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EUROPEAN RESEARCH PROJECT

Overlapping crises (re)shaping the future of regional labour markets [OVERLAP]

Main Report // October 2025

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Table of contents

List of maps, figures, charts and tables

List of figures

List of maps

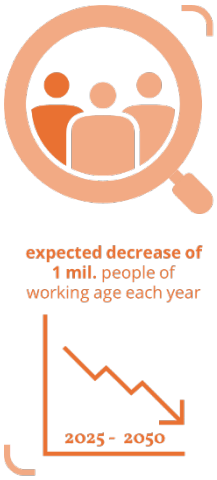
List of tables

Why OVERLAP?

"If left unaddressed, this process [shrinking working age population] will trigger new and growing territorial disparities as regions age and fall behind in terms of size and skills of their workforces. The change in Europe's demographic landscape will hamper the resilience and competitiveness of the EU as a whole and compromise Cohesion. This is taking place in the context of a fierce global race for talent and against the backdrop of other structural transformations, such as the transition to a climate neutral and resilient economy and technological change, that may also exacerbate disparities between regions."

Communication of the European Commission: Harnessing talent in Europe's regions[1]

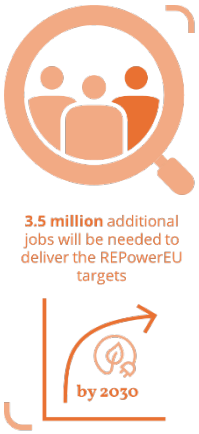
Europe's labour market is entering a decade in which three structural forces converge and pull unevenly on every region. First, the demographic change is steadily thinning the labour supply: between now and 2050 the EU is projected to shrink by one million people of working age each year. As the prime-age (20-50 years) workforce will diminish, the number of older workers will rise; this is expected to reduce overall participation rates unless countered by alleviating policies, that may facilitate the extended participation in the working lives and bring under-represented groups into employment, for instance. Furthermore, this contraction is expected to hit rural and peripheral areas earlier and harder than the large metropolitan poles, that still are expected to attract migrants in the long run.[2]



Second, the digital transition is accelerating demand for specialised skills faster than workers can acquire them. Demand is soaring for software developers, data and network specialists and other ICT professionals, with the programming sector singled out for strong growth. Yet digitalisation is not confined to tech teams: the share of vacancies that require medium-to-high digital skills is rising fastest in traditionally low-skill occupations such as manufacturing labourers and crane operators. Across the board, businesses need workers who can blend technical know-how with problem-solving and collaboration, and shortages of ICT talent are already acute, especially for smaller firms. These dynamics can result in a widening geography of digital opportunity, where tech-savvy urban regions hoard growth while less connected territories risk marginalisation.

[1] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Harnessing talent in Europe's regions (17.01.2023) – COM(2023) 32 final
[2] Employment and Social Developments in Europe (European Commission, 2024). See: link

Third, the green transition promises both disruption and expansion. To deliver the REPowerEU targets, the Commission estimates that more than 3.5 million additional jobs will be needed by 2030, with up to 100,000 new factory positions in net-zero technologies and a further 130,000–145,000 installation and service roles clustered around only wind and solar deployment. Those gains will concentrate in construction, transport and technical services, whereas carbon-intensive clusters face displacement unless large-scale reskilling is rapidly mobilised.[3] Without such targeted training and mobility support, the benefits could bypass smaller firms, routine workers and regions tied to high-carbon industries.



These interacting factors may amplify long-standing territorial disparities in age structure, industrial fabric and human-capital endowment. Understanding ***where*** labour will transform and ***where*** new demand will arise is therefore indispensable. It is precisely this spatial intelligence that the OVERLAP project supplies—by charting the possible employment trajectories of every NUTS-3 labour market - to 2035 - under a varied set of assumptions, driven by policy or shock, within scenarios covering ageing, green ambition and digital diffusion across all EU Member States and ESPON partner countries. In doing so, in this forward-looking exercise, the study equips policymakers with the granular evidence needed to anticipate potential shortages, target up- and reskilling investments, and steer and match transition funding to address local needs and the regions that need it most.

Objectives, research questions and geographic scope

The study starts from **two overarching objectives**:

i. Compile a granular portrait of Europe's regional labour markets by tracing demographic dynamics and their (possible) implications for employment trends, at NUTS-3 level, out to 2035.

ii. Gauge how major drivers—including population change and the twin digital-green transition—may reshape labour demand under a range of forward-looking (possible) scenarios, out to 2035.

From these aims, flow the following main guiding research questions.

- Which territories and sectors are set to gain or lose employment as ageing, automation and decarbonisation unfold simultaneously?
- What policy mixes can cushion vulnerable regions while helping them capture new growth niches?

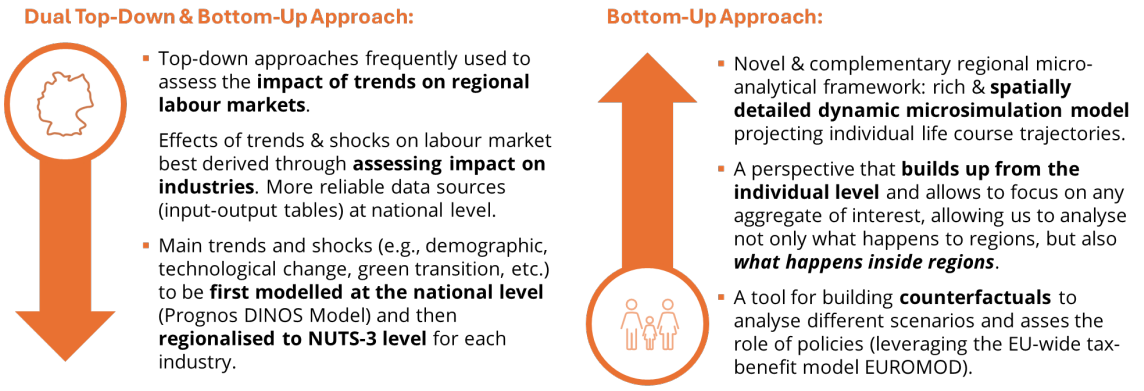
[3] See: link

Addressing these questions across the ESPON space—i.e. all EU Member States plus Iceland, Liechtenstein, Norway and Switzerland—requires a geography-sensitive lens; hence results will be mapped down to individual NUTS-3 regions. To deliver evidence at that resolution, the project combines a **dual analytical architecture**.

- A **top-down** stream employs the DINOS dynamic input-output model[4] to translate demographic, technological and climate-policy shocks into sectoral employment and wage shifts, then regionalises these outputs to the full NUTS-3 grid.
- In parallel, a **bottom-up** stream extends the SimPaths dynamic microsimulation platform[5]—already validated for the United Kingdom —to Hungary, Poland, Greece and Italy, enriching the macro picture with individual life-course trajectories.

Taken together, this design equips the study to provide a better perspective on where overlapping crises and shifts —population decline, digital disruption and climate imperatives—are likely to converge, how large the employment and skills shocks could possibly be, and which policy levers can turn potential fault-lines into engines of inclusive growth. However, it is important to highlight from the onset, that this study it should not be perceived as a *crystal globe*, as it does not cover all possible shocks or situations, but acts upon the accumulated knowledge, in order to provide some modelled scenarios that are aimed at informing and opening the forward-looking strategies, with a pre-emptive component.

Figure 1: Schematic description of the approach chosen: top-down and bottom-up



Structure of the report

This report is structured into four main chapters. ***Chapter 1*** introduces the **three overlapping transitions** that are analysed in the OVERLAP project – namely demographic, green and digital. ***Chapter 2*** presents the **top-down modelling results** derived from the input-output modelling (using the DINOS framework). It details the scenario architecture, the regionalisation methodology, and the projected employment impacts at NUTS-3 level across sectors, territories and scenarios. ***Chapter 3*** shifts to the **bottom-up**

[4] See: link

[5] See: link

perspective, and complements the picture, by describing the individual-level microsimulation work carried out for four selected countries (Greece, Hungary, Italy, Poland) and, includes also the United Kingdom- as the baseline country used for initial modelling (carried out outside of the project). This includes an overview of the SimPaths model, key indicators produced, and overarching insights across the selected countries. ***Chapter 4*** synthesises the **findings from the two analytical streams** and puts forward a set of policy recommendations grounded in the projections and stakeholder consultations.

Supporting deliverables

In addition to this main report, **three complementary reports** are also available.

(I) **The first** is the **report compiling the country-level insights,** for all ESPON countries + the United Kingdom. It provides the top-down results on employment projections for all NUTS-3 regions per country, allowing policymakers and interested readers to view the impacts on their country of interest.

(II) **The second** is the **methodological report** that describes in more detail the framework employed for each of the two analytical perspectives - top-down and bottom-up.

(III) **The third** report offers the detailed case studies of the four countries analysed from the micro-analytical perspective (Greece, Hungary, Italy, Poland), including the policy reflections from the stakeholder consultation. The report includes the results for the United Kingdom.

N.B. The work carried out within the research project is complemented by the interactive products, available on the ESPON portal: the dedicated OVERLAP **dashboard** allows a deeper dive into the top-down projections and exploration of the results for different scenarios, different industries and individual regions.

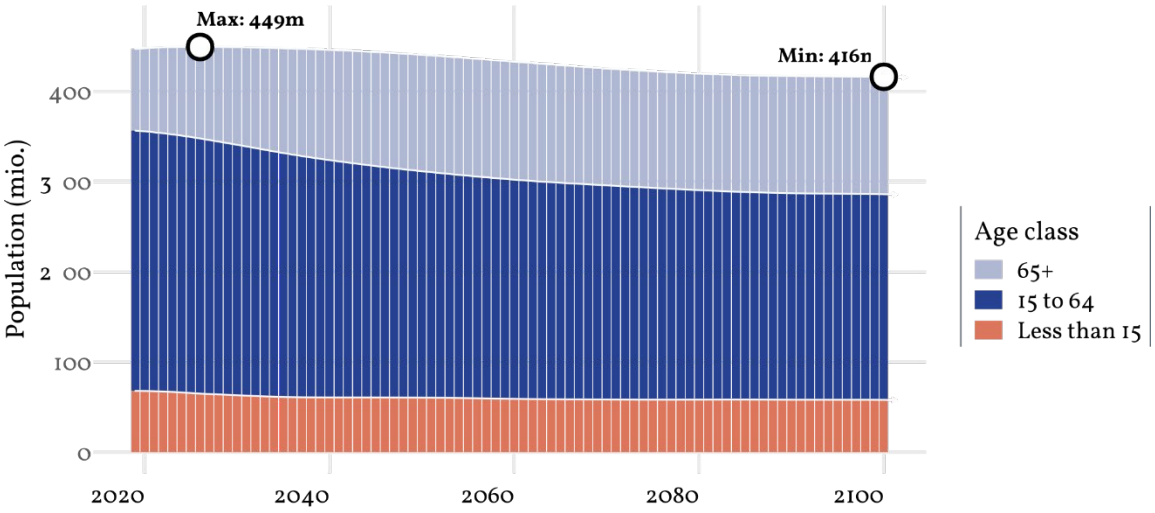
Additionally, on the project page are to be found the links to access to the four micro-simulations modules developed within the project, namely for Greece, Hungary, Italy, Poland, and that are freely accessible for further use.

1. Analysing three overlapping transitions

1.1 The demographic transition

Europe's demographic profile is set to peak and then reverse just as the digital and green transitions demand additional labour mobility and skills. The *2024 Ageing Report* foresees the EU-27 population falling from a projected high of 449 million in 2026 to a low of 416 million by 2100, a net decline of 7%.[6]

Figure 2: Population projections, 2019-2100



Sources: Eurostat – Population on 1st January by age, sex and type of projection (Online data code: proj_19np)

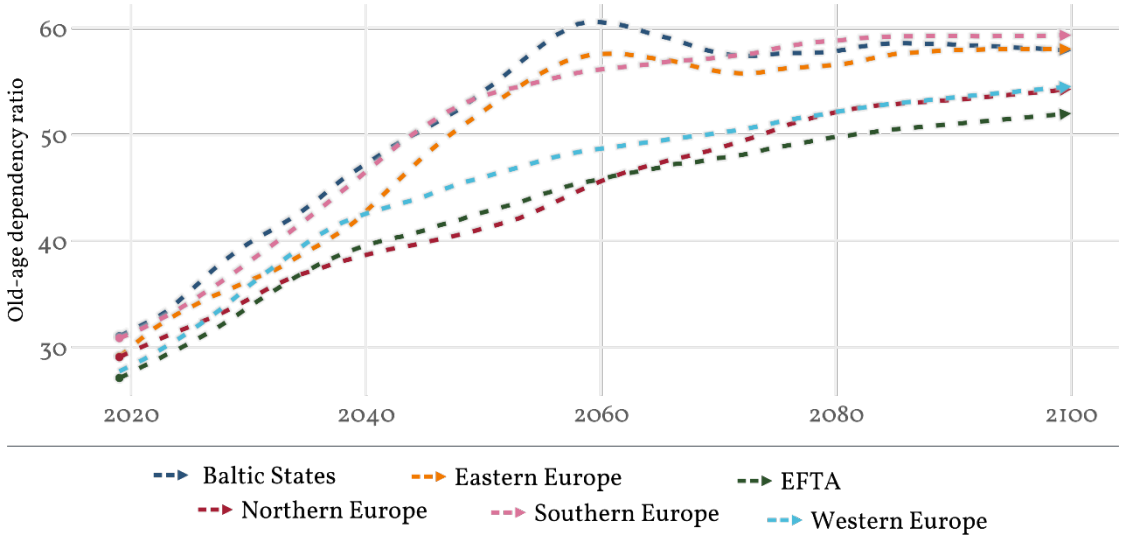
This is the result of the convergence of four long-term trends that are defining some of the more chain reactions. First, the average fertility rate has been decreasing or has stagnated in all EU Member States over the past decade. In 2021, the average fertility rate across the Union stood at 1.53 births per woman - largely below the replacement rate foreseen at 2.1. On average, birth rates have changed considerably – with fewer children in the family and their appearance later in life (once the career paths have stabilised, for instance). Secondly, many Member States witnessed a "baby boom" in the years following World War II. As this large cohort of individuals reaches now the retirement age, it considerably increases the share of elderly citizens in the population. Thirdly, continuous investments in research and advances in healthcare, nutrition, and medical technology have led to longer and more comfortable lives; the average *life expectancy* at birth is expected to increase from 78.4 in 2022 to 86.1 in 2070 for men and from 84.0 in 2022 to 90.4 in 2070 for women, with a continued convergence between sexes. Finally, accompanying all these positive developments, more and more people are engaging with and completing tertiary education paths, leading to higher educated societies. This is important from a demographic

[6] "2024 Ageing Report" (European Commission, 2024). See: link

perspective because higher educated individuals generally tend to delay marriage and childbearing in favour of career advancement.

These fundamentals contribute to the sharply worsening economic dependency. By 2070 almost 6 people out of 10 in today's "working age" bracket will themselves be over 65. Supporting more adults into work helps at the margin, but cannot offset the sheer loss of workers, as *baby-boom* cohorts retire and birth rates stay far below replacement. Even on optimistic participation trends, the EU labour force is expected to shrink by 1 worker in 8 and aggregate hours worked to slide 9%. As a result, the economy is expected to move from 22 workers/per 10 retirees in 2022, to just 14/per 10, by 2070.[7] By extension, every euro of pension or health spending will have to be financed by a much smaller tax base.[8] Because the labour input will decrease, future growth hinges almost completely on productivity improvements: better technologies, skills and organisational efficiency must fuel the growth that demographic momentum no longer provides. Population ageing does not come only with a fiscal challenge, but an innovation imperative; without sustained gains in productivity, living standards and the sustainability of Europe's social model are at risk.

Figure 3: Old-age dependency projections by area, 2019-2100



Sources: Eurostat – projected old-age dependency ratio (Online data code: tps00198)

Furthermore, aggregate EU figures conceal sharp regional divides. In one of its recent briefs, Bruegel Institute projects that between 2023 and 2050 the population will still grow in Northern (+2.6 ‰ annually) and Western Europe (+1.1 ‰ annually), yet contract in Southern (-0.4‰ annually) and, most steeply, Eastern Europe (-3.2‰ annually) despite positive migration balances. Annual net inflows are expected to average between

[7] Ibid.

[8] Baseline projections add 2.6 percentage points of GDP to EU pension, health-care and long-term-care budgets by 2070, with larger fiscal strains in countries where ageing is fastest and fiscal space scarcest. See: link

4.1‰ residents in the South and 3.2‰ in the North, but only 0.9‰ in the East, where natural decline of the overall population is most acute.

Table 1: Projected natural population change, net migration and total population change within the EU, 2023-2050 (average annual change per 1,000 residents)

Area	Total population change	Natural population change	Net migration
European Union	-0.3	-3.0	+2.6
Baltic countries	-8.0	-5.9	-2.0
Eastern countries	-3.2	-4.1	+0.9
Northern countries	+3.3	-0.1	+3.4
Southern countries	-0.4	-4.5	+4.1
Western countries	+1.1	-1.6	+2.6

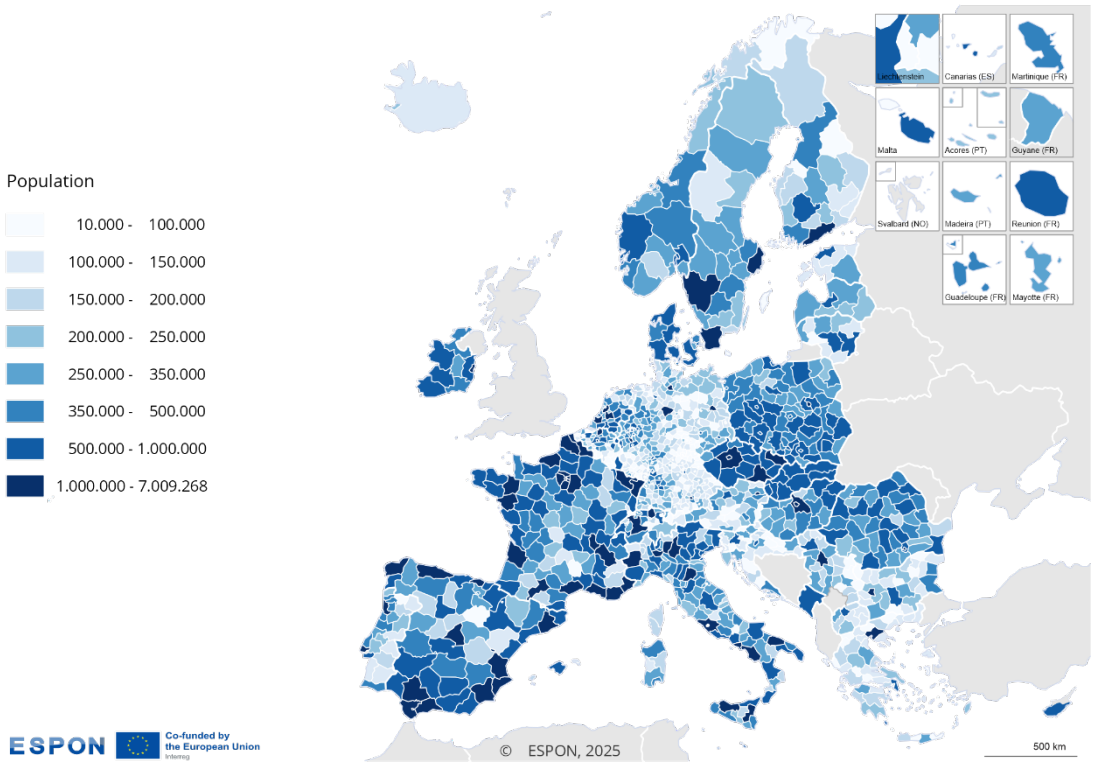
Sources: Own computation based on Eurostat data (Online data code: proj_19ndbi)

The pace of ageing will also be unequal: the share of people aged 85+ is set to more than double across the Union—trebling the very-old-age dependency ratio in the South and quadrupling it in the East.[9] These patterns are replicated at the sub-national and local level. Indeed, migration chiefly favours large metropolitan hubs, leaving many rural districts and former industrial belts to confront simultaneous depopulation, ageing, and skill loss. This dynamic deepens Europe's emerging "brain divide": capital cities and innovation poles attract talent and investment, while peripheral regions struggle to keep schools open, staff hospitals and sustain viable labour markets. Without targeted mobility, education and regional-development policies, demographic divergence could lock entire territories into decline and undermine cohesion across the single market. **Demography is at present the European Union's tightest structural constraint.**

[9] "The demographic divide: Inequalities in ageing across the European Union" (Bruegel, 2025). See: link

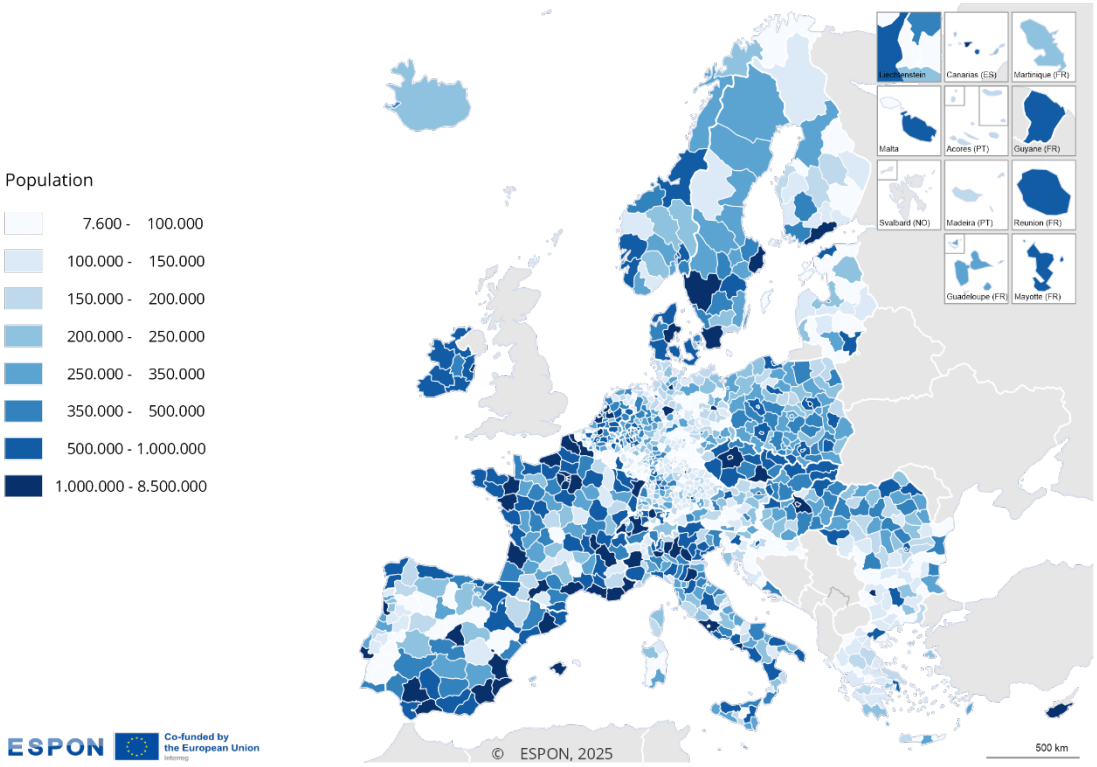
Map 1: Population distribution in 2024 and in 2100 (projections)

Total population distribution across the ESPON space in 2024



Territorial level: NUTS 3 (2024)
Source: ESPON Overlap, 2025
Origin of data: "Population on 1 January by age group, sex and NUTS 3 region" (Eurostat – Online data code: demo_r_pjangrp3) .
Administrative boundaries: ©EuroGeographics ©ESPON

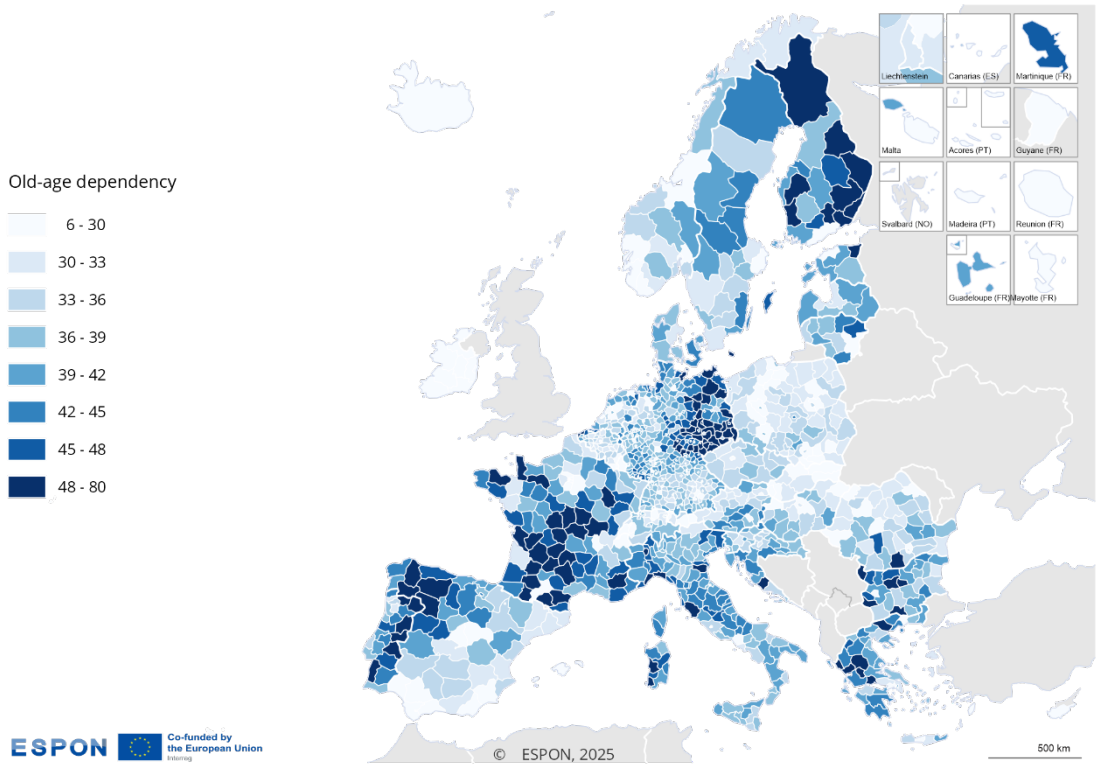
Total population distribution across the ESPON space in 2100 (projections)



Territorial level: NUTS 3 (2016)
Source: ESPON Overlap, 2025
Origin of data: "Population on 1 January by age group, sex and NUTS 3 region" (Eurostat – Online data code: demo_r_pjangrp3).
Administrative boundaries: ©EuroGeographics ©ESPON

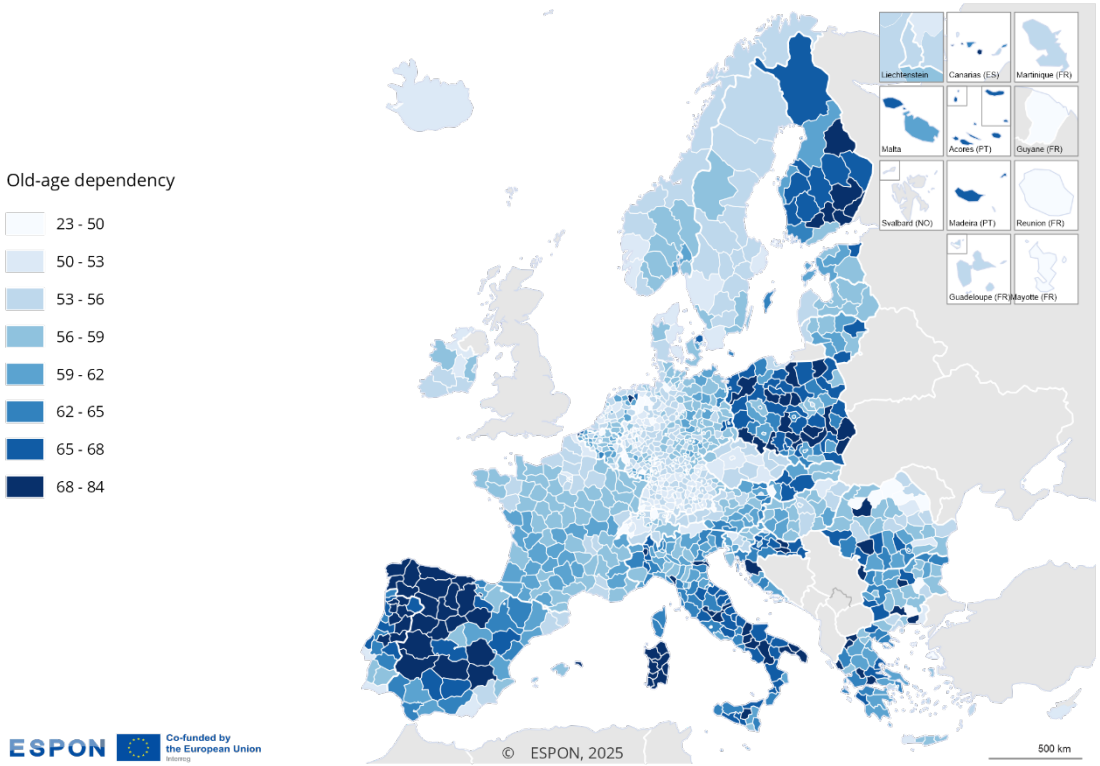
Map 2: Old-age dependency ratios across the EU in 2025 and in 2100 (projections)

Old-age dependency ratio across the ESPON space in 2025



Territorial level: NUTS 3 (2016)
Source: ESPON Overlap, 2025
Origin of data: "Demographic balances and indicators by type of projection and NUTS 3 region" (Eurostat – Online data code: proj_19rdbi3).
Administrative boundaries: ©EuroGeographics ©ESPON

Old-age dependency ratio across the ESPON space in 2100 (projections)



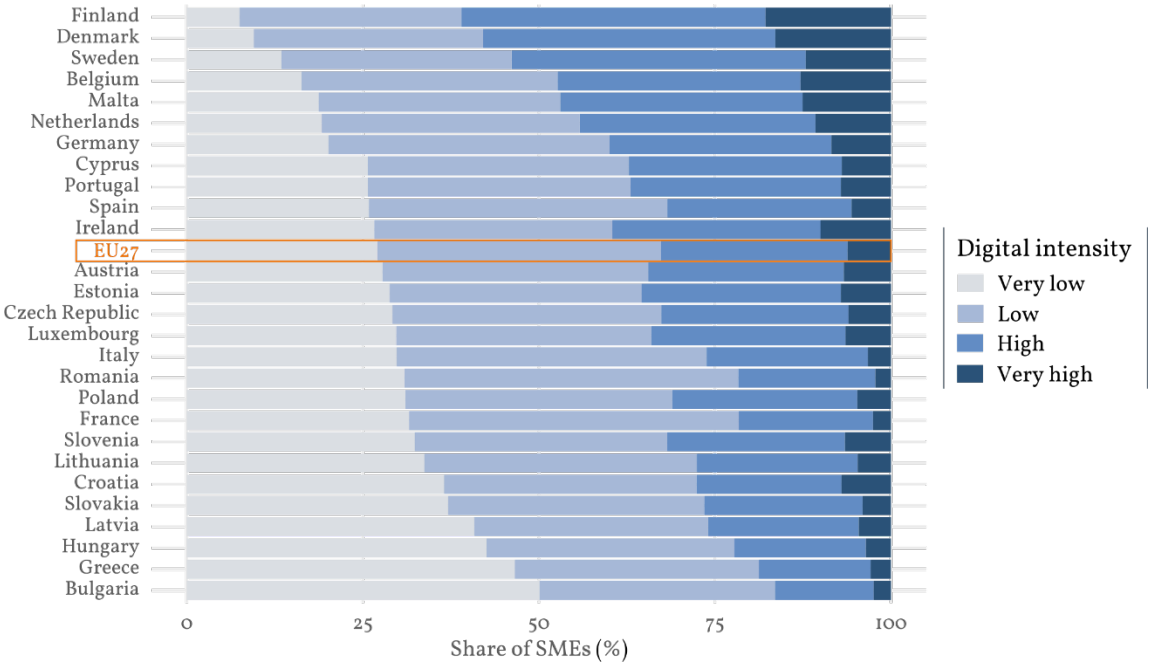
Territorial level: NUTS 3 (2016)
Source: ESPON Overlap, 2025
Origin of data: "Demographic balances and indicators by type of projection and NUTS 3 region" (Eurostat – Online data code: proj_19rdbi3).
Administrative boundaries: ©EuroGeographics ©ESPON

1.2 The digital transition

Digitalisation is best understood as the full-scale integration of data-driven software, connected devices and algorithmic decision-making into how goods and services are produced, managed and exchanged, replacing simple "going online" with a fundamental redesign of value creation.

Mutually reinforcing forces propel this shift: robots, software bots and generative AI automate repetitive physical and cognitive routines; cloud-based, sensor-rich systems translate paper or analogue workflows into real-time data streams that tighten quality control and cut lead times; and multi-sided digital platforms match buyers, sellers and workers at unprecedented speed, spawning entirely new business models in e-commerce, mobility and freelance work.

Figure 4: Digital intensity level in Small and Medium Enterprises (SMEs), 2024



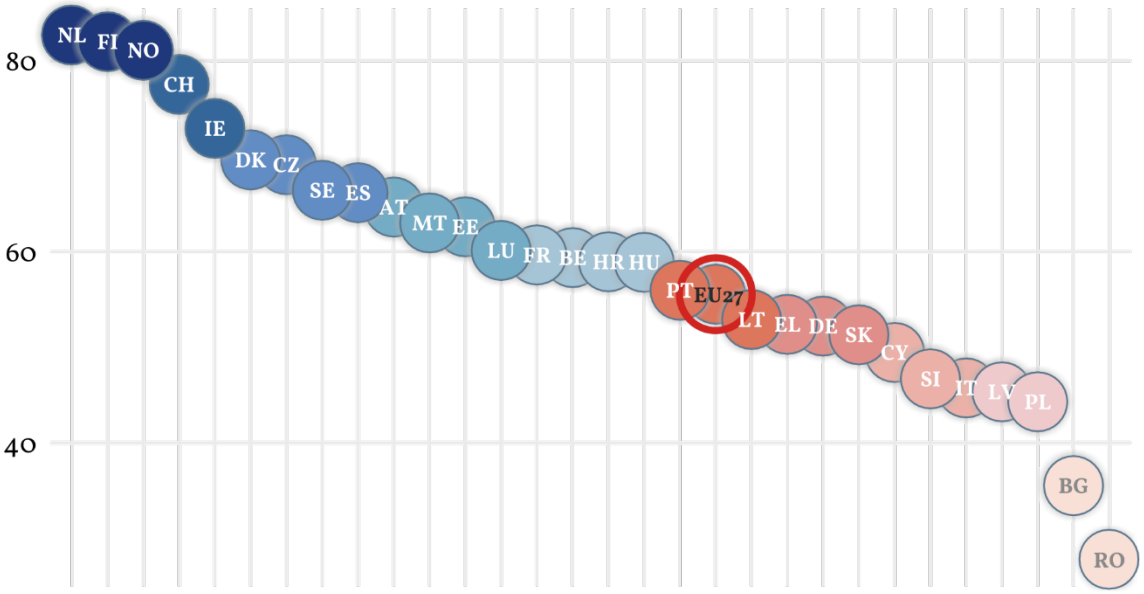
Sources: Eurostat – Digital Intensity by size class of enterprise (Online data code: isoc_e_dii)

The transition is advancing unevenly, but decisively. EU survey data shows that 28% of establishments with 10 or more employees are already highly digitalised, while 27% still use only basic tools; 40% of large workplaces sit in the vanguard against just 17% of small ones. COVID-19 turbocharged remote working and cloud migration yet largely reinforced pre-existing divides. Advanced applications remain niche—fewer than 1 in 5 firms deploy the *Internet of Things* (IoT), and under 5% use 3-D printing or augmented reality—but where they are adopted, they pair with AI to unlock large productivity gains, hinting at substantial latent potential once diffusion widens.[10]

[10] "The digital age: Implications of automation, digitisation and platforms for work and employment" (Eurofound, 2021). See: link

Evidence gathered from 2016-2019 points to a modest net job gain, but with pronounced polarisation: 40-45% of highly digital firms increased headcount, compared to roughly 30% of their less digital peers; yet automation continues to hollow out routine middle-skill roles, while expanding both high-skill digital occupations, and low-skill personal-service jobs. This split widens wage dispersion and strains social-security finances, as many, new, low-skill posts are part-time or platform-mediated, with fewer hours worked and less contributions. At the same time, demand for ICT expertise is outpacing supply; although more than 70% of vacancies now ask for at least basic digital skills, about 30% of workers fall into a skills gap, especially in smaller firms and lagging regions.[11]

Figure 5: Share of people (%) with basic or above basic digital skills by country, 2023



Sources: Eurostat – Individuals' level of digital skills (Online data code: isoc_sk_dskl_i21)

Non-standard work arrangements are spreading on the back of digital matching and monitoring technologies. Part-time, fixed-term, agency, solo self-employment and platform gigs now account for nearly one third of EU employment, offering firms flexibility and some workers a better work-life fit, but exposing many to volatile earnings, weaker bargaining power and patchy social protection. The 2024 Platform-Work Directive[12] and measures under the European Pillar of Social Rights[13] seek to close these gaps by clarifying employment status, tightening algorithmic oversight and promoting portable benefits, yet implementation remains a challenge.

Polarisation and non-standardisation reinforce each other: displaced middle-skill workers often re-enter the labour market through temporary low-skill service roles, while companies increasingly source high-skill expertise via freelance platforms rather

[11] Ibid.
[12] DIRECTIVE (EU) 2024/2831 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2024 on improving working conditions in platform work. See: link
[13] See: link

than full-time hires. The result is a more agile yet more fragmented labour market that boosts productivity for frontier firms, but complicates tax collection, wage equality and the financing of collective insurance.

Spatially, digitalisation amplifies Europe's existing economic geography. Highly digitalised firms cluster in large urban regions with strong innovation ecosystems, deep capital pools and talent pipelines, while peripheral and rural areas face finance constraints, slower broadband and limited training infrastructure. Populations in these regions are, on average, less digitally savvy and their business fabric less innovative, making it harder to adopt new tools just as their traditional middle-skill manufacturing jobs come under pressure. Unless targeted support—such as broadband rollout, SME advisory services, regional up- and reskilling programmes—levels the playing field, digitalisation risks entrenching a new territorial divide, with prosperous tech hubs pulling still further ahead of lagging regions. Ensuring that the benefits of Europe's digital decade are shared widely, rather than concentrated in a handful of metropolitan poles, is therefore critical not only for growth, but for cohesion across the single market and the ESPON space at large.

1.3 The green transition

The EU's climate-neutrality goal has turned decarbonisation into an economy-wide restructuring programme: meeting the Green Deal, Fit-for-55 and Net-Zero Industry Act targets requires roughly €520 billion a year in additional investment for energy and transport infrastructure for this decade, plus €92 billion to scale up clean-tech manufacturing.[14] Although most of that capital must come from national budgets and private finance, EU instruments play a catalytic role: the Recovery and Resilience Facility dedicates €2.4 billion to green-skills reforms, the European Social Fund nearly €10 billion to green jobs, the €40 billion Just Transition Fund supports the regions most exposed, and the new Social Climate Fund will add €65 billion for vulnerable households between 2026 and 2032.

In September 2023, Parliament backed a new target of 42.5% of renewable energy sources by 2030, although EU countries are urged to strive for 45% - a target also backed by the Commission under its REPowerEU plan.[15] This follows a positive trend that shows that share of renewable energy almost tripled between 2004 and 2023, where the EU reached a 24.5% share of its gross final energy consumption from renewable sources in 2023, around 1.5 % higher than in 2022[16] (where Sweden, Finland, Denmark, Latvia and the non-EU countries – Iceland and Norway, have already surpassed the43% target).

Macro-modellings converge on a modest, but positive employment effect of these investments by 2030: total EU employment is projected to stand from 0.1% to 1.2% (≈

[14] "Estimating labour market transitions and skills investment needs of the green transition" (European Commission, 2025). See: link

[15] See: link

[16] See: link

0.2–2.5 million jobs) above a pre-Green-Deal baseline. Gains cluster in sector such as construction, renewables, equipment manufacturing and circular-economy services, while coal, oil, gas and other energy-intensive activities are expected to contract. 'Brown' sectors currently employ only 5.7% of the EU workforce, yet they account for more than 1 in 5 jobs in several Greek and Romanian regions; mining employment in Poland is expected to fall by almost 50% relative to 2019—a reminder that **small national aggregates can hide sharp local shocks**.[17]

Labour-flow data confirm early reallocation. EU Labour Force Survey records net inflows into every "transforming" sector except mining, with the energy supply chain, manufacturing and construction absorbing most movers; notably, workers in energy-intensive industries are less likely to fall into unemployment than average, a pattern linked to strong union coverage and male-dominated workforces. At the same time, only about 1 worker in 10 across these sectors receives job-related training each year, and participation in construction—the sector with the steepest future demand projected —is among the lowest.

Closing the emerging skills gap therefore ranks high. Achieving the 2030 wind- and solar-deployment targets alone, will require an extra 130,000–145,000 specialised technicians, electricians and crane operators and €1.1–1.4 billion in training outlays; 90% of these new roles arise in construction and related services, and job creation is strongest in member states that are now lagging on taking up renewable energies. Employment factors remain favourable—roughly 2.4 jobs per megawatt of wind, and 2.1 per megawatt of solar capacity added—but the qualified-labour bottleneck is already binding in several countries.[18]

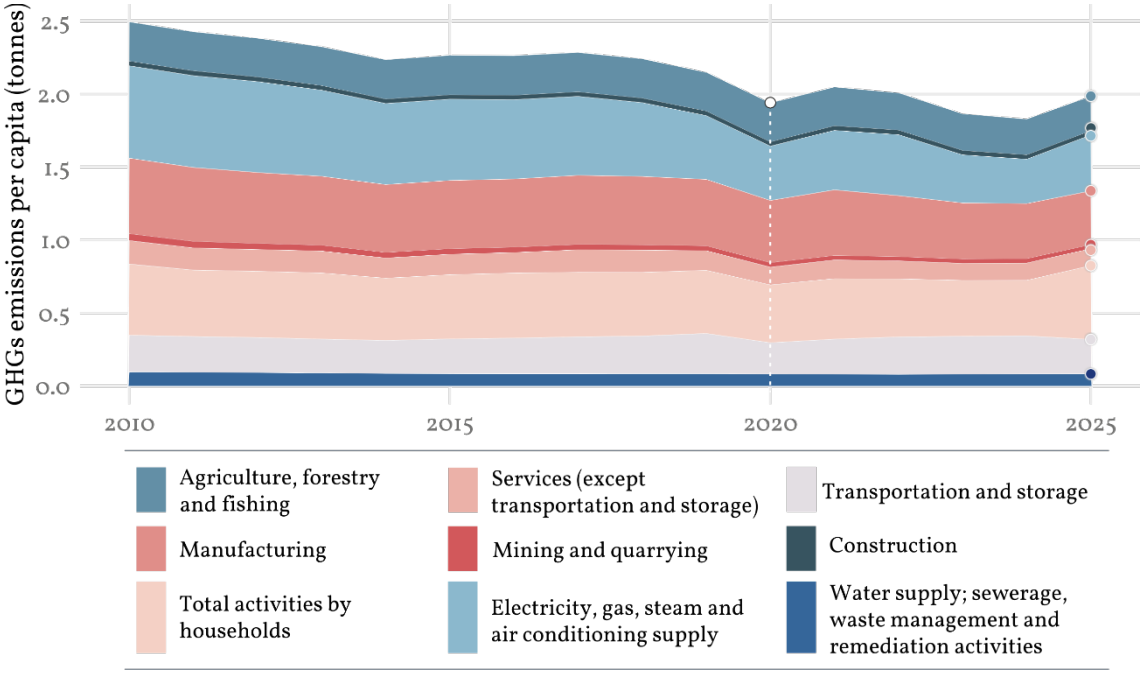
To smooth workforce transitions, EU policy now couples investment finance with active labour-market tools. The Just Transition Mechanism[19] funds up reskilling in coal-dependent regions; and Net-Zero Industry Academies[20] will deliver standardised training for battery, heat-pump and hydrogen value chains. The Council Recommendation on a Fair Transition[21] urges member states to mobilise portable learning accounts and targeted mobility incentives. National authorities still need to flesh out local packages—ranging from housing support for relocating workers to innovation clusters that anchor new clean-tech firms—so that low-carbon growth opportunities match the territories where high-carbon jobs disappear.

In short, **decarbonisation promises net job creation and higher-quality work**, but only if Europe invests as heavily in people as it does in hardware. The balance between opportunity and disruption hinges on timely training, robust social protection and place-

[17] "Social and labour market impact of the green transition" (EPRS, 2024). See: link
[18] "Estimating labour market transitions and skills investment needs of the green transition" (European Commission, 2025). See: link
[19] See: link
[20] See: link
[21] "Proposal for a COUNCIL RECOMMENDATION on ensuring a fair transition towards climate neutrality" (COM/2021/801 final). See: link

based development strategies that prevent the green boom from deepening regional divides.

Figure 6: Air emissions of greenhouse gases by industry, across EU, for the 2010-2024 period



Sources: Eurostat – Air emissions accounts for greenhouse gases by NACE Rev. 2 activity (Online data code: env_ac_aigg_q)

2. Macro-level analyses

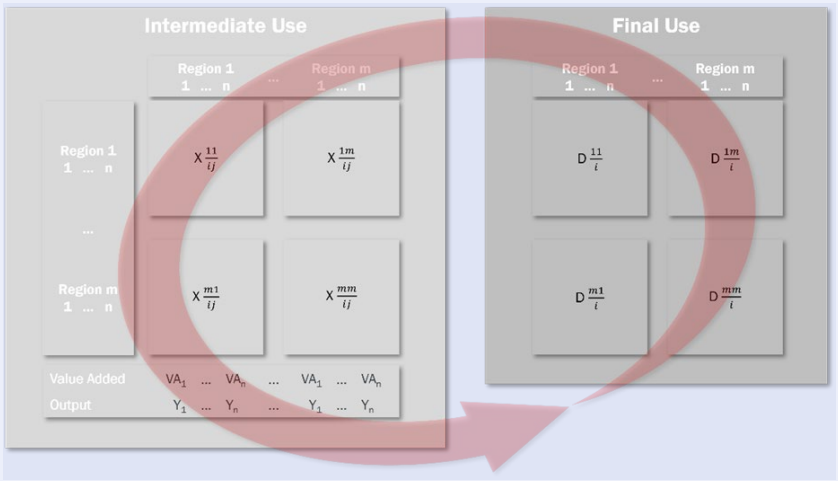
2.1 Rationale for a top-down approach

The top-down approach refers to a macro-level modelling strategy that begins with national economic aggregates, traces broad structural trends across industries, and subsequently disaggregates the resulting labour-market effects to individual regions. By working from the "whole economy" downward, this framework captures systemic interactions—such as supply-chain spill-overs—beyond the reach of purely regional models.

Box 1 – The Dynamic Input-Output Model (DINOS)

The approach uses the global industry macroeconomic model named DINOS (Dynamic Input Output System), developed and maintained by Prognos. DINOS depicts **the complete economic cycle of the production, distribution and use of gross domestic product, differentiated by economic sectors and countries.** Central economic variables, such as wage and price dynamics, technical progress, foreign trade and the demand for labour and capital goods are **modelled at the level of the economic sectors**. For designing behavioural rules of the economic actors which are implemented in the model, it falls back on the findings of the (micro) empirical literature. The actors act under bounded rationality; the acquisition and processing of information is subject to restrictions; and the actors try to achieve their respective local goals using simple routines and heuristics. The institutional design of modern industry-service economies, such as the sectoral differentiation between companies and private households, the distinction between profit and wage income on the part of private households or the credit and money creation capability of commercial banks are also implemented in DINOS.

Cycle of production, distribution and use of GDP in DINOS



For the functioning of the model, main data is retrieved from the JRC FIGARO database (Full International and Global Accounts for Research in input-Output analysis); the project used the 2023 FIGARO edition, covering the whole time series of 2010 to 2021 for EU 27 Member States, the United Kingdom, the United States and 17 main EU partners. It should be noted that due to binding constraint - the evidence needed to *regionalise* the projections in a harmonised and justifiable way, the project used the **11 industries** for which **regional allocation keys exist** (based on the Eurostat employment dataset nama_10r_3empers).

Scope note: ageing in the macro model - in the top-down framework, ageing feeds through demographics and shapes labour supply and the overall scale of final demand. The dynamic IO core covers wages/prices, investment and supply-chain effects, but **does not** reweight private or public consumption by age (e.g., towards health/LTC) over the horizon. IO coefficients are extrapolated with limited autonomous trends, not age-profiled baskets. Accordingly, ageing-driven shifts in demands for goods and services are not separately identified in the NUTS-3 results (11 industries).

There are three main advantages to this approach:

i. First, a top-down macroeconomic perspective anchors regional labour-market projections in the **richest** and **most reliable evidence base available**. National accounts and multi-country input–output tables—such as Eurostat-JRC's FIGARO—capture the full network of inter-industry linkages and cross-border spill-overs that drive employment responses to demographic change, digitalisation and the green transition; datasets of comparable quality are not available at the NUTS-3 level at this moment.
ii. Second, simulating shocks at the national scale with the DINOS model allows that indirect supply-chain effects to be accounted for firstly, before results are distributed to regions.
iii. Third, addressing impacts at industry level recognises that **forces such as automation or decarbonisation manifest primarily in sectors rather than places**; regional outcomes are thus derived transparently from each territory's sectoral mix, yielding estimates that remain both plausible and relevant for policy.

2.2 Scenario architecture and assumptions

In the course of the research, the following proxies and datasets were used to investigate the effects of different shocks and trends:

Population projections: Population figures were taken from the official projections produced by Eurostat (EUROPOP2019). The series are 'what-if scenarios' that aim to show the hypothetical developments of the population size and its structure, based on a set of assumptions for fertility, mortality and net migration; they are presented for a long period, covering the time horizon from 2019 to 2100. Three distinct assumptions were considered to calculate the OVERLAP scenarios:

➲ **Baseline** assumptions - where fertility, mortality and migration hypotheses define the *main* trajectory of population growth / decline in the coming century - Eurostat's baseline EUROPOP-2019 scenario rests on partial convergence: national fertility trajectories edge towards 1.83 births per woman; age-specific mortality aligns with a shared "ultimate" life table, lifting life expectancy into the high-80s/low-90s by 2100; and migration evolves from recent trends, augmented by a working-age feedback that replaces 10% of annual working-age losses via extra non-EU inflows.

Low migration assumptions: low migration reduces net migration in every projection year by 1/3 relative to the baseline, while fertility and mortality assumptions remain unchanged; smaller external inflows systematically curtail the replacement of ageing cohorts, accelerating working-age decline and raising dependency ratios, compared with the central path, and bringing forward population shrinkage in many Member States.

High migration assumptions: high migration increases net migration in each year by 1/3 relative to the baseline, leaving fertility and mortality settings intact; the extra inflows—mainly of working-age entrants—slow population ageing, cushion labour-force decline and lift total population levels, thereby dampening the rise in dependency ratios and yielding a more favourable demographic outlook than the baseline.

Technological change and digitalisation: technological change was effectively proxied by productivity - defined as value added per hour worked. This measure was determined endogenously within the model, which addressed the concerns about data availability while maintaining empirical rigor. This has been modelled and evaluated under three different assumptions, including a baseline, high productivity and low productivity one.

➲ **Baseline** assumptions: an exogenous gain of **0.5% per year** is assigned to the industry-country with the highest 2021 productivity, for each FIGARO sector; all other countries in that sector grow faster, with a calibrated convergence factor replicating historical catch-up speeds; the result is a moderate, historically grounded rise in value added per hour worked that varies by industry and country.

High-productivity assumptions: the frontier growth rate is increased by **33%** to **approx. 0.665% per year**, and the convergence factor is also raised **by 33%**; this combination lifts every productivity trajectory above the baseline and accelerates catch-up, simulating rapid technological diffusion across industries and countries.

Low-productivity assumptions**:** the frontier gain is reduced by **25%** to **approx. 0.375% per year**, while the convergence factor is cut by **25%**; productivity therefore advances more slowly everywhere, lengthening the gap-closing process and modelling a sluggish pace of innovation and adoption.

Green transition: to evaluate the impact of the green transition on regional labour markets, the analysis drew on the investment modelling developed in a previous study: *Green Finance's Contribution to Achieving Climate Neutrality in Germany*[22](by Prognos and partners), which quantified the capital required for Germany's net-zero pathway by 2050. That framework was adopted to calculate industry-specific average costs for abating one tonne of greenhouse-gas emissions.

The main assumption: each country in the study was assumed to pursue a net-zero target by 2050 and was linked to publicly available sectoral emissions data[23]. Emission-reduction volumes by country and industry were then multiplied by their corresponding unit costs to derive total investment needs in euro terms. These investment shocks were fed into the DINOS dynamic input-output model, to project sectoral and regional labour-market effects. The procedure produced a single scenario that quantified the consequences of a successful green transition, defined as reaching the stipulated net-zero targets via the necessary investments.

The different series representing different assumptions about future demographic, productivity and green transition scenarios were then mixed and combined, giving rise to

[22] See: link

[23] Air Emissions Accounts (OECD) – see link

13 separate scenarios. Of these, **6 were selected for further analysis in this report (in bold** across Table 2). The chosen 6 form a principled subset that spans (i) a *business-as-usual* anchor, (ii) the digital/productivity shock, (iii) the green-transition investment shock, and (iv) demographic bounds (low vs high migration) under the green transition. This ensures coverage of the 3 transitions, while avoiding clutter that would make cross-typology comparisons opaque. The underlying dataset (all 13 scenarios) are nevertheless available through the ESPON portal dashboard, for any in-depth analysis required.

Table 2: Calculated scenarios (with an indication on the ones that are further detailed)

No.	Population	Productivity	Green transition
1	➲ Baseline	➲ No change	➲ No change
2	🕩 Low migration	➲ No change	➲ No change
3	🕪 High migration	➲ No change	➲ No change
4 ✓	**➲ Baseline**	**➲ Baseline**	**➲ No change**
5	➲ Baseline	🕩 Low	➲ No change
6✓	**➲ Baseline**	**🕪 High**	**➲ No change**
7	🕪 High migration	🕪 High	➲ No change
8	🕩 Low migration	🕩 Low	➲ No change
9 ✓	**➲ Baseline**	**➲ Baseline**	**☑ Successfully achieved**
10	➲ Baseline	🕪 High	☑ Successfully achieved
11 ✓	**➲ Baseline**	**🕩 Low**	**☑ Successfully achieved**
12 ✓	**🕪 High migration**	**🕩 Baseline**	**☑ Successfully achieved**
13 ✓	**🕩 Low migration**	**🕩 Baseline**	**☑ Successfully achieved**

This restricted display **does not change** the convergence of results: across scenarios the ranking of front-runners/depleting regions, and the **urban–intermediate–rural pattern** is highly stable; adding all 13 would only add noise without altering the message. Additionally, to remove any perception of arbitrariness, table 3 provides more justification for each chosen scenario.

Table 3: Justification of the selection of scenarios

Scenario	Justification
Baseline population, baseline productivity (BAU / *baseline*).	this is *business-as-usual* anchor – a reference path to read all other shocks/ scenarios against; it preserves interpretability across typologies.

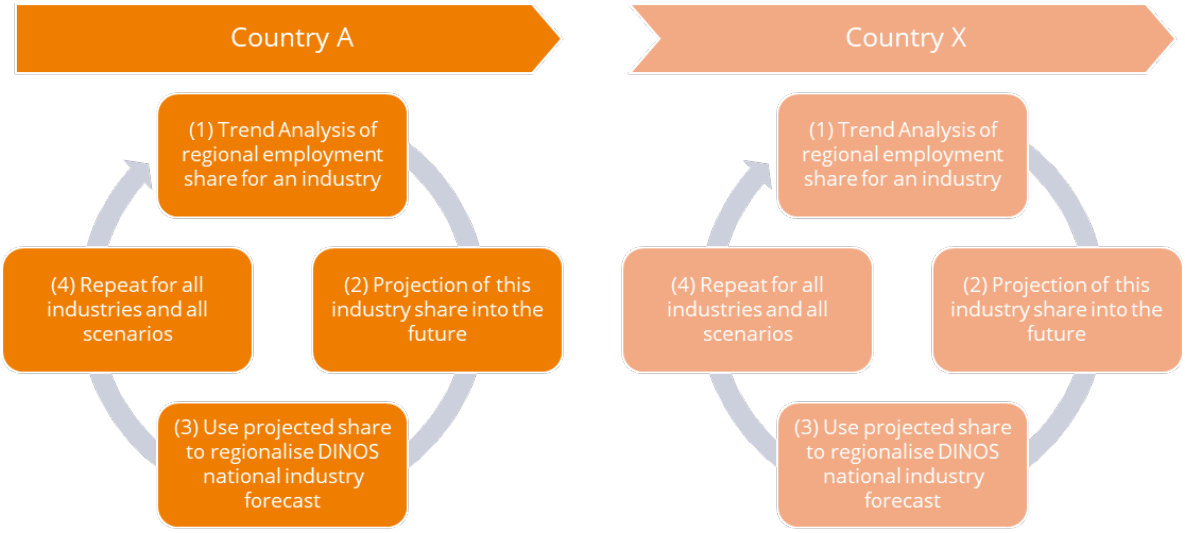
Scenario	Justification
Baseline population, high productivity.	this isolates the digital/productivity effect, while holding demography constant; tests the extent to which higher productivity cushions declines.
Baseline population, green transition achieved.	this adds the net-zero investment shock to the BAU scenario, to quantify the stand-alone employment effect of the green transition across typologies.
Baseline population, high productivity, green transition achieved	this stacks digital and green transitions, upon the baseline demography (bringing the study's *twin transitions* focus), giving an upper-bound for offsetting demographic drag.
Low migration, baseline productivity, green transition achieved	this accounts for the demographic lower-bound under the green transition; shows the primacy of demography for rural/intermediate areas when inflows weaken.
High migration, baseline productivity, green transition achieved	this accounts for the demographic upper-bound under the green transition; it illustrates how stronger inflows cushion are lost in many regions, with the caveat that net-outflow countries can see adverse effects.

2.3 Regionalisation to NUTS-3 level

The DINOS model produces national employment forecasts for 34 sectors; hence, a separate regionalisation model was adopted to translate these totals to the NUTS-3 scale. In order to do so, a harmonised database of regional employment by sector (covering 2012-2023) was built from Eurostat, ARDECO, OECD, and national sources. For each country and sector, the share of national employment located in every NUTS-3 region was calculated for each year and a simple time-trend regression projected those shares to 2035, assuming recent gains or losses continue but gradually taper. The projected regional shares were multiplied by the DINOS national sector totals, yielding absolute employment levels by region, sector and year; repeating the operation for every scenario and every country produced complete regional employment projections. Figure 7 provides a schematic of the procedure.

Where DINOS treated several small states together (Malta, Luxembourg, Cyprus), national shares derived from the database were used to split the combined totals. Iceland and Liechtenstein, absent from DINOS, were given baseline projections by holding recent sector shares constant and scaling total employment with population growth, then adjusting scenario differences in line with structurally similar Nordic or Central-European reference countries. More information on the methodology underpinning this process can be found in the **methodological annex** (section 5.1.2).

Figure 7: Regionalisation of macro-trends to NUTS-3 level



2.4 Results of regionalisation

In 2024, Europe's labour market posted strong headline figures: **75.8% of working-age adults (20–64) were employed**, and the **overall unemployment rate hovered around 6.1%.** Yet these averages conceal stark regional contrasts. Employment patterns today often foreshadow tomorrow's growth or decline, making current distributions especially consequential for EU cohesion and policy.

On the one hand, about **45%** of regions have already hit or surpassed the 78% employment target.[24] These high-performing areas cluster in the Czech Republic, Denmark, Germany, Hungary, the Netherlands, Slovakia and Sweden. Leading regions are: the Polish capital region of Warszawski stołeczny (86.5%) and Bratislavský kraj (85.8%), with Trier (85.4%), Stockholm (85.2%), Praha (84.8%) and Budapest (84.4%) close behind. This pattern—where major cities and capitals surpass rural districts—is a familiar one, and will also appear in the employment projections; however from a policy perspective, this may soon be pursued not in a comparative perspective, but in a integrative way of referring to different needs and opportunities of different places.

On the other hand, roughly **25%** of regions fall below a 72.5% employment rate. This situation is considerably more frequent in Southern Europe and Eastern Europe, but also affects territories in the deep Northern pats, Belgium or France. For instance, the capital of Belgium showcases a meagre result by metropolises' standards (66.5%).

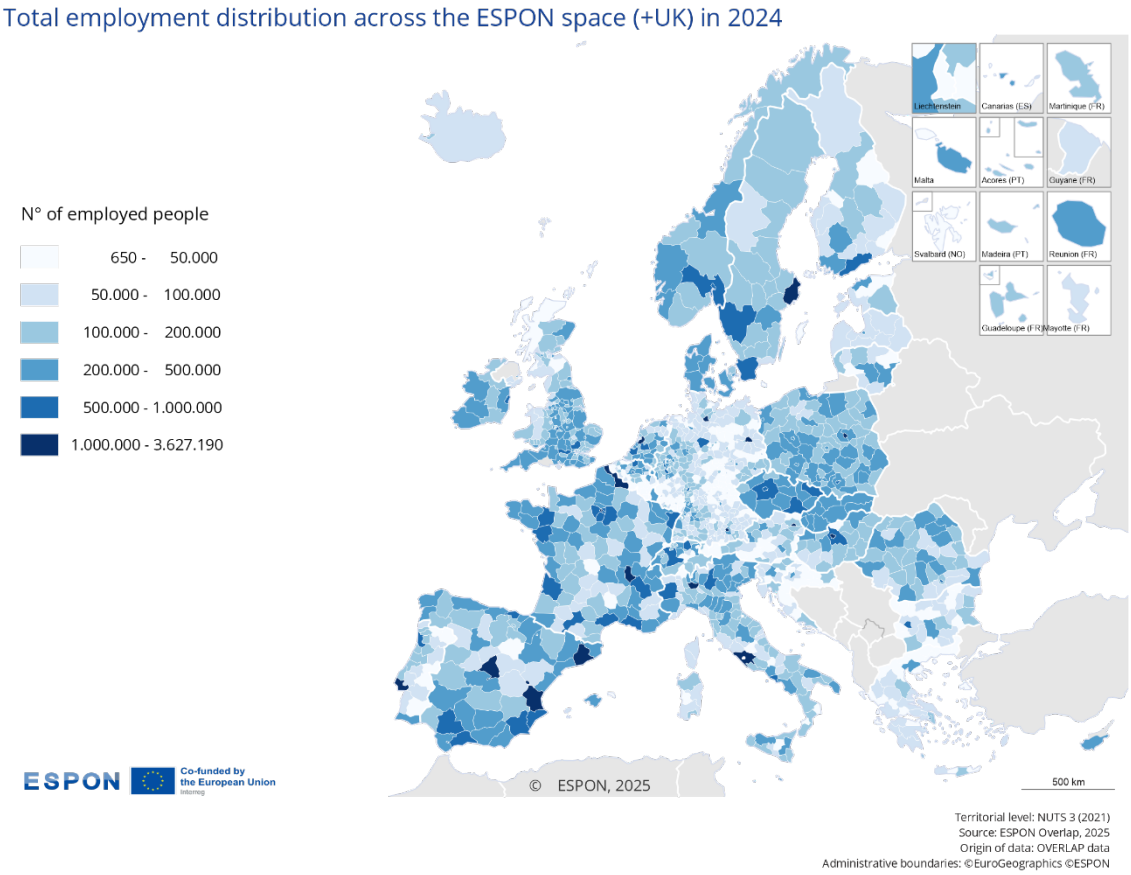
This disparity underscores first a clear north–south divide. Northern Europe not only meets but often exceeds the 78% goal—Denmark stands at 80.2%, Sweden at 81.9% and the Netherlands at 83.5%. In contrast, southern and Eastern *hotspots* grapple with elevated

[24] See: link

unemployment levels: Andalucía, for example, recorded an 18.3% unemployment rate, while Calabria's employment rate remained at 48.4% in 2023.

Still, only considering employment *rates* can lead into blind spots. For example, countries that are experiencing intense out-migration, might see their employment rates rise by virtue of their population's decline. This is intuitively an undesirable situation, as agglomeration effects suggest that greater opportunities and greater economic benefits accrue to *growing* labour basins, as opposed to declining ones.

Map 3: Total employment distribution across the ESPON space (+UK) in 2024



Map 3 depicts the current distribution of employed across NUTS-3 regions at a pan-European level. Here, the situation of pale-blue regions is to be kept in mind. These regions – most often rural or remote in nature – host relatively small populations of employed individuals. The projections will show that these regions are likely to suffer the largest (relative) negative employment swings, as the different shifts – demographic, digital and green transitions – will come to bear. These regions are also the ones which shall receive the dedicated attention of policymakers, as severe drops in employment in communities that are already small can pose existential threats to the viability and liveability of these places, forcing once thriving regions into development traps.

Starting form this initial picture, the following sections will further explore the employment projections developed during the project lifetime. **The scenario-building exercise and subsequent regionalisation produced a sizeable dataset**: employment projections for 1,377 NUTS-3 regions across the EU, EFTA and the United Kingdom, covering 11

industries (or 12, if to include the total), under 13 scenarios. In wide format this yields 214,344 records.

N.B: The full dataset produced is to be found in the ESPON Portal, where a dedicated dashboard was developed, enabling users to explore the projections independently and comparatively. There the users will find an interactive map, covering all NUTS 3 regions of the ESPON space. Similarly to the maps presented below, but with added features, the visual tool hosts the maps that reflect the projected percentage changes in employment from 2024 to 2035. A series of dynamic filters allows to focus iteratively on: 1 out of the 13 scenarios; 1 out of the 12 available industries (A, B-E, C, G-I, O-Q, A, M_N, R-U, L, K, J and TOTAL[25]), and to search and filter through all 1,377 NUTS-3 regions. Furthermore, upon hovering the cursor on any given NUTS-3 region, a pop-up window appears that showcases additional information.

The sections that follow present an overview of the results and highlight the key stylised facts that emerge. The following sections will thus analyse projected employment change at NUTS-3 level for the period 2024-2035. The 6 alternative scenarios—varying the strength of migration, productivity, and the green transition—were plotted to test the robustness of results. Together, these assumptions allow to identify where employment is possibly going to contract or expand, and to gauge whether those patterns hinge on a single assumption or persist across a range of futures. The results that follow could forge one possible message: **employment is likely to shrink in most European regions, but the magnitude of the declining varies widely across NUTS-3 regions**. The discussion that ensues considers the following **6 selected scenarios**, namely:

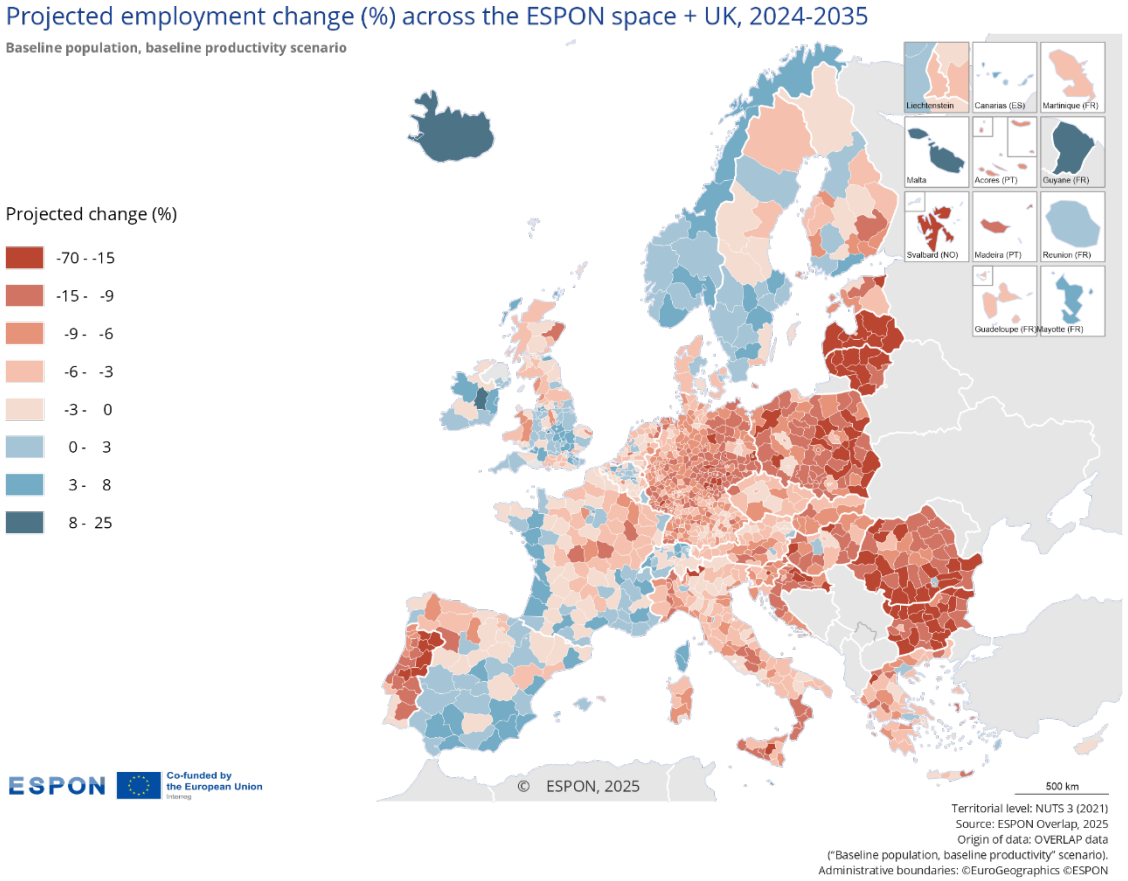
selected scenarios	Population	Productivity	Green transition
scenario 1	baseline	baseline	no change
scenario 2	baseline	high	no change
scenario 3	baseline	baseline	achieved
scenario 4	baseline	high	achieved
scenario 5	low migration	baseline	achieved
scenario 6	high migration	baseline	achieved

[25] A - Agriculture, forestry and fishing; B-E -Industry (combining sections B, C, D, and E); C – Manufacturing; G-I -Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities; J - Information and communication; K - Financial and insurance activities; L - Real estate activities; M-N- Professional, scientific and technical activities; and Administrative and support service activities; O-Q - Public administration and defence; compulsory social security; Education; Human health and social work activities; R-U - Arts, entertainment and recreation; and other service activities; Activities of households as employers; activities of extraterritorial organisations and bodies.

2.4.1 Baseline population, baseline productivity scenario [*baseline scenario*]

The **"baseline population, baseline productivity"** scenario can be interpreted as a *business-as-usual* forecast. The 2 baseline assumptions considered: (1) population projections are the baseline projections computed by Eurostat; (2) productivity—which is taken as a proxy measure of digitalisation—is also assumed to grow at a similar rate as in the past 10 years. Map 4 plots the employment projections derived via this combination of assumptions.

Map 4: Projected employment change – across ESPON space (+ UK) – 2024 – 2035 / *baseline population, baseline productivity scenario [baseline scenario]*



As a way of favouring contextualisation and comparison - Map 3 in the previous section presented the employment distribution in 2024: the most populous labour markets, for example, *Greater London*, Île-de-France, Madrid, Lombardy and the Ruhr district, stand out as employment hotspots, reflecting their roles as Europe's economic hubs. Surrounding metropolitan fringes also register high employment, while peripheral regions in eastern and southern Europe, as well as many rural areas, have less than 100,000 workers in 2024.

On the comparison, if one observes Map 4 – which plots the **projected** employment changes between 2024 and 2035 – deepest oranges (i.e., reflecting expected sharp losses, from –10 to -30%) cluster across Romania, Bulgaria and much of Poland, alongside interior southern Italy, inland Portugal and East Germany, signalling acute demographic and outmigration pressures. Moderate expected declines (–5 to –10%) extend through Greece, Hungary and much of Italy. Grey and lighter blues (-3 to 3%) appear in western Germany,

western France and parts of the Nordic countries, indicating relatively muted contractions or even marginal gains. A scattering of regions in Ireland, Western France, Southern Spain, eastern UK and Scandinavia evade noticeable drops, with tiny pockets edging into neutral or slight positive changes (darker blues), likely buoyed by urban draw and cross-regional migration.

The histogram in Figure 8 displays the distribution of projected employment changes (the two colours are used to better differentiate regions that are projected to grow from the ones that are projected to decline). The plot highlights how **the bulk of European regions (1,135 under this scenario, or 82.5% of the sample) are projected to decline**, with an average decline rate of -5.7% and a median of -5.4%. The **distribution is also asymmetric**, showcasing stronger declines in the left-tail (the bottom 10% of the regions is expected to shrink, on average by -13.36%) than increases in the right-tail (the top 10% of regions is expected to grow, on average by 1.94%).

Figure 8: Distribution of employment changes / *baseline population, baseline productivity scenario [baseline scenario]*

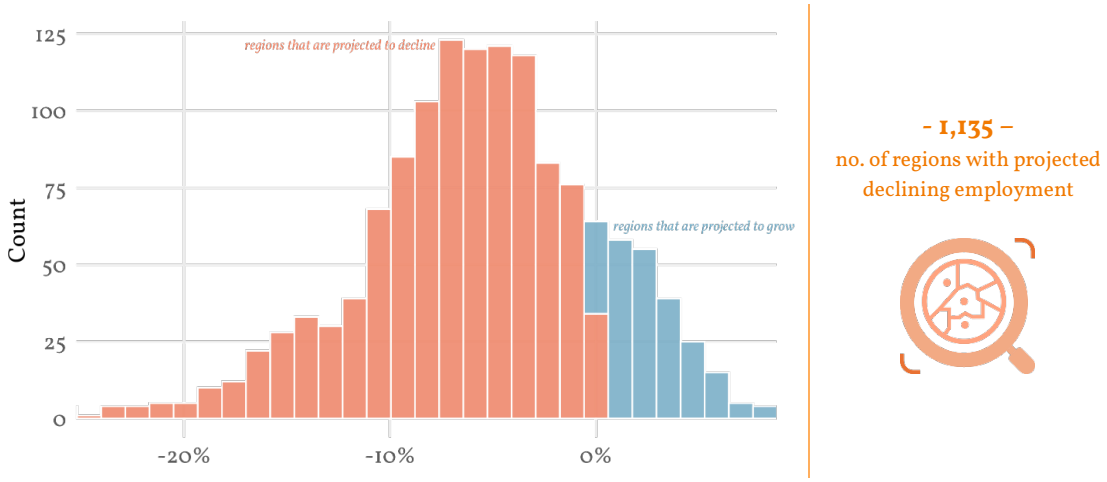


Table 4: Summary statistics / *baseline population, baseline productivity scenario [baseline scenario]*

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline population, baseline productivity / *baseline scenario for comparison*	**-5.6%**	**-23.7%**	**-13.2%**	**-5.4%**	**+2%**	**+7.2%**

Interestingly, it is only the top 1% of regions – gathering the most dynamic and productive European hubs, and usually coinciding with capital regions and major metropolises – that captures expected significant growth, in the order of 6.5% (See Table 4).

Table 5 highlights this point by listing the top and bottom 10 regions ranked by projected growth – and metropolitan hubs are overrepresented amongst the front-runners of this scenario.

Table 5: High growing and lagging behind NUTS-3 regions in the ESPON space (+ UK) / *baseline population, baseline productivity scenario*

NUTS code	Region	Employed in 2024	Employed in 2035 - projection	Projected employment change, 2024-2035 (%)
UKI41	Hackney & Newham (NUTS 2021)	317,874	369,870	16.4%
UKG32	Solihull (NUTS 2021)	159,181	182,320	14.5%
FRY30	Guyane	72,516	81,948	13.0%
UKI31	Camden & City of London (NUTS 2021)	1,081,005	1,211,856	12.1%
IE063	Midland	146,274	162,209	10.9%
UKD33	Manchester (NUTS 2021)	463,414	507,786	9.6%
UKH32	Thurrock (NUTS 2021)	81,387	88,485	8.7%
UKI52	Barking & Dagenham and Havering (NUTS 2021)	168,827	182,244	7.9%
CH031	Basel-Stadt	251,337	271,300	7.9%
FRY50	Mayotte	51,488	55,500	7.8%
RO317	Teleorman	84,470	46,270	-45.2%
RO315	Ialomiţa	84,414	48,389	-42.7%
LV007	Pieriga (NUTS 2021)	88,009	53,465	-39.2%
HR021	Bjelovarsko-bilogorska županija	35,554	23,817	-33%
RO312	Călăraşi	86,740	59,335	-31.6%
LT029	Utenos apskritis	42,491	29,249	-31.2%
RO413	Mehedinţi	75,586	53,948	-28.6%
RO314	Giurgiu	61,592	45,494	-26.1%
RO422	Caraş-Severin	57,560	42,725	-25.8%
LV009	Zemgale	73,989	54,958	-25.7%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

2.4.2 Baseline population, high productivity scenario

The **"baseline population, high productivity"** scenario assumes the same population projections as the previous one, within an increased level of productivity. As such, it can provide some insights into the effects that digitalisation may have on employment, in the coming decade, which turn out to be positive. Map 5 plots the employment projections derived under the combination of assumptions.

The high-productivity dimension in Map 5 reveals spatial patterns that closely mirror those of the baseline assumptions. The deepest oranges remain concentrated in Romania, Bulgaria, Poland, southern Italy and inland Portugal, indicating the expected sharpest losses (beyond -15%). Considerable declines (–3% to –9%) still span Greece, Hungary and parts of inland France, while western Germany, western France, southern Spain and much of the Nordics occupy pale or dark blues, signalling more moderate expected contractions (–3% to 3%) or even expansion of the local employed population. However, it is only a handful of regions which achieve these gains, underscoring that productivity gains alone cannot reverse demographic pressures across most of Europe.

Map 5: Projected employment change – across ESPON space (+ UK) – 2024 – 2035 / *baseline population, high productivity scenario*

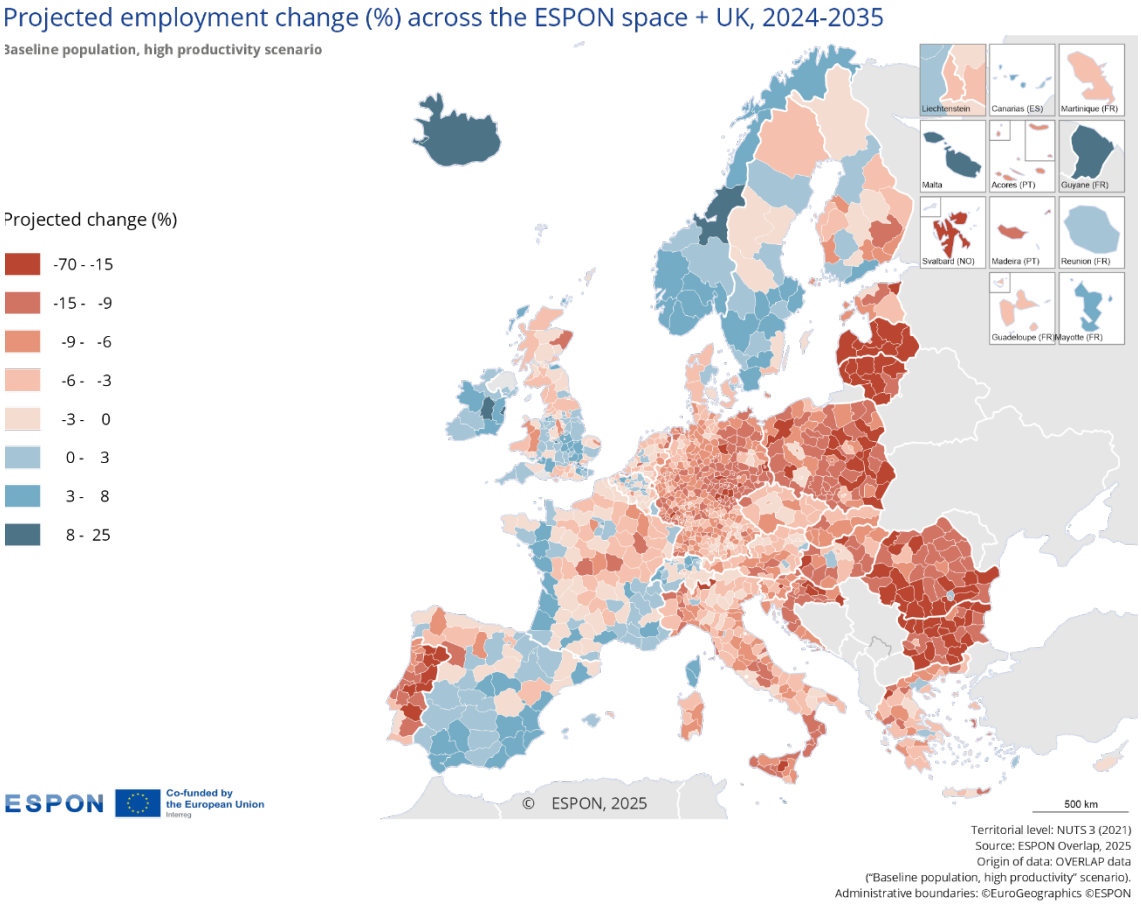
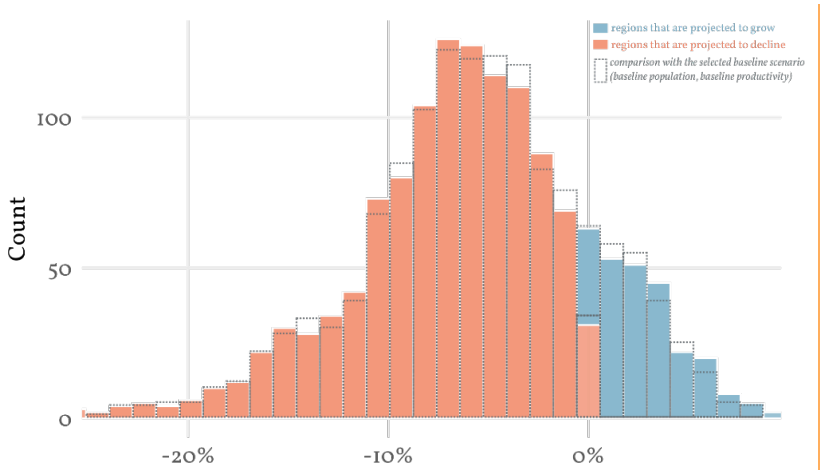


Figure 9: Distribution of employment changes / *baseline population, high productivity scenario*



- 1,130 –

no. of regions with projected declining employment

Table 6: Comparison of summary statistics against baseline assumptions/ *baseline population, high productivity scenario*

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline scenario for comparison	-5.6%	-23.7%	-13.2%	-5.4%	+2%	+7.2%

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline population, high productivity	-5.6%	-23.7%	-13.2%	-5.5% (-0.1)	+2.3% (+0.3)	+8% (+0.8)

The differences that do exist between this scenario and the baseline one, are in terms of magnitude, but are marginal at best. The accompanying histogram again shows that the vast majority of regions (1,130 - only 5 less than the "baseline population, baseline productivity" scenario) are projected to shrink, with an average decline of -5.6% and a median of -5.5%. The left tail remains more predominant than the right: the bottom decile contracts by around –23.7%, while the top decile grows by about 2.3%. Notably, only the top 1%—the continent's most dynamic metropolitan hubs—are expected to achieve significant growth (circa 8%). Compared with the baseline scenario, higher productivity softens the overall decline by only a few tenths of a percentage point, while the geographic concentration of growth in Europe's premier urban centres persists; or, at best, appears strengthened. **The latter finding suggests that faster productivity growth will favour those regions that are already productive; while scarcely raising the prospects of those that are falling behind.**

Also largely unchanged appears the list of front-runner and laggards, reported in Table 7. Interestingly, an assumed growth in productivity is consequential enough to provide a minor reshuffling of the top 10 regions (Dublin and Trøndelag/Tröndelage are new appearances).

Table 7: High growing and lagging behind NUTS-3 regions in the ESPON space (+UK) / *baseline population, high productivity scenario*

NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
UKI41	Hackney & Newham (NUTS 2021)	318,258	370,743	16.5%
UKG32	Solihull (NUTS 2021)	159,373	182,751	14.7%
IE063	Midland	147,058	166,070	12.9%
FRY30	Guyane	72,816	82,191	12.9%
UKI31	Camden & City of London (NUTS 2021)	1,082,309	1,214,717	12.2%
UKD33	Manchester (NUTS 2021)	463,973	508,985	9.7%
UKH32	Thurrock (NUTS 2021)	81,485	88,694	8.8%
IE061	Dublin	749,436	811,279	8.2%
NO060	Trøndelag/Tröndelage	252,642	273,345	8.2%
UKI52	Barking & Dagenham and Havering (NUTS 2021)	169,030	182,674	8.1%
RO317	Teleorman	84,503	46,168	-45.4%
RO315	Ialomiţa	84,447	48,283	-42.8%
LV007	Pieriga (NUTS 2021)	88,067	53,461	-39.3%
HR021	Bjelovarsko-bilogorska županija	35,611	23,825	-33.1%
RO312	Călăraşi	86,773	59,204	-31.8%
LT029	Utenos apskritis	42,549	29,237	-31.3%
RO413	Mehedinţi	75,615	53,829	-28.8%

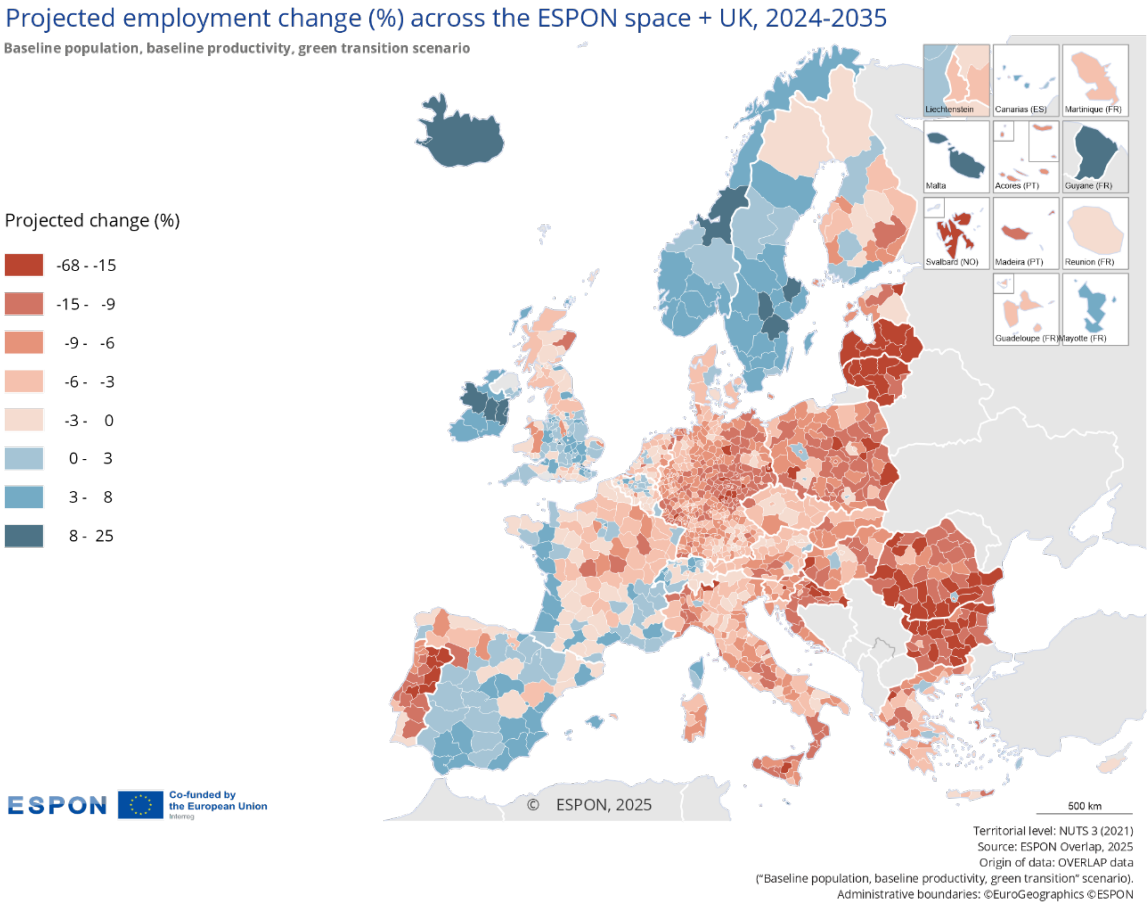
NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
RO314	Giurgiu	61,616	45,394	-26.3%
RO422	Caraş-Severin	57,582	42,631	-26%
LV009	Zemgale	74,038	54,953	-25.8%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

2.4.3 Baseline population, baseline productivity, green transition achieved scenario

The **"baseline population, baseline productivity, green transition achieved"** scenario modifies the *business-as-usual* forecast by considering the employment impacts of successfully carrying out the green transition. This is done by considering the necessary investments to achieve net-zero goals by 2050. The employment gains implied by a successful green transition are noticeable. Map 6 plots the employment projections derived via this combination of assumptions.

Map 6: Projected employment change – across ESPON space (+ UK) - 2024 – 2035 / *baseline population, baseline productivity, green transition achieved scenario*



Map 6 shows that the green transition is expected to soften but not overturn the continent's demographic drag. The darkest oranges—losses beyond –30%—are still to be

found in Romania and the Baltic States. Bulgaria, Poland, inland Portugal and southern Italy are still forecasted to observe large employment dips (-15% to -6%), though extreme declines now are expected to affect slightly fewer regions than under the *baseline assumptions*. Moderate declines (–6% to 0%) persist across Greece, Hungary and much of Germany. Wider swaths of France lighten into pale blues (0% to 8%), suggesting expected moderate gains, while several clusters in Ireland, Spain, western and southern France, and – quite notably – Scandinavia may touch visible gains, buoyed by green-sector investments.

Overall, achieving net-zero through targeted investment trims the average expected regional employment decline from about –5.6% (under the baseline) to –5.3%, yet the geographic pattern remains remarkably consistent: job growth is still almost exclusively confined to Europe's most productive metropolitan cores (the top 10% and 1% of regions are expected to receive an employment boost of 2.8% and 9.4%, respectively), while the periphery is expected to continue face steep workforce erosion. Still, this scenario is able to swing a few regions into positive territory: 1,117 regions are projected to decline (81%) compared to 1,135 under the baseline.

Figure 10: Distribution of employment changes / baseline population, baseline productivity, green transition achieved scenario

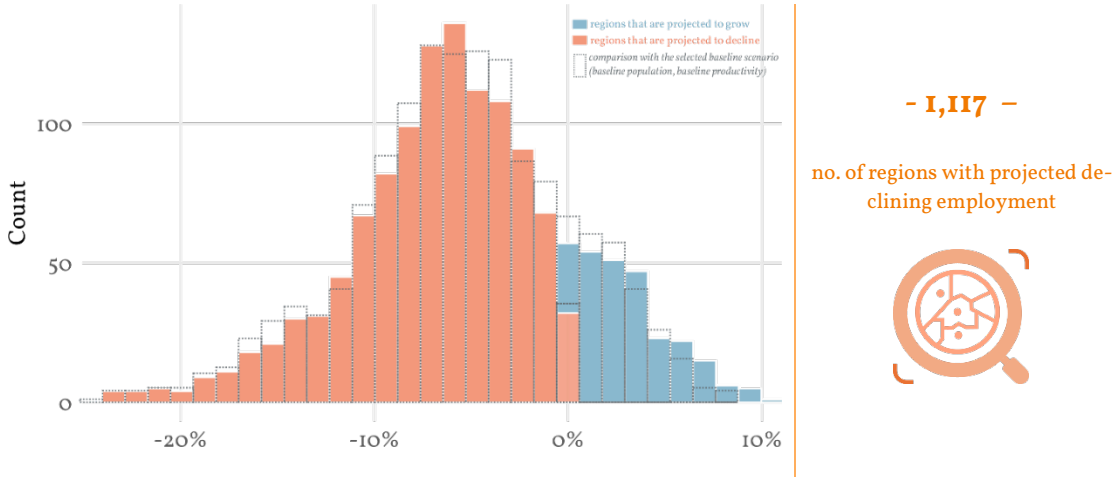


Table 8: Comparison of summary statistics against baseline assumptions/ *baseline population, baseline productivity, green transition achieved* scenario

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline scenario for comparison	*-5.6%*	*-23.7%*	*-13.2%*	*-5.4%*	*+2%*	*+7.2%*
baseline population, baseline productivity, green transition achieved	**-5.3% (+0.3)**	**-23.4% (+0.3)**	**-12.7% (+0.5)**	**-5.4%**	**+2.8% (+0.8)**	**+9.4% (+2.2)**

An interesting observation concerning Table 9 is the appearance of three Swedish regions in the top 10 category; this might be indicative of the country's relative strength in green industries.

Table 9: High growing and lagging behind NUTS-3 regions in the ESPON space (+UK) / *baseline population, high productivity, green transition achieved scenario*

NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
UKI41	Hackney & Newham (NUTS 2021)	318,745	372,699	16.9%
IE063	Midland	149,030	173,222	16.2%
UKG32	Solihull (NUTS 2021)	159,617	183,714	15.1%
FRY30	Guyane	73,254	82,537	12.7%
UKI31	Camden & City of London (NUTS 2021)	1,083,965	1,221,123	12.6%
IE061	Dublin	759,487	846,218	11.4%
SE123	Östergötlands län	244,625	271,955	11.2%
UKD33	Manchester (NUTS 2021)	464,682	511,669	10.1%
SE121	Uppsala län	190,472	209,158	9.8%
SE124	Örebro län	156,169	171,086	9.5%
RO317	Teleorman	84,607	46,615	-44.9%
RO315	Ialomiţa	84,551	48,750	-42.3%
LV007	Pieriga (NUTS 2021)	88,122	53,510	-39.3%
HR021	Bjelovarsko-bilogorska županija	35,662	23,878	-33.0%
LT029	Utenos apskritis	42,634	29,318	-31.2%
RO312	Călăraşi	86,881	59,777	-31.2%
RO413	Mehedinţi	75,709	54,350	-28.2%
LV009	Zemgale	74,085	55,004	-25.8%
RO314	Giurgiu	61,692	45,834	-25.7%
PT11D	Douro	78,023	58,125	-25.5%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

2.4.4 Baseline population, high productivity, green transition achieved scenario

The **"baseline population, high productivity, green transition achieved"** scenario layers accelerated productivity growth onto the investments needed for net-zero by 2050. Map 7 plots the employment projections derived via this combination of assumptions.

Projected employment changes from 2024 to 2035 show robust growth across northern and western Europe, coastal hubs in Iberia, and divergences elsewhere. Scandinavia's regions, as well as Dublin, *London*, and metropolitan France, are expected to benefit from digital, cleantech, and green investments (employment growth expected from +8% to +25%). In southern Europe, dynamic centres such as Madrid, Barcelona, and Porto also see mild-to-substantial gains, while many interior provinces register only modest increases or, in the case of Italy and Portugal, noticeable declines (in the order of -9% to -6%). Italy's industrial north appears to stave of the brunt of the decline, contrasted by a fragile Mezzogiorno; in similar fashion, Greece's service-driven Athens outperforms declining islands and northern regions. In central Europe, major German and Dutch cities

project slight employment rises, whereas peripheral areas trend flat or mildly negative – or even strongly negative in the case of East Germany. Poland, Czechia, and Slovakia prosper around capital clusters, while smaller towns risk contraction. The Balkans and Romania-Bulgaria face pronounced declines amid demographic outflows.

Map 7: Projected employment change– across ESPON space (+ UK) - 2024- 2035 / *baseline population, high productivity, green transition achieved*

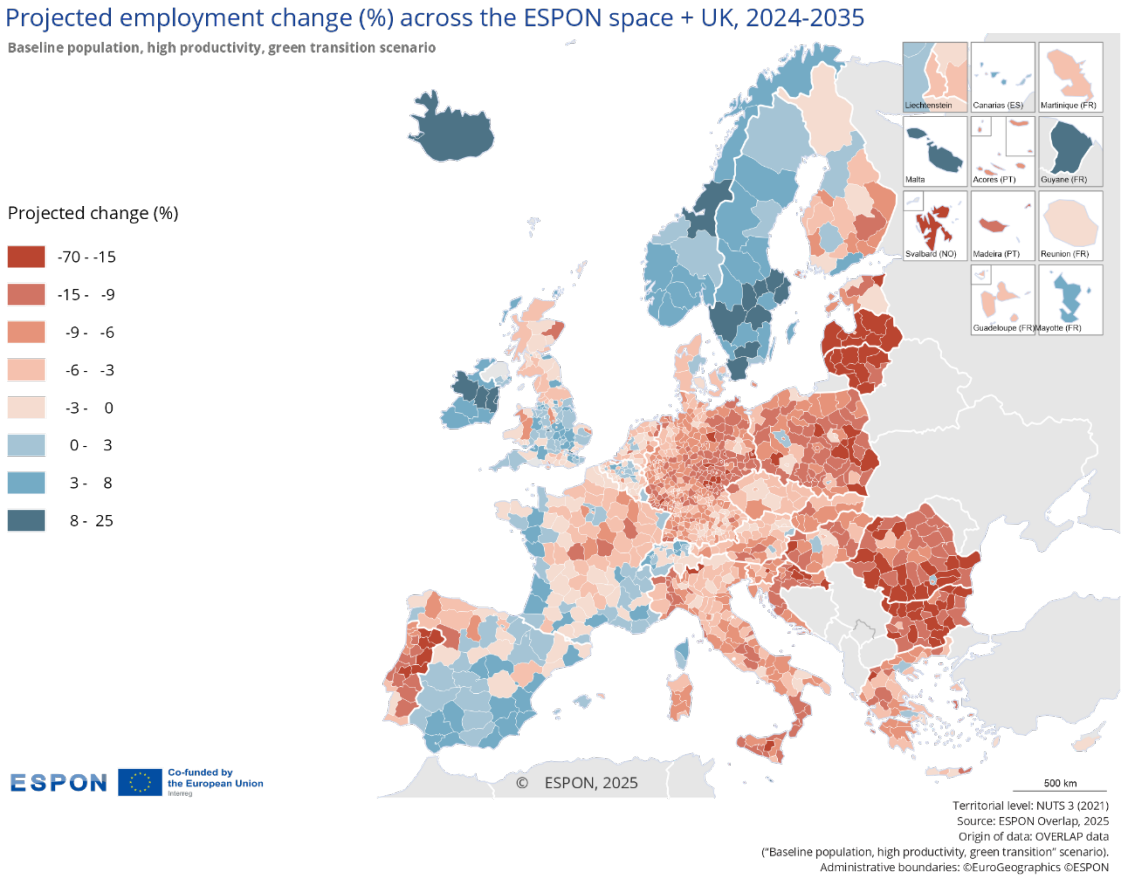


Figure 11: Distribution of employment changes/ *baseline population, high productivity, green transition achieved* scenario

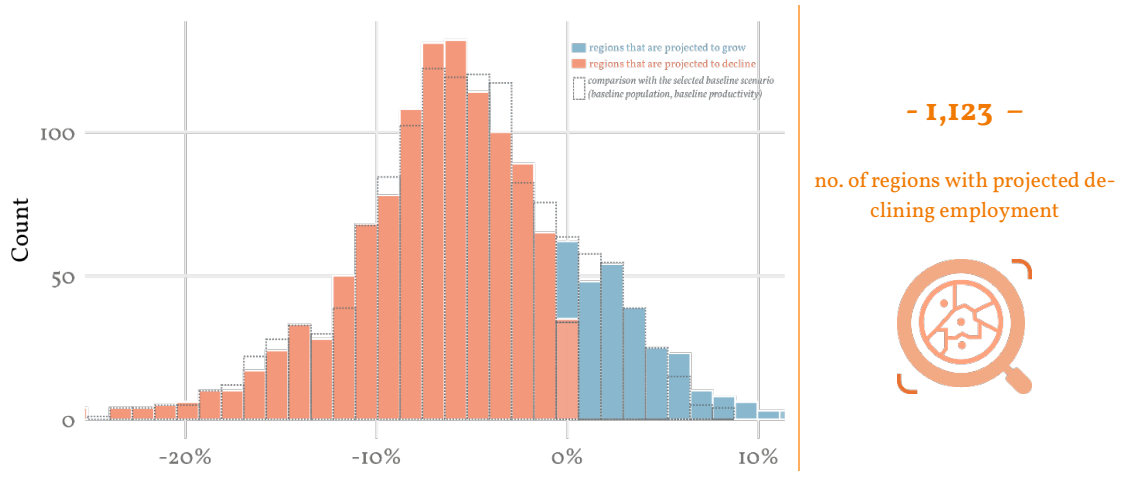


Table 10: Comparison of summary statistics against baseline assumptions/ *baseline population, high productivity, green transition achieved* scenario

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline scenario for comparison	-5.6%	-23.7%	-13.2%	-5.4%	+2%	+7.2%
Baseline population, baseline productivity, green transition achieved	**-5.4% (+0.2)**	**-23.6% (+0.1)**	**-12.9% (+0.4)**	**-5.6% (-0.2)**	**+2.6% (+0.6)**	**+9.7% (+2.5)**

Overall, combining higher productivity with the green transition trims the average regional employment decline from about –5.6% (baseline) to –5.4% under this scenario. Employment growth remains tightly concentrated: the top decile of regions sees an average increase of 2.6%, and the top 1% still captures the *lion's share* (≈ 9.7%). Meanwhile, 1,123 regions (≈ 81% of the total) are forecast to shrink—down from 1,135 regions (82.4%) in the baseline scenario—**highlighting that even a successful twin transition risks delivering only marginal relief outside Europe's most dynamic metropolitan cores.**

Table 11: High growing and lagging behind NUTS-3 regions in the ESPON space (+UK) / *baseline population, high productivity, green transition achieved scenario*

NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
UKI41	Hackney & Newham (NUTS 2021)	318,976	372,984	16.9%
IE063	Midland	149,738	174,443	16.5%
UKG32	Solihull (NUTS 2021)	159,733	183,855	15.1%
UKI31	Camden & City of London (NUTS 2021)	1,084,752	1,222,056	12.7%
FRY30	Guyane	73,440	82,621	12.5%
SE123	Östergötlands län	245,291	275,791	12.4%
IE061	Dublin	763,091	852,179	11.7%
SE121	Uppsala län	190,991	212,108	11.1%
SE124	Örebro län	156,594	173,500	10.8%
UKD33	Manchester (NUTS 2021)	465,020	512,060	10.1%
RO317	Teleorman	84,622	46,509	-45%
RO315	Ialomiţa	84,566	48,640	-42.5%
LV007	Pieriga (NUTS 2021)	88,159	53,506	-39.3%
HR021	Bjelovarsko-bilogorska županija	35,693	23,885	-33.1%
RO312	Călăraşi	86,896	59,642	-31.4%
LT029	Utenos apskritis	42,664	29,313	-31.3%
RO413	Mehedinţi	75,722	54,227	-28.4%
RO314	Giurgiu	61,703	45,730	-25.9%
LV009	Zemgale	74,115	55,000	-25.8%
PT11D	Douro	78,080	58,147	-25.5%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

2.4.5 Low migration, baseline productivity, green transition achieved

The **"low migration, baseline productivity, green transition achieved"** modifies the assumptions underpinning the population projections, while presuming a constant rate of productivity convergence and maintaining the investments to achieve the green transitions. Specifically, net migration levels are 33% lower than in the baseline assumptions, in each year of the entire horizon of projections. This scenario represents a lower-bound to the estimates, and as such reveals the primacy of demographic forces in determining the final level of employment. Map 8 plots the employment projections derived via this combination of assumptions.

Under the "low migration, baseline productivity, green transition" scenario, employment gains are largely confined to northern and western Europe, while much of southern and eastern Europe may faces stagnation or decline. Scandinavia again stands out, with most Norwegian, Swedish and Finnish regions expected to enjoy modest to strong growth (0% to +25%), alongside pockets of resilience in the *UK* and Ireland. In France, Île-de-France and parts of Brittany see slight increases, but interior *départements* may slip toward zero or mild losses. Coastal Spain and Portugal are expected to register modest gains (0 % to +3%), whereas inland provinces indicate negative trends. Only a scatter of regions in Italy's industrial north are expected to hold close to flat, while most may venture into negative territory. Still, the Mezzogiorno is expected to record sharper declines (-15% to -9%), mirrored by Greece's islands and northern peripheries. Central Europe around Berlin, Amsterdam and Vienna are expected to hover near neutrality, yet rural German and Dutch areas trend downwards. The harshest contractions (beyond -15%) may afflict the Balkans and regions along the eastern-most edges of the EU, highlighting acute demographic pressures. Overall, the map underscores a pronounced northwest–southeast divide in job prospects.

Map 8: Projected employment change – across ESPON space (+ UK) - 2024- 2035 / *low migration, baseline productivity, green transition achieved* scenario

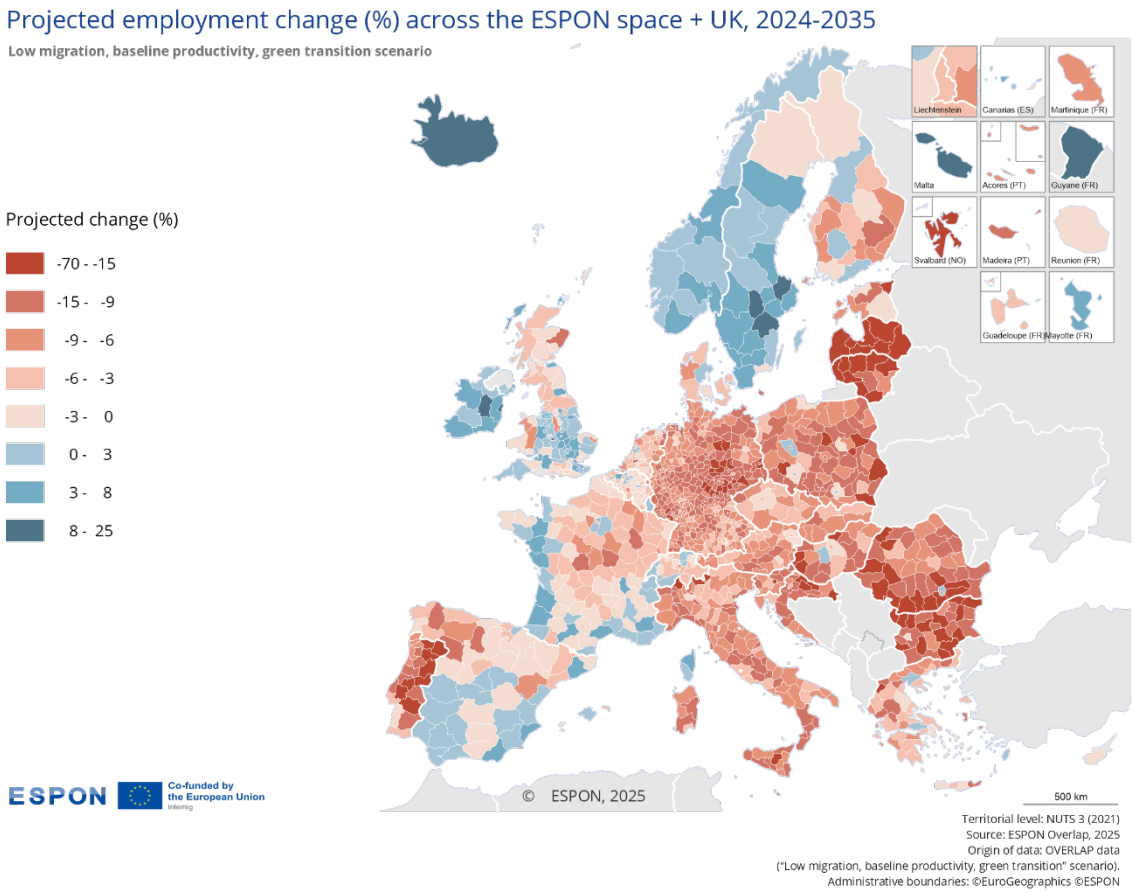
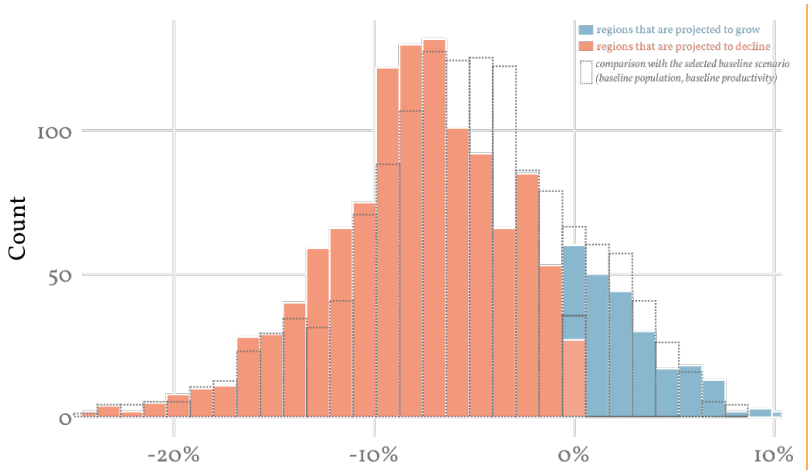


Figure 12: Distribution of employment changes/ *low migration, baseline productivity, green transition achieved* scenario



- 1,156 –

no. of regions with projected declining employment

Overall, reduced migration is expected to heighten the average regional employment decline from about -5.6% under the baseline scenario to -6.4% here. Expected employment growth remains tightly confined: the top decile of regions sees an average gain of +1.7%, although this is slightly lower than that predicted under baseline assumptions, revealing the primacy of migration to maintain employment growth in productive hubs. The top 1%

is expected still to capture most of the growth - on average 8.7%. Overall, 1,156 regions (≈84% of the total) are projected to shrink—up from 1,135 regions (82%) under baseline assumptions—**underscoring the primacy of demographic forces even when green transition investments are fully mobilised.**

Table 12: Comparison of summary statistics against baseline assumptions/ *low migration, baseline productivity, green transition achieved* scenario

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline scenario for comparison	-5.6%	-23.7%	-13.2%	-5.4%	+2%	+7.2%
Low migration, baseline productivity, green transition achieved	**-6.4% (-0.8)**	**-23% (+0.7)**	**-13.6% (-0.4)**	**-6.8% (-1.4)**	**+1.7 (-0.3)**	**+8.7% (+1.5)**

Table 13: High growing and lagging behind NUTS-3 regions in the ESPON space (+UK) *//low migration, baseline productivity, green transition achieved scenario*

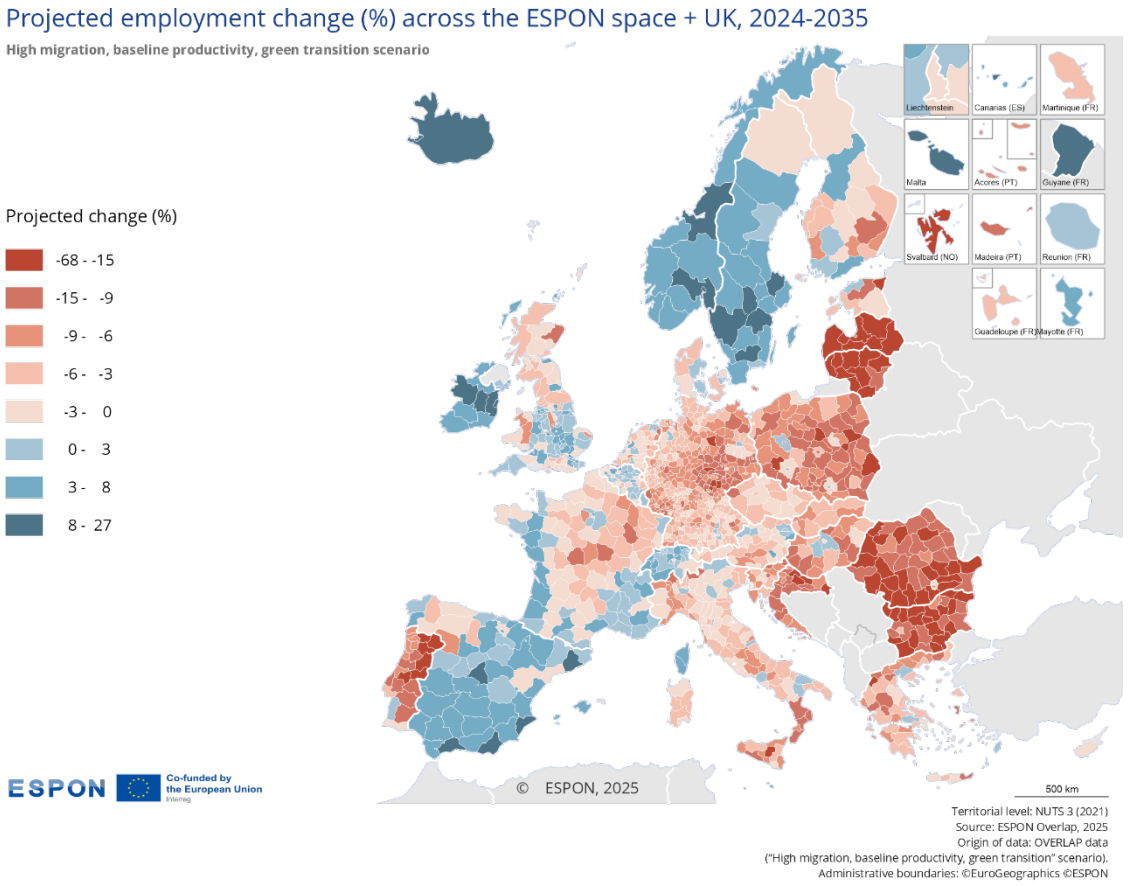
NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
UKI41	Hackney & Newham (NUTS 2021)	318,743	372,712	16.9%
UKG32	Solihull (NUTS 2021)	159,616	183,721	15.1%
IE063	Midland	148,804	170,005	14.2%
UKI31	Camden & City of London (NUTS 2021)	1,083,958	1,221,165	12.7%
FRY30	Guyane	73,200	82,158	12.2%
SE123	Östergötlands län	244,440	269,613	10.3%
UKD33	Manchester (NUTS 2021)	464,680	511,687	10.1%
IE061	Dublin	758,334	830,499	9.5%
UKH32	Thurrock (NUTS 2021)	81,609	89,165	9.3%
SE121	Uppsala län	190,328	207,357	8.9%
RO317	Teleorman	85,023	47,519	-44.1%
RO315	Ialomiţa	84,967	49,696	-41.5%
LV007	Pieriga (NUTS 2021)	88,595	55,336	-37.5%
HR021	Bjelovarsko-bilogorska županija	35,706	23,940	-32.9%
RO312	Călăraşi	87,308	60,937	-30.2%
LT029	Utenos apskritis	42,676	30,021	-29.6%
RO413	Mehedinţi	76,081	55,405	-27.2%
PT11D	Douro	77,898	57,797	-25.8%
RO314	Giurgiu	61,995	46,723	-24.6%
RO422	Caraş-Severin	57,937	43,879	-24.3%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

2.4.6 High migration, baseline productivity, green transition achieved

The **"high migration, baseline productivity, green transition achieved"** modifies the assumptions underpinning the population projections, as it presumes a constant rate of productivity convergence and maintaining the investments to achieve the green transitions. Specifically, net migration levels are set 33% higher than in the baseline assumptions, in each year of the entire horizon of projections. It is worth noting that this way of modelling migration is rather agnostic as to where the migrants come from: they may come from outside of the EU + EFTA space or from own members. It is also important to note that, given the way migration is modelled, higher migration levels can have adverse effects on countries experiencing persistent net outflows. In Romania, for instance, the crude net migration rate in 2021 was –3.8 per 1,000 inhabitants, meaning around 72,400 people left the country that year. Under the high-migration scenario, this net loss increases by 33%, resulting in a projected outflow of approximately 96,298 people.

Map 9: Projected employment change – across ESPON space (+ UK) – 2024 – 2035 / *high migration, baseline productivity, green transition achieved* scenario



This scenario represents an upper-bound to the estimates, and as such once more reveal the primacy of demographic forces in determining the final level of employment. Map 9 plots the employment projections derived via this combination of assumptions.

Under a "high migration, baseline productivity, green transition" scenario, projected employment gains spread more widely across Europe, though stark contrasts persist. Scandinavia again is expected to lead, with nearly all Norwegian, Swedish and Finnish regions in the top growth tier (+8% to +27%), while the *UK* and Ireland see reinforced strength around London, Dublin and their commuter belts. Spain

transforms further: coastal and many previously lagging interior provinces now register solid expansions (3% to 8% and 8% to +27%), reflecting high levels of inbound mobility. Italy's industrial north and parts of central Italy shift into modest growth, although the Mezzogiorno remains mixed. In Greece, Athens and Thessaloniki outperform, yet many islands and mountainous areas linger near neutrality or slight decline. Central Europe around Berlin, Amsterdam and Vienna show consistent rises, and eastern regions—including Warsaw, Prague and Bratislava metros—move into positive territory. Despite improvements, the deepest contractions remain in remote Balkan and Romanian and Bulgarian rural zones – due to structural bottlenecks, severe emigration and accelerated population ageing (as younger cohorts move out, the population age pyramid results hollowed-out at the bottom, implying that once older workers reach retirement, it will be increasingly harder to substitute them).

Figure 13: Distribution of employment changes / *high migration, baseline productivity, green transition achieved* scenario

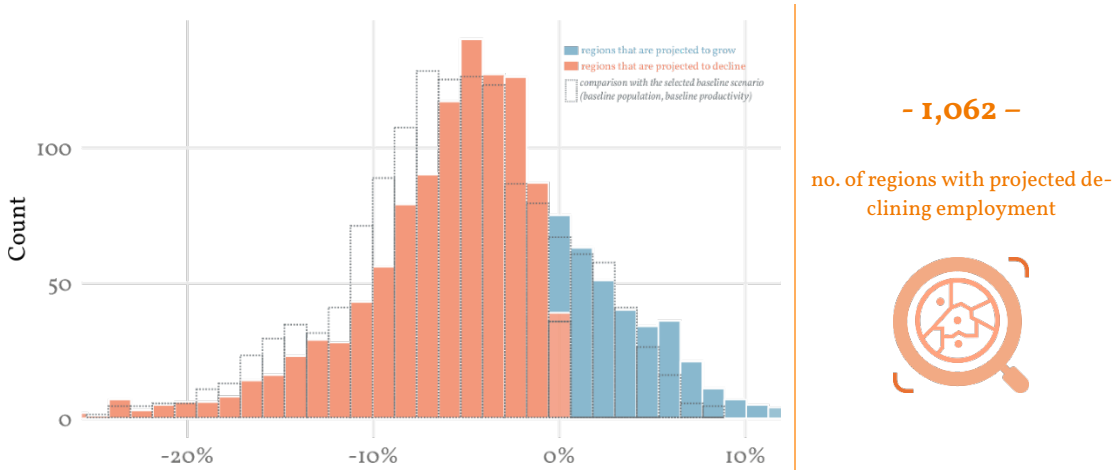


Table 14: Comparison of summary statistics against baseline assumptions / *high migration, baseline productivity, green transition achieved* scenario

Scenario	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
baseline scenario for comparison	-5.6%	-23.7%	-13.2%	-5.4%	+2%	+7.2%
High migration, baseline productivity, green transition achieved	-4.3% (+1.3)	-24% (-0.3)	-12.2% (-1)	-4.1% (-1.3)	+3.7% (+1.7)	+10.2% (+3)

Elevated migration is expected to cut the average regional employment decline from roughly −5.6 % under baseline assumptions to −4.3 %, bringing overall a significant expected decrease. Growth remains highly concentrated – indeed, more than in previously considered scenarios: the top decile of regions now posts an average increase of +3.7%, and the top 1 % captures about 10.2%. This reflects the strong pull of dynamic urban areas and major metropolitan centres, which attract an ever-growing share of talent and human resources in every year to 2035. This outcome is telling, but it is also partly a function of the model's assumptions: the high-migration scenario applies a uniform 33% increase in net migration to every region in the dataset, in every year of the projection period. As a result,

regions that already enjoyed substantial in-migration in the base year—often the most economically vibrant cities—experience an amplified inflow over time, further reinforcing their competitive advantages and widening the gap with less attractive locations.

Overall, 1,062 regions (≈ 77% of the total) are projected to shrink—down from 1,135 regions under the baseline—**underlining that even substantial migration inflows only partially offset Europe's broader ageing pressures.**

Table 15: High growing and lagging behind NUTS-3 regions in the ESPON space (+UK) *//high migration, baseline productivity, green transition achieved scenario*

NUTS code	Region	Employed in 2024	Employed in 2035 - projections	Projected employment change, 2024-2035 (%)
IE063	Midland	149,156	174,697	17.1%
UKI41	Hackney & Newham (NUTS 2021)	318,747	372,692	16.9%
UKG32	Solihull (NUTS 2021)	159,618	183,711	15.1%
FRY30	Guyane	73,304	82,915	13.1%
UKI31	Camden & City of London (NUTS 2021)	1,083,972	1,221,099	12.6%
IE061	Dublin	760,127	853,420	12.3%
SE123	Östergötlands län	244,804	273,288	11.6%
CH031	Basel-Stadt	252,983	280,323	10.8%
NO060	Trøndelag/Tröndelage	254,338	281,518	10.7%
SE121	Uppsala län	190,612	210,183	10.3%
RO317	Teleorman	84,187	45,696	-45.7%
RO315	Ialomiţa	84,131	47,789	-43.2%
LV007	Pieriga (NUTS 2021)	87,649	51,673	-41%
HR021	Bjelovarsko-bilogorska županija	35,618	23,815	-33%
LT029	Utenos apskritis	42,592	28,615	-32.8%
RO312	Călăraşi	86,449	58,599	-32.2%
RO413	Mehedinţi	75,332	53,279	-29.3%
LV009	Zemgale	73,686	53,116	-27.9%
RO314	Giurgiu	61,386	44,930	-26.8%
RO422	Caraş-Severin	57,367	42,195	-26.4%

Note: Iceland, Malta and Liechtenstein were excluded from the ranking due to the simplifying assumptions applied to their employment projections. Additionally, NUTS 3 regions with fewer than 3 319 employed persons in 2024 (i.e. below the 30th employment percentile) were omitted to focus the analysis on areas with a substantial labour force.

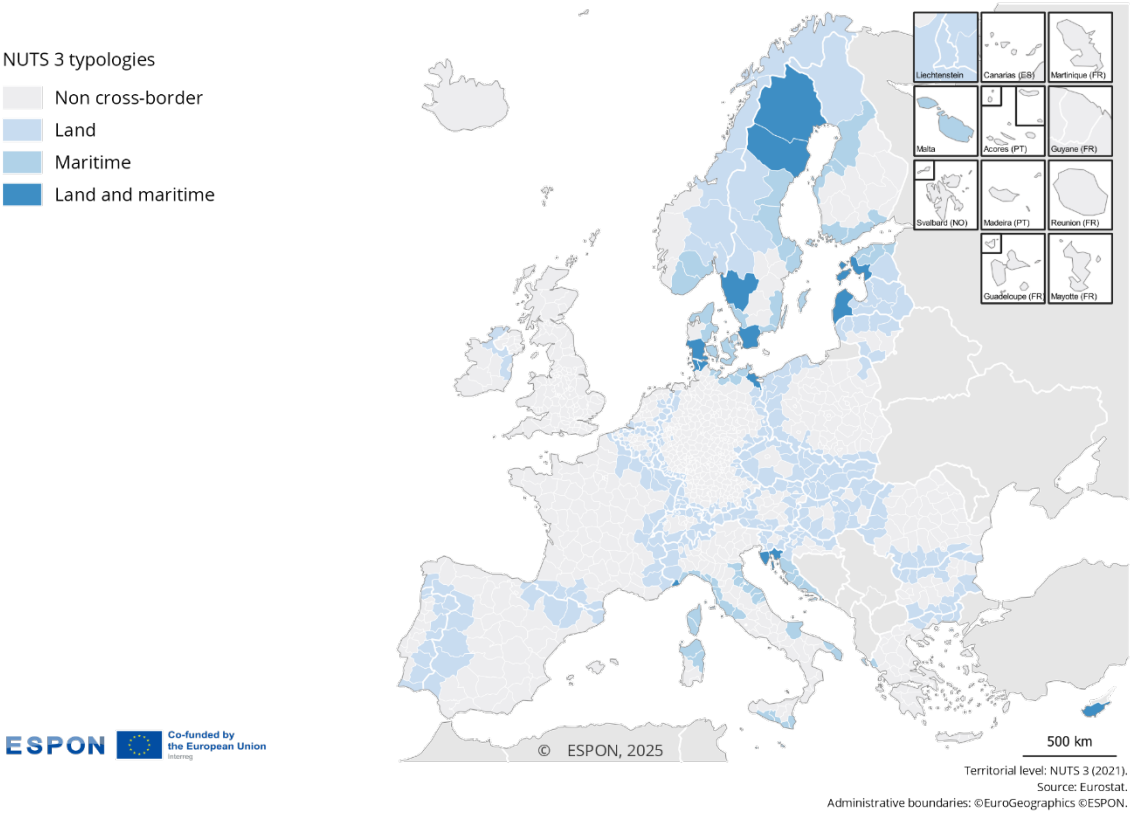
2.4.7 Focus on different typologies of regions

The comprehensive employment estimates for all NUTS-3 regions reveal a complex mosaic of trends, but the next categories should be given further consideration: **urban / rural** and **cross-border regions**. Both exhibit characteristic patterns—in population dynamics, labour-market structure and economic resilience—that are hardly noticeable when taking a pan-European point of view. An isolated analysis of these two typologies of regions is therefore essential to unlock targeted insights and policy responses. Rural and cross-border regions face **distinct** demographic pressures and labour-market dynamics, and accordingly, in the following sections, these different types of regions are studied in isolation. Such targeted insights are crucial if employment projections for NUTS-3 regions are to translate into effective, place-based strategies that leave no region behind.

2.4.7.1 Cross-border regions

Cross-border regions account for roughly 1/3 of the EU's population and GDP (see Map 10). Some of these territories consistently underperform compared to national averages. Per-capita GDP in border areas is only about 86 percent of the EU mean, reflecting persistent historical under-investment, obstacles, and the difficulties of a peripheral status.[26]

Map 10: Cross-border regions across the ESPON space



[26] See: link

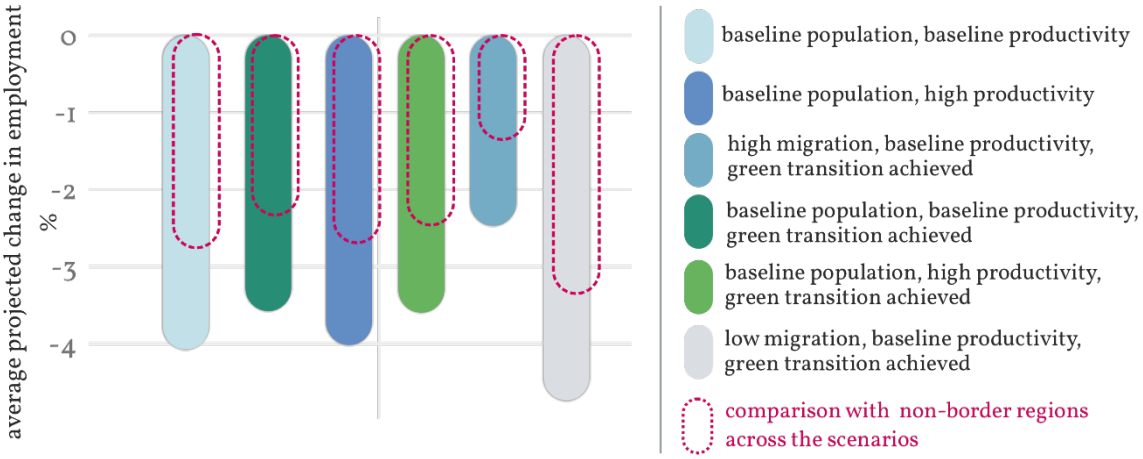
Firms trading across borders incur up to 50% higher costs than domestic competitors, and during the COVID-19 crisis border closures saw these economies contract at twice the rate of the EU average.[27]

Cumulatively, unresolved legal, administrative and linguistic obstacles in cross-border areas have been estimated to cost approx. €458 billion (≈3% of EU GDP) and the equivalent of 6 million jobs. Demographically, border regions tend toward lower density (≈68 vs. 143 people/km² across EU), display a rural or semi-rural character and net out-migration—especially of young, educated adults—leading to older age structures and shrinking workforces within the respective regions.[28]

These challenges are shaped by pulling and pushing forces, that drive high workforce mobility, in a commuting pattern (where some richer territories attract the working force of surrounding areas). Hence, employment patterns are further shaping these areas. Some local labour markets often lack dynamism, with fewer job opportunities and lower wages driving workers to seek employment across the border even, while retaining their place of residency (as a cause of lower living costs). As such, cross-border commuting has surged by over 20% since 2013, with more than 2 million workers crossing daily into a neighbouring country. In some regions—Switzerland's border cantons or Luxembourg's hinterland—cross-border workers make up from 10 to 30% of the workforce. This deep interdependence on adjacent labour markets is absent in interior regions, complicating conventional region-by-region analyses and calling for a bespoke focus on cross-border dynamics.

Figure 14 investigates projected employment declines in cross-border and non-cross-border regions across the ESPON space.

Figure 14: Cross-border regions: average projected change in employment (%) for 2024-2035, and across scenarios



[27] See: link
[28] Ibid.

Across all six scenarios analysed, cross-border NUTS-3 regions are projected to lose more employment between 2024 and 2035 than non-cross-border regions. While the precise drivers vary by scenario, the common thread is that cross-border NUTS-3 regions start from a structural disadvantage and are more sensitive to demographic, sectoral, and institutional shocks:

Demographic headwinds are stronger: border areas typically display older age profiles and net losses of young adults, compared to inner or urban regions, shrinking the resident labour pool faster than elsewhere. Workplace labour supply can diverge from residence trends because many border NUTS-3 regions are net *exporters* of commuters to nearby municipalities, including across national borders; all, while only modestly *importing* commuters given their peripheral locations, thinner service ecosystems and legal/language frictions. In high-migration scenarios, these frictions matter: (i) inflows may raise *residency* counts without proportionate *workplace* gains, if newcomers settle for lower housing costs in border areas, but commute out for jobs—or (ii) even bypass border regions altogether for larger labour markets. The result is that border regions capture a smaller share of migration-driven employment gains, unless cross-border commuting and local job accessibility improve.

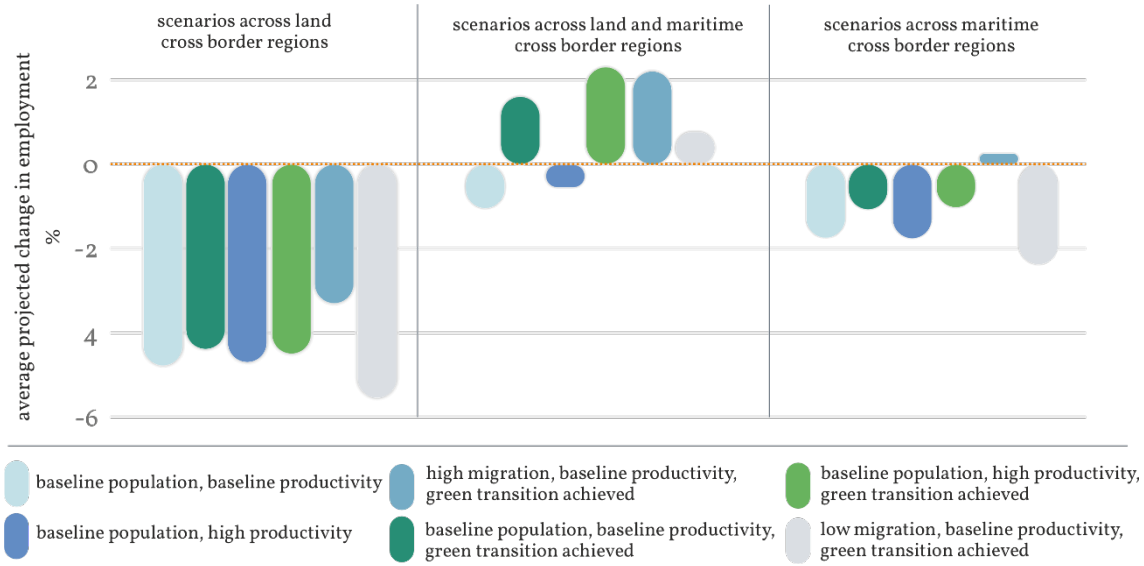
Economic structure magnifies downturns: many cross-border areas rely heavily on manufacturing, border-dependent trade, or seasonal tourism—sectors that are more vulnerable to automation, trade shocks, or regulatory obstacles. Productivity scenarios therefore shave off a larger share of jobs in these sectors, whereas inner regions with stronger service and digital economies hold up better. Even in positive scenarios (e.g. high-productivity growth), border regions' peripheral status and weaker infrastructure mean fewer new firms and fewer high-growth industries locate there, so they miss out on potential job gains.

Institutional and linguistic obstacles persist: even under a single-market baseline, firms in border regions pay up to 50% more in administrative and legal overhead. Those costs rise deter investment in any scenarios, and lead to sharper job losses. Interior regions, lacking that cross-border dimension, remain largely insulated.

Cumulative sensitivity to shocks: because cross-border regions suffer from lower starting wages, fragile infrastructure, older workforces, and high commuting dependency, any single shock (e.g. demographic, productivity, etc.) hits harder—and when multiple factors combine, the result is consistently in larger declines than in more diversified, inner NUTS-3 regions.

Figure 15 further accounts for a greater variety of cross-border regions: regions that communicate with other countries via a land border, via maritime borders, or both. **Land-only cross-border regions consistently shoulder the heaviest job losses across all scenarios, reflecting somewhat a more peripheral, rural character.** By contrast, regions with maritime borders fare slightly better: although these are still expected to see employment declines under the most adverse conditions, their average losses are far milder. **Most strikingly, regions that combine land and maritime frontiers are actually expected to register positive employment growth in nearly every scenario**, outpacing not only their land-locked counterparts but also the broader non-cross-border average.

Figure 15: Average projected change in employment (%) by type of cross-border region and scenario, 2024-2035



Several interlocking factors might explain why maritime and mixed-border regions may be expected to be more resilient:

Gateway function and diversified economies: ports and coastal zones often serve as logistics hubs in global value chains. Under higher productivity and decarbonisation scenarios, these regions may capture the bulk of gains from improved connectivity, automation in shipping, and efficiency improvements in freight handling. Even where manufacturing or tourism face headwinds, the sheer scale of maritime trade ensures a steadier flow of jobs in port operations, warehousing, and associated services—which are largely absent in land cross border areas.

Urbanisation and human-capital density: many land and maritime border regions coincide with the EU's most integrated metro areas—for instance Øresund region (DK–SE), the French-Italian Riviera, or the German-Polish Baltic corridor. These areas combine ferry or bridge links with dense urban cores, high levels of tertiary education, and vibrant service sectors. Their stronger starting-point in human capital and infrastructure means they can outcompete both rural borderlands and even many interior regions when it comes to attracting firms and skilled workers.

Tourist flows and amenity migration: maritime border regions enjoy cross-border tourism spillovers that inland areas cannot replicate. Even in scenarios of tight labour markets or lower migration, amenities like beaches, marinas and culinary tourism keep these regions attractive for domestic and foreign visitors—supporting restaurants, hotels and seasonal employment at higher levels than interior border regions.

Policy support and cross-border cooperation: the EU's Interreg maritime programmes and macro-regional strategies (Baltic, Atlantic, Adriatic-Ionian) channel disproportionately and large cohesion funds into marine-adjacent territories. These initiatives not only upgrade ports and shore infrastructure, but also simplify administrative and legal linkages across the water—or across both land and sea—diminishing the "border cost" altogether.

In short, **maritime access transforms border regions from fragile peripheries into dynamic gateways, while combining land and sea links creates a synergy**—road, rail, bridge or tunnel connections plus port infrastructure—**that underpins job creation even amid demographic headwinds.** This heterogeneity within cross-border areas underscores the need to disaggregate them further: by isolating land-only, maritime-only and mixed border types, the data can pinpoint where policy levers (blue-economy investments, port modernisation, improved cross-border transit) will yield the greatest employment dividends—and where frontier, land-locked borderlands, require a wholly different toolkit.

Table 16: High growing and lagging behind NUTS-3 cross-border regions / ***baseline population, high productivity and green transition achieved scenario***

Cross-border type	NUTS ID	Region	Employment in 2024	Employment in 2035 - projections	Projected employment change, 2024-2035 (%)
Maritime	MT001	Malta	281,210	315,693	12.3
Maritime	MT002	Gozo and Comino/ Għawdex u Kemmuna	16,328	18,262	11.8
Maritime	SE121	Uppsala län	190,991	212,108	11.1
Land	IE062	Mid-East	359,129	393,025	9.4
Land and maritime	SE232	Västra Götalands län	915,048	996,428	8.9
Land	NO060	Trøndelag/Tröndelage	253,768	276,194	8.8
Maritime	SE110	Stockholms län	1,387,778	1,508,443	8.7
Land and maritime	SE224	Skåne län	657,204	710,786	8.2
Land	CH031	Basel-Stadt	252,373	272,616	8.0
Land	NO082	Viken	578,577	623,524	7.8
Maritime	SE231	Hallands län	153,970	165,113	7.2
Land	SE311	Värmlands län	127,279	135,978	6.8
Maritime	FRM02	Haute-Corse	71,913	76,350	6.2
Maritime	NO092	Agder	148,955	158,182	6.2
Land and maritime	SE331	Västerbottens län	134,901	142,981	6.0
Land	NO071	Nordland/ Nordlánnda	124,416	130,715	5.1
Maritime	SE313	Gävleborgs län	130,024	136,632	5.1
Land	BG332	Dobrich	57,896	44,527	-23.1
Maritime	EE00A	Kirde-Eesti	45,100	34,472	-23.6
Land and maritime	LV003	Kurzeme (NUTS 2021)	86,091	65,727	-23.6
Land	BG343	Yambol	40,236	30,610	-23.9
Land	PT11D	Douro	78,080	58,147	-25.5
Land	LV009	Zemgale	74,115	55,000	-25.8
Land	RO314	Giurgiu	61,703	45,730	-25.9
Land	RO413	Mehedinţi	75,722	54,227	-28.4
Land	LT029	Utenos apskritis	42,664	29,313	-31.3
Land	RO312	Călăraşi	86,896	59,642	-31.4
Land	LV007	Pieriga (NUTS 2021)	88,159	53,506	-39.3
Land	RO317	Teleorman	84,622	46,509	-45.0

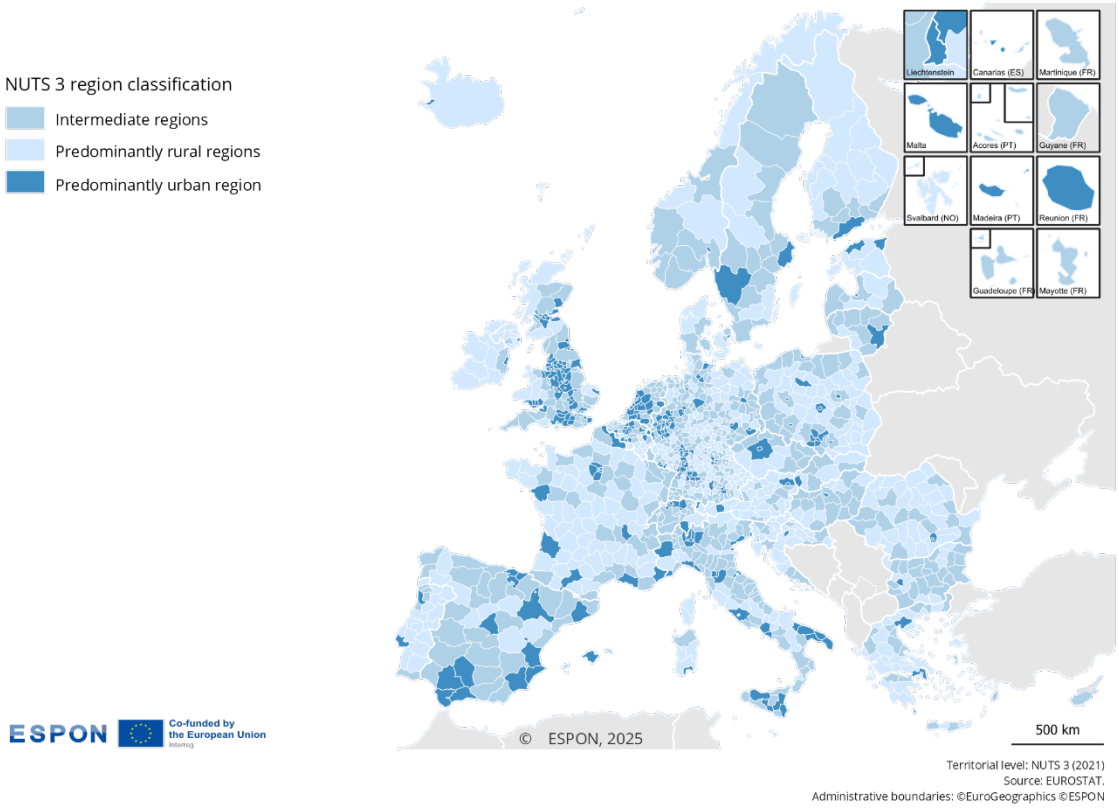
2.4.7.2 Urban, rural and intermediate regions

On a similar note, **rural regions** span 45 % of EU territory and house only 20.6 % of its population - underscoring low densities and a more peripheral status within national

frameworks (see Map 11).[29] On average, working-age adults (20–64 years) constitute only 55.6% of rural inhabitants—well below the 59.9% registered in urban areas; and over-65s population account for 24.9%, versus the 20.0% registered in urban areas.

Map 11: Rural, intermediate and urban regions across the EU

Urban-rural typologies across the ESPON space + UK



Youth out-migration exacerbates depopulation and aging, with several rural NUTS-3 areas losing more than 10% of their population per year through net migration.

Economically, rural regions account for 18.7% of EU employment, and 19.7 % of GDP, signalling below-average labour productivity.[30] Sectoral reliance on agriculture, forestry, and fishing remains high (over 10% of jobs), while services employment lags (around 60 %, versus more than 80 % in cities).

Urban-rural typology

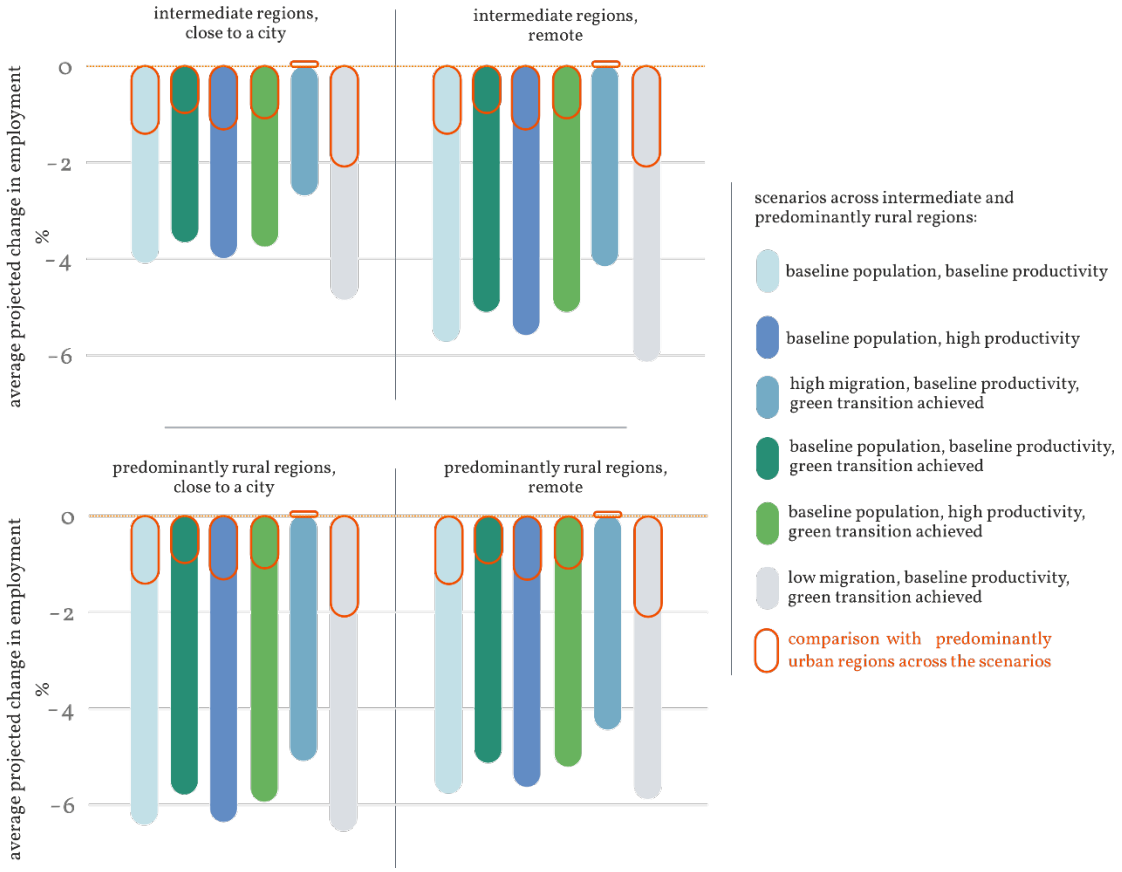
Figure 16 disaggregates employment changes by predominantly rural, intermediate, and predominantly urban NUTS-3 regions across the ESPON space. Intermediate and rural areas are further distinguished by their closeness to major cities. **The results highlight that rural NUTS-3 regions are expected to decline, with projected employment drops that are consistently outpacing those in more urbanised localities.** Urban NUTS-3 regions will not be able to completely stave off declines in employment, but may

[29] Urban-rural Europe - demographic developments in rural regions and areas (Eurostat). See: link

[30] See: link

benefit from more diverse sectoral structures and stronger in-migration—both of which help cushion employment losses.

Figure 16: Average projected change in employment (%) by type of NUTS-3 region and scenario, 2024-2035



Looking at the situation of **intermediate** and **rural areas** - distinguished by their **closeness to a city**, another element emerges. In intermediate areas, projected employment declines hover around −3.5% to −4% when they are close to a city, but this trend may deepen to roughly −5% to −6% when the area is defined as remote, **hinting that being farther from an urban centre exacerbates job losses in these mid-sized regions.** The situation is paradoxically reversed for rural areas. When these are close to a city, job losses peak at around -6% to -7%; whereas losses are milder when these areas are defined as remote. **Therefore, rural zones nearer a city fare worse than their more isolated counterparts,** part of the gravitational model with the urban centre at its core.

Several hypotheses may explain why remote intermediate areas and peri-urban rural areas show deeper declines than their counterparts:

Connectivity and economic structure: *intermediate regions close to cities* benefit from better transport links (roads, railways) and reliable broadband connectivity. These connections attract a variety of businesses—distribution centres, light manufacturing, professional services—that can better withstand technological shifts (like automation or supply-chain reorganization). In contrast, *remote intermediate areas* often lack such infrastructure and investment. With poorer connectivity and fewer diversified industries, their economies struggle to **pivot when headwinds hit**, making job losses more severe.

Land-use dynamics in rural fringe areas: in rural zones near cities, urban expansion can drive the conversion of farmland and open space into housing developments, shopping centres, or business parks. This peri-urban development often **displaces traditional agricultural and resource-based jobs**. By comparison, in more isolated rural areas, land tends to remain in primary production (farming, forestry) or is used for niche activities like eco-tourism and conservation projects. These uses may provide a steadier base of local employment, so remote rural communities don't decline as sharply as those on the metropolitan fringe that are caught in land-use transitions.

Commuter-belt effects: many rural communities just outside city boundaries effectively function as **commuter belts**—a large share of residents travel to the nearby city for work. If employment in the urban core contracts (for instance, due to a shift to remote work or a downturn in city-based industries), these commuter towns suffer from job losses and reduced local spending. In truly remote rural areas, by contrast, the workforce is more likely to be employed locally (often self-employed or in local enterprises), which makes them **less directly exposed** to a slump in city jobs or commuting patterns.

Policy and investment bias: governments often target special programs or infrastructure investment at **sparsely populated, remote rural regions** to counteract severe depopulation—for example, subsidising broadband in remote villages or providing economic incentives for businesses to locate there. Rural areas nearer to cities may be overlooked for such support under the assumption that they can benefit from proximity to an urban economy. This can result in peri-urban rural areas receiving **less dedicated development aid**, leaving them relatively more vulnerable if the nearby city's growth doesn't spill over.

Demographic and skill factors: differing population profiles could also be at play. *Remote intermediate areas* might have older populations or suffer skill shortages, which amplify job losses when industries shrink (since there are fewer young workers or innovators to adapt to changes). Meanwhile, *rural areas close to cities* often see **youth out-migration**—where young people leave for opportunities in the cities, weakening the local talent pool and entrepreneurial base. An eroding base of young, skilled workers can make peri-urban rural economies less dynamic and more prone to decline.

The hypotheses above are not mutually exclusive— but indeed are likely to **interact** and shape the observed patterns. For example, a rural area on a city's edge might simultaneously experience land-use changes, a commuter downturn, and an absence of targeted policy support, all compounded by an ageing population. In sum, the geography of demographic decline in Europe is complex: it spans multiple scales, from international migration trends affecting whole countries, down to local factors determining why one region prospers while a neighbouring area struggles.

Furthermore, one should note that these **dynamics manifest to different extents** and across the ESPON space, employment trajectories vary markedly not only between urban, intermediate, and rural regions, but also between their counterparts in different parts of Europe. Eastern regions, and particularly the Baltic States, are expected to face the steepest projected declines regardless of settlement type, with intermediate areas in the Baltics consistently posting losses of around –18% to –22% across scenarios. In Eastern European countries more broadly, declines are expected to be less severe but still pronounced,

especially in rural and intermediate areas (generally between –7% and –11%). By contrast, Northern European countries are expected to show modest growth or stability in urban regions and, in some scenarios, even in rural areas, reflecting stronger economic resilience. Southern Europe's picture is mixed: intermediate and rural regions are expected to contract, but more slightly than in the east (often by –5% to –8%), while urban areas should remain broadly stable. And in general, Western European countries indicate smaller declines across all settlement types.

These contrasts underscore that regional typologies alone cannot explain employment outcomes—geography, economic structure, and macro-regional trends compound to shape markedly different futures for similarly classified regions. As such, Table 17 marks the average projected changes in total employment, grouped across different areas of the ESPON space and for different typologies of NUTS-3 regions.

Table 17: Average projected changes in total employment for 2024 to 2035 - divided by scenario, typology of region and macro-area.

Scenario	Type of region	Baltic countries	Eastern Europe	Northern Europe	Southern Europe	Western Europe
Baseline population, baseline productivity	Intermediate	-19.66	-8.52	1.82	-2.76	-3.06
	Predominantly rural	-11.37	-10.98	-0.77	-6.45	-3.06
	Predominantly urban	-7.69	-7.44	2.95	-0.22	-1.04
Baseline population, baseline productivity and green transition	Intermediate	-19.74	-7.57	4.21	-2.88	-2.96
	Predominantly rural	-10.89	-9.76	0.28	-6.77	-2.69
	Predominantly urban	-7.43	-6.24	5.57	-0.03	-0.78
Baseline population, high productivity	Intermediate	-19.76	-8.46	2.51	-2.77	-3.04
	Predominantly rural	-11.27	-10.92	-0.38	-6.64	-2.92
	Predominantly urban	-7.75	-7.41	3.49	-0.09	-0.99
Baseline population, high productivity and green transition	Intermediate	-19.79	-7.76	4.76	-3.22	-2.99
	Predominantly rural	-10.99	-10.02	0.46	-7.06	-2.71
	Predominantly urban	-7.53	-6.51	6.18	-0.42	-0.80
High migration, baseline productivity and green transition	Intermediate	-21.70	-7.35	5.24	-0.83	-1.83
	Predominantly rural	-11.58	-9.82	1.39	-5.45	-1.61
	Predominantly urban	-8.89	-6.00	6.40	1.99	0.08

Scenario	Type of region	Baltic countries	Eastern Europe	Northern Europe	Southern Europe	Western Europe
Low migration, baseline productivity and green transition	Intermediate	-17.79	-7.8	2.95	-4.99	-4.11
	Predominantly rural	-10.2	-9.72	-0.95	-8.09	-3.86
	Predominantly urban	-5.97	-6.49	4.51	-2.17	-1.66

2.4.8 Focused analyses for the *baseline population, high productivity, green transition achieved* scenario

Recollection on the assumption of the **"baseline population, high productivity, green transition achieved"** scenario: it layers accelerated productivity growth onto the investments needed for net-zero by 2050. As such, this scenario encompasses the 3 transitions that motivate this study:

1. The **demographic transition** (baseline forecasts follow what are the most likely future demographic developments).
2. The **digital transition** (assumption of the accelerated productivity growth to be a proxy for digitalisation).
3. The **green transition** (assumption of the necessary investments to achieve net zero targets are successfully carried out).

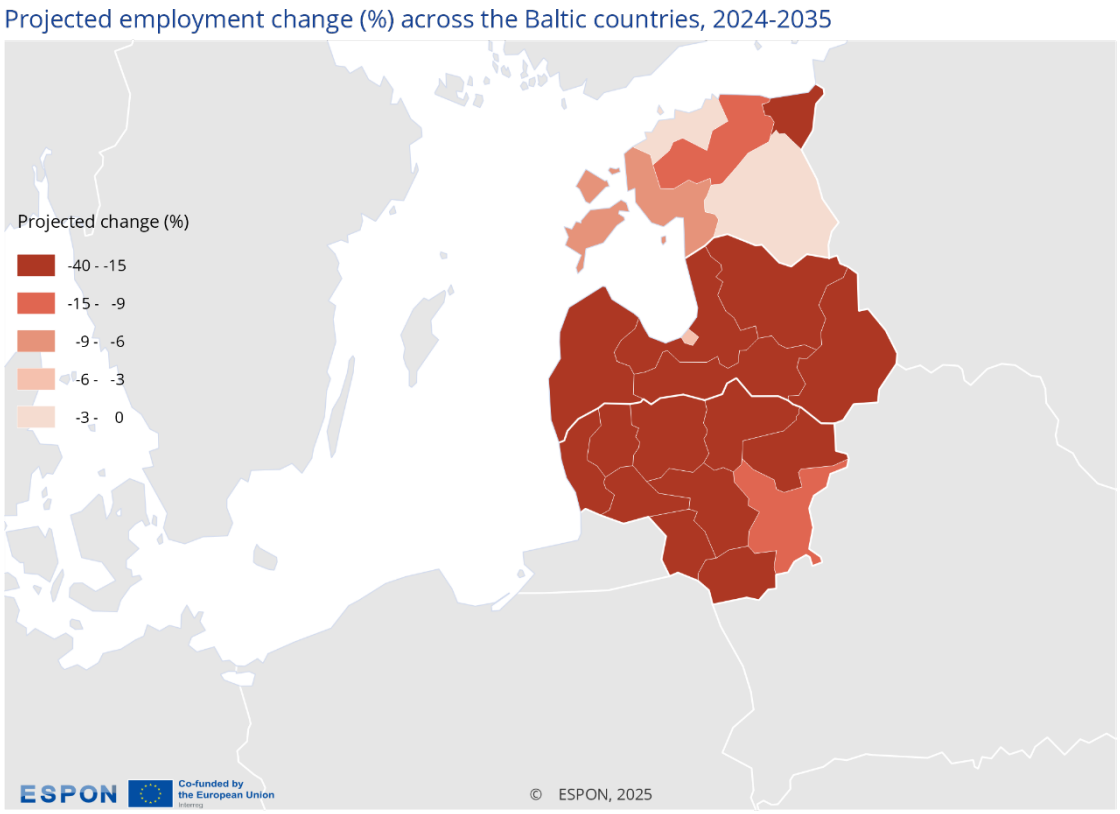
Accordingly, in the sections that follow, more attention is devoted to this scenario. This is done by means of maps and distributional analysis, focusing iteratively on different parts of the European continent and on different industries.

2.4.8.1 Macro-areas

Baltic Countries

This macro area of the continent encompasses Estonia, Latvia, and Lithuania – accounting for a total of 21 NUTS-3 regions (7 rural, 4 urban and 10 intermediate). As of 2024, approximately 2,864,000 people were employed in this basin. According to the projections, however, this number is forecasted to drop to around 2,499,600 by 2035 – registering a **-12.7%** decrease.

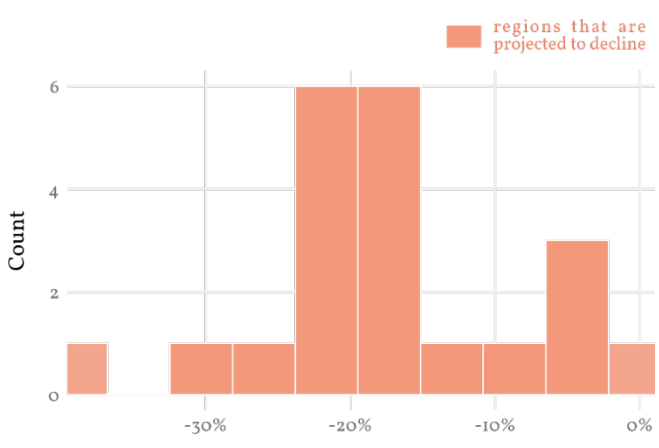
Map 12: Projected employment change (%) across the Baltic countries – 2024 - 2035



Territorial level: NUTS 3 (2016)
Source: ESPON Overlap, 2025
Origin of data: OVERLAP data ("Baseline population, high productivity, green transition" scenario).
Administrative boundaries: ©EuroGeographics ©ESPON

Under the current scenario, all Baltic NUTS-3 regions are expected to face employment declines ranging between 0% and –40% by 2035. The highest relative resilience appears in northern Estonia—Harju County around Tallinn—and Lithuania's western Klaipėda area, with job losses limited from–3% to 0%. Surrounding Estonian districts and Lithuania's coastal and island zones may incur moderate drops (–9% to –6%), while inland counties across both states slip by –40% to –15%. Latvia endures the most acute downturn, with the Riga metro hub suffering an estimated –40% to –35% plunge and adjoining regions declining –35% to –30%. This uniform downturn underscores acute demographic ageing, labour out-migration and the limits of productivity-driven gains amid stagnant population trends.

Figure 17: Distribution of projected employment growth in the Baltic countries



no. of regions with projected declining employment

Baltic States - 21 / 21
Estonia - 5 / 5
Lithuania- 10 / 10
Latvia- 6 / 6

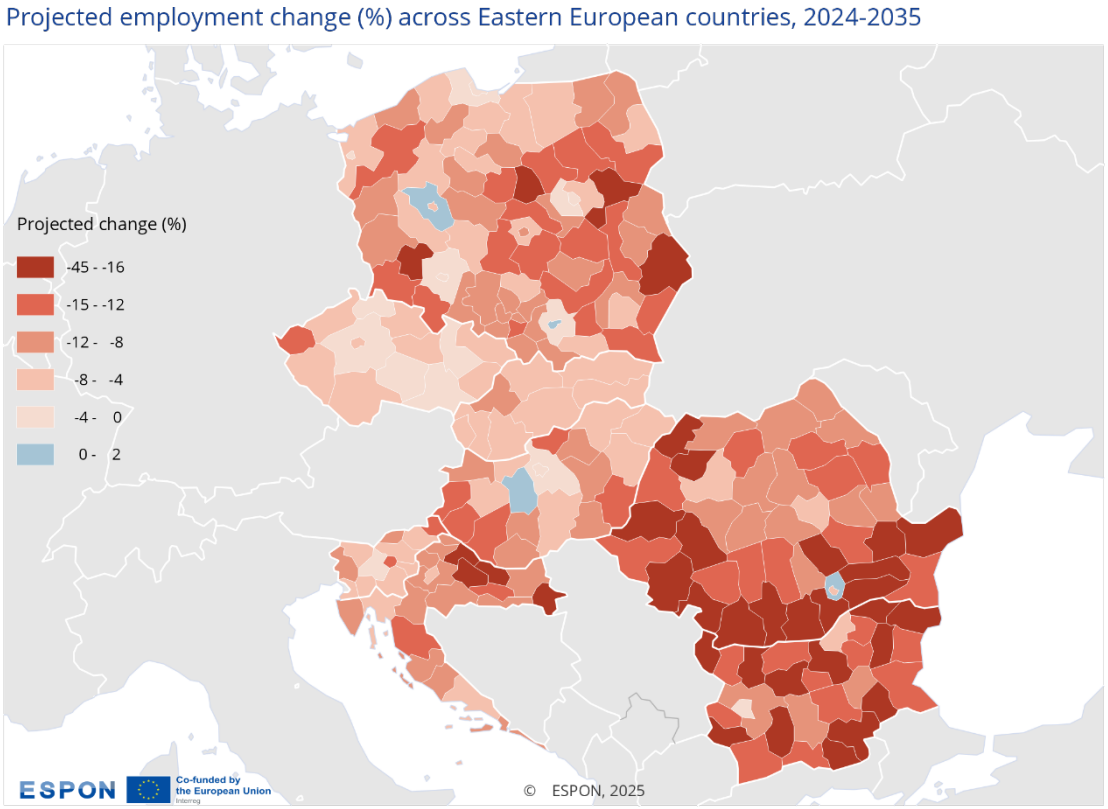
Table 18: Summary statistics for the Baltic countries

Area / Country	Average growth	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
Baltic States	**-17.7%**	**-37.7%**	**-25.8%**	**-19.3%**	**-4.9%**	**-0.8%**
Estonia	-8.8%	-23.1%	-18.7%	-6.3%	-1.3%	-0.4%
Lithuania	-19.3%	-30.5%	-23.1%	-18.9%	-14.7%	-10.6%
Latvia	-22.4%	-38.6%	-32.5%	-22.6%	-12.2%	-5.7%

Eastern European countries

This area of the continent encompasses Poland, Czech Republic, Hungary, Slovakia, Slovenia, Bulgaria and Romania, for a total of 218 NUTS-3 regions (102 rural, 22 urban and 94 intermediate). As of 2024, over 43 million people were employed in this basin. According to our projections, however, this number is forecasted to drop significantly to around 39,764,000 by 2035 – a -8.2% decrease.

Map 13: Projected employment change (%) across Eastern European countries – 2024 – 2035



Territorial level: NUTS 3 (2016)
Source: ESPON Overlap, 2025
Origin of data: OVERLAP data ("Baseline population, high productivity, green transition" scenario).
Administrative boundaries: ©EuroGeographics ©ESPON

Under the current scenario, nearly every NUTS-3 region in Eastern Europe is expected to face job losses through 2035, albeit with notable variation. Poland's industrial south and western provinces—especially Silesia and Lower Silesia—hold up best, slipping only –8% to 0%, whereas north-eastern voivodeships endure steeper declines (–45% to –12%). Czech and Slovak areas clustered around Prague and Bratislava likewise show modest contractions (–8% to 0%), contrasting with more pronounced losses in peripheral districts. Hungary's Budapest region appears relatively resilient (0% to +2%), while rural border counties fall into the –15% to –8% bracket. In Romania, Transylvania's major centres decline by –5% to –10 %, but southeastern counties such as Galați and Teleorman suffer severe drops of –30% to –45%. Bulgaria and Croatia mirror this pattern: capitals and coasts register milder falls (–5% to –10%), whereas interior and border zones trend toward deeper losses. **Overall, urban and industrial hubs fare better, but Eastern Europe broadly confronts significant employment contraction.** Only 4 NUTS-3 regions from this part of the ESPON space are forecasted to grow: Fejér (HU211) at +1.1%,

Miasto Kraków (PL213) at +1.3%, Poznański (PL418) at +0.1% and Ilfov (RO322) at + 1% - all of the above are fairly popolous regions to begin with.

Observing the distribution of projected percentage changes in total employment (Figure 18), one can notice the same asymmetry that was identified under all scenarios in the previous section: **almost all regions are projected to suffer a decline in the employed population, with a long left-tail, which implies that some areas might experience decline as rough as -30%** (i.e. 1 person in 3). Table 20 provides some summary statistics to more accurately depict this distribution.

Figure 18: Distribution of projected employment growth in Eastern Europe

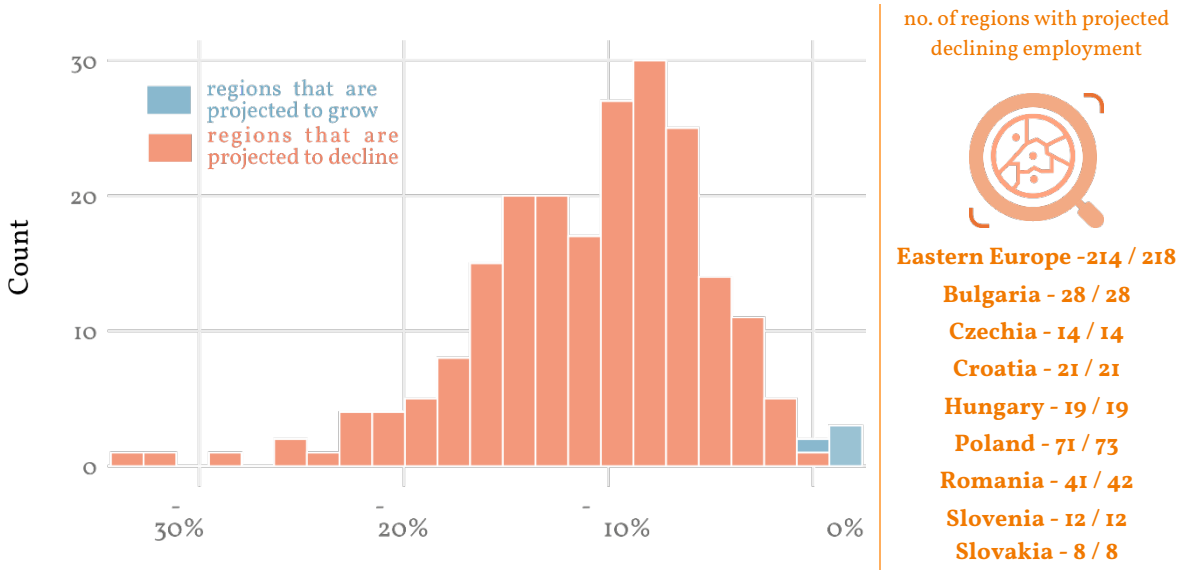


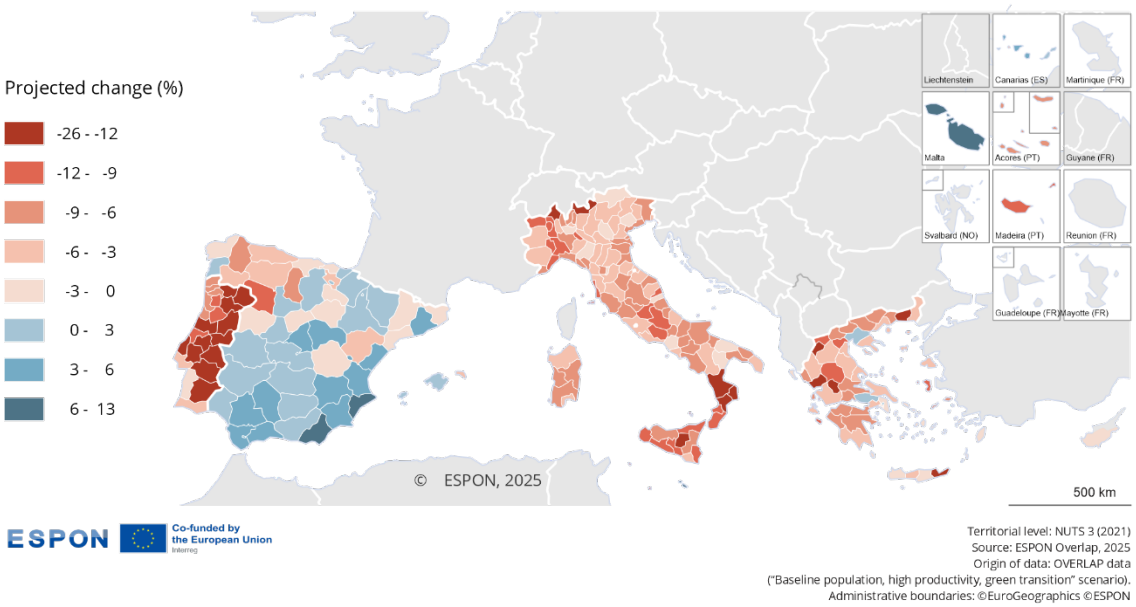
Table 19: Summary statistics for Eastern European countries

Area / Country	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
Eastern Europe	**-11%**	**-32.8%**	**-17.8%**	**-9.9%**	**-4.2%**	**0.9%**
Bulgaria	-15.6%	-23.7%	-21.4%	-15.6%	-9.8%	-4.1%
Czechia	-5%	-12.8%	-6.1%	-4.3%	-2.7%	-1.2%
Croatia	-11.4%	-30.1%	-16.6%	-9.7%	-7.5%	-5.1%
Hungary	-8.2%	-15.6%	-14.4%	-8.3%	-2.9%	0.6%
Poland	-9.4%	-17.6%	-14.8%	-9.4%	-3.1%	0.4%
Romania	-15.6%	-44%	-25.8%	-13.7%	-8.2%	-1.4%
Slovenia	-8.1%	-15.1%	-12.1%	-7.6%	-5.2%	-3.4%
Slovakia	-6.3%	-9%	-8%	-6.2%	-4.3%	-4.2%

Southern European countries

This area of the continent encompasses Greece, Italy, Portugal, and Spain, for a total of 246 NUTS-3 regions (76 rural, 60 urban and 110 intermediate). As of 2024, over 53 million people were employed in this basin. According to our projections, this number is forecasted to drop a more moderate amount to around 52,624,000 by 2035 – a -2.1% decrease.

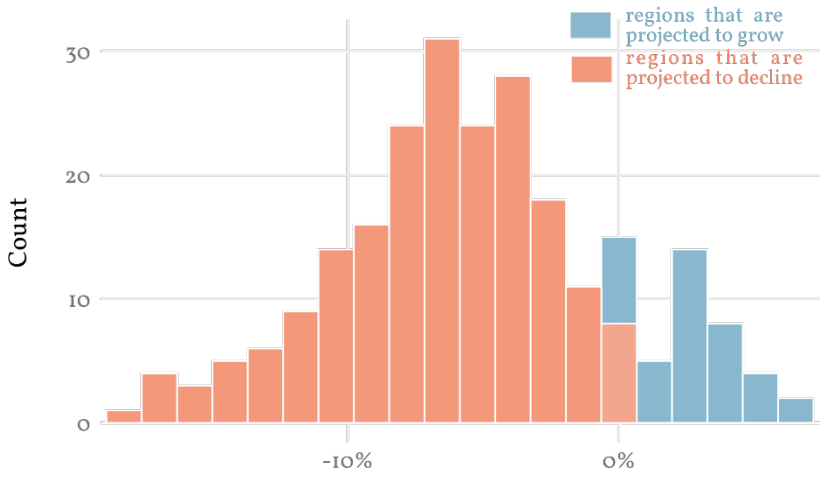
Map 14: Projected employment change (%) across Southern European countries – 2024- 2035



Under the current scenario, Southern Europe displays a strong east–west split. Spain emerges as the clear front-runner, with almost every NUTS-3 region posting employment growth (0% to +13%). Italy broadly contracts by –9% to 0%, with its industrial north and metropolitan hubs around Milan and Rome closest to stability, and the Mezzogiorno enduring steeper declines (beyond -12%). Greece follows suit: Attica and Thessaloniki slip slightly (–3% to 0%), whereas rural hinterlands and islands drop by –10% to –20%. Malta and Cyprus remain essentially neutral, reflecting marginal demographic and productivity shifts in these small island states.

Figure 19, which plots the distribution of projected employment changes, reveals the same skewed pattern noted under all earlier scenarios and reference areas: nearly every region is expected to see job losses. Table 19 offers summary statistics that more precisely capture this distribution.

Figure 19: Distribution of projected employment growth in Southern European countries



no. of regions with projected declining employment

Southern Europe - 204 / 246
Cyprus - 1/1
Greece - 49/52
Spain - 22/59
Italy - 107/107
Malta - 0/2
Portugal- 25/25

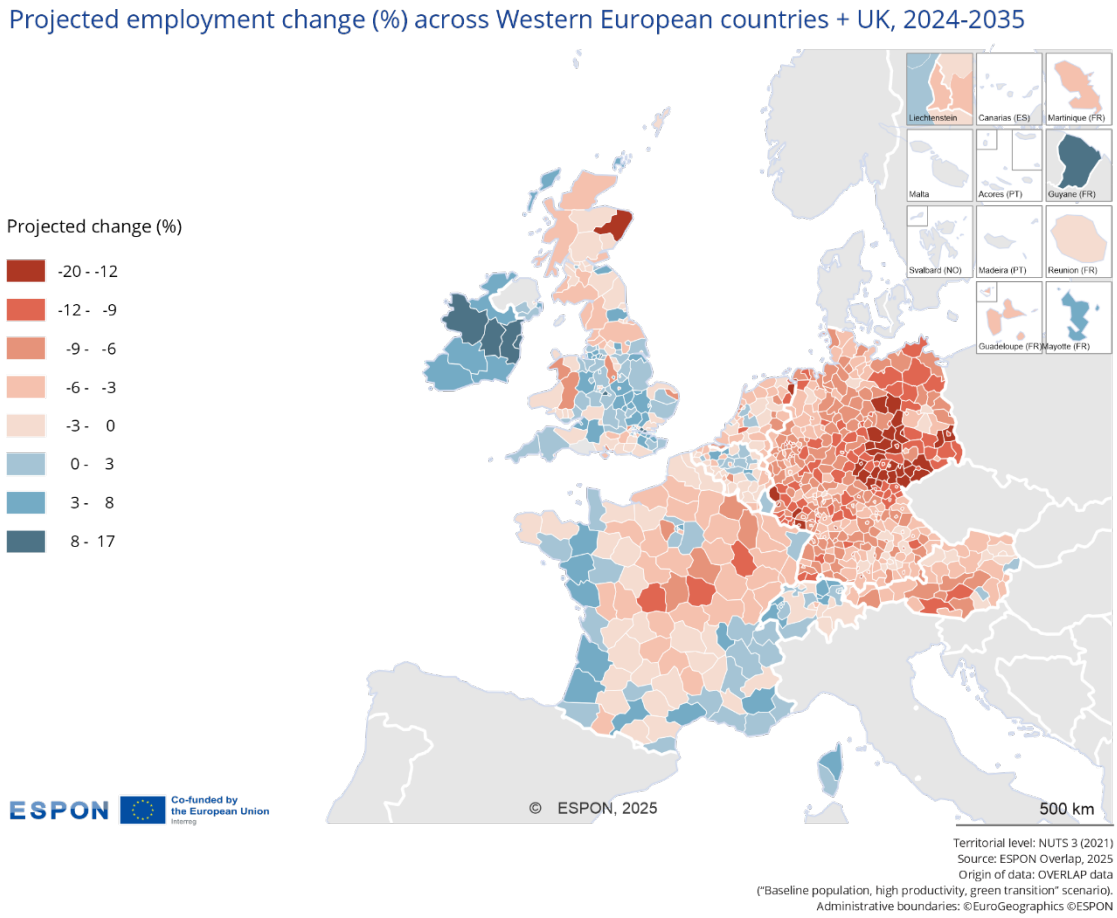
Table 20: Summary statistics for Southern European countries

Area / Country	Average growth rate	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
Southern Europe	-5.2%	-17.9%	-11.7%	-5.3%	2.3%	6.2%
Cyprus	-2.6%	-2.6%	-2.6%	-2.6%	-2.6%	-2.6%
Greece	-6.1%	-16.4%	-11.5%	-5.9%	-1.3%	0.3%
Spain	0.7%	-9.2%	-3.9%	1.3%	4.7%	6.2%
Italy	-6.9%	-16.1%	-11.1%	-6.6%	-3.3%	-0.6%
Malta	12.1%	11.8%	11.9%	12.1%	12.2%	12.3%
Portugal	-11.6%	-24.6%	-16.5%	-11.3%	-5.6%	-0.9%

Western European countries

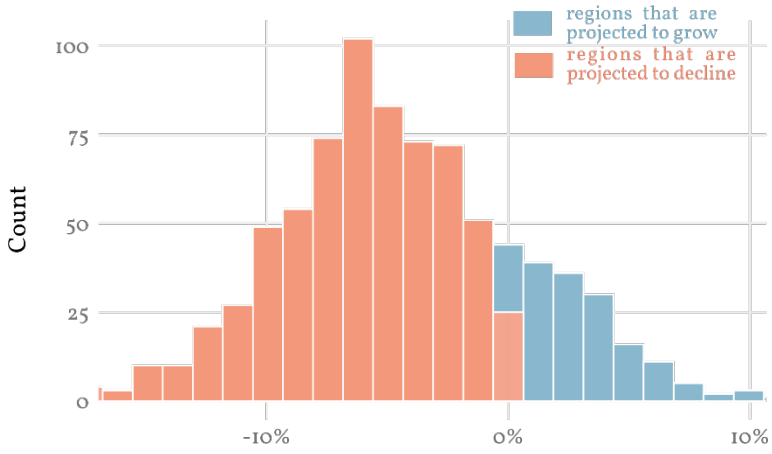
This area of the continent encompasses Austria, Belgium, France, Germany, Ireland, Switzerland, Liechtenstein, Luxembourg, the Netherlands *plus the UK*, for a total of 246 NUTS-3 regions (76 rural, 60 urban and 110 intermediate). As of 129 million people were employed in this basin. According to our projections, however, this number is forecasted to drop to around 127 million by 2035 – a moderate -1.7% decrease.

Map 15: Projected employment change (%) across Western European countries + UK – 2024 - 2035



Under the baseline-population, high-productivity, green-transition scenario, Western Europe splits into clear zones of gain and loss. The British Isles show net employment growth: Ireland's commuter belts and Dublin top +8 % to +17%, while most of the UK ranges from 0% to 8%, with only a handful of northern and rural areas dipping (–12% to -3%). France is mixed, but leans negative: Île-de-France and parts of the southwest hold near zero or small gains, whereas central and eastern *départements* slip by –12% to –6%. Germany endures the steepest declines, especially in the east (–20% to -12%), with western Länder faring somewhat better (–6% to –3%). The Benelux countries and western Germany hover around –6 % to 0 %, reflecting modest contraction. French overseas territories vary widely: Guyane expands strongly (+8% to +17%), while Guadeloupe, Martinique and Mayotte contract by beyond -12%. Overall, employment growth concentrates in the British Isles and a few green-tech hubs, while core continental regions face moderate to sharp downturns.

Figure 20: Distribution of projected employment growth in Western European countries + UK



no. of regions with projected declining employment

Western Europe - 660/727
Austria- 33/35
Belgium- 32/44
Switzerland - 9/26
Germany - 401/401
France - 65/101
Ireland - 0/8
Liechtenstein -1/1
Luxembourg - 0/1
The Netherlands - 37/40
United Kingdom - 82/170

Table 21: Summary statistics in Western European countries + UK

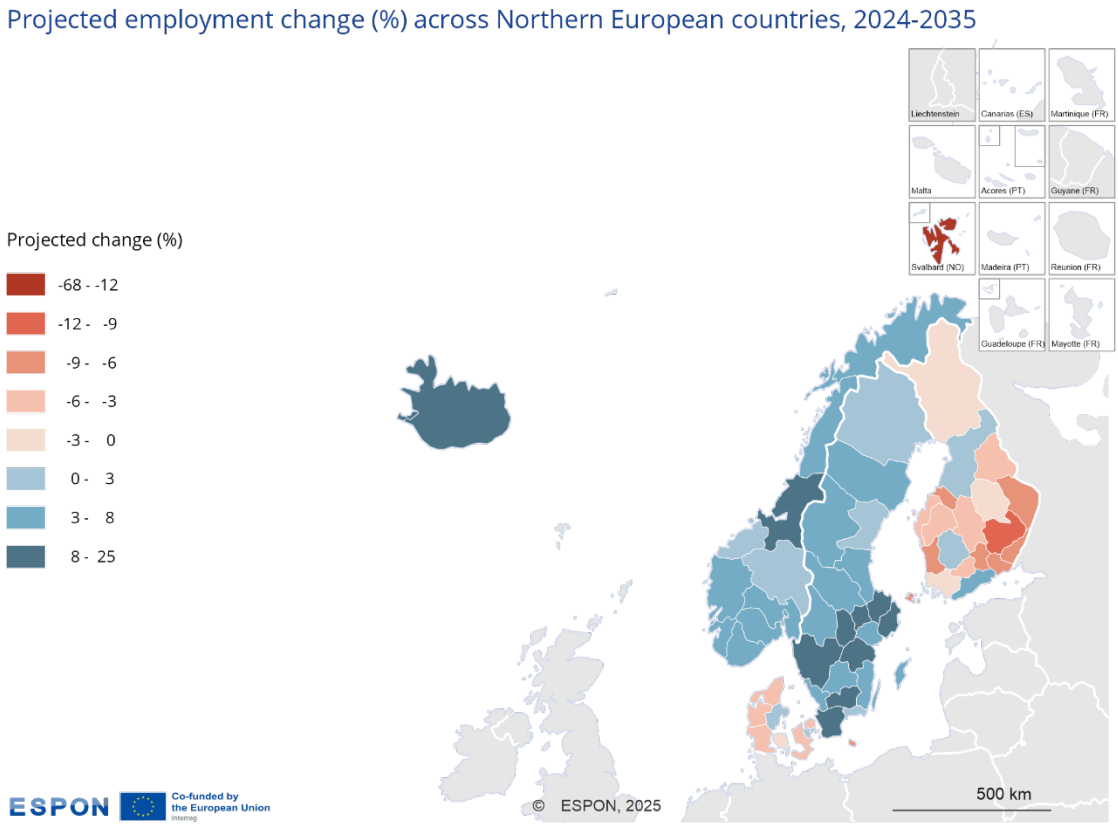
Area / Country	Average growth	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
Western Europe	-4.2%	-15.7%	-10.4%	-4.8%	2.7%	9.4%
Austria	-4.3%	-9.8%	-7.0%	-4.4%	-0.8%	1.1%
Belgium	-1.2%	-5.7%	-3.6%	-1.2%	1.7%	4.2%
Switzerland	1.2%	-4.2%	-2.4%	1.8%	4.0%	7.0%
Germany	-7.9%	-17.1%	-12.1%	-7.4%	-4.1%	-1.2%
France	-1.4%	-10.1%	-5.8%	-1.6%	3.7%	7.3%
Ireland	8.6%	4.1%	4.7%	8.1%	13.1%	16.2%
Liechtenstein	-3.2%	-3.2%	-3.2%	-3.2%	-3.2%	-3.2%
Luxembourg	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
The Netherlands	-4.3%	-12.0%	-7.9%	-4.2%	-0.6%	2.2%
United Kingdom	0.5%	-6.8%	-4.7%	0.3%	5.5%	13.4%

This histogram reveals 2 things. First, a large majority of Western Europe's NUTS 3 regions are forecast to see employment declines: the red bars (negative changes) dominate, peaking at just over 100 regions around –2% to –3%. Second, the distribution is noticeably left-skewed, with a long tail of regions facing steep drops—some as large as –15% or more. By contrast, the right side of the curve (green bars) is shorter and tapers off quickly: relatively few areas are projected to grow, and even positive gains rarely exceed +5%, with only a handful pushing toward +10%. Overall, the median change lies below zero, and the bulk of the mass sits between –5% and 0%, underscoring that modest losses will be far more common than modest gains under this scenario.

Northern European countries

This area of the continent encompasses Denmark, Finland, Iceland, Sweden and Norway, for a total of 65 NUTS-3 regions (27 rural, 7 urban and 31 intermediate). As of 2024, around 14 million people were employed in this basin. According to our projections, **this number is forecasted to rise to around 14.5 million by 2035 – bringing a +4.2% increase.**

Map 16: Projected employment change (%) across Northern European countries – 2024 - 2035



Territorial level: NUTS 3 (2021)
Source: ESPON Overlap, 2025
Origin of data: OVERLAP data
("Baseline population, high productivity, green transition" scenario).
Administrative boundaries: ©EuroGeographics ©ESPON

Under the baseline-population, high-productivity, green-transition scenario, Northern Europe is overwhelmingly set for job growth between 2024 and 2035. Nearly every NUTS-3 region in Norway, Sweden and Iceland fall into the +0% to +25% range, with southwestern Norway and central Sweden showing the strongest gains (+8% to +25%). Denmark and Finland show more mixed results: central hubs like Cophenaghen and Helsinki grow modestly (+3% to +8%), but some inland and eastern counties in Finland and peripheral areas in Denmark face slight declines (–9% to 0%). The sole extreme outlier is Svalbard, which projects a dramatic contraction (around –68%), reflecting its unique demographic and economic dynamics. Overall, Map 16 highlights a broadly positive employment outlook across the northern periphery, with only a handful of remote zones under pressure.

Figure 21: Distribution of projected employment growth in Northern European countries

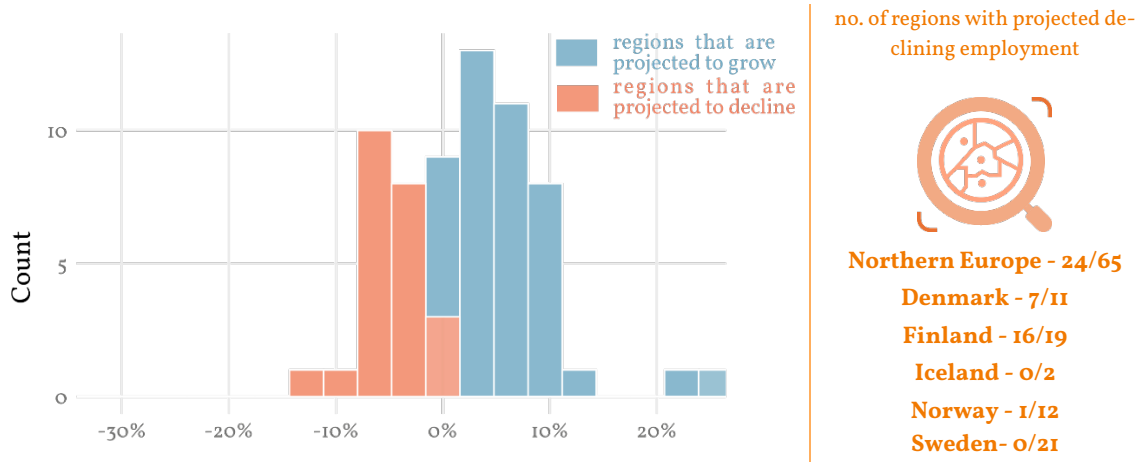


Table 22: Summary statistics in Northern European countries

Area / Country	Average growth	Average growth for the bottom 1%	Average growth for the bottom 10%	Median growth rate	Average growth for the top 10%	Average growth for the top 1%
Northern Europe	**1.2%**	**-31.5%**	**-6.8%**	**2.1%**	**8.9%**	**23.7%**
Denmark	-2.3%	-8.1%	-5.2%	-3.2%	1.2%	1.7%
Finland	-4.0%	-10.6%	-7.8%	-4.5%	1.2%	3.1%
Iceland	24.0%	23.1%	23.3%	24.0%	24.6%	24.8%
Norway	-0.9%	-59.9%	2.3%	4.6%	7.7%	8.7%
Sweden	6.7%	0.7%	2.1%	7.2%	10.8%	12.2%

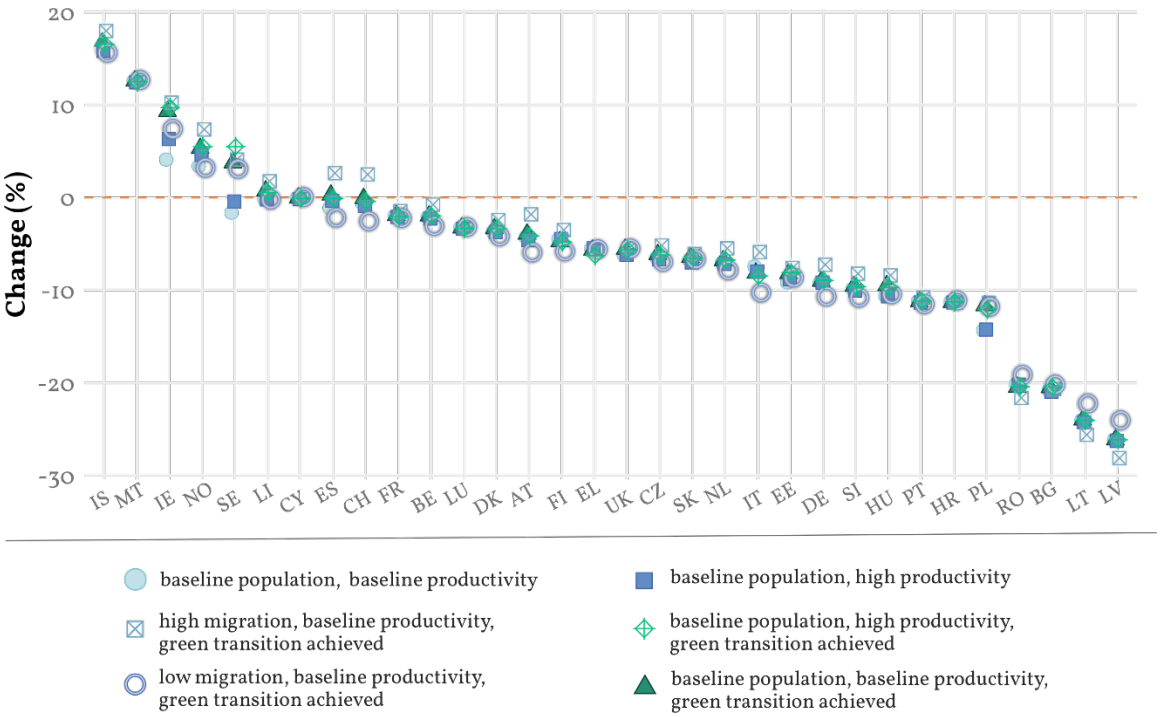
The distribution displayed in Figure 21 underscores Northern Europe's overwhelmingly positive employment outlook under the "baseline population, high productivity, green transition" scenario. The red bars on the left show that only a handful of regions (roughly 10–15) are projected to lose jobs, with declines clustered between −5% and 0% and very few exceeding −10%. In contrast, the green bars dominate the right side: most NUTS 3 areas expect gains of 0% to +15%, peaking around +8% to +12%. A long positive tail extends all the way to +25 %, indicating that some regions—particularly in southwestern Norway and central Sweden—could see exceptionally strong growth. Overall, the median change sits well above zero, and the bulk of the mass lies in modest-to-strong increases, highlighting a stark contrast between a small minority of shrinking areas and a broad majority poised for job expansion.

Macro-areas: a comparative analysis

As shown above, **some NUTS-3 regions will be more affected by the impending demographic headwinds**; while others may be able to stave off population decline through migration, being as they are attractive destinations for international talent. Figure 22 aggregates these differences at the country level. Each country along the horizontal axis is plotted with multiple symbols, each symbol representing a different scenario (6 in total). The vertical axis indicates the **projected percentage change in total employment**

between 2024 and 2035. Values above the zero-line mean employment is projected to grow under that scenario; values below zero indicate a decline. Countries like Malta, Ireland, Sweden, Switzerland, Spain, and Luxembourg appear predominantly above zero. In other words, most scenarios project positive employment growth or smaller declines for these nations. Around the centre, countries such as France, Belgium, Norway, Denmark, and Finland are closer to the zero line; some scenarios show slight positive growth, others mild declines, signalling more moderate or mixed outcomes. Countries including Romania, Bulgaria, Lithuania, and Latvia consistently register larger negative changes under each scenario. They are set to lose more employment in the coming decade, reflecting demographic pressures, outmigration, or weaker economic fundamentals.

Figure 22: Projected changes in total employment by country and scenario, 2024-2035



Notes: Due to issues of data availability and limitations of the modelling framework employed, the figures for Malta, Cyprus, and Luxembourg were compiled by making strong simplifying assumptions. These values should therefore be taken with caution.

Figure 23: Projected changes in total employment according to different scenarios by macro area, 2024-2035

Figure 23 summarises the different projections by area of reference and scenario. As hinted at in section 2.4.9.1., **the scenarios for the Baltic and for Eastern European countries lead to particularly concerning assumptions**. All scenarios yield negative employment growth, averaging –12.70% in the Baltics and –8.40% in Eastern Europe. Even with boosted productivity and the heightened investments needed to achieve net-zero goals (the scenario which was given further attention), these countries still face sizable losses in employment, highlighting strong demographic pressures and potential outflows of workers.

It should be noted that, given how migration is modelled, a higher level of migration can be detrimental to countries that register consistent net losses. For example, the crude rate of net migration for Romania in 2021 was -3.8 per 1,000 persons; which implied that roughly 72,404 people left the country that year.[31] Increasing this net loss by 33% as per the high migration projection's assumptions means that the loss is higher, or approx.

[31] Source: Eurostat "Population change by NUTS 2 region - Crude rates of total change, natural change and net migration plus adjustment" (Online data code: tgs00099)

96,298. This suggests that countries which experience strong outflows should devote more efforts to establishing the conditions that would enable more people stay.[32]

The situation for Northen European countries appears to be more promising, as the projections point to positive growth across all scenarios (an average of +2.89%). However, the size of the workforce in the North is fairly small compared to the rest of Europe—so this growth is muted in the aggregate.

Maps from Map 4 to Map 9 clearly illustrate that **not all European regions will face the same trajectory**; while most areas are shaded in at least a moderate orange or pale blue, some pockets display especially dark hues. This suggests that certain local economies—likely facing demographic pressures (e.g., population ageing and outmigration) and structural challenges (e.g., reliance on industries in decline)—are expected to contract more sharply than others. Three broad geographies emerge.

Eastern and South-Eastern Europe— notably large parts of Romania, Bulgaria, the Baltic countries and inland Greece—form a contiguous belt of deep orange shading, signalling cumulative employment losses well above 10%. These areas already experience low fertility and heavy out-migration, so forthcoming retirement waves are expected to hit harder.

Southern Europe's periphery — including interior Portugal, parts of Spain and certain island territories, shows a more variegated palette but still tilts negative, reflecting similar demographic pressures compounded by limited industrial diversification.

Northern and North-Western Europe (+ UK) — Ireland, *the United Kingdom*, Benelux and much of Scandinavia—display lighter tones and occasional blue pockets. Here, higher in-migration and more dynamic, service-heavy economies partly offset ageing losses.

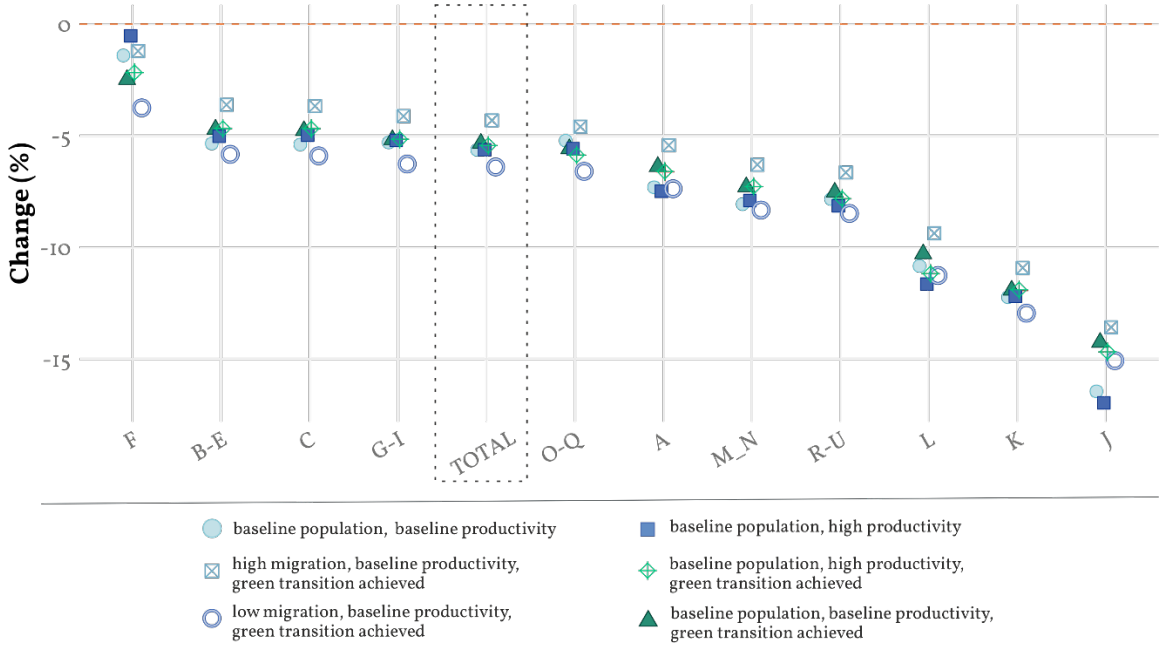
Across every scenario examined, the spatial pattern of workforce decline remains strikingly stable, pointing to **demographic headwinds**—low fertility, net out-migration, and looming retirement waves—as one dominant force shaping future employment. Even when assumptions are altered—for instance, by raising or lowering migration inflows, tweaking productivity trajectories, or varying the ambition of the green transition—the map of front-runners and lagging scarcely shifts, with only minor tonal differences that do little to offset the underlying demographic drag documented in the annexed figures. This consistency makes clear that Europe's labour-market outlook is governed less by sectoral or technological variables and more by deep-seated population trends, implying that **effective policy must directly and effectively address ageing and depopulation**.

[32] This is consistent with the recently launched concept of a European "Right to Stay", enunciated in the Letta Report (2024). See: link

2.4.9 Specific industries

This next section explores the scenarios across the industries, in order to provide even more in-depth observations related to expected shifts. Figure 24 plots the projected employment changes differentiated by industry.[33] Each industry along the horizontal axis is plotted with multiple symbols, each symbol representing a different scenario (6 in total). The vertical axis indicates the projected percentage change in total employment between 2024 and 2035.

Figure 24: Projected changes in total employment by industry and scenario, 2024-2035



The NACE codes are as follows – A: Agriculture, forestry and fishing; B-E: Industry (except construction); C: Manufacturing; F: Construction; G-I: Wholesale & retail trade; transport; accommodation & food service; J: Information and communication; K: Financial and insurance activities; L: Real estate activities; M_N: Professional & administrative services; O-Q: Public administration, education & health; R-U: Arts, other services, households & extraterritorial bodies. For more information, follow the link.

Across all 6 scenarios, every NACE section shows a negative bar: total EU employment is projected to shrink whatever combination of population, productivity or green-investment assumptions is applied. The common driver is a **rapidly contracting working-age population**: as anticipated, Eurostat expects the EU-27 cohort aged 20-64 to fall by roughly 6 million between 2024 and 2035, with the median age rising past 46 years.[34] Even if output keeps expanding, fewer people are available to work; the model therefore translates higher productivity mainly into *labour saving* rather than *job creation*. In short,

[33] The NACE codes used are as follows – A: Agriculture, forestry and fishing; B-E: Industry (except construction); C: Manufacturing; F: Construction; G-I: Wholesale & retail trade; transport; accommodation & food service; J: Information and communication; K: Financial and insurance activities; L: Real estate activities; M_N: Professional & administrative services; O-Q: Public administration, education & health; R-U: Arts, other services, households & extraterritorial bodies. For more information, see: link

[34] "Population projections in the EU" (Eurostat). See: link

demand for workers is outrun by a smaller labour supply, so every sector posts net job losses.

Construction (NACE **F**) is projected to shrink the least—around 3 to 4 % —likely because several forces cushion the demographic drag. **First, a powerful demand shock is baked in.** The Commission's *Renovation Wave* aims to upgrade 35 million buildings by 2030 and could generate ≈160,000 additional jobs, while national recovery plans and REPowerEU channel further billions into renewable-energy parks, grids and rail projects—all of which translate directly into civil-engineering and specialised-trade work that must be performed on site.[35] **Second, the sector's task mix is hard to automate.** CEDEFOP's automation-risk indicator places most bricklaying, carpentry and finishing trades in the medium-to-low risk band; even where robotics enters, it tends to augment rather than displace labour, so productivity gains raise output more than they cut headcount.[36] **Third, replacement demand is substantial.** Despite a projected net drop of only about 1% between 2025 and 2035, retirements alone will create at least 7 million vacancies that firms must still fill, keeping regional construction labour markets tight.[37] Taken together, green-driven investment, low automatability and high retirement churn, might explain why construction appears the most resilient industry in the face of Europe's looming workforce contraction.

At the other end of the spectrum lies information and communication (NACE **J**). This sector is forecast to suffer the steepest headcount drop—around 15%—perhaps because the very forces that raise its output, also incise its labour demand. Recent McKinsey modelling shows up to **30% of workhours in Europe could be automated by 2030**, with software development, data processing and routine IT support among the most exposed tasks.[38] The sector is therefore assumed to realise **exceptionally strong productivity gains**, so a smaller, highly skilled core workforce can deliver more digital services. Eurofound likewise highlights that a growing share of ICT functions can be carried out through cloud platforms or low-code tools, squeezing mid-level technical jobs even as demand for top-end specialists rises.[39] Meanwhile, global sourcing further reduces EU headcounts: companies can contract coding or help-desk services to lower-cost regions while keeping value creation in Europe.

By 2035, then, total employment in the EU is projected to decline across all sectors, driven primarily by a shrinking working-age population. The expected magnitude of job losses, however, is differentiated. Construction and other locally anchored, labour-intensive activities record the smallest contractions: their tasks remain difficult to automate, and they receive direct support from EU and national renovation, energy and transport programmes. At the opposite end, information and communication—and, by extension, other high-productivity, trade-exposed services (such as finance)—post the steepest

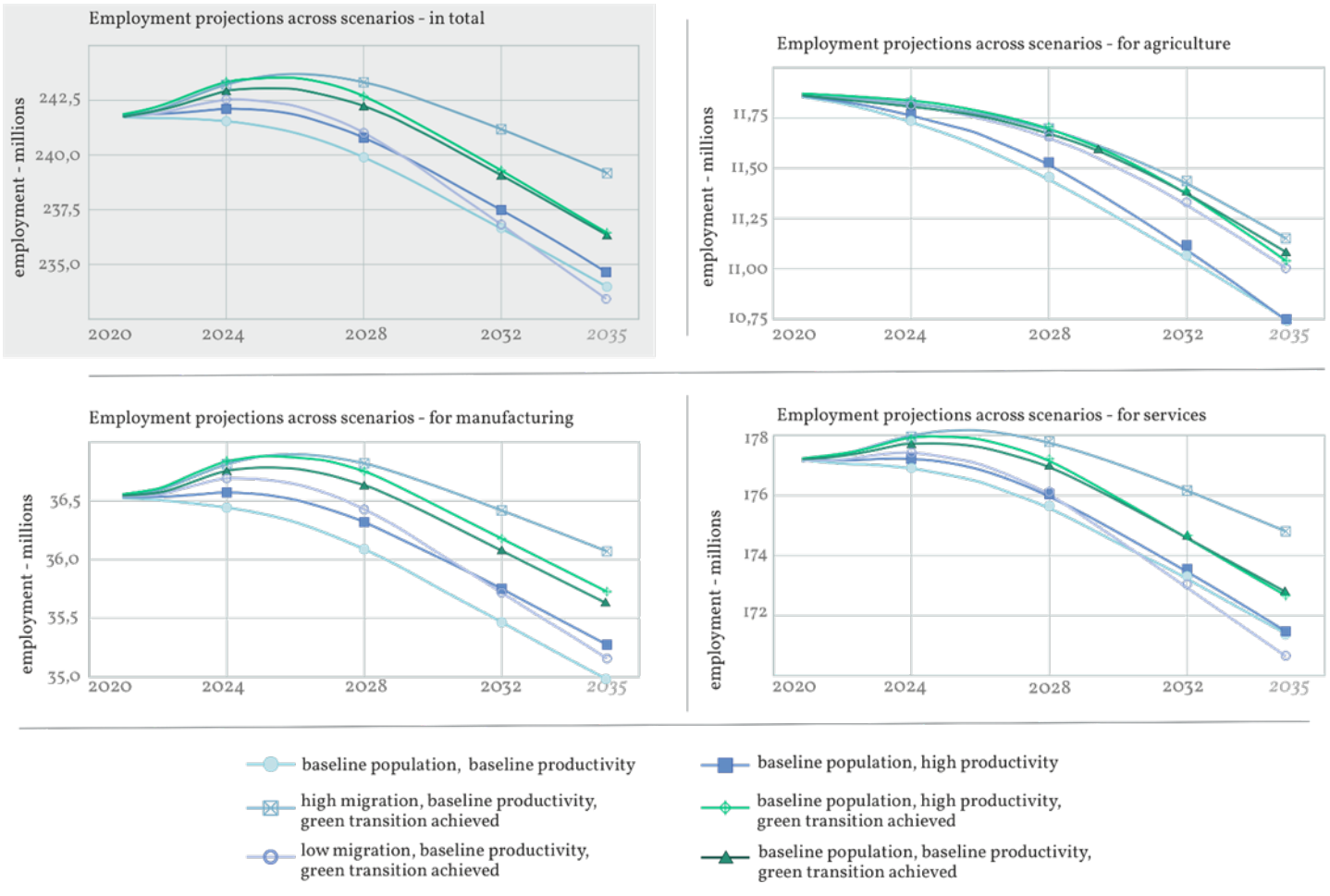
[35] "Renovation Wave" (International Energy Agency). See: link
[36] "Skills intelligence" (CEDEFOP). See: link
[37] "The greening of the EU construction sector" (CEDEFOP, 2023). See: link
[38] "A new future of work: The race to deploy AI and raise skills in Europe and beyond" (McKinsey, 2024). See: link
[39] "Employment impact of digitalisation" (Eurofound). See: link

headcount reductions. Rapid adoption of AI, cloud technologies and global sourcing raises output per worker, enabling firms to meet demand with smaller workforces. Between these extremes, medium-technology manufacturing regions, many located in Europe's periphery, face concurrent demographic decline and high automation risk; without targeted reskilling and investment in human-centred production technologies, they may experience accelerated industrial contraction.

Green and resilience investments constitute the main offsetting mechanism: they direct demand toward sectors with lower automation potential and higher regional spillovers, thereby moderating net employment losses where such projects are concentrated. The evidence suggests that regional employment strategies will need to combine measures that attract or retain labour—through migration, upskilling and improved living conditions—with selective public and private investment aimed at generating locally based, less automatable jobs.

Given these fundamentals, it is worth to explore the OVERLAP employment projections at the sectoral level. Figure 25 describes the overall trend for agriculture, industry and services. The following sections isolate the "*baseline population, high productivity and green transition achieved" scenario* and dive deeper into each one, as well as in the more narrowly defined industries *F – Construction* and *J – Information and communication*, which Figure 24 highlights as the expected highs and lows in the coming years, respectively.

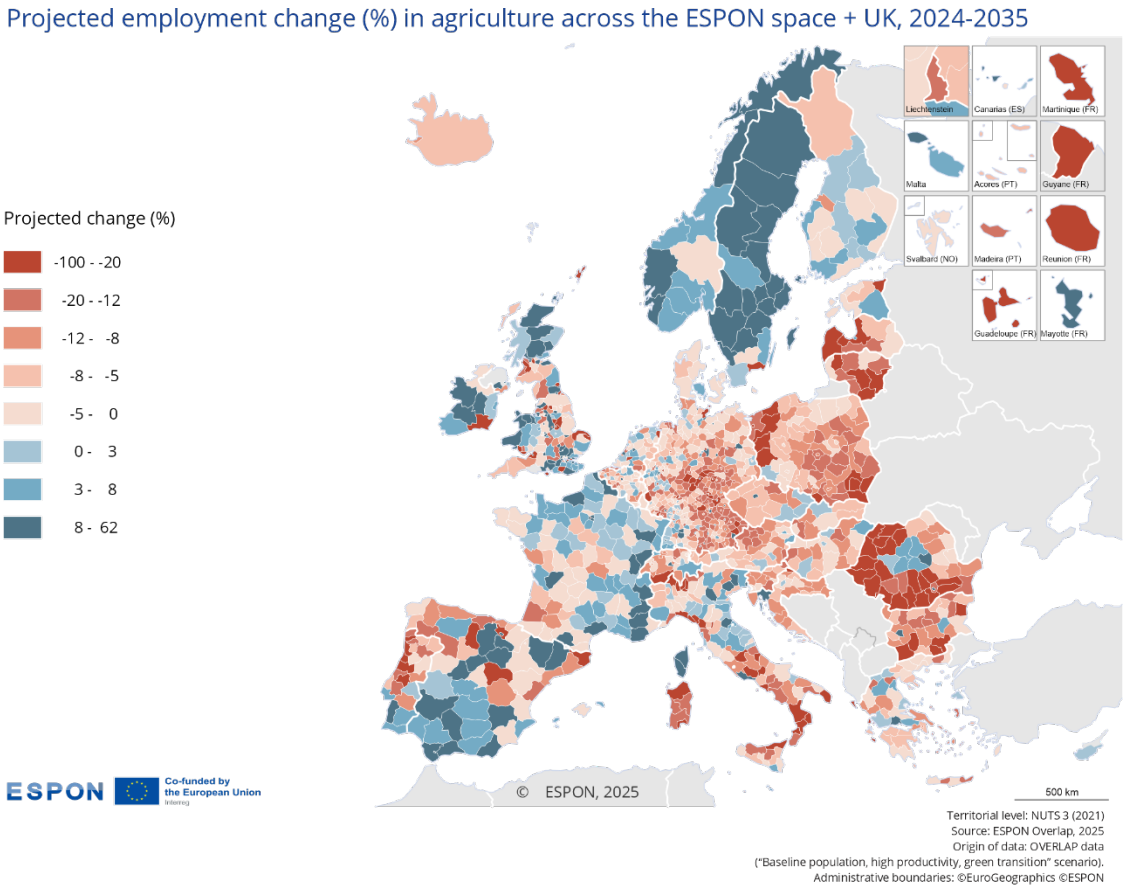
Figure 25: Employment projections by sector and scenario, 2021 – 2035



Agriculture (NACE A)

Map 17 displays the projected percentage change in agricultural employment across NUTS 3 regions of Europe for 2024–2035 under the "*baseline population, high productivity and green transition*" scenario. The diverging colour scale highlights where relative gains (up to +62%) and losses (down to –100%) are expected, with the most extreme swings typically reflecting small initial farm workforces rather than large absolute job shifts.

Map 17: Projected employment change in agriculture (NACE A sector) – 2024-2035



Under the *baseline-population, high-productivity, green-transition* scenario, projected percentage changes in agricultural employment paint an uneven picture. In Scandinavia, Ireland and parts of Spain and Portugal, many NUTS-3 areas register double-digit gains (+8 % to +62%), likely driven by productivity improvements and only handfuls of new farm jobs. Likewise, some French and Portuguese rural regions show strong relative growth despite marginal shifts in absolute numbers.

By contrast, large relative losses (beyond -20%) occur in parts of the Baltic countries, Romania, Bulgaria and, peripheral, southern Italy. These dramatic declines typically stem from small absolute falls—e.g. a drop from 50 to 20 agricultural jobs yields a –60% change—even though overall workforce shifts remain modest in headcount terms.

Across Western Europe's core, most regions cluster between –8% and +3%, underscoring that in agriculture, percentage metrics must be read alongside baseline employment: minor headcount shifts in tiny rural sectors can appear as extreme percentages.

Table 23: Summary statistics for agriculture (NACE A sector) – 2024-2035

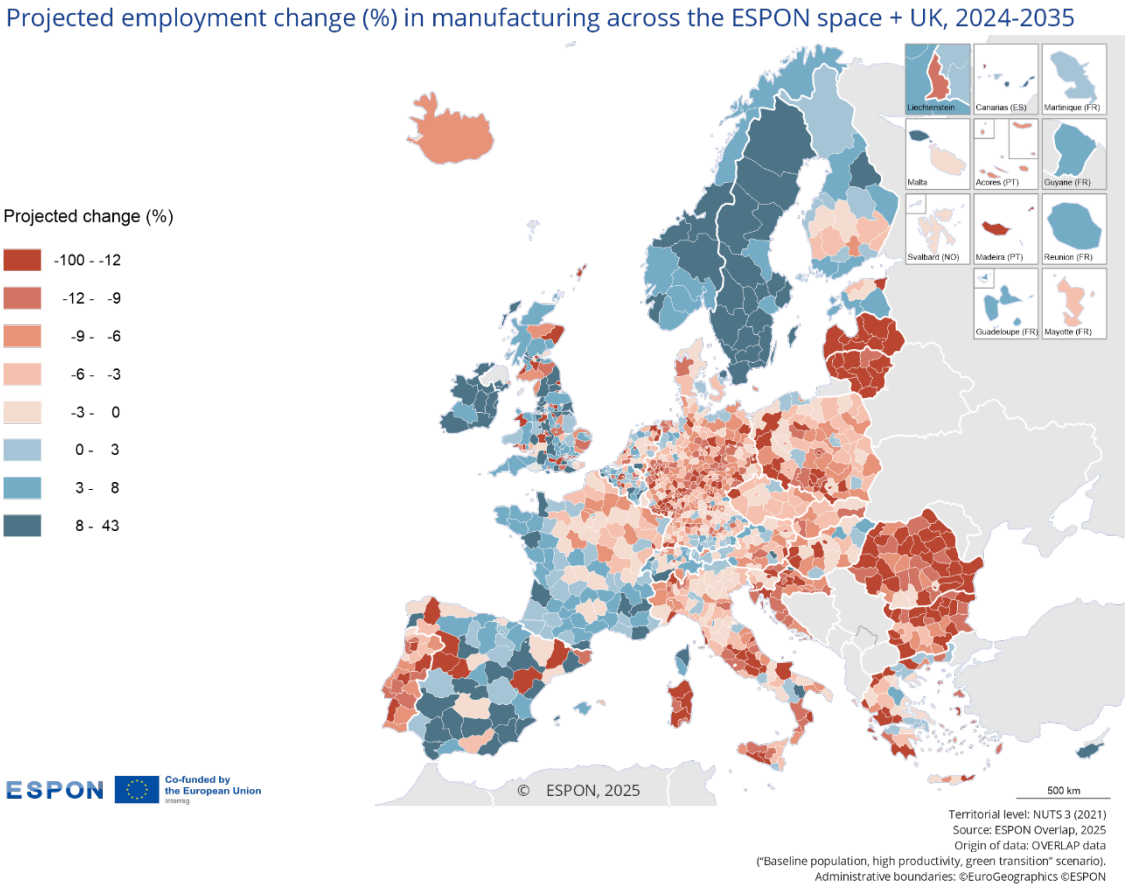
Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
A - Agriculture	**968/1377**	**-6.6**	**-73.4**	**-21.1**	**-5.2**	**8.5**	**27.9**
AT	30/35	-6.5	-15.9	-14.5	-6.4	0.7	4.0
BE	34/44	-3.7	-17.4	-10.9	-3.4	2.4	18.1
BG	26/28	-11.7	-33.1	-22.8	-9.7	-4.6	7.5
CH	22/26	-7.1	-27.1	-15.7	-7.8	2.9	9.0
CY	0/1	0.9	0.9	0.9	0.9	0.9	0.9
CZ	10/14	-3.8	-12.8	-9.7	-5.8	2.2	16.6
DE	327/401	-8.4	-46.0	-19.0	-7.0	3.5	12.8
DK	8/11	-0.8	-5.7	-1.4	-1.1	0.0	4.9
EE	4/5	-8.5	-35.6	-24.4	-2.9	1.9	3.6
EL	43/52	-6.7	-39.7	-13.3	-6.3	2.7	8.0
ES	27/59	-0.9	-69.3	-13.3	2.7	16.2	26.9
FI	9/19	0.5	-8.1	-5.4	0.2	5.1	14.1
FR	43/101	-0.6	-78.5	-7.7	1.4	9.9	27.7
HR	19/21	-10.7	-74.3	-11.0	-8.5	-0.8	8.8
HU	16/20	-5.6	-16.7	-11.4	-5.7	2.8	3.9
IE	2/8	0.1	-36.9	-13.9	3.4	11.8	14.3
IS	2/2	-8.0	-8.5	-8.4	-8.0	-7.7	-7.6
IT	78/107	-10.2	-76.8	-30.6	-5.4	4.0	12.1
LI	1/1	-19.9	-19.9	-19.9	-19.9	-19.9	-19.9
LT	10/10	-19.0	-34.7	-34.6	-19.0	-2.9	-2.6
LU	1/1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1
LV	5/6	-19.8	-68.5	-50.0	-10.7	1.3	3.9
MT	0/2	7.6	5.3	5.7	7.6	9.6	10.0
NL	26/40	-3.3	-26.9	-12.3	-1.8	4.8	14.5
NO	1/12	8.5	-1.3	0.3	5.0	18.1	22.1
PL	72/73	-13.0	-53.5	-28.2	-10.1	-1.9	0.2
PT	20/25	-10.3	-33.9	-30.2	-8.1	4.2	19.8
RO	35/42	-20.3	-61.7	-55.1	-16.9	6.0	9.5

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
SE	**2/21**	14.6	-17.2	1.5	20.8	22.3	25.1
SI	**12/12**	-8.9	-17.2	-13.5	-9.8	-2.6	-2.1
SK	**7/8**	-6.5	-13.7	-11.1	-6.9	-1.6	1.5
UK	**76/170**	-3.5	-100.0	-37.7	0.0	23.9	62.0

Manufacturing (NACE B-E)

Map 18 displays the projected percentage change in manufacturing employment across NUTS 3 regions of the ESPON space for 2024–2035 under the "*baseline population, high productivity and green transition*" scenario.

Map 18: Projected employment change in manufacturing (NACE B-E sectors) – 2024-2035



The map reveals that established manufacturing hubs —such as in the southern regions of Sweden, southern Norway, parts of Ireland and the Benelux—are largely set for gains of 0% to +43%, possibly reflecting strong green-tech and advanced-manufacturing investments. Conversely, many regions in Central and Eastern Europe, especially in Romania, Bulgaria, peripheral Greek and Italian provinces, face declines of –9% to beyond -

12%. While the worst expected reductions occur mainly where baseline manufacturing workforces are small (yielding large relative drops from modest absolute changes), the overall geographic pattern here is dominated by genuine, large-scale shifts in industrial employment rather than purely base-effect anomalies.

Table 24: Summary statistics for manufacturing (NACE B-E sectors) – 2024-2035

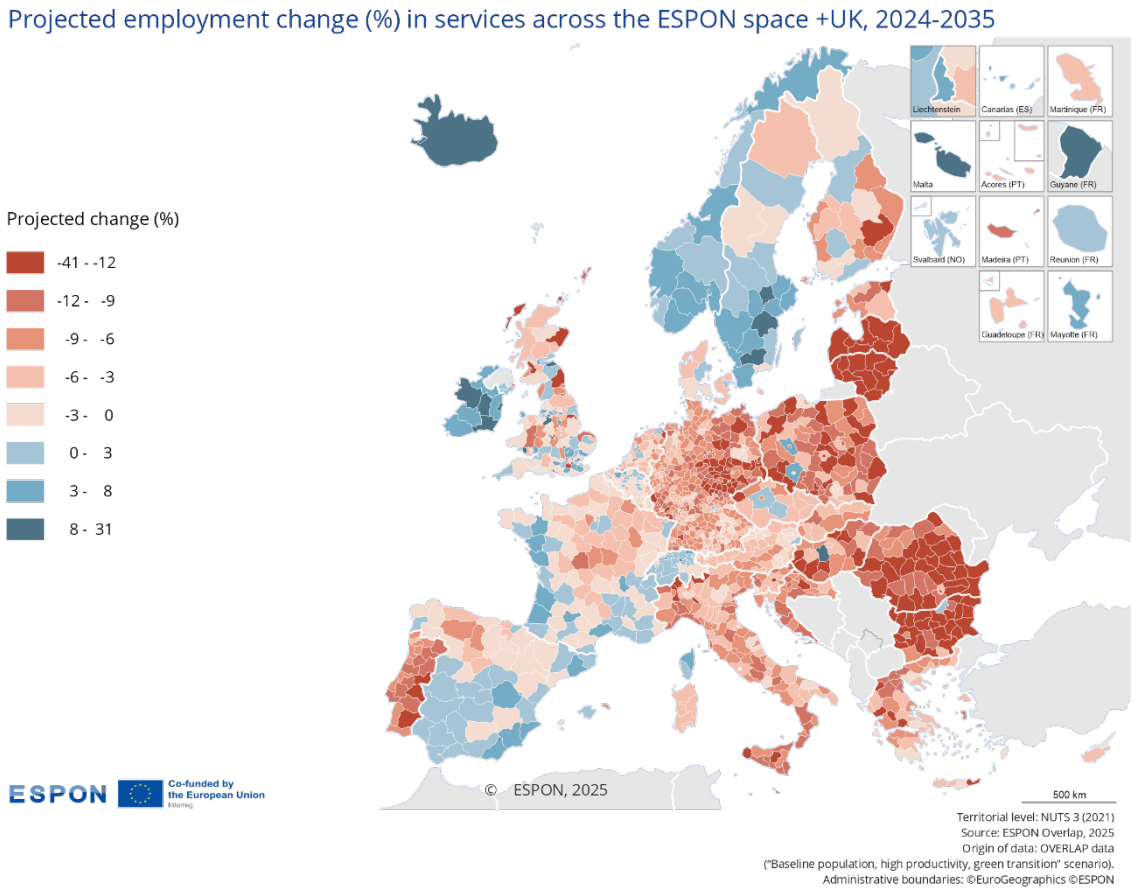
Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
B-E – (Extended) Manufacturing	**979/ 1,377**	**-4.7**	**-36.4**	**-15.5**	**-4.6**	**7.6**	**20.2**
AT	25/35	-3.0	-14.6	-8.1	-2.5	2.6	8.6
BE	12/44	0.9	-20.9	-11.3	2.3	8.6	13.7
BG	28/28	-15.0	-32.7	-26.0	-13.6	-7.6	-4.2
CH	11/26	2.2	-9.2	-6.6	3.1	8.5	17.3
CY	0/1	8.4	8.4	8.4	8.4	8.4	8.4
CZ	13/14	-5.2	-17.8	-6.9	-4.1	-2.3	0.4
DE	362/401	-7.6	-33.8	-14.8	-6.8	0.0	5.3
DK	6/11	-0.9	-10.1	-6.7	-0.6	3.1	9.2
EE	3/5	-5.2	-30.5	-20.4	-0.8	5.2	5.9
EL	39/52	-6.2	-22.6	-18.3	-4.9	2.0	4.0
ES	20/59	1.7	-53.1	-12.9	3.8	14.6	21.4
FI	7/19	0.5	-6.2	-5.0	1.7	5.1	8.1
FR	41/101	1.1	-9.0	-6.1	0.9	7.4	14.7
HR	20/21	-9.3	-20.7	-14.7	-10.1	-7.0	16.0
HU	16/20	-4.4	-16.5	-13.1	-2.4	3.0	5.7
IE	0/8	15.9	4.9	8.5	17.2	20.7	22.1
IS	2/2	-4.1	-6.2	-5.8	-4.1	-2.5	-2.1
IT	96/107	-6.1	-19.9	-13.7	-5.0	-0.1	7.3
LI	1/1	-11.6	-11.6	-11.6	-11.6	-11.6	-11.6
LT	10/10	-17.0	-25.2	-23.9	-15.9	-12.4	-10.1
LU	1/1	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
LV	6/6	-15.8	-17.5	-17.3	-16.5	-13.7	-13.6
MT	1/1	4.1	-1.1	-0.1	4.1	8.4	9.3
NL	31/40	-4.1	-18.6	-12.0	-3.6	2.1	11.0
NO	0/12	7.2	0.4	3.5	6.2	12.7	13.2

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
PL	**67/73**	-7.2	-24.4	-15.7	-6.4	-0.9	1.3
PT	**24/25**	-8.4	-16.0	-13.9	-8.6	-3.5	-0.5
RO	**42/42**	-14.0	-32.5	-21.3	-12.9	-6.9	-1.0
SE	**0/21**	14.8	5.5	8.8	15.0	20.7	23.1
SI	**12/12**	-8.8	-28.2	-14.5	-8.9	-0.6	-0.1
SK	**8/8**	-6.5	-11.5	-9.8	-6.2	-3.7	-2.9
UK	**75/170**	-2.6	-72.6	-29.1	2.4	14.6	33.7

Services (NACE G-I, J, K, L, M-N, O-Q, R-U)

Map 19 displays the projected percentage change in services employment (industries G–I, J, K, L, M–N, O–Q, R–U) across NUTS 3 regions for 2024–2035 under the "*baseline population, high productivity and green transition*" scenario.

Map 19: Projected employment change in service (NACE G-I, J, K, L, M-N, O-Q, R-U sectors) – 2024 -2035



The map highlights a pronounced north–south and west–east gradient. Northern Europe—especially Norway, Sweden, Iceland and Ireland—sees widespread gains of 0% to +31%; strong growth could be spotted around the capitals - Oslo, Stockholm and Dublin, driven by ICT, finance and green-energy services. In Western Europe, key metro areas such as *London*, Paris and Madrid also register modest increases (+3% to +8%), while many rural French and German regions hover near flat or slight decline (–6% to 0%). Southern and Eastern Europe face more pervasive service-sector contractions: peripheral Italian provinces, Croatia, Greece, Romania or Bulgaria fall predominantly between –41% and –10%, reflecting slower population growth and weaker high-value service expansion.

Table 25: Summary statistics in service (NACE G-I, J, K, L, M-N, O-Q, R-U sectors)

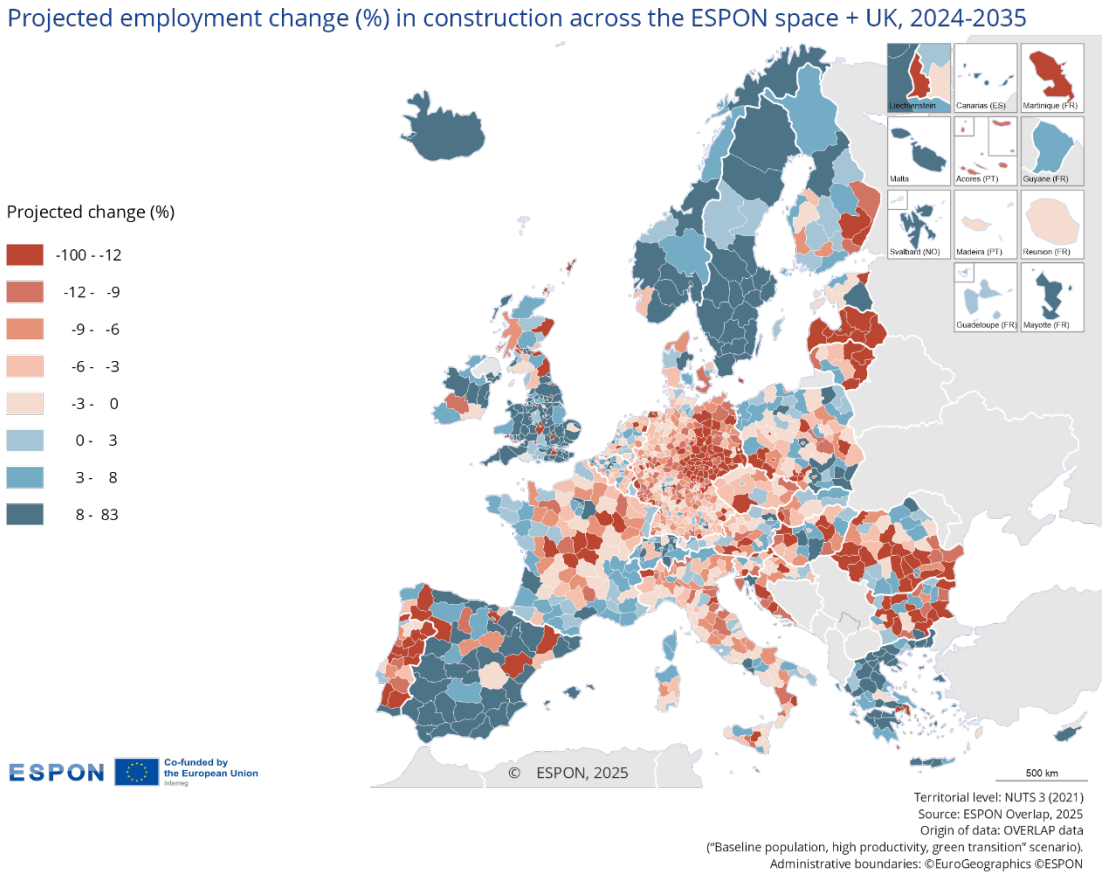
Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
Services	**1,152/1,377**	**-5.6**	**-21.7**	**-12.7**	**-5.8**	**2.0**	**10.5**
AT	34/35	-3.6	-7.8	-6.7	-3.7	-0.8	1.4
BE	33/44	-1.3	-5.2	-4.9	-1.2	1.9	3.8
BG	27/28	-14.8	-26.7	-20.4	-15.1	-7.6	-1.3
CH	5/26	1.6	-1.8	-0.9	1.3	3.6	8.9
CY	1/1	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
CZ	12/14	-4.6	-11.5	-6.7	-4.7	-0.6	0.9
DE	400/401	-8.1	-18.2	-12.7	-7.6	-4.1	-1.2
DK	7/11	-2.2	-5.7	-4.9	-2.8	1.0	1.3
EE	5/5	-8.3	-16.5	-14.0	-6.4	-4.0	-3.1
EL	52/52	-6.4	-15.7	-11.8	-5.6	-1.8	-0.9
ES	29/59	-0.4	-7.4	-4.3	0.1	3.4	5.2
FI	16/19	-4.5	-11.5	-8.4	-5.1	1.3	1.9
FR	67/101	-1.0	-8.8	-4.9	-1.0	3.3	7.4
HR	21/21	-10.1	-33.6	-10.1	-9.0	-8.2	-4.7
HU	19/20	-9.2	-16.3	-15.2	-9.4	-4.5	6.1
IE	0/8	8.0	3.4	4.6	7.4	11.8	16.3
IS	0/2	25.8	21.5	22.3	25.8	29.2	30.0
IT	107/107	-7.2	-17.8	-11.2	-6.8	-3.8	-1.3
LI	0/1	3.6	3.6	3.6	3.6	3.6	3.6
LT	10/10	-17.7	-23.7	-21.7	-17.2	-13.0	-12.7
LU	1/1	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
LV	6/6	-25.6	-40.5	-36.8	-25.4	-14.6	-7.0
MT	0/2	14.5	14.1	14.1	14.5	14.9	15.0
NL	36/40	-4.5	-13.6	-7.8	-4.3	-0.8	2.3
NO	0/12	3.7	0.7	1.6	3.3	7.0	7.6
PL	71/73	-8.8	-14.4	-13.2	-9.5	-3.2	3.5
PT	25/25	-9.0	-12.8	-12.0	-9.3	-6.4	-4.8
RO	42/42	-13.0	-20.4	-17.3	-13.2	-7.8	-5.2
SE	4/21	3.8	-3.8	-2.4	5.2	8.4	10.2

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
SI	**12/12**	-7.3	-11.9	-9.9	-7.4	-4.4	-4.3
SK	**8/8**	-6.5	-9.2	-8.2	-6.3	-5.1	-4.5
UK	**102/170**	-1.7	-29.3	-10.0	-1.1	6.9	13.5

Construction (NACE F)

Map 20 displays the projected percentage change in construction employment across NUTS 3 regions for 2024–2035 under the "*baseline population, high productivity and green transition*" scenario.

Map 20: Projected employment change in construction (NACE F sector) – 2024 - 2035



The map shows widespread expansion in construction jobs, driven by green infrastructure and retrofitting investments. Nearly all Scandinavian regions—from southern Norway through central Sweden—expect double-digit gains (0% to +83%), reflecting major offshore wind and energy-efficiency projects. Western European countries – such as Ireland, *the UK* or much of Spain and Portugal, register similar robust growth (+0% to +83%), while core French and German Länder see more moderate increases (0% to +8%). Eastern Europe presents more mixed possibilities: many Romanian, Bulgarian and Baltic regions face declines (beyond -12%), though on small base populations these often reflect modest absolute losses. Because construction workforces start relatively small, even genuine demand-driven hiring surges can appear as very large percentages.

Table 26: Summary statistics in sonstruction (NACE F sector)

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
F -Construction	**848/1,377**	**-2.2**	**-42.4**	**-16.8**	**-2.6**	**15.1**	**30.1**

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
AT	20/35	-1.3	-13.6	-8.0	-0.2	5.6	7.4
BE	24/44	0.2	-16.2	-6.3	-1.8	9.1	19.8
BG	19/28	-10.3	-59.7	-25.6	-10.3	6.2	12.7
CH	3/26	7.0	-4.3	0.6	6.7	13.4	16.4
CY	0/1	13.4	13.4	13.4	13.4	13.4	13.4
CZ	12/14	-4.9	-15.6	-8.9	-5.1	0.3	2.7
DE	365/401	-7.9	-32.8	-18.4	-6.2	-0.2	7.1
DK	6/9	-1.4	-17.5	-9.3	-2.9	6.8	10.5
EE	3/5	-4.8	-33.4	-21.8	-1.9	7.9	9.0
EL	5/52	10.8	-61.2	1.4	11.2	23.3	41.9
ES	15/59	9.3	-38.6	-13.3	15.1	23.7	34.3
FI	8/19	-1.6	-15.2	-12.2	0.6	6.6	8.6
FR	52/101	-1.0	-17.4	-10.9	-0.7	6.8	14.0
HR	18/21	-8.4	-47.3	-13.7	-6.4	0.1	7.6
HU	13/20	-4.9	-25.5	-18.8	-4.0	6.4	9.8
IE	2/8	7.5	-9.6	-5.0	7.8	19.5	25.2
IS	0/2	49.0	38.0	40.0	49.0	58.0	60.0
IT	84/107	-3.5	-16.6	-11.1	-2.8	3.2	8.2
LI	1/1	-13.2	-13.2	-13.2	-13.2	-13.2	-13.2
LT	8/10	-18.8	-94.7	-47.1	-7.4	5.0	7.1
LU	0/1	0.8	0.8	0.8	0.8	0.8	0.8
LV	5/6	-26.5	-59.2	-49.3	-25.2	-4.9	2.7
MT	0/2	18.0	15.9	16.3	18.0	19.6	20.0
NL	28/40	-3.0	-17.1	-10.2	-2.9	3.0	9.8
NO	1/12	16.2	-3.7	2.2	10.3	21.6	76.1
PL	45/73	-3.3	-37.5	-19.1	-1.9	9.3	13.3
PT	22/25	-10.1	-28.3	-22.4	-9.8	-0.4	6.8
RO	31/42	-10.6	-43.5	-30.0	-8.5	4.5	9.1
SE	0/21	16.3	1.8	2.2	18.2	22.7	25.3
SI	10/12	-6.8	-20.0	-17.8	-4.8	0.6	3.0
SK	5/8	-3.8	-14.3	-10.9	-2.3	1.6	3.3

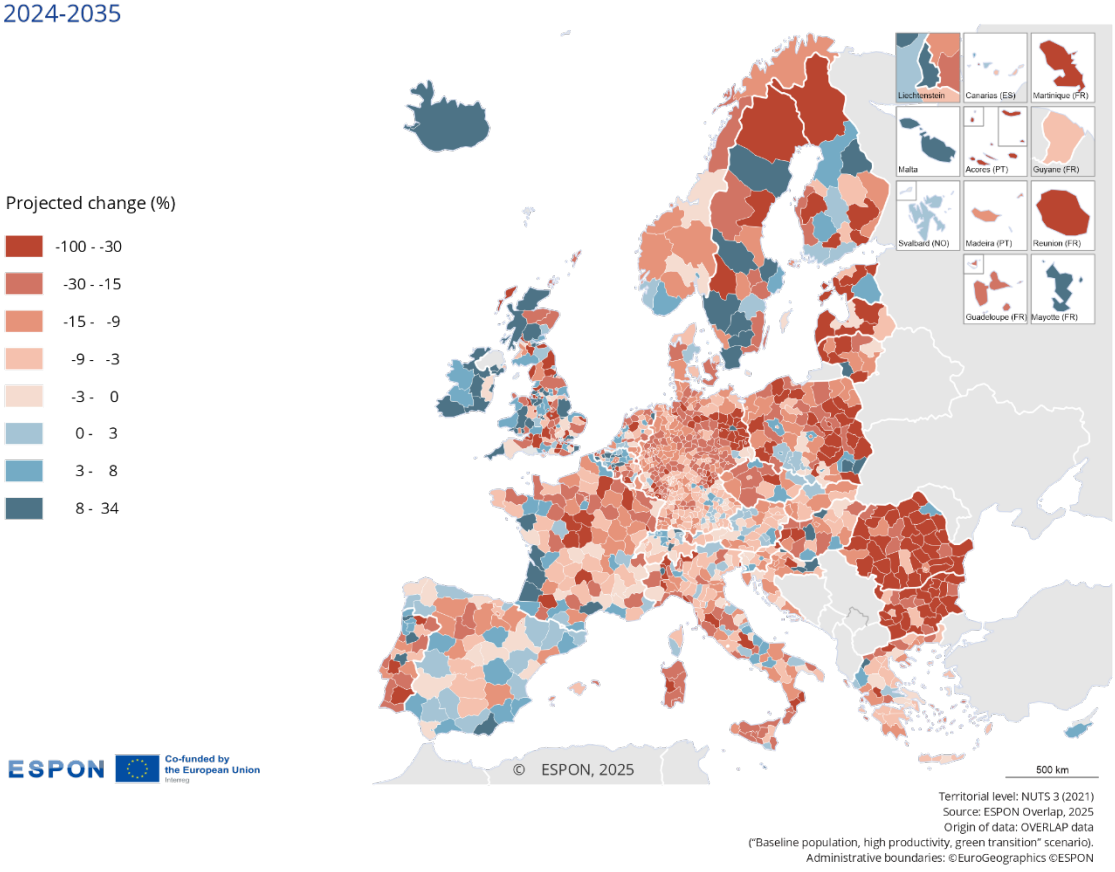
Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
UK	**43/170**	5.2	-50.1	-23.1	9.9	23.3	32.5

Information and communication (NACE J)

Map 21 displays the projected percentage change in employment in the Information and Communication sector (NACE J) across NUTS 3 regions for 2024–2035 under the "*baseline population, high productivity and green transition*" scenario.

Map 21: Projected employment change in information and communication (NACE J sector) – 2024-2035

Projected employment change (%) in information and communication across the ESPON space + UK, 2024-2035



The map highlights a core–periphery divide. Major tech hubs—*Greater London*, Dublin, Île-de-France, Amsterdam, Helsinki and Stockholm—are set for moderate growth (0% to +34%) as investments concentrate in established innovation centres. By contrast, many peripheral and eastern regions—particularly in Romania, Bulgaria, parts of Greece and the Baltic interior—face steep declines (beyond -15%), reflecting both slower digital uptake and competitive pressures. Southern Italian, Spanish and Portuguese rural provinces also trend downwards (–30% to -9%); similar mid-range losses span much of central Europe outside metropolitan corridors.

Table 27: Summary statistics in information and communication (NACE J sector)

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
J- Information and communication	**1,084/1,377**	**-14.7**	**-100.0**	**-40.2**	**-10.0**	**5.2**	**25.3**
AT	24/35	-5.0	-17.5	-13.5	-4.3	2.4	5.9
BE	23/44	-9.1	-83.4	-24.3	-4.1	9.3	15.9
BG	28/28	-49.8	-100.0	-87.3	-48.3	-16.5	-3.5
CH	14/26	1.4	-5.9	-4.7	-0.1	9.1	16.3
CY	0/1	6.1	6.1	6.1	6.1	6.1	6.1
CZ	11/14	-10.9	-31.8	-22.5	-10.0	2.6	5.7
DE	384/401	-15.0	-60.5	-27.9	-12.7	-3.1	3.3
DK	8/11	-10.3	-26.4	-20.2	-8.5	2.8	3.9
EE	4/5	-31.3	-59.3	-54.6	-46.7	-0.6	3.6
EL	48/52	-8.6	-40.0	-19.1	-7.1	-1.1	9.2
ES	34/59	-4.1	-35.0	-13.8	-1.2	4.8	8.0
FI	13/19	-16.0	-58.6	-48.6	-9.7	4.1	12.7
FR	79/101	-11.2	-60.3	-31.1	-7.8	5.9	11.5
HR	18/21	-8.4	-77.6	-12.1	-8.7	10.9	29.2
HU	16/20	-8.2	-34.0	-21.4	-9.9	6.0	25.4
IE	1/8	10.5	-2.1	2.2	8.9	21.2	26.0
IS	0/2	29.2	28.4	28.5	29.2	29.9	30.0
IT	87/107	-13.2	-67.5	-30.2	-10.5	1.8	6.9
LI	0/1	15.8	15.8	15.8	15.8	15.8	15.8
LT	8/10	-33.9	-99.4	-94.0	-15.3	1.3	12.2
LU	1/1	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
LV	5/6	-39.6	-98.4	-83.7	-31.2	-3.7	-0.4
MT	0/2	17.2	10.9	12.0	17.2	22.3	23.5
NL	30/40	-9.5	-31.6	-25.3	-9.3	3.4	12.8
NO	8/12	-5.9	-18.6	-13.3	-6.8	3.4	3.7
PL	60/73	-20.5	-100.0	-45.9	-14.4	2.6	9.7
PT	18/25	-13.5	-49.5	-33.2	-13.2	7.5	13.6
RO	41/42	-59.5	-100.0	-100.0	-55.5	-10.6	1.0

Industry / Country	N° of declining regions (out of total)	Average growth (%)	Average growth for the bottom 1% (%)	Average growth for the bottom 10% (%)	Median growth rate (%)	Average growth for the top 10% (%)	Average growth for the top 1% (%)
SE	**11/21**	-11.8	-87.6	-50.8	-11.9	12.1	17.0
SI	**9/12**	-7.1	-37.2	-13.2	-6.8	5.4	5.8
SK	**7/8**	-7.6	-11.1	-11.0	-8.5	-3.9	0.1
UK	**94/170**	-14.2	-100.0	-65.1	-2.6	17.2	29.6

3. Micro-analytical approach

3.1 Rationale for a bottom-up approach

As a complement to the top-down approach described above, the project developed a suite of rich and **spatially detailed dynamic microsimulation models** to project individual life course trajectories in the selected countries, namely Greece, Hungary, Italy, Poland; to this report *the United Kingdom* is added as the initial-modelled-country (baseline used to develop the 4 case studies). This novel, regional, micro-analytical framework sheds additional light on the distributional impact of the ongoing economic and social transformations, going beyond the broad picture and simplified assumptions that had to be made in the top-down approach (macro-analyses). The dynamic framework integrates a defining feature in every simulated period: inputs from a static tax-benefit calculator (EUROMOD), hence allowing to study to what extent tax and benefit systems can smooth out transitional dynamics.

The following section provides some overarching findings that emerged from the analyses of the case studies. A complete account of the micro-simulations conducted for each case study is provided within a complementary report.

As mentioned, this constitutes a novelty, as such a micro-analytical approach has not yet been applied in regional analyses; however, it offers several key advantages:

- Modelling not only **what happens to regions, but also what happens within them.** The framework allows to fully account for population heterogeneity, both within and between regions. It enables the examination and correlations between individual risks, identify vulnerable population segments, and simulate the effects of policies with a high level of detail. This also includes identifying stress points for public budgets and challenges facing regional labour markets, such as those arising from population ageing and disparities in human capital accumulation.
- Constructing **policy counterfactuals**: the modelling approach enhances the capabilities of EUROMOD (the EU-27 tax-benefit model), by allowing for longer-term simulations to assess the distributional and fiscal effects of policies and policy changes. Considering the role of policies is crucial not only because they directly affect individual welfare, but also because they influence individual behaviour—for instance, decisions about labour supply—which, in turn, impact regional labour markets. Since tax-benefit systems operate at the individual and household level, capturing their true effects requires a modelling framework that incorporates individuals and households, as this one does.
- **Incorporating health and family dynamics,** as drivers of labour market outcomes. This is especially relevant in the context of rapid population ageing and declining fertility. The framework preserves family linkages, enabling the analysis of care responsibilities for elderly relatives, which may constrain the continued rise in female labour market participation. Health and family dynamics co-evolve with labour market outcomes, and the model accounts for feedback between these three domains. As demographic changes intensify, the interaction between socio-economic and health inequalities is expected to grow in importance. On one hand,

health tends to deteriorate rapidly in older age groups; on the other, pensioners are somewhat shielded from socio-economic shocks—although large disparities in coverage and adequacy persist, making elderly poverty a pressing issue in some EU regions. Whether the correlation between regional socio-economic and health inequalities will increase or decrease remains an open question—one that can only be answered through a modelling framework that integrates both economic and health outcomes, as this one does. Including the health domain is also critical, considering its interaction with mobility and its implications for public finances, which may limit available resources for other social protection measures and growth and cohesion policies.

Box 2 – Dynamic microsimulations using the SimPaths framework

The structure of the micro-analytical framework, labelled **SimPaths**, is described in detail in Annex 2. Dynamic microsimulations are tools to analyse where different ongoing dynamics and trends—each separately investigated in the data—are cumulatively leading if left unchecked, and to assess the role of policies within these dynamics. Within the SimPaths framework, the following trends are considered: (i) demographic trends, including increased longevity and decreased fertility, (ii) trends towards increasing levels of education and postponing entry into the labour market, (iii) a trend towards delaying the moment when individuals leave the parental home and set up their own household, (iv) a trend towards delaying the formation of relatively stable partnerships, (v) a trend towards increasing levels of homophily between partners (the degree to which partners share similar socio-economic backgrounds, levels of education, and labour market outcomes), (vi) more ambiguous trends towards higher fragmentation in family life (e.g. partnership dissolution and re-partnering), (vii) trends towards increased career mobility, or fragmentation in working life (including growing job insecurity, especially for younger generations), (viii) trends towards better health outcomes by age, (ix) a trend towards postponing labour market exit (retirement).

These trends are estimated separately using longitudinal data, with cohort effects included among the covariates explaining the different outcomes. Each force in the model may push in a different direction—some reinforcing, others offsetting one another. Microsimulation models function as aggregators of these forces and tools for calculating their interaction and combined impact. For instance, the effects of population ageing on the labour force may be counteracted by increasing female labour force participation, although caregiving responsibilities for elderly relatives may moderate this effect. Similarly, the impact of automation on labour markets could be mitigated by higher educational attainment among the workforces. On the other hand, population ageing may be worsened by the outmigration of skilled workers, a process further reinforced by deteriorating economic conditions that push more people to leave the region. Clearly, when such forces generate persistent imbalances, they cannot be expected to continue unchecked indefinitely. At some point, adjustment mechanisms are likely to emerge, either through behavioural shifts or institutional changes. These may result from political processes activated by the very imbalances they aim to correct. Typically, however, the modelling of such endogenous correction mechanisms lies outside the scope of microsimulation analysis. In this context, the role of microsimulation models is to highlight imbalances, thereby signalling the need for corrective action whether through policy intervention or institutional reform.

The outcomes produced by the models are related to:

- Education rates.
- Employment rates.
- Hours worked.
- Wages.
- Gross (individual) income.
- Disposable household income.
- At-risk-of-poverty rates.
- Economic dependency rates.

3.2 Country-level insights – an integrated perspective

The examined countries—Greece, Hungary, Italy, Poland, and the [initial-modelled-country] *United Kingdom*— using a bottom-up approach, display both common patterns and notable differences. A common denominator is the ageing population, which has the potential to significantly constrain labour supply, economic growth, and fiscal sustainability. However, the pace and dynamics of this demographic transition are far from being uniform or following the same path.

Table 28 presents the share of the population aged 65 and over for all EU Member States plus the *United Kingdom*.

The first four columns show observed values for 2011 and 2024, and projected values for 2035 and 2050.

Looking at the most recent data (2024), three broad groups emerge:

i. Very high elderly share (close to a quarter of the population: 23%–25%): Italy, Portugal, Bulgaria, Finland, Greece, and Croatia.
ii. High elderly share (between one-fifth and one-quarter: 21%–23%): Germany, Slovenia, France, and Latvia.
iii. Moderate elderly share (around one-fifth or less: 15%–21%): all remaining countries.

Table 28: Share of population (%) *aged 65 and over* – for 2011 and 2024, and projected for 2035 and 2050; and growth between periods of the share of population *aged 65 and over*

period	2011	2024	2035	2050	2011- 2024	2024- 2035	2024-2050
Italy	**20.4**	**24.3**	**29.8**	**33.7**	***3.9***	***5.5***	***9.4***
Portugal	18.7	24.1	28.8	33.9	*5.4*	*4.7*	*9.8*
Bulgaria	18.5	23.8	24.4	30.1	*5.3*	*0.6*	*6.3*
Finland	17.5	23.4	26.1	27.4	*5.9*	*2.7*	*4.0*
Greece	**19.3**	**23.3**	**28.6**	**35.5**	***4.0***	***5.3***	***12.2***
Croatia	17.7	23.0	26.9	30.	*5.3*	*3.9*	*7.0*
Germany	20.7	22.4	26.5	27.1	*1.7*	*4.1*	*4.7*
Slovenia	16.5	21.8	26.1	30.2	*5.3*	*4.3*	*8.4*
France	16.7	21.4	24.9	27.3	*4.7*	*3.5*	*5.9*
Latvia	18.4	21.3	25.4	30.1	*2.9*	*4.1*	*8.8*
Denmark	16.8	20.7	23.7	25.3	*3.9*	*3.0*	*4.6*
Hungary	**16.7**	**20.7**	**21.8**	**26.8**	***4.0***	***1.1***	***6.1***
Sweden	18.5	20.6	22.1	23.4	*2.1*	*1.5*	*2.8*
Netherlands	15.6	20.5	24.4	25.5	*4.9*	*3.9*	*5.0*
Estonia	17.4	20.5	23.1	27.1	*3.1*	*2.6*	*6.6*
Poland	**13.6**	**20.5**	**22.8**	**29.1**	***6.9***	***2.3***	***8.6***
Czechia	15.6	20.5	22.2	27.2	*4.9*	*1.7*	*6.7*
Spain	17.1	20.4	26.1	32.7	*3.3*	*5.7*	*12.3*
Lithuania	17.9	20.3	25.9	30.8	*2.4*	*5.6*	*10.5*
Liechtenstein	13.9	20.3	*NA*	*NA*	*6.4*	*NA*	*NA*
Romania	16.1	20.0	23.3	28.5	*3.9*	*3.3*	*8.5*
Belgium	17.1	19.9	23.3	25.3	*2.8*	*3.4*	*5.4*

period	2011	2024	2035	2050	2011- 2024	2024- 2035	2024-2050
Austria	17.6	19.8	24.9	27.5	2.2	5.1	7.7
UK	*16.5*	*19.6*	*23.1*	*24.8*	*3.1*	*3.5*	*5.2*
Switzerland	16.9	19.3	23.9	27.1	2.4	4.6	7.8
Norway	15.1	18.7	22.4	24.9	3.6	3.7	6.2
Slovakia	12.6	18.4	21.7	28.4	5.8	3.3	10.0
Malta	15.7	18.4	19.2	22.6	2.7	0.8	4.2
Cyprus	12.7	17.7	20.3	23.9	5.0	2.6	6.2
Iceland	12.3	15.6	17.5	20.5	3.3	1.9	4.9
Ireland	11.5	15.5	19.4	25.5	4.0	3.9	10.0
Luxembourg	13.9	15.0	18.5	22.8	1.1	3.5	7.8

Source: Our elaboration on EUROSTAT data and projections (demo_pjanind and proj_23np series) and ONS data and projections.

The case studies include: (**i**) 2 countries from the first group (*very high elderly share*)—Italy, with the highest share overall (24.3% in 2024), and Greece (23.3%)—and (**ii**) 3 countries from the last group (*moderate elderly share*)—namely Hungary (20.7%), Poland (20.5%), and the *UK (19.6%)*. As can be seen from the four right-most columns in Table 27, Italy, Greece, and Hungary experienced similar rates of population ageing between 2011 and 2024, each seeing an increase of roughly 4% in the elderly share. Poland, starting from a much lower level in 2011, recorded a sharper rise of almost 7 %, partly due to high emigration. Conversely, high levels of immigration in the UK helped slow the increase in its elderly share over the same period.

Looking ahead to 2025–2035, Italy and Greece are projected to undergo an even faster ageing process, with increases of more than 5 %. Hungary and Poland are expected to slow markedly, with gains limited to around 1–2 %, while the UK is set to continue its previous trend, rising by roughly 3.5 %. Longer-term projections to 2050 suggest that the demographic transition in Italy and Greece is still in its early stages, and Poland is also expected to see a sharper rise after 2035. By contrast, Hungary and the UK are likely to experience relatively modest further changes in population structure.

In sum, over the coming decade, the case studies include two countries that may face rapid and accelerating ageing (Italy and Greece) and three with lower initial levels and slower expected change (Hungary, Poland, and the UK)—although Poland's demographic transition may intensify beyond the projection horizon.

Traditional projections of the effects of population ageing often rely on reweighting observed age- and gender-specific outcomes—such as activity and employment rates—to reflect changes in population structure. This approach, however, overlooks deeper structural and behavioural shifts that the micro-analytical framework is able to capture. These shifts include rising educational attainment, smaller household sizes, increased female labour force participation, improved health, and delayed retirement, all of which can help boost employment and income levels.

The analysis shows that in some countries—such as Hungary and Greece—these countervailing trends largely offset the impact of population ageing, resulting in nearly stable economic dependency ratios (defined as the ratio of non-employed to employed individuals). In others, such as Poland, the ratio is projected to rise modestly, but remains below

historical peaks. Even where these mitigating factors are weaker (e.g. Italy) projected increases are still more moderate than simple trend extrapolations would suggest.

The integration of a detailed tax–benefit calculator into our micro-analytical framework enables a more precise estimation of the fiscal impacts of demographic trends than aggregate projections allow. In terms of fiscal sustainability, the results suggest that the demographic transition could create substantial fiscal gaps in some countries (e.g., Italy), while leading to fiscal gains in others (e.g., Hungary, Poland), with minimal effects expected in Greece.

This section offers a comparative overview of selected projected outcomes for the 5 case studies, with in-depth, country-specific discussions; as mentioned, the detailed regional analyses are provided in a separate report. Simulations begin in 2011 to ensure consistency in the treatment of past and future periods. Noteworthy, discrepancies between the simulated dynamics and official statistics may stem from:

- structural differences between the 2011 population cross-section and those in later years, as reflected in survey data;
- systematic differences between the survey data and the datasets used for official statistics; and
- limitations of the microsimulation models in fully reproducing observed dynamics. This point is addressed separately in the methodological report, which documents the comprehensive validation tests for each national model, comparing simulations starting in 2011 with observed survey data for 2011–2023.

Overall, the analysis indicates that countervailing factors significantly mitigate the effects of population ageing in most of the countries studied, with Italy being the main exception. This is illustrated next in Figure 26, which compares projected old-age dependency ratios with economic dependency ratios. The economic dependency ratio (*second graph*) is derived from our simulations. It shows a marked increase in Italy after a period of decline that lasted until the early 2020s. Greece started 2011 with a slightly higher ratio than Italy, which worsened rapidly during the financial crisis. The trend reversed in the second half of the 2010s as recovery took hold, and by 2035 the simulations project that Greece's ratio will fall below Italy's; rising employment rates in Greece are expected to almost entirely offset the impact of population ageing.

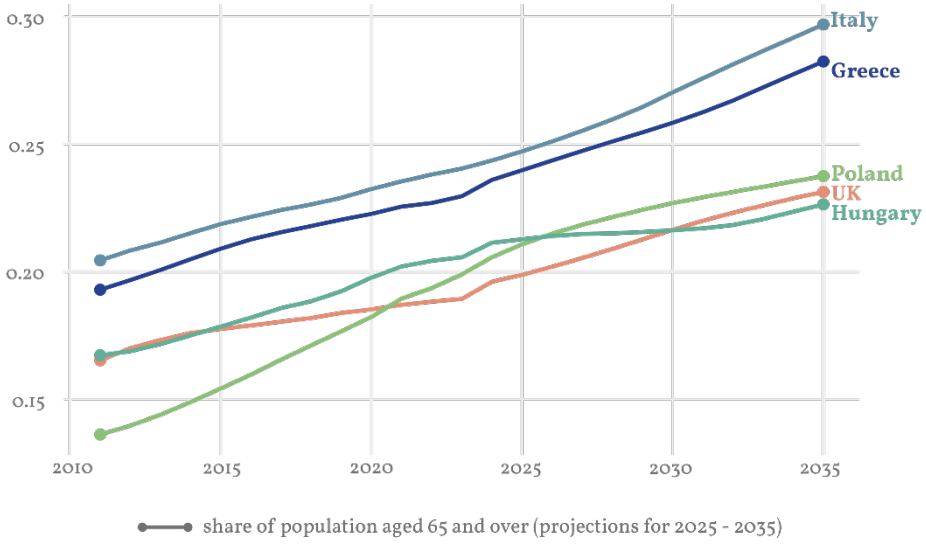
Hungary, Poland, and the UK all start from similar ratios in 2011, with Poland still affected by substantial post-accession emigration. Both Poland and the UK maintain relatively stable economic dependency ratios through 2011–2035, as employment growth offsets population ageing—although in both cases the ageing process is milder than in Greece or Italy.

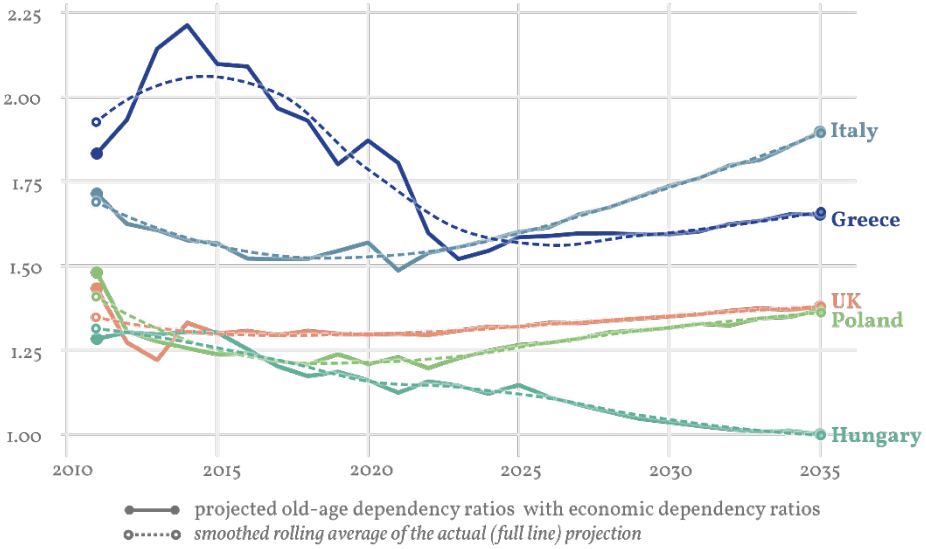
Hungary's strong economic performance during 2011–2023, partly supported by state intervention and the avoidance of austerity measures, underpins projected future declines in its economic dependency ratio. While such policies may be difficult to sustain over long term, risking structural inefficiencies in the economy and governance, Hungary currently records the lowest economic dependency ratio among the countries studied. Coupled with the slowest pace of population ageing, this supports a relatively favourable outlook for the coming decade.

Setting aside cases where the benefits of growth accrue to actors outside, regional economic strength ultimately depends on the earning capacity of its inhabitants relative to population size, supplemented by transfers from the central government.

The share of the population aged 65+ graphically represents the data from Table 27. As discussed earlier, Italy and Greece exhibit high levels and increasingly steep upward trends. Hungary and the United Kingdom follow a common pattern of more moderate growth in the elderly share of the population. Poland begins in 2011 at a much lower level, rapidly converging towards the Hungarian and UK levels before aligning with their trajectory.

Figure 26: Projected share of population aged 65 and over [top] and projected economic dependency ratios [bottom] across the selected countries, 2011-2035



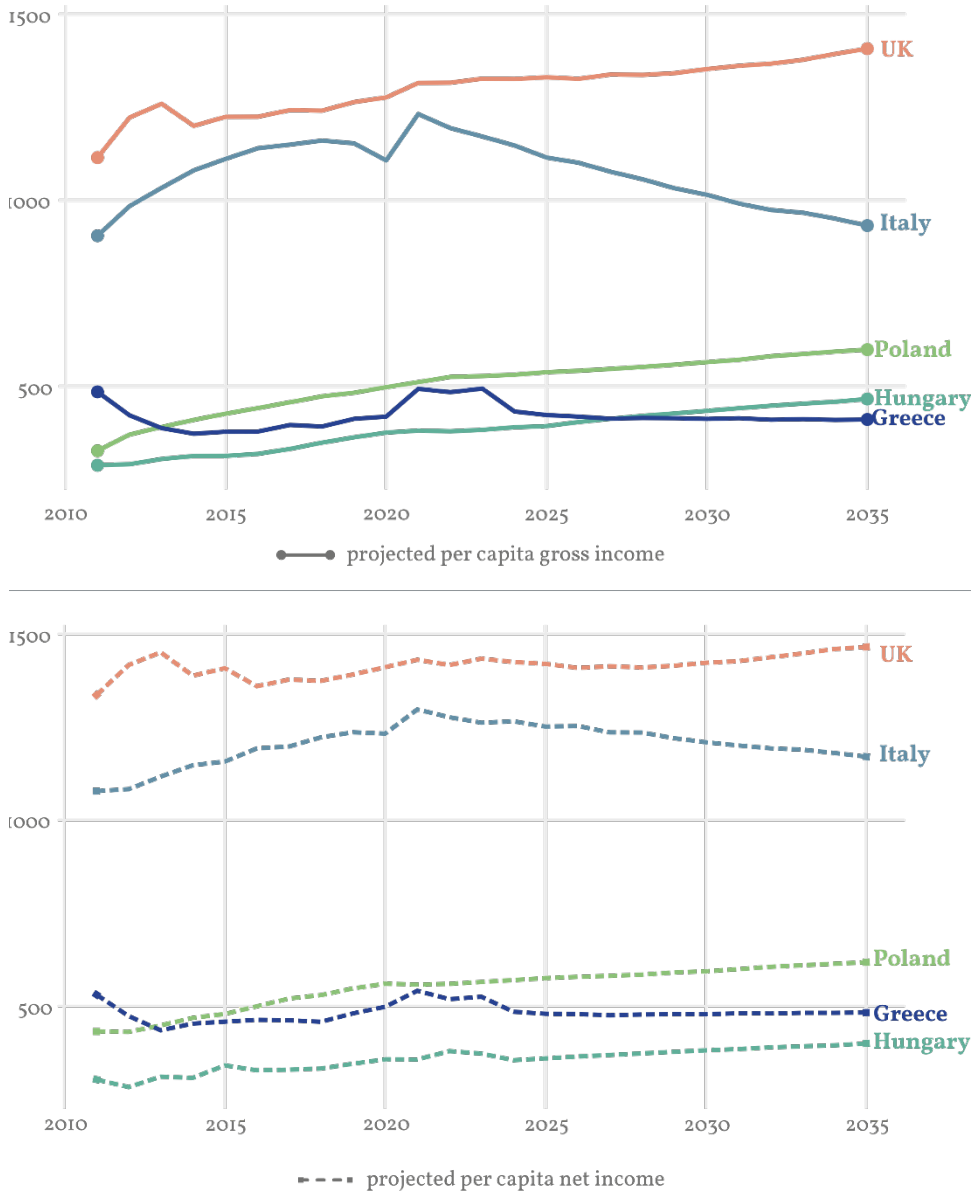


The solid line shows the raw projection at each time point, while the dotted line is a moving-average smoothed version of that same series. Smoothing reduces short-term noise and outliers, making the underlying trend clearer (with slight lag and edge effects).

Notes: The economic dependency ratio is defined as the share of not employed to the employed population. Sources for the population share aged 65+: our computation on EUROSTAT and ONS population projections. Sources for the economic dependency ratios: simulations using the various SimPaths country models. Spline added. Also note that the figures show simulated data only. The series starts in 2011 to overlap with historical data (2011–2023) for calibration and validation (see Methodology Report, Section 2.2.2).

Figure 27 presents projected per-capita gross and net incomes for the analysed countries. At the start of the observation period, 2 distinct groups emerge: (i) Italy and the United Kingdom, both with relatively high and comparable income levels, and (ii) Hungary, Greece, and Poland, all display similarly lower levels.

Figure 27: Projected per capita gross income [top] and projected per capita net income [bottom] across the selected countries



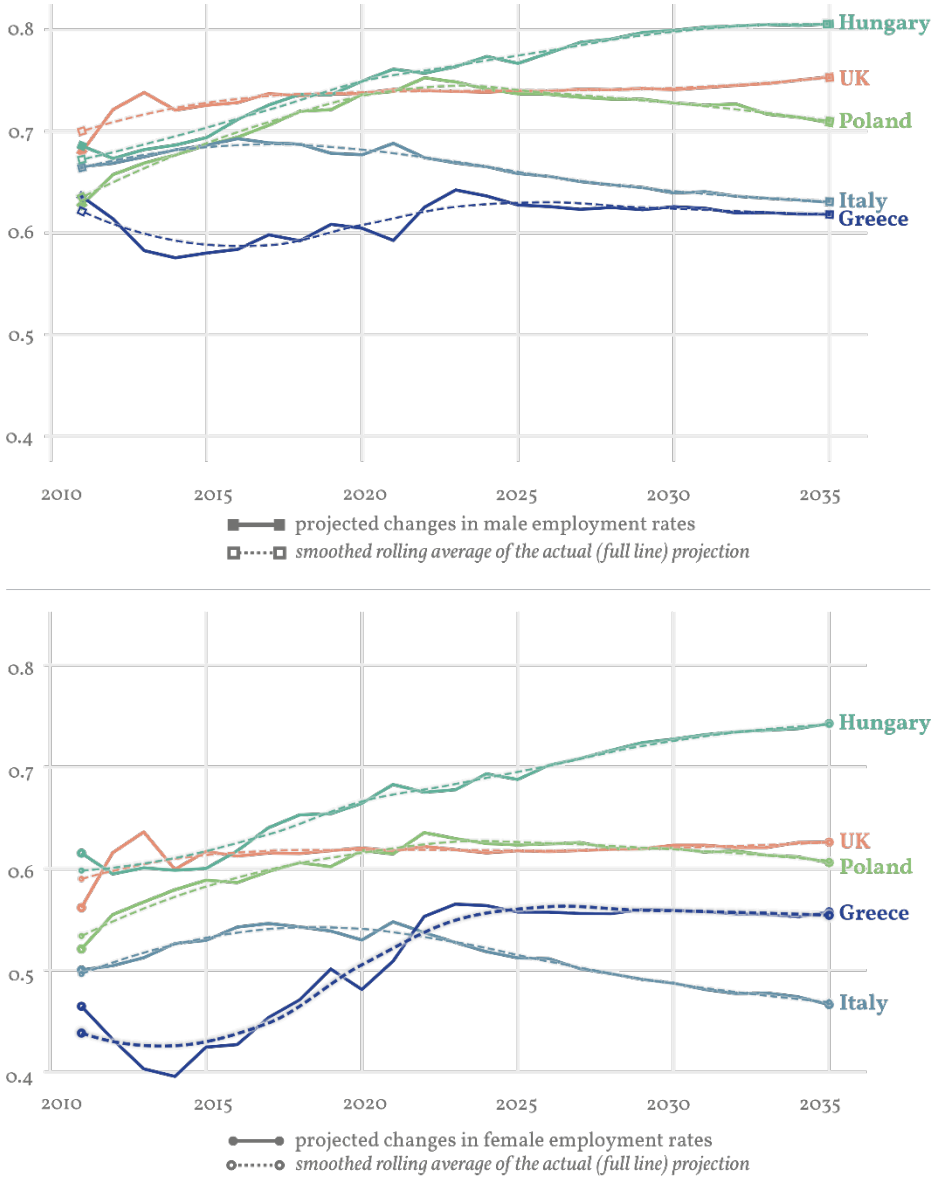
Notes: In both graphs, values are expressed in EUR (€) for EU countries and in GBP (£) for the UK. Also note that the figures show simulated data only. The series starts in 2011 to overlap with historical data (2011–2023) for calibration and validation (see Methodology Report, Section 2.2.2).

Gross per-capita incomes (top graph) are projected to grow at a comparable pace in the UK, Hungary, Greece, and Poland. In contrast, Italy's gross incomes stagnated from the mid-2010s and subsequently began to decline. Projections indicate a worsening outlook for Italy, with its gross income level converging towards that of the lower-income group.

Taxes and benefits slow the growth of disposable income in the UK—reflecting reduced real benefit values and higher taxes—and substantially cushion the decline in Italy (bottom panel). In Italy's case, this cushioning effect helps stabilise disposable incomes but at the cost of a deteriorating fiscal position.

The trajectories of economic dependency ratios and income levels are shaped by two main factors: population ageing and labour market performance, particularly by changes in employment rates. Figure 28 presents these employment trends separately for men and women.

Figure 28: Projected employment rates for male [top] and female [bottom] population aged 15-64, across the selected countries



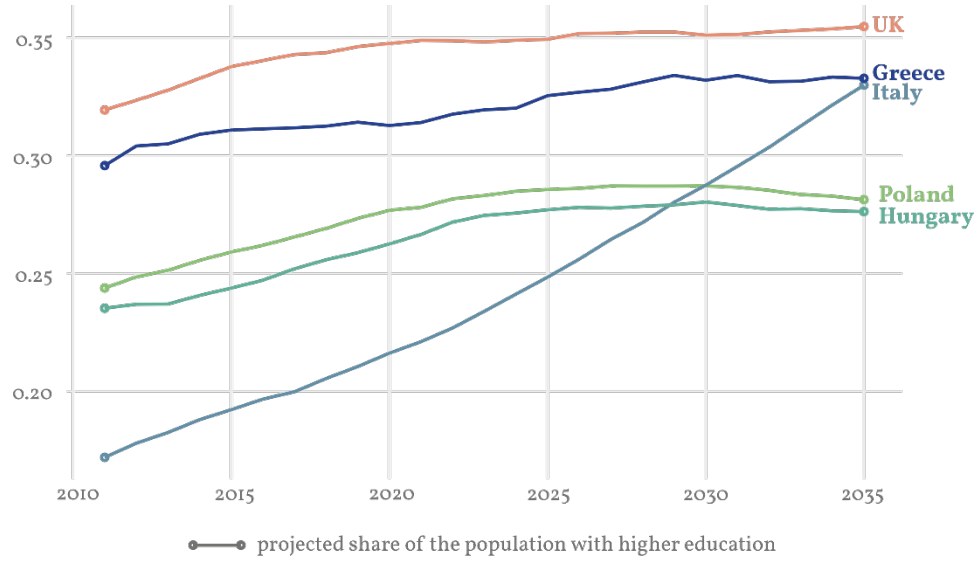
The solid line shows the raw projection at each time point, while the dotted line is a moving-average smoothed version of that same series. Smoothing reduces short-term noise and outliers, making the underlying trend clearer (with slight lag and edge effects).

Hungary's strong labour market performance, the significant narrowing of the employment gender gap in Greece during its recovery period, the short-lived employment boom

in Poland up to the start of this decade, and—most notably—the weak performance of the Italian labour market, all reinforce the findings discussed above. Particularly striking is the projected decline in female employment rates in Italy, which reverses a long-term upward trend. This reversal can be partly attributed to shifts in the workforce's age structure and partly to a growing burden of care provision, in the context of rapid population ageing and declining state support.

Nevertheless, there is a more optimistic aspect to Italy's outlook when considering educational attainment, as shown in Figure 29. Italy, which began the 2010s with the lowest share among the case studies, has quickly closed the gap, with projections indicating continued improvement into the next decade. While this trend is partly driven by the lack of job opportunities for younger people—and has so far not translated into higher employment rates—it represents a potential long-term asset for addressing future challenges.

Figure 29: Projected share of population with high education, across the selected countries



4. Synthesis and policy recommendations

Before pursuing the section, it is important to recollect that the efforts conducted within the project are part of a ***forward-looking exercise***, aimed at enhancing the knowledge and informing the policymakers with respect to some potential patterns that the labour markets could follow, under different assumptions. This research should not to be treated differently than a scenario-making exercise, which could only calibrate a handful of factors. The reality could be far different in 5 or 10 years, but preparing and becoming more shock-resistant is aspirational, and should be part of the planning process.

Therefore, in addition to the analysis that was pursued as part of the OVERLAP research, dedicated effort was placed to present results to and consult with policymakers and relevant stakeholders on the possible policy implications. This section distils some of the key lessons acquired throughout these discussions and outlines the policy advice. Seven core points are summarised here, that address the current labour markets in securing a more sustainable future.

Address labour scarcity through skills development: modernise vocational and technical training (including micro-credentials) and lifelong learning to close skills gaps, especially in green and digital sectors, while tailoring strategies to regional economic specialisations.

Mobilise underused labour reserves: boost participation of women, and both youth and seniors via active labour market policies, childcare expansion, flexible work options, and incentives for the voluntary delaying retirement.

Reduce territorial disparities through place-based investment: strengthen public services, infrastructure, and governance in lagging regions, promote urban–rural linkages, and invest in digital connectivity, transport, healthcare, and education to reverse population loss and broaden economic participation.

Ensure digital and green readiness in all regions: expand broadband coverage, provide digital skills training (including for older workers), and support communities transitioning from declining industries to ensure they benefit from the twin transitions.

Leverage EU funding strategically: use recovery and cohesion instruments, such as the Just Transition Fund and digital innovation hubs, to finance training, education, and innovation in regions at risk of being left behind.

Adopt a balanced migration strategy: combine targeted recruitment of foreign workers with strong retention policies for domestic talent, creating quality jobs and incentives for graduates to return to lagging regions.

Maximise the benefits of migration through integration: strengthen language training, upskilling, faster qualification recognition, and access to housing and social support to improve migrants' economic contribution, retention, and social cohesion.

The further argumentation, benefitting from the OVERLAP analysis and the policy workshops conducted during the project, are found next in sections 4.1 to 4.4.

4.1 Labour scarcity and intensifying skill shortages

The first priority is to tackle Europe's growing labour scarcity and acute skill mismatches. Demographic ageing is already contributing to shrinking the workforce as projections show employment rates declining across virtually all regions, by 2035 due to a dwindling working-age population.

Paradoxically, many employers report unfilled vacancies even as joblessness persists, pointing to **structural mismatches**. In Italy, roughly half of job openings are going unmet despite high unemployment, underscoring the urgency of **bridging skills gaps**. Stakeholders in Poland likewise observed a shift among the young toward shorter vocational training over university degrees, highlighting the need to modernise vocational education and lifelong learning. Indeed, workshop discussions in Poland called for **strengthening vocational and technical training (including micro-credentials) to meet emerging industry needs**, especially in the green economy.

At the same time, countries are seeking to **mobilise underutilised labour reserves**: for instance, increasing women participation and extending careers. In Italy, women and youth employment were identified as ***the most critical*** gaps in the labour market. Some positive trends offer hope – for instance, Italy's projections assume rising female employment (albeit from a very low base) as a partial offset to ageing – but unlocking this potential requires concerted action. Participants stressed that **stronger active labour market policies** for women and young people must be paired with **deeper social changes**. Insufficient childcare services, persistent gender stereotypes, and limited flexible work options remain formidable barriers to women's workforce participation.

Addressing these constraints (for example, by expanding childcare infrastructure and promoting more inclusive workplace practices) could substantially expand the labour pool in regions with low female employment. Similarly, retaining older workers through **lifelong learning and incentives for voluntary delayed retirement** can help mitigate labour shortages. Experts also noted that policy can influence labour supply at the margins: in Poland, recent legislative efforts to activate the inactive, coupled with rising living costs, are already encouraging more people to enter the job market than the model initially assumed.

In sum, alleviating labour scarcity will require a **multifaceted push** – from upskilling the existing workforce to engaging women, youth, and seniors more fully in economic activity – so that Europe's talent base is not only larger but better aligned with the needs of a changing economy.

4.2 Urban innovation hubs versus small and remote regions

A second key finding is the lingering **divide in outcomes** between dynamic **urban hubs** and Europe's smaller, more **remote regions**.

Major cities and innovation centres continue to attract skilled workers and investment, reinforcing a virtuous cycle of growth, whereas many rural, peripheral, or deindustrialising areas struggle with population loss and stagnating opportunities, albeit possibilities for working remotely are changing some landscapes (but this remains marginal).

National workshops run with the stakeholders underlined these disparities. In Hungary, for example, the modelling and discussions revealed a pronounced east–west divide: on indicators like employment and even health status, eastern counties consistently lag behind Budapest and the western counties. Likewise, Polish experts noted the enduring gap between the booming metropolitan areas, such as Warsaw, and less-developed provinces – as higher educational attainment and prosperity remain concentrated in the urban centres, while peripheral regions trail behind. Italy exhibits a well-known North–South dualism alongside the urban–rural differences: Northern and central regions generally boast more robust institutional capacity and labour market performance, whereas the South faces chronic shortfalls. The Italian projections show southern regions (Calabria, Sicily, etc.) suffering some of the sharpest labour supply contractions by 2035. Notably, urban and semi-urban areas are expected to fare better than rural ones across the board – some resilient cities might even maintain employment levels despite demographic headwinds – although Italy's case suggests that integrating rural areas with nearby towns can soften the urban–rural gap.

These territorial imbalances are exacerbated by **uneven access to infrastructure and services**. Participants pointed out that quality of public services often correlates with regional prosperity: for instance, the efficacy of public employment services (PES) and training programs varies widely, with well-resourced regions like Emilia-Romagna seen as a best practice, in contrast to weaker support in many remote areas. Gaps in childcare, education, and healthcare provision also hit hardest the poorer regions – concerns were raised about inadequate healthcare capacity in ageing rural communities, which deters older people from extending their working lives there. Without remedial investment, such deficits create a **vicious circle**, as lack of services and connectivity drives further out-migration of young families and skilled workers. Breaking this cycle will require

place-based cohesion policies to bolster lagging regions – improving digital connectivity, transport links, school and hospital networks, and local governance capacity. Targeted initiatives (for example, dedicated training centres, business incentives, or service hubs in remote areas) can help smaller regions participate in innovation and stop the brain drain.

Bridging the urban–remote divide is not only a matter of equity; it is essential to ensuring all corners of Europe contribute to and benefit from future growth.

4.3 Twin transitions and demographic decline

The twin transitions – the digital revolution and the shift to a green economy – are unfolding in parallel with Europe's demographic decline, and this convergence presents a complex **double challenge** for regional labour markets. On one hand, the push towards a carbon-neutral, digitally advanced economy is expected to create **new industries and demand for skills**; on the other, many regions face shrinking, older populations and risk **not having the workforce or skill base to seize these opportunities.**

The project's findings reflect this tension. For instance, the OVERLAP scenarios indicate that even as overall employment contracts due to ageing, certain high-tech or green sectors could expand – but this is conditional on the presence and availability of workers with the right skills. In Poland, stakeholders questioned projections of educational decline in some northern regions like Pomorskie, arguing that growing green industries (such as offshore wind energy developed in the Baltic sea) could attract or retain a more educated workforce, if properly supported. This points to the importance of **aligning skills development with the green transition.** Across the workshops, participants emphasized **upskilling and reskilling programs** as pivotal tools: regions need to train people for emerging jobs in renewable energy, energy efficiency, digital services and beyond. Public employment services and education systems must become more agile in anticipating skill needs – for example, Poland's discussion highlighted strengthening vocational education in fields relevant to the green economy and supporting regional skill strategies tied to each area's economic specialisation.

Digital readiness is another recurrent concern. While the COVID-19 era accelerated digitalisation, many lagging regions still lack the infrastructure or human capital to fully benefit. Italian experts noted that digitalisation offers enormous potential for productivity and remote work, but regions with poor broadband coverage and limited digital skills capacity risk falling further behind.

The **need for investments in digital infrastructure and training** – especially for older workers and small businesses – came through clearly. In fact, some participants from Central and Eastern Europe observed that technological automation has been slower to

disrupt jobs in their countries, compared to Western Europe; this now provides a critical window to prepare the workforce before digital disruption intensifies. This preparation includes **promoting lifelong learning** and embracing the concept of **"active ageing"** in the workforce. As people live longer and retire later, continuous training and flexible work arrangements for older employees will be crucial to harness their experience and keep them productive in a tech-driven economy. Several regions are already piloting such approaches – for example, in Italy, regions like Emilia-Romagna and Trentino have introduced lifelong learning initiatives and alternatives to early retirement to support older workers' continued participation.

Simultaneously, the green transition must be managed in a **socially inclusive way**. The shift to sustainable industries can create front-runners and laggards across territories: coal-dependent communities, for instance, will need help retraining workers for cleaner industries, while fast-growing green tech hubs will need an influx of skilled labour.

The *twin transitions* therefore call for **proactive, forward-looking policies**. Europe's recovery and cohesion instruments (such as the Just Transition Fund and digital innovation hubs) are opportunities to invest now in training, education, and innovation in regions at risk of being left behind. By doing so, policymakers can ensure that a smaller workforce does not stall progress on climate and digital goals, and that the benefits of these transitions are shared widely rather than deepening regional disparities.

4.4 Migration and demographic replacement

Finally, **managing migration emerges as a pivotal** – yet nuanced – strategy for addressing Europe's demographic critical point. In many regions the population is ageing and shrinking so fast, that even bold improvements in fertility or labour participation will not fully stabilize the workforce in the short term. As a result, immigration is often seen as an essential piece of the solution to the declining labour pool. The OVERLAP scenarios confirms that higher migration rates can indeed soften the blow of demographic decline, but it is not a silver bullet.

In Italy's projections, even an optimistic scenario combining high inward migration, productivity gains and green investment only modestly improves employment outcomes – labour shortages remain a dominant trend regardless. This suggests that while attracting foreign workers is important, it cannot by itself compensate for all the ongoing shortfalls in many regions. Moreover, **the impact of migration is highly context-dependent**. In parts of Central and Eastern Europe, *"high migration"* often means an increase in people leaving rather than arriving. Hungary's stakeholders cautioned that a scenario of high net migration for their country primarily reflects intensified emigration of young

talent, which would exacerbate labour deficits, especially in the east. Indeed, significant outflows from less developed regions or countries (whether to domestic metros or abroad) can hollow out local labour forces and tax bases. During the workshop for the Hungary case study, it was noted that such out-migration is a key factor widening the east–west divide in that country. It can even undercut social progress in sending areas – for example, Budapest, despite being relatively prosperous, it could still see a slight uptick in poverty rates under a high-emigration scenario.

These insights reinforce the idea that migration must be managed in a balanced way, with attention to both attracting new workers and retaining existing ones. Participants in Poland and Italy case study workshops argued for a two-pronged approach: ***talent retention* is just as crucial as recruitment**. Curbing the brain drain of educated youth – for instance, by creating quality jobs in lagging regions or incentives for graduates to return – should go hand-in-hand with efforts to welcome needed skills from outside. For destination regions that are counting on immigration to rejuvenate their labour markets, the message was clear: **integration policies will determine success**. Italian stakeholders stressed that simply increasing the inflow of foreign workers is not enough; new arrivals must be supported with **proper integration pathways**, including language training, upskilling opportunities, and faster recognition of their qualifications, which is still too bureaucratic at present. **Better housing and social support** are also important to make regions attractive and help new workers settle into communities and jobs. Without such measures, potential gains from immigration could be lost due to low retention or underutilisation of migrants' skills.

In sum, **a comprehensive strategy** for Europe's demographic renewal will require both internal and external action: investing in the current workforce (through education, gender inclusion, and regional development) while also implementing smart, integrative migration policies that fill labour gaps and uphold social cohesion. By doing so, regions can transform what might look like a looming labour shortage crisis into an opportunity – leveraging migration and mobility to inject new dynamism into ageing economies and fostering a more sustainable age balance in the labour market for decades to come.

Final considerations

The future of European labour markets will depend not only on how well policies address demographic decline, skills shortages - with the "right to stay" emerging as a crucial lever for sustainable growth and social cohesion, and but also on how increased competitiveness may be addressed from a social perspective. The Draghi report draws attention and emphasizes the need for comprehensive reforms linking talent attraction and retention, technological investment, and policy harmonization to shore up Europe's position in advanced sectors, but also address demographic-driven labour shortages.

Labour markets are strongly shaped by public and private decisions. While private investment and innovation tend to focus on profitability, technological progress, and market leadership, addressing competitiveness from a social angle requires attention to inclusive growth, equitable access, and long-term resilience. In this sense, the European policy debate increasingly recognises that economic and social agendas are complementary rather than contradictory.

This study contributes to the debate by analysing demographic prospects and exploring different scenarios for regional labour markets over the coming decade—highlighting both challenges and the potential for transformation. A key limitation, inherent to any forward-looking scenario-based methodology, is that it cannot anticipate all potential economic shocks, geopolitical tensions, or policy shifts. Nor can it fully capture the many macro- and micro-level factors that shape the movement of people and businesses. The innovative strength of this research lies in its detailed regional perspective, opening pathways for further studies that could develop and validate new metrics to better capture the evolving composition, divergence, or convergence of labour markets. Initial steps have been taken in this direction through microsimulations for selected countries, complementing the macro-level analysis.

At the same time, while the results may point toward future labour market contraction, European regions have repeatedly shown remarkable capacity to adapt, innovate, and even thrive—particularly in times of crisis or transition. The study should therefore be viewed through a positive and forward-looking lens. The future is not predetermined. Recognising the resilience and transformative potential of European regions and communities, this work should serve as a practical tool for policymakers as they design strategies, build on past lessons, and seize emerging opportunities. More than ever, fostering collaborative innovation models that bring together government, industry, academia, and civil society—the "quadruple helix"—is essential for shaping resilient and competitive territories.

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