



Aviation Manufacturing

NESsT Empowers Industry Profile

About the Research

High-growth industries of Poland – including the manufacturing, aviation, food processing, logistics and warehouse market, nursing and long-term care, and retail industries – will create thousands of jobs in the next five years. Many of the available positions in these industries provide dignified employment, yet do not require a university degree or long-term experience. Is this an opportunity for labour inclusion of underserved communities? NESsT believes it is.

NESsT conducted the following research as part of its NESsT Empowers initiative, which tackles the lack of quality, skilled jobs available for under-served communities in emerging market countries. The NESsT Empowers program invests in social enterprises that prepare people from these communities for dignified employment. Read all the NESsT Empowers industry profiles, at www.nesst.org/nesst-empowers-poland.

CREDITS

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Industry Characteristics

The aviation manufacturing industry develops in line with the dynamic growth of the air transportation sector globally. Seen as one of the sectors with the biggest potential to grow in Poland, it produces light aircrafts and gliders, provides plane services, and supplies the world's biggest passengers and military aircraft producers.

The projected growth of the Polish aviation industry is based on (1) the global aviation development trend, (2) the plans to modernise the Polish army, (3) European Union donations (Euro 8.6 billion / USD10 billion by 2020), aiming to increase the Polish companies' innovation and competitiveness,¹ and (4) the government incentives for the Special Economic Zones.

SPECIAL ECONOMIC ZONE

According to the World Bank, "the principles incorporated in the basic concept of a special economic zone include:

- Geographically delimited area, usually physically secured (fenced-in)
- Single management/administration
- Eligibility for benefits based upon physical location within the zone
- Separate customs area (duty-free benefits) and streamlined procedures."²

¹ Polish Investment and Trade Agency, Aerospace sector, 2015: www.paih.gov.pl.

² The World Bank Group, *Special Economic Zones: Performance, Lessons Learned, and Implications for Zone Development*, 2008: www.documents.worldbank.org.

To learn more on regulations regarding Special Economic Zones in Poland, see *Tax and legal aspects of the functioning of the Special Economic Zones in Poland by TAAC Solutions for the Polish Investment and Trade Agency*, 2017: www.paih.gov.pl.

The industry is competitive in terms of product quality – constantly investing in research and development – and labour costs. Polish companies take part in innovative international projects, in space missions and European Space Agency's programs. The National Centre for Research and Development (NCBiR) supports their research activities and allocated PLN 314 billion (USD 88 billion) to the aviation industry between 2014 and 2017.³

In 2015, Poland exported aircrafts, spacecraft and components to USA, Ukraine, Australia, Italy and Great Britain (total exports value: PLN 3.3 billion / USD 0.9 billion).⁴ The value of the total sold production was of PLN 6.7 billion (USD 1.9 billion) in 2016 and PLN 3.6 billion (USD 1 billion) in the first half of 2017,⁵ increased values in comparison to 2015.

The aviation manufacturing facilities are located in several voivodships: Pomorskie, Kujawsko-Pomorskie, Wielkopolskie, Mazowieckie, Dolnośląskie, Śląskie, Małopolskie, Podkarpackie, Lubelskie i Łódzkie. But most of the aviation facilities are in south-eastern Poland, in Podkarpackie (cities of Dębica, Tarnowiec, Krosno, Rzeszów, Stalowa Wola, Mielec and Tomaszów Lubelski). With 80 years of aviation industry history, Podkarpackie currently concentrates 90% of the national aviation production and is well positioned to continue attracting new investments given the region's competitive labour costs and incentives for investors.

³ Polish Investment and Trade Agency, Aerospace sector, 2015: www.paih.gov.pl.

⁴ Central Statistical Office, Yearbook of Foreign Trade, 2016: www.stat.gov.pl.

⁵ Central Statistical Office, Industry Outlays and Results in 2016: www.stat.gov.pl.
Central Statistical Office, Industry Outlays and Results in 1st and 11nd quarter of 2017: www.stat.gov.pl.

MAIN PLAYERS

Aviation companies collaborate under industry associations and clusters. The biggest aviation manufacturers are owned by foreign corporations, as Pratt & Whitney, UTC Aerospace Systems or Airbus Defence and Space Company.

Table 1. Main Industry Players Operating in Podkarpackie⁶

Company Name	Location in Poland
Pratt and Whitney Rzeszów	Rzeszów – a facility launched in 1937 as national manufacturer, owned by United Technologies Corporation since 2002
Lockheed Martin	Mielec – a facility launched as national manufacturer in 1938, later PZL Mielec, by 2015 Sikorsky Aircraft, currently owned by Lockheed Martin
MTU Aero Engines	Jasionka - launched in 2009
UTC Aerospace Systems	Krosno, Tajęcin - earlier Goodrich Corporations; facility in Krosno launched in 1996, facility in Tajęcin launched in 2012
Safran Transmission Systems Poland	Sędziszów Małopolski - earlier Hispano Suiza Polska; facility launched in 2001
Thoni Alutec	Stalowa Wola

⁶ Rzeszów Regional Agency of Development, Center of Services for Investors: www.coi.rzeszow.pl/pl/dlaczego-podkarpackie/inwestycje-na-podkarpaciu/ (access November 2017).

JLL, Polish Information and Foreign Investment Agency, EY, Hays. Made in Poland. An Investment Guide for Manufacturing Sector Companies, 2016: www.made-in-poland.live.jll.com.



NEW INVESTMENTS

According to a 2017 global PwC study, Poland holds the 26th place on the list of world's most attractive locations for aerospace manufacturing investments.⁷ In early 2017, Aero Gearbox International (AGI), a venture of Safran Transmission Systems Poland and Rolls Roys, opened its factory in Ropczyce, Podkarpackie,⁸ investing PLN 250 mln / USD 70 mln and expecting to employ 200 persons.

In 2016 Pratt and Whitney opened its R&D centre in Rzeszów, investing PLN 213 mln / USD 60 mln (mostly co-financed with European funds). Airbus plans to invest PLN 840 mln / USD 245 mln in research and development and in its facilities in Warsaw, Mielec (existing ones), Łódź and Radom (new ones). GE Aviation, UTC Aerospace Systems,⁹ MTU Aero Engines also invested recently in Poland.

⁷ PwC, 2017 Aerospace Manufacturing Attractiveness Ranking 2017: www.pwc.com

⁸ Portalsamorzadowy.pl, Zakład lotniczy Aero Gearbox International w Ropczycach: www.portalsamorzadowy.pl/serwis/top-inwestycje-polski-wschodniej-2017/nominacje/zaklad-lotniczy-aero-gearbox-international-w-ropczycach,96443.html (access November 2017).

⁹ Nowiny 24, Bartosz Gubernat, Budują podwozia do samolotów. UTC Aerospace Systems zatrudni jeszcze 150 osób: www.nowiny24.pl/wiadomosci/rzeszow/art/6172921,buduja-podwozia-do-samolotow-utc-aerospace-systems-zatrudni-jeszcze-150-osob,id,t.html (access November 2017)

Employment Opportunities

The air and spacecraft manufacturing employed 14,000 people in 2016, increasing by mid-2017 to 15,000 people which is 0.7% of all manufacturing workers¹⁰ (these figures exclude the jobs in the components manufacturing and service provision to aircrafts). Overall, the broad aviation sector in Poland employs around 30,000 people – 27,000 in southeast Poland, mostly in the Podkarpackie region.

Engineers are the most demanded profession in this industry. While unemployment rates in Podkarpackie are among the highest in Poland, aviation employers suffer from shortages of technical engineers.¹¹ According to recruitment experts, companies located in Podkarpackie have to compete for qualified candidates with the new aviation manufacturing investments in Dolnośląskie that are attracting talent with higher salaries.

Also, in a broader perspective, while renowned Polish technology universities, including Technology University in Rzeszów, provide students with high-quality education in engineering, the aviation companies from Poland compete with other European labour markets, where the salaries are higher.

The manufacturing companies in the aviation sector also search for candidates with vocational level of education, for positions under occupied, such as cutting machine operators, welders, locksmiths and lathe operators.¹² In the first half of 2017, the Regional Labour Office of Podkarpackie, registered over 11.2 thousand vacancies for manufacturing workers and tailors, fitters and operators of machines and devices, as well as workers fulfilling simple tasks, also in the aviation industry.¹³ For entry-level positions in manufacturing, many employers are open to candidates with no professional experience, training them after employment.

As vocational education is a minimum requirement for entry-level positions, the companies collaborate with technical schools: organising together job fairs for students and offering internships for the best. In the recent years, there is an increasing trend of employing economic migrants for such positions – with the majority coming from Ukraine – as the Labour Office representative noticed, until recently they were only filling the lower skilled positions, with no qualifications needed, while now they fill in jobs with vocational level of education, especially as welders.

¹⁰ Central Statistical Office, *Industry Outlays and Results in 2016*: www.stat.gov.pl.

Central Statistical Office, *Industry Outlays and Results in 1st and 1st quarter of 2017*: www.stat.gov.pl.

¹¹ Regional Labour Office in Cracow, *Barometer of Professions Report for Poland, 2017*: www.barometrzawodow.pl.

¹² Regional Labour Office in Cracow and Regional Labour Office in Rzeszów, *Barometer of Professions Report for Podkarpackie Voivodship, 2017*: www.barometrzawodow.pl.

¹³ Regional Labour Office of Podkarpackie, *Analiza sytuacji na rynku pracy w województwie podkarpackim w pierwszym półroczu 2017 r.*, 2017: www.wuprzeszow.praca.gov.pl.

Table 2. The Most Common Positions in the Aviation Industry

Position	Responsibilities	Qualifications	Experience
Fitter of aircraft engineer	<ul style="list-style-type: none"> • Assembly and dismantling of aircraft engine components and whole engines • Review of components • Measurement and calculation 	<ul style="list-style-type: none"> • Vocational education • Understanding of technical drawing • Ability to use basic measuring tools • Time flexibility – three shifts system • Teamwork 	No experience needed
CNC and conventional cutting machine operator / locksmith	<ul style="list-style-type: none"> • Conducting technical operations on cutting machines • Measurement • Collecting data 	<ul style="list-style-type: none"> • Secondary technical education • Knowledge of lathe, milling and baling machines operations • Use of measurement tools • Understanding of technical documentation • Basic use of computers • Teamwork • Time flexibility 	Work experience -an advantage.
TIG (Tungsten Inert Gas) Welder	<ul style="list-style-type: none"> • Preparation of elements to welding, welding, initial standard control • Observance of quality, safety and ethical standards 	<ul style="list-style-type: none"> • Basic knowledge of welding processes and metal materials • Good knowledge of technical drawing 	Two years of experience.
Chassis dynamometer operator	<ul style="list-style-type: none"> • Preparing engines for testing • Conducting the tests • Dismantling engines from dynamometer after tests • Replacement of engine parts • Collaboration with other departments • Maintenance of work station 	<ul style="list-style-type: none"> • Secondary education (automotive, electronics, aviation or similar) • Practical and theoretical knowledge on engine testing • Understanding of technical drawing • Ability to use basic measuring tools • Manual skills • English language A2 minimum • Communication and interpersonal skills • Motivation to learn • Concession or license requirements: must be over 21 years, have no criminal record and have positive psychological tests results 	Two years of experience (as fitter in automotive or similar manufacturing industry). Employers also consider technical schools graduates; experience with aircraft engines as an advantage.

Position	Responsibilities	Qualifications	Experience
Shift Leader	<ul style="list-style-type: none"> • Coordination, management and supervision of teams • Assessment and reporting of the team members' performance • Implementation of the production plans • Collaboration with other departments 	<ul style="list-style-type: none"> • Higher level of education from technological university • Knowledge on metal processing • Excellent understanding of technical drawing and documentation • English skills • Communication, teamwork and leadership skills • Time flexibility 	Two years of experience as shift leader
Designer/constructor	<ul style="list-style-type: none"> • Product adjustments and improvements • Collaboration with other departments and suppliers • Reporting 	<ul style="list-style-type: none"> • Higher level of education from technological university • English minimum B2 level • Excellent knowledge of design computer programs (e.g. Catia) • Understanding of technical documentation • Interpersonal and communication skills • Analytical and IT skills • Concession or license requirements: must be over 21 years, have no criminal record and have positive psychological tests results 	2-5 years in the design department of an aviation manufacturing facility.
Facility Manager / Technical Coordinator	<ul style="list-style-type: none"> • Management, maintenance and supervision of plant buildings • Collecting documentation • Ensuring compliance with national and corporate regulations and standards regarding production facility • Coordination of relations with suppliers and subcontractors • Responsible for the business performance of the plant • Occupational safety 	<ul style="list-style-type: none"> • Higher level of education from technological university • Entrepreneurial and leadership skills • Teamwork and communication skills • Use of MS Office and technical programs (e.g. AutoCAD) • English minimum B2 level 	Experience at facility management

Source: NESsT, analysis based on the review of the job offers published by the leading aviation companies from Podkarpackie

WORK CONDITIONS IN THE AVIATION INDUSTRY

The employees in the aviation manufacturing industry receive permanent contracts and benefits, such as private healthcare or additional life insurance. Many companies offer individually-tailored professional development opportunities, such as Pratt and Whitney's Scholar training program, internship programs for people interested in starting an aviation carrier or free of charge English classes.

According to the Central Statistical Office data, in 2016 the average national monthly salary in the aircraft and space ship manufacturing industry was PLN 5,580 gross (USD 1,560);¹⁴ Sedlak & Sedlak 2016 estimated the earnings in the aviation industry of Podkarpackie to be PLN 5,100 gross (USD 1,425) in Rzeszów and PLN 3,650 (USD 1,020) in Mielec.¹⁵ According to the Central Statistical Office data, the average earnings in Podkarpackie are PLN 3,836 gross (USD 1,070). Only in Warmińsko-Mazurskie is the average salary lower.¹⁶ However, considering the variety of the positions in the industry, with different levels of education and experience, the earnings vary widely. While the salaries of low-grade manufacturing workers are closer to the minimum wage (PLN 2,000 / USD 560 gross), the production managers' and plant managers' salaries start from PLN 10,000 / USD 2,800 gross.¹⁷

¹⁴ Central Statistical Office, *Industry Outlays and Results in 2016*, www.stat.gov.pl.

¹⁵ Sedlak & Sedlak, Karolina Jurczak, *Wynagrodzenia w przemyśle lotniczym w 2016 roku*: <https://wynagrodzenia.pl/artukul/wynagrodzenia-w-przemysle-lotniczym-w-2016-roku> (January 2018).

¹⁶ Central Statistical Office, *Zatrudnienie i wynagrodzenia w gospodarce narodowej w 2016, 2017*: www.stat.gov.pl

¹⁷ Hays, *Raport Płacowy 2017. Trendy na rynku pracy*: www.hays.pl.

MARGINALISED GROUPS

According to the Regional Labour Office in Rzeszów statistics, there were 92,000 unemployed people registered at the end of June 2017, out of which 62,000 were registered in the first half of 2017 (9,500 people registered for the first time and 53,500 registered again). In the same period around 40,000 people were excluded from the Labour Office register, as they undertook a new job. Over 30% of all unemployed people were in the age range of 25-34 – the biggest unemployment rate among age groups. Almost 30% of them were graduates of basic vocational schools.¹⁸ And the third most common occupations of unemployed people is locksmiths – 2,200 people (only 200 of them are under 30, while 40% over 50 years old¹⁹).

On the other hand, the aviation industry is one of the sectors that needed the highest number of employees in Podkarpackie - the vacancies registered for CNC operators, operators of the automatized production line, locksmiths and welders amounted to 2,000 in the first half of 2017.²⁰ Based on the analysed data and NESsT interviews with labour market experts, the aviation industry creates jobs well suited for young people with no professional experience (entry-level positions), and also for at-risk young people and people over 50 who are not interested in searching for jobs abroad. The most needed candidates are the ones that have reached a vocational level in technical education.

The research does not identify any social enterprise providing jobs or skills for the aviation industry. People

¹⁸ Regional Labour Office in Rzeszów, 2017, *Analiza sytuacji na rynku pracy w województwie podkarpackim w I półroczu 2017 r.*: www.wuprzeszow.praca.gov.pl.

¹⁹ Regional Labour Office in Rzeszów, 2017, *Ranking zawodów deficytowych i nadwyżkowych w województwie podkarpackim w I półroczu 2017 r.*: www.wuprzeszow.praca.gov.pl.

²⁰ Regional Labour Office in Rzeszów, 2017, *Ranking zawodów deficytowych i nadwyżkowych w województwie podkarpackim w I półroczu 2017 r.*: www.wuprzeszow.praca.gov.pl.



are usually gaining needed skills and qualifications in the public education systems or directly in the companies, after employment – also because of the use of specialised, expensive machines. However, there are some examples of private training companies, providing training individually and on demand (i.e. CNC Modern in Rzeszów, training machine's operators and

programmers). Furthermore, besides the hard skills, employers are still searching for candidates with soft skills, especially team work, a crucial success element on the production line. Social enterprises, experienced at working with underserved groups, could be well fitted to answer this need, by providing training programs targeting the soft skills as well.

Summary

- The aviation manufacturing industry in Poland is projected to grow in the next years, especially in southeast Poland, where the biggest industry clusters and manufacturing facilities are located.
- The sector of aviation manufacturing offers a variety of positions, with no expected experience for entry-level jobs, while providing professional development opportunities – appropriate for at-risk youth and persons marginalized in the labour market.
- A secondary education is a minimum requirement for lower-skill positions in aviation manufacturing. Technical skills, such as understanding technical drawings, are also needed to secure a job in the sector.
- Due to qualified candidate shortages, employers from the aviation manufacturing industry are more often employing migrants, with a vocational level of education, of whom the majority come from Ukraine.





ABOUT NESsT

NESsT has been working for 20 years to provide dignified employment to lift people out of poverty in emerging markets. NESsT achieves its mission by raising philanthropic capital to invest in and develop social enterprises that create employment and viable income opportunities for the poorest communities facing isolation, discrimination, lack of job skills and poor education. To date, NESsT has invited 176 social enterprises to enter its portfolio providing them with an average of four years of support and investing more than USD 14 million in capacity building and direct funding. Through this investment, NESsT has contributed to creating more than 49,000 dignified employment and sustainable income opportunities.

SUPPORT

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