



EUROPEAN RESEARCH PROJECT //

Collecting and analysing data for the post-27 INTERREG (Core-IB)

Germany-Denmark

Border profile

March 2026



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This document is a final report.

The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2030 Cooperation Programme.

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1 Introduction

1.1 Context and objective of the border profile

The ESPON Core-IB project (Collecting and analysing data for the post-27 INTERREG) provides evidence-based, non-binding analytical work to support the next generation of Interreg programmes post-2027. By collecting and analysing harmonised territorial data, the project highlights key socio-economic characteristics, cross-border interactions, and governance structures. Its spatial focus covers 48 cross-border cooperation areas (40 land and 8 maritime), including all EU internal border regions and those bordering Liechtenstein, Switzerland, and Norway. The findings are analytical and informative; they do not create regulatory or policy obligations for Member States, the European Commission, or programme authorities. Each border profile serves as a comparable knowledge base for policymakers at EU, national, and regional levels, supporting dialogue and reflection rather than prescribing policy choices. The profiles aim to provide consistent, data-driven territorial evidence that can inform strategic discussions about future cross-border cooperation and contribute to the preparation of Interreg programmes post-2027.

The Core-IB border profiles are designed to support the upcoming steps in the Interreg programming process with analyses based on data that is available at the European scale, including ESPON, Eurostat, DG REGIO, JRC, and Interreg databases. Their main purpose is to ensure comparability of data analyses and to provide programme areas with access to recent harmonised data at high geographical resolution (NUTS3 level or finer). Member States may hold additional or more detailed data which can further enrich or contextualise the findings beyond the Core-IB project. These national sources are essential for refining and validating territorial evidence in policymaking processes, including additional regional, fine-scale information and insights from political processes related to prioritisation and objective setting. All border profiles follow a systematic and methodologically robust approach. They provide territorial evidence, structured along 6 thematic dimensions, offering insights into the geographic, economic, environmental, socio-economic, border security and governance characteristics of the border region. Quantitative data and qualitative analyses are combined to ensure meaningful insights into all 48 border areas. Due to methodological constraints and limited resources, local studies and national datasets falling outside the European data framework could not be included. Visualisations, such as maps and charts based on descriptive statistics, facilitate understanding and support evidence-based policymaking. The profiles analyse the border region as a whole at NUTS3 (2021) level (corresponding to the current Interreg VI-A programme area)¹ and position it within a broader European context. For comparative purposes, several reference categories are applied:

- › European averages (EU27 + Norway, Switzerland and Liechtenstein, depending on data availability)
- › National averages
- › National border region averages
- › Aggregated border region averages

To complement the quantitative evidence, the profiles also draw on strategic and qualitative sources, including:

- › Strategic documents from the Interreg Programme 2021-2027
- › Border Orientation Papers from the 2021-2027 programming period
- › Information from the keep.eu database on cross-border cooperation activities
- › Information from the Cohesion Open Data platform
- › Information from the b-solutions initiative
- › Information from recent ESPON Projects (i.e., CROSSGOV, House4All, PROFECY Update, CPS 2.0)

¹ As defined by Annex 1, Commission Implementing Decision (EU) 2022/74 of 17 January 2022, as amended by Commission Implementing Decision (EU) 2023/1638 of 14 August 2023 (OJ L204, 17.8.2023, p. 9): https://eur-lex.europa.eu/eli/dec_impl/2022/75/oj/eng

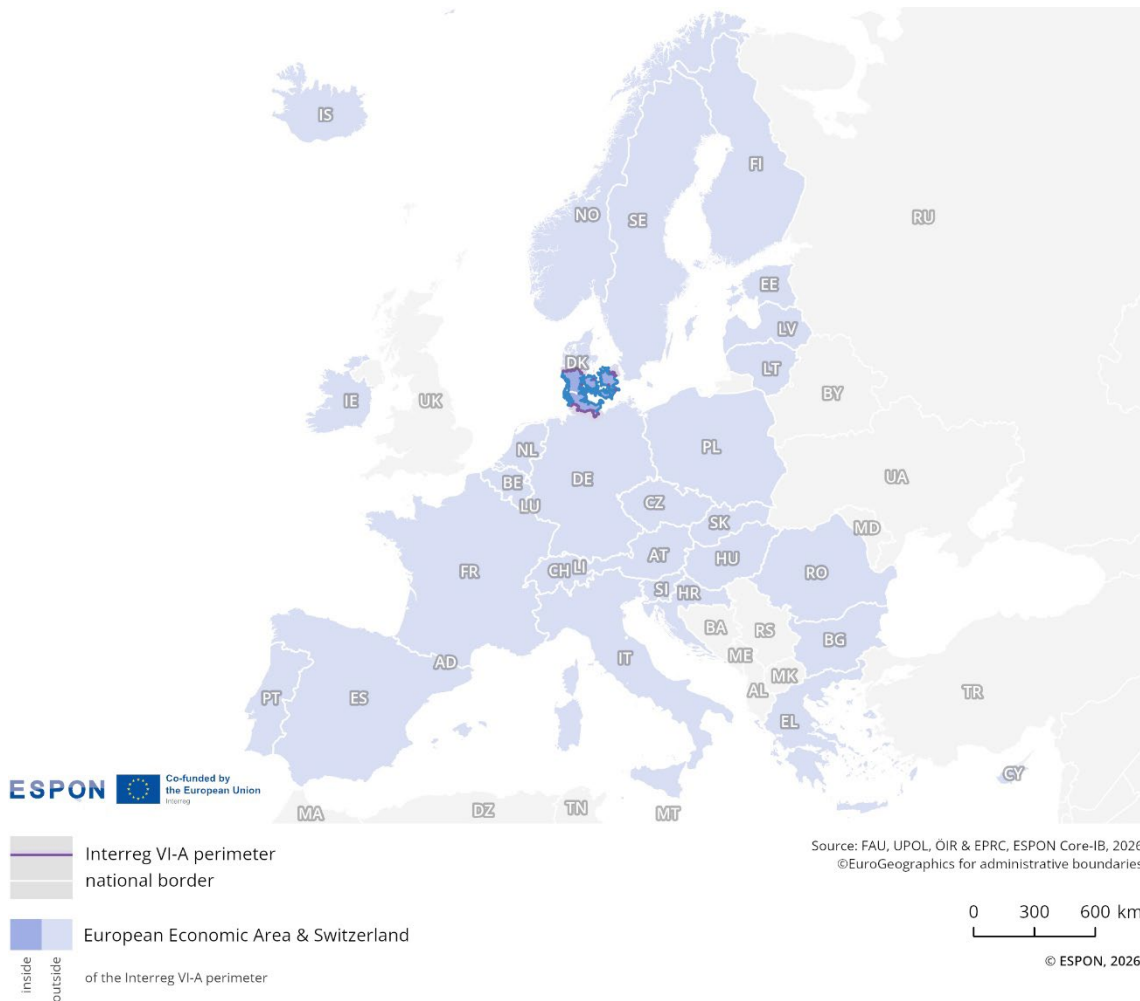
Within the ESPON framework, the CROSSGOV project (Governance mechanisms for cross-border functional areas) has been implemented in parallel to Core-IB. The CROSSGOV hub² provides a comprehensive platform for interactive data exploration, and selected data have been incorporated into this study.

Additional project-related information can be explored separately in the Core-IB **Final Report**. Further technical information on this border profile can be found in a separate **Technical Annex** providing an overview of data and methods.

1.2 Presentation of the border area

The Interreg VI-A border region ‘Germany–Denmark’ covers the area between northern Germany and southern Denmark (see Figure 1.1). In Germany, the programme area includes parts of the federal state of Schleswig-Holstein, which functions as both a NUTS1 and NUTS2 region, comprising a total of 9 out of its 15 NUTS3 regions. In Denmark, it covers the entire NUTS2 regions of Southern Denmark and Zealand, encompassing a total of 4 NUTS3 regions. Region Hovedstaden with the Danish capital Copenhagen is on the island of Zealand, but not part of the programme area.

Figure 1.1: Overview map



² ESPON CROSSGOV Hub: <https://gis-portal.espon.eu/arcgis/apps/experiencebuilder/experience/?id=27e3b86ef44441b08793a2239c370607>

significant ecological value. On the Baltic side, the coastline features fjords, bays, and steep cliffs, particularly near Flensburg Fjord and the Bay of Kiel.

Hydrologically, the programme area has numerous rivers, lakes, and canals, including the Eider River and the Kiel Canal (Nord-Ostsee-Kanal), which is one of the world's busiest artificial waterways and connects the North Sea and the Baltic Sea. Inland water bodies, moorlands and glacial lakes, such as Plöner See and Ratzeburger See, also contribute to the cross-border region's landscape.

Geologically, the programme area is largely underlain by young glacial sediments, including terminal moraines, outwash plains and sandy soils formed during the last Ice Age. These features define much of the programme area's physical geography and agricultural use.

Natural habitats include extensive wetlands, protected coastal zones and mixed forests. The cross-border region also encompasses numerous Natura 2000 sites and national parks, particularly in the Wadden Sea and Baltic Sea coastal zones, as will be highlighted in section 2.3.

2 Cross-border analysis

2.1 Territorial dimension

The territorial dimension refers to the spatial characteristics and dynamics of a border region. It specifically depicts how factors such as population density, demographic trends, changes in settlement areas and accessibility influence and reflect cross-border integration.

2.1.1 Population and settlements

This sub-dimension illustrates the population characteristics and land use dynamics of the border region, based on analysed indicators. It examines population density, population development by age groups, and changes in settlement areas. The analysis highlights whether the border functions as a catalyst for integration or as a barrier. Comparisons with the respective countries and the EU average provide context for understanding the cross-border region's dynamics.

2.1.1.1 Population density

Indicator description

Population density refers to the number of residents per km². This indicator shows the number of inhabitants per square kilometre in a 1x1 km grid. It therefore provides information on the distribution and concentration of population across the region and allows to identify agglomerations of high density. In particular agglomerations at or close to the border area of key interest.

- **Source:** Eurostat
- **Temporal coverage:** 2021
- **Unit:** Inhabitants/km²

Please refer to the technical annex for more information.

The border region includes 14 urban centres with a population of over 30,000 inhabitants. Figure 2.1 shows that the territory is also covered by a uniform pattern of smaller central settlements in both the German and Danish areas. These settlements are not densely clustered together and the settlement pattern spans the border. The cities of Lübeck and the port of Kiel, in the southern part of the German territory, have the largest populations. In the Danish part of the programme area, the population is concentrated in several ports and the largest city, Odense (185,000 inhabitants).

The population density of the whole border region is 121 inhabitants/km², which exceeds the EU average of 109 inhabitants/km² (according to Eurostat). The figure is comparable to the aggregated average of all EU evaluated border regions, which is 125 inhabitants/km².

The German part of the border region has an average population density of around 166 inhabitants/km², which is lower than the national average population density in Germany (231 inhabitants/km²). The part of the border region in Denmark has an average population density of around 99 inhabitants/km², which is lower than the national average population density in Denmark (129 inhabitants/km²).

2.1.1.2 Population development (by age groups)

Indicator description

Population development refers to the percentage change in population at regional level between 2014 and 2024. The data reflects on the total population, as well as on the age groups 0-14, 15-64 and 65+.

- **Source:** Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2014-2024
- **Unit:** Change in %

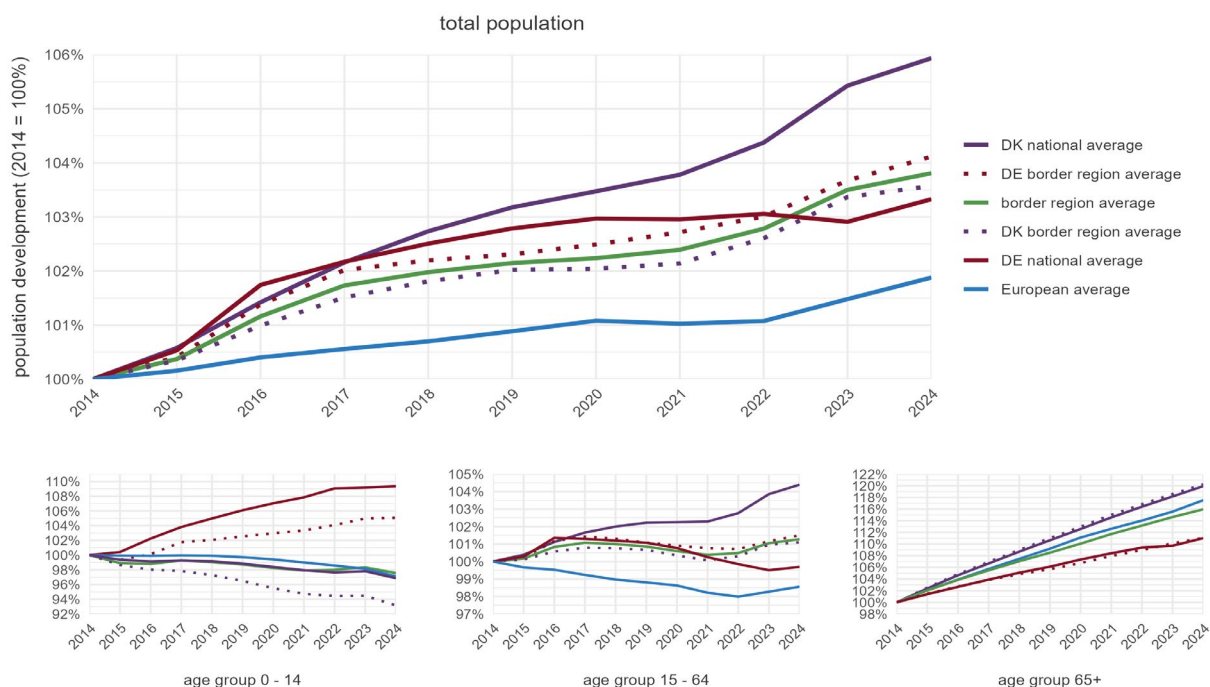
Please refer to the technical annex for more information.

The population in the Germany–Denmark region in 2024 (Eurostat) was 3.7 million inhabitants, of which:

- › 43.8% in the German border territory (1.6 million inhabitants);
- › 56.2% in the Danish border territory (2.1 million inhabitants).
- › The region within the border region that has experienced the highest population increase since 2014 is Flensburg, Kreisfreie Stadt (DEF01) with an increase of 14.8%.

Figure 2.2 shows the population growth in the Germany–Denmark region between 2014 and 2024. During this period, the cross-border region has experienced moderate growth of 3.8%, with the highest growth rate observed on the German side.

Figure 2.2: Population development (2014=100)



Population growth across the border region is slightly above the European average (3.8% vs. 1.9%) and also above the average development in all border regions (3.8% vs 1.5%). While the German border area

shows slightly higher growth than the national average (4.1% vs. 3.3%), the Danish border area shows lower growth than the national average (3.6% vs. 5.9%).

In terms of the development of individual age groups in the programme area, the population aged 0–14 experienced a slight decrease of -2.4%, while the working-age population (15–64) showed a slight increase of 1.3%. The population aged 65 and over underwent a substantial increase of 16%.

2.1.1.3 Change in settlement areas

Indicator description

The indicator shows the relative change in settlement areas per LAU in the border region. It considers changes in land cover, from non-artificial areas (such as agricultural, forest and seminatural areas, wetlands and water bodies) to artificial areas (such as urban, industrial, construction sites) between 2012 and 2018. This indicator has to be viewed alongside population development in particular.

- **Source/method of retrieval:** The indicator is retrieved via processing of raster data from CORINE Land cover. The raster information is crossed with Local Administrative Units (LAU) to calculate a change in %.
- **Temporal coverage:** 2012-2018
- **Unit:** Change in %

Please refer to the technical annex for more information.

Figure 2.3 illustrates the change in settlement areas at municipal level between 2012 and 2018. Overall, the map shows differing patterns of change in settlement areas on both sides of the German-Danish border. In many parts of the German parts of the programme area, increases in settlement size are evident around the urban centres of Lübeck, Kiel and Rendsburg. In contrast, on the Danish side the changes are not clustered around the cities but are more widespread. Husum is an exception, with no significant change during the observed time period. High growth in settlement areas is particularly evident between Rendsburg and Schleswig as well as along the German side of the border. Near to the national borders, the settlement area increases mainly in Denmark. On the German side, the changes are evident around the cities of Flensburg and Süderlügum. The map also reflects the topographical characteristics of the border region, with significant changes in settlement areas visible along the coasts, e.g., as is visible in the case in the North Frisian Islands and Funen.

Figure 2.3: Settlement area dynamics

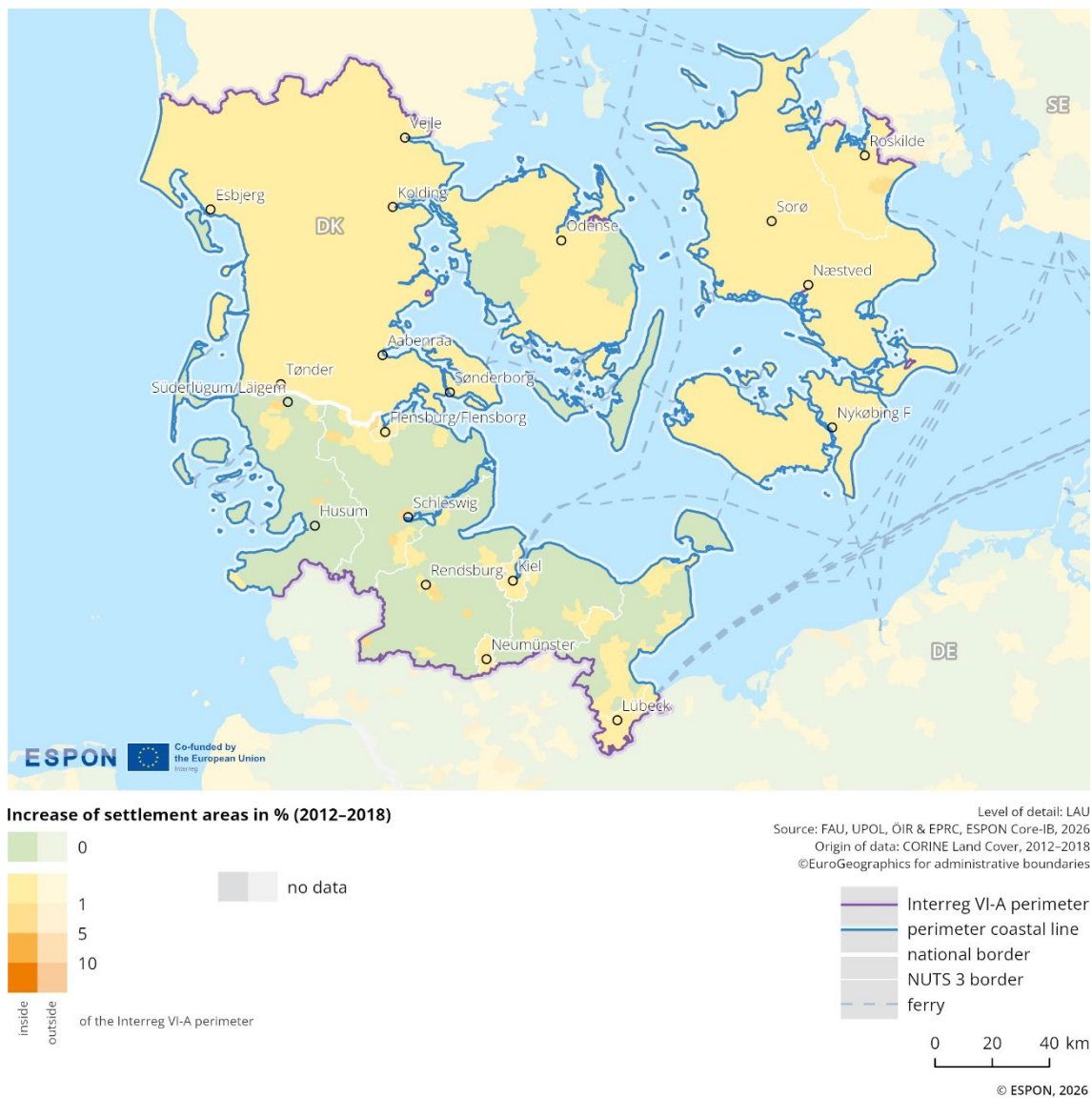
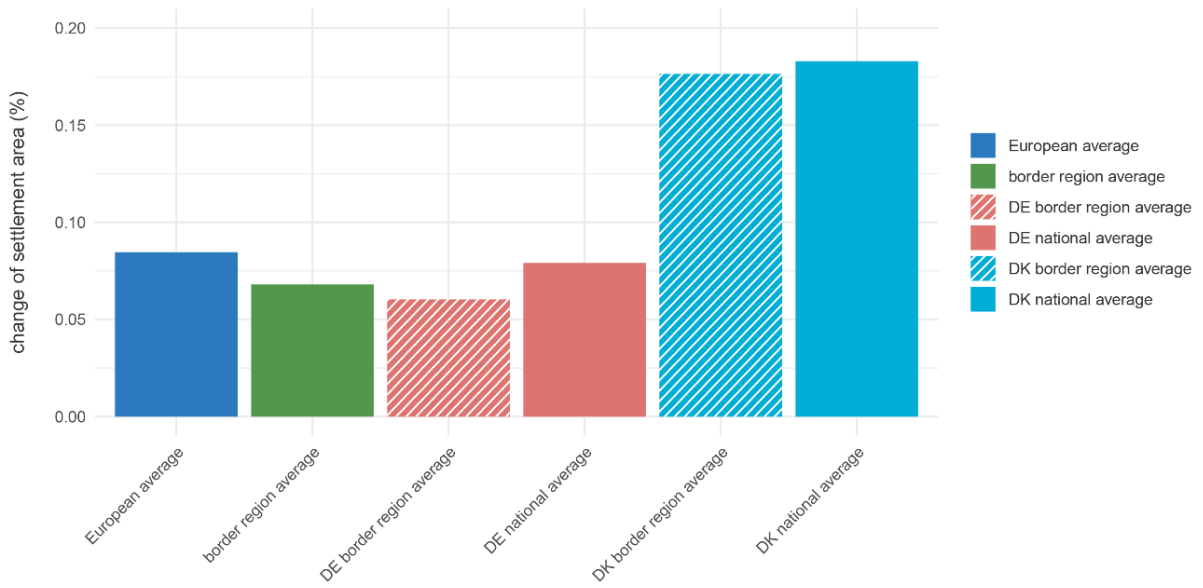


Figure 2.4 presents the change in settlement areas from a comparative perspective. The average for the Germany-Denmark programme area is lower than the overall European average, which includes both EU member states and the EFTA countries Switzerland, Liechtenstein, and Norway. The Danish values are higher than the German ones, which applies for both, the national average as well as the border regions. The Danish and German border-regional averages lie slightly below the national averages.

Figure 2.4: Change in settlement areas (2012-2018) (comparison)



2.1.2 Accessibility of the border area

This sub-dimension illustrates the functional travel connections that already exist in the border region. It examines average cross-border travel times for different modes of transport and cross-border catchment areas based on mobility flows. It also considers travel times to and from border crossings. The analysis shows whether mobility flows are integrated between border regions or if the border hampers mobility.

2.1.2.1 Comparative quality of selected cross-border connections

Indicator description

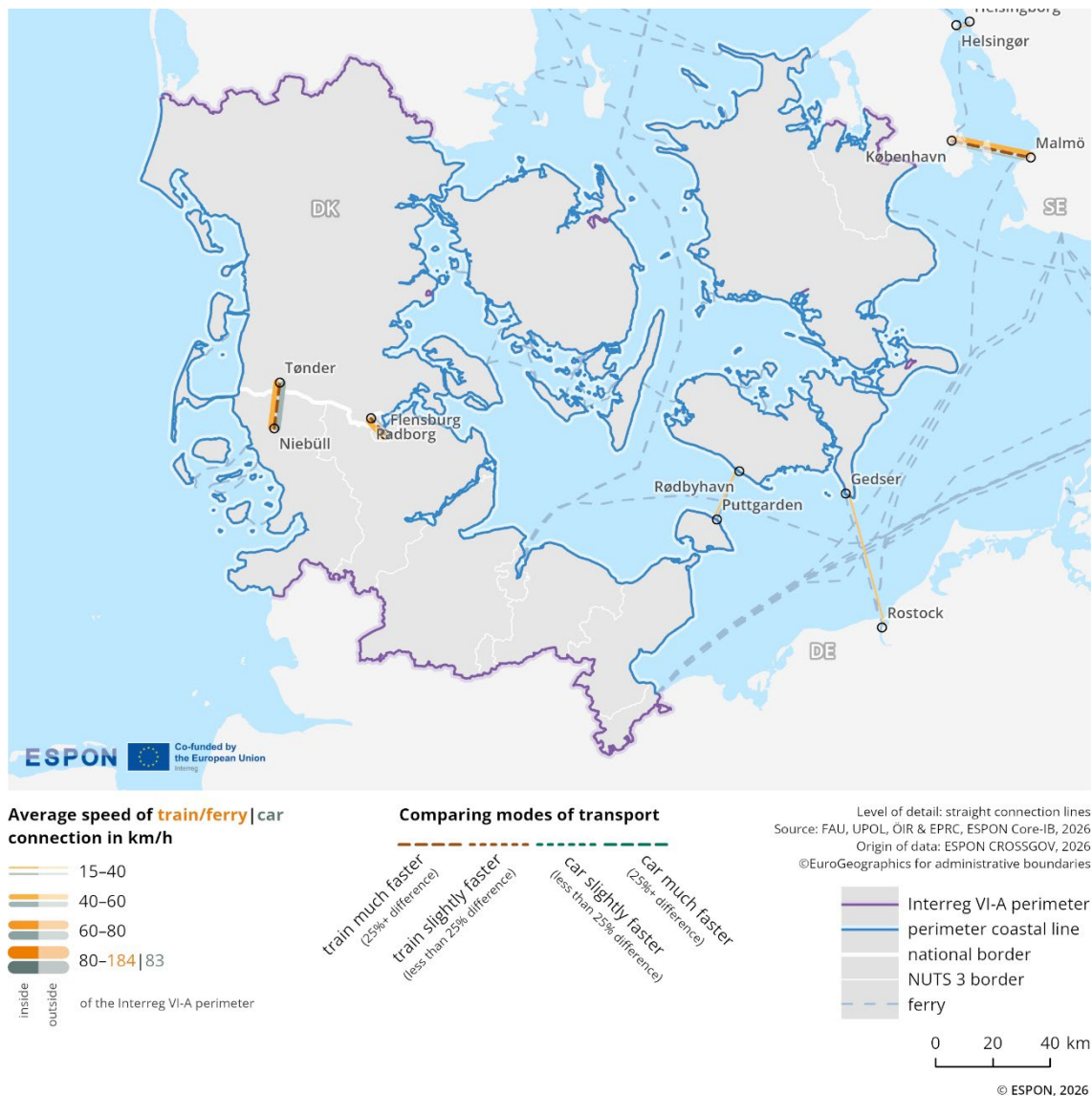
The indicator presents a comparative perspective for different modes of transport (public and private) and their average travel speed (so-called space-time-lines). As such it helps to understand and interpret accessibility patterns along the border and highlights the comparative quality of selected cross-border connections.

- **Source/method of retrieval:** Average number and speed of rail connections/ferries, average speed of car connections between selected cities and towns in border regions using Rail Travel Sites, Google Maps, luftlinie.org, Direct Ferries, local ferry companies
- **Temporal coverage:** 2025 (first quarter)
- **Unit:** km/h

Please refer to the technical annex for more information.

Cross-border accessibility shapes cross-border interactions. Figure 2.5 illustrates this using a "space-time-line" map, which shows parts of a European overview of car, train and ferry travel times in the Germany-Denmark border region. This visualisation enables an assessment of transport quality by highlighting differences between public (train, ferry) and private (car) transport modes.

Figure 2.5: Comparative quality of selected cross-border connections



The selection of cities and connections covered is based on a set of criteria applied throughout Europe within the ESPON CROSSGOV project.⁴ These criteria include the presence of a railway station, population size, distance to the border, node hub and functionality. The thickness of the lines (orange for trains and ferries and grey for cars) indicates the average speed of connections in km/h, with thicker lines representing faster connections. Dotted lines in-between reflect the indexed ratio between train and car speeds. A brown colour scale (values below 100) denotes that trains are faster than cars along the specific route, while a green scale (values above 100) indicates the opposite.

The selected connections within the programme area include Tønder-Niebüll, Flensburg-Padborg, and the ferry line Puttgarden-Rødbyhavn. For the Tønder-Niebüll and Flensburg-Padborg routes, train connections outperform car travel in terms of speed. Notably, the Tønder-Niebüll connection also offers a relatively fast car option. In contrast, the Flensburg-Padborg route is characterised by slow travel times for both train and car, although the train remains significantly faster. The ferry connections are comparatively slow.

⁴ ESPON CROSSGOV Atlas, see Storymap on 'Space-time-lines': <https://gis-portal.espon.eu/arcgis/apps/storymaps/collections/345c978adf784ad-fac30c16b90219d35?item=4>

2.1.2.2 Cross-border catchment area based on mobility flows

Indicator description

This indicator measures the movement of people across borders. The density of cross-border movements by Twitter/X users is displayed on a grid cell covering an area of 20x20 km. The indicator does not differentiate between reasons for movement.

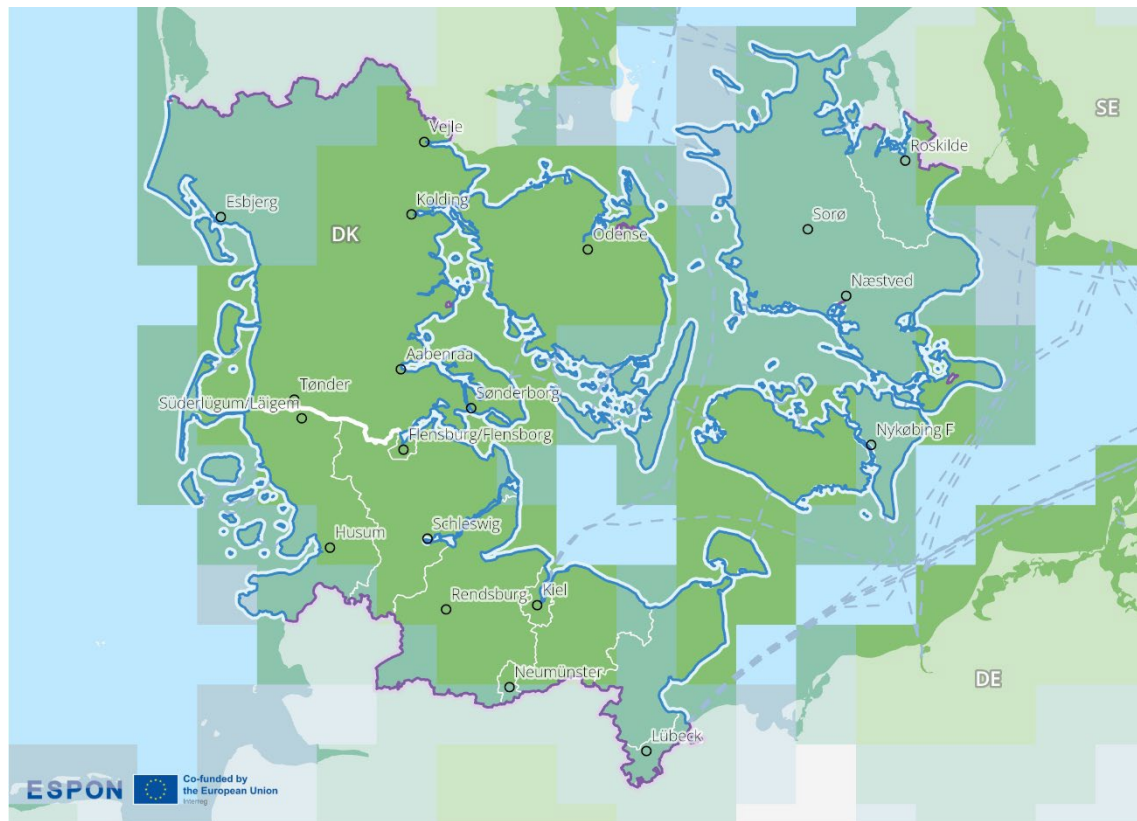
- **Source/method of retrieval:** The indicator is calculated based on Twitter (currently X) data. The digital footprint of individual users provides information about physical mobility flows and is used to calculate cross-border catchment areas of different intensity.
- **Temporal coverage:** 2013-2023
- **Unit:** n/a

Please refer to the technical annex for more information.

Figure 2.6 shows the cross-border catchment area in the border region based on mobility flows from 2013 to 2023, highlighting estimated cross-border mobility intensity across 3 different quartiles. The first quartile represents the 25% highest mobility intensity shown in dark green, the second quartile represents 25-50% coloured in green-blue, and the third quartile represents 50-75% in light blue.

The intensity of cross-border mobility of people within this cross-border region is variable. The highest mobility intensity is recorded in the central areas of the territory, around the cities of Vejle, Odense, Tønder, Husum, Rendsburg, and Kiel. On the western coast, the east and around the city of Lübeck, the intensity is predominantly moderate.

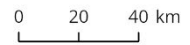
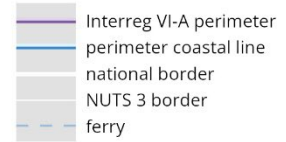
Figure 2.6: Cross-border mobility intensity



Estimated cross-border mobility intensity (2013-2023)



Level of detail: 20km aggregated grid
 Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
 Origin of data: ESPON CROSSGOV, 2026
 ©EuroGeographics for administrative boundaries



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2.1.2.3 Cross-border travel-time accessibility

Indicator description

The indicator shows the time it takes to travel from any location within a region to the next border crossing, using grid data and subsequent categorisations into accessibility groups of 30, 60 and 90 minutes. It reflects the accessibility in cross-border areas, considering road transport. The indicator can describe the quality and speed of road connections and thus spatial reach of the cross-border services.

- **Source/method of retrieval:** Based on the OpenStreetMap road network, the travel time to the border is calculated for a grid of the border area. Based on this, areas are calculated within which border crossings can be reached below thresholds of 30, 60 and 90 minutes. As additional visual element, key services pharmacies, doctors, hospitals and shops (retrieved from the ESPON PROFECY project) are displayed and categorised into the accessibility groups.
- **Temporal coverage:** 2025 (first quarter, for accessibility data), 2021 (for service facility data)
- **Unit:** Minutes

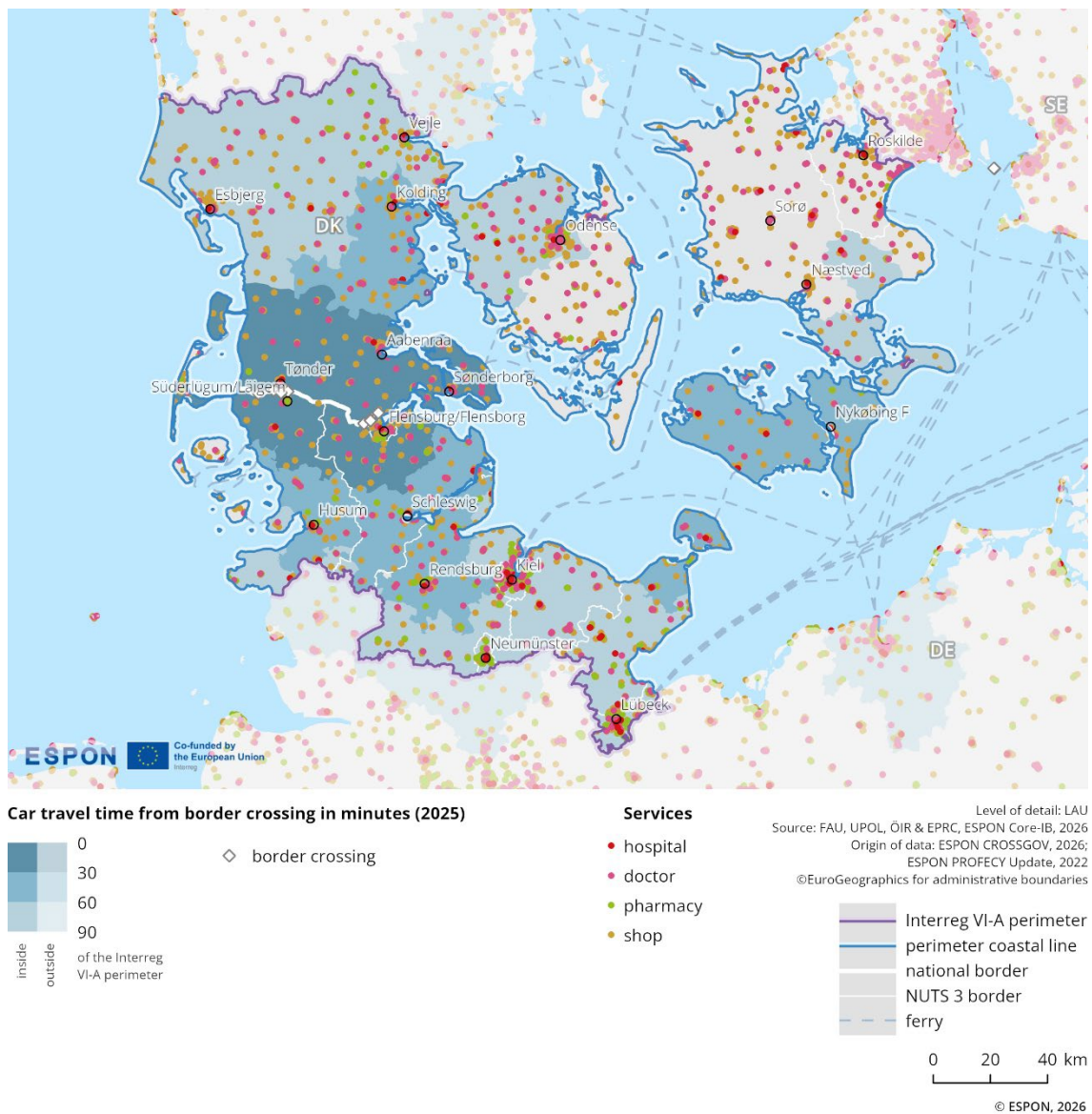
Please refer to the technical annex for more information.

Figure 2.7 illustrates cross-border travel time accessibility in the Interreg area, showing the time distance from the national border in 2025. The legend indicates 3 travel time categories in minutes (30, 60 and 90) represented by different shades of blue. In addition, it marks the location of services, including hospitals, doctors (general practitioners), pharmacies, and shops (supermarkets and convenient stores), with distinct coloured symbols.

The map shows that the short border between Germany and Denmark is surrounded on both sides by a wide zone of the shortest travel time category, up to 30 minutes. This is followed by bands with accessibility within 60 and 90 minutes of travel time. These 3 categories nearly almost completely cover the area. There is almost no category above 90 minutes of travel time from the border, except for the eastern part of Denmark in the islands. This means that the mainland border has a good road connection.

Services such as shops, hospitals, doctors, and pharmacies are evenly distributed. The largest concentration of services is in Flensburg (Germany), near the border on the east coast. Other centres of services are far from the border. e.g., Kiel (Germany) is located within a 90-minute travel time zone. The same travel zone of 90 minutes is for services located in Odense (Denmark).

Figure 2.7: Travel-time accessibility from border crossings



2.1.3 Key messages on the territorial dimension

The area has a closely connected land border but is also characterised by lengthy coastlines and islands. The area has a uniform pattern of settlements and population centres, with 14 urban centres and a uniform pattern of smaller central settlements across the area as a whole. The population density is above the EU average. The area has experienced moderate population growth, which is highest in the German border area. However, there is a decrease in the population aged 0-14 and only a slight increase in the working age population. The population aged 65 and over increased substantially, by 16%.

The programme area shows a varying pattern of settlement development, with settlement growth focussed around cities in the German parts of the programme area but more widespread in the Danish parts. These patterns could highlight variations in the extent and quality of urban-rural links in the area and impacts of population and economic growth. The intensity of cross-border mobility of people within this cross-border region is also variable, largely linked to the physical geography and connectivity of the area. The highest mobility intensity is recorded in the central part of the cross-border region, around the cities of Vejle, Odense, Tønder, Husum, Rendsburg, and Kiel.

Analysis of cross-border transport links show some comparatively fast road transport links, rail connections, as well as ferry links. This is despite having a long coastline and islands in the programme area. Analysis of travel time accessibility underlines that the mainland border has relatively good road connections. This indicates potential for expanding cross-border public transport services to reduce reliance on private cars and enhance regional integration.

2.2 Economic dimension

The economic dimension includes analyses of gross domestic product, labour market conditions, competitiveness, and key infrastructure and housing indicators. The aim is to illustrate the impact of the border on economic performance, whether it acts as a barrier or a bridge, and the extent to which integration is supported by labour mobility, remote working, and infrastructure connectivity.

2.2.1 Gross Domestic Product

This sub-dimension illustrates the economic situation of the border region by analysing gross domestic product (GDP). It shows economic development within the border region and how this has changed over time. Comparisons with the respective countries and the EU average provide important context for understanding the cross-border region's dynamics.

2.2.1.1 Gross domestic product per capita at current market prices

Indicator description

The indicator shows the regional GDP/capita in current prices and its development over the past years. It highlights structural differences and similarities between the border region and the respective national figures as well as the European average. Furthermore, it highlights patterns within the border region, although has to be interpreted with care in the case of a strong presence of commuters.

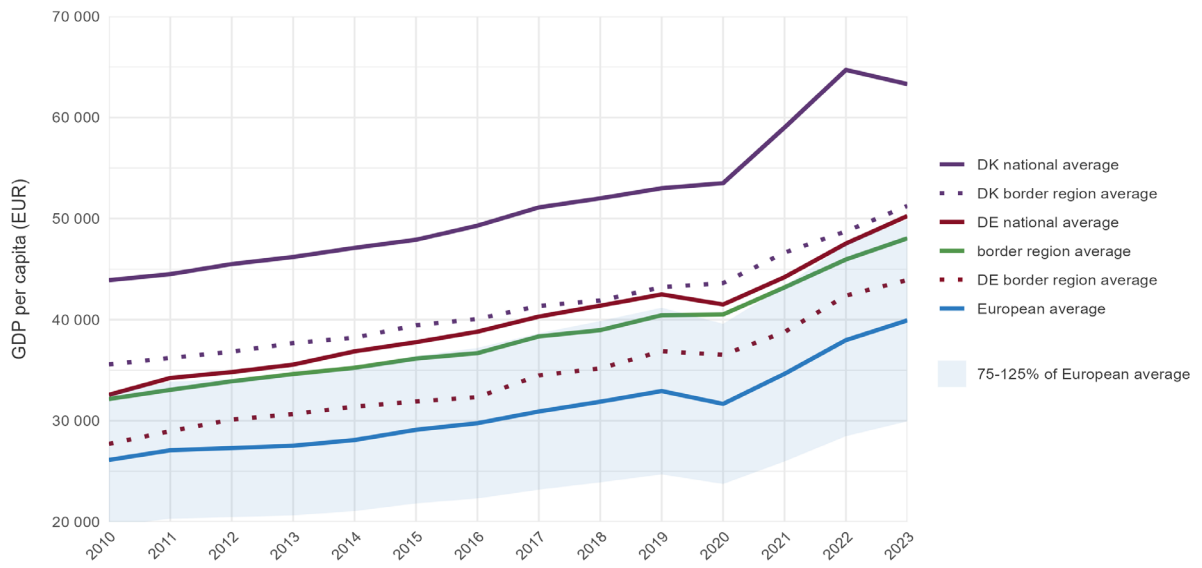
- **Source:** Eurostat, Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2010-2023
- **Unit:** Euro per capita

Please refer to the technical annex for more information.

The cross-border region shows a GDP per capita value of 127.5% of the EU average in 2022 and 129.5% of the average in European border regions in general. The programme area has experienced a 31.7% increase of GDP per capita in the border region between 2014 and 2022.⁵ This is 4 percentage points lower increase in the border region compared to the EU average and a 3.5 percentage points lower increase compared to the average of European border regions. The GDP per capita of both sides of the border remains firmly above the EU average, even though it trails behind the respective national averages.

⁵ Percentage changes are calculated using Eurostat data to ensure harmonised statistics from official sources. The latest year for which full coverage of all European regions is available on Eurostat is 2022. For visualisation purposes, ARDECO data has been used to enable longer time series to be visualised by filling the official dataset's existing gaps with model-based estimates. Therefore, slight deviations between the calculation and visualisation are possible.

Figure 2.8: Gross domestic product at current market prices (per capita)



2.2.2 Labour market and commuting

This sub-dimension highlights the existing and potential functional links within the labour market of the border region. It examines the employment situation and commuting patterns, as well as the role of telework agreements, and considers developments over time based on analysed indicators. The analysis identifies factors that facilitate or hamper cross-border labour market integration.

2.2.2.1 Share of employment

Indicator description

This indicator shows the share of employees in the population aged 15 to 64. Although it does not fully capture entrepreneurs, marginal employees, or civil servants, this is an important statistic for understanding general labour market patterns. It covers 2 aspects: first, high values can result from a high proportion of the resident population being employed. Second, high values can result from a high number of incoming commuters (from other NUTS3 regions within the country or from neighbouring countries). The same arguments apply to low values: they may indicate low levels of employment, or they may result from high shares of outgoing commuters. Values of more than 100% are possible, since the number of incoming commuters can exceed the number of inhabitants aged 15 to 64 (including both domestic and cross-border commuters).

- **Source:** Eurostat, Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2014-2023
- **Unit:** Share in %

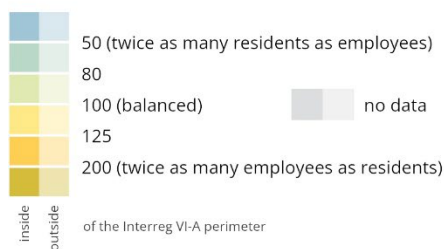
Please refer to the technical annex for more information.

Figure 2.9 illustrates the share of employment per capita in the population aged 15 to 64 in 2023. The data are categorised into ranges from below 50% (twice as many residents aged 15 to 64 as employees) to above 200% (twice as many employees as residents aged 15 to 64), with 100% representing a balanced ratio. Blue or green-coloured regions indicate more residents aged 15 to 64 than employees, while yellow regions indicate more employees than residents aged 15 to 64.

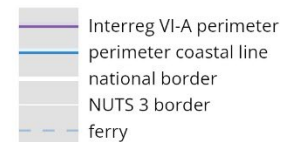
Figure 2.9: Employment share⁶



Share of employment per capita in % (2023)



Level of detail: NUTS3
 Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
 Origin of data: JRC/REGIO, Eurostat, 2025
 ©EuroGeographics for administrative boundaries



© ESPON, 2026

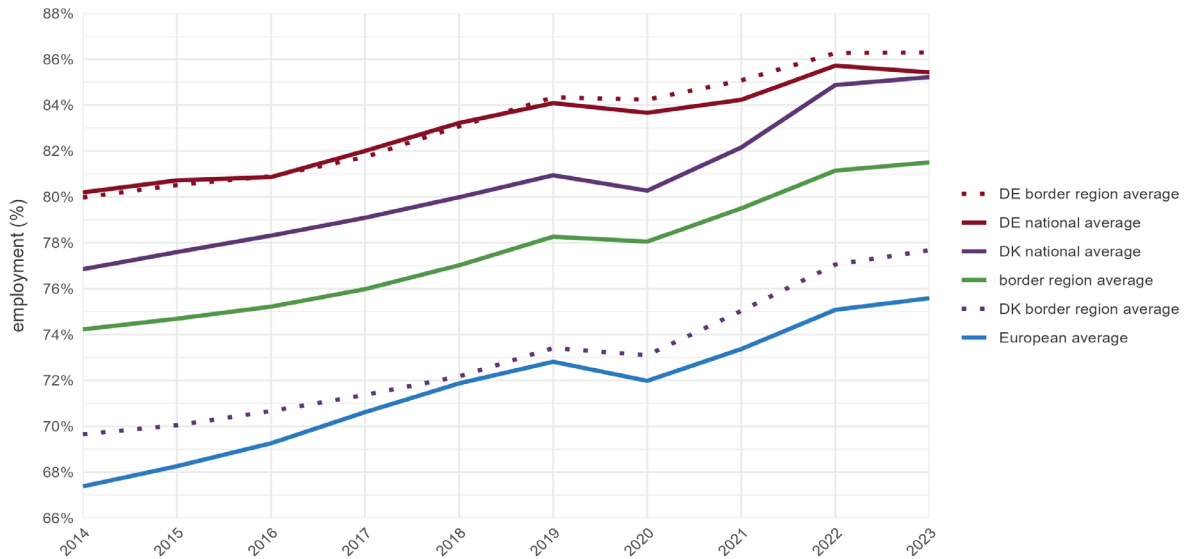
The share of employment in this border region is relatively stable, with the regional average reaching 81.5% in 2023, representing an increase of 7.3 percentage points since 2014. Values between 80% and 100% are observed in the mainland part of Denmark, as well as around the cities of Husum and Lübeck in Germany. In 3 small areas of the German part of the programme area, values fall within the 100-125% range. These are around Kiel, Neumünster, and Flensburg. In the remaining parts of the cross-border region, values range from 50% to 80%. When comparing the share of employment in this border region with different averages, the following can be observed (see Figure 2.10):

- › Compared to the European average, values in the cross-border region are higher by 5.9 percentage points; in 2014, the difference was 6.9 percentage points.
- › Compared to Denmark, values in the cross-border region are lower by 3.7 percentage points; in 2014, they were lower by 2.6 percentage points.
- › Compared to Germany, values in the cross-border region are lower by 3.9 percentage points; in 2014, they were lower by 6 percentage points.

⁶ Note: In this map, 'residents' refers to the population aged 15 to 64.

- › The Danish border area shows values 7.6 percentage points below the Danish national average. The German border area has values 0.9 percentage points above the German national average.
- › Compared to the average of all cross-border regions, values in this region are higher by 7.1 percentage points; in 2014, they were higher by 7.9 percentage points.

Figure 2.10: Employment share over time (comparison)



2.2.2.2 Share of working-age population

Indicator description

This indicator shows the share of people aged 15 to 64 in the total population, reflecting the potential working-age population. The population counted includes all residents who live in the country permanently, excluding foreign students and military personnel. Using the 15–64 age range is a standard European statistical proxy, since differences in retirement age or labour participation across countries cannot be captured systematically. It allows for regional differentiation of potential workforce throughout the border region.

- **Source:** Eurostat, Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2014-2023
- **Unit:** Share in %

Please refer to the technical annex for more information.

Figure 2.11 shows the evolution of the share of the working-age population in the Germany–Denmark cross-border region from 2014 to 2023. In 2023, the cross-border region shows an average working-age population share of 62.1%, compared to the European average of 63.9% and 63.7% for the average of all cross-border regions.

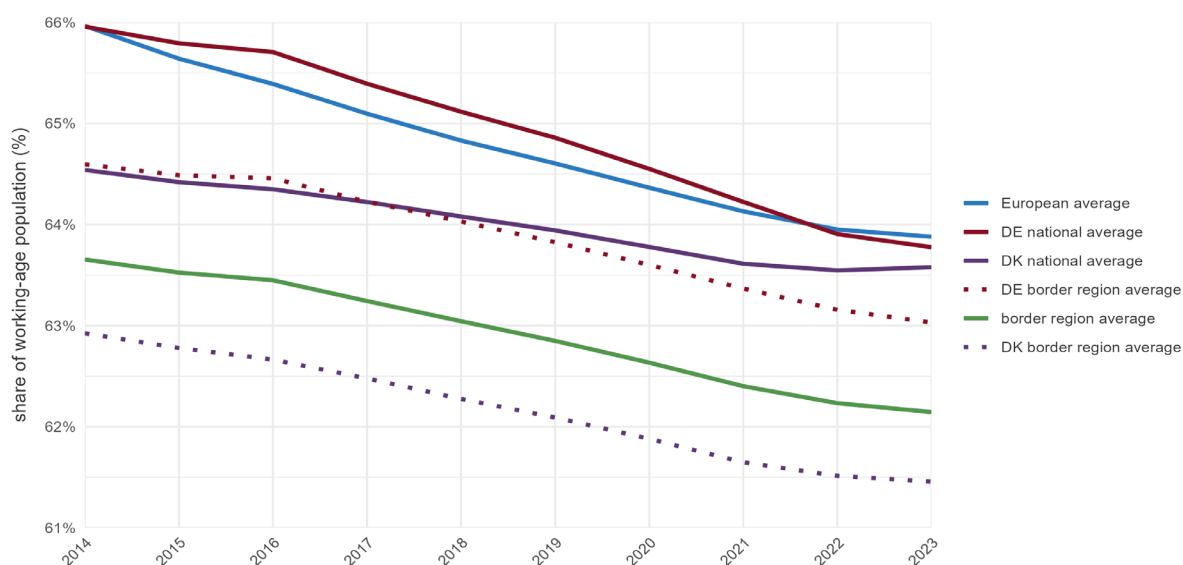
The share of the working-age population in the whole cross-border region is slightly lower than the German border average (63%), and slightly higher than the Danish border average (61.5%). Compared

to national levels, it is also slightly lower than both the German national average (63.8%) and the Danish national average (63.6%).

The programme area experienced a moderate 1.6 percentage point decrease in the share of working-age population between 2014 (63.7%) and 2023 (62.1%). This decline is slower than the European average, which dropped by 2.1 percentage points in the same period. All areas in the programme area show a declining trend, with the decrease being slightly more pronounced in the German parts (-1.6 percentage points at the border and -2.2 percentage points at the national level) than in the Danish parts (-1.4 percentage points at the border and -0.9 percentage points at the national level).

The Germany–Denmark cross-border region experienced a moderate overall decline in the share of the working-age population between 2014 and 2023. In 2023, the programme area remained below both the EU and cross-border averages, with comparable demographic trends on both sides of the border.

Figure 2.11: Share of working-age population over time (comparison)



2.2.2.3 Employment by sector

Indicator description

The indicator differentiates the number of jobs in a region by sector. This indicator focuses on workplace-based employment, providing insight into the employment landscape of a region. The dataset can be disaggregated according to “10-sector” NACE (Nomenclature statistique des activités économiques dans la Communauté européenne) classifications, allowing for detailed analysis of employment distribution across various industries.

- **Source:** Eurostat, Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2014-2023
- **Unit:** Share in %

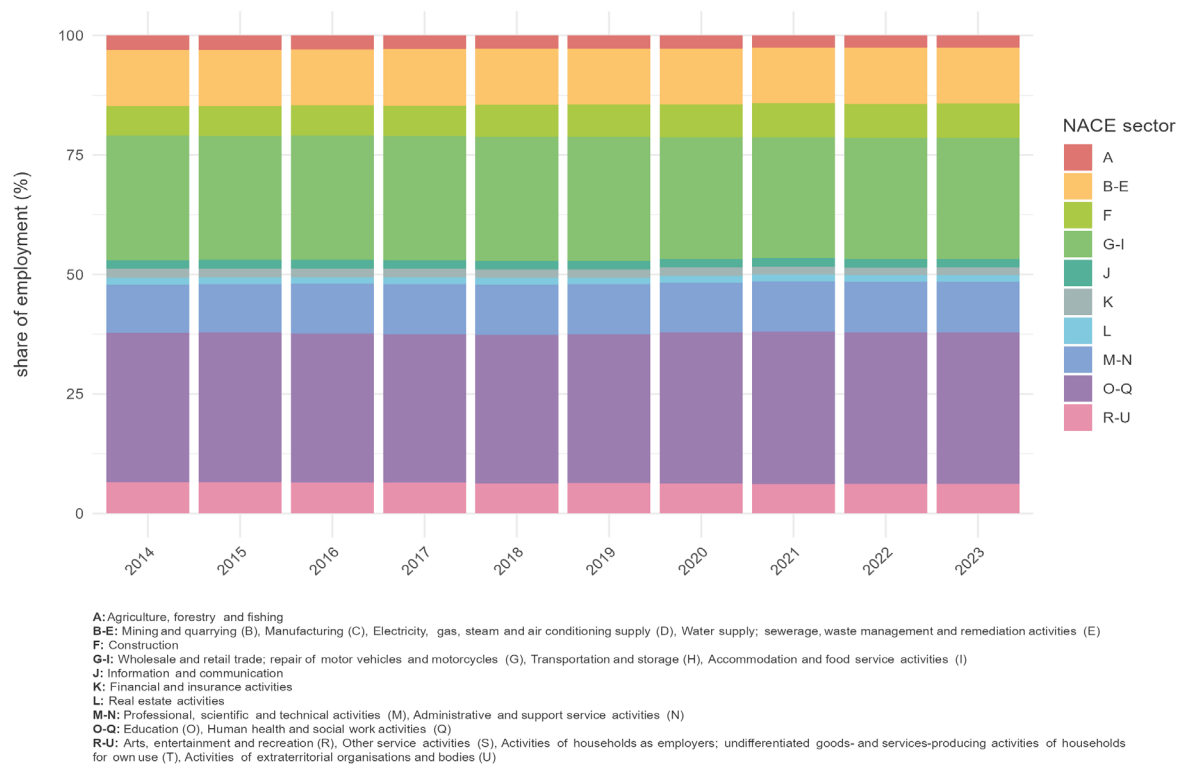
Please refer to the technical annex for more information.

Figure 2.12 illustrates the relative number of jobs in the border area differentiated by sectors. It shows where jobs are located (not where employed persons live). This workplace-based indicator offers insight into the employment structure of a region.

The dataset uses a '10-sector' classification based on NACE categories. The sectoral breakdown is as follows:

- › A: Agriculture, forestry and fishing
- › B-E: Mining and quarrying (B), Manufacturing (C), Electricity, gas, steam and air conditioning supply (D), Water supply; sewerage, waste management and remediation activities (E)
- › F: Construction
- › G-I: Wholesale and retail trade; repair of motor vehicles and motorcycles (G), Transportation and storage (H), Accommodation and food service activities (I)
- › J: Information and communication
- › K: Financial and insurance activities
- › L: Real estate activities
- › M-N: Professional, scientific and technical activities (M), Administrative and support service activities (N)
- › O-Q: Education (O), Human health and social work activities (Q)
- › R-U: Arts, entertainment and recreation (R), Other service activities (S), Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (T), Activities of extraterritorial organisations and bodies (U)

Figure 2.12: Employment by sector (comparison)



Between 2014 and 2023, the relative number of jobs in the different sectors remains relatively stable. There is a slight decline in the share of employment in agriculture, forestry and fishing (A). Conversely, there is a modest increase in the number of jobs in construction (F), professional, scientific and technical activities (M) and administrative and support service activities (N).

Over the entire period, the sectors with the highest share of jobs are 'B-E' (mining, quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply; sewerage, waste management and remediation activities, 'G-I' (wholesale and retail trade; repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities) and 'O-Q' (education, human health and social work activities).

2.2.2.4 Outgoing cross-border commuters

Indicator description

The indicator shows outgoing cross-border commuting dynamics at NUTS3 level. Even though no origin-destination information can be provided, it is assumed that commuters primarily travel across the nearest border. Spatial, economic and population arguments are combined to calculate the number of outgoing cross-border commuters.

- **Source/method of retrieval:** Eurostat/LFS data on outgoing commuters currently available on NUTS2 level has been regionalised for NUTS3 by means of weighting by border length, NUTS3 population-weighted centroid distance to border, population per NUTS3 region (15–64 years old) and real compensation per employee
- **Temporal coverage:** 2015-2023
- **Unit:** Share in %

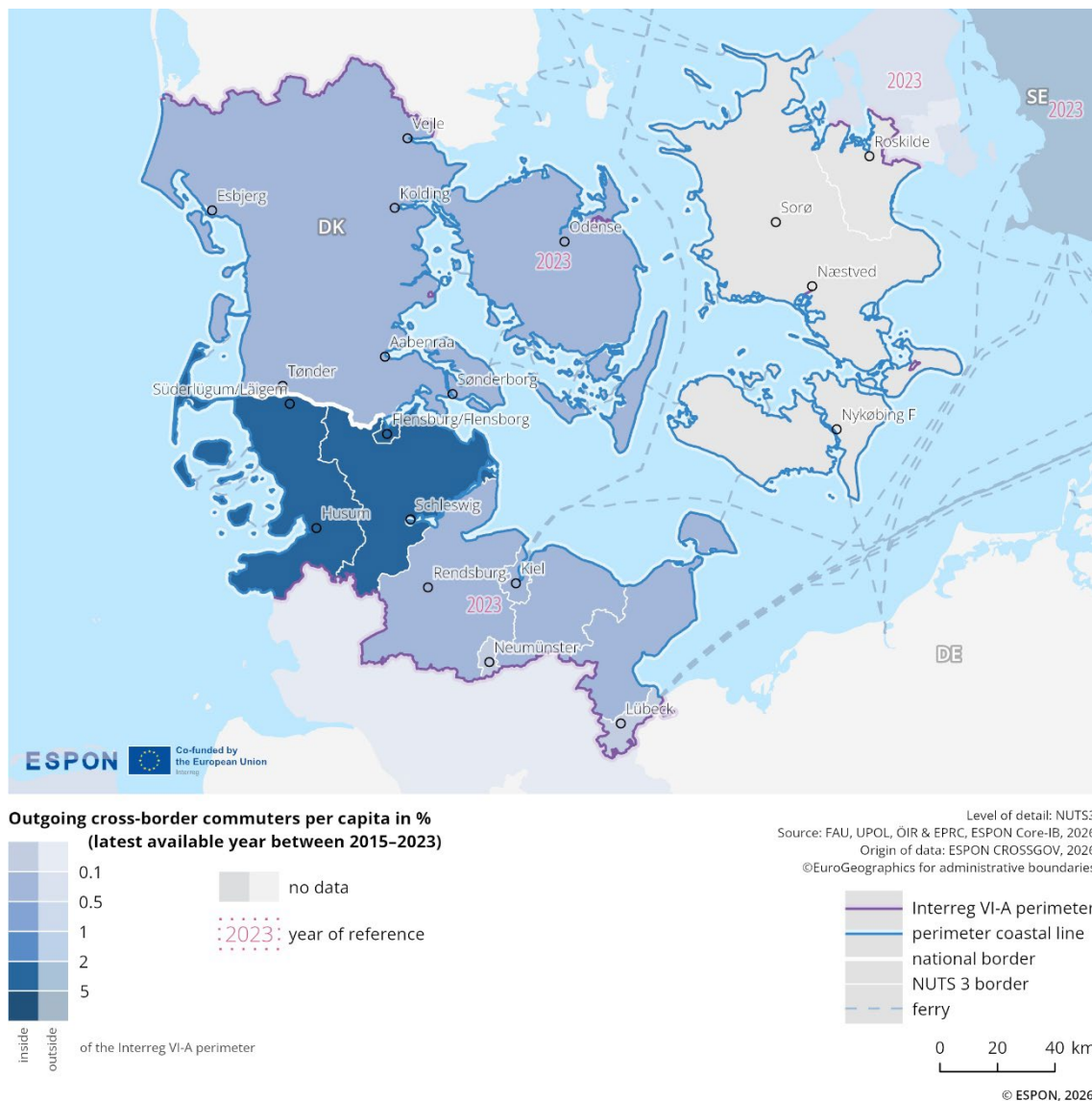
Please refer to the technical annex for more information.

Commuting is one of the most relevant cross-border flows to identify functional linkages. Figure 2.13 illustrates the share of outgoing commuters per capita for each NUTS3 region (more concretely speaking the share of outgoing commuters among the residential population of the age group 15-64 years old, resembling the potential labour force). Origin-destination information cannot be provided, but the share of outgoing commuters in regions close to the border indicates the relevance of commuting. It highlights functional relations in the labour market within the cross-border region.

The map illustrates the share of cross-border commuters, based on the most recent available year of data. It shows a relatively strong and even distribution of cross-border commuting activity in areas directly adjacent to the border on both the German and Danish sides. However, the German region of Flensburg (Kreisfreie Stadt) stands out in particular, with high levels of outgoing commuters, highlighting the important role of this border area as a commuting corridor.⁷ Other 'hotspots' include Nordfriesland and Schleswig-Flensburg, both located on the German side. These NUTS3 regions also show elevated shares of outgoing cross-border commuters per capita.

⁷ See Eurostat Statistical Atlas for NUTS3 (2021) regions: <https://ec.europa.eu/statistical-atlas/viewer/?config=typologies.json&ch=NUTS&mids=BKGCNT.NUTS2021L3.CNTOVL&o=1.1.0.7¢er=49.69576,14.33324&lcis=NUTS2021L3&>

Figure 2.13: Outgoing cross-border commuting patterns



2.2.2.5 Cross-border telework agreements

Indicator description

The indicator shows what kind of legal framework for cross-border telework is enacted.

- **Source/method of retrieval:** The indicator is based on information about the legal framework for social security regarding cross-border teleworking, categorised by border pair.
- **Temporal coverage:** Status as of March 2025
- **Unit:** n/a

Please refer to the technical annex for more information.

Denmark is not a signatory state of the 2023 Framework Agreement on Cross-Border Telework. Therefore, the 2 countries apply the standard rules under Article 13 of Regulation (EC) No. 883/2004. This means that cross-border telework is generally limited to 25% of the total working time, beyond which social security affiliation may shift to the country of residence.

2.2.3 Competitiveness

This sub-dimension illustrates the competitiveness of the border region by analysing the main industry sectors that contribute to its economic development. It assesses gross value added (GVA) at basic prices by sector, as well as nominal compensation per hour worked, in order to understand productivity levels and sectoral strengths.

2.2.3.1 Gross value added at basic prices by sector

Indicator description

The indicator shows the gross value added (GVA), which is a measure of the contribution of a country or region to the economy. Regional GVA represents the value generated by all units involved in the production of goods and services within a specific area. This indicator can be disaggregated by industry and service sector, allowing for a detailed analysis of economic contributions across different fields. Additionally, the sum of GVA across all industries or sectors, combined with taxes on products and minus subsidies on products, yields the gross domestic product (GDP) of the region. The dataset is available in "10-sector" NACE classifications, facilitating comprehensive evaluations of the regional economy.

- **Source:** Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2014-2023
- **Unit:** Million purchasing power standards (PPS)

Please refer to the technical annex for more information.

Figure 2.14 visualises gross value added (GVA), which is an important indicator of economic activity. GVA measures the value created by all economic activities involved in producing goods and services in a specific area. It is differentiated by sectors to provide detailed insights into the economic contributions of different fields.

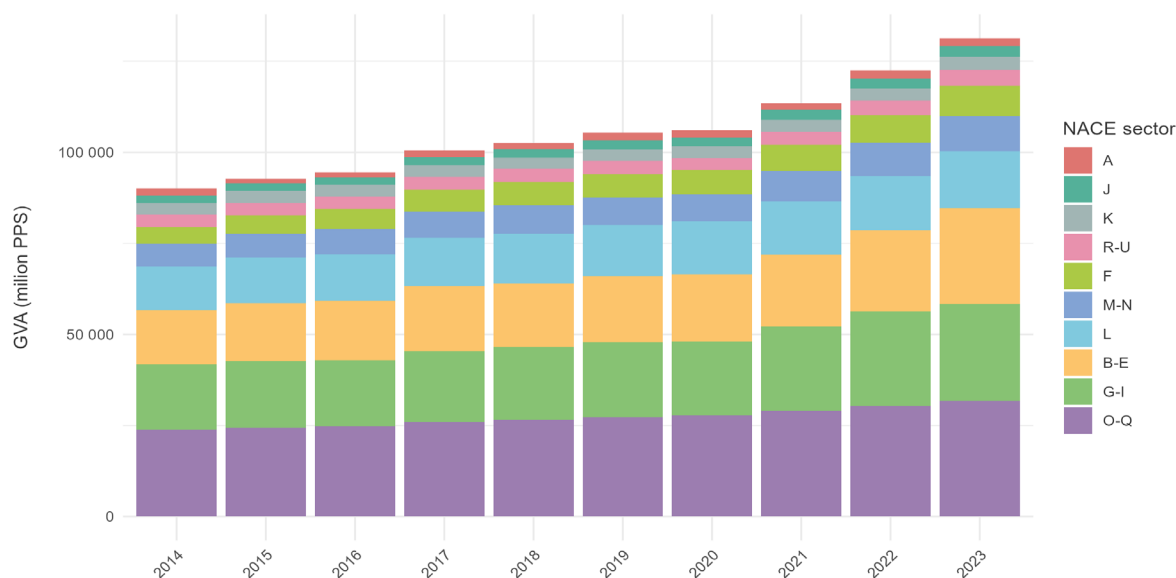
The dataset uses a '10-sector' classification based on NACE categories. The sectoral breakdown is as follows:

- › A: Agriculture, forestry and fishing
- › B-E: Mining and quarrying (B), Manufacturing (C), Electricity, gas, steam and air conditioning supply (D), Water supply; sewerage, waste management and remediation activities (E)
- › F: Construction
- › G-I: Wholesale and retail trade; repair of motor vehicles and motorcycles (G), Transportation and storage (H), Accommodation and food service activities (I)
- › J: Information and communication
- › K: Financial and insurance activities
- › L: Real estate activities
- › M-N: Professional, scientific and technical activities (M), Administrative and support service activities (N)
- › O-Q: Education (O), Human health and social work activities (Q)

- › R-U: Arts, entertainment and recreation (R), Other service activities (S), Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (T), Activities of extraterritorial organisations and bodies (U)

Between 2014 and 2023, the GVA in the border area of Germany-Denmark increased from 90,028 million purchasing power standards (PPS) to 131,266 million PPS, representing growth of 46%. Sector groups B-E, G-I, and O-Q together make up over half of the total GVA, highlighting their significant contribution to the regional economy within the border area. The sector groups O-Q contributed the largest share, with a total of 31,794 million PPS in 2023. This underlines the significance of sectors such as Education (O), Human health and social work activities (Q) in the Germany-Denmark border region.

Figure 2.14: Gross value added at basic prices by sector (comparison)



A: Agriculture, forestry and fishing
 B-E: Mining and quarrying (B), Manufacturing (C), Electricity, gas, steam and air conditioning supply (D), Water supply; sewerage, waste management and remediation activities (E)
 F: Construction
 G-I: Wholesale and retail trade; repair of motor vehicles and motorcycles (G), Transportation and storage (H), Accommodation and food service activities (I)
 J: Information and communication
 K: Financial and insurance activities
 L: Real estate activities
 M-N: Professional, scientific and technical activities (M), Administrative and support service activities (N)
 O-Q: Education (O), Human health and social work activities (Q)
 R-U: Arts, entertainment and recreation (R), Other service activities (S), Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (T), Activities of extraterritorial organisations and bodies (U)

2.2.3.2 Nominal compensation per hour worked

Indicator description

The indicator shows the average income paid for each hour worked, known as compensation per hour worked. This measure is calculated by dividing the “compensation of employees at current prices” by the total number of “hours worked (employees).” Employees, in this context, are defined as individuals engaged by contract in productive activities for a resident unit, receiving remuneration irrespective of their place of residence. The total hours worked is considered the most appropriate measure of labour input, representing the aggregate number of hours actually worked by employees. This indicator provides valuable insights into labour productivity and wage dynamics within the economy.

- **Source:** Annual Regional Database of the European Commission (ARDECO)
- **Temporal coverage:** 2023 (missing data from 2023 in Switzerland were supplemented by values from 2022)
- **Unit:** Euro

Please refer to the technical annex for more information.

Figure 2.15 shows the average values for the 'compensation per hour worked'. This indicator is calculated by dividing the total compensation of employees (at current prices) by the total number of hours worked by those employees. In this context, 'employees' are defined as individuals engaged by contract in productive activities. The data is available for the place of work, regardless of the place of residence. Total hours worked represent the actual number of hours worked by employees and are considered the most accurate measure of labour input.

In 2023, nominal compensation per hour worked in the Germany–Denmark border region appears to be somewhat unevenly distributed. In the German areas, the average hourly income ranges between €30 and €40, with no region reporting values significantly above the general range. In the Danish areas, the average hourly income ranges between €40 and €50, and no region reports a value above this general range. In comparison, the national averages of nominal compensation per hour worked for 2023 were €39.40 in Germany and €49.20 in Denmark.

Figure 2.15: Average income per hour



Average income per hour worked in euros (2023)



2.2.4 Infrastructure and housing

This sub-dimension shows the impact of the border on infrastructure and housing in the cross-border region. It assesses housing prices and average internet speed in order to identify cross-border effects, including potential price spillovers and disparities. The analysis reveals whether infrastructure and housing markets facilitate integration or expose structural challenges that are specific to the border area.

2.2.4.1 Advertised sales prices

Indicator description

The indicator shows the advertised sales price per square meter for houses/appartements as retrieved from commercial real estate websites at national level. In the cross-border region, local differences between average sales prices are highlighted and the “cutting” effect of the border and its influence on price levels is visualised.

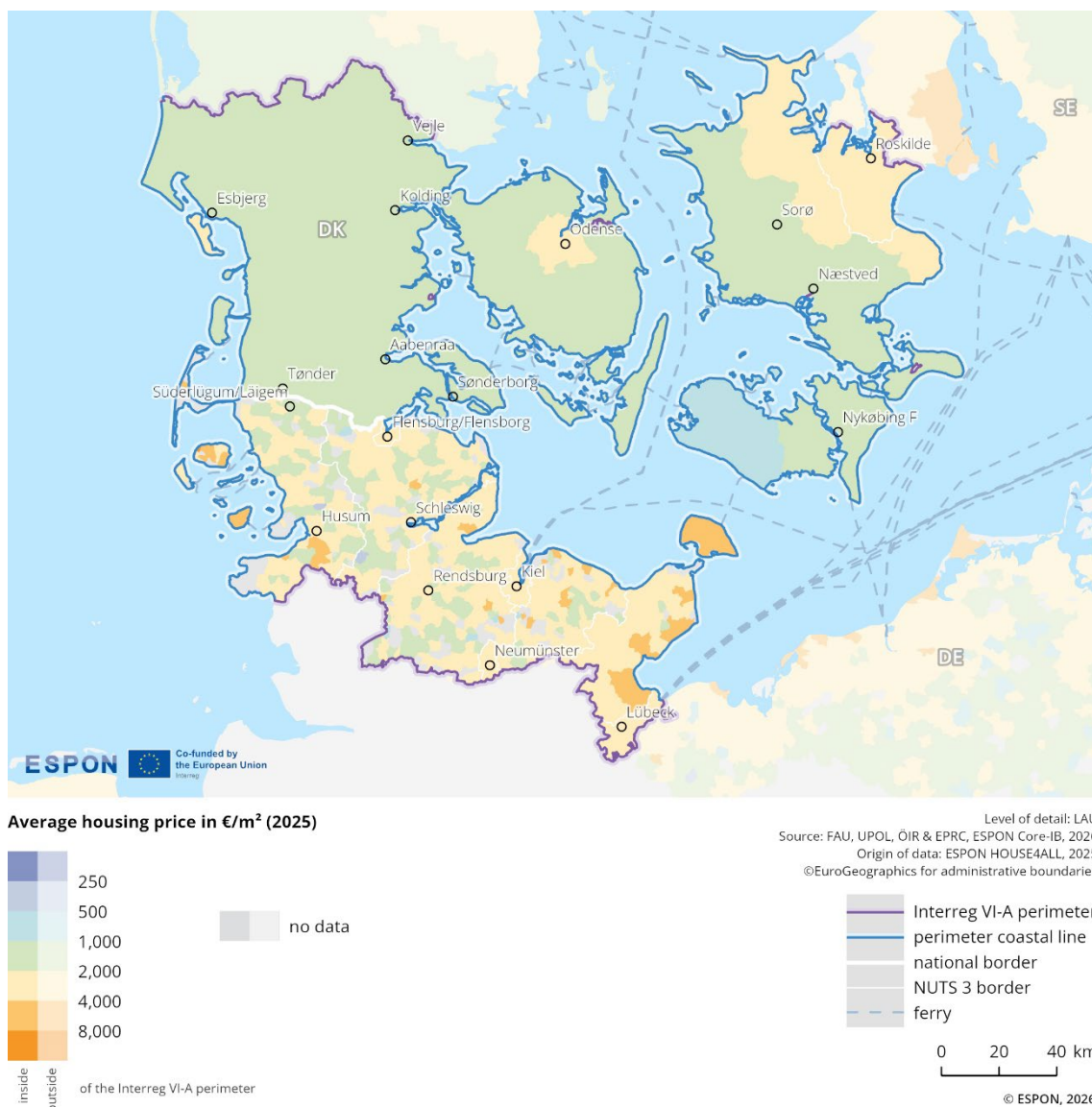
- **Source/method of retrieval:** Processed ESPON House4all data. The original data is collected via web-scraping of national listing websites over a one-year period.
- **Temporal coverage:** 2024/2025
- **Unit:** Average price per square meter (€/m²)

Please refer to the technical annex for more information.

Figure 2.16 illustrates the advertised sales price of housing in 2025 across the border region. The data are categorised into ranges of average housing price per square metre, from below 250 €/m² up to more than 8,000 €/m², shown in colours ranging from purple and blue to green, yellow and orange.

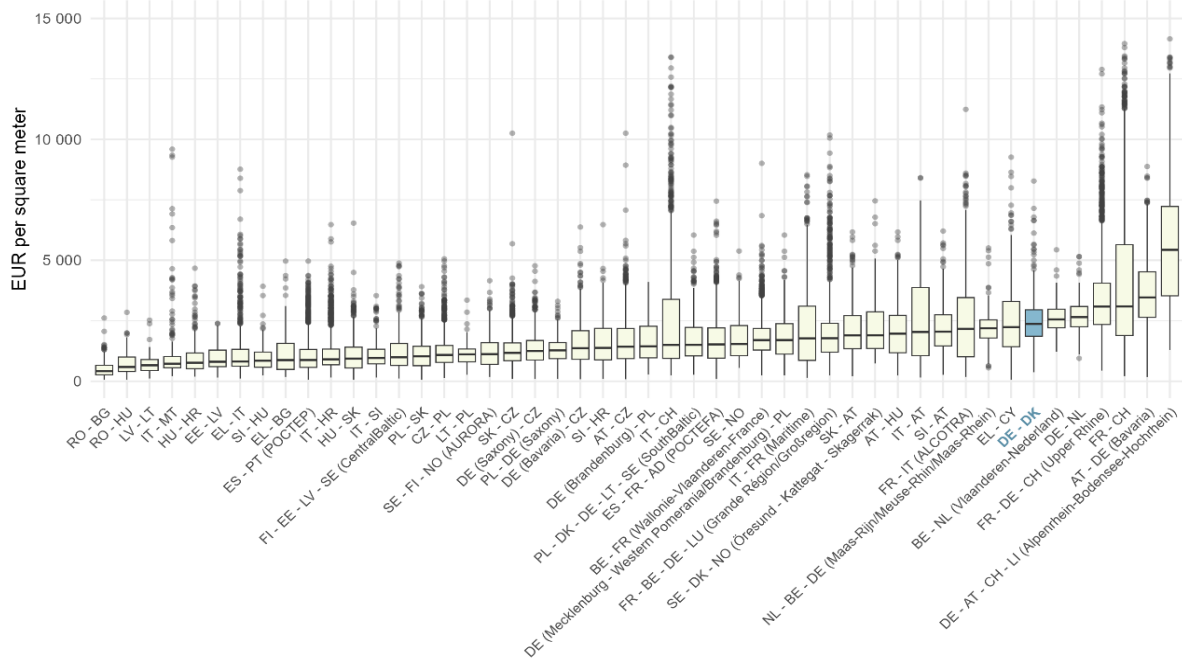
The cross-border area has a difference in average advertised sales prices between the Danish and German territories. The map shows that a large part of Denmark has the same price range for advertised house sales of between €1,000 and €2,000². Some areas of a higher price category are found in the vicinity of Odense and in the eastern part of the Danish cross-border area, up to €4,000/m². The German part of the cross-border area shows a pattern of 2 price categories, up to and above €2,000/m². The €4,000/m² limit is exceeded in several small coastal areas in the south towards the city of Lübeck, and prices are also higher on the German coastal island of Fehmarn, where an undersea tunnel to Denmark is being built.

Figure 2.16: Advertised housing prices



The border region in the German part of the programme area has an average advertised sales price of around €2,582/m². The part of the border region in Denmark has an average advertised sales price of around €1,868/m². The average advertised sales price in this whole border region is €2,523/m². This figure exceeds the average of all EU evaluated border regions, which is €1,900/m². The prices are below European average of €5,600/m².

Figure 2.17: Advertised housing prices (comparison)



2.2.4.2 Average internet speed

Indicator description

The indicator shows the population weighted average internet speed available at municipal level. It highlights differences in the “digital preparedness”. In border regions, this indicator is particularly relevant for identifying digital infrastructure gaps that may hamper balanced development and cross-border integration.

- **Source/method of retrieval:** Processing of data provided by Speedtest by Ookla Global Fixed and Mobile Network Performance Maps, based on Ookla’s analysis of Speedtest Intelligence data.
- **Temporal coverage:** 2022
- **Unit:** Download speed in Mbps

Please refer to the technical annex for more information.

Digitalisation is a highly relevant issue in European border regions, with the overarching objective of ensuring appropriate digital access. It is widely recognised as a key precondition for successful regional and economic development. A major challenge in this process is preventing ‘digital divides’, i.e., avoiding significant disparities in economic, social and spatial terms.

Average internet speed is a telling indicator of such disparities, highlighting differences in ‘digital preparedness’ at the local level. Figure 2.17 shows the average download speed at the municipality level. The colour scheme ranges from dark blue (very slow speeds) to orange (very fast speeds). The data, prepared by OBC Transeuropa for EDJNet, is based on Speedtest Intelligence data from Speedtest/Ookla’s Global Fixed and Mobile Network Performance Maps for the first quarter of 2022.

2.2.5 Key messages on the economic dimension

The area has strong shared characteristics. It has a GDP/capita value of 127.5% compared to the EU average in 2022 and 129.5% compared to other European border regions. However, it has experienced lower growth rates than the EU and has lower than national averages of GDP. Compared to the EU averages, high levels of employment are recorded across the area, although rates in the border area are lower than domestic averages.

The programme area experienced a moderate 1.6 percentage point decrease in the share of working-age population between 2014 and 2023. Between 2014 and 2023, the relative number of jobs available in the different sectors remained fairly stable and similar in the area, with slight increases in the number of jobs in Construction (F), professional, scientific and technical activities (M) and administrative and support service activities (N). Key employment sectors include 'B-E' 'G-I' and 'O-Q'. Sector groups B-E, G-I, and O-Q together make up over half of the total GVA, highlighting their significant contribution to the regional economy within the border area. Linked to reduced numbers in working age population and growth particularly in specific sectors a key challenge for the entire cross-border region is the shortage of skilled labour as well as a general labour shortage in some sectors.

The area has relatively strong cross-border commuting activity, but commuting across the border is particularly intense from the German border regions into Denmark, a finding reinforced by the European Commission; 2025 labour market analysis of the area.⁸ As the analysis shows, the drivers behind these patterns are high wage levels in Denmark, which are accompanied by favourable working conditions. Compensation per hour worked in the Germany-Denmark border region shows some variation, with average hourly income between €30 and €40 in Germany and €40 and €50 in Denmark. These strong commuting flows indicate a need for harmonised labour regulations and infrastructure planning to support sustainable cross-border workforce mobility.

House prices on the 2 sides of the border also show a slight variation, with higher levels in some urban and coastal areas. Average internet speed reveals significant differences between urban and rural areas in Germany. However, in Denmark, almost the entire area shows high internet speeds.

2.3 Green dimension

The green dimension highlights the environmental characteristics, vulnerabilities and sustainability-related interactions within the border region. The analysis provides insight into the environmental interdependence of border regions. Additionally, the spatial distribution of renewable and conventional energy infrastructure, alongside indicators of resources and the circular economy, reveals whether the border facilitates collaborative transitions towards sustainability.

2.3.1 Nature protection and pollution

This sub-dimension investigates cross-border functional links in protected areas and areas affected by air and water pollution. It analyses the presence of protected areas in order to identify cross-border ecological links and conservation efforts. It also highlights the extent to which air and water pollution affects people living in border regions.

⁸ CEC (2025) Cross-border regional labour market analysis Case study: region Schleswig – Sønderjylland (Germany – Denmark), AEBR, Directorate-General for Regional and Urban Policy (European Commission), HÉTFA, Nordregio, ÖIR, <https://op.europa.eu/en/publication-detail/-/publication/23a527c8-0b84-11f0-b1a3-01aa75ed71a1/language-en>

2.3.1.1 Protected areas

Indicator description

The indicator shows the presence and territorial coverage of protected areas based on the combination of 3 data sources, i.e., Nationally designated areas, Natura 2000 Network and Emerald Network.

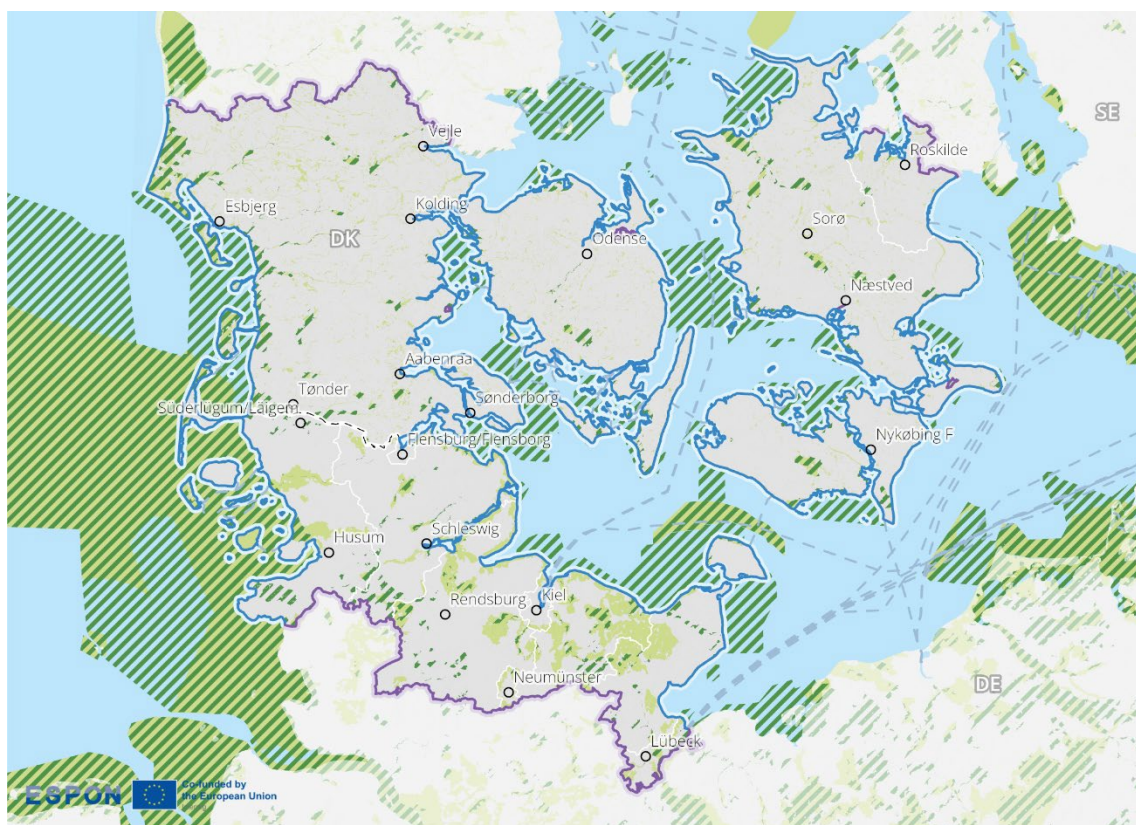
- **Source/method of retrieval:** The indicator represents a combination of nationally designated areas, Natura 2000 and Emerald network provided by EEA (European Environment Agency) Geospatial data catalogue.
- **Temporal coverage:** 2024
- **Unit:** n/a

Please refer to the technical annex for more information.




Figure 2.19 illustrates the distribution of protected areas in 2024 across the border region. The data differentiate between Natura 2000 sites, the Emerald Network, and nationally designated protected areas, with only protected areas larger than 4 km² displayed.

Coastal and marine protected areas dominate the spatial pattern, around all coastlines though. Several marine and coastal protected areas show continuity across the German–Danish border, particularly in the Wadden Sea region. Protected landbound areas within the Interreg region are comparably sparse and fragmented. However, in the southern (German) areas, particularly around Kiel, Lübeck, and Rendsburg, some Natura 2000 and national designated sites overlap. In contrast, the northern section of the cross-border region around Tønder, Esbjerg, and Vejle shows sparse or absent coverage of landbound protected areas within the Interreg boundary.

Figure 2.19: Nature protected areas








European protected areas (2024)

-  Natura2000
 -  Emerald Network
 -  national designated protected area
- inside
outside
of the Interreg VI-A perimeter

Only protected areas larger than 4km² were visualised on the map.

Level of detail: geolocalised areas greater than 4 km²
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON CROSSGOV, 2026
©EuroGeographics for administrative boundaries

-  Interreg VI-A perimeter
-  perimeter coastal line
-  national border
-  NUTS 3 border
-  ferry

0 20 40 km

© ESPON, 2026

2.3.1.2 Air pollution

Indicator description

The indicator shows the air pollution from fine particulates (PM2.5) at NUTS3 level. The data shows the population-weighted average air pollution level (µg/m³), providing an indication of the extent to which the regional population is affected by air pollution.

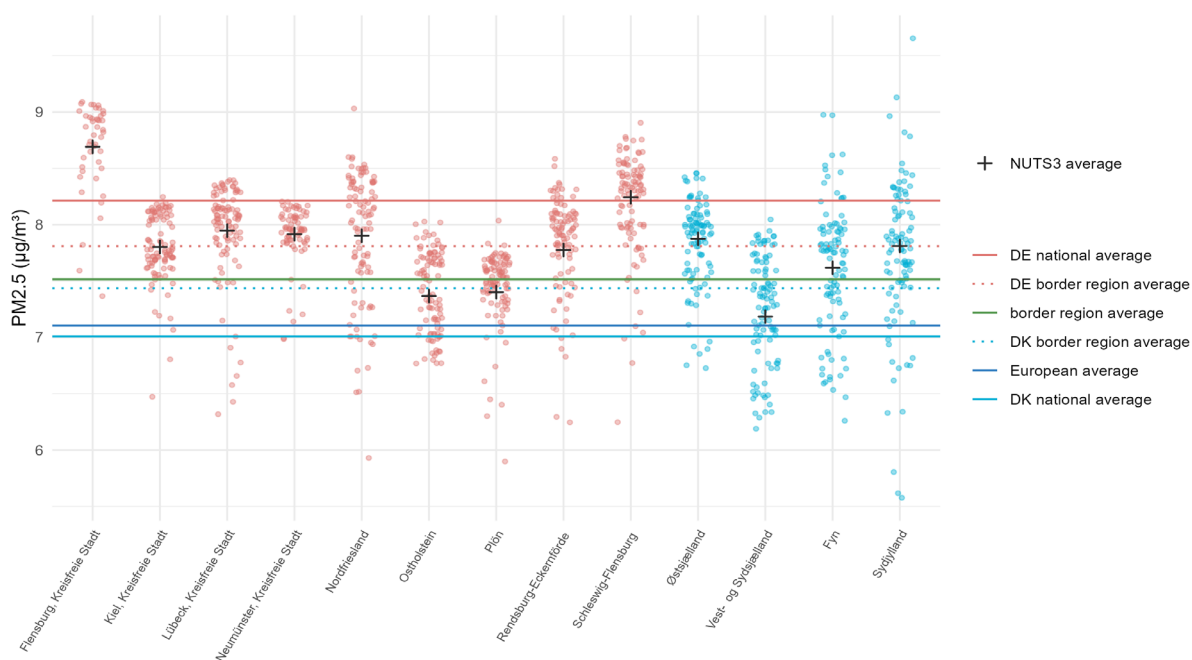
- **Source/method of retrieval:** Processing and analysis of European Environment Agency data
- **Temporal coverage:** 2022
- **Unit:** Population weighted average of µg/m³

Please refer to the technical annex for more information.

Figure 2.19 illustrates PM2.5 concentrations (in $\mu\text{g}/\text{m}^3$) across NUTS3 regions in Germany and Denmark. Each small dot represents an individual measurement, while the black crosses indicate the average PM2.5 concentration for each NUTS3 region.⁹ The regions are aligned along the x-axis, with German regions on the left (in red) and Danish regions on the right (in blue).

PM2.5 values in both countries span a wide range. Overall, the German national average is significantly higher than the Danish national average. However, the national average in Germany is higher than the average in the German border region. In contrast, the Danish border region average is higher than the Danish national average. While the Danish national average is slightly below the European average, both the Danish and German border regions averages are higher. The cross-border average is also noticeably above the European average, positioned between the higher German border region average and the lower Danish border region averages.

Figure 2.20: Air pollution



⁹ See Eurostat Statistical Atlas for NUTS3 (2021) regions: <https://ec.europa.eu/statistical-atlas/viewer/?config=typologies.json&ch=NUTS&mids=BKGCNT.NUTS2021L3.CNTOVL&o=1.1.0.7¢er=49.69576,14.33324&lcis=NUTS2021L3&>

2.3.1.3 Water pollution

Indicator description

The indicator shows the ecological status or potential for coastal and river water bodies. It is based on an assessment of biological, hydro-morphological, chemical and physico-chemical quality elements.

- **Source/method of retrieval:** Processing and analysis of European Environment Agency data
- **Temporal coverage:** 2022 (supplemented by 2016 data)
- **Unit:** n/a

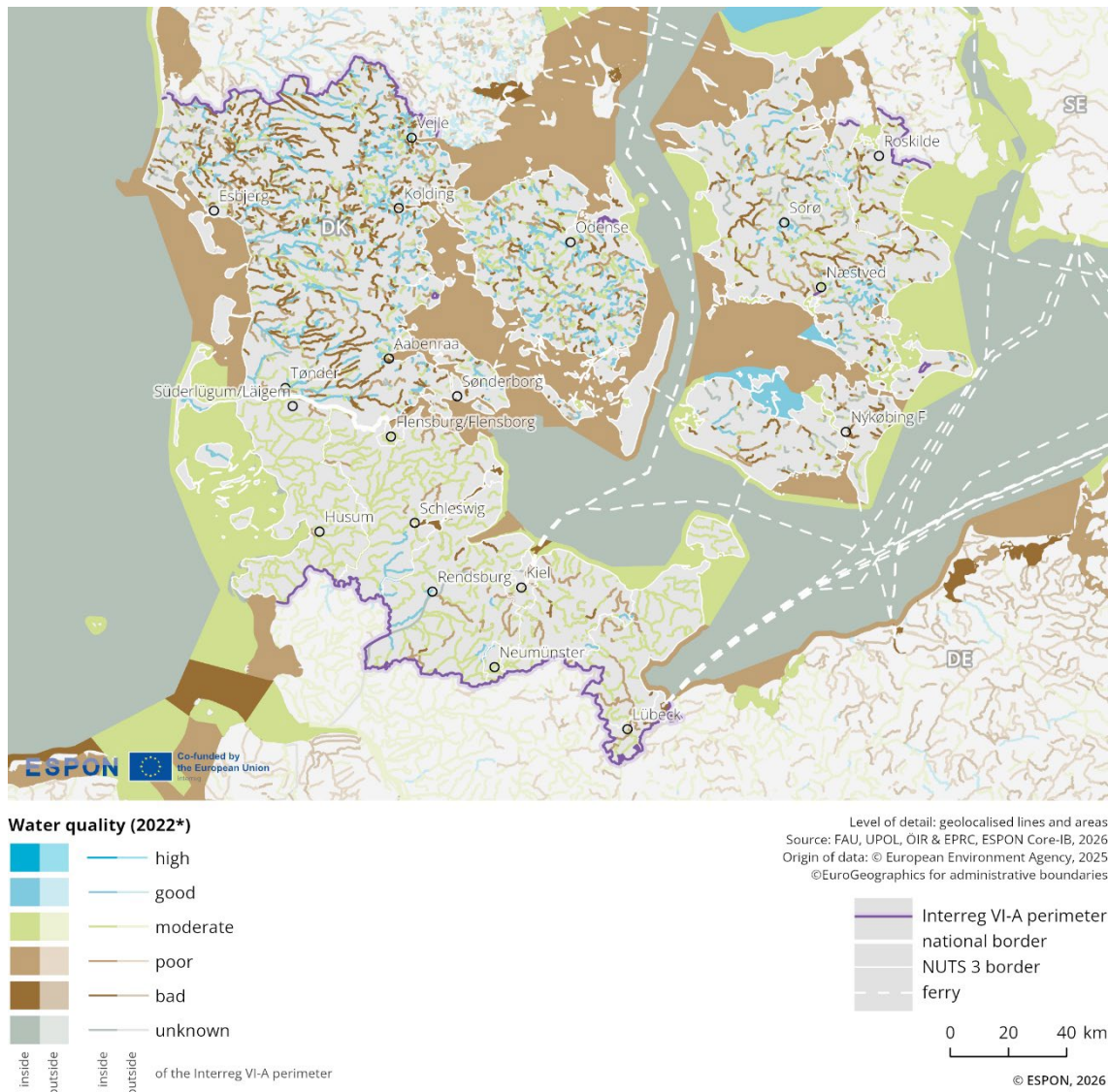
Please refer to the technical annex for more information.

Figure 2.20 illustrates water pollution levels in the Germany–Denmark Interreg region in 2022. Water quality is represented using 6 colour-coded categories, ranging from "bad" to "high", including an "unknown" category.¹⁰

In the Danish part of the Interreg region, water bodies across around the coast near Esbjerg, Kolding and Odense are predominantly classified as "poor" or "bad". Some smaller stretches are rated as "moderate", "good", or "high", but these are limited. Near the east coast the water quality is frequently rated as "moderate". In the German part of the Interreg region, rivers are predominantly classified as "moderate". Water bodies around Rendsburg and Kiel and Lübeck are slightly more rated as "poor" and "bad".

¹⁰ For more information see the Water Framework Directive Reporting Guidance (2022): https://cdr.eionet.europa.eu/help/WFD/WFD_715_2022

Figure 2.21: Water quality patterns



2.3.2 Climate risks and resilience

This sub-dimension examines cross-border functional links relating to climate risks and resilience. It analyses exposure to natural hazards such as landslides, earthquakes, droughts and floods in order to identify vulnerabilities and risks.¹¹

2.3.2.1 Natural hazard risks

Indicator description

The indicator shows the risk the border region is facing in relation to natural hazards (floods, droughts, landslides and earthquakes). The map highlights potential cross-border affectedness and allows to judge the relative relevance of each risk for the cross-border region.

- **Source/method of retrieval:** The indicator is based on geodata from the Disaster Management Risk Knowledge Centre/JRC. It provides the likelihood of specific natural hazard events at grid level.
- **Temporal coverage:** 2024
- **Unit:** n/a

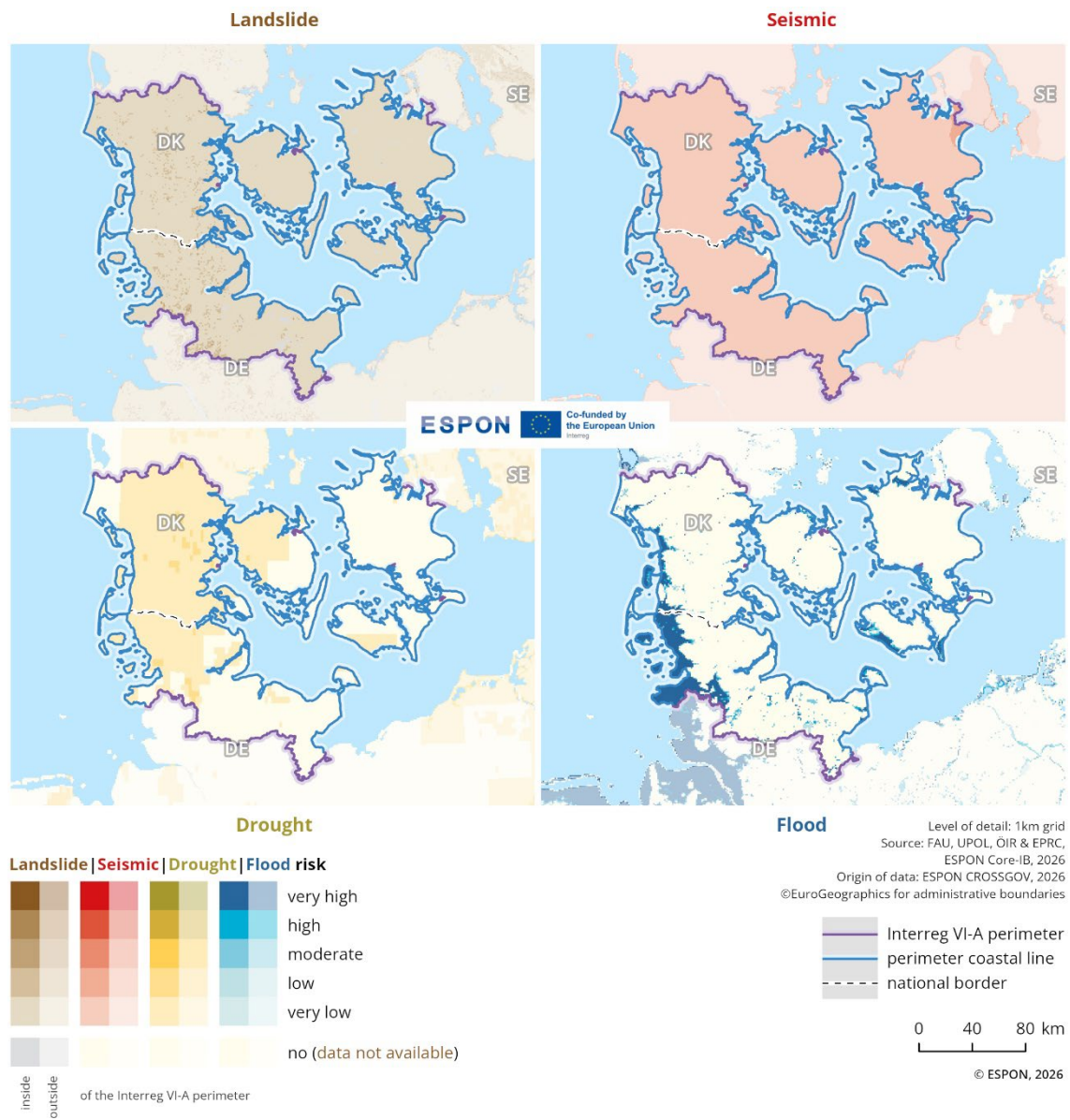
Please refer to the technical annex for more information.

Figure 2.21 illustrates the spatial distribution of natural hazards in the Germany-Denmark region, highlighting areas where risks are shared across national boundaries and where risks are not necessarily cross-border relevant.

The cross-border region has a very low risk of landslides, earthquakes and droughts that is shared across both sides of the border. However, there is a very high risk of flooding alongside the North Sea coast both in Germany and Denmark. The tidal flats, islands of the coast and the low elevation increase the risk of flooding.

¹¹ See also: European Commission 2024: Strengthening the Resilience of EU Border Regions, https://ec.europa.eu/regional_policy/sources/studies/KN-02-24-586-2A-N.pdf

Figure 2.22: Natural hazard risks



2.3.3 (Renewable) Energy and energy infrastructure

This sub-dimension assesses cross-border functional links in energy supply and infrastructure, focusing on existing connections and missing links. The distribution of power lines, energy infrastructure and power stations is analysed to identify supply patterns and potential integration gaps. The analysis reveals whether the border facilitates energy cooperation and connectivity, or if infrastructural differences create barriers.¹²

2.3.3.1 Power lines and energy infrastructure

Indicator description

The indicator shows the distribution of power lines and energy infrastructures in the cross-border region. The geodata highlights the existing links and gaps in the cross-border interconnections of the energy transmission network.

- **Source/method of retrieval:** Geodata on high-voltage energy infrastructure (100 kV and above) has been collected and processed from OpenStreetMap.
- **Temporal coverage:** 2025
- **Unit:** kV

Please refer to the technical annex for more information.

Figure 2.23 illustrates the distribution of power lines and cables in 2025 across the border region. The data distinguish between overhead and underground power lines, further classified into high-voltage (100-230 kV), extra-high-voltage (230-1,000 kV), and ultra-high voltage (above 1,000 kV).

The cross-border region of Germany-Denmark shows a relatively complex system of high- and extra-high-voltage transmission infrastructure. Due to the nature of the mainland part of the programme area, the main extra high-voltage power lines run in a north-south direction. However, in the northern part of the mainland, they branch off both to the west (where, in the vicinity of Esbjerg, they continue as underground and mainly submarine cables further west/southwest towards the Netherlands and the United Kingdom) and to the east towards the other Danish islands. Here the lines continue alternately on the surface, below ground, or under the sea. Interconnection between countries is relatively strong, both through high-voltage lines (both categories) and underground cables (although the latter run from the Danish part of the cross-border region outside its German part, they still end up in Germany).

¹² See also: European Commission 2025: Handbook on Cross-border Energy Communities, https://ec.europa.eu/regional_policy/sources/studies/2025/Handbook_on_Cross-border_Energy_Communities.pdf

2.3.3.2 Power stations

Indicator description

The indicator shows the location of power stations by type and energy production levels (coal, gas and oil, nuclear, hydro). It can indicate differences and complementarities in the national energy supply systems as well as highlight potential supply-demand links when viewed in conjunction with power lines infrastructure.

- **Source:** OpenStreetMap, Global Energy Monitor, JRC Hydro-power plants database
- **Temporal coverage:** 2025
- **Unit:** MW

Please refer to the technical annex for more information.

In the Germany-Denmark cross-border region, in total, there are 7 power station locations and their classification into types is straightforward - they are all gas and oil power stations (see Table 1).

Table 1: Number and type of power stations

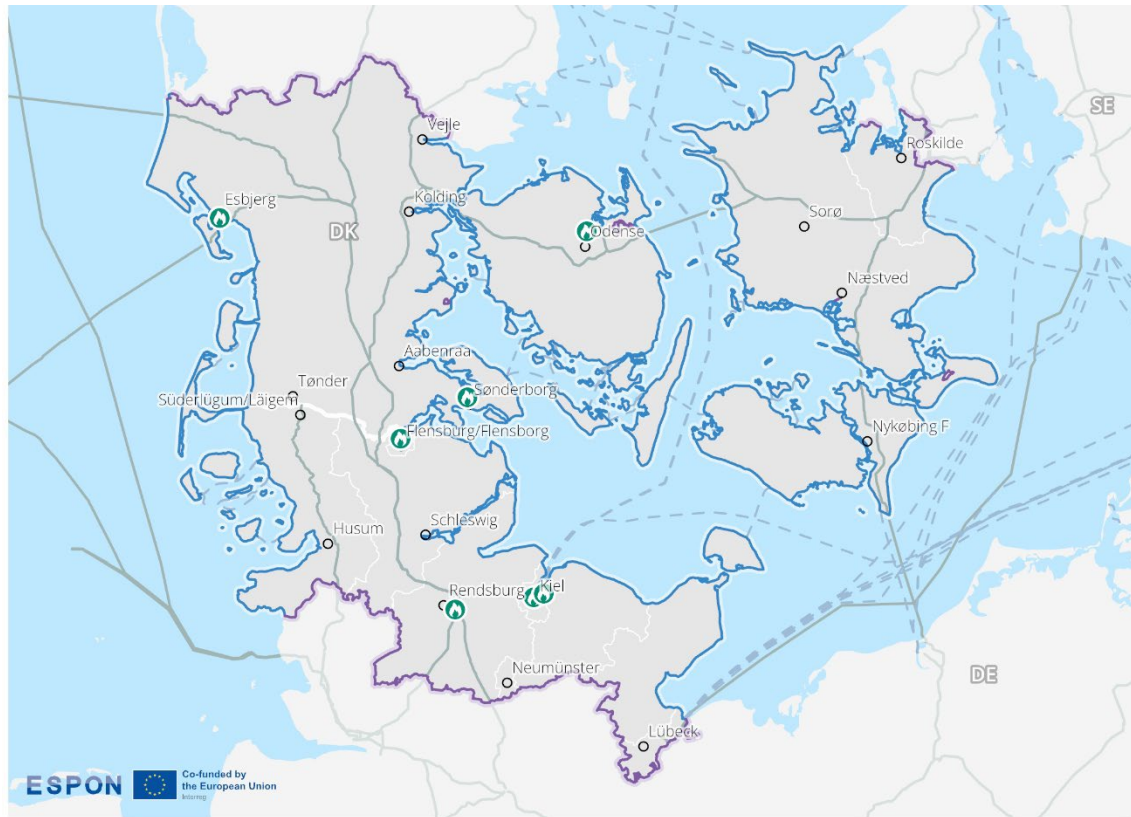
Power stations/plants	Less than 1GW	1GW and up
Nuclear	/	/
Coal	/	/
Gas and oil	7	/
Hydro	/	/

3 stations are located in Denmark, in Esbjerg, Odense, and relatively close to the border with Germany (in Sønderborg) (see Figure 2.24). The remaining 4 gas and oil power stations are located in Germany, one of which (Flensburg) is almost directly on the border with Denmark. This power station has 3 different operations. 2 other locations are near the city of Kiel and one near Rendsburg, both latter mentioned being located in the south-eastern part of the cross-border region.

On a different scale, the EC report on Cross-border Energy Communities (2025) notes the case of a cross-border district heating system between Flensburg and Padborg (DE-DK), which has been in operation since 1983.¹³

¹³ CEC (2025) Handbook on Cross-border Energy Communities, Spatial Foresight, Eurac, EureConsult, https://ec.europa.eu/regional_policy/sources/studies/2025/Handbook_on_Cross-border_Energy_Communities.pdf

Figure 2.24: Power stations infrastructure



Power stations (2025)

- nuclear
 - coal
 - gas and oil (greater than 20MW)
 - hydro (greater than 20MW)
- ≥ 1GW
 < 1GW

Power lines and cables (2025)

- ≥ 230kV
 inside
 outside
 of the Interreg VI-A perimeter

Level of detail: geolocated point and linear features
 Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
 Origin of data: ESPON CROSSGOV, 2026
 ©EuroGeographics for administrative boundaries

- Interreg VI-A perimeter
- perimeter coastal line
- national border
- NUTS 3 border
- ferry



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2.3.4 Resources and circular economy

This sub-dimension focuses on resource use patterns in the border region and their implications for circular economy practices. It analyses resource productivity and waste generation in order to evaluate the efficiency and sustainability of resource utilisation across the border.

2.3.4.1 Resource productivity

Indicator description

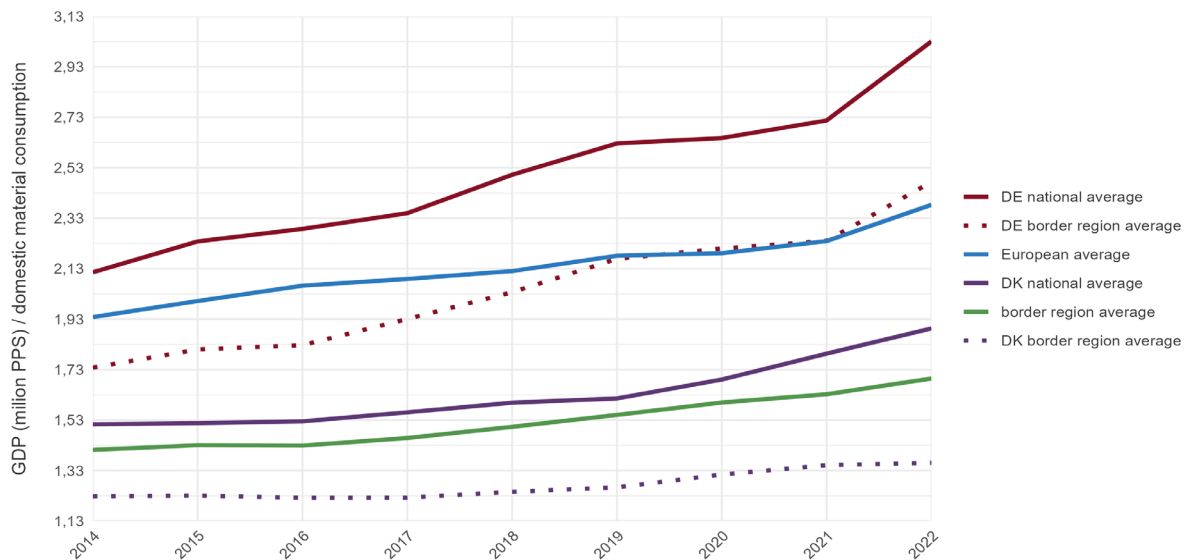
The indicator shows the economic value generated per unit of material consumed for each region within the cross-border area. Developments over time provide insights if the decoupling of productivity from resource use is progressing on regional level.

- **Source/method of retrieval:** Processing of Eurostat and ESPON CIRCTER (Circular Economy and Territorial Consequences) Update data
- **Temporal coverage:** 2014-2022
- **Unit:** PPS/tons

Please refer to the technical annex for more information.

Figure 2.25 illustrates the development of GDP per unit of domestic material consumption in million PPS/DMC (purchasing power standards per domestic material consumption) between 2014 and 2022. The data compare the national averages, the averages of their respective border regions, and the overall border regional average with the European average.

Figure 2.25: Resource productivity



The German national average of resource productivity is represented by the highest line in the graph, showing an increase over the period from approximately 2.13 in 2014 to over 3.03 million PPS/DMC in 2022. The German border region average follows a similar trend but remains significantly lower, reaching around 2.43 million PPS/DMC in 2022.

The Danish national average also shows an upward trend over the observed period but remains significantly below both the German values and the European average, while still being slightly higher than the border region average. The Danish border region average follows a similar pattern, but at lower levels.

The European average lies notably below the German national average, but during the period from 2014 to 2019, it was higher than the German border region average. From 2020 onward, the 2 values are almost aligned, and from 2021, resource productivity in the German border region increases more strongly. The border region average represents a combination of the higher values from the German border regions and the lower values from the Danish border regions, reaching approximately 1.73 million PPS/DMC in 2022. However, notable disparities exist within the border region itself.

2.3.4.2 Generation of waste per GDP

Indicator description

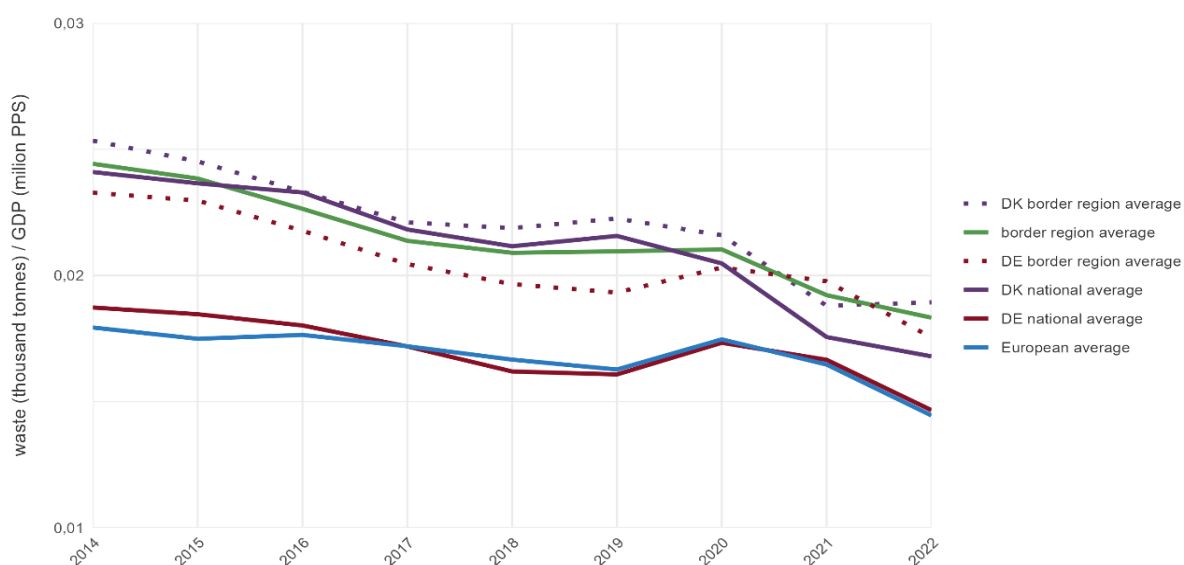
The indicator shows the regional distribution of waste creation in relation to the GDP development. Comparing waste generated to GDP reflects the waste intensity of the economy and provides a measure of “eco-efficiency”. Observation of its change from year to year permits to assess whether the economy is able to produce more wealth while at same time generating less waste.

- **Source/method of retrieval:** Processing of Eurostat and ESPON CIRCTER Update data
- **Temporal coverage:** 2014-2022
- **Unit:** Tons/PPS

Please refer to the technical annex for more information.

Figure 2.25 illustrates the trend in waste generation relative to economic output, measured in tonnes of waste per million PPS (Purchasing Power Standard) of GDP from 2014 to 2022 in Germany, Denmark and their Interreg border region.

Figure 2.26: Waste generation per GDP



The averages for both the German national level and the German border regions show a gradual downward trend over the entire period. The average for the German border region is consistently higher than the national German average, which closely aligns with the European average. Danish values are generally higher than the German ones but show a marked decline, particularly since 2020. Throughout the period, the average for the Danish border region remains slightly above the national Danish average.

The European average gradually decreases from around 0.018 in 2014 to approximately 0.015 tonnes of waste per million PPS in 2022. The cross-border regional average remains significantly above the European average and lies between the higher values of the Danish border region and the lower values of the German border region. However, some fluctuations can be observed from 2020 onward. In 2022, it reaches a value of approximately 0.018 tonnes of waste per million PPS.

2.3.5 Key messages on the green dimension

With a long coastline, marine and coastal protected areas are a key characteristic of the area, and several are linked across the German and Danish border. In contrast, inland protected areas are more fragmented. Air quality in the cross-border area is notably higher than the EU average. In terms of environmental risks, high levels are visible along the Danish and German coastlines, particularly for tidal flats, islands and areas with low elevation.

Energy infrastructure and interconnectivity are strong, with some long-standing cross-border cooperation. The cross-border region has a complex system of high- and extra-high-voltage transmission infrastructure. The area is identified in the EC Handbook on Cross-Border Energy Communities (2025) as amongst the areas with the strongest national foundations for enabling cross-border energy communities.¹⁴ This potential can extend to joint solutions around energy consumption, production and planning.

Average levels of resource productivity have generally increased across the area, with the highest levels in Germany and notable disparities exist within the border region. There has been a gradual decline in waste generation. However, the cross-border regional average remains significantly above the European average and lies between the higher values of the Danish border region and the lower values of the German border region. All these points underline the need for ongoing cooperation on the adoption of green solutions and indicate opportunities in the field of circular economy policies. The decline in waste suggests potential for joint recycling facilities.

¹⁴ CEC (2025) Handbook on Cross-border Energy Communities, Spatial Foresight, Eurac, EureConsult, https://ec.europa.eu/regional_policy/sources/studies/2025/Handbook_on_Cross-border_Energy_Communities.pdf, p. 19.

2.4 Socio-economic dimension

The socio-economic dimension examines patterns of social integration, tourism, and access to public services in the border region. It identifies how socio-cultural links; visitor flows and essential services influence development in the cross-border area. By examining interpersonal interactions via social media, language similarities, tourism intensity, and the accessibility of facilities such as secondary schools, grocery shops, hospitals, doctors, pharmacies and cinemas this dimension highlights both functional integration and potential socio-spatial differences.

2.4.1 Social integration

This sub-dimension evaluates the level of social integration in the border region by identifying areas with low or high cross-border connectivity. It analyses cross-border connectivity in social media and language similarities across and along national borders to evaluate the potential for cultural and social integration.

2.4.1.1 Cross-border connectivity in social media

Indicator description

The indicator refers to the existing connections between users of META social media (in particular Facebook) across the border. It aims at giving an overview of the degree of personal connectivity between inhabitants of the border area. Even though not all these internet connections will relate to real communication exchanges but sometimes just “following” content from other users, they give an overview of interpersonal and cultural knowledge of the social media landscape from across the border.

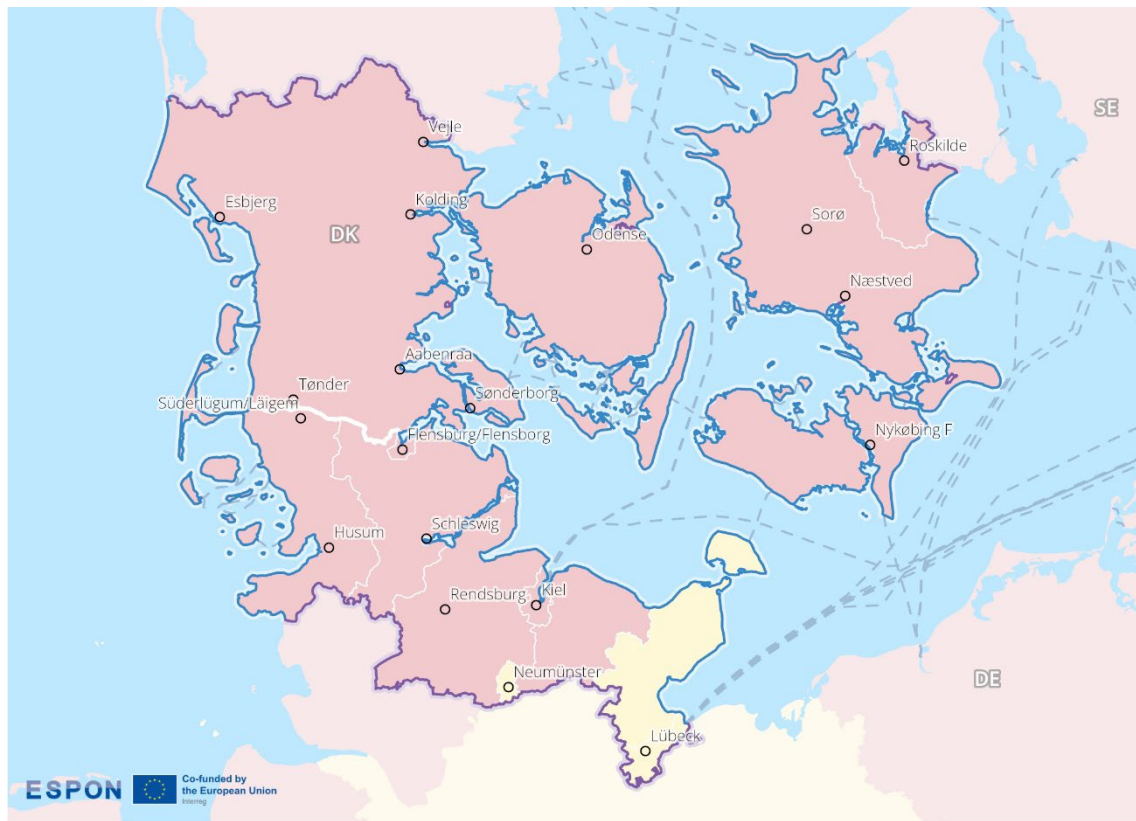
- **Source/method of retrieval:** Processing Facebook data on existing connections across the border (data for Good Meta)
- **Temporal coverage:** 2021
- **Unit:** n/a

Please refer to the technical annex for more information.

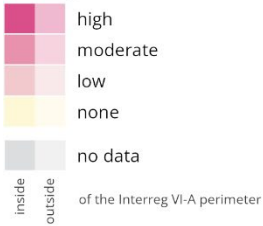
Figure 2.27 illustrates the spatial distribution of cross-border connectivity based on Facebook information in the border area. The different shades of pink indicate varying intensities of connectivity, ranging from low to high, with darker tones representing stronger intensity of cross-border connectivity in social media.

Based on this measure, the intensity of cross-border connectivity among residents of this border region is largely uniform, and thus no cross-border differences are evident between the included countries. Cross-border connectivity is low across most of the programme area, including cities such as Vejle, Odense, Esbjerg, Kolding, Tønder, Husum, Rendsburg, and Kiel. No cross-border connectivity intensity is recorded in 2 areas in the southern part of the cross-border region: a small NUTS3 unit south of Kiel and the area around Lübeck.

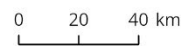
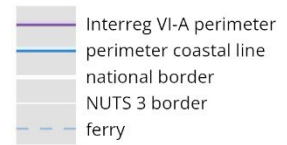
Figure 2.27: Cross-border connectivity in social media



Intensity of cross-border connectivity based on META data (2021)



Level of detail: NUTS3
 Source: FAU, UPOL, ÖIR & EPRC, ESPON Core-IB, 2026
 Origin of data: ESPON CROSSGOV, 2026
 ©EuroGeographics for administrative boundaries



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2.4.1.2 Language similarities along national borders

Indicator description

The indicator specifies whether the language is the same across the border, whether the respective national languages have commonalities, whether while different, there are local linguistic commonalities, and whether the language is different.

- **Source/method of retrieval:** ESPON cross-border public services (CPS) 2.0 database along border segments
- **Temporal coverage:** 2022
- **Unit:** n/a

Please refer to the technical annex for more information.

2 different languages characterise the border region. In the German border region there are approximately 50,000 members of the Danish minority in Southern Schleswig, many of whom still speak Danish fluently or at home. These communities are concentrated around Flensburg, Nordfriesland, and Schleswig-Flensburg. There is also smaller German minority on the Danish side of the border, comprising c. 15,000 people, mainly in the municipalities of Aabenraa, Tønder and Sønderborg.

2.4.2 Tourism

This sub-dimension identifies key tourism hotspots in the border region to highlight tourism dynamics. It analyses the number of nights spent in tourist accommodation establishments in order to evaluate the attractiveness of, and developments in, the tourism sector. Comparisons with the respective countries and the EU average provide context for understanding the cross-border region's dynamics.

2.4.2.1 Nights spent at tourist accommodation establishments

Indicator description

The indicator shows the number of nights a guest or tourist actually spends in a tourist accommodation establishment or non-rented accommodation (overnight stays). This may reveal the tourism attractiveness of a region and shed light on the role of tourism in the local economy, i.e., tourists/guests staying overnight may spend more in the region than one-day visitors.

- **Source:** Eurostat
- **Temporal coverage:** 2020-2023
- **Unit:** Nights per capita

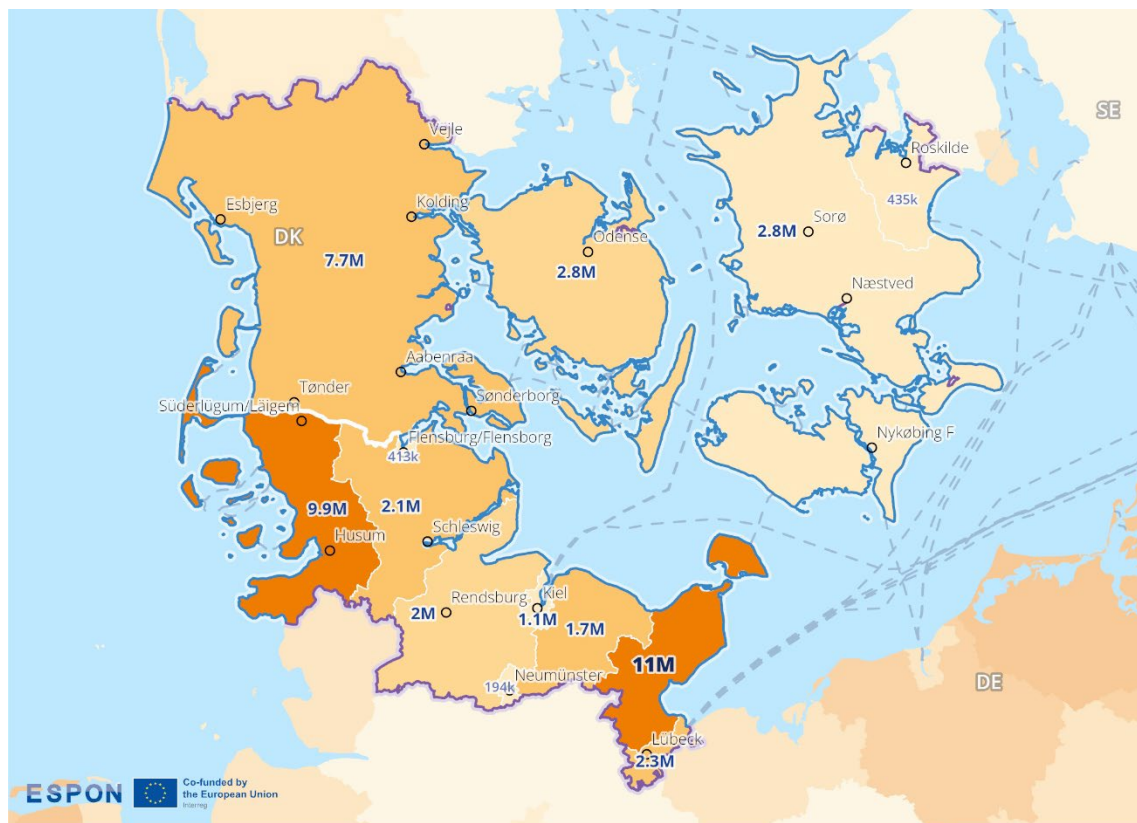
Please refer to the technical annex for more information.

The spatial distribution of overnight stays highlights the importance of key tourist destinations in border areas. Tourism contributes significantly to regional income, infrastructure development and employment, and thereby supports regional prosperity. At the same time, it affects environmental and living conditions, which may reduce local acceptance despite its economic benefits. This is in particular the case in places of overtourism, seasonal pressures, and increasing land-use conflicts.

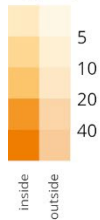
Figure 2.28 shows the number of overnight stays per capita at tourist accommodation establishments in 2023. It includes hotels, holiday and other short-stay accommodation, as well as campsites, caravan and trailer parks. The map uses a colour gradient, with darker shades indicating a higher number of nights spent per capita in 2023. It also shows the cumulative number of overnight stays from 2020 to 2023.

In 2023, 2 German NUTS3 regions show more than 40 nights per capita, including Ostholstein and Nordfriesland.¹⁵ On the Danish side, the per capita figures are somewhat lower, though still comprising 10 to 20 nights spent per capita in Sydjylland directly adjacent to the national border. In terms of total overnight stays over the 3-year period, the leading tourism regions are also Ostholstein (approx. 11 million), Nordfriesland (approx. 9.9 million) and Sydjylland (approx. 7.7 million).

Figure 2.28: Overnight stays in tourism



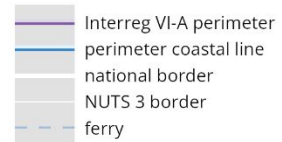
Nights per year per capita (2023)



Absolute counts are presented directly by labels. This contains nights spent at tourist accommodation establishments (hotels, holiday and other short-stay accommodation, camping grounds, recreational vehicle parks and trailer parks) from 2020 to 2023.

no data
inside outside of the Interreg VI-A perimeter

Level of detail: NUTS3
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: Eurostat, 2025
©EuroGeographics for administrative boundaries



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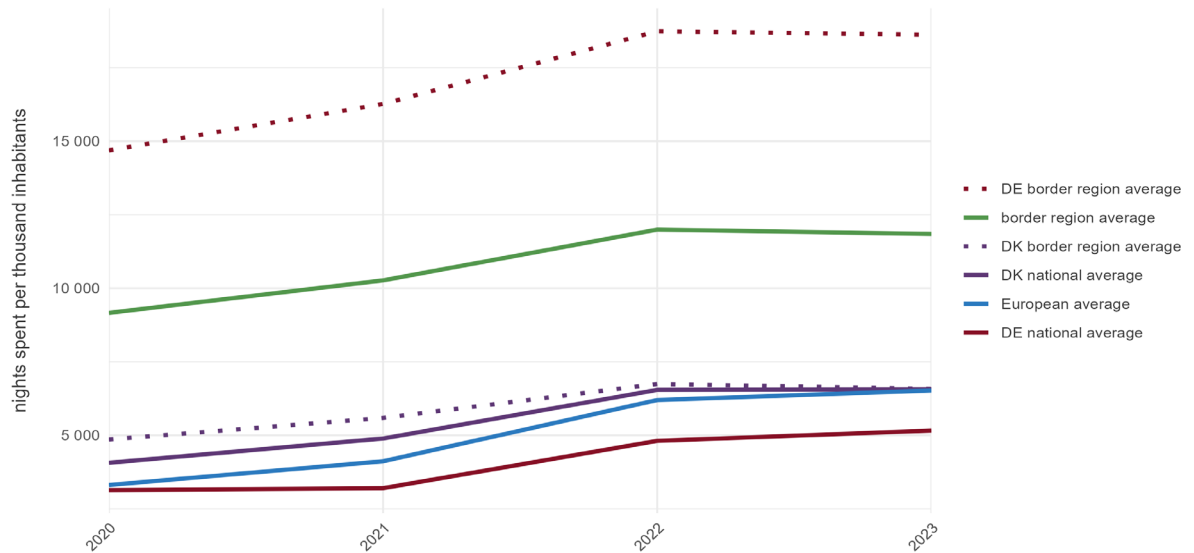
Figure 2.29 illustrates the development of nights spent at tourist establishments per thousand inhabitants from 2020 to 2023. Over the entire period, the average for the Germany-Denmark programme area is higher than the overall European average, which includes both EU member states

¹⁵ See Eurostat Statistical Atlas for NUTS3 (2021) regions: <https://ec.europa.eu/statistical-atlas/viewer/?config=typologies.json&ch=NUTS&mids=BKGCNT.NUTS2021L3.CNTOVL&o=1.1.0.7¢er=49.69576,14.33324&lcis=NUTS2021L3&>

and the EFTA countries Iceland, Liechtenstein, Switzerland and Norway. In all 4 years, the border regional averages of both countries are higher than their respective national averages. Additionally, the regional average for the German border area is significantly higher than that for the Danish throughout the given period.

Patterns of tourism have a series of implications for spatial development on either side of the border. Transport infrastructure must consider peak volumes and balancing recreating activities with socio-cultural as well as environmental heritage can be a challenge.

Figure 2.29: Overnight stays in tourism (comparison)



2.4.3 Services of general interest

This sub-dimension looks at how accessible services of general interest (SGIs) are in the border region, identifying areas that are well-served and those that are more difficult to access. It analyses access to essential services such as secondary schools, grocery shops, hospitals, doctors, pharmacies and cinemas.

2.4.3.1 Accessibility to services of general interest

Indicator description

The indicator shows, for the below listed facilities and services, the average driving time to the nearest facility of a series of services of general interest.

- **Source/method of retrieval:** Processing and analysis of standardised travel-time accessibility to secondary schools, grocery shops, hospitals, doctors, pharmacies and cinemas available in the ESPON PROFECY Update (2022)
- **Temporal coverage:** 2021
- **Unit:** Minutes (in 2.5 x 2.5 km grid)

Please refer to the technical annex for more information.

Figures 2.30 to 2.35 visualise average car travel times to services of general interest within the programme area. The maps display accessibility to:

- › Secondary schools (Figure 2.30);
- › Grocery shops (Figure 2.31);
- › Hospitals (Figure 2.32);
- › Doctors (Figure 2.33);
- › Pharmacies (Figure 2.34); and
- › Cinemas (Figure 2.35).

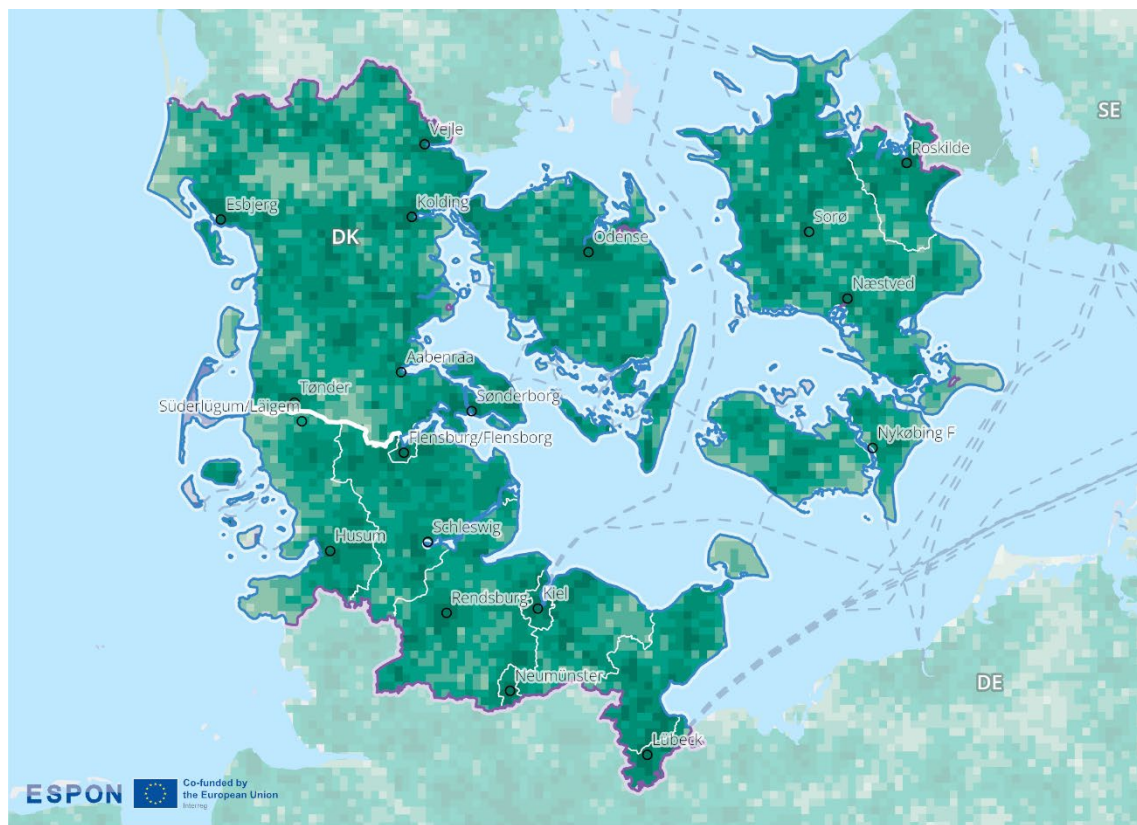
These indicators show how long, on average, it takes to reach the nearest facility by car. The data comes from the ESPON PROFECY Update project (2022) and is visualised based on a 2.5-kilometer grid.

In the Germany–Denmark border area, essential services such as doctors, schools, and grocery shops are evenly distributed across most areas in both countries. This results in travel times of less than one hour throughout the programme area. The only exception is travel time to schools from the island of Sylt, which exceeds one hour. Accessibility to pharmacies is evenly distributed in Germany but more concentrated around metropolitan areas in Denmark.

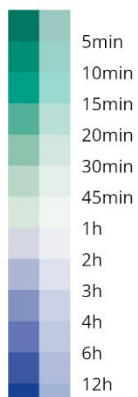
Near the national border, travel times to hospitals appear to be somewhat longer in the eastern regions compared to the western regions. Travel times to pharmacies are generally longer on the Danish side of the border compared to the German side.

Hospitals, as a medical service, are mainly located in cities and more densely populated areas. This leads to an urban–rural gradient, with shorter travel times in and near urban centres and longer travel times in rural or remote regions. The same applies to cinemas as a cultural service.

Figure 2.30: Travel time to secondary schools

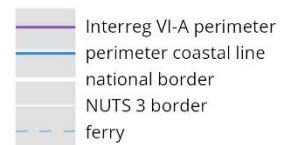


Car travel time to the nearest secondary school (2021)



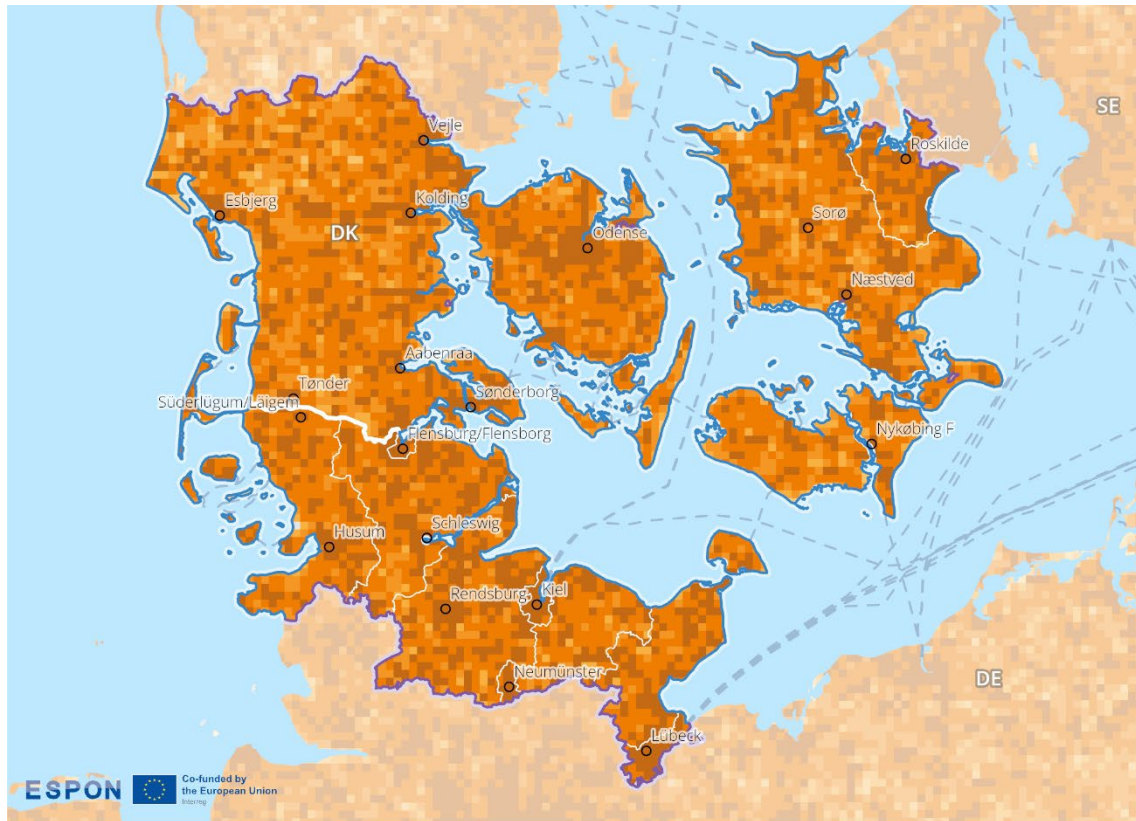
inside
outside
of the Interreg VI-A perimeter

Level of detail: 2.5km grid
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON PROCECY Update, 2022
©EuroGeographics for administrative boundaries

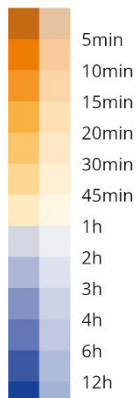


© ESPON, 2026

Figure 2.31: Travel time to grocery shops

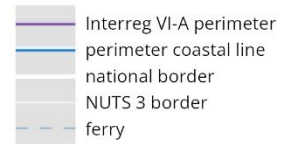


Car travel time to the nearest shop (2021)



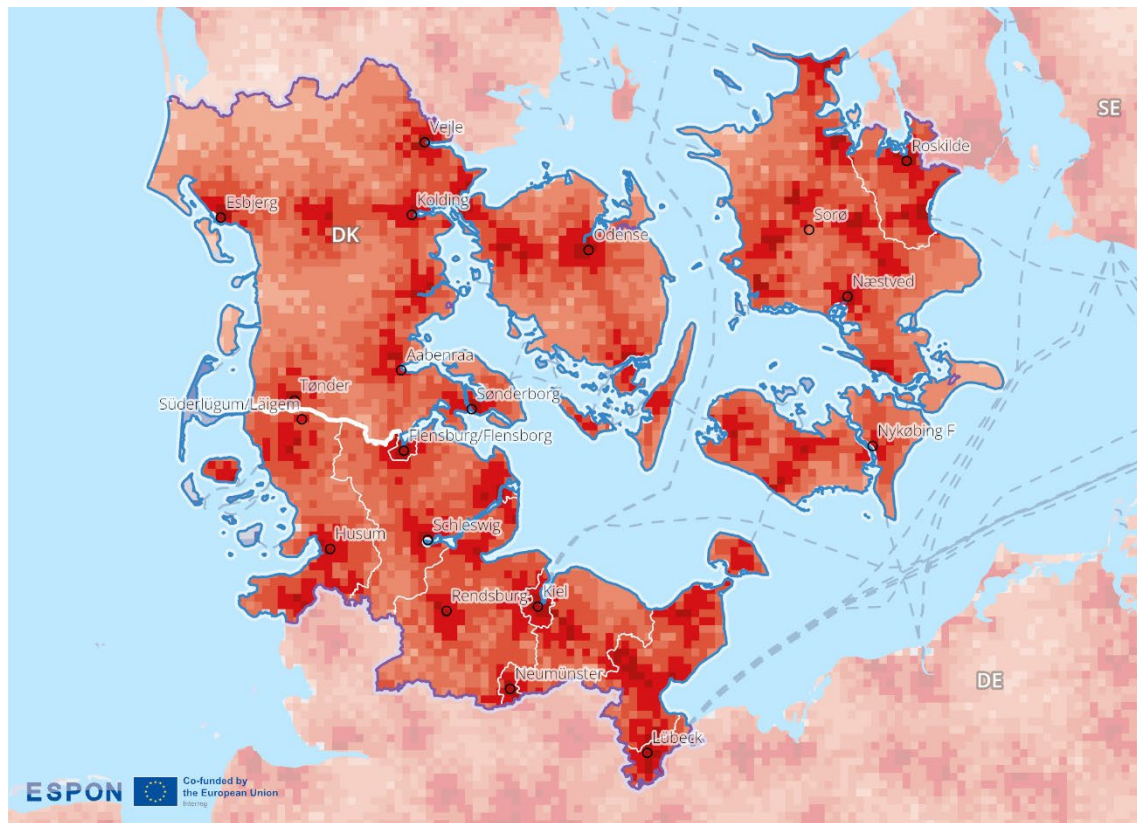
inside
outside
of the Interreg VI-A perimeter

Level of detail: 2.5km grid
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON PROCECY Update, 2022
©EuroGeographics for administrative boundaries

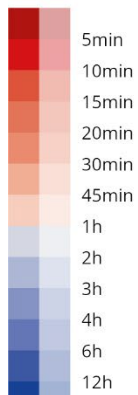


© ESPON, 2026

Figure 2.32: Travel time to hospitals

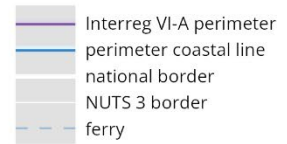


Car travel time to the nearest hospital (2021)



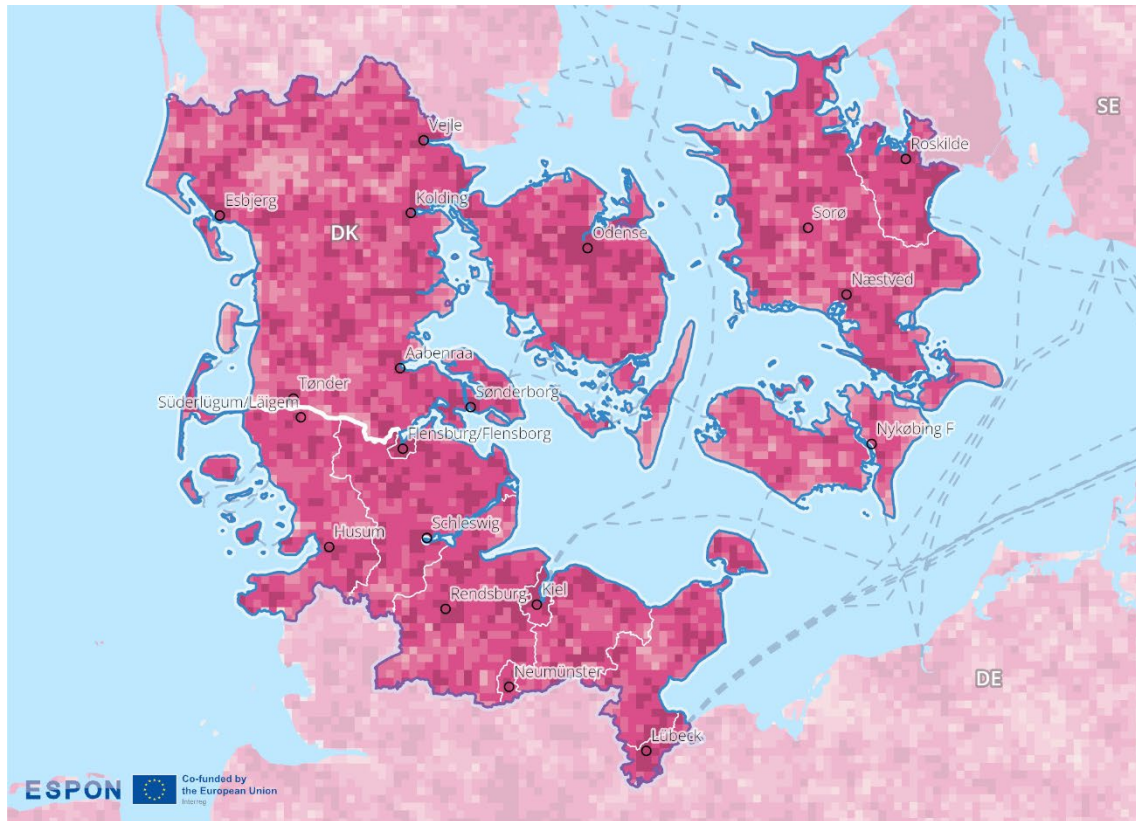
inside
outside
of the Interreg VI-A perimeter

Level of detail: 2.5km grid
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON PROCECY Update, 2022
©EuroGeographics for administrative boundaries

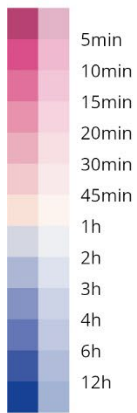


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Figure 2.33: Travel time to doctors

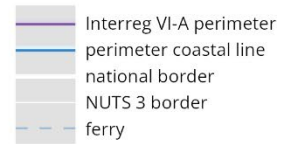


Car travel time to the nearest doctor (2021)



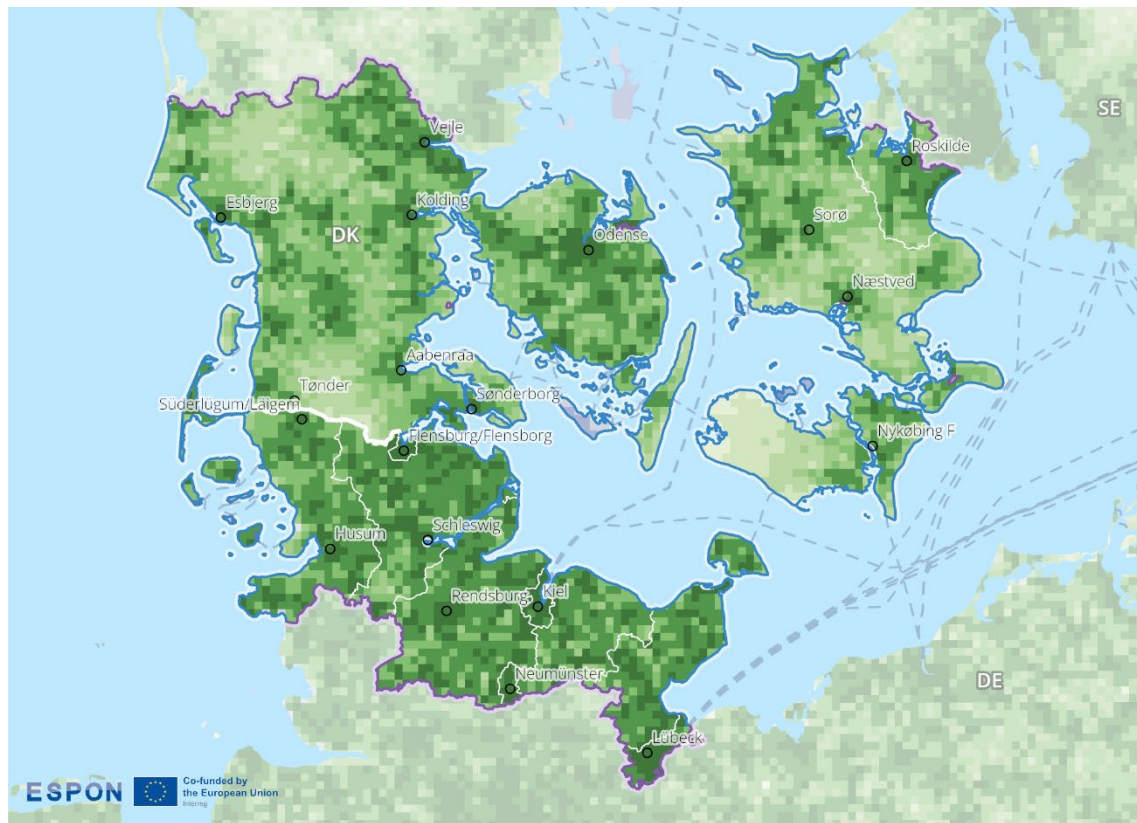
inside
outside
of the Interreg VI-A perimeter

Level of detail: 2.5km grid
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON PROCECY Update, 2022
©EuroGeographics for administrative boundaries

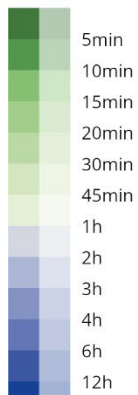


© ESPON, 2026

Figure 2.34: Travel time to pharmacies

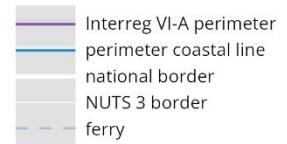


Car travel time to the nearest pharmacy (2021)



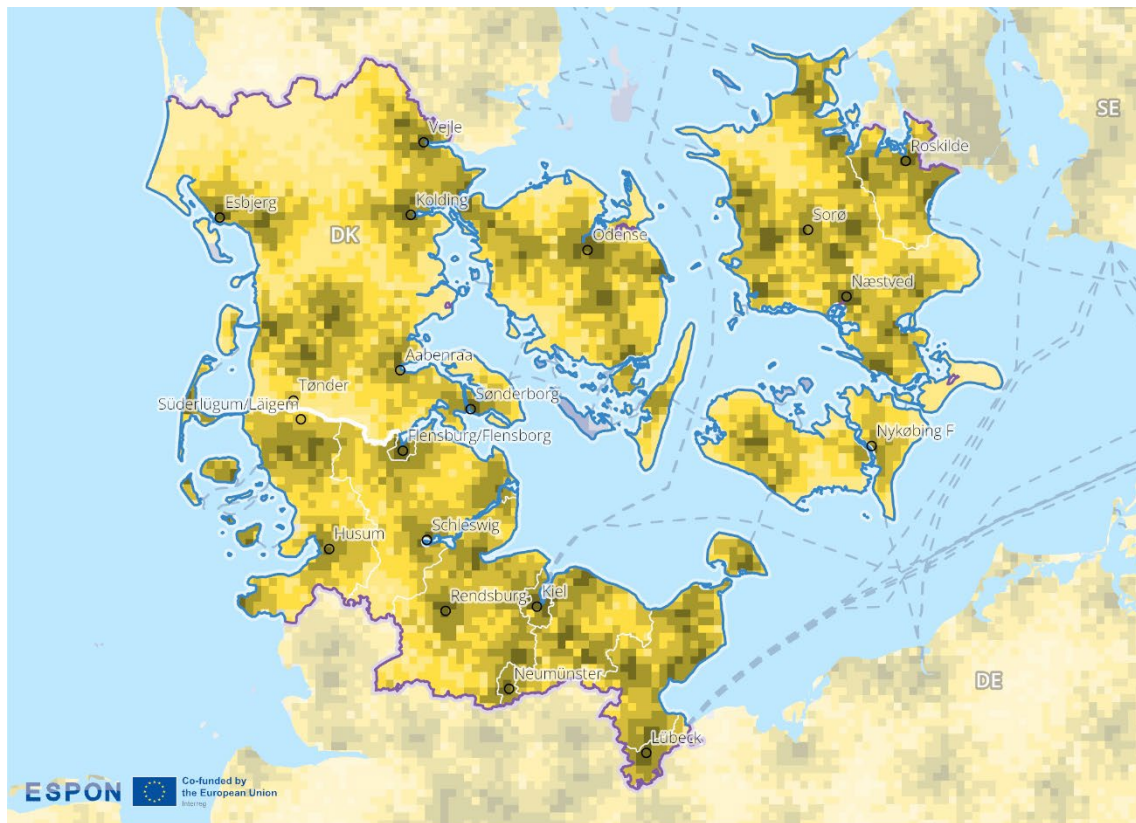
inside
outside
of the Interreg VI-A perimeter

Level of detail: 2.5km grid
Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
Origin of data: ESPON PROCECY Update, 2022
©EuroGeographics for administrative boundaries

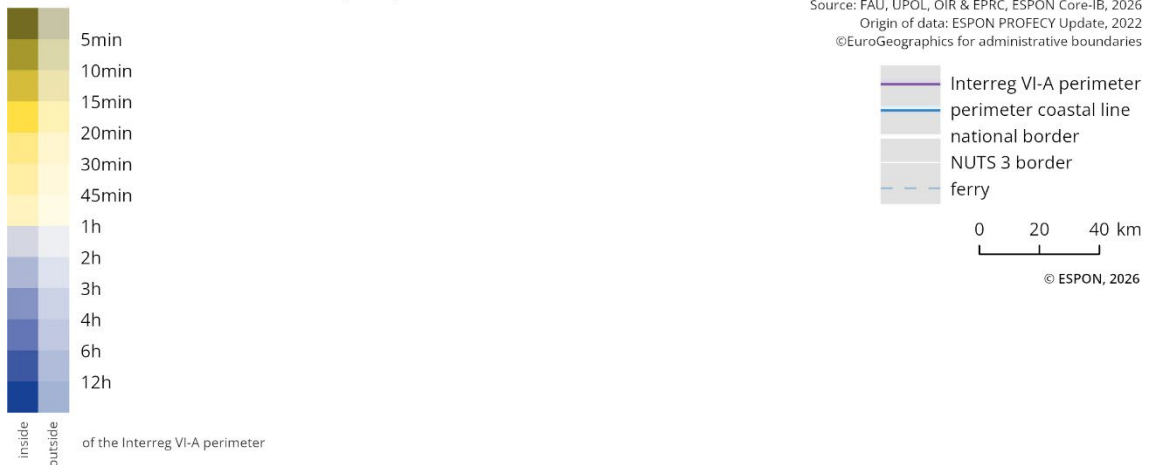


© ESPON, 2026

Figure 2.35: Travel time to cinemas



Car travel time to the nearest cinema (2021)



2.4.4 Key messages on the socio-economic dimension

The intensity of social interaction among the inhabitants of this border region is largely homogeneous and generally low. Although the main languages on both sides of the border are different, there are minority communities on both sides of the border, speaking German in Denmark and Danish in Germany.

Tourism is important on both sides of the border, contributing significantly to regional income, infrastructure development and employment. Leading regions for tourism in the area are Ostholstein and Nordfriesland in Germany and Sydjylland in Denmark.

In the Germany-Denmark border area, essential services such as doctors, schools, and grocery shops are evenly distributed across most areas in both countries. This results in travel times of less than one

hour throughout the programme area. However, there is still an urban-rural divide, with longer travel times in rural or remote regions.

2.5 Border security and safety

This dimension shows the security and safety conditions in border regions. It analyses the number of days on which border control is temporarily reintroduced at internal borders, using this as an indicator of security concerns and restrictions on cross-border movement.

2.5.1 Temporary reintroduction of border controls at internal borders

Indicator description

The indicator shows the number of days of temporary reintroduction of border control at internal borders, including the official reasons behind. The reintroduction of border control at the internal borders must be applied as a last resort measure, in exceptional situations, and must respect the principle of proportionality. The scope and duration of reintroduced border control should be restricted to the bare minimum needed to respond to the threat in question.

- **Source/method of retrieval:** Processing and analysis data of European Commission information pursuant to Article 25 and 28 et seq. of the Schengen Borders Code
- **Temporal coverage:** 2006-2025 (cut-off: 08 May 2025, in order to allow data treatment before work package completion)
- **Unit:** Days per year

Please refer to the technical annex for more information.

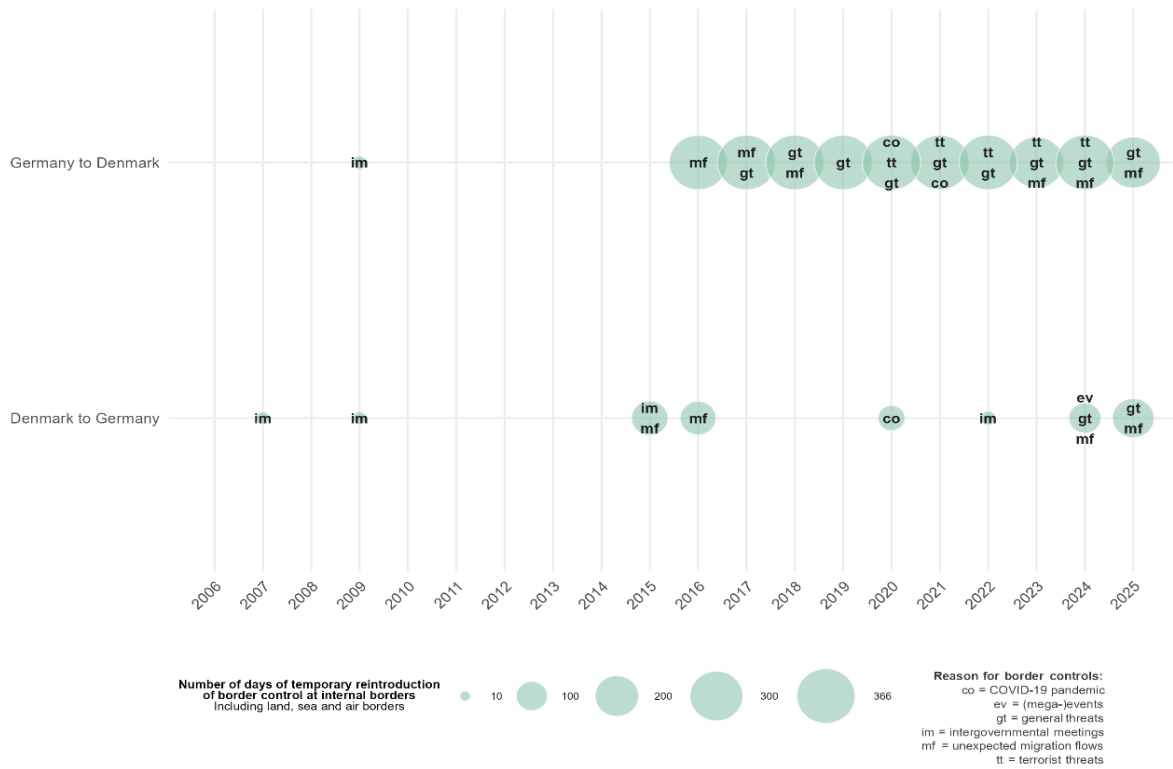
Figure 2.36 illustrates the number of days during which temporary border controls were reintroduced at internal borders within the Schengen Area. Each bubble represents a specific year with bubble sizes indicating the number of days the respective border was under control. The categories of reasons for reintroducing controls include:

- > co – COVID-19 pandemic
- > ev – (Mega-)events
- > gt – General threats
- > im – Intergovernmental meetings
- > mf – Unexpected migration flows
- > tt – Terrorist threats

The data spans from 2006 to 2025 (cut-off: 08 May 2025) and is based on notifications from the European Commission information pursuant to Article 25 and 28 et seq. of the Schengen Borders Code. In line with Schengen rules, the reintroduction of controls is to be used only as a last resort, for exceptional circumstances, and with strict adherence to the principle of proportionality in terms of both duration and scope.

Both, Germany and Denmark had already been part of the Schengen Area by 2006.

Figure 2.36: Temporary reintroduction of border controls



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Co-funded by the European Union

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The Germany-Denmark border area is characterised by an asymmetric pattern:

- › Crossing the border from Germany to Denmark: Temporary border control occurred in 11 out of 20 years, driven by UN Climate Change Conference (2009). From 2016 until 2024 the border is permanently controlled. The reasons are mainly terrorist threats. Further the border has been controlled due to COVID-19 (2020-2022) and general threats like internal security, organised crime and smuggling (2020-2025). Another reason is the unexpected and persistent migration flows since 2016 (until 2025).
- › Crossing the border from Denmark to Germany: Temporary border control occurred in 8 out of 20 years, driven by a wide range of security and migration-related factors, including high-level summits (e.g., G7, NATO), persistent irregular migration (2015–2025), secondary movements, COVID-19 (2020), smuggling, and threats related to international crises such as the war in Ukraine.

From a comparative perspective, Denmark controlled its border for significantly more days than Germany, indicating an unequal impact on cross-border movements.

These controls tend to have a tangible effect on the smooth functioning of cross-border flows, especially commuting and logistics, as they introduce delays and unpredictability.

2.5.2 Key messages on the border security dimension

In terms of border restrictions, the Germany-Denmark border area is characterised by an asymmetric pattern, mainly linked to specific high-level events, covid, and security and migration issues. Denmark controlled its border for significantly more days than Germany, indicating an unequal impact on cross-border movements. This indicates the need for coordinated cross-border crisis management frameworks to minimise disruptions to labour flows.

The interdependence of cross-border labour markets in the area issues of the cross-border region became particularly visible during the temporary border closures of the COVID-19 pandemic. Faced with pressure from commuters and employers, the border closure restrictions had to be loosened.¹⁶

2.6 Governance dimension

The Danish-German cross-border area has well-established cross-border cooperation across a range of themes. Interreg activities have been running since 1991 and have developed in various programme structures. Additionally, an agreement establishing the Sønderjylland-Schleswig region was adopted on 16 September 1997. The agreement constitutes a basis for cross-border cooperation activities among German and Danish stakeholders through the region Sønderjylland-Schleswig. It focuses on cross-border labour market, culture activities and improvements of mutual language skills. The term Region Sønderjylland-Schleswig refers to the formalised political cooperation between the German partners Kreis Nordfriesland, Kreis Schleswig-Flensburg and the city of Flensburg with the Danish administrative unit Sønderjyllands Amt, in order to expand cross-border cooperation in the German-Danish border region. The cross-border region is included in the EU Strategy for the Baltic Sea Region (Baltic Sea Strategy). The border area is also subject to 2 crisis and risk management agreements.

2.6.1 Cross-border cooperation

This sub-dimension identifies the extent of cross-border cooperation in the border region. It illustrates areas of high cooperation intensity and identifies functional links in governance structures across borders. It also identifies areas with high awareness of obstacles and the willingness and support services to overcome them, as well as areas where Interreg cooperation intensity is already strong.

2.6.1.1 Cross-border governance structures

Indicator description

The indicator shows active institutionalised cooperation that act as cross-border entities. It includes cooperation formats such as Eurocities, Euroregions, EGTC, cross-border associations, cross-border councils, etc.

- **Source/method of retrieval:** Localisation and categorising of cross-border cooperation formats (Eurocities, Euroregions, EGTC, cross-border associations, cross-border councils, conferences, working communities), based on desktop research.
- **Temporal coverage:** Status as of October 2025
- **Unit:** n/a

Please refer to the technical annex for more information.

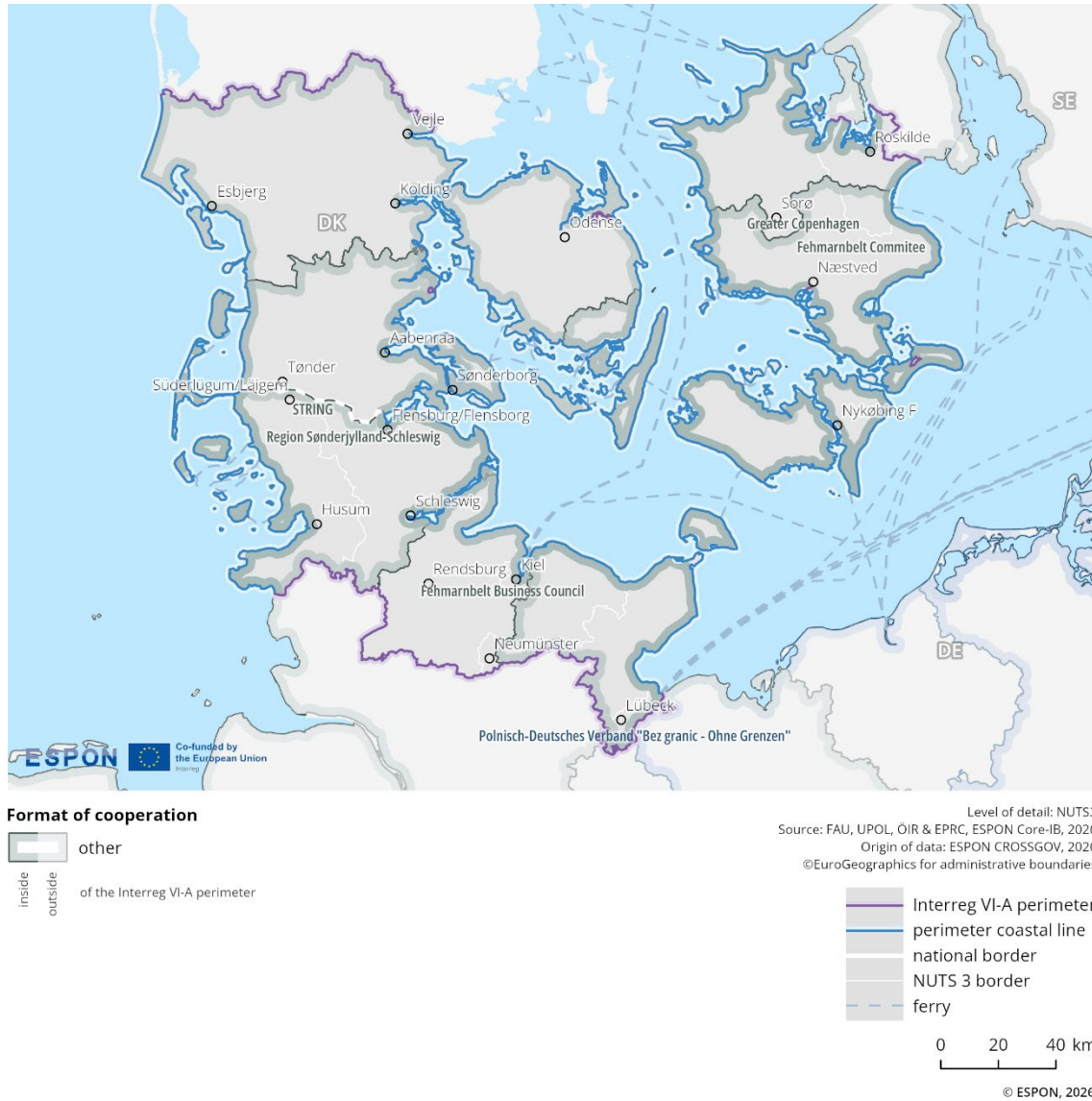
Figure 2.37 shows the different types of institutionalised cooperation. These governance structures either function as cross-border entities or bring together stakeholders from the cross-border region around shared topics. The governance structures covered include Eurocities, Euroregions, European Groupings of Territorial Cooperation (EGTCs), cross-border associations and councils. Project-based cooperation is not included.

¹⁶ CEC (2025) Cross-border regional labour market analysis Case study: region Schleswig – Sønderjylland (Germany – Denmark), AEBR, Directorate-General for Regional and Urban Policy (European Commission), HÉTFA, Nordregio, ÖIR, <https://op.europa.eu/en/publication-detail/-/publication/23a527c8-0b84-11f0-b1a3-01aa75ed71a1/language-en>, p. 7

The coloured markings on the map indicate different types of institutionalisation: EGTCs are shown in red, Eurocities in yellow, Euroregions/Euregios/Europaregions/Eurodistricts in blue, and other formats in grey.

The multi-level governance structure in this programme area shows broad spatial coverage along the borders. Overall, the cross-border region exhibits high levels of cooperation along the national border. The most prevalent formats are councils, committees and conferences.

Figure 2.37: Cross-border governance structures



2.6.1.2 Cross-border public services

Indicator description

The indicator shows different services specialised on cross-border challenges and development potential, including their domain of operation. As a specific form of services of general interest, cross-border public services (CPS) address joint problems or development potentials of border regions that are located on different sides of one or more national borders.

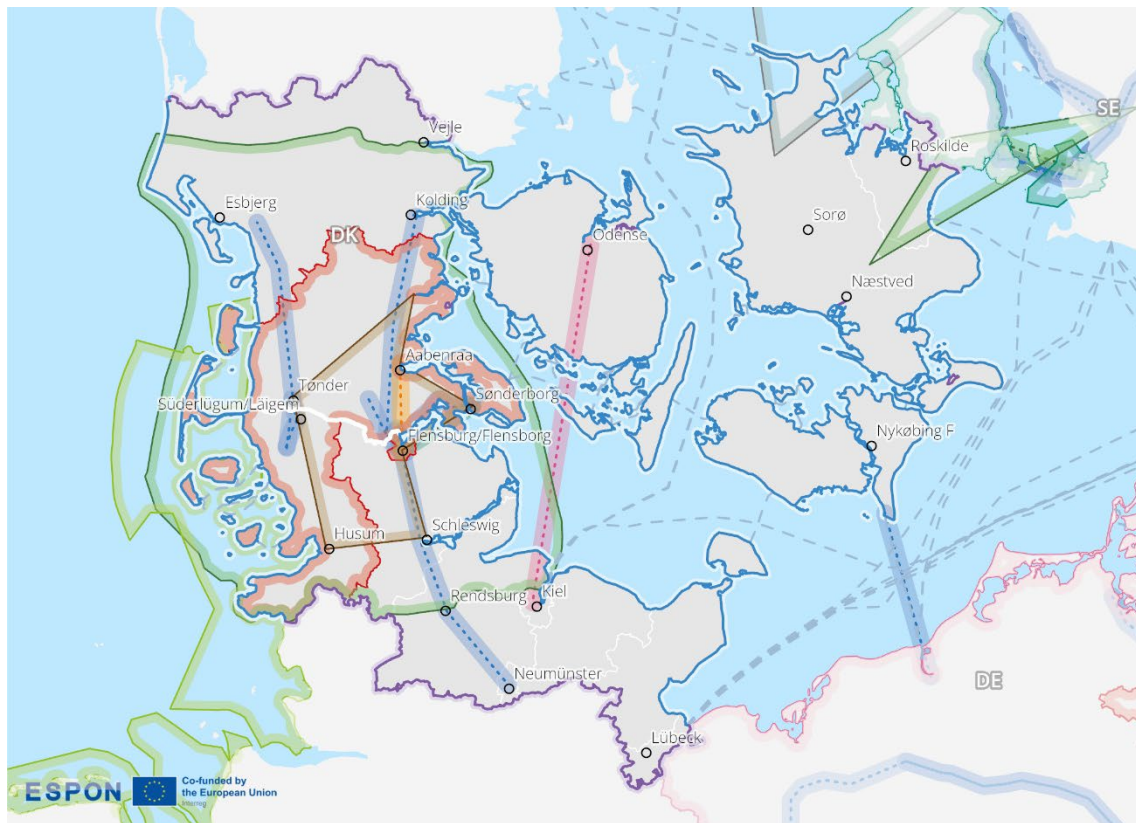
- **Source:** ESPON cross-border public services (CPS) 2.0 database
- **Temporal coverage:** 2022
- **Unit:** n/a

Please refer to the technical annex for more information.

Figure 2.38 depicts the geographical extent of cross-border public services in the border area in 2022. Different thematic areas are represented by distinct symbols and colours, indicating services such as disaster management, health care, transportation, education, environment, energy, job placement, and culture. The visualisation highlights where these services operate across the national boundary.

Cross-border public services in the German-Danish border region are highly concentrated along the Schleswig-Sønderjylland corridor. Services covered are diverse, including disaster management, transport, education & research, job placement, heating & energy, culture and tourism & information. Transport links span coastal and inland areas, including close to Esbjerg-Tønder and Kolding-Rendsburg. In addition, health care services can be found between Kiel and Odense. The North Sea coast is mainly dominated by cross-border sectors including environment & water, disaster management and tourism & information services.

Figure 2.38: Cross-border public services



Geographical extent of cross-border public service themes (2022)

areal	linear	character of the service
		Disaster management
		Health care
		Transportation
		Tourism & information
		Education & research
		Environment & water
		Heating & energy
		Job placement
		Culture

inside outside of the Interreg VI-A perimeter

Cross-border public services covering more than one theme have been assigned only to one. Furthermore, some polygons have been excluded because they were only approximately and not accurately spatially defined.

Level of detail: geolocalised lines and areas
 Source: FAU, UPOL, OIR & EPRC, ESPON Core-IB, 2026
 Origin of data: ESPON CPS, 2022
 ©EuroGeographics for administrative boundaries

- Interreg VI-A perimeter
- perimeter coastal line
- national border
- NUTS 3 border
- ferry



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2.6.1.3 Perceived cross-border obstacles in b-solutions

Indicator description

The indicator shows cases of legal or administrative obstacles selected in the framework of the b-solutions initiative. This indicator lists the number, location and nature of suggested solution of cases in the b-solutions initiative, including the topic and parties involved.

- **Source/method of retrieval:** Processing and analysis of the b-solutions initiative data
- **Temporal coverage:** 2018-2025 (first quarter)
- **Unit:** n/a

Please refer to the technical annex for more information.

The b-solutions initiative is a European Union project that supports the resolution of legal, operational and administrative cross-border obstacles. It offers funding for pilot actions and legal expert advice in border regions. A high level of cross-border integration often reveals strong barriers of cross-border functioning. In order to exploit the cross-border potentials, these obstacles have to be overcome or at least addressed. Both the number of reported obstacles and the general interest in solutions serve as important indicators of cross-border interaction.

As part of the ESPON CROSSGOV project, all b-solutions initiatives were analysed to deepen the understanding of the thematic focus of the perceived cross-border obstacles across different border regions and the suggested solution, in particular from the European perspective.

In the border area of Germany-Denmark, 4 b-solutions pilot actions were identified. These included initiatives focused on cross-border internships, the deductibility of private pension contributions in Denmark, and the applicable labour law for telework. Applications for these pilots were mainly submitted by public bodies and bodies governed by public law.

In this border area, in the field of labour markets and education, issues relate to youth mobility, talent acquisition, and social security coordination for both internships and remote work settings. Governance and institutional cooperation touch on the formulation of legal agreements that address the complexities of cross-border employment and the recognition of qualifications. Challenges in this area include navigating the bureaucratic requirements associated with the cross-border exchange of interns and ensuring that pension contributions are adequately managed across borders.

The solutions proposed in the pilot actions are predominantly legal or hybrid in nature. For example, the cross-border internships initiative advocates for a European Charter on internships and recommends modifications to Regulation (EC) No 883/2004 to facilitate the recognition of internships across borders. Additionally, it suggests the development of ad hoc bilateral agreements based on Article 16 of the same regulation, ensuring compliance with social security arrangements for interns moving between Germany and Denmark.

The pilot addressing the deductibility of private pension contributions seeks legal modifications to the Danish pension tax act and introduces a double taxation agreement to promote the acceptance of pan-European pension products. This aims to simplify the financial implications for employees who contribute to pension schemes in both countries, enabling a smoother transition for workers as they navigate their rights and obligations.

Furthermore, the initiative concerning applicable labour law for telework emphasises the hybrid nature of its solutions. This includes legal proposals such as the establishment of a European charter for labour in the EU and the introduction of the concept of digital frontier workers. The initiative seeks modifications to the framework agreement on cross-border telework and emphasises the development of bilateral agreements to facilitate remote work arrangements. Operationally, it aims to

create an information portal to support workers and employers in understanding their rights and obligations regarding telework.

2.6.1.4 Institutionalised advice centres for cross-border issues

Indicator description

The indicator shows where institutionalised advice centres on cross-border issues are located, including their thematic focus and geographical perimeter.

- **Source/method of retrieval:** Localisation and thematic focus of advice centres for cross-border issues are identified via desktop research.
- **Temporal coverage:** Status as of February 2025
- **Unit:** n/a

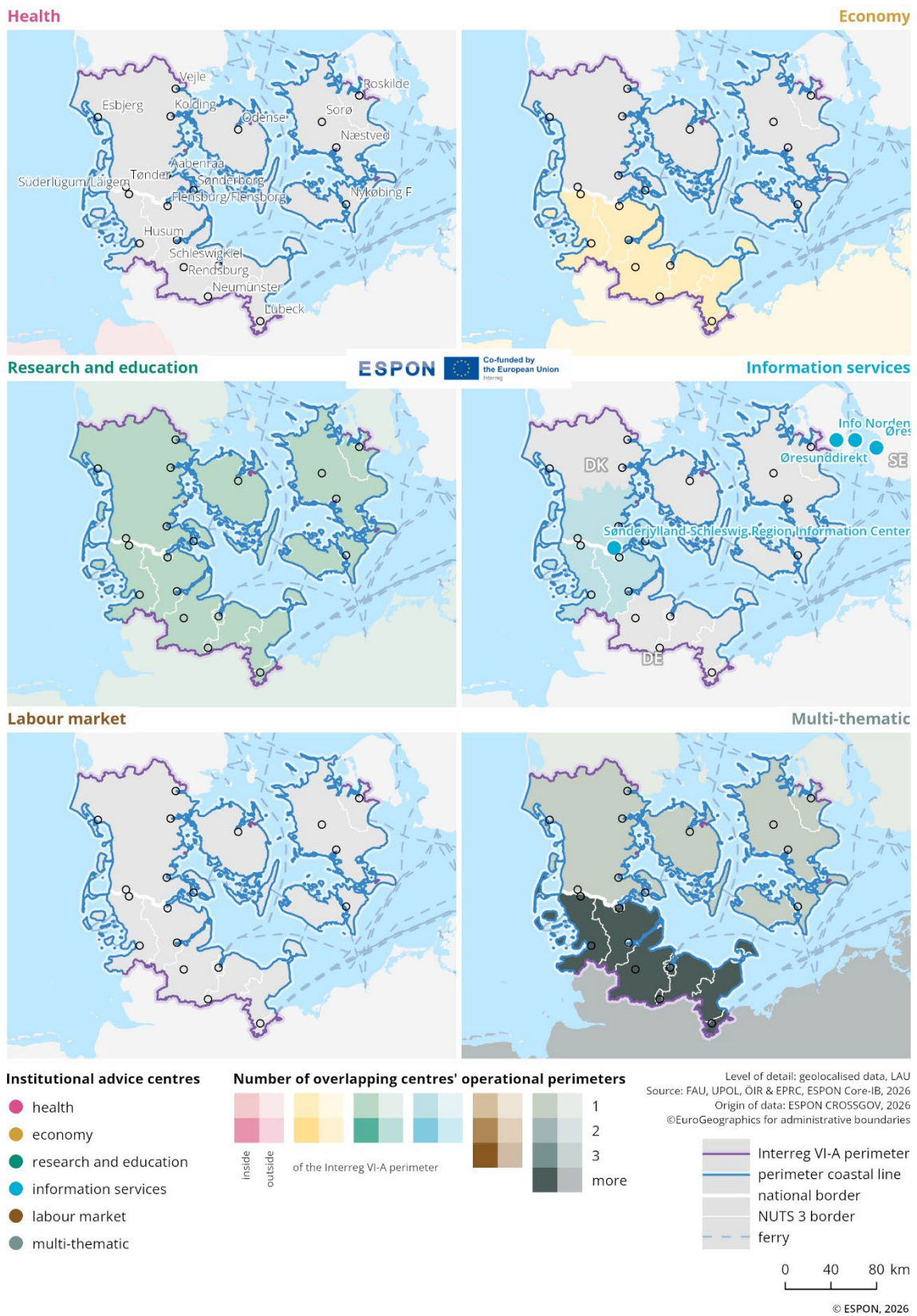
Please refer to the technical annex for more information.

Figure 2.38 shows the locations and types of institutionalised advice centres, along with their operational domains, in the cross-border Interreg region between Germany and Denmark. These centres throughout Europe provide support in various fields such as health, economy, research & education, information services, the labour market, and multi-thematic issues. The operational domains of these centres are also indicated by coloured shading on the map. The more intense the colour, the stronger the influence of that specific domain in the corresponding area.

There is one information service-related institutionalised advice centre located along the Danish-German border, the Sønderjylland-Schleswig Region Information Centre. Outside the Interreg region, there are additional information service-related institutionalised advice centres in the northeast, near the Swedish border.

Centres with multi-thematic, as well as research and education operational domains, are represented in both Germany and Denmark within the Interreg area, although they are more pronounced in the German part. Additionally, economic operational domains are also present in the German part of the Interreg region.

Figure 2.39: Institutionalised cross-border advice centres



2.6.2 Outline of Interreg activities

The following section outlines the key Interreg activities in the 2021-2027 programming period. The aspects included concern the development opportunities and challenges identified (see Table 2), the budget available and split of allocation (Figure 2.40), overlapping Interreg programmes and the key aspects drawn from the programme.

Table 2: Interreg VI (2021-2027): Opportunities and challenges

Topic	Key development opportunities and challenges identified for Interreg 2021-27
Population and spatial	<ul style="list-style-type: none"> ▪ Large number of smaller settlements and rural areas, larger agglomerations can be found along the Baltic Sea coast
Innovation	<ul style="list-style-type: none"> ▪ German-Danish border region overall is a very competitive region with high levels of innovation potential ▪ Scope for development of advanced technologies and R&D, e.g., the maritime economy, life sciences and welfare technologies, food industry digital economy, robotics
Climate	<ul style="list-style-type: none"> ▪ Pioneering role in reducing CO2 emissions and the use of fossil fuels and to promote renewable energies ▪ Impacts of climate change ▪ Capacity for renewables and smart energy systems ▪ Waste management and circular economy
Environment	<ul style="list-style-type: none"> ▪ Protected wetland areas and Wadden Sea
Education	<ul style="list-style-type: none"> ▪ Training and skills in key sectors
Tourism	<ul style="list-style-type: none"> ▪ The cross-border region has regional strengths in tourism ▪ Culture and sustainable tourism, e.g., along Wadden Sea Coast and islands
Governance	<ul style="list-style-type: none"> ▪ Cooperation in the legal and administrative fields and cooperation between citizens

Total Budget: EUR 117,214,372.65

Figure 2.40: Split of Interreg allocation

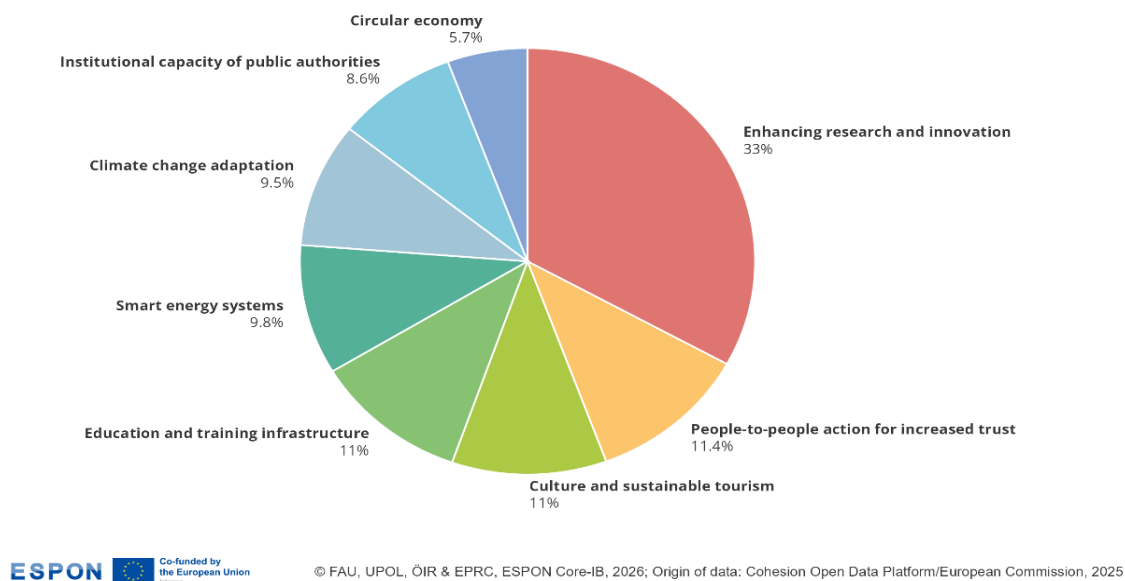


Table 3 shows the number of Interreg 2021-2027 cross-border and transnational programmes which share at least one NUTS3 region with the border area. Each programme has its own distinct rationale, value and territorial focus. However, for the purposes of, for example, planning and capitalisation activities it is potentially helpful for programmes and programme stakeholders to be aware of and connected to other Interreg programmes with which they share a direct territorial link.¹⁷ The 4 Interreg C programmes Interreg ESPON, Interact, Interreg Europe and URBACT cover the whole EU territory and provide a range of joint services and initiatives.

Table 3: Shared geographies with other cross-border and transnational programmes

Interreg A (cross-border)	Interreg B (transnational)
2	2

Key aspects

- › Activities focus on innovation in SMEs and startups, green transition, labour market and education and developing a functional region in relation to the development of culture and tourism.
- › The programme area includes some territories that are also eligible under the Interreg A 2021-27 programmes South Baltic and Sweden-Denmark-Norway as well as the Interreg B programmes North Sea and Baltic Sea.

¹⁷ It is noted that synergies and links with a wide range of other territorial cooperation and sectoral programmes and initiatives are also valuable and this is reflected in the wider analyses presented in this border profile, but not specifically covered in this table.

2.6.2.1 Interreg cooperation

Indicator description

Based on the keep.eu database, this indicator illustrates the network density of Interreg V-A (2014–2020). It is derived from the geographical location of all partners within a project consortium and reflects the intensity of cooperation between them. For the analysis, project networks were visualised by drawing lines between the locations of partners within a consortium. These connections were subsequently aggregated and spatially abstracted by calculating line density using GIS software. Dark red areas indicate a high density of connections between project partners, while yellow areas represent a lower density of cooperation links.

An additional element in this section is the development of project partner numbers between Interreg IV-A (2007–2013) and Interreg V-A (2014–2020), based on data from the keep.eu database. The datasets were cleaned to remove duplicates, using the partner names as reported in keep.eu. For both programming periods, keep.eu indicates a high level of data completeness.¹⁸ Nevertheless, this development should be interpreted as indicative, as variations in partner name reporting and general limitations regarding the representativeness of the dataset affect the robustness of the results.

- **Source/method of retrieval:** Processing and analysis of the keep.eu database
- **Temporal coverage:** 2007-2013 (Interreg IV-A), 2014-2020 (Interreg V-A)
- **Unit:** n/a

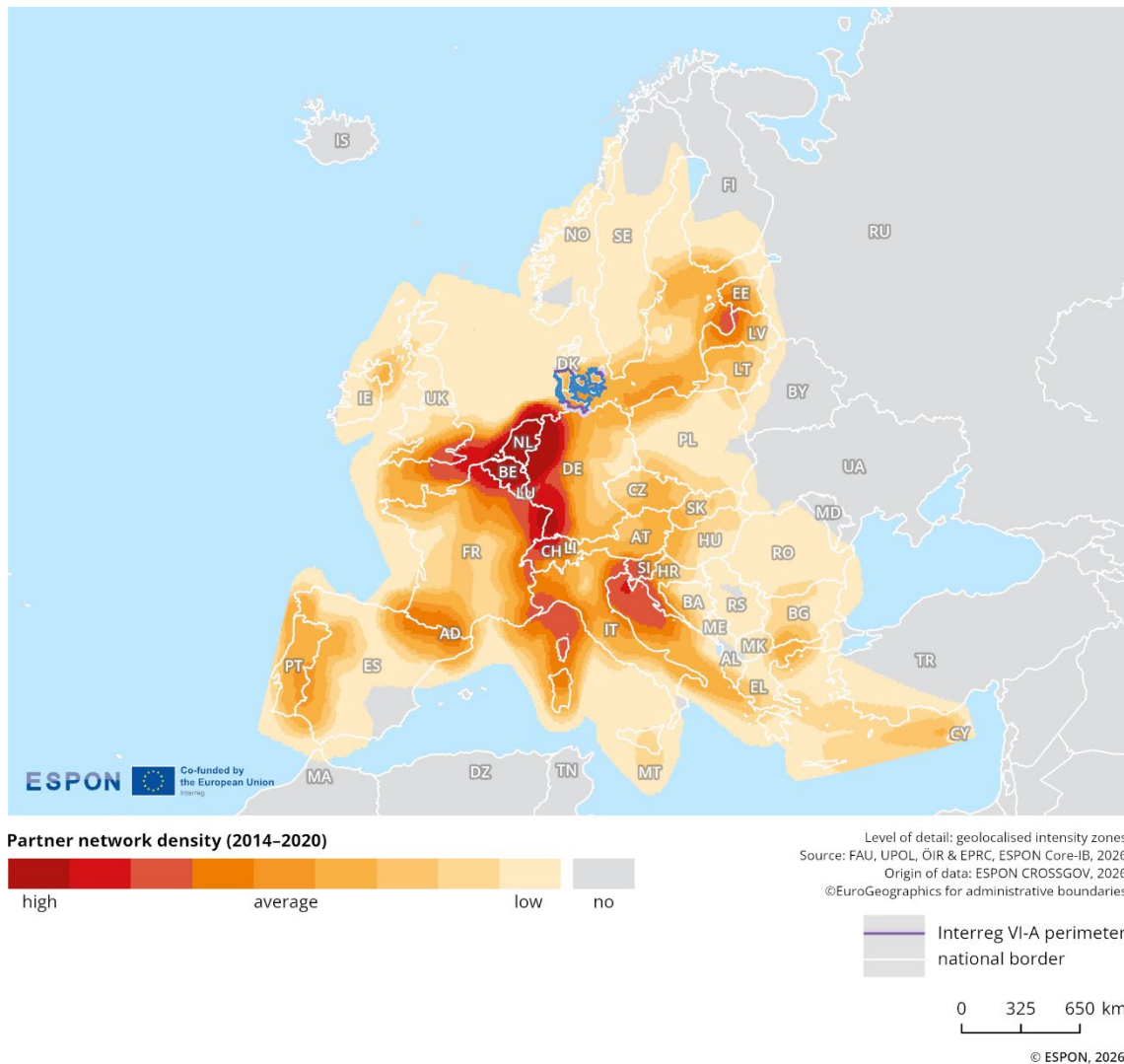
Please refer to the technical annex for more information.

Cooperation activities and networks are among the most meaningful types of information for delineating cross-border functional areas. As such, the indicator on cooperation through Interreg can help to identify networks among cross-border actors and highlight the density of cooperation in specific border segments.

Figure 2.41 shows the density of Interreg V-A (2014–2020) partner networks. The indicator includes the location of, and links between, Interreg project partners within a project consortium. From a European perspective, partner network density in the Germany-Denmark border area appears quite evenly spread. No specific border segments within the programme area show significantly higher or lower partner network levels than others. Overall, the partner network density in this border area is close to the European average. Based on the keep.eu database and excluding duplicates, the number of project partners increased from 102 in Interreg IV-A (2007–2013) to 381 in Interreg V-A (2014–2020), an increase of about 274%. However, the reason for the very significant increase is that 2 Interreg programmes have been merged into one. Also, it is important that these changes are considered in the context of factors such as change in programme budgets between 2007-13 and 2014-20, emphasis on targeting impact, and numbers of strategic projects.

¹⁸ see [Keep.eu representativeness: Interreg, Interreg-IPA and ENI cross-border](#)

Figure 2.41: Interreg V-A partner network density



2.6.3 Key messages on the governance dimension

The German-Danish cross-border area has well-established cross-border cooperation across a range of themes. The multi-level governance structure in this programme area shows broad spatial coverage along the borders. Overall, the cross-border region exhibits high levels of cooperation along the national border. The most prevalent formats are councils, committees and conferences.

Where available, cross-border public services in the German-Danish border region are highly concentrated along the Schleswig-Sønderjylland corridor and include disaster management, transport, education and research, job placement, heating and energy, culture, and tourism and information. Transport links span coastal and inland areas.

Advancing cooperation, in the border area of Germany-Denmark, 4 b-solutions pilot actions were identified and covered issues such as cross-border internships and the labour law for telework. Through Interreg, activities focus on innovation in SMEs and startups, green transition, labour market and education and developing a functional region in relation to the development of culture and tourism.

As well as the Germany-Denmark cross-border programme, parts of the area are also eligible under the following Interreg A 2021-27 South Baltic, Sweden-Denmark-Norway Interreg A Programmes, North Sea and Baltic Sea Interreg B Programmes. From a European perspective, the partner network density in the Germany-Denmark border area appears quite evenly spread.

3 Summary and key observations

To support the strategic dialogue on cross-border cooperation beyond 2027, this territorial analysis provides harmonised and comparable information. Its data-driven evidence helps to inform the future direction of cross-border cooperation by facilitating alignment with EU priorities and the evolving regulatory framework. The Core-IB border profiles adopt a harmonised methodology and provide programme areas with access to recent European data. As this approach comes along with limitations, member states may hold additional or more detailed data which can further enrich or contextualise the findings beyond the Core-IB project (see final report and technical annex of this project). These national sources are essential for refining and validating territorial evidence in policymaking processes, including: a) regional, fine-scale data and b) insights from political processes related to prioritisation and objective setting. The study's findings are analytical and are intended to support reflection and discussion. They do not create regulatory or policy obligations for Member States, the European Commission, or programme authorities.

Table 4 provides 2 types of information. Firstly, it summarises the key analytical findings for the border region, as discussed earlier in this profile. Secondly, it suggests policy options based on the analytical findings. These options are intended to provide a practical and informative basis for the strategic dialogue among programme bodies, managing authorities and the European Commission.

Generally speaking, the aim of cohesion policy is to promote harmonious territorial development (also) across borders. The objective is to mitigate the impact of borders and achieve 360° functionality, thereby enhancing the quality of life and fostering prosperous development on both sides of the border. The upcoming Interreg period offers an opportunity to address these objectives and potentials through targeted cooperation projects.

Table 4: Evidence-based conclusions

Territorial dimension	
Key analytical findings	<ul style="list-style-type: none"> • The area has a closely connected land border but is also characterised by lengthy coastlines and islands. • The area has a uniform pattern of settlements and population centres, with population density above the EU average, but below the national averages of both countries; • Although there is moderate population growth, demographic development is characterised by aging, with decreasing younger and increasing older population groups; • The programme area shows a dynamic settlement development, with higher value on the Danish side of the border; • The intensity of cross-border mobility of people varies between higher mobility in the central areas and a lower one in the west and east of the territory; • Cross-border transport links are strong, especially with regard to fast road and rail connections on the mainland, but also well-established ferry links.

Territorial dimension	
Policy options	<p>Territorial aspect</p> <ul style="list-style-type: none"> The expansion of cross-border public transport services could contribute to reducing reliance on private car use while strengthening regional integration across the border area. <p>Cross-cutting aspect</p> <ul style="list-style-type: none"> Territorial cooperation can play a strong role in anticipating, planning for and managing demographic change, including impacts on labour market access, skills availability, health and care for the elderly and the provision of public services.

Economic dimension	
Key analytical findings	<ul style="list-style-type: none"> Although the border region shows higher GDP/capita values than the EU average and other border regions, these values are lower than the respective national averages in Germany and Denmark; The programme area experienced a moderate decrease in the share of working-age population, with high dominance of some sectors groups, e.g. in the areas education, health, social work and services. Growth in areas requiring skilled workers (social work, metal industry, trade, sales) is important for future planning; Cross-border commuting activity is relatively strong particularly from the German areas along the border with Denmark and linked to higher hourly wages and working conditions on the Danish side; Significant differences remain in terms of internet speed between the 2 countries, with particularly rural areas in Germany lagging.

Economic dimension	
Policy options	<p>Economic development aspects</p> <ul style="list-style-type: none"> • Cross-border cooperation may contribute to enhanced competitiveness and economic growth, supporting efforts to narrow the gap between border regions and national GDP averages; • Cross-border commuting arrangements offer potential benefits for communities on both sides of the border, particularly in the context of demographic change and evolving labour market needs; • Disparities in internet speed and access that constrain cross-border exchange and economic interaction may be addressed through coordinated cross-border digital initiatives. <p>Cross-cutting aspect</p> <ul style="list-style-type: none"> • Cross-border cooperation can function as a driver of deeper economic integration while simultaneously supporting the green transition.

Green dimension	
Key analytical findings	<ul style="list-style-type: none"> • With a long coastline, marine and coastal protected areas are a key characteristic of the area, and several are linked across the German and Danish border; • There are high levels of environmental risks, especially for tidal flats, islands and areas with low elevation, which underline the need for ongoing collaboration on risk prevention, management and response; • Energy infrastructure and interconnectivity are strong, with the cross-border region displaying a complex system of energy transmission infrastructure; • The area is identified as having a strong basis for cross-border cooperation on energy.

Green dimension	
Policy options	<p>Green aspects</p> <ul style="list-style-type: none"> Existing cross-border initiatives on risk management and preparedness related to environmental hazards and climate change could be further strengthened, including in areas such as coastal management, protection measures and flood risk reduction; Cross-border cooperation offers opportunities to reinforce energy networks, including through the development of cross-border energy communities. <p>Cross-cutting aspect</p> <ul style="list-style-type: none"> A focus could be on joint green solutions that may serve as a foundation for advancing economic integration across the territory.

Socio-economic dimension	
Key analytical findings	<ul style="list-style-type: none"> The intensity of social interaction among the inhabitants of this border region is largely homogeneous and generally low; There is a Danish-speaking minority on the German side of the border, as well as a (smaller) German minority in Denmark; Tourism is important on both sides of the border, contributing significantly to regional income, infrastructure development and employment; Essential services such as doctors, schools, and grocery shops are evenly distributed across most areas in both countries, but there is still an urban-rural divide, with longer travel times in rural or remote regions.

Socio-economic dimension	
Policy options	<p>Social aspects</p> <ul style="list-style-type: none"> • Cooperation projects could address cooperation beyond core thematic areas to provide a basis for extending collaboration into new fields and communities, increasing awareness of and engagement in cross-border exchanges, e.g. building on the current programme’s innovative approaches that have a strong focus on governance and people to people action; • A focus can be on strengthening functional linkages, e.g. between the strongly tourism-oriented regions of Sydjylland and Nordfriesland, that could support the sustainable development of tourism across the border region. <p>Cross-cutting aspect</p> <ul style="list-style-type: none"> • Cooperation and exchange on innovative approaches to improving access to services (e.g. use of digital tools in the field of healthcare) may help reduce persistent urban–rural disparities.

Border security and safety dimension	
Key analytical findings	<ul style="list-style-type: none"> • Border restrictions show an asymmetric pattern, mainly linked to specific high-level events, covid, and security and migration issues; • Denmark controlled its border for significantly more days than Germany, indicating an unequal impact on cross-border movements.
Policy options	<p>Cross-cutting aspects</p> <ul style="list-style-type: none"> • The impacts of border controls on cross-border commuting and logistics can be mitigated through coordinated and institutionalised cross-border policy dialogue; • The mitigation of border control effects can form part of cross-border cooperation projects in various sectors. Economic networks, transport infrastructure initiatives and tourism-related actions can incorporate considerations related to the impacts of border controls.

Governance dimension	
Key analytical findings	<ul style="list-style-type: none"> • Cross-border cooperation is well-developed across a range of themes, with broad spatial coverage through multi-level governance structures; • Cross-border public services are highly concentrated along a corridor on the mainland and include a wide range of themes from disaster management and transport to education and tourism; • 4 b-solutions pilot actions covered issues such as cross-border internships and the labour law for telework; • In addition to the Germany-Denmark cross-border programme, parts of the area are also eligible under 2 further A programmes and 2 B programmes (North Sea and Baltic Sea).
Policy options	<p>Cross-cutting aspects</p> <ul style="list-style-type: none"> • Progress in embedding cross-border cooperation could be extended into new thematic areas, building on existing experience (e.g. labour market and culture); • Lessons learned from b-solutions offer a valuable basis for addressing legal and administrative obstacles to cross-border interaction in a more systematic manner; • A focus could be on addressing challenges related to social cohesion, particularly in contexts of limited everyday interaction. The opportunities to directly engage across communities vary due to a mix of both land and maritime border. However, linked to specific territorially relevant themes, such as the needs of coastal communities, there are opportunities to build on shared experiences and responses.

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