levels.

ARDECO primarily relies on official data from sources like Eurostat's 'Regional Accounts'[1] and national or regional statistical offices. However, it also incorporates data from supplementary sources (such as the European Regional Database from Cambridge Econometrics[2]) and estimates generated using various methodologies (such as data interpolation, regional shares of closest year, and proxy variables).

In cases where official data exhibits inconsistencies across the time-series due to breaks or provisional values, ARDECO replaces these values with estimates based on the most suitable methodology. Ensuring consistency across variables and over time, therefore, sometimes requires adjustments of official values.

For most variables and countries, ARDECO extends its time-series back to 1980 (1960 for population data). Additionally, short-term projections based on AMECO[3] forecasts are included whenever possible.

The *ARDECO Viewer* offers web-based access to a spreadsheet detailing the source and nature (official vs. estimated) of each value, its calculation method, and its evolution over time. This traceability ensures full transparency on the origin of each data point.

ARDECO releases are updated quarterly: after the annual 'Regional Accounts' update in March, following the AMECO Spring (May) and Autumn (November) economic forecasts, and during the summer. Minor versions may also be released as needed.

Users can download ARDECO time-series data through various methods, including a dedicated package[4] that seamlessly integrates with the R statistical computing software.

[1] https://ec.europa.eu/eurostat/web/national-accounts/methodology/european-accounts/regional-accounts
[2] http://www.camecon.com/wp-content/uploads/2019/01/ERD-manual.pdf
[3] https://economy-finance.ec.europa.eu/economic-research-and-databases/economic-databases/ameco-database_en
[4] https://cran.r-project.org/web/packages/ARDECO/index.html

2 General considerations

2.1 Primary sources

ARDECO comprises a collection of regional socio-economic and demographic variables and indicators for EU Member States and, when data is available, for other European countries[5]. ARDECO adheres to the same principles as its primary data sources, ensuring consistency through common methodologies. These methodologies harmonise concepts, definitions, classifications, and accounting rules, facilitating cross-country and cross-regional comparisons.

ARDECO follows the European System of National and Regional Accounts (ESA 2010)[6], an internationally compatible accounting framework that provides a systematic and detailed description of an economy. Alternatively, for earlier years, ESA 95 or ESA 79 may be applied.

Eurostat offers a comprehensive manual[7] that outlines the general methodology for measuring regional accounts and provides practical guidelines for implementing this methodology within the ESA 2010 framework. Regional accounts break down key economic output measures such as Gross Domestic Product (GDP) and Gross Value Added (GVA) at the regional level. However, due to conceptual and measurement limitations, regional accounts do not cover the same range of accounts and transactions as national accounts. For example, collecting data on imports and exports across regions is nearly impossible for enterprises and statistical offices. While regional accounts align with national account concepts, additional compilation rules address specific regional-level issues.

ARDECO also draws from demographic and household-based datasets, such as the Labour Force Survey (EU-LFS), to source some variables.

In most cases, Eurostat's regional time-series begin in the year 2000, with a few exceptions (Czechia, Estonia, Italy, Luxembourg, Portugal) occasionally starting in 1995. To extend time-series data further into the past, ARDECO relies on complementary sources and estimates. The 'European Regional Database' from Cambridge Econometrics (CE-ERD), although discontinued in 2016, served as one such complementary source. Additionally, official sources like National or Regional Statistical Offices contribute to ARDECO's data. Short-term projections (typically spanning 2 to 3 years) are estimated by downscaling country forecasts from AMECO.

Major ARDECO updates coincide with the public availability of new AMECO forecasts (in May and November) and the annual regional accounts update from Eurostat (in March).

Table 1: Comparison of various sources with ARDECO

	ARDECO	CE-ERD	EUROSTAT	AMECO
Spatial detail	Regional	Regional	Regional	National
Geographical Coverage	EU, AL, CH, IS, LI, ME, MK, NO, RS, TR (depending on availability from Eurostat) + UK	EU, NO, UK	EU, AL, CH, IS, LI, ME, MK, NO, RS, TR (depending on variable / indicator)	EU, AL, CH, IS, LI, ME, MK, NO, RS, TR, UK, AUS, CAN, KOR, MEX, NZL, JPN, USA
Initial year	1980 (1960 for population)	1980	2000 or 1995 (1990 for population)	1960
Extra-Regio	Yes	No	Yes	N/A
Data gaps	No	NL21, NL22, NL23 (1980-1985)	Possible (due to change of NUTS version)	No
Currency	EUR (current), PPS, EUR (ref. 2015)	EUR (ref. 2010)	EUR (current), PPS, Index (ref. 2015)	EUR (current), PPS, EUR and National Currency (ref. 2015)

[5] Additional countries are Norway, Switzerland, Iceland, Liechtenstein, Albania, Montenegro, North Macedonia, Serbia, Türkiye, United Kingdom

[6] https://ec.europa.eu/eurostat/web/esa-2010

[7] https://ec.europa.eu/eurostat/documents/3859598/5937641/KS-GQ-13-001-EN.PDF

2.2 Sectoral breakdown

NACE[8] is the acronym used to designate the various statistical classifications of economic activities developed since 1970 in the European Union. The term NACE is derived from the French 'Nomenclature statistique des activités économiques dans la Communauté européenne'. NACE provides the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics (e.g. business statistics, labour market, national accounts) and in other statistical domains. Statistics based on NACE are comparable at European and, in general, at world level.

NACE consists of a hierarchical structure (as established in Regulation (EC) No 1893/2006), introductory guidelines and explanatory notes.

The structure of NACE is described in the NACE Regulation as follows:

- a first level consisting of headings identified by an alphabetical code (sections),
- a second level consisting of headings identified by a two-digit numerical code (divisions),
- a third level consisting of headings identified by a three-digit numerical code (groups),
- a fourth level consisting of headings identified by a four-digit numerical code (classes).

Table 2: Broad Structure of NACE Rev.2

Section	Title	Divisions
A	Agriculture, forestry and fishing	01 – 03
B	Mining and quarrying	05 – 09
C	Manufacturing	10 – 33
D	Electricity, gas, steam and air conditioning supply	35
E	Water supply; sewerage, waste management and remediation activities	36 – 39
F	Construction	41 – 43
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 – 47
H	Transportation and storage	49 – 53
I	Accommodation and food service activities	55 – 56
J	Information and communication	58 – 63
K	Financial and insurance activities	64 – 66
L	Real estate activities	68
M	Professional, scientific and technical activities	69 – 75
N	Administrative and support service activities	77 – 82
O	Public administration and defence; compulsory social security	84
P	Education	85
Q	Human health and social work activities	86 – 88
R	Arts, entertainment and recreation	90 – 93
S	Other service activities	94 – 96
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	97 – 98
U	Activities of extraterritorial organisations and bodies	99

[8] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Statistical_classification_of_economic_activities_in_the_European_Community_(NACE)

The following NACE sectoral aggregations are particularly relevant:

Table 3: Sectoral aggregation in AMECO, CE-ERD and Eurostat tables

4-sector (AMECO)	6-sector (CE-ERD)	10-sector (Eurostat)*
Agriculture, forestry and fishing (A)	Agriculture, forestry and fishing (A)	Agriculture, forestry and fishing (A)
Industry except construction (B-E)	Industry except construction (B-E)	Industry except construction (B-E)
Construction (F)	Construction (F)	Construction (F)
Services (G-U)	Wholesale, retail, transport, accommodation & food services, information and communication (G-J)	Wholesale and retail trade, transport, accommodation and food service activities (G-I)
	Financial & business services (K-N)	Information and communication (J)
	Non-market Services (O-U)	Financial and insurance activities (K)
		Real estate activities (L)
		Professional, scientific and technical activities; administrative and support service activities (M-N)
		Public administration, defence, education, human health and social work activities (O-Q)
		Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies (R-U)

(*) 'Manufacturing' is included in sector B-E and is also available as a separate sector (C)

Regional accounts are available as 'total economy' and 'by NACE sector' (also referred to as 'by industry').

ARDECO was initially released with a 6-sector disaggregation (following the CE-ERD disaggregation scheme). In 2024, 10-sector disaggregation has been introduced and implemented in all variables.

From 2025 onwards, European statistics will start being produced based on NACE Rev. 2.1[9].

[9] https://ec.europa.eu/eurostat/web/products-eurostat-news/w/WDN-20230210-1

2.3 Definition of the economic territory

The economic territory of a country is unambiguously defined in ESA 2010[10]. A regional economy of a country is part of the total economy of that country. The total economy is defined in terms of institutional units and sectors. It consists of all the institutional units which have a centre of predominant economic interest within the economic territory of a country. The economic territory of a country does not coincide exactly with its geographic territory. It is divided into 'regional territory' and the 'extra-regio territory'. The former consists of that part of the economic territory of a country that is directly assigned to a region, including any free zones and bonded warehouses. The latter is made up of parts of the economic territory of a country which cannot be assigned to a single region.

In particular, the extra-regio territory consists of:

a. The national air-space, territorial waters and the continental shelf lying in international waters over which the country enjoys exclusive rights;

b. Territorial exclaves (i.e. geographic territories situated in the rest of the world and used, under international treaties or agreements between states, by general government agencies of the country, e.g. embassies, consulates, military bases, scientific bases, etc);

c. Deposits of oil, natural gas etc. in international waters, outside the continental shelf of the country, worked by resident units.

2.4 The Nomenclature of Territorial Units for Statistics (NUTS)

The Nomenclature of Territorial Units for Statistics[11] (NUTS) provides a single uniform breakdown of the economic territory of the European Union. In practice, the NUTS classification is composed of territorial units organised in four hierarchical and nested levels, i.e. where the upper level corresponds to aggregates of the lower level – from NUTS0 (corresponding to national level) to NUTS3 (corresponding to sub-regional level) – used for the following purposes:

- Collection, development and harmonisation of EU regional statistics
- Socio-economic analysis of the regions
- Framing of EU regional policies

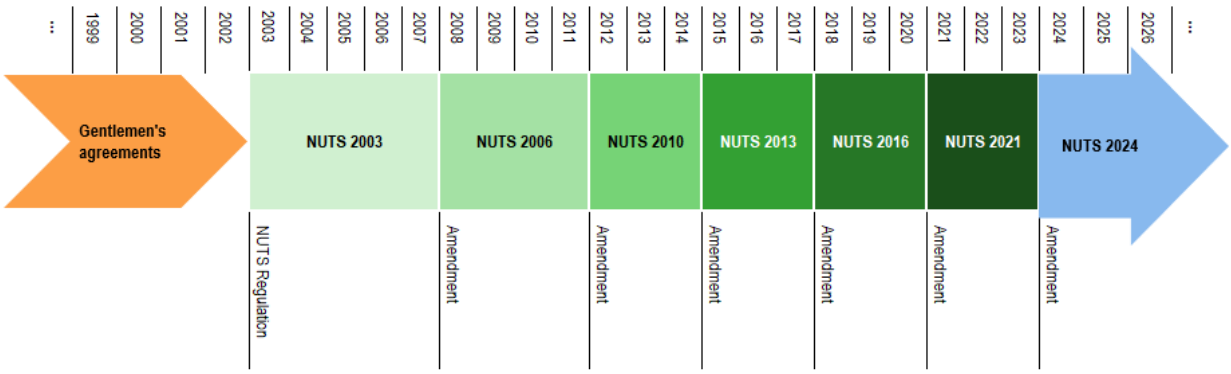


Figure 1: History of NUTS versions (source: Eurostat)

ARDECO is maintained in the two most recent versions of the NUTS classification, with the most recent one being the master reference. Variables at the NUTS3 level are also available by Metropolitan Regions[12] and by Urban/Rural typology[13].

[10] Chapter 13, Regional territory
[11] https://ec.europa.eu/eurostat/web/nuts/history
[12] Background - Metropolitan regions - Eurostat (europa.eu)
[13] Methodology - Rural development - Eurostat (europa.eu)

2.5 Understanding current prices, constant prices and PPS

Economic variables in ARDECO are normally provided in current prices (EUR), in Purchasing Power Standards (PPS)[14] and in constant prices (equivalent EUR of a specified year, e.g. 2015).

Data reported in **current prices** for each year are measured in the **prices for that particular year**. For example, current price values for 2010 are based on 2010 prices, for 2020 are based on 2020 prices, and so on. It is to be noted that current prices do not take into account the differences in reference price levels across countries, nor the effects of inflation over time.

Constant price series show the data for each year in the **prices of a chosen reference year**. For example, data reported in constant 2015 prices show data for all years in 2015 prices. Constant price series are used to measure the true volume growth, i.e. adjusted for the effects of price inflation. Current price series are influenced by the effects of inflation, hence they are also referred to as '**nominal**' prices, whereas constant prices are also called '**real**' prices.

Constant prices are most suitable for comparisons over time within a specific country or region.

It is worth mentioning that, until 1st quarter 2024, sectoral variables in ARDECO were disaggregated by 6 sectors, and related constant price tables were based on 4-sector price deflators from AMECO (agriculture, industry, construction, services). From the ARDECO Spring Forecast 2024 edition (released on 15 May 2004), all sectoral variables are disaggregated by 10 sectors, and constant prices are primarily based on 10-sector price deflators from Eurostat (national accounts tables at country level). The original approach is still in place to prolong the time-series in the past – in this case, the generic 'services' price deflator from AMECO is converted into equal growth rates applied to each sectoral price deflator from the national accounts.

For GDP and for total GVA, growth rates at the NUTS2 level (expressed as chain linked indices) are used when they are available from Eurostat. A fundamental feature of chain-linking is the **loss of additivity in levels**[15] for all years except the reference year and the year directly following. This means that, apart from those two years, **neither geographical nor accounting coherence can be expected in the chain-linked volume series**.

The **purchasing power standard**, abbreviated as PPS, is an artificial currency unit. Theoretically, one PPS **can buy the same amount of goods and services in each country**. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country.

PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities. Purchasing power parities (PPP) are indices that convert different currencies to a common currency and, in the process of conversion, equalise their purchasing power by eliminating the differences in price levels between countries. PPPs can be interpreted as the exchange rate of the PPS against the euro. When indicators are valued at the same price level, they reflect only differences in the volumes.

PPS are most suitable for geographical comparisons across different countries. At ordinary current prices and at constant prices, cross-country comparability is hindered by differences in price levels (i.e., different purchasing powers), notably in non-tradable sectors[16]. The PPS correction enables users to compare data across different countries. Anyway, since PPS correction does not imply inflation correction, **PPS is not suitable for comparisons over time**, as values are affected by different inflation trends. It is also important to be aware that, due to the difficulty to collect regional trade data, **regional PPS are not available** and national PPS are therefore used to convert values of all the regions belonging to the same country. By doing so, despite the lack of regional PPS, the Balassa-Samuelson effect is at least partially corrected across national borders.

[14] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Purchasing_power_standard_(PPS)

[15] Additivity is only preserved in growth rates. In the Laspeyres chained index adopted in the EU the aggregate growth rate is the (weighted) sum of the subnational growth rates.

[16] This is the Balassa-Samuelson effect. See Michael R. Pakko & Patricia S. Pollard, 2003. 'Burgernomics: a big Mac™ guide to purchasing power parity,' Review, Federal Reserve Bank of St. Louis, vol. 85(Nov), pages 9-28

2.6 What's in ARDECO?

ARDECO is maintained using the two most recent regional classifications: NUTS 2021 and NUTS 2016 (as of May 2024). When Eurostat begins releasing data in a new NUTS version (such as NUTS 2024), the second older version becomes frozen and is no longer updated. However, older releases—also in NUTS versions that are no longer actively maintained—remain accessible for browsing and download through *ARDECO Explorer*.

To ensure consistency across the entire time-series for the two most recent NUTS versions, ARDECO employs backcasting processes and customised estimation methods. These techniques help bridge any gaps caused by changes in regional classifications.

Official data availability varies by geographical level. Depending on the availability of sources for each individual variable, data may be provided at the NUTS3 or NUTS2 level. In cases where NUTS3-level values are not directly available, estimates are derived by downscaling NUTS2 figures using identified proxies.

ARDECO also includes data related to 'Metropolitan regions' and by 'Urban/Rural Typology', which are based on aggregations of NUTS3 regions. Typically, this data is available for download as well.

For analytical purposes, ARDECO disaggregates data by NACE sectors, allowing the study of specific groups of economic activities. In earlier ARDECO versions, a 6-sector NACE disaggregation was implemented (inherited from CE-ERD). However, the database is progressively increasing sectoral disaggregation from 6 to 10 sectors.

Within ARDECO, both variables and indicators are provided. Variables represent core data expressed as 'volumes' and are computed from primary sources. Indicators, on the other hand, are expressed as 'ratios' and result from dividing one variable (e.g., GDP) by another (e.g., average population).

As of July 2024, the following variables and indicators are available:

Population

Code	Name	Last update	
SNPTN	Population on 1st January by sex Unit: Persons	30/07/2024	
SNPTD	Average annual population Unit: Persons	30/07/2024	
SNPCN	Total population change Unit: Crude rate (per 1000), Persons	30/07/2024	
SNMTN	Net migration Unit: Persons	30/07/2024	

Vital Statistics

Code	Name	Last update	
SNPBN	Live births Unit: Persons	30/07/2024	
SNPDN	Deaths Unit: Persons	30/07/2024	
SNPNN	Natural change of population Unit: Persons	30/07/2024	

Domestic Product

Code	Name	Last update	
SUVGD	GDP at current market prices Unit: Million EUR, Million PPS	08/07/2024	
SUVGDP	GDP per capita at current prices Unit: EUR, PPS	06/07/2024	
SUVGE	GVA at basic prices Unit: Million EUR, Million PPS	08/07/2024	
SUVGZ	GVA at basic prices by industry (10 NACE sectors) Unit: Million EUR, Million PPS	08/07/2024	
SOVGD	GDP at constant prices Unit: Million EUR2015	08/07/2024	
SOVGDP	GDP per capita at constant prices Unit: EUR2015	08/07/2024	
SOVGE	GVA at constant prices Unit: Million EUR2015	08/07/2024	
SOVGZ	GVA at constant prices by industry (10 NACE sectors) Unit: Million EUR2015	08/07/2024	
SPVGD	GDP price index (implicit deflator, 2015=100, euro) Unit: Index, Percent	08/07/2024	
SPVGE	GVA price index (implicit deflator, 2015=100, euro) Unit: Index, Percent	06/07/2024	
PVGZ	GVA price indices by industry (implicit deflators, national, 2015=100, euro) Unit: Index	08/07/2024	

Households

Code	Name	Last update	
RUVNH	Households net disposable income Unit: Million EUR, Million PPS	06/07/2024	
RUYNH	Net property income Unit: Million EUR	06/07/2024	
RUONH	Net operating Surplus and Mixed Income Unit: Million EUR	06/07/2024	
RUTYH	Current taxes on income and wealth Unit: Million EUR	06/07/2024	

Employment

Code	Name	Last update	
SNETD	Total Employment (workplace based, employed persons) Unit: Thousands Persons	08/07/2024	
SNWTD	Wage and salary earners (workplace based, employees) Unit: Thousands Persons	06/07/2024	
SNETZ	Employment by industry (10 NACE sectors) Unit: Thousands Persons	08/07/2024	
RNECN	Employment from LFS (age class = 15 years and over) Unit: Thousands Persons	06/07/2024	
RNUTN	Unemployment (LFS) Unit: Thousands Persons	06/07/2024	
RNLHT	Hours Worked (employed persons) Unit: Thousands Hours	08/07/2024	
RNLHTP	Hours worked per capita Unit: Hours	06/07/2024	
RNLHTE	Hours worked per employed person Unit: Hours	06/07/2024	
RNLHW	Hours Worked (employees) Unit: Thousands Hours	06/07/2024	
RNLHZ	Hours Worked by industry (10 NACE sectors) Unit: Thousands Hours	08/07/2024	
RNLCN	Civilian Labour Force Unit: Thousands Persons	06/07/2024	
RNLTN	Total Labour Force Unit: Thousands Persons	06/07/2024	
SNETDP	Employment per capita Unit: Persons	06/07/2024	

Labour Productivity

Code	Name	Last update	
SUVGDH	Nominal labour productivity per hour worked Unit: EUR, PPS	06/07/2024	
SUVGDE	Nominal labour productivity per person employed Unit: EUR, PPS	06/07/2024	
SOVGDH	Real labour productivity per hour worked Unit: EUR2015	08/07/2024	
SOVGDE	Real labour productivity per person employed Unit: EUR2015	08/07/2024	

Labour costs

Code	Name	Last update	
RUWCD	Compensation of employees at current prices Unit: Million EUR, Million PPS	06/07/2024	
RUWCDH	Nominal compensation per hour worked Unit: EUR	06/07/2024	
RUWCDW	Nominal compensation per employee Unit: EUR, PPS	06/07/2024	
RUWCZ	Compensation of employees at current prices by industry (10 NACE sectors) Unit: Million EUR, Million PPS	06/07/2024	
ROWCD	Compensation of Employees at constant prices Unit: Million EUR2015	06/07/2024	
ROWCDH	Real compensation per hour worked Unit: EUR2015	06/07/2024	
ROWCDW	Real compensation per employee Unit: EUR2015	06/07/2024	
ROWCZ	Compensation of employees at constant prices by industry (10 NACE sectors) Unit: Million EUR2015	06/07/2024	
RUWCDHH	Nominal unit labour cost based on hours worked Unit: EUR	06/07/2024	
RUWCDWE	Nominal unit labour cost based on persons Unit: EUR	06/07/2024	

Capital Stock

Code	Name	Last update	
ROKND	Capital Stock at constant prices Unit: Million EUR2015	08/07/2024	

Capital Formation

Code	Name	Last update	
RUIGT	Gross Fixed Capital Formation at current prices Unit: Million EUR, Million PPS	08/07/2024	
RUIGZ	Gross Fixed Capital Formation by industry (10 NACE sectors) at current prices Unit: Million EUR, Million PPS	08/07/2024	
SUKCT	Consumption of fixed capital at current prices Unit: Million EUR	08/07/2024	
SUKCZ	Consumption of fixed capital by industry (10 NACE sectors) at current prices Unit: Million EUR	08/07/2024	
ROIGT	Gross Fixed Capital Formation at constant prices Unit: Million EUR2015	08/07/2024	
ROIGZ	Gross Fixed Capital Formation by industry (10 NACE sectors) at constant prices Unit: Million EUR2015	08/07/2024	
SOKCT	Consumption of fixed capital at constant prices Unit: Million EUR2015	08/07/2024	
SOKCZ	Consumption of fixed capital by industry (10 NACE sectors) at constant prices Unit: Million EUR2015	08/07/2024	
PIGT	GFCF price index (implicit deflator, national, 2015=100, euro) Unit: Percent	08/07/2024	
PIGZ	GFCF price indices by industry (implicit deflators, national, 2015=100, euro) Unit: Index	08/07/2024	

GHG Emissions

Code	Name	Last update	
EDGAR	Emissions Database for Global Atmospheric Research Unit: Kton CO2eq	12/07/2024	

2.7 Methodology

ARDECO time-series can be divided into three main blocks:

- **base time-series** (in most cases from 2000), based on data from Eurostat;
- **past time-series** (in most cases, before 2000) based on Cambridge Econometrics '*European Regional Database*';
- **short-term forecasts** (latest 2 to 3 years of the time-series) based on AMECO estimates at the country level.

As a rule, ARDECO variables are constructed following the steps described hereafter:

- The relevant source table from Eurostat is used as a starting point. If the unit is a currency, the main reference is **euro in current prices**. In most cases, Eurostat provides data from the year 2000 onwards;
- Gaps are filled with data from either official sources (e.g. National or Regional Statistical Offices) or estimates based on various techniques (data interpolation, downscaling based on fixed regional shares or proxies, etc.);
- ERD is used as an auxiliary source to prolong the time-series back in the past. ERD is no longer maintained and its last version was released as NUTS 2013, hence it has been converted to most recent NUTS versions (2016 and 2021) by applying back-casting methods. Values for extra-regio territories, which were not computed in ERD, have also been estimated. Additionally, ERD tables having euros as a unit were converted from constant prices (ref. year 2010) to current prices in order to align all sources to the same working unit. Differences between ERD and Eurostat on the first overlapping year of the two time-series (normally, year 2000) were assessed. If a difference between the two sources is found for year 2000, the past time-series from ERD is rescaled by applying the 2000 ratio of the two sources to the 1980-1999 period from ERD, so that the two time-series are perfectly aligned at the junction year;
- As of May 2024, national accounts have been introduced to a) improve references at the country level (especially for the period 1995-1999) and b) for the computation of values in constant prices;
- A short-term regional forecast is provided when a corresponding forecast is available at the national level in AMECO. This is achieved by downscaling the AMECO country forecast according to fixed regional shares of the most recent year for which full regional data are available;
- Consistency of totals is enforced at all levels (the sum of NUTS3 regions has to correspond to the value of their related NUTS2 parent region, and so on). A small tolerance is applied as to avoid replacing official data with artificial auto sums when the difference is due to rounding and is negligible;
- The EU aggregated value is computed wherever values for all 27 Member States are available;
- Regional or national and sectoral deflators are used to convert tables in current prices to constant prices. Conversion rates for PPS are used to convert current prices from Euro to PPS.

Details related to the construction of each individual variable are given in chapter 3.

2.8 Naming convention of ARDECO codes

The naming convention used for ARDECO codes reflects to a large extent the one used in AMECO.
In ARDECO, to refer to the same variable, a prefix is added to the AMECO code. The meaning of this first character is the following:

- '**R**' (i.e. '**regional**') for tables with official data up to the NUTS2 level (NUTS3 data, if present, are estimated by downscaling NUTS2 values according to NUTS3 regional shares from a proxy table)
- '**S**' (i.e. '**sub-regional**') for tables with official data up to the NUTS3 level

Examples:
Total population on 1st January (AMECO) = **NPTN**
Total population on 1st January (ARDECO) = **SNPTN** (official data up to the NUTS3 level)

Total hours worked (AMECO) = **NLHT**
Total hours worked (ARDECO) = **RNLHT** (official data up to the NUTS2 level)

The **second letter** of ARDECO codes normally refers to the unit:

- N = volume
- U = current prices
- O = constant prices

The **third letter** identifies the type of the variable:

- E = employed persons
- I = capital formation
- L = LFS (Labour Force Survey)
- K = capital stock
- P = population
- V = domestic product
- W = employees

The **fourth letter** refers to:

- C = civilian
- G = currency
- H = hours
- T = total

The **fifth letter** refers to:

- D = domestic concept
- N = national concept
- Z = sectoral disaggregation

In ARDECO, sectoral disaggregated variables are combined in one single table whose code has the root of the 'total economy' parent, with its last letter replaced by '**Z**'.
Example: Total Employment = **SNETD** → Employment by industry (10 NACE sectors) = **SNETZ**

Codes of indicators have 6 characters (variable1 / variable2) or 7 characters (indicator1 / indicator2)

Examples:
SUVGDP = GDP per capita at current prices (SUVGD + 'P' for *population*)
RUWCDH = Nominal compensation per hour worked (RUWCD + 'H' for *hours worked*)

3 Close-up on variables and indicators

3.1 Population

3.1.1 Population on 1st January

Code:	**SNPTN**
Unit:	**persons**
Data source(s):	**Eurostat, National Statistical Offices, DG REGIO (Historical Population Data 1961-2011 at LAU level)[17], AMECO**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Population consists of all persons, nationals or foreigners, who are permanently settled in the economic territory of the country on 1st January of each year and therefore it is based on demographic tables. A person staying or intending to stay at least one year is considered to be settled in the territory. By convention, the total population includes neither foreign students nor members of foreign armed forces stationed in a country. Population is a household-based measure, meaning people are allocated to the region in which they *live*, rather than where they *work*.

The construction of 'Population on 1st January' deviates from the general approach used for other variables, as ERD is not used as an auxiliary source, and the starting year is 1960. When collecting data from different sources, the following criteria are considered to ensure the highest consistency:

- Figures are based on the concept of 'usual residence' and not 'legal residence';
- Data refer to 1st January or, when not available, to the closest possible date.

Building steps:

1. This variable is built starting from Eurostat table '*demo_r_pjanaggr3*' (starting year: 1990);
2. Official data from National or Regional Statistical Offices and from the 'historical population data from 1961 to 2011 by municipality' are used to prolong the time-series back to 1961; municipality (LAU) values have been aggregated at NUTS 3 level;
3. Values for 1960 are mostly obtained by downscaling the country value according to regional shares of 1961;
4. Missing values are estimated according to the following methods:
    - Data interpolation between known values;
    - Downscaling based on regional shares of the closest known year ('fixed-share' approach);
    - Copy/paste of values from parent or child region (when they are identical at different levels);
5. Estimates for most recent years are based on short-term forecasts from AMECO (NPTN);
6. A consistency check is implemented for all territorial levels: the value of the parent NUTS region must be equal to the sum of its underlying sub-regions;
7. The total population for EU is calculated by summing up EU country values.

[17] Historical population data from 1961 to 2011 is as an experimental project supported by the Directorate-General for Regional and Urban Policy, Source data is available at https://ec.europa.eu/eurostat/web/nuts/local-administrative-units

3.1.2 Annual average population

Code:	**SNPTD**
Unit:	**persons**
Source(s):	**ARDECO.SNPTN, AMECO**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

The annual average of head counts of the regional total population is the appropriate denominator to enable comparisons ('per capita' indicators).

The methods for the compilation of the annual average population differ between countries because of the varying availability of population data sources. The compilation of the annual average population may be based on any of the following methods:

- 12 monthly averages;
- 4 quarterly averages;
- The average of the population on 1st January of two consecutive years;
- A mid-year estimates.

In ARDECO, the annual average population is derived from the population on 1st January, as the average of two consecutive years, by applying the following formula: $SNPTD^{(t)} = (SNPTN^{(t)} + SNPTN^{(t+1)}) / 2$

The latest year of the time-series is based on country-level estimates from AMECO (NPTD).

As this variable is automatically derived from SNPTN (population on 1st January), values may differ from those provided by Eurostat (table *nama_10r_3popgdp*) because they inherit data improvements and estimates applied to SNPTN.

3.1.3 Total population change

Code:	**SNPCN**
Unit:	**persons, crude rate per 1000 persons**
Data source(s):	**ARDECO.SNPTN**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Total population change is the difference in total population on 1st January of two consecutive years. It is equal to natural change (live births minus deaths) plus net migration.

Formula (unit=persons): $SNPCN^{(t)} = SNPTN^{(t+1)} – SNPTN^{(t)}$

Formula (unit=crude rate x 1000): $SNPCN^{(t)} = SNPCN(persons)^{(t)} / SNPTN^{(t)} * 1000$

3.1.4 Net migration

Code:	**SNMTN**
Unit:	**persons**
Data source(s):	**ARDECO.SNPCN, ARDECO.SNPNN**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Net migration is the difference between the number of immigrants and the number of emigrants. Eurostat produces net migration figures as the difference between total population change and natural change; this concept is referred to as 'net migration plus statistical adjustment'. This variable is affected by all the statistical inaccuracies in the two sources, especially population change. From one country to another 'net migration plus statistical adjustment' may cover, besides the difference between inward and outward migration, other changes observed in the population figures between 1 January in two consecutive years which cannot be attributed to births, deaths, immigration and emigration.

Formula: $SNMTN^{(t)} = SNPCN^{(t)} - SNPNN^{(t)}$

3.2 Vital statistics

3.2.1 Live births

Code:	**SNPBN**
Unit:	**persons**
Data source(s):	**Eurostat, OECD, National Statistical Offices, ESPON**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Live birth is the result of conception, irrespective of the duration of pregnancy, which after the separation from the mother breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached. Each result of such a birth is considered live-born, regardless of gestational age.

Building steps:

1. This dataset is built starting from Eurostat table "*demo_r_births*" (starting year: 1990);
2. Complemenary data from *demo_r_fagec* (NUTS2) and *demo_fagec* (NUTS0) are used when these sources provide more accurate values than *demo_r_births*;
3. Data from National/Regional Statistical Offices and from other authoritative sources (such as OECD) are used to prolong the time-series in the past and to fill gaps in the Eurostat series;
4. Missing values are estimated according to the following methods:
    - Data interpolation between two known values;
    - Downscaling based on regional shares of the closest known year ("fixed-share" approach);
    - Copy/paste of values from parent or child region (when they are identical at different levels).

3.2.2 Deaths

Code:	**SNPDN**
Unit:	**persons**
Data source(s):	**Eurostat, OECD, National Statistical Offices, ESPON**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

A death is the permanent disappearance of all vital functions without possibility of resuscitation at any time after a live birth has taken place.

Building steps:

1. This dataset is built starting from Eurostat table "*demo_r_deaths*" (starting year: 1990);
2. Data from National/Regional Statistical Offices and from other authoritative sources (such as OECD) are used to prolong the time-series in the past and to fill gaps in the Eurostat series;
3. Missing values are estimated according to the following methods:
    - Data interpolation between two known values;
    - Downscaling based on regional shares of the closest known year ("fixed-share" approach);
    - Copy/paste of values from parent or child region (when they are identical at different levels).

3.2.3 Natural change of population

Code:	**SNPNN**
Unit:	**persons**
Data source(s):	**Eurostat (demo_r_gind3), ARDECO.SNPBN, ARDECO.SNPDN**
Geo coverage:	**EU, Albania, Iceland, Liechtenstein, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Natural population change is the difference between the number of live births and the number of deaths during a given time period. It can be either positive or negative.
Natural population increase is a positive natural change, i.e. the number of live births is larger than the number of deaths during the time period considered. Natural population decrease is the opposite, i.e. the number of deaths exceeds the number of births.

Formula: $SNPNN^{(t)} = SNPBN^{(t)} - SNPDN^{(t)}$

3.3 Domestic Product

3.3.1 Gross Domestic Product

Code:	**SUVGD** (current prices) – **SOVGD** (constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**EUROSTAT, CE-ERD, AMECO**
Geo coverage:	**EU, Albania, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

GDP is a measure of total domestic production, i.e. the monetary value of all the goods and services produced within a region or country during a specific period (usually a year). Regional GDP can also be defined as regional GVA plus taxes on products less subsidies on products.

Building steps:

1. This variable is built starting from Eurostat regional account table '*nama_10r_3gdp*', `unit=[MIO_EUR]`;
2. Data from Eurostat national accounts table '*nama_10_gdp*' `na_item=[B1GQ] unit=[CP_MEUR]` are added;
3. Ancillary data from CE-ERD are used to prolong the time-series in the past;
4. Backcasting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates for most recent years are based on country-level short-term forecasts from AMECO (UVGD);
6. Values in PPS are generated by using EUR/PPS conversion rates.

Real GDP (SOVGD) is calculated in the following way:

- Values at the NUTS1 and NUTS2 levels are computed, upon their availability, by using the regional GDP growth rates from Eurostat (table *nama_10r_2gvagr*, `na_item=[B1GQ] and unit=[I15])`.
  In general, these growth rates are available from 1999. The calculation is based on the following formula: $[ARDECO.SUVGD_{(NUTS1/2)}^{2015}] * [NAMA\_10R\_2GVAGR_{(NUTS1/2)}^{t}] / 100$;
- At the NUTS1 and NUTS2 level, values for years before 1999 and for the forecasted years are obtained by applying country-level GDP price deflators from AMECO (table: *PVGD*). The formula is: $[ARDECO.SUVGD_{(NUTS1/2)}^{t}] / [AMECO.PVGD_{(NUTS0)}^{t}]$;
- Values at the NUTS3 level are computed by multiplying the shares of NUTS3 regions in current prices by the value in constant prices of their parent NUTS2 region, as computed above. The formula is: $[ARDECO.SUVGD_{(NUTS3)}^{t}] / [ARDECO.SUVGD_{(NUTS2)}^{t}] * [ARDECO.SOVGD_{(NUTS2)}^{t}]$;
- Values at the NUTS0 (country) level are imported from National Accounts or derived from AMECO.

As explained in chapter 2.5, chain-linked volume series are non-additive, hence differences in the totals of each geographical level are normal and expected (i.e., the sum of NUTS2 levels may differ from country-level totals). This is valid for all variables and indicators expressed in constant prices.

3.3.2 GDP per capita

Code:	**SUVGDP** (at current prices) **– SOVGDP** (at constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**EUROSTAT, CE-ERD, AMECO**
Geo coverage:	**EU, Albania, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Nominal GDP per capita is calculated by dividing '*GDP at current prices*' (SUVGD) by '*annual average population*' (SNTPD).

Formula: $SUVGDP^{(t)} = SUVGD^{(t)} / SNTPD^{(t)}$

Real GDP per capita is calculated by dividing '*GDP at constant prices*' (SOVGD) by '*annual average population*' (SNTPD).

Formula: $SOVGDP^{(t)} = SOVGD^{(t)} / SNTPD^{(t)}$

3.3.3 Gross Value Added

Code:	**SUVGE** (total at current prices) **– SUVGZ** (by industry at current prices) **SOVGE** (total at constant prices) **– SOVGZ** (by industry at constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**EUROSTAT, CE-ERD, AMECO**
Geo coverage:	**EU, Albania, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Regional GVA can be defined from two perspectives: the *production approach*, and the *income approach*.

Using the production approach, regional GVA at basic prices by industry is equal to the difference between output (at basic prices) and intermediate consumption (at purchasers' prices).

Using the income approach, regional GVA at basic prices by industry is equal to the sum of taxes less subsidies on production, wages and salaries, employers' social contributions, consumption of fixed capital and net operating surplus.

Building steps:

1. This variable is built starting from Eurostat table nama_10r_3gva, filtered by `unit=[MIO_EUR] nace_r2=[TOTAL]/[individual sectors]`;
2. Data from Eurostat national accounts table '*nama_10_a10*' filtered by `unit=[CP_MEUR] [na_item=[B1G] nace_r2=[TOTAL]/[individual sectors]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 NACE sectors to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Missing values are estimated according to the following methods:
    - Data interpolation between known values at the start and at the end of the series;
    - Downscaling based on regional shares of the closest known year ('fixed-share' approach);
    - Copy/paste of values from parent or child region (when they are identical at different levels);
6. Estimates for most recent years are based on short-term forecasts from AMECO (UVGE).

Real GVA (total) is calculated in the following way:

- Values at the NUTS1 and NUTS2 level are computed, upon their availability, by using the regional GDP growth rates from Eurostat table *nama_10r_2gvagr*, `na_item=[B1G] unit=[I15]`. In general, these growth rates are available from 1999. The calculation is based on the following formula: [ARDECO.SUVGE(NUTS2)^{2015}] * [NAMA_10R_2GVAGR(NUTS2)^{t}] /100;
- Values at the NUTS1 and NUTS2 level for years before 1999 and for the forecasted years are obtained by applying country-level GDP price deflators from AMECO (table: *PVGD*). The formula is: [ARDECO.SUVGE(NUTS$_x$)^{t}] / [AMECO.PVGD(NUTS0)^{t};
- Values at the NUTS3 level are computed by multiplying the shares of NUTS3 regions in current prices by the value in constant prices of their parent NUTS2 region, as computed above. The formula is: [ARDECO.SUVGE(NUTS3/NUTS2)^{t}] * [ARDECO.SOVGE(NUTS2)^{t}];
- Values at the NUTS0 (country) level are imported from National Accounts or derived from AMECO.

Real GVA (sectoral) is computed by applying sectoral GVA country deflators from Eurostat (table nama_10_a10, `unit=[PD15_EUR]`).

3.3.4 GDP / GVA growth rates

Code:	**SPVGD (GDP growth rates) – SPVGE (GVA growth rates)**
Unit:	**Index 2015=100, year on year change**
Sources:	**SUVGD, SUVGE, SOVGD, SOVGE**
Geo coverage:	**EU, Albania, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

This table is generated by applying the following formulas:

For regional GDP growth rates (NUTS3): $SPVGD^{(t)} = SOVGD^{(t)} / SUVGD^{(t)}$

For regional GVA growth rates (NUTS3): $SPVGE^{(t)} = SOVGE^{(t)} / SUVGE^{(t)}$

3.4 Employment

3.4.1 Civilian labour force

Codes:	**RNLCN**
Unit:	**1000 persons**
Source(s):	**Eurostat, CE-ERD, AMECO**
GEO coverage:	**EU, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye**

The active population includes both employed and unemployed people, but not the economically inactive (e.g.: students, pensioners, disabled, people not working and not looking for work).

Active population is a household-based measure (i.e. based on the *national* concept), meaning that people are allocated to the region in which they *live*, rather than where they *work*. Active population may be defined as:

- 'Civilian labour force', which includes individuals who are not members of the Armed Services, and are not in institutional households such as prisons, mental hospitals, or nursing homes;
- 'Total labour force'.

Building steps:

1. This variable is built starting from Eurostat table '*lfst_r_lfp2act*' (which is based on the Labour Force Survey[18], LFS) filtered by `unit=[THS_PER] sex=[T] age=[Y_GE15]`;
2. Data from CE-ERD are used to prolong the time-series in the past;
3. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
4. Estimates for most recent years are based on short-term forecasts from AMECO (NLLN).

3.4.2 Total labour force

Codes:	**RNLTN**
Unit:	**1000 persons**
Source(s):	**Eurostat (lfst_r_lfp2act), CE-ERD, AMECO (NLTN)**
Geo coverage:	**EU, Iceland, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye**

As data for Total Labour Force is not available from Eurostat at the regional level, this is estimated by converting absolute values of the Civilian labour force (RNLCN) into regional shares that are then multiplied by country values from the AMECO table '*NLTN*' (Total labour force). This approach evenly redistributes Armed Services and institutional households across all regions of the same country, hence it provides an approximation and not a precise measurement.

[18] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_labour_force_survey

3.4.3 Total employment (workplace based, domestic concept)

Code:	**SNETD** (total) **- SNETZ** (by industry, 10 NACE sectors)
Unit:	**1000 employed persons**
Sources:	**EUROSTAT, CE-ERD, AMECO**
Geo coverage:	**EU, North Macedonia, Norway, United Kingdom**

Total Employment covers all persons engaged in some productive activity (within the production boundary of the national accounts). **Employed persons** are either **employees** (working by agreement for another resident unit and receiving remuneration) or **self-employed** (owners of unincorporated enterprises).

Total Employment is a workplace-based measure and therefore attributes people to the region in which they *work* rather than where they *live*. In practice, this variable measures the number of jobs available in a region, rather than the employed persons living in that region.

ESA 2010 distinguishes **two employment concepts**, depending on the geographical scope:

- *Resident persons in employment* (i.e. the so-called **national concept** of employment, hereafter also referred to as *residence-based*)
- *Employment in resident production units* irrespective of the place of residence of the employed person (i.e. **domestic concept,** hereafter also referred to as workplace-based).

The difference between the two concepts corresponds mainly to the net number of cross-border workers. Regional accounts report both domestic and national figures, but more importance is given to the former (e.g. this concept is more appropriate when examining employment and GDP together). Labour Force Survey (LFS), on the other hand, covers resident households.

Due to their sources and integration methods, regional accounts estimates are best suited to measure the overall level of employment in an economy, its breakdown into economic sectors, and productivity, while social or gender aspects of employment are provided in the LFS based employment statistics. As workplace-based employment can be seen as a measure of jobs rather than people, statistics by age class are not available for this variable.

Building steps:

1. These variables are built starting from Eurostat table '*nama_10r_3empers*' filtered by `unit=[THS] nace_r2=[TOTAL]/[individual sectors] wstatus=[EMP]`;
2. Data from Eurostat national accounts table '*nama_10_a10_e*' filtered by `unit=[THS_PER] nace_r2=[TOTAL]/[individual sectors] na_item=[EMP_DC]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates for most recent years are based on short-term forecasts from AMECO (NETD)

3.4.4 Wage and salary earners (workplace based, domestic concept)

Code:	**SNWTD** (total)
Unit:	**1000 employed persons**
Sources:	**EUROSTAT, AMECO**
Geo coverage:	**EU, North Macedonia, Norway**

This variable measures the number of employees in a region. An **employee** is a person who has a contract to carry out work for an employer and receives compensation in the form of wages, salaries, fees, gratuities, piecework pay or remuneration in kind.

Building steps:

1. This variable is built starting from Eurostat table '*nama_10r_3empers*' filtered by `unit=[THS] nace_r2=[TOTAL] wstatus=[SAL]`;
2. Data from Eurostat national accounts table '*nama_10_a10_e*' filtered by `unit=[THS_PER] nace_r2=[TOTAL] na_item=[SAL_DC]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates for most recent years are based on short-term forecasts from AMECO (NWTD)

3.4.5 Hours worked (employed persons)

Code:	**RNLHT** (total) **– RNLHZ** (by industry, 10 NACE sectors)
Unit:	**1000 Hours**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Norway, Serbia, United Kingdom**

Hours worked is the number of hours actually worked, defined as the sum of all periods spent on direct and ancillary activities to produce goods and services.

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2emhrw*' filtered by `unit=[THS] nace_r2=[TOTAL]/[individual sectors] wstatus=[EMP]`;
2. Data from Eurostat national accounts table '*nama_10_a10_e*' filtered by `unit=[THS_HW] nace_r2=[TOTAL] /[individual sectors] na_item=[EMP_DC]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 NACE sectors to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates at the NUTS3 level are computed by using SNETD (total employment) and SNETZ (sectoral employment) as proxies, according to the following formula:

   $RNLHx_{(NUTS3)} = SNETx_{(NUTS3)} / SNETx_{(NUTS2)} * RNLHx_{(NUTS2)}$

6. Estimates for most recent years are based on short-term forecasts from AMECO (NLHT).

3.4.6 Hours worked (employees)

Code:	**RNLHW** (total)
Unit:	**1000 Hours**
Sources:	**Eurostat**
Geo coverage:	**EU**

Hours worked is the number of hours actually worked, defined as the sum of all periods spent on direct and ancillary activities to produce goods and services.

Building steps:

1. This variable is built starting from Eurostat regional account table '*nama_10r_2emhrw*' filtered by `unit=[THS] nace_r2=[TOTAL] wstatus=[SAL]`;
2. Data from Eurostat national accounts table '*nama_10_a10_e*' filtered by `unit=[THS] nace_r2=[TOTAL] na_item=[SAL_DC]` are added;
3. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
4. Estimates at the NUTS3 level are computed by using SNETD (total employment) as a proxy, according to the following formula:

   $RNLHW_{(NUTS3)} = SNETD_{(NUTS3)} / SNETD_{(NUTS2)} * RNLHW_{(NUTS2)}$

3.4.7 Employment from LFS (residence-based, national concept)

Code:	**RNECN**
Unit:	**1000 Persons**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Switzerland, Serbia, Türkiye, United Kingdom**

Employment from LFS measures all residents of a region who are engaged in some productive activity.

Employment from LFS is a residence-based measure and therefore attributes people to the region in which they *live* rather than where they *work*. In practice, this variable measures tthe employed persons living in that region.

Methodology:

ESA 2010 distinguishes **two employment concepts**, depending on the geographical scope:

- *resident persons in employment* (i.e. the so-called **national concept** of employment, hereafter also referred to as *residence-based*)
- *employment in resident production units irrespective of the place of residence of the employed person* (i.e. **domestic concept,** hereafter also referred to as *workplace-based*).

The difference between the two concepts corresponds mainly to the net number of cross-border workers. Regional accounts report both domestic and national figures, but more importance is given to the former (e.g. this concept is more appropriate when examining employment and GDP together). Labour Force Survey (LFS), on the other hand, covers resident households.

Due to their sources and integration methods, regional accounts estimates are best suited to measure the overall level of employment in an economy, its breakdown into economic sectors, and productivity, while social or gender aspects of employment are provided in the LFS based employment statistics. As residence-based employment measures residents of a region with a job, statistics by age class may also be available for this variable.

Building steps:

1. This variable is built starting from Eurostat table lfst_r_lfsd2pwn filtered by `unit=[THS_PER] citizen=[TOTAL] sex=[T] wstatus=[EMP] age=[Y_GE15];`
2. Missing values are estimated according to the following methods:
   - Data interpolation between known values;
   - Downscaling based on regional shares of the closest known year ('fixed-share' approach);
   - Copy/paste of values from parent or child region (when they are identical at different levels);
3. Estimates for most recent years are based on short-term forecasts from AMECO (NELN).

3.4.8 Unemployment from LFS (residence-based, national concept)

Code:	**RNUTN**
Unit:	**1000 Persons**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Switzerland, Serbia, Türkiye, United Kingdom**

An unemployed person is defined as:

- someone aged 15 to 74;
- not employed during the reference week (according to the definition of employment);
- currently available for work, i.e. available for paid employment or self-employment before the end of the 2 weeks following the reference week;
- actively seeking work, i.e. had either carried out activities in the four-week period ending with the reference week to seek paid employment or self-employment, or found a job to start within a period of at most 3 months from the end of the reference week.

Unemployment from LFS is a residence-based measure and therefore attributes people to the region in which they *live.*

Building steps:

1. This variable is built starting from Eurostat table lfst_r_lfsd2pwn filtered by `unit=[THS_PER] citizen=[TOTAL] sex=[T] wstatus=[UNE] age=[Y_GE15];`
2. Missing values are estimated according to the following methods:
   - Data interpolation between known values;
   - Downscaling based on regional shares of the closest known year ('fixed-share' approach);
   - Copy/paste of values from parent or child region (when they are identical at different levels);
3. Estimates for most recent years are based on short-term forecasts from AMECO (NUTN).

3.5 Labour costs

3.5.1 Compensation of employees

Code:	**RUWCD** (total at current prices) – **RUWCZ** (by industry at current prices) **ROWCD** (total at constant prices) – **ROWCZ** (by industry at constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

Compensation of Employees (national accounts code: D.1) is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period. Compensation of employees consists of wages and salaries, and of employers' social contributions. This variable refers to the domestic concept, which includes residents as well as non-residents working for resident producer units.

Compensation of Employees is a component of primary income. The other components of primary income are net property income (national accounts code D.4), net operating surplus and mixed income (national accounts codes: B.2n and B.3n).

Building steps:

1. This variable is built starting from Eurostat regional account table '*nama_10r_2coe*' filtered by `unit=[MIO_EUR] nace_r2=[TOTAL]/[`*`individual sectors`*`]`;
2. Data from Eurostat national accounts table '*nama_10_a10*' filtered by `unit=[MIO_EUR] [na_item=[D1] nace_r2=[TOTAL]/[`*`individual sectors`*`]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 NACE sectors to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates at the NUTS3 level are computed by using SNETD (total employment) and SNETZ (sectoral employment) as proxies, according to the following formula:
    a. $RUWCx_{(NUTS3)} = SNETx_{(NUTS3)} / SNETx_{(NUTS2)} * RUWCx_{(NUTS2)}$
6. Estimates for most recent years are based on short-term forecasts from AMECO (UWCD);
7. Real Compensation of Employees is calculated by applying the GVA country deflator for the total economy (ROWCD) or for each NACE sector (ROWCZ) available from Eurostat national accounts (table '*nama_10_a10*', `unit=[PD15_EUR]`).

3.5.2 Compensation per hour worked

Code:	**RUWCDH** (at current prices) **– ROWCDH** (at constant prices)
Unit:	**EUR, PPS, EUR in 2015 ref. level**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the average income paid for each hour worked. Compensation per hour worked is calculated by dividing '*compensation of employees at current prices*' (RUWCD) or '*compensation of employees at constant prices*' (ROWCD) by the number of '*hours worked (employees)*' (RNLHW).

Formulas
current prices: $RUWCDH^{(t)} = RUWCD^{(t)} / RNLHW^{(t)}$
constant prices: $ROWCDH^{(t)} = ROWCD^{(t)} / RNLHW^{(t)}$

Employees in the domestic concept are persons engaged by contract in a productive activity for a resident unit and receiving remuneration, regardless of their place of residence. Total hours worked is the most appropriate measure of labour input and represents the aggregate number of hours actually worked by employees.

3.5.3 Compensation per employee

Code:	**RUWCDW** (at current prices) **– ROWCDW** (at constant prices)
Unit:	**EUR, PPS, EUR in 2015 ref. level**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the average income earned by each employee. Compensation per employee is calculated by dividing '*compensation of employees at current prices*' (RUWCD) or '*compensation of employees at constant prices*' (ROWCD) by the number of '*employees*' (SNWTD).

Formulas:
current prices: $RUWCDW^{(t)} = RUWCD^{(t)} / SNWTD^{(t)}$
constant prices: $ROWCDW^{(t)} = ROWCD^{(t)} / SNWTD^{(t)}$

Employees in the domestic concept are persons engaged by contract in a productive activity for a resident unit and receiving remuneration, regardless of their place of residence.

3.5.4 Nominal unit labour cost based on hours worked

Code:	**RUWCDHH**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the ratio of nominal labour cost to real labour productivity. It is usually considered as a measure of price competitiveness. Nominal unit labour cost based on hours worked is the ratio between the indicator 'compensation of employees per hour worked' (RUWCDH) and 'real labour productivity per hour worked' (SOVGDH).

Formula: $RUWCDHH^{(t)} = RUWCDH^{(t)} / SOVGDH^{(t)}$

This indicator is a ratio of the average cost of hours worked over real productivity, which is interpreted as the average cost of labour per unit of output (real labour productivity). The numerator (compensation per hour worked) refers only to employees, while the denominator (real labour productivity, in terms of hours worked) refers to all employment (including the self-employed). The indicator implicitly assumes that the productivity of the self-employed is equal to employees productivity.

3.5.5 Nominal unit labour cost based on persons

Code:	**RUWCDWE**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

Nominal unit labour cost based on persons is the ratio between the indicator 'compensation of employees per employee' (RUWCDW) and 'real labour productivity per person employed' (SOVGDE).

Formula: $RUWCDWE^{(t)} = RUWCDW^{(t)} / SOVGDE^{(t)}$

This indicator represents the ratio of nominal labour cost to real labour productivity. It is usually considered as a measure of price competitiveness. In fact, it is a ratio of the average cost of employees over real productivity, which is interpreted as the cost of labour based on persons per unit of real productivity. The numerator (compensation per employees) refers only to employees, while the denominator (real labour productivity, in terms of persons employed) refers to all employment (including the self-employed). The indicator implicitly assumes that the productivity of the self-employed is equal to employees productivity.

3.6 Labour productivity

3.6.1 Nominal labour productivity per hour worked

Code:	**SUVGDH**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the GDP per hour worked. Nominal labour productivity per hour worked is calculated by dividing '*GDP in current prices*' (SUVGD) by *'hours worked'* (RNLHT).

Formula: $SUVGDH^{(t)} = SUVGD^{(t)} / RNLHT^{(t)}$

GDP is a measure of the total economic activity taking place in an economic territory which leads to output meeting the final demands of the economy. Hours worked include total hours worked by all persons engaged in production in the domestic concept, i.e. by employees and self-employed persons, in either primary or secondary activity , engaged in a productive activity for a resident unit and receiving remuneration regardless of their place of residence.

This ratio, expressed in euro per hour worked, indicates how much economic production activity in nominal prices in a given a period can be attributed to each hour worked in the economy.

3.6.2 Nominal labour productivity per person employed

Code:	**SUVGDE**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the GDP per employed person. Nominal labour productivity per person employed is calculated by dividing '*GDP in current prices*' (SUVGD) by *'total employment'* (SNETD).

Formula: $SUVGDE^{(t)} = SUVGD^{(t)} / SNETD^{(t)}$

GDP is a measure of the total economic activity taking place in an economic territory which leads to output meeting the final demands of the economy. Total employment includes all persons engaged in production in the domestic concept, i.e. employees and self-employed persons, engaged in a productive activity for a resident unit and receiving remuneration regardless of their place of residence.

3.6.3 Real labour productivity per hour worked

Code:	**SOVGDH**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the real GDP per hour worked. Real labour productivity (based on hours worked) is calculated by dividing '*GDP in constant prices*' (SOVGD) by *'hours worked'* (RNLHT).

Formula: $SOVGDH^{(t)} = SOVGD^{(t)} / RNLHT^{(t)}$

Real GDP is measured in chain-linked volumes, i.e. volume measures obtained by chain linking a monetary series of a reference year. Labour input is measured as total hours worked by all persons engaged in production in the domestic concept, i.e. hours worked by employees and the self-employed, in either their primary or secondary activity, engaged in a productive activity for a resident unit and receiving remuneration regardless of their place of residence.

This ratio, expressed in euro per hour worked, indicates how much economic production activity over a given period in real terms can be attributed to each hour worked by each employed person within the economic territory, regardless of their place of residence.

3.6.4 Real labour productivity per person employed

Code:	**SOVGDE**
Unit:	**EUR**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Montenegro, North Macedonia, Norway, Serbia, United Kingdom**

This indicator represents the real GDP per person employed. Real labour productivity per person employed is calculated by dividing '*GDP in constant prices*' (SOVGD) by *'total employment (persons employed)'* (SNETD).

Formula: $SOVGDE^{(t)} = SOVGD^{(t)} / SNETD^{(t)}$

Real GDP is measured in chain-linked volumes, i.e. volume measures obtained by chain linking a monetary series of a reference year. Labour input is measured as the number of employed persons in the domestic concept, i.e. persons engaged by contract in a productive activity for a resident unit and receiving remuneration regardless of their place of residence.

This ratio indicates how much economic production activity over a given period in real terms can be attributed to each employed person within the economic territory, regardless of their place of residence.

3.7 Capital formation

3.7.1 Gross fixed capital formation

Code:	**RUIGT** (total at current prices) – **RUIGZ** (by sector at current prices) **ROIGT** (total at constant prices) – **ROIGZ** (by sector at constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**Eurostat, CE-ERD, AMECO**
Geo coverage:	**EU, Albania, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Fixed capital formation is the expenditure on tangible or intangible assets used in the production process for more than one year. Gross fixed capital formation (GFCF) consists of producers' acquisitions less disposals of fixed assets.

Examples of tangible and intangible fixed assets are: dwellings and non-residential buildings, civil engineering works, transport equipment, machinery, equipment and computers, cultivated assets (trees and livestock), mineral exploration, computer software, entertainment, literary or artistic originals.

Fixed capital formation also includes:

- Work in progress of construction, such as unfinished dwellings, non-residential buildings and civil engineering works. These are recorded as fixed capital formation of the client;
- Military structures and equipment, similar to those used by civilian producers, such as airfields and hospitals;
- Improvements to existing fixed assets that go well beyond the requirements of ordinary maintenance and repairs;
- Transfer costs of fixed assets, such as conveyance fees and costs made by real estate agents, architects and notaries.

Fixed capital formation is assigned to the industry and region that can be considered the economic owner of the capital goods concerned. Fixed assets owned by a multiregional unit are allocated to the establishments where they are used. Fixed assets obtained through operational leasing are recorded in the region of the owner and those through financial leasing, in the region of the user.

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2gfcf*' filtered by `unit=[MIO_EUR] nace_r2=[TOTAL]/[`*`individual sectors`*`]`;
2. Data from Eurostat national accounts table '*nama_10_a64_p5*' filtered by `unit=[MIO_EUR] asset10=[N11G] [na_item=[P51G] nace_r2=[TOTAL]/[`*`individual sectors`*`]` are added;
3. Data from CE-ERD are used to prolong the time-series in the past, after disaggregating them from 6 NACE sectors to 10 NACE sectors based on their sub-sectoral trends;
4. Back-casting is applied to regions affected by breaks in series due to change of NUTS version;
5. Estimates for most recent years are based on short-term forecasts from AMECO (UIGT);
6. Real GFCF (ROIGT) is calculated by applying the GFCF deflator from AMECO (table PIGT);
7. Real GFCF by industry (ROIGZ) is calculated by applying the sectoral deflators from Eurostat (table '*nama_10_a64_p5*', `unit=[PD15_EUR]`).

3.7.2 Consumption of fixed capital

Code:	**SUKGT** (total at current prices) **– SUKCZ** (by sector at current prices) **SOKCT** (total at constant prices) **– SOKCZ** (by sector at constant prices)
Unit:	**Million EUR, Million PPS, Million EUR in 2015 ref. level**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, North Macedonia, Norway, Serbia, Switzerland, Türkiye, United Kingdom**

Consumption of fixed capital, abbreviated as CFC, reflects the decline in the value of the fixed assets of enterprises, governments and owners of dwellings in the household sector.

Fixed assets decline in value due to normal wear and tear, foreseeable ageing (obsolescence) and a normal rate of accidental damage. Unforeseen obsolescence, major catastrophes and the depletion of natural resources, however, are not included.

Unlike 'depreciation' in business accounting, CFC in national accounts is not a method for allocating the costs of past expenditures on fixed assets over subsequent accounting periods. Rather, it is the decline in the future benefits of the assets due to their use in the production process.

Building steps:

1. As consumption of fixed capital is not available in regional accounts, this variable is built starting from Eurostat national accounts (table '*nama_10_a64*', variable code [p51c]);
2. Country level data are downscaled to the NUTS3 level by using GVA (SUVGE/SUVGZ) as proxies;
3. Estimates for most recent years are based on short-term forecasts from AMECO (UKCT);
4. Real CFC (SOKCT) is calculated by applying the deflator from AMECO (table PIGT);
5. Real CFC by industry (SOKCZ) is calculated by applying the sectoral deflators from Eurostat (table '*nama_10_a64*').

3.8 Capital stock

3.8.1 Capital stock at constant prices

Code:	**ROKND** (total at constant prices)
Unit:	**Million EUR in 2015 ref. level**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Norway, Switzerland, Türkiye, United Kingdom**

Capital stock is calculated as follows:

Capital stock at the beginning of the period $(K)^{t-1}$ +

Amount of capital formation during the period $(GFCF)^{t}$ -

Amount of capital consumption during the period $(CFC)^{t}$ =

Capital stock at the end of the period $(K)^{t}$

where K^t is the (level of) capital stock at time *t*; K^{t-1} is the initial level of capital at time *t-1*, that is at the beginning of the observation period;

$GFCF^t$ denotes **Gross fixed capital formation** between *t-1* and *t*;

CFC^t is **consumption of fixed capital** between *t-1* and *t*.

Initial capital stock: AMECO provides country-level estimates (table OKND) which are broken down by region, proportionally to the share of each region in the country's GFCF.

3.9 Households

3.9.1 Households net disposable income

Code:	**RUVNH** (current prices)
Unit:	**Million EUR, Million PPS**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Norway**

Net disposable income is the amount of money that an individual or household has to spend or save after taxes and other mandatory charges are deducted. It includes all income from work (employee wages and earnings from self-employment), private income from investment and property, transfers between households and all social transfers received in cash including old-age pensions.

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2hhinc*' filtered by `unit=[MIO_EUR] na_item=[B6N] direct=[BAL];`
2. Back-casting is applied when country-level data is available from AMECO or other authoritative sources;
3. Estimates for most recent years are based on short-term forecasts from AMECO (UVNH).

3.9.2 Net property income

Code:	**RUYNH** (current prices)
Unit:	**Million EUR**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Norway**

In the context of households, net property income (national accounts code: D.4) refers to the difference between gross revenue generated from property (such as rental income) and the operating expenses directly related to that property. These operating expenses include property maintenance fees, property taxes, and other costs associated with maintaining the property. It includes, among other elements, interest received by households from their financial investments (less interest paid on loans), dividends, withdrawals from income of 'quasi-corporations', investment income from insurance or pension entitlements, and rents on land.

Net property income is a component of primary income. The other components of primary income are the compensation of employees (national accounts code D.1), net operating surplus and mixed income (national accounts codes: B.2n and B.3n).

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2hhinc*' filtered by `unit=[MIO_EUR] na_item=[D4] direct=[PAID];`
2. Back-casting is applied when country-level data is available from AMECO or other authoritative sources;
3. Estimates for most recent years are based on short-term forecasts from AMECO (UYNH).

3.9.3 Net operating surplus and mixed income

Code:	**RUONH** (current prices)
Unit:	**Million EUR**
Sources:	**Eurostat**
Geo coverage:	**EU, Norway**

Net operating surplus (national accounts code: B.2n) includes the activities of unincorporated enterprises (which are not included in other institutional sectors), housing services to others or own accommodation services (normally called owner-occupied dwelling services) and own-account production of goods by households.

Net mixed income (national accounts code: B.3n) includes the joint remuneration of capital and labour in unincorporated enterprises.

Net operating surplus and mixed income are components of primary income. The other components of primary income are the compensation of employees (national accounts code D.1) and net property income (national accounts code: D.4).

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2hhinc*' filtered by `unit=[MIO_EUR] na_item=[B2A3N] direct=[BAL]`

3.9.4 Current taxes on income and wealth

Code:	**RUTYH** (current prices)
Unit:	**Million EUR**
Sources:	**Eurostat, AMECO**
Geo coverage:	**EU, Norway**

Current taxes on income, wealth, etc. (D.5) include taxes on income (D.51) and other current taxes (D.59). Taxes on income cover both taxes on individual or household income and the income or profits of corporations, and include taxes on holding gains.

Building steps:

1. This variable is built starting from Eurostat regional accounts table '*nama_10r_2hhinc*' filtered by `unit=[MIO_EUR] na_item=[D5] direct=[PAID]`;
2. Back-casting is applied when country-level data is available from AMECO or other authoritative sources;
3. Estimates for most recent years are based on short-term forecasts from AMECO (UTYH).

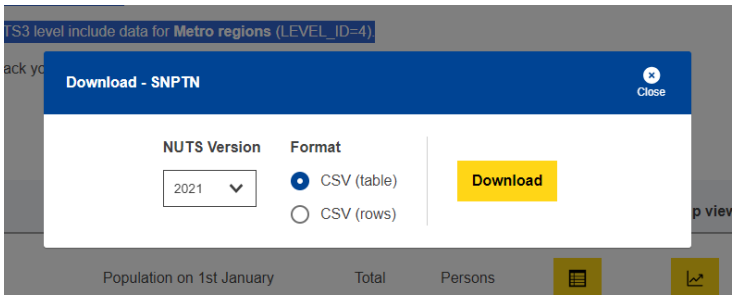
4 Browsing and downloading ARDECO

ARDECO is available at the following link: https://urban.jrc.ec.europa.eu/ardeco. The current release is displayed by default, while previous versions are accessible from the 'Release' selector.

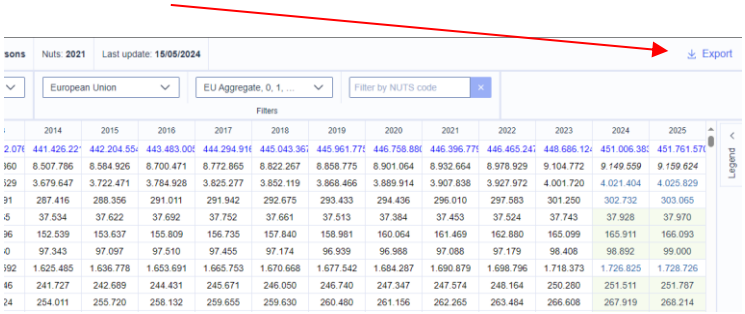
'ARDECO Explorer' gives access to 1) metadata, 2) data in a feature-rich online spreadsheet called *ARDECO Viewer* and 3) interactive maps and graphs. It also offers a 4) download option.

ARDECO tables can be downloaded in several ways:

- from the **Download** function of 'ARDECO Explorer', the full content of a variable is available as *CSV* file, either in 'flat' or 'table' format



- from the **Export** function of 'ARDECO Viewer', the live view is downloaded as an Excel file (*XLSX*)



- via **API**, data can be downloaded as *CSV* files by using the following syntax:
  https://urban.jrc.ec.europa.eu/ardeco-api-v2/rest/export/[VARIABLE_CODE]?*filter&more_filters*
  [VARIABLE_CODE] is a mandatory argument
  The following *filters* are optional arguments:
  version=NUTS version (values*: 2021, 2016)*
  level_id=regional level (values: *0, 1, 2, 3, 4*)
  year=*[year]*
  territory_id=*[NUTScode]*
  format=*csv-table*

  Examples:
  https://urban.jrc.ec.europa.eu/ardeco-api-v2/rest/export/SNPTN
  the SNPTN table is downloaded as *CSV* in 'flat' format – all available NUTS versions are included

  https://urban.jrc.ec.europa.eu/ardeco-api-v2/rest/export/SNPTN?version=2021&format=csv-table
  the SNPTN table is downloaded as *CSV* in 'table' format – only NUTS2021 version is included

- using the ARDECO package[19] in 'R'

ARDECO datasets are available also in the Urban Data Platform and Rural Observatory.

[19] https://cran.r-project.org/web/packages/ARDECO/index.html

5 A look under the hood: the ARDECO Viewer

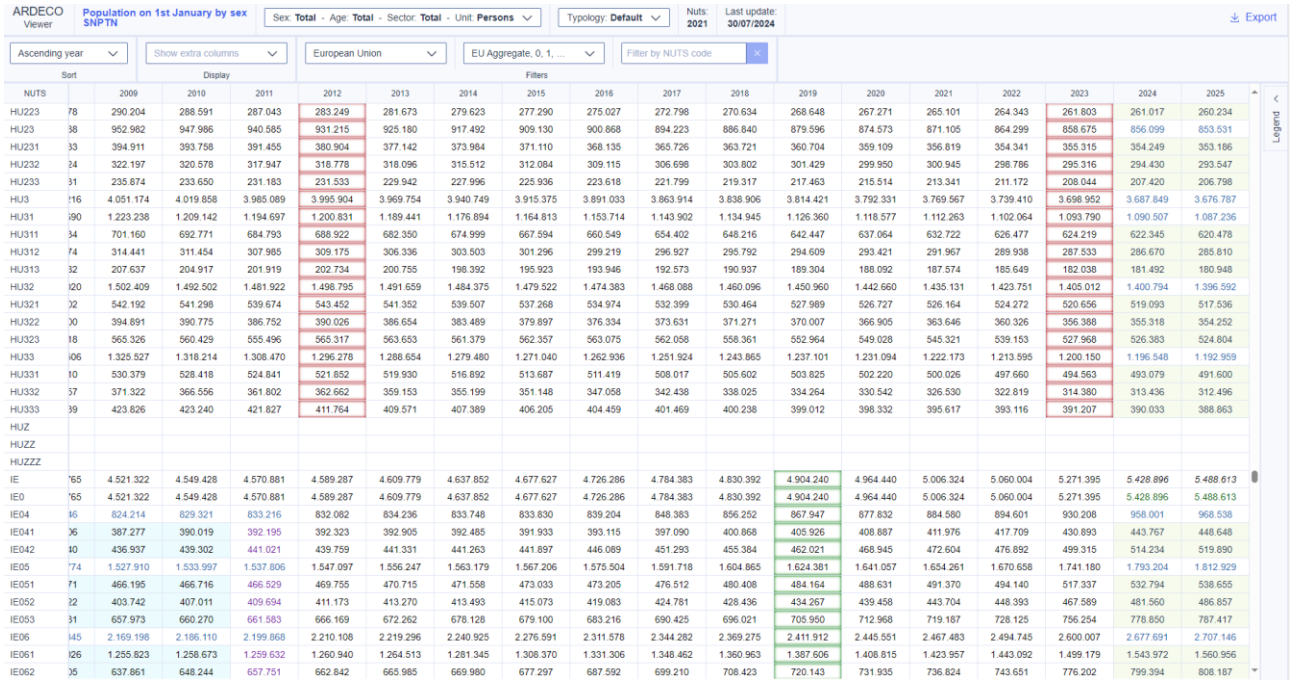
ARDECO combines data from official sources with data from auxiliary sources and own estimates.

ARDECO Viewer allows to identify the source of each value, as well as all historical changes.

This spreadsheet-like tool presents regions on the vertical axis and years on the horizontal axis. Each value is displayed in a font and colour that represents its origin (official or estimate) and, in the case of estimates, the type of process that has generated it.

It allows to:

- Sort data by year in ascending or descending order;
- View 'EU countries' or 'All available countries';
- Filter the regional level(s) of interest;
- Filter by NUTS code;
- View data by Metropolitan regions;
- View data by territorial typology (Urban/Rural, also including remoteness);
- Display additional columns (region name, unit, sector, etc.);
- View the historical values of each cell;
- Export the current view as an *XLSX* file.



NUTS		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
HU223	78	290.204	288.591	287.043	283.249	281.673	279.623	277.290	275.027	272.798	270.634	268.648	267.271	265.101	264.343	261.803	261.017	260.234
HU23	38	952.982	947.986	940.585	931.215	925.180	917.492	909.130	900.868	894.223	886.840	879.596	874.573	871.105	864.299	858.675	856.099	853.531
HU231	33	394.911	393.758	391.455	380.904	377.142	373.984	371.110	368.135	365.726	363.721	360.704	359.109	356.819	354.341	355.315	354.249	353.186
HU232	24	322.197	320.578	317.947	318.778	318.096	315.512	312.084	309.115	306.698	303.802	301.429	299.950	300.945	298.786	295.316	294.430	293.547
HU233	31	235.874	233.650	231.183	231.533	229.942	227.996	225.936	223.618	221.799	219.317	217.463	215.514	213.341	211.172	208.044	207.420	206.798
HU3	116	4.051.174	4.019.858	3.985.089	3.995.904	3.969.754	3.940.749	3.915.375	3.891.033	3.863.914	3.838.906	3.814.421	3.792.331	3.769.567	3.739.410	3.698.952	3.687.849	3.676.787
HU31	190	1.223.238	1.209.142	1.194.697	1.200.831	1.189.441	1.176.894	1.164.813	1.153.714	1.143.902	1.134.945	1.126.360	1.118.577	1.112.263	1.102.064	1.093.790	1.090.507	1.087.236
HU311	34	701.160	692.771	684.793	688.922	682.350	674.999	667.594	660.549	654.402	648.216	642.447	637.064	632.722	626.477	624.219	622.345	620.478
HU312	74	314.441	311.454	307.985	309.175	306.336	303.503	301.296	299.219	296.927	295.792	294.609	293.421	291.967	289.938	287.533	286.670	285.810
HU313	32	207.637	204.917	201.919	202.734	200.755	198.392	195.923	193.946	192.573	190.937	189.304	188.092	187.574	185.649	182.038	181.492	180.948
HU32	120	1.502.409	1.492.502	1.481.922	1.498.795	1.491.659	1.484.375	1.479.522	1.474.383	1.468.088	1.460.096	1.450.960	1.442.660	1.435.131	1.423.751	1.405.012	1.400.794	1.396.592
HU321	02	542.192	541.298	539.674	543.452	541.352	539.507	537.268	534.974	532.399	530.464	527.989	526.727	526.164	524.272	520.656	519.093	517.536
HU322	00	394.891	390.775	386.752	390.026	386.654	383.489	379.897	376.334	373.631	371.271	370.007	366.905	363.646	360.326	356.388	355.318	354.252
HU323	18	565.326	560.429	555.496	565.317	563.653	561.379	562.357	563.075	562.058	558.361	552.964	549.028	545.321	539.153	527.968	526.383	524.804
HU33	106	1.325.527	1.318.214	1.308.470	1.296.278	1.288.654	1.279.480	1.271.040	1.262.936	1.251.924	1.243.865	1.237.101	1.231.094	1.222.173	1.213.595	1.200.150	1.196.548	1.192.959
HU331	10	530.379	528.418	524.841	521.852	519.930	516.892	513.687	511.419	508.017	505.602	503.825	502.220	500.026	497.660	494.563	493.079	491.600
HU332	57	371.322	366.556	361.802	362.662	359.153	355.199	351.148	347.058	342.438	338.025	334.264	330.542	326.530	322.819	314.380	313.436	312.496
HU333	39	423.826	423.240	421.827	411.764	409.571	407.389	406.205	404.459	401.469	400.238	399.012	398.332	395.617	393.116	391.207	390.033	388.863
HUZ																		
HUZZ																		
HUZZZ																		
IE	765	4.521.322	4.549.428	4.570.881	4.589.287	4.609.779	4.637.852	4.677.627	4.726.286	4.784.383	4.830.392	4.904.240	4.964.440	5.006.324	5.060.004	5.271.395	*5.428.896*	*5.488.613*
IE0	765	4.521.322	4.549.428	4.570.881	4.589.287	4.609.779	4.637.852	4.677.627	4.726.286	4.784.383	4.830.392	4.904.240	4.964.440	5.006.324	5.060.004	5.271.395	5.428.896	5.488.613
IE04	46	824.214	829.321	833.216	832.082	834.236	833.748	833.830	839.204	848.383	856.252	867.947	877.832	884.580	894.601	930.208	958.001	968.538
IE041	06	387.277	390.019	392.195	392.323	392.905	392.485	391.933	393.115	397.090	400.868	405.926	408.887	411.976	417.709	430.893	443.767	448.648
IE042	40	436.937	439.302	441.021	439.759	441.331	441.263	441.897	446.089	451.293	455.384	462.021	468.945	472.604	476.892	499.315	514.234	519.890
IE05	774	1.527.910	1.533.997	1.537.806	1.547.097	1.556.247	1.563.179	1.567.206	1.575.504	1.591.718	1.604.865	1.624.381	1.641.057	1.654.261	1.670.658	1.741.180	1.793.204	1.812.929
IE051	71	466.195	466.716	466.529	469.755	470.715	471.558	473.033	473.205	476.512	480.408	484.164	488.631	491.370	494.140	517.337	532.794	538.655
IE052	22	403.742	407.011	409.694	411.173	413.270	413.493	415.073	419.083	424.781	428.436	434.267	439.458	443.704	448.393	467.589	481.560	486.857
IE053	31	657.973	660.270	661.583	666.169	672.262	678.128	679.100	683.216	690.425	696.021	705.950	712.968	719.187	728.125	756.254	778.850	787.417
IE06	145	2.169.198	2.186.110	2.199.868	2.210.108	2.219.296	2.240.925	2.276.591	2.311.578	2.344.282	2.369.275	2.411.912	2.445.551	2.467.483	2.494.745	2.600.007	2.677.691	2.707.146
IE061	126	1.255.823	1.258.673	1.259.632	1.260.940	1.264.513	1.281.345	1.308.370	1.331.306	1.348.462	1.360.963	1.387.606	1.408.815	1.423.957	1.443.092	1.499.179	1.543.972	1.560.956
IE062	05	637.861	648.244	657.751	662.842	665.985	669.980	677.297	687.592	699.210	708.423	720.143	731.935	736.824	743.651	776.202	799.394	808.187

Figure 2: ARDECO Viewer

A legend is available in a panel on the right side. The legend lists all the steps and processes applied to generate the table, each one displayed in a different colour. Detailed information for each step are available by clicking on the icon.

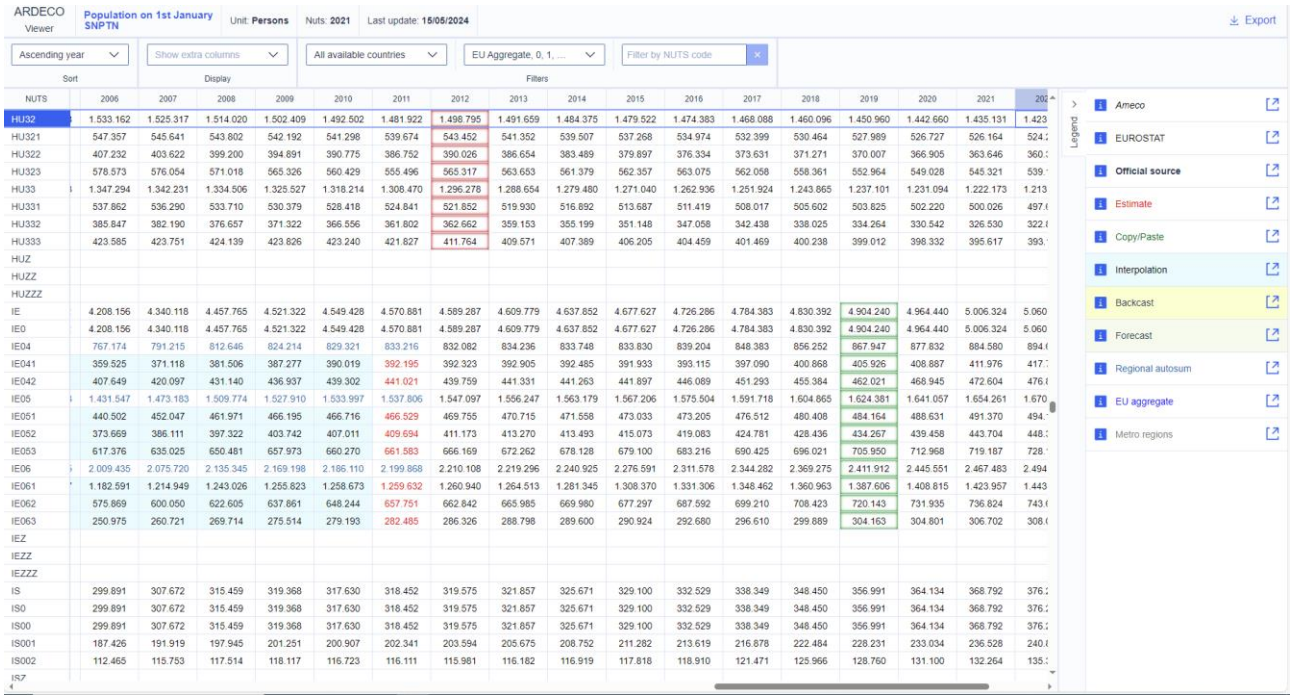


Figure 3: Legend (panel on the right)

From the legend, by clicking on the icon besides each step, it is possible to access the intermediate status of a table as it would appear immediately after the processing of that specific step.

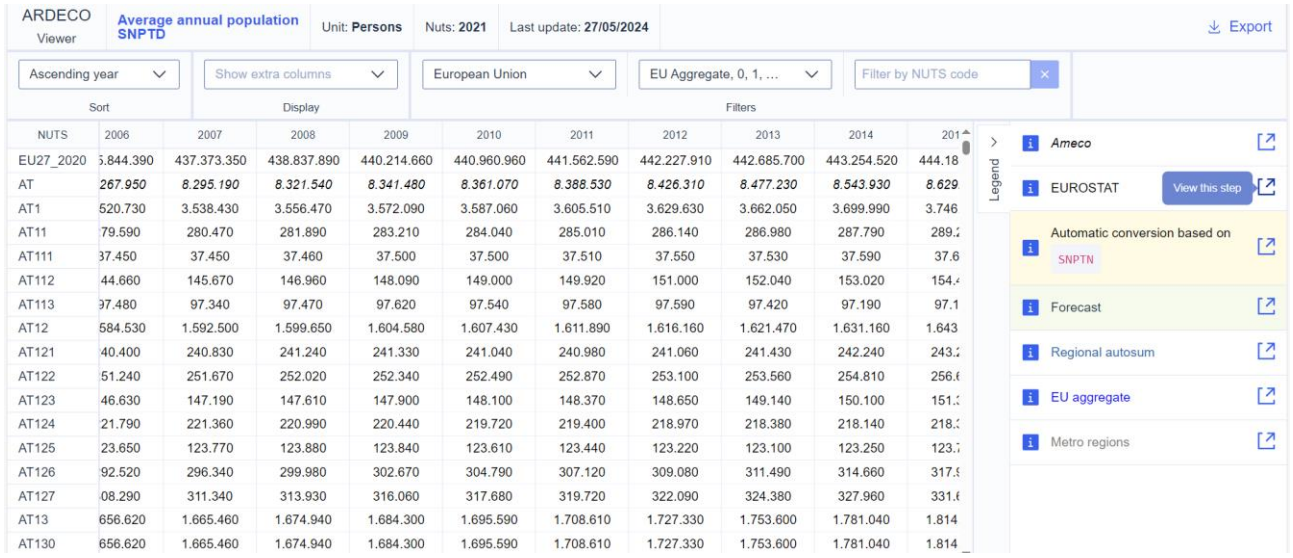


Figure 4: Accessing an intermediate status of a table

By clicking on each individual cell, a detailed view with all historical values is displayed.

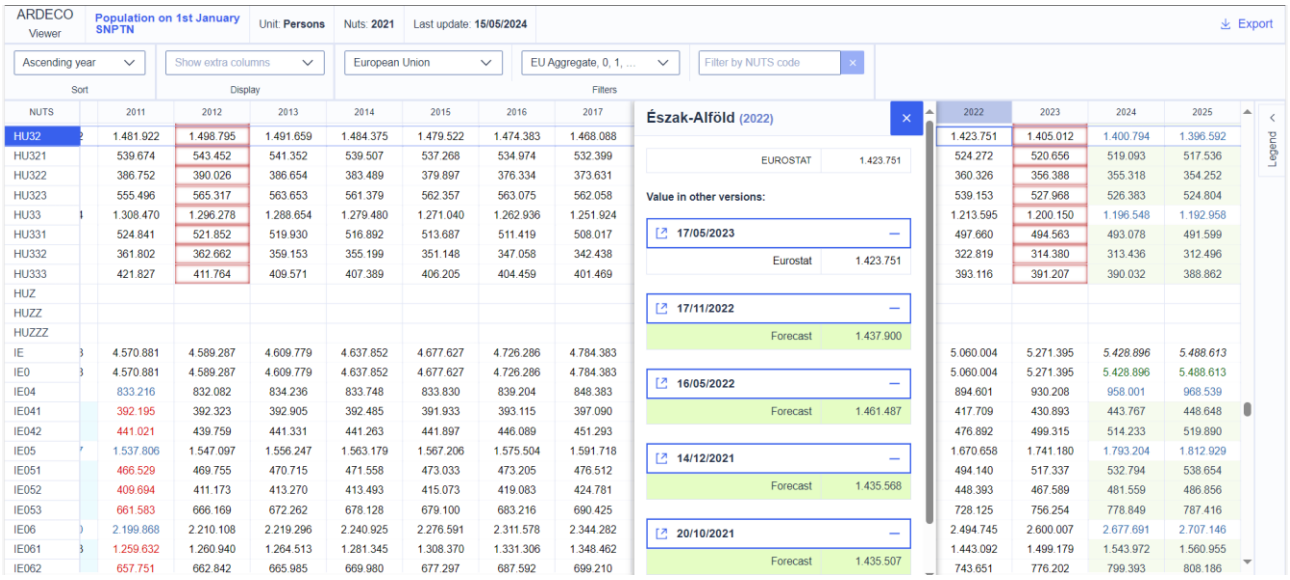


Figure 5: Detailed view (cell history)

Access to the table of a specific point in time is possible by clicking on the ↗ icon besides each date.

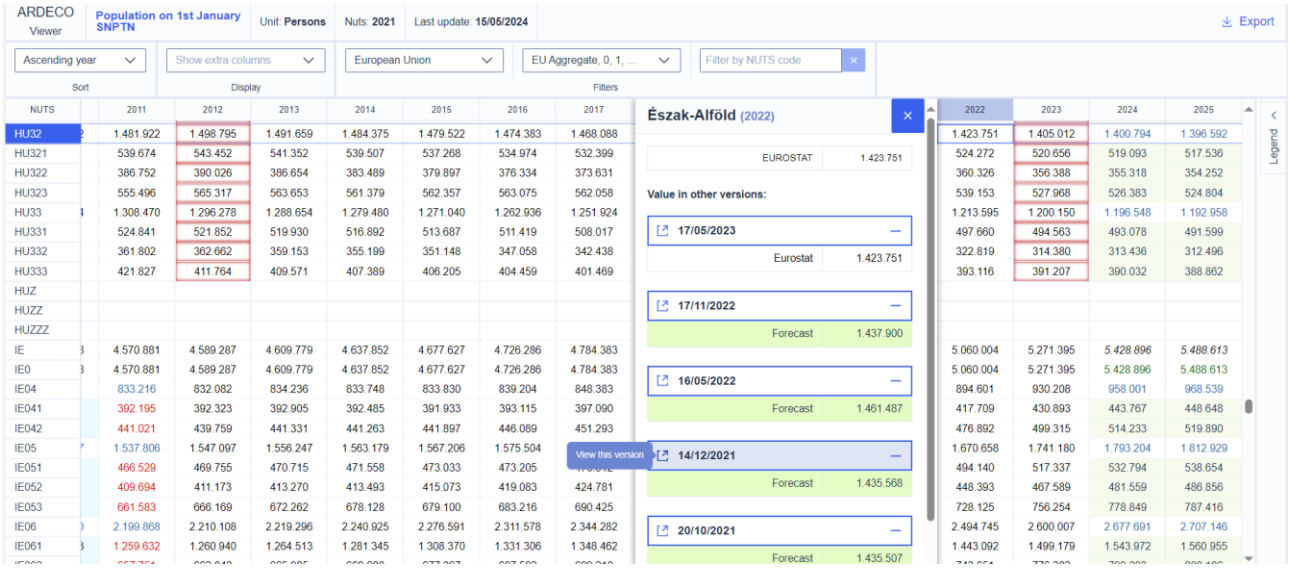


Figure 6: Accessing a specific time version from the cell history

From the 'Typology' box, the viewer switches between 'default' (i.e., regional) and Urban/Rural typology (also including remoteness).

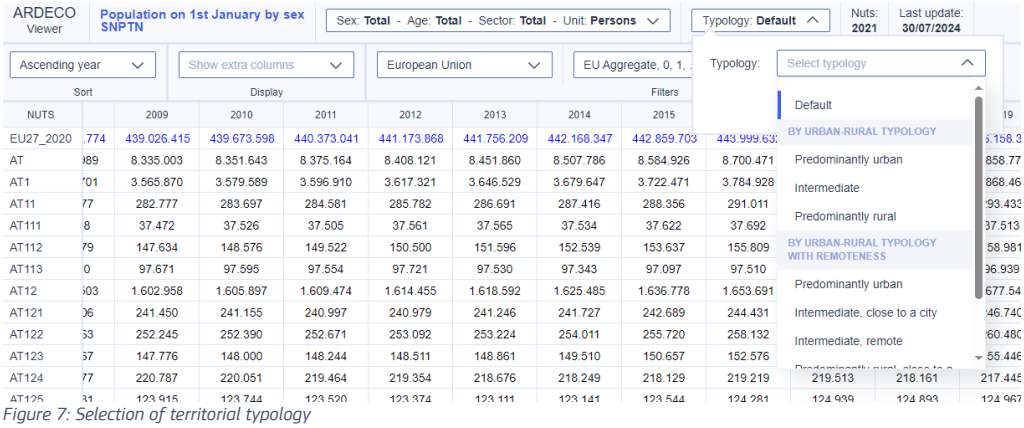


Figure 7: Selection of territorial typology

6 Next steps

ARDECO undergoes continuous updates and enhancements. In addition to maintaining and improving existing variables, we are evaluating new variables and indicators for future inclusion in ARDECO. Specifically, the following variables are expected to be added:

1. **Labour variables (Residential Concept):**
    - These variables are based on household surveys and the Labor Force Survey (LFS). They include residence-based employment and unemployment data, along with employment and unemployment rates.
2. **Demographic Statistics:**
    - We plan to incorporate more demographic data, such as population breakdowns by age class and sex.
3. **Total Factor Productivity:**
    - This indicator will provide insights into overall productivity levels.
4. **Education and R&D Expenditure Indicators:**
    - We aim to include indicators related to education and research and development (R&D) expenditure.

7 Conclusions

ARDECO serves as a reliable source of regional and sub-regional data, focusing on demographic and socio-economic variables and indicators. It offers long, harmonised, and continuously updated time-series, ensuring consistency across variables, over time, and across different NUTS versions.

Key features of ARDECO include:

- **Data availability:** ARDECO provides long and gap-free time-series data for regions and sub-regions up to the NUTS3 level, as well as for metro regions and Urban/Rural typologies. It covers all EU Member States plus some non-EU countries (depending on official source availability);
- **Data sources:** While ARDECO primarily relies on official sources, it also incorporates auxiliary data and estimates to fill gaps, enhance spatial granularity, and achieve higher sectoral disaggregation;
- **Transparency:** The origin and history of each value are transparently provided through the *ARDECO Viewer*;
- **Visualisations:** Data can be visualised through interactive maps, views, and graphs using the 'Urban Data Platform' and the 'Rural Observatory';
- **Regular updates:** ARDECO is updated quarterly:
    - End of February/beginning of March (yearly updates of Regional and National Accounts)
    - Mid-May (following AMECO's Spring Economic Forecast)
    - July/August (interim release)
    - Mid-November (following AMECO's Autumn Economic Forecast)

ARDECO streamlines access to enriched regional data by providing a centralised platform. Researchers and policymakers can focus on data analysis, saving time otherwise spent on data collection, cleaning, and harmonisation.

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List of abbreviations and definitions

AMECO	Annual Macro Economic Database of the European Commission
ARDECO	Annual Regional Database of the European Commission
CE-ERD	European Regional Database (Cambridge Econometrics)
CFC	Consumption of Fixed Capital
CLV	Chain-Linked Volume
ESA	European System of Accounts
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GVA	Gross Value Added
LFS	Labour Force Survey
NACE	Nomenclature statistique des Activités économiques dans la Communauté Européenne (European industrial activity classification)
NUTS	Nomenclature of Territorial Units for Statistics
PPP	Purchasing Power Parities
PPS	Purchasing Power Standards
SNA	System of National Accounts

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