



PILLARS – Pathways to Inclusive Labour Markets: The case study of the Köln region

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1 Introduction

The Köln region is located in Western Germany, in the larger Nordrhein-Westfalen region. For brevity, the region will be named Köln throughout the case study. The region is home to almost 4.5 million people, and it is the most populous region in Germany. Hence, it can be described as a highly urbanised region, with a population density of 613.4 people per square km. This is considerably higher than the national average of 240 people per square km. The region's capital is Cologne, which is Germany's 4th largest city with 1.086 million inhabitants. The city is home to the main governing body of the region, the regional council of Köln (Bezirksregierung Köln).

Köln, as most regions in West Europe, has an aging population. The region's old age dependency ratio has steadily increased in the last decades, up to 31.3 in 2021. The median age (44.4) is similar to the EU median age (44.1), but lower than Germany's median age (45.8). There is a notable increase of younger population living in Köln, due to the influx of students and young workers who are attracted by the dynamic regional business environment. In addition, Köln is attractive to young people, due to presence of (higher) education institutions, different entertainment facilities, access to nature, thus ensuring high life quality. In fact, over the past decade, the region's population has increased by 5%. This increase comes from the region's crude net migration rate, as the crude rate of natural population change has been negative in the last two decades.

Over 32% of the 25-64 population in Köln has tertiary education. This is slightly below the EU average (33.4%), but higher than the national average (30.9%). At the same time, 49.4% of the 25-64 population in the region has a secondary education, which is higher than in the EU (45.9%), but relatively low for German standards, as the national average is 53.8%.

The region has one of the strongest economies in the European Union. It has a diversified economy, innovative industries, and it is very attractive to highly skilled migrants. With the Rhine River flowing through the region, it has historically been an important industrial and transport hub.

| | | | | |
|--------------------------|--|--|---|--|
| Total population in 2021 | Population density (persons per square km) ¹ , 2021 | Average crude rate of net migration plus statistical | GDP per inhabitant in PPS (% of EU-27 avg. from 2020 average) in 2021 | Tertiary education attainment (ages of 30-34), 2021 ² |
|--------------------------|--|--|---|--|

¹ The EU average population density in 2021 was 109

² The EU average of tertiary education attainment in 2021 was 41.5%

| | | | | |
|-----------|-------|---------------------------|------|-------|
| | | adjustment (2013-2020) | | |
| 4,478,847 | 613.4 | 5.6% | 124% | 38.9% |

2 Overview of the labour market in Köln

Labour market trends and key skills in demand

In 2021, the unemployment rate in Köln was 4%, which is lower than in the entire North-Rhine Westphalia and across Germany, on average (6.7% and 5.1%, respectively). The region's unemployment has been steadily decreasing over the past decade (5.8% in 2013), given a continuously growing economy in the region and availability of highly-skilled labour.¹

The region's economic growth has led to an increase in the number of vacancies in the past years, not only in sectors where seasonal and temporary employment are dominant, but also in the real-estate and in the scientific and technical services sectors.

The regional labour demand is high across all skills levels, given the dynamic and highly diversified economy of the region. The occupations in high demand are at the top and at the bottom of the skills spectrum. Among the high-skilled occupations, the region has many vacancies for nurses, electronic technicians, and professions related to STEM fields (in particular, medical technology professionals and engineers). At the bottom of the skills spectrum, there are many job vacancies for cooks, agriculture, and construction workers.

Major job sectors/industries

The city of Cologne has been the financial centre of Germany, and even of Europe, since the Middle Ages. This stimulated the development of the following industries - engineering, electrical engineering, machinery, chemical and pharmaceuticals are significant sectors, and so as the automotive industry, media and communication, ICT and tourism and hospitality.

Some industries, such as the financial, logistics and automotive, are considered main, traditional employers of the local labour force. In recent years, media, communications and the IT sectors have been steadily growing, providing new job opportunities. The development of these sectors turned the region into a major hub for creative industries and innovative IT start-ups. As a result, the city of Cologne has a major role in the country's software development and digital innovation.

¹https://ec.europa.eu/eurostat/databrowser/view/LFST_R_LFU3RT_custom_6594303/default/table?lang=en

Key challenges on the labour market and vulnerable groups

The key challenges on the region's labour market are (i) skills mismatches among older working population; (ii) poor integration of immigrants and refugees, who are often engaged in non-standard forms of work (such as platform work) or in informal sectors; (iii) limited labour mobility of low-skilled workers employed in declining industries.¹

| Indicator | Data |
|--|-------|
| Employment rate, 2021 ² | 72.8% |
| Employment in high-tech sectors, 2021 ³ | 6.5% |
| Unemployment rate, 2021 ⁴ | 4% |
| Youth unemployment rate, 2021 ⁵ | 7.8% |
| Unemployment rate of males (15 years or over), 2021 ⁶ | 4.7% |
| Unemployment rate of females (15 years or over), 2021 ⁷ | 3.2% |
| Unemployment rate among individuals with less than primary, primary and lower secondary education (levels 0-2), 15 years or over, 2021 ⁸ | 8.8% |
| Unemployment rate among individuals with upper secondary and post-secondary non-tertiary education (levels 3-4), 15 years or over, 2021 ⁹ | 3.35% |
| Unemployment rate among individuals with tertiary education (levels 5-8), 15 years or over, 2021 ¹⁰ | 2.8% |

¹ <https://www.globalmigrationpolicy.org/articles/activities/Europe-%20Crisis%20&%20Migration%20Taran%20Final%202021-2-12.pdf>

² The EU average rate of employment in 2021 is 73.2%

³ The EU average of employment in high-tech sectors in 2021 was 4%

⁴ The EU average unemployment rate in 2021 was 7.2%

⁵ The EU average youth unemployment rate in 2021 is 14.5%

⁶ The EU average unemployment rate among males (15 years or over) in 2021 was 7%

⁷ The EU average unemployment rate among females (15 years or over) in 2021 was 8.1%

⁸ The EU average unemployment rate among individuals with less than primary, primary and lower secondary education (levels 0-2), 15 years or over, in 2021 was 13.9%

⁹ The EU average unemployment rate among individuals with less than primary, primary and lower secondary education (levels 3-4), 15 years or over, in 2021 was 7.6%

¹⁰ The EU average unemployment rate among individuals with tertiary education (levels 5-8), 15 years or over, in 2021 was 5.4%

| | |
|--|------|
| Labour market slack, 2021 ¹ | 7.75 |
|--|------|

3 Technological transformation and policies/instruments to stimulate innovative and inclusive job creation

Köln's region is one of the innovation leaders of the EU (RIS 2021). The region outperforms most EU regions across many R&D&I indicators.² Since 2014, the region has been successful in increasing the number of international scientific co-publications, business process innovations, trademark applications and sales of new-to-market and new-to-firm innovations. Moreover, the region has a very dynamic start-up ecosystem, especially in highly innovative and growing sectors, such as fintech, digital healthcare and cybersecurity. Finally, Köln has developed digital hubs in cutting-edge automation technologies, such as Artificial Intelligence, Augmented Reality, Internet of Things, Robotics, Micro and Nano Electronics and Big Data and data analytics.³

As an innovation leader in Germany and in the EU, the region was at the forefront of Industry 4.0 developments, and regional policymakers have been proactive in creating a supportive ecosystem for it. They have implemented policies that encourage innovation and collaboration among stakeholders, including manufacturers, research institutions and technology providers. This has led to the establishment of dedicated R&D centres, where cutting-edge technologies are developed and tested before being deployed in the manufacturing sector. Moreover, the government has provided financial incentives and subsidies to manufacturers willing to invest in Industry 4.0 technologies. This has significantly reduced the initial costs, associated with adopting robots, IoT devices, and AI systems.

Additionally, the availability of public grants and funding programs has encouraged companies to upgrade their existing infrastructure and retrain their workforce. These funding schemes take the form of training programs and vocational education, contributing not only to business development in high-innovation sectors, but also addressing labour market shortages and integration of vulnerable groups on the labour market. These policy instruments are typically funded by the federal state or by the EU.

According to consulted stakeholders, the regional government has been praised for its significant investment in digital infrastructure. The high-speed broadband connectivity

¹ The EU average labour market slack in 2021 was 14%

² https://ec.europa.eu/invest-in-research/pdf/download_en/kina24050enn.pdf

³ <https://s3platform.jrc.ec.europa.eu/region-page-test/-/regions/DEA2>

supports business development and facilitates integration of IoT devices and AI systems into the manufacturing processes. Furthermore, the government has fostered partnerships with telecommunication providers to develop tailored solutions that meet the specific needs of manufacturers in the region.

An example of high-level collaboration between the manufacturing sector, academic research and policymakers is the Plastics Innovation Centre 4.0.

The Plastics Innovation Centre 4.0 (PIC 4.0) is the facility in the region of Koln that represents a completely interconnected research and development environment occupying a total area of 4,205 m².¹ It has been funded jointly by the North Rhine Westphalia state and the European Regional Development Fund.

The establishment of the Plastics Innovation Centre 4.0 aims to advance in the field of digitisation in plastics processing and to become one of the world leaders in the industry.² Besides expanding the innovation capabilities of the German plastic processing industry, PIC 4.0 also aims to provide specific skills to workers employed in the sector.

Success factors of the project include:

- Implementation of digital technologies and high-end assistance systems in production, fostering the benefits of digitization and automation with a state-of-the-art Smart Factory in Industry 4.0.
- The centre and its operations build on the local capabilities of the region and work together with local organizations. This way it contributes to the cluster of excellence.
- The Centre serves as a demonstration platform to present real-world solutions of future oriented research topics. Thus, it contributes to the region's reputation and competitiveness.³
- Cooperation with the Aachen University supports the transfer of knowledge, research results into industries and attracts students to the field of Plastics Industry 4.0.⁴

¹ <https://www.ikv-aachen.de/en/research/pic-40/>

² <https://www.tpe-forum.de/ikv-approval-to-build-new-plastics-innovation-centre-4-0/>

³ <https://en.kunststoffe.de/a/specialistarticle/the-pic-40-as-part-of-the-internet-of-pr-316298>

⁴ <https://www.compositesworld.com/news/institute-for-plastics-processing-at-rwth-aachen-university-to-build-smart-factory->

Köln also actively promotes the expansion of the start-up ecosystem, which is supported by more than 18 universities and colleges.¹ Besides the region's flagship tech and innovative start-ups, regional policymakers foster social and impactful entrepreneurship.² These are assisted through the Cologne Chamber of Industry and Commerce.³

4 Policies/instruments to prevent and mitigate job displacement

In addition to excellent performance in innovation, Köln has experienced improvements in labour productivity in the last decade. The productivity gains after technological adoption may, however, be skewed towards bigger and more productive firms, deepening pre-existing unbalances across firms, and across workers.

Despite significant technological transformation in the region, the level of job displacement has not been high. As mentioned earlier, the most vulnerable groups on labour market in Köln are migrant workers and low-skilled workers. Among them, the manufacturing plant workers seem to have a more difficult time to re-integrate on the labour market. These are the workers that have been performing routine tasks, which are easily codified and, thus, can be performed by automation technologies (e.g., industrial robots).⁴ Although industrial technological transformation has created new jobs (e.g., service-oriented occupations, ICT-related occupations), and raised demand for certain skills, job transitions are not automatic. There is, then, scope for public instruments that support labour mobility.

In North Rhine-Westphalia, career guidance programs are a crucial instrument to support the unemployed, prevent job displacement and increase employability of low skilled workers.⁵ The state set up a network of publicly funded career guidance providers, which can accompany individuals throughout their working life. The programme, called Beratung zur Beruflichen Entwicklung (Guidance for Career Development), works in parallel with other active labour market policies, such as literacy polices (e.g., the "Social partners together for work-oriented basic education in NRW" programme to promote in-job training in basic education), or other small scale projects (e.g., support to low-skilled workers in their journey

¹ <https://scalecities.com/cities/cologne/>

² <https://www.ihk.de/koeln/hauptnavigation/gruendung/social-entrepreneurship-sozialunternehmen-impact-startups-5724128>

³ <https://www.ihk.de/koeln/hauptnavigation/gruendung/social-entrepreneurship-sozialunternehmen-impact-startups-5724128#titleInText0>

⁴ <https://www.politico.eu/article/green-deal-job-drain/>

⁵ <https://www.oecd.org/employment/career-guidance-for-low-qualified-workers-in-germany-5e6af8da-en.htm>

to pass the official skilled labour examination in the metal industry). The most frequent users of the Guidance for Career Development are migrants, women, and refugees, to whom career guidance is given free of charge. The local experts refer to the programme as a case of success and requested by many people – putting pressure on the response capacity of the career advisers. To expand the programme, the government is now expanding the network of providers.

To support integration of migrants on the labour market in the region, in 2021 North Rhine-Westphalia introduced the ‘Act to support social participation and integration in North Rhine-Westphalia’ (Gesetz zur Förderung der gesellschaftlichen Teilhabe und Integration in Nordrhein-Westfalen) by which the state’s government commits to invest at least 130,000€ per year on integration programs. To conceptualise, coordinate and operationalize the integration efforts, the regional government created municipal centres of integration (Kommunale Integrationszentren).¹

One of most consensual labour market practices in Köln and, more broadly, in all North Rhine Westphalia, is the *Beratung zur Beruflichen Entwicklung* programme and the Educational check (Bildungsscheck NRW).

The *Beratung zur Beruflichen Entwicklung* programme is focused on providing career guidance of low-qualified workers. The state-wide publicly funded career guidance network – consisting of private HR companies that contribute to career path guidance together with public councillors – is open to both employed and unemployed people.²

Success factors of this good practice include:

- Individual attention to workers through councillors, that avoid a one size fits all approach which proven to be ineffective.
- Re-skilling programmes, tailored to individual needs of people, some of which include the “Social partners together for work-oriented basic education in NRW”, consisting of temporary literacy courses or “Next station skilled worker” that focus on selected small-scale project for low-qualified employees.^{3, 4}
- Strong partnerships with companies that are actively engaged in the process. Companies are incentivised to train and upskill their workers through financial

¹ <https://asylumineurope.org/reports/country/germany/content-international-protection/employment-and-education/access-labour-market/>

² <https://www.oecd-ilibrary.org/sites/bc4572cc-en/index.html?itemId=/content/component/bc4572cc-en>

³ <https://www.fachkraefteinitiative-nrw.de/einzelregionen/ostwestfalen-lippe/projekte-nachstation-facharbeiter-al-2019-09-17.pdf>

⁴ <https://grundbildung-nrw.de>

support. Career counsellors are subsidised for employees, after which costs for the trainings are split between the state and the company. Further subsidies can also be applied for by small companies.

The Educational check (Bildungsscheck NRW) promotes continuing education by covering training costs up to €500 per person. There is an income ceiling to be able to benefit from the programme, and some demographic groups are deliberately picked, such as immigrants, employees without professional qualifications, professional returners, older workers and atypically employed persons (e.g., temporary workers).¹

Some of the success factors of this EC good practice include:

- Personal consultation that allows for a good match between an individual's needs, the needs of the labour market and the provided training.
- Strong links with local educational providers and the counselling centres that are numerous throughout the region, increasing accessibility.²
- It improves employability of people with low qualifications and helps companies to strengthen their competitiveness through well-qualified employees.
- Small companies can also access the programme through company training checks, in the so-called "company-access", receiving financial support that enables them to implement vocational trainings for their employees. This works as an incentive for small companies to employ vulnerable groups whilst enabling them to simultaneously innovate.³

5 Policies/instruments to support employers and employees during job transformation

The region of North-Rhine Westphalia is arguably one of the EU regions with fastest and more profound technological transformations. Simultaneously, a transition towards green economy is taking place. The region seeks to hold the competitiveness that it has worldwide and foster regional productivity by combining digital and green transformations.⁴ The

¹ <https://www.weiterbildungsberatung.nrw/finanzierung/bildungsscheck>

² <https://www.mags.nrw/bildungsscheck>

³ <https://www.weiterbildungsberatung.nrw/finanzierung/bildungsscheck>

⁴ <https://www.euractiv.com/section/politics/interview/germanys-core-industrial-region-aims-for-transformation/>

transition towards a digital and green economy has implications on the labour market, especially in sectors that are in decline, and in areas where these declining sectors are economically more relevant.

Regional policymakers have tried to be proactive when addressing the labour market challenges stemming from the ongoing digital and green transition. The European Social Fund (ESF) operational program 2014-2020 for North Rhine-Westphalia had a budget of €1.25 billion to support a just transition, namely by (i) promoting sustainable, high-quality jobs and labour mobility, (ii) promoting social inclusion and tackling poverty and, (iii) investing in education, skills and lifelong learning. Under the large scope of the operational programme directed to North Rhine-Westphalia, measures such as vocational training, reskilling or early retirement schemes have been responding to labour market disruptions in declining sectors (e.g., the coal sector).¹

The multiple levels of policy agents involved in the decision process of projects under the ESF for just transition implies heavy administrative and bureaucratic procedures, as the project is funded by the EU and Federal Government, managed by the NRW state and intermediary agency, and executed at state, regional and civil level. In that sense, several stakeholders have claimed for stronger local capabilities, in order to align the set of policy instruments to the smart specialization strategy of the region. The involved local social partners and other local stakeholders are not only aligned with the ILO's recommendations for a just transition, but are willing to introduce more coherent and successful interventions.² Furthermore, active participation of local stakeholders and policymakers (such as municipal governments), supported by significant financial resources, have been considered the key drivers of success in the German technological and green transformation.

One of the good practices in the Köln region regarding job transformation is JOBSTARTER - Digital manufacturing processes - Additional qualification for the future career in INDUSTRY 4.0! (Digitale Fertigungsprozesse - Zusatzqualifikation für die berufliche Zukunft in INDUSTRIE 4.0!).

The JOBSTARTER - Digital manufacturing processes - Additional qualification for the future career in INDUSTRY 4.0! (Digitale Fertigungsprozesse - Zusatzqualifikation für die berufliche Zukunft in INDUSTRIE 4.0!) is the programme in Germany that support employers and employees during technological transformation.

¹ https://brill.com/view/journals/clla/11/2/article-p176_176.xml?language=en

² <https://www.rff.org/publications/reports/german-just-transition-a-review-of-public-policies-to-assist-german-coal-communities-in-transition/>

The main stakeholders of this programme are the Federal Ministry of Education and Research and the Federal Institute for Vocational Education and Training. The scope of the programs is to target advanced manufacturing technologies and to prepare individuals for future transformations on the labour market. Some success factors are:

- There are no costs implied for participants, meaning they get additional qualifications for free.
- It links individuals to SMEs where they have the possibility to take apprenticeships and eventually get employed at this company.
- There is a high degree of networking and knowledge transfer in competitive and innovative environments – as demand to participate in the program is high (from individuals and companies).
- Results of the program are implemented in vocational training and colleges since mid-2019 – assuring the transferability and scalability of the program¹.

6 Lessons learned

Stimulation of innovative and inclusive job creation, powered by automation technologies:

- The Köln region is one of the most innovative regions of the EU. This is attributable, in part, to the region's dynamic start-up ecosystem. Assistance (support and advice) to entrepreneurs is made freely available in the region. Social entrepreneurs receive special attention and financial incentives.
- Innovation in the region is actively supported by the regional council. Financing projects that seek to build on the region's key industries and competences, aligned with its smart specialization strategy.
- State and EU-financing support vocational education and training. VET programs target people in the most vulnerable groups, and the employment services provide personal assistance through counselling centres and local education providers in order to support labour market integration.

Prevention and mitigation of job displacement, following adoption of automation technologies:

- The industrial history of the region has vast implications for the re-structuring of its labour force – challenges go hand in hand with the green transition.

¹ https://skills4industry.eu/sites/default/files/2019-11/EA-01-19-571-EN-N_incl-exec-sum.pdf

- The region has a particular focus on the re- and up-skilling of its labour force and aims to include every working individual on its labour market to leverage the region's automation and digitization opportunities.
- Career guidance for the unemployed is one of the tools used by the region to re-integrate vulnerable groups on the labour market.
- Integration programs of vulnerable groups and in particular migrants, are executed through public-private partnerships with training companies and companies where people work in the form of apprenticeships.
- Low-qualified unemployed people remain one of the region's biggest challenges on the labour market – aligning training and education policies with policies aiming structural change is a crucial narrative for the region. Increasing job-quality for vulnerable groups will be one of its priorities to reach full-employment.

Supporting employers and employees during job transformation, following adoption of automation technologies:

- The simultaneous green and digital transition that the region is currently enduring has extensive implications for its labour market.
- International partnerships with similar regions allow the region to learn from and implement good practices.
- Re-skilling those that are currently employed in SMEs is one of the biggest challenges of the region, especially as a lack of participation in training and education programs of SME employees contributes to the widening skill gap in the region. Structural policies are being implemented to identify and mitigate these skills mismatches.
- Experts of every sector are actively engaged in the formulation of new policies seeking to re- and up-skill the labour market, including citizen participation.
- The region seeks to increasingly engage in proactive labour market policies that aim to fundamentally increase the competitiveness of the region, whilst closing the gap between the low and high-skilled people. In this approach, the region also seeks to engage the geography, putting in place special policies for regions that will be facing larger structural changes in the coming years, due to the twin transition.