



# PILLARS – Pathways to Inclusive Labour Markets: The case study of the North Jutland (Nordjylland) region

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# 1 Introduction

The North Jutland region is in the north of Denmark, and it is the most distant region from the capital, Copenhagen.<sup>1</sup> The total population of the region is 589.926 inhabitants, which makes it the smallest region of Denmark in terms of population. The population density is relatively low (about 76/km<sup>2</sup> per person), while the urbanization rate of the region is high, with 81.7% of the population living in urban areas. This shows how the population of the region is mostly concentrated in cities. More specifically, it is mainly concentrated in the region's capital, Aalborg.

The region's population has remained mostly constant in recent years, with a 3% increase between 2006 and 2023.<sup>2</sup> Denmark has a positive net migration and a low birth rate, with the replacement rate in the past decade oscillating between 1.79 and 1.55 children per woman.<sup>3,4</sup> Most immigrants come from European countries, with the largest non-European immigrant community being the Asian one.<sup>5</sup> About 40.3% of the population has attained a tertiary education, which is lower than the EU average (41.5%). Hence, North Jutland has one of the least educated populations in Denmark.

Aalborg is the region's largest city and the business centre of the region. North Jutland is governed by a democratically elected regional council. The region has limited power, with the municipalities wielding more power despite being one administrative level below the region.<sup>6</sup> Lastly, as of 2021 the GDP per inhabitant in PPS of the region was 105% (% of EU-27 average). This reflects that the region has a relatively developed economy, despite being considered as a periphery region of Denmark.

Total population in 2021	Population density (persons per square km) <sup>1</sup> , 2021	Average crude rate of net migration plus statistical adjustment (2013-2020)	GDP per inhabitant in PPS (% of EU-27 avg. from 2020 average) in 2021	Tertiary education attainment (ages of 30-34), 2021 <sup>2</sup>
589.926	76.4	2.7	105%	40.3%

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<sup>1</sup> <https://rn.dk/>

<sup>2</sup> [https://www.citypopulation.de/en/denmark/admin/NJL\\_nordjylland/](https://www.citypopulation.de/en/denmark/admin/NJL_nordjylland/)

<sup>3</sup> <https://www.dst.dk/en/Statistik/emner/borgere/flytninger>

<sup>4</sup> <https://www.statista.com/statistics/611790/fertility-rate-in-denmark/>

<sup>5</sup> [https://www.citypopulation.de/en/denmark/admin/NJL\\_nordjylland/](https://www.citypopulation.de/en/denmark/admin/NJL_nordjylland/)

<sup>6</sup> [https://en.wikipedia.org/wiki/Regions\\_of\\_Denmark](https://en.wikipedia.org/wiki/Regions_of_Denmark)

## 2 Overview of the labour market in Nordjylland

### **Labour market trends and key skills in demand**

Overall, the labour market of North Jutland performs better than the EU, on average. The region has a higher employment rate and low unemployment rate. However, employment in the high-tech sector is falling behind the EU average. Based on 2022 data, there are 376.700 people of working age in the North Jutland region.<sup>1</sup> However, according to the Regional Labour Market Council (RAR), almost half of the working age population is over 50 years old.<sup>2</sup> The aging population and lower education attainment in the region results in significant labour shortages, especially for high-skilled occupations.<sup>3</sup> According to interviewees, many job openings in the region cannot be fulfilled, therefore companies invest in upskilling/reskilling of existing labour force and in attracting labour from other regions/countries. However, consulted experts indicated that the region struggles to attract labour force, as it is considered a periphery of Denmark with fewer work and entertainment opportunities.

Based on analytical projections, the region's demand for labour will fall, due to the impact of automation and technological transformations. The exception will be the highly qualified specialists, particularly in the ICT sector.<sup>4</sup>

### **Major job sectors/industries**

Besides a large public sector in the region that provides healthcare, education, and other public services (36% of employment), North Jutland's economy is driven by the following industries – trade and transport (19%), mining/quarrying (17%), business services (8%), and building and construction (8%). The region has a strong focus on sustainability and green transition; therefore the energy sector is highly innovative, rapidly growing and becoming one of the largest exporters. Thus, North Jutland has strong expertise in the fields of wind energy, hydrogen fuel cells, biomass, wave energy, energy optimisation, and sustainable construction

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<sup>1</sup> <https://rar-bm.dk/rar-nordjylland/beskaeftigelsespolitik/beskaeftigelsesplaner-i-kommunerne/beskaeftigelsesplaner-i-kommunerne-2022/>

<sup>2</sup> <https://rar-bm.dk/rar-nordjylland/beskaeftigelsespolitik/beskaeftigelsesplaner-i-kommunerne/beskaeftigelsesplaner-i-kommunerne-2022/>

<sup>3</sup> <https://www.agediversity.org/course/older-workers-outdated-skills-and-resistance-to-retraining/>

<sup>4</sup> [https://eures.ec.europa.eu/living-and-working/labour-market-information\\_en](https://eures.ec.europa.eu/living-and-working/labour-market-information_en)

and building.<sup>1</sup>The traditional primary sectors of the economy, such as agriculture, forestry, and fisheries, still employ a relatively large share of the labour force.<sup>2</sup>

The local economy is dominated by SMEs. Most vacancies are oriented towards people who have completed tertiary education.<sup>3</sup> Their need for healthcare specialists, business and IT specialists is increasing every year.

### **Key challenges on the labour market and vulnerable groups**

The Regional Labour Market Council (RAR) has identified an aging population as a major challenge for the North Jutland labour market, as between 2008 and 2020 the working population aged over 50 increased from 33.3% to 46.8%.<sup>4</sup> The second key challenge is the labour market mismatch, resulting from a large pool of low/middle-skilled people and a decreasing number of highly skilled (between 2008 and 2020 the skilled workforce in the region decreased by 5.7%). Based on interviewees, this reflects unwillingness of young people, particularly men, to study, a lack of local vocational education and training options and high attractiveness of other regions/cities.

In the last decade, North Jutland, and Denmark generally, has struggled with employability of youth, given low educational attainment among some of them.<sup>5</sup> A few interviewees argue that a strong social protection system and labour shortages across most sectors disincentivise high investment in education. Despite that, the relationship between the level of education attainment and employability still holds, as in 2022, the employment rate for the less educated in the region was 55.8%, while the employment rate for the highly skilled or those with a tertiary education was 80.7% and 82.1%, respectively.<sup>6,7</sup>

<b>Indicator</b>	<b>Data</b>
Employment rate, 2021 <sup>8</sup>	77.5%

<sup>1</sup> [https://rn.dk/-/media/Rn\\_dk/Regional-Udvikling/REVUS/RegionNordjylland\\_REVUS\\_2015\\_2018\\_engelsk.ashx?la=da](https://rn.dk/-/media/Rn_dk/Regional-Udvikling/REVUS/RegionNordjylland_REVUS_2015_2018_engelsk.ashx?la=da)

<sup>2</sup> [https://rn.dk/-/media/Rn\\_dk/Regional-Udvikling/REVUS/RegionNordjylland\\_REVUS\\_2015\\_2018\\_engelsk.ashx?la=da](https://rn.dk/-/media/Rn_dk/Regional-Udvikling/REVUS/RegionNordjylland_REVUS_2015_2018_engelsk.ashx?la=da)

<sup>3</sup> [https://eures.ec.europa.eu/living-and-working/labour-market-information\\_en](https://eures.ec.europa.eu/living-and-working/labour-market-information_en)

<sup>4</sup> <https://rar-bm.dk/rar-nordjylland/beskaeftigelsespolitik/beskaeftigelsesplaner-i-kommunerne/beskaeftigelsesplaner-i-kommunerne-2022/>

<sup>5</sup> <https://www.cedefop.europa.eu/en/news/denmark-government-combat-youth-unemployment-education>

<sup>6</sup> <https://www.statista.com/statistics/811955/youth-unemployment-rate-in-denmark/>

<sup>7</sup> <https://www.cedefop.europa.eu/en/news/denmark-government-combat-youth-unemployment-education>

<sup>8</sup> The EU average rate of employment in 2021 is 73.2%

Employment in high-tech sectors, 2021 <sup>1</sup>	2.7%
Unemployment rate, 2021 <sup>2</sup>	5%
Youth unemployment rate, 2021 <sup>3</sup>	10.8%
Unemployment rate of males (15 years or over), 2021 <sup>4</sup>	4.7%
Unemployment rate of females (15 years or over), 2021 <sup>5</sup>	5.4%
Unemployment rate among individuals with less than primary, primary and lower secondary education (levels 0-2), 15 years or over, 2021 <sup>6</sup>	7.3%
Unemployment rate among individuals with upper secondary and post-secondary non-tertiary education (levels 3-4), 15 years or over, 2021 <sup>7</sup>	4.9%
Unemployment rate among individuals with tertiary education (levels 5-8), 15 years or over, 2021 <sup>8</sup>	3.7%
Labour market slack, 2021 <sup>9</sup>	10.7%

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

In the last decade, the North Jutland region has paid significant attention to innovation. The RSI indicators show that the region has increased the number of international scientific co-publications, product process innovators, business process innovators, and innovative SMEs

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<sup>1</sup> The EU average of employment in high-tech sectors in 2021 was 4%

<sup>2</sup> The EU average unemployment rate in 2021 was 7.2%

<sup>3</sup> The EU average youth unemployment rate in 2021 is 14.5%

<sup>4</sup> The EU average unemployment rate among males (15 years or over) in 2021 was 7%

<sup>5</sup> The EU average unemployment rate among females (15 years or over) in 2021 was 8.1%

<sup>6</sup> 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%

<sup>7</sup> 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%

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

<sup>9</sup> The EU average labour market slack in 2021 was 14%

collaborating with others. A significant contribution to this result has been made by the energy, maritime and ICT sectors.<sup>1</sup>

The strategy of the local policymakers in North Jutland focused on ensuring high-quality education and on increasing the connectivity and synergies between the local innovation stakeholders. Thus, significant investment has been made in universities, development of technology transfer offices (TTOs) and partnerships between academia/research sector and industries. In view of interviewees, Aalborg University has been the catalyst of innovation and economic development in the region, leading to innovative and inclusive job creation. The University has been contributing to the National Danish Technology Pact (Danish STEM strategy), thereby creating local programmes that focus on promotion and support the development of STEM competences. In addition, Aalborg University has made agreements with the Aalborg PES for the development of upskilling/reskilling programmes for local companies and for the unemployed.<sup>2</sup> In view of interviewees, the collaboration between the regional PES offices, local industries and the University is exceptionally strong, which helps to reduce skills mismatches on the labour market in North Jutland.

The creation of TTOs encouraged innovation in local businesses, provided scientific expertise and different support mechanisms for commercialisation of research findings, acquisition of technology patents and intellectual property rights.<sup>3</sup> Business incubators and other tech hubs, such as BusinessAalborg and Startup café, have contributed to the development of local start-ups and SMEs, thereby increasing innovative job creation. Overall, the university-industry collaborative model of the region has proved very successful. The universities have been attracting young people from other regions, encouraging local young people to undergo education in the region, and then supporting their connection to local industries. This increased availability of skilled labour in the region, stimulated entrepreneurship, job creation and improved the overall reputation of the region.

To support the development of the region, the national policymakers decided to shift several national public administration organisations to the region. Such step has been highly appreciated by the regional policymakers and contributed to attracting more resources to the North Jutland region.

Giving the ambition of Denmark to become a climate leader, significant resources across the country have been devoted to the development of the energy sector. For this purpose, several

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<sup>1</sup> [Hent strategien på engelsk \(PDF-dokument\)](#)

<sup>2</sup> <https://www.en.aau.dk/cooperation/continuing-education>

<sup>3</sup> <https://www.en.aau.dk/cooperation/inventions-technology/technology-transfer-agreement>

energy clusters and hubs have been established. In addition, the regional and national policymakers strongly support the twin transition through various initiatives, such as GRØN.

Green Hub Denmark, a co-operation platform for green business development, has been set up in North Jutland. It strengthens cooperation between new and existing companies and works to attract companies with green ambitions.<sup>1</sup> The Hub offers facilities that enable testing and demonstration of green solutions, supports the development and implementation of green business models, solutions, and technologies.

The good collaboration between the knowledge institutions, companies and the Hub ensures its effectiveness. Additional success factors represent the commitments of the national and regional stakeholders to support the green/green-tech sector. Thus, the activities of the Hub are supported through various national/regional initiatives.

GRØN (Green Resource-Ecosystems North Jutland) is a project that aimed to ensure that North Jutland's SMEs are ready to face future challenges by achieving an industrial symbiosis between the green and the digital. By creating new, greener business models, it is expected that businesses would improve their competitiveness by reducing their resource and energy needs. The project's concrete goals were the following:<sup>2</sup>

- Screening 100 North Jutland SMEs
- Identifying 50 green business models
- Providing 40 counselling, sparring and maturation courses
- Realising at least 10 green business models

The project comes after a recommendation from the Danish Business Promotion Board and was ran by the Network for Sustainable Business Development Northern Denmark and the Centre for Logistics and Cooperation. It ran from November 2020 to December 2022. The project had a total funding of about 12.2 million DKK (1.6 million EUR), with the Denmark's Business Promotion Board, the EU's Regional Fund and the decentralized business promotion funds being the primary funders.<sup>3</sup>

GRØN has been considered effective by its stakeholders, helping to achieve goals of its participants. In addition, the project highlighted that collaboration in innovation increases competitiveness of all participants involved.

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<sup>1</sup> <https://greenhubdenmark.dk/hvad-vi-laver/>

<sup>2</sup> <https://nben.dk/groen>

<sup>3</sup> <https://nben.dk/groen>

The key success factors of the GRØN project are the strong partnerships between the private and public sector actors involved in green economy. The project further strengthened these partnerships by engaging more relevant actors, particularly in the SME community, and increasing commitment to green economy in the region.

In light of remaining skills-related challenges, the Strategy for Regional Development of North Jutland aims to achieve the following by 2025:

- 85% of its working population educated to at least a vocational level;
- At least 33% of students choose to undertake vocational training immediately after 9th or 10th grade;
- Students enrolled in formal continuing or higher education make up 55% of the workforce;
- 20% more people enter a STEM-related higher education locally.

One of the ways it plans to achieve these goals is by capitalizing on the National Danish Technology Pact. The Pact was approved by the Regional Council in 2019 and has been implemented through several successful initiatives.

“LabSTEM Nord+” is a local initiative in North Jutland, launched under the National Danish Technology Pact.<sup>1</sup> LabSTEM Nord+ is implemented by Aalborg University and aims to increase interest in STEM education across the entire education chain by ensuring that children and young people maintain an interest in STEM subjects. This is hoped to be achieved by implementing problem-based learning in basic and higher education.<sup>2</sup>

LabSTEM Nord+ is considered to be a supporting project to the LabSTEM project, based at the University of Southern Denmark. The project received a grant amount of about 1.3 million DKK (176k EUR) and will run from January 2021 until December 2024. So far, the project has involved about eighty teacher and researchers from primary, secondary, and vocational schools, as well as researchers from Aalborg University. The focus of project has been to develop a base of STEM teaching methods as well as developing online STEM teaching courses that can be scaled up or down in terms of complexity to meet the needs of different education levels and ages.

There has been no project evaluation conducted, however, Aalborg University published a paper in 2022 that examined how LabSTEM Nord+ was helping bridge the gender gap in

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<sup>1</sup> <https://rn.dk/regional-udvikling/uddannelse-og-kompetence/teknologipagt/initiativer-2023>

<sup>2</sup> <https://astra.dk/projekter/labstem-nord-problemorienteret-stem-undervisning/>



STEM labs.<sup>1</sup> The paper argues that preliminary findings point to the project being extremely successful in attracting young women to STEM. The case study they used was a biotechnology course, where interviews with students in high school, technical high school and first year university examine the “meaningfulness” of health-related subjects and how this is a large motivator for choosing an education and career in this field. The research paper found that the project has been able to highlight the importance of “meaning” and “exemplarity” when choosing a career. This means that if the gender gap in STEM related careers is to be closed, women should find meaning as well as examples where they can see themselves (other women) in these careers. Moreover, findings and lessons from the LabSTEM Nord+ inform the cross-institutional and co-creation aspects of STEM teaching; The programme is aware that uncovering what is needed to bridge the gender gap in STEM can lead to more overall diversity and inclusion in the fields of STEM, meaning that women are not the only ones who will benefit from this.

Success factors of the project include:

- The project is locally funded and implemented, putting the project in an ideal position to address highly localised barriers to entry in the STEM fields;
- The project helps address the skill mismatch in the region by addressing the low participation in STEM fields despite the high need for them;
- The project aims to have a positive long-term impact on teaching methods by targeting how classes are designed and addressing all levels of education.

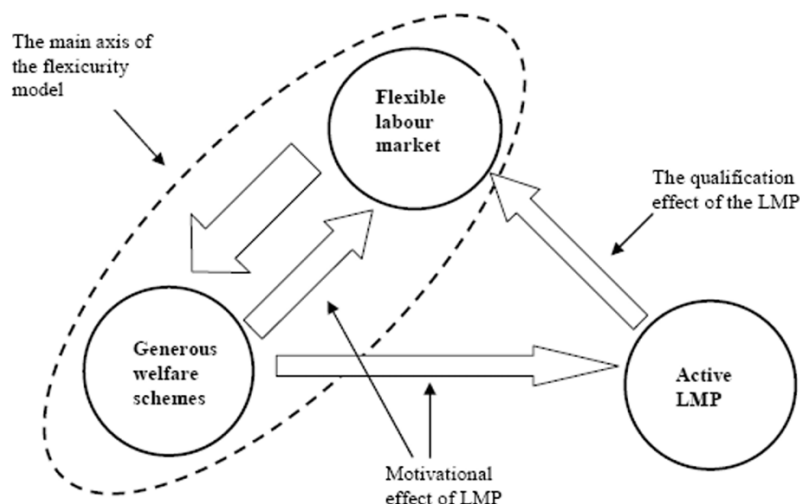
## 4 Policies/instruments to prevent and mitigate job displacement

Approximately 20% of the workforce in Denmark experiences unemployment each year. The PES in North Jutland recognises the job displacement effect, following technological transformation. However, it is relatively effectively addressed through the Danish Employment Policy. The Policy is largely characterized as the “flexicurity model.” The model can be understood as a triangle, with the first side of the triangle consisting of flexible rules for hiring and firing of employees (Figure 1). The second side of the triangle consists of security for employees in the form of a far-reaching social safety net that covers unemployment. Lastly, the active labour market policies (ALMPs) make up the third side of the flexicurity triangle.

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<sup>1</sup> <https://ieeexplore.ieee.org/document/9962400>

**Figure 1 The Danish Flexicurity Model**



Key: LMP = Labour Market Policy

Source: <https://www.oecd.org/employment/leed/40575308.pdf>

The flexicurity model seeks to encourage employment, despite providing extensive social protection. Thus, Denmark is one of the biggest spenders on ALMPs in the world. The ALMPs encompass employment and integration programs, education/training services, sanctions programs (the removal of unemployment benefits due to no longer meeting eligibility criteria), and initiatives for people with disabilities.<sup>1</sup> To avoid abusive practices of the model, Denmark has shifted from a “train-first” to a “work-first” system.<sup>2,3</sup> This shift partially derives from a move to more right-wing, conservative politics. In practice, the new system means that the focus of the ALMPs is no longer on training of the unemployed, but on a rapid return to employment. In fact, Danish people might face punitive measures if they do not accept a job offer while claiming unemployment benefits, regardless of the type of job offered.<sup>4</sup>

The disadvantage of the new system is that in some cases it leads to skill mismatches and puts the burden of training on employers. However, the creation of the new system was considered essential in light of youth unemployment and low educational attainment among youth.<sup>5</sup> Although the underlying causes of this are not known, some interviewees argue that it signals complacency and abuse of the social protection system. Nevertheless, it should be noted that

<sup>1</sup> <https://mpra.ub.uni-muenchen.de/23168/>

<sup>2</sup> <https://journals.sagepub.com/doi/full/10.1177/0950017020935323>

<sup>3</sup> <https://mpra.ub.uni-muenchen.de/23168/>

<sup>4</sup> <https://journals.sagepub.com/doi/full/10.1177/0950017020935323>

<sup>5</sup> <https://ec.europa.eu/social/BlobServlet?docId=13635&langId=en>

the Danish culture strongly supports the idea of the welfare state, social responsibility and the moral obligations that come with it; the most important of these obligations being the obligation to work.<sup>1</sup> Additionally, several interviewees noted that although companies can fire people relatively easily according to the national legislation, due to the strong labour unions this might negatively affect the company's reputation or cause other legal challenges.

An important instrument that incentivises work and prevents abuse of the flexicurity model is considered the unemployment insurance funds, voluntary funds that complement the very basic state benefit known as "kontanthjælp".

The unemployment insurance funds, known as "arbejdsløshedskasse," or simply "a-kasse", is a form of voluntarily social protection to which an individual can contribute. The funds are additional to the basic state unemployment benefit "kontanthjælp." Basic state unemployment benefits are universal cash benefits to all those who lose their jobs and do not have savings or assets amounting to more than 10k DKK (1.3k EUR). Any person with more savings or assets than this must completely rely on their chosen a-kasse to pay out their unemployment benefits.<sup>2</sup>

The funds are managed by private associations of employees or of self-employed individuals who organise themselves with the aim of safeguarding economic support in case of unemployment.<sup>3</sup> A-kasses are also meant to provide career and job search counselling by acting as professional networks. For this reason, many, but not all, a-kasses are profession or sector-based.

Although the insurance funds are private, they are still largely financed by the Danish government.<sup>4</sup> Most of the funds from a-kasses are transferred to the government, but when an individual becomes unemployed, the unemployment benefits are paid out from a-kasses, transferred to them as a refund from the government.<sup>5</sup>

Success factors of a-kasses:

- Private, optional unemployment insurance funds have helped ensure that people who are traditionally excluded from unemployment benefits, such as the self-employed, are also covered;

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<sup>1</sup><https://publishing.cdlib.org/ucpressebooks/view?docId=ft9k4009qs&chunk.id=d0e3848&toc.depth=1&toc.id=d0e3848&brand=ucpress>

<sup>2</sup><https://dm.dk/students/about-dm-and-ma/what-is-an-unemployment-insurance-fund>

<sup>3</sup><https://www.a-kasser.dk/unemployment-insurance/>

<sup>4</sup><https://www.star.dk/en/about-the-danish-agency-for-labour-market-and-recruitment/unemployment-insurance-funds/>

<sup>5</sup><https://www.star.dk/en/about-the-danish-agency-for-labour-market-and-recruitment/unemployment-insurance-funds/>

- A-kasses have been able to provide up to 90% of an unemployed person's original income while also providing job search support, acting as additional support to the PES and ensuring financial stability while unemployed;
- Private unemployment insurance funds are an effective way of extending unemployment benefits to cover instances and individuals that might not be covered by governmental schemes.

In 2007, a major structural reform came into effect that gave municipalities greater autonomy, which provided the local PES with the opportunity to plan and implement employment-related measures according to own strategy, as long as they demonstrate good results.<sup>1</sup> This does not mean that ALMPs in each municipality are different, but that each municipality and job centre can decide how and when a specific ALMP measure will be applied. Such approach has been considered very effective in North Jutland, as it allowed each municipality/area to determine its most vulnerable groups, develop a more coherent and effective local employment strategy and select ALMP instruments that will be prioritised.

In view of youth unemployment and a higher demand for digital and social skills due to technological transformation, several effective programmes have been deployed in North Jutland.

“Uddannelseshjælp” is the programme in Denmark that has been implemented by local jobcentres since 2014. The programme targets NEET by reducing social assistance to a level equivalent to education support and by a new obligation to join education programmes.<sup>2</sup>

The young recipients of “education support” (uddannelsesyndelse) are classified into three groups, depending on their prior educational background and personal characteristics:

- (1) Obviously education-ready (begin education as soon as possible),
- (2) Education-ready (assistance to get ready for education, e.g., courses in basic reading, writing and math, mentor-assistance)
- (3) Activity-ready (participate in activation programs, i.e., “Nytteindsats”).

The programme has been successful, due the following factors:

- Youth are provided tailored education classes, depending on their readiness to undertake education and assessment of their skills;

<sup>1</sup> <https://www.oecd.org/employment/leed/40575308.pdf>

<sup>2</sup> [https://vbn.aau.dk/ws/portalfiles/portal/281826363/WP35\\_Youth\\_employment\\_policies\\_in\\_Denmark.pdf](https://vbn.aau.dk/ws/portalfiles/portal/281826363/WP35_Youth_employment_policies_in_Denmark.pdf)

- The education programmes are focused on providing most relevant skills for the future work, in light of technological transformation;
- The programme obliges young people to undertake education/training, thereby increasing probability of their long-term employability.

Youth Education Guide Aalborg (Ungdommens uddannelsesvejledning) is the programme in North Jutland that focuses on encouraging further education and employment by helping students (between the ages of 12 and 24) to identify the most suitable education and professional path for them.<sup>1</sup>

The programme is delivered by the Job and Education Department of the Aalborg municipality. It includes promotion of education and employment across schools, assistance in finding an internship or a job, and it offers educational guidance and free training (preparatory basic education and specialized youth education).

The programme has been considered successful, due to its focus on increasing the motivation of young people to enter education/employment based in their personal strengths and professional ambitions. In addition, the success has been ensured due to strong cooperation with the school's teachers and parents throughout the training and guidance process. Lastly, each student received a supervisor that resulted in an individualized and long-term support.

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

In view of increasing technology adoption in the region and labour shortages, technological transformation is a dominant effect on the labour market. As a country, Denmark has a strong tradition of tripartite co-operation between trade unions, employers' organisations and the government, which stimulates a productive dialogue between employers and employees, ensuring decent working/employment conditions during job transformation.<sup>2</sup> This has meant that the Danish labour market has regularly relied upon tripartite agreements and not on state regulation of working, employment conditions. The culture of mediation and collaboration has been supporting the dialogue, effective identification of challenges and the co-design of solutions by all social partners involved. This has ensured that technological transformation

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<sup>1</sup> <https://uu-aalborg.dk/>

<sup>2</sup> <https://www.oecd.org/employment/leed/40575308.pdf>

has not disrupted the workplaces, health and safety of employees and employers in most Danish companies in North Jutland.

To illustrate, given the shortage of workers, the employers' and employees' organisations agreed to allow students between the age of 13 and 17 to be engaged in part-time work.<sup>1,2</sup> In addition, in Denmark the early retirement scheme has been reformed several times (in 1999, 2006, and 2011).<sup>3</sup> Each reform has made eligibility for early retirement more restrictive.

Overall, employers in North Jutland try to make workplaces comfortable and pleasant to ensure job satisfaction, greater productivity and to stimulate higher retention rate, given labour shortages. A few interviewees noted that technological transformation in the region has been faced by opposition in some organisations, as employees were afraid of negative impacts on workplaces and of job displacement. To tackle this, employers have been investing in training for employees that will highlight the benefits of technologies for work. In most cases, such strategy seemed to lead to more positive attitudes towards new technologies.

It has also been highlighted by interviewees that municipal PES maintain good relationships with local businesses, which ensures that employers receive significant support during job transformation. PES employees regularly do field visits to companies/organisations to discuss with them what jobs are currently available and what skills are needed to fulfil these jobs. If there are job vacancies, the PES employees try to find a suitable match or suggest upskilling/reskilling activities. New employees typically have a testing period during which an employer decides if an organisation should keep a new staff member or not. If the new employee cannot manage tasks effectively, the PES will support both the employers and employees until the match is found. Alternatively, PES finances the development of the new training, designed by education institutions (such as Aalborg University), to provide courses where necessary skills can be acquired.

“Growth through Knowledge” is a programme, implemented in the North Jutland region between 2016 and 2020.<sup>4</sup> The aim of the programme was to incite growth and employment in North Jutland companies by providing a bigger supply of highly skilled labour. This was done by matching graduating students with companies, with the support of PES. A precondition of this matching was that the graduate’s skills must support the company’s growth ambitions.

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<sup>1</sup> <https://www.thelocal.dk/20230202/how-many-teenagers-work-part-time-in-denmark-and-what-jobs-do-they-have>

<sup>2</sup> <https://businessindenmark.virk.dk/guidance/employment-and-dismissal/working-hours/>

<sup>3</sup> <https://www.ceps.eu/ceps-publications/extending-working-lives-case-denmark/>

<sup>4</sup> <https://kohesio.acceptance.ec.europa.eu/en/projects/Q2100888>

The graduates followed an eight-week internship and then were employed for at least four months. Their wages were subsidised by the programme's funds. In total, 98 graduates participated in the programme, most of which received long-term contracts following the programme. In the coming two years, it is expected that the programme will create at least 175 new jobs.

Success factors of the programme included:

- Close relationships between local PES and businesses to ensure the match;
- The costs for business were minimised through subsidised wages.

## 6 Lessons learned

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

- The strategy that focuses on ensuring high-quality education and on increasing the connectivity and synergies between the local innovation stakeholders is considered effective for stimulating technological transformation and job creation. In addition, selecting a central actor that will drive the local ecosystem is also advantageous, especially if the innovation ecosystem is small.
- In view of limited resource, especially in peripheral regions, it is essential to focus on specific sectors (i.e., green/energy sector) that will drive innovation and business ecosystem;
- Collaborative culture in a region/country is critical for doing business and innovation. It facilitates negotiations at all levels and allows to identify solutions even without direct government interference/control.
- TTOs, clusters and business hubs are critical actors for stimulating academic-industry linkages and for driving innovation in new sectors.
- The synergies between the digital and green sector for Twin transition can produce benefits for several sectors, industries simultaneously.
- The transformation of the education/training sector is necessary in case of labour and skills shortages.

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

- A delicate balance is needed between the AMPL and PLMP policies to ensure high employment, low unemployment and to reduce labour market mismatches.
- The flexicurity model can be effective, however, it is essential to stimulate a culture of social responsibility, collaboration and to provide significant upskilling/reskilling support for the unemployed.

- A greater autonomy of municipalities in planning and implementation of employment-related measures may be effective, as it is tailored to the labour market challenges of a specific location.
- The problem of youth unemployment requires a comprehensive approach that will focus on increasing the motivation of young people to participate in education and training and ensures relevance of their knowledge/skills for the labour market. To achieve this, it is critical to help young people identify their personal strengths and career aspirations, and then provide a tailored training and guidance that will involve schools and parents.

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

- Effective tripartite co-operation between trade unions, employers' organisations and the government stimulates the development of a collaborative culture and allows to address challenges in a cooperative manner. The latter leads to more positive outcomes for both employers and employees.
- Employers that are responsive to the needs, challenges and concerns of their employees observe greater job satisfaction, productivity and retention rate. Awareness raising and trainings are effective instruments in support of employees during job transformation.
- The PES should develop strong and lasting relations with employers to support them during job transformation.