POLAND

MARKET OPPORTUNITIES

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1 COUNTRY PROFILE

Largest economy in Central & Eastern Europe with impressive GDP growth since 1990s

- Key player in EU policies related to Eastern Europe, especially Ukraine and Russia
- 5th largest country in the EU by population
- The largest consumer market by value in Central & Eastern Europe (CEE)
- 32 years of GDP growth since 1992 (except in 2020 (-2.5 %) due to covid pandemic)
- EU member since 2004, NATO member since 1999

Total area: 120,733 square miles (three times the area of Virginia)
Population: 38 million
Government type: Parliamentary democracy
Language: Polish (official)
Capital + major cities: Warsaw (1.8 million) + Krakow (802,000), Lodz (664,000)
Currency: Polish zloty (PLN), 2024: average annual exchange rate – PLN 3.981 per USD 1

cia.gov, The World Factbook

Poland stands out as one of the most successful and open transition economies in the CEE region. Privatization of small and medium-size firms in the early 1990s and liberal law on establishing new firms led to the rapid development of a private sector, now accounting for 83% contribution to Poland's GDP.

The country performed well during the last decade with the real GDP growth rate generally exceeding 3-4%. When the recession triggered by the Covid pandemic hit in 2020, Poland recorded one of the shallowest GDP declines in the EU (down by only 2.5%) followed by a growth rate of 6.9% in 2021 and 5.6% in 2022, slowing down to 0.2% in 2023 as a result of the global consequences of the Russian aggression in Ukraine and the sharp rise in prices. Poland then returned to solid growth reaching 2.9% in 2024. The country's high competitiveness, market resilience, economic diversification, and good fiscal policy should ensure growth in the forthcoming years.

Economic growth in Poland is set to remain robust in 2025 and 2026, supported by strong private consumption and investment; real disposable income continues to rise robustly, while investment growth is set to pick up strongly mainly due to higher EU-funded public investment.

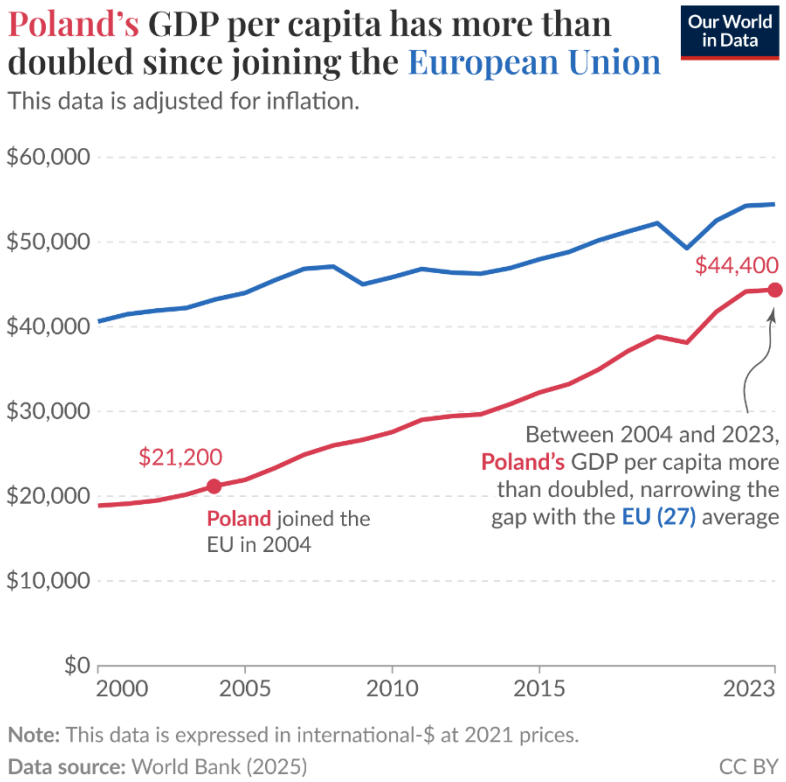
Key economic indicators, Poland

GDP nominal	USD 979.96 billion
GDP growth	2024: 2.9% 2025: 3.3% (est.) 2026: 3.0% (est.)
GDP per capita PPP (worldwide ranking)	USD 55,186 (37th)
Inflation	2024: 3.7% 2025: 3.6% (est.) 2026: 2.8% (est.)
Unemployment	2.8% (2025)

Source: Eurostat, 2025

The Polish economy structure has changed dramatically over the last 30 years. The service sector has gained importance, and the significance of industry diminished. The changes resulted from a dynamic development of the service sector and profound restructuring of ineffective national industrial companies in the 1990s. The process was accompanied by the development of modern industrial sectors, largely driven by strong inflow of foreign investment. The leading sectors in Poland are the food & beverage industry, automotive, chemicals and pharmaceuticals, electronics, ICT, mechanical engineering, and furniture.

A targeted selection of the top sectors that present export opportunities for US exporters is presented in this dedicated VEDP report, with the sectors presented in alphabetical order.



2 ROUTE TO MARKET

This document maps seven sectors that present specific market opportunities for Virginia exporters. However, business potential is much broader. The Polish economy is highly diversified with **opportunities for all exporters who offer strong and unique selling points.**

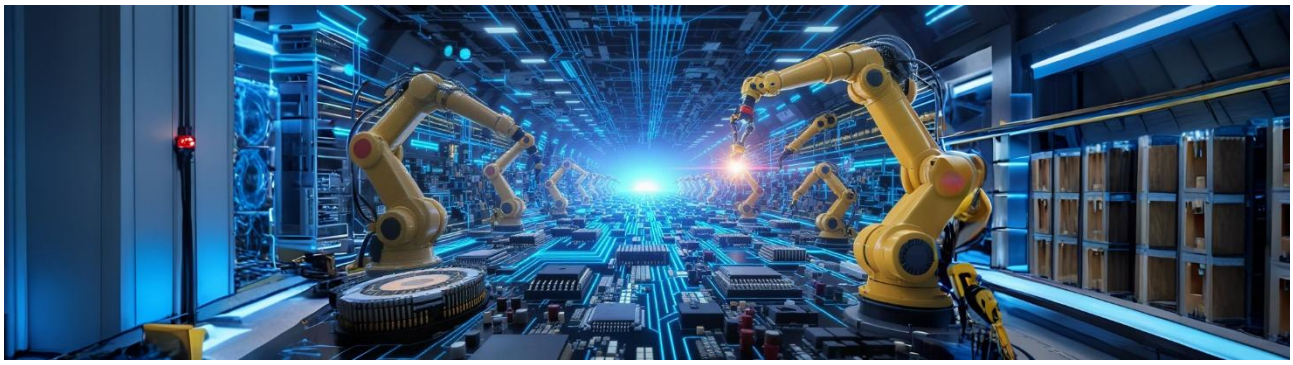
Poland is a member of the EU, OECD, and WTO, and applies all international regulations from those bodies. US companies can apply the same business principles as when entering any other EU market.

US companies can gain access to the Polish market via multiple channels – direct sales to end-customers, appointing a distributor, setting up own subsidiary or representative office, acquiring an existing market player, or appoint a sales agent (not very common in Polish market).

Having local presence through partners, distributors or reps with command of Polish language and local business connections brings a major advantage for US exporters. Local contractors and suppliers with daily operations in the market, access to information and contacts with decision makers can better identify and respond to business opportunities.

3 TARGET SECTORS

3.1 ADVANCED MANUFACTURING



Poland is a significant European manufacturing hub across many industries, which brings opportunities for US suppliers of a wide range of components, technologies, measurement and control systems, and services.

Poland – strong manufacturing base in the EU

Sector	Strengths
Aerospace	17,900 people employed in aerospace manufacturing and 98,400 in related machinery and equipment manufacturing; directly contributing around 0.5% to Poland's GDP; almost every passenger aircraft in the world features at least one component produced in Poland. The Aviation Valley, a cluster in southeastern Poland with nearly 160 entities, has become a prime location in Central Europe for development and fulfillment of aerospace projects thanks to its concentration of aerospace production, research, educational and training facilities. Key technologies being developed involve metal 3D printing of components, innovative solutions in engines and aircraft transmissions, and engine control software. The world's five largest manufacturers of aircraft engines have placed production capacity in Poland.
Automotive	Generating over 8% of GDP and 13.5% of exports, directly employing 213,000 people; for long Poland has been treated as a low-cost base, but now the transformation of the sector demands a technological leap; major manufacturing hub for vehicle components and passenger cars; electric vehicle batteries, engines and transmissions, buses, auto parts and accessories (brakes, suspension systems, wiring harnesses); in 2024, 332,043 vehicles were produced (up 7.6% year-on-year) by Stellantis plant in Tychy (electric Jeep Avenger), Volkswagen in Poznań and Września (Caddy and Crafter models) and Toyota in Jelcz-Laskowice and Wałbrzych (production of hybrid drives)
Building materials	Generating 6% of Poland's GDP, this sector directly and indirectly employs over 400,000 people. Polish companies are global leaders in the production and export of key materials such as windows, doors, ceramic tiles, and cement. The industry's competitiveness is fueled by innovation, especially in sustainable solutions, and by growth in foreign markets, with exports nearly doubling over the last decade.
Chemical & pharmaceutical	Contributes over 7% to Poland's GDP, accounts for 12% of the total manufacturing sector – pharmaceuticals, paints, adhesives, coatings, cosmetics and personal care products, fertilizers

Electrical and electronics	Estimated at 2-5% of GDP including the manufacturing of electronic and electrical products, parts and components; high share of FDI; very strong in electronics manufacturing services (EMS), major producer of TV sets (16 million annually), a European leader in production of household appliances, of cables and wiring systems, electronic components and PCBs, LED lighting systems, consumer electronics assembly, control systems and sensors, computer and server parts
Food and beverage processo	Major EU food producer with robust processing equipment sector; food processing accounts for over 9% of Poland's GDP
Furniture	The furniture sector accounts for about 2.3% of Poland's GDP, which is the highest share among EU countries in this industry; employing around 210,000 people, making it the EU's largest furniture manufacturing workforce; 6th in furniture manufacturing globally; strong in office and home furniture, upholstered products, wood-based panels and components
Machinery	Employing around 143,300 people; machine tools, industrial automation systems, mining and construction machinery, agricultural machinery (tractors, harvesters), HVAC equipment (air conditioners, boilers)
Medical devices	Poland serves as a regional hub for medical device manufacturing and distribution in Central and Eastern Europe, often used as a pilot market for introducing medical devices before broader regional deployment
Metallurgy and metal products	6th largest fabricated metal manufacturing sector in Europe; historically strong in steel and non-ferrous metal manufacturing - steel and aluminum products, castings and forgings, industrial fasteners, metal structures and construction components
Plastics	Employing over 220,000 people; the plastics and rubber products manufacturing sector contributes 7.7% to total industry employment; production of plastics, rubber, and polymers; the Polish industry processes more plastics than the other Central European countries combined

This strong and broad industrial base and increasing demand for innovation and digitalization drive demand for advanced manufacturing technologies and solutions.

Robotics and automation

Poland's relatively low level of robotization presents business opportunity for qualified suppliers as robotics and automation will be crucial for Polish industrial sectors to remain competitive. In 2023, Poland ranked 28th globally with 78 robots per 10,000 workers, significantly below the global average of 162 and EU average of 219 (world's highest). In 2023, 2,685 new robots were installed in Poland, down by 15% year-on-year and returning to the 2018 level.

According to Eurostat, in 2022, 10.75% of manufacturing companies in Poland used industrial robots, which was below the EU average of 16.28%.

Opportunities exist for US suppliers of industrial robots, control systems, and smart factory solutions (e.g., IoT, AI, predictive maintenance), especially in automotive, aerospace, electronics, and food processing.

Networking and industry contacts
Industry 4.0 - Modern Industry Portal (przemysl-40.pl)
Automation and computerization of industry, new production technologies (3D printing, VR, collaborative robots), IT/communication solutions (Cloud Computing, Big Data, IoT) and enterprise management

Polish Automation and Robotics Forum (fairp.pl)
Popularizing implementation of automation and robotization processes in Poland

AI

In 2024, 13.5% of EU enterprises with 10 or more employees and self-employed persons used AI technologies In Poland the share reached only 5.9%, which was one of the lowest in the EU – alongside Romania (3.07%) and Bulgaria (6.47%). The highest share was recorded in Denmark (27.58%), followed by Sweden (25.09%), and Belgium (24.71%).

Additive Manufacturing (3D Printing)

Interest in using 3D printing for rapid prototyping and custom parts is seen especially in the automotive and aerospace sectors, with demand for suppliers of 3D printers, materials, and software.

According to 3D printing Journal, the adoption of additive manufacturing technology in Poland has not been as widespread as in neighboring countries (e.g. the Czech Republic), which is attributed to technological conservatism. The domestic industrial machines market is sizeable, but traditional manufacturing technologies such as milling, injection molding, and casting have been preferred.

Top Opportunities for US Exporters

Poland's advanced manufacturing sector is growing rapidly, driven by defense modernization, EU strategic policies, and digital transformation. Opportunities exist for US exporters offering cutting-edge manufacturing technologies, materials, and digital solutions, robotics, automation solutions, and manufacturing process technologies to support capacity expansion and modernization efforts.

- **Advanced manufacturing** technologies: Key players in the defense sector such as PGZ (Polish Armaments Group), Mesko, Huta Stalowa Wola (HSW), and WB Group are investing heavily in advanced manufacturing technologies, including 3D printing, friction stir welding, additive manufacturing, and automation to boost efficiency and innovation.
- **Dual-Use Technologies and High-Tech Security Products**: Poland is a growing hub for dual-use goods—technologies applicable to both civilian and military markets - such as cybersecurity tools, AI applications, sensors, and unmanned systems.
- **Advanced Materials and Components**: Demand for high-performance materials, precision metal components, and electronics is rising sharply due to Poland's defense modernization and EU security policy shifts favoring intra-EU production (SAFE program). US suppliers of advanced alloys, composites, precision machining, and control systems have strong market potential.
- **Industry 4.0 and Smart Manufacturing**: Poland is embracing Industry 4.0 technologies such as IoT, digital twins, AI-driven quality control, and predictive maintenance in manufacturing plants, especially in defense and aerospace sectors.
- **Strategic Funding and EU Support**: Poland benefits from significant EU cohesion funds and strategic technology programs (e.g., Strategic Technologies for Europe Platform - STEP) that co-finance investments in cutting-edge manufacturing infrastructure and R&D. US companies can leverage these programs by partnering with Polish firms and accessing co-financing opportunities.

3.2 AGRICULTURE & AGRICULTURAL EQUIPMENT

Employing around 10% of the workforce and contributing 2.75% to GDP, agriculture remains a significant part of Poland's economy and rural culture. The majority of farms are small to medium-sized family farms.

Poland is among EU's leading agricultural producers – EU's third largest wheat, rapeseed, and corn producer and second largest rye producer, the world leader in triticale; it also grows significant quantities of silage corn, barley, oats, potatoes, sugar beets, and beans; it is a large producer of meat (poultry, pork), dairy products, and mushrooms.

According to Statistics Poland, there are **over 1.3 million farms, of which 3% (close to 40,000 farms) have an area larger than 50 hectares (124 acres)**, over 106,000 farms are in the 20-50 ha (50 to 124 acres) range, while 75% (974,000 farms) have no more than 10 hectares (25 acres). Key initiatives include raising productivity, increasing farms' profitability, and reducing the gap in income between smaller farms and larger enterprises. While small farms dominate in terms of their number, larger commercial farms are expanding and investing in modern machinery, digital solutions, and sustainable practices, and thus shall be targeted for advanced equipment and technology exports. Over 1,600 producer groups have been formed to pool resources and invest in new technologies.

The **key product categories exported from the United States** include soybeans, distilled spirits, wine, tree nuts, fish and seafood, beef, dried fruit, condiments, and innovative food ingredients.

The agricultural sector is undergoing significant transformation through the adoption of innovative technologies to help farmers increase productivity, improve sustainability, and adapt to environmental challenges. Business opportunities include precision agriculture technologies and solutions, and efficient, affordable, and modern farm machinery and equipment. Selected solutions/projects applied by Polish farms are presented below.

Telemonitoring solutions are becoming increasingly popular, including the locally developed systems for remote monitoring of dairy herds and remote monitoring of the health of herds of pigs. In the greenhouse production sector, Polish solutions are emerging that automate lighting management based on proprietary lighting systems and lamps. An increase in indoor cultivation of micro herbs, salads and other plants in containers, greenhouses or other closed facilities, such as old warehouses, has been observed as well as finding new sources of protein as an alternative to meat. Satellite-based monitoring, drones, and IoT sensors are increasingly adopted by Polish farms.

Agricultural Valley 4.0 project was launched in Podlaskie region to target the agricultural, food, and health technologies sector. The region is strong in dairy production and agricultural machinery production. The initiative aims to drive economic growth by transforming its traditional agri-food industry through digital and technological innovation and also establish strong international connections to broaden its reach.

As an example of a successful and growing domestic player, **SatAgro** (satagro.pl) develops tools using satellite data for the agricultural sector; their main product (SatAgro service, app.satagro.pl) is the most actively developing project in the field of precision agriculture. This well recognized comprehensive platform, which was developed by a Polish start-up in 2015, delivers actionable insights from satellite imagery, soil sampling, weather data, and other sensor inputs and creates practical fertilization and management plans, compatible with modern farming equipment.

Top Opportunities for US Exporters

- **Government and EU Funding Programs:** Poland's current Common Agricultural Policy (CAP) Strategic Plan covers the period 2023–2027, with a total budget of about EUR 25 billion, including around EUR 22 billion from the EU and EUR 3 billion in national co-financing. This plan supports sustainable farm development, rural livelihoods, environmental and climate action, and modernization of the agricultural sector.
- **Low Level of Digitalization and Mechanization:** There are some large, highly mechanized farms; however, much of the sector remains fragmented, with many small and medium-sized farms lacking advanced machinery and digital solutions – thus creating demand for modern agricultural equipment, precision farming technologies (sensors, drones, AI, robotics), and smart irrigation systems. The government is actively promoting smart agriculture and precision farming through draft regulations and public consultations to accelerate technology uptake.
- **Irrigation Infrastructure Modernization:** Only a small fraction of Poland's arable land is irrigated, and much of the infrastructure is outdated or insufficient. Recent pilot programs and subsidies aim to expand and modernize irrigation, including construction of wells, tanks, water collection, and distribution systems.
- **Demand for Precision and Sustainable Technologies:** Although there is growing awareness and adoption of precision agriculture, especially among larger farms, market potential remains untapped. US exporters can offer farm management software, variable-rate technology, remote sensing, and data analytics platforms.
- **Emerging AgriTech Startups and Innovation Potential:** Poland's AgriTech sector is expanding, with increasing numbers of startups focused on digital agriculture, smart machinery, and supply chain solutions. There are opportunities for partnerships, technology.

3.3 CLEAN ENERGY

Poland's energy fuel base is undergoing a significant transformation aimed at reducing reliance on coal and increasing the share of low-carbon and renewable energy sources. The country targets achieving 56% renewable energy in its electricity mix by 2030 supported by nuclear power as a zero-emission baseload source, with coal and natural gas playing diminishing but transitional roles.

Coal remains the backbone of Poland's energy supply, providing 57% of the total power in 2024, the highest share in the EU. It is the only EU country without a formal coal phase-out date. Most coal-fired power plants in Poland were built between 1960 and 1980 and are now up for retirement and replacement. However, the pace of expansion and modernization of energy generation has so far been insufficient to ensure energy security in the face of planned shutdowns in conventional power generation.

In 2024, renewables generated 29% of electricity; wind contributed almost 15%, solar energy 11%, biomass 1.5%, and hydropower 1.2%.

Nuclear power

The country is on the way towards nuclear power technology deployment involving both large nuclear infrastructure as well as small modular reactors, as multiple energy-intensive industrial companies have declared interest to upgrade their plants with SMRs.

There has never been a large nuclear power production reactor in operation in Poland. In 1980s, four 440 MWe Russian VVER-440 units were under construction in Zarnowiec; however, the project was cancelled in 1990 and its components were sold. Poland also considered a stake in the planned (now cancelled) Visaginas nuclear power plant in Lithuania.

The nuclear program is expected to stimulate investment, create high-skilled jobs, and develop local expertise in advanced technologies. It will also foster growth in related sectors like manufacturing, engineering, and research. U.S. support will be critical for the success of Poland's nuclear power program, playing a pivotal role in technology provision, financing, and strategic partnership.

Overview of planned nuclear power projects

Polskie Elektrownie Jądrowe sp. z o.o. (Polish Nuclear Power Plants, ppej.pl/en)

- Investor in the construction project of the first nuclear power plant in Poland & responsible for the construction of other nuclear reactors (total capacity of between 6 and 9 GWe)
- Technology: Westinghouse AP1000 (3x1250 MWe) for the country's first three reactors in Pomerania (Lubiatowo-Kopalino site)
- EPC contractor: Bechtel
- Construction to begin in 2026, with commissioning of the first unit in 2033

Nuclear power plant in Pątnów in central Poland (www.gkpge.pl)

- In April 2023, a 50/50 joint venture special purpose vehicle was formed by ZE PAK (www.zepak.com.pl/en) and Polska Grupa Energetyczna (PGE)
- Technology: Korea Hydro & Nuclear Power (KHNP) - two reactors with a total installed capacity of 2,800 MW to provide 22 TWh of energy annually (12% of the current electricity demand in Poland)

Orlen Synthos Green Energy (OSGE, osge.com/en)

- In December 2023, the Ministry of Climate and Environment issued decisions-in-principle for the implementation of investments in six locations
- Technology: 24 GE Hitachi BWRX-300 units, planned for deployment by 2030

KGHM (kghm.com)

- In July 2023, application to the Ministry of Climate and Environment for the construction of a NuScale VOYGR modular nuclear power plant with a capacity of 462 MWe consisting of six 77 MWe modules was approved.

According to the Ministry of Climate and Environment, roughly 80 companies based in Poland already provide services to nuclear technology vendors around the world, while another 300 entities could join the Polish nuclear supply chain.

Wind energy

Poland is EU's third-largest wind energy market, after Denmark and Germany. It boasts excellent conditions for developing offshore wind energy due to stable and strong winds, shallow depths, low salinity, relatively small waves, weak currents, and the absence of major environmental or social conflicts.

Baltic Towers, Europe's largest and most modern offshore wind tower factory, began production in June 2025. Located on Ostrów Island in Gdańsk, the facility is designed to manufacture over 150 offshore towers annually; it is expected to reach full production capacity by the end of November 2026, employing 500 workers.

According to the Polish Wind Energy Association Poland's total offshore wind potential is estimated at 33 GW (enough to cover over 50% of Poland's current electricity demand), making Poland the leading country for offshore wind in the Baltic Sea. Poland aims for 5.9 GW of offshore wind capacity by 2030 as part of its first phase of offshore wind projects, which combines 7 individual offshore wind farms.

The **Baltic Power offshore wind farm** (balticpower.pl) - a joint venture between ORLEN and Northland Power - is the most advanced offshore wind project in Poland and the first one to have reached the construction phase. In 2023, the project received a final investment decision (FID) as well as financing from 25 international institutions. Both onshore and offshore installations are underway at the moment. Baltic Power will be among the world's first projects to install 15 MW wind turbines and the first Polish offshore wind farm operating in the Baltic Sea.

In March 2025, the Polish government approved draft legislation (yet to be approved by parliament) to ease rules for the development of onshore wind farms. The changes include a cut in the distance required between planned installations and residential locations. According to the Polish Wind Energy Association, this could lead to the installation of some 41 GW of onshore wind capacity by 2040, up from the current installed wind capacity of 11 GW.

Solar energy

According to the Institute for Renewable Energy (IEO) Poland's cumulative installed PV capacity amounted to some 21 GW at the end of 2024, adding around 4 GW of new capacity in 2024. The large-scale segment contributed the most to the growth of Poland's solar market last year, continuing a trend which first began in 2023 when the prosumer market began to shrink. By the end of 2024, there were over 1.5 million registered renewable energy source micro-installations with combined capacity of 12.7 GW. Prosumers (i.e. individuals or entities that both consume and produce electricity) owned nearly 98.6% of these systems.

Solar capacity is expected to reach 25 GW by the end 2025 and over 30 GW by the end of 2026.

Hydrogen

Poland is the third largest producer of hydrogen in the European Union after Germany and the Netherlands, producing 1.3 million tons of grey hydrogen. Poland seeks to transition from fossil-derived hydrogen to low-carbon and renewable hydrogen, harnessing its abundant renewable energy potential. In October 2024, the Polish government announced plans to develop an up to USD 2.2 billion green hydrogen project. In June 2025, Poland allocated USD 733 million to six green hydrogen production projects.

Poland is developing several Hydrogen Valleys to promote regional hydrogen ecosystems as well as larger-scale projects:

- **Clean Cities – Hydrogen Mobility in Poland project by Orlen** for the development of hydrogen refueling stations network; the project's third phase aims to establish 16 additional stations, to be funded by non-repayable EU grant of EUR 62 million
- **Polenergia S.A. H2SILESIA** involves the construction of a large-scale renewable hydrogen production facility with a capacity of about 105 MW for heavy industry and zero-emission transportation – in June 2025 the project was qualified for the funding support under the National Recovery and Resilience Plan.

Top Opportunities for US Exporters

- **Renewable Energy Project Development and Equipment Supply**: solar panels, wind turbines, inverters, energy storage systems, and hybrid renewable energy technologies to meet this growing demand
- **Offshore Wind Energy Development**: offshore wind turbine technology, installation services, grid connection equipment, and maintenance
- **Energy Infrastructure Modernization and Grid Expansion**: smart grid technologies, advanced transformers, energy storage solutions, and grid management software
- **Energy Storage Facilities**: battery storage technologies, power electronics, and energy management systems
- **Biogas, Biomass, and Other Renewable Sources**: Poland's 2025 renewable auctions include significant volumes for biogas (landfill, agricultural, wastewater), biomass, hydropower, geothermal, and hybrid systems. US exporters can offer biogas plant equipment, biomass boilers, geothermal heat pumps, and hybrid renewable energy solutions
- **Solar Energy Expansion**: advanced photovoltaic technologies and storage integration solutions

3.4 CLEAN TECHNOLOGIES

Since joining the EU in 2004, Poland has made significant strides in environmental protection, benefiting from access to EU funding, regulatory frameworks, and enhanced cooperation. Despite this progress, several challenges remain—particularly in air pollution, water and wastewater treatment, and waste management—necessitating continued investment and sustained efforts.

Air pollution

Poor air quality remains a major environmental challenge despite various recent initiatives. Air pollution is an issue for large urban centers as well as smaller towns, resulting from the country's dependence on coal, outdated heating systems, and urban traffic congestion. In Poland, air pollution causes over 40,000 premature deaths and millions of cases of illness every year. Between 2014 and 2020, the economic cost from air pollution was estimated to account for 13% GDP, which was one of the highest in the EU.

Poland has the oldest (average age of 14–15 years, many vehicles exceeding 20 years of age) and sixth largest vehicle fleet in the EU, with 24.3 million cars - a significant portion of these vehicles do not meet Euro 5 standards mandatory for all new vehicles in the EU since 2009 and many cars even struggle to meet the Euro 3 emissions standard introduced in 2000.

IQAir's live ranking of air quality

- February 5, 2025: Kraków and Wrocław among the most polluted major cities in Europe
- February 6, 2025: Warsaw just behind Sarajevo, Skopje, and Belgrade

Multiple programs have been implemented to combat air pollution, including Clean Air program (czystepowietrze.gov.pl, a national subsidy scheme that supports renovation), measures to improve air quality in urban and industrial areas through stricter emission limits and monitoring, air quality improvement initiatives by Polish cities.

Water and waste water treatment

With the effects of climate change **flooding poses a growing risk to the population**. The country is located in the drainage basins of two large rivers – the Oder and the Vistula. Large cities like Warsaw, Kraków, and Wrocław are increasingly affected by both river and urban flash floods. 10% of population live in flood-prone areas, when wider economic interdependencies are considered, the share of population possibly affected is estimated at 60%.

Poland has initiated several large-scale flood mitigation projects, including upgrading embankments, constructing flood gates and polders, and enhancing river channels as well as improving flood forecasting systems and strengthening institutional capacity for flood management.

Water resources are scarce in Poland in comparison to other countries; Poland's average renewable freshwater resources stand at about 1,600 cubic meters per person per year, which is significantly below the EU average (5,000 m^3/person/year).

Water quality remains a major concern. Two main sources of pollution include nutrients from agriculture and the inadequate treatment of municipal and industrial waste. Despite heavy investment, Poland has not met EU targets for treating wastewater properly. Untreated wastewater re-entering water sources threatens the quality of drinking water and wildlife.

According to Statistics Poland, the share of population served by wastewater treatment plants increased from 65% in 2010 to 76% in 2023 - in urban areas growing from 88% to about 95% and in rural areas from 29% to 48%. Within the EU, five countries (the Netherlands, Luxembourg, Malta, Germany and Austria) record at least a 95% rate of population served by wastewater treatment plants, while the lowest percentage was recorded in Croatia (47%) and Romania (58%).

A high priority in the area of environmental protection has been given to restoring the purity of water. The National Program of Municipal Wastewater Treatment estimates that 60 treatment plants and 8,022 km of sewerage network will be developed by 2027, plus modernization of 978 treatment plants and 3,173 km of the network is planned. Between 2000–2023, 832 municipal wastewater treatment plants were added, and the number of wastewater treatment plants with increased nitrogen and phosphorus removal increased by 389.

Waste management

Since joining the EU in 2004, Poland has aligned its waste management policies with the EU Waste Framework Directive, **implementing regulations to reduce landfill dependency and promote recycling**.

The municipal waste recycling rate significantly increased over the years, reaching 41% in 2022 (below the EU-27 average of 49%). Technological level of Polish waste sorting plants varies quite significantly. There are some 80 waste sorting facilities; many lack modern equipment like advanced conveyor belts, shredders, and automated systems; some facilities use modern optical sorters and AI-driven systems. Experts estimate that at least 150 technologically advanced sorting plants will be needed by 2035 to meet the EU's recycling and landfill reduction targets – making investments in modern sorting technologies and facility expansions urgent.

Although the landfilling rate significantly decreased to 38%, it remains far from the EU's 2035 target (below 10% of total waste). 21% of municipal waste is currently incinerated. There are eight waste-to-energy plants with a combined annual capacity of 1.18 million tons, which is below the current needs.

Top Opportunities for US Exporters

- **Battery Manufacturing and Energy Storage**: Poland is the second largest producer of lithium-ion batteries globally, manufacturing about 60% of all batteries made in Europe. This sector is a cornerstone of Poland's cleantech industry and a key export driver. US exporters can supply advanced battery components, manufacturing equipment, and energy storage technologies to support Poland's expanding battery and electric vehicle (EV) supply chains.
- **Clean Industrial Technologies and Decarbonization Solutions**: industrial electrification, process optimization, and emissions reduction technologies
- **Buildings**: energy-efficient building technologies
- **Research, Innovation, and Workforce Development**: Poland faces skills shortages, especially in battery manufacturing and cleantech sectors, driving demand for training, upskilling programs, and collaborative R&D projects.

3.5 DEFENSE

GFP Ranking: **21**
Active Personnel: **202,100** (highest in EU)
Reserve Personnel: **350,000**
Paramilitary Forces: **50,000**
Total Aircraft: **479 (216 helicopters)**
Tank Strength: **614**
Armored Vehicles: **23,138**
Naval Fleet Strength: **62 (440km coastline)**
Airports: **288**
Ports & Terminals: **10**

Global Firepower Index 2025

PZL W-3 RL Sokół by Bartlomiej Mostek

Among NATO members, Poland records the **highest defense spending relative to GDP** – up from 2.7% in 2022 to 4.2% of GDP in 2024, and projected to reach 4.7% in 2025.

Modernization

Since the full-scale Russian invasion of Ukraine, Poland has boosted efforts to expand and modernize its military, divesting legacy Soviet equipment. The country has embarked on the most ambitious military modernization program since the fall of the Iron Curtain. A dedicated extra-budgetary mechanism was introduced to supplement the annual budget. For 2025, equivalent of 3% of GDP will be funded by the Ministry of National Defence and additional 1.7% from an extra-budgetary Armed Forces Support Fund managed by the state-owned National Development Bank with bonds as the main funding source.

This ambitious multi-year, multi-billion-dollar defense modernization program includes procurement of modern U.S. defense systems including air defense missile launchers, AMRAAM air-to-air missiles, F-35 fighter jets, HIMARS rocket launchers, Hercules transport planes, Black Hawk helicopters, Javelin anti-tank missiles, and Turkish drones. Poland has also announced plans to acquire 1,400 new tanks, many from South Korea, which is Poland's second-largest arms supplier after the US and ahead of Türkiye.

In addition, the government aims to tighten defense cooperation with EU partners and key European allies such as the U.K. and Türkiye, securing weapons and military technology from these countries as well. The Polish government has declared its willingness to participate in the German-led European Sky Shield Initiative, a continent-wide project to coordinate countries' air defense-related purchases and procedures.

Poland will redirect PLN 26 billion (USD 6.9 billion) from its EU-financed National Recovery Plan (previously earmarked for green urban transformation) to a new Security and Defense Fund to finance projects in four areas: civil-protection infrastructure, defense industry development, modernization of "dual-use" assets such as roads and airports, and investment in cybersecurity.

Domestic production and NATO facilities

Poland's strategic aim is to "Polonize" its defense production in order to significantly reduce dependence on foreign military imports by expanding and modernizing its domestic defense industry – i.e. import only those defense products that Poland cannot yet produce independently, which leads to prioritizing investments in local manufacturing capabilities to supply the Polish Armed Forces with domestically produced weapons, ammunition, and equipment.

Defense production in Poland has been consolidated, giving rise to **PGZ (POLSKA GRUPA ZBROJENIOWA S.A.**, grupapgz.pl/en), the key player in Poland's defense modernization; it was established by the Polish government in 2013 to unite Polish state-owned defense industry companies.

Poland hosts several NATO facilities, including the Headquarters Multinational Corps Northeast in Szczecin and the Joint Force Training Centre in Bydgoszcz. The U.S. missile defense installation in Redzikowo with an Aegis Ashore system reached operational capability in December 2023 as a unit of the U.S. Navy, and now is formally subordinated to the command-and-control structures of NATO.

Assistance to Ukraine

Since the full-scale Russian invasion in 2022 through the end of 2024, Poland supplied Ukraine with 318 tanks, 536 combat vehicles of various types, 136 artillery systems of differing calibers, 10 aircraft, and 10 combat helicopters as well as significant volumes of ammunition, combat materials, fuel, lubricants, and spare parts. The total value of military assistance provided by Poland is estimated at approximately USD 4.9 billion.

Key defense trade event in CEE: MSPO (Kielce, September 2 to 5, 2025) - Central Europe's largest defense exhibition and the third largest in Europe following Paris and Farnborough Air (www.targikielce.pl/en/mspo)

Procurement priorities

Poland's defense procurement priorities emphasize modernization and capability enhancement across land, air, naval, and cyber domains, with a strong focus on interoperability with NATO systems, indigenous industry development, and countering emerging threats such as drones and cyberattacks. The integration of advanced unmanned systems, expansion of air defense, and investment in command-and-control infrastructure reflect Poland's commitment to maintaining a robust, flexible, and technologically advanced military posture.

Land Systems

- **Tracked and Wheeled Combat Vehicles:** Continued modernization including delivery of over 250 M1A2 Abrams SEPv3 tanks; procurement of modern APCs and IFVs such as the Borsuk IFV (planned production).
- **Artillery Systems:** Acquisition of 20+ HIMARS multiple launch rocket systems ("Homar") and modernization of 155mm self-propelled howitzers (e.g., Krab).
- **Individual and Squad Equipment:** Upgrading infantry weapons to NATO standards, including Spike anti-tank missile systems and modern CBRN gear.

Air Defense and Aviation

- **Combat Aircraft:** Contract for 32 F-35A Lightning II jets, with initial deliveries underway.
- **Air Defense Systems:** Deployment and modernization of Patriot missile batteries (4+ batteries), SHORAD and V-SHORAD systems including Grom and Piorun MANPADS.
- **Helicopters:** Procurement of 96 AH-64E Apache attack helicopters (largest Apache order in Europe), plus medium and heavy-lift helicopters to support mobility and logistics.

Unmanned Systems

- **Tactical UAS:** Active procurement of Class 2 and 3 UAS such as Warmate loitering munitions and Orbiter drones for reconnaissance and target acquisition.
- **Counter-UAS (C-UAS):** Investments in systems like the Israeli Drone Dome and other C-UAS technologies.
- **Supporting Infrastructure:** Development of Ground Control Stations and training facilities aligned with UAS expansion.

Naval Systems

- **Combat Ships:** Modernization of three ORP frigates; procurement of 3+ Miecznik-class (F-100 variant) multipurpose frigates and several Kormoran II minehunters.
- **Support Vessels:** Acquisition of special operations support vessels and logistics ships to enhance fleet endurance.

Command, Control, and Intelligence

- **C5ISR Systems:** Investments in integrated C5ISR networks, including SATCOM upgrades with planned satellite communication capabilities.
- **ISR Platforms:** Deployment of mobile radar and optical sensor systems, including purchase of advanced reconnaissance drones.

Cybersecurity and Electronic Warfare

- Strengthening of cyber defense infrastructure and development of electronic warfare capabilities, including cooperation with NATO partners.

Top Opportunities for US Exporters

- **Advanced Military Platforms**: Poland is heavily investing in state-of-the-art military equipment. This includes the ongoing acquisition of 5th-generation fighter jets (F-35A program), which will require significant training, maintenance, and support from U.S. suppliers.
- **Air Defense Systems**: A top priority for Poland is strengthening its air defenses. A nearly USD 2 billion agreement with the U.S. for logistical support, technical assistance, and training for the Patriot air defense system, plus opportunities exist for SHORAD/V-SHORAD, and MANPAD systems.
- **Armored Vehicles**: Poland is acquiring M1A2 Abrams SEPv3 tanks and is continuously modernizing its fleet of armored personnel carriers and infantry fighting vehicles.
- **Ammunition and Munitions Production**:
    - Domestic Production Expansion: Poland is making massive investments to increase its own ammunition production, aiming for self-sufficiency. Mesko, Poland's largest ammunition producer, has increased its small-caliber ammunition production fivefold to 1 million rounds per working day as part of Project 400.
    - This drive for "repolonization" creates opportunities for U.S. companies to engage in technology transfer, provide specialized machinery and components, or form joint ventures to support the expansion of production lines, including for 155mm artillery shells.
- **Cybersecurity and Digital Defense (C5ISR**): Poland is heavily investing in its C5ISR capabilities, including integrated communication systems, satellite communication (SATCOM), and advanced ISR systems. As part of its broader defense strategy, Poland is prioritizing network security and electronic warfare capabilities.
- **Joint Ventures and Technology Transfer:**
    - Poland's government is committed to "repolonizing" its defense industry, aiming to reduce dependence on foreign suppliers and build independent production capacity, which encourages offset agreements, where foreign suppliers are expected to ensure that at least 50% of military expenditure benefits the domestic industrial base.
- **Research, Development, and Innovation (R&D):** Opportunities exist for collaborative projects in advanced electronics, unmanned systems (UAS Class 2 & 3, Counter-UAS), and dual-use technologies, aligning with Poland's strategic defense priorities. Poland is interested in implementing Industry 4.0 and additive manufacturing , which can create further R&D opportunities.

3.6 DIGITAL TECHNOLOGIES

Poland is embarking on an ambitious journey to become a digital leader in Europe, building on strong existing foundations in fixed internet connectivity, quantum computing, and AI. This push is underpinned by a clear vision for advancing its digital economy and society, which will see substantial investment and widespread technological adoption across various sectors.

According to the 2025 Digital Decade Country Report, fixed internet connectivity is strong in Poland and the country is progressing on quantum computing and AI as well as enhancing cybersecurity at different levels of government.

On the other hand, some key challenges exist, including:

- Slow adoption of advanced technologies by businesses, especially by SMEs
- Limited digital skills in rural regions and in certain age groups.

The level of digitalization in Polish businesses differs quite widely based on company size; while larger companies are often quite advanced, for instance in using cloud services and artificial intelligence, many small businesses still continue to rely on basic solutions (e.g. physical hard drives for data storage).

Digital Strategy 2035: A Comprehensive Roadmap for Digital Transformation, the most ambitious digital transformation plan to date, was presented by the Polish government in the fall of 2024 as a ten-year plan **aiming for over PLN 100 billion (USD 25.6 billion) in digital spending by 2030**. The strategy envisions that by 2035, 5% of Poland's GDP will be channeled to digital governance. It should lead to widespread use of AI tools in businesses and provide a digital identity wallet for 20 million people. This strategy takes Poland beyond simple e-government services, it targets a complete digital transformation of the society, economy, and public administration, with focus on four key areas: digital infrastructure (5G networks, edge computing capabilities, quantum-resistant cryptography, data centers), cybersecurity, digital competencies, and technological innovation.

Cybersecurity

As one of the most frequently targeted countries for cyberattacks, Poland faces unprecedented levels of cyber threats, with state-sponsored attacks increasing by 300% in 2023. In June 2024, Poland announced plans to raise spending to USD 760 million to protect the country’s critical infrastructure from growing malicious threats, in particular from Russia.

Data centers

According to Telecom Review Europe, the Polish data center market is forecast to reach 500 MW by 2030 and 1,200 MW by 2034. The country is considered a Tier 2 growth market in Europe. AWS, Google Cloud, and Microsoft Azure are already present. Microsoft announced an investment in Polish infrastructure in early 2025. Other projects include a EUR 720 million facility in Warsaw, a 150 MW AI-Ready Campus in Poznan, and new developments from Data4 Group, Equinix, and Vantage Data Centers.

Artificial intelligence

Polish Ministry of Digital Affairs plans to spend over EUR 1 billion for the development of AI technologies in 2025. The Artificial Intelligence Fund, financed from the Polish National Centre for Research and Development (NCBR), will among other initiatives fund the AI Factory project (expanding the computing infrastructure at the AGH University of Science and Technology in Kraków to become a hub for developing, testing, and implementing advanced AI technologies, supporting both scientific research and practical applications in sectors such as healthcare, environmental protection, and public administration) and the development of a Polish large language model (PLLuM).

Poland is participating in the EU's AI Gigafactory building program. **Poznań Supercomputing and Networking Center** will receive EUR 50 million (USD 51 million) to develop the **Piast AI factory** – a new R&D center aimed at advancing AI in the following sectors:

- Space and robotics – developing AI algorithms for automation and space exploration
- Health and life sciences – applying AI in bioinformatics and medical diagnostics
- Sustainable development – utilizing AI in agriculture, energy, and mitigating extreme weather phenomena.

The Ministry of Digital Affairs estimates that the proposed Gigafactory will eventually scale up to 30,000 graphics processing units - an investment of approximately PLN 5 billion (USD 1.3 billion).

Poland-based data center operator Beyond.pl has announced the launch of a Sovereign AI Factory at its 100 MW data center campus in Poznan. The move positions the company as one of the first in CEE to offer a commercially available, full-stack AI platform that includes NVIDIA AI Enterprise software, GPU-as-a-Service (GPUaaS), AI-as-a-Service (AIaaS), data center infrastructure, and fully managed services.

5G

5G mobile network development has been delayed due to late allocation of crucial pioneer bands; 3.4-3.8 GHz was allocated in December 2023 and the auction for 700 MHz and 800 MHz bands took place in March 2025 – rights to be granted in mid-2025. Due to lack of interest on the part of operators, the 26 GHz band is not expected for allocation before 2026. The country remains ambitious on 5G deployment, aiming to achieve 100% coverage already in 2027.

IoT

The IoT sector is anticipated to grow substantially due to rising demand for connected devices as well as smart manufacturing, smart transportation, and smart energy applications; current adoption rates lag behind the EU average.

Semiconductors

Poland's semiconductor industry has potential to contribute to the European and global technology landscape. Poland boasts niche expertise in areas such as design of integrated circuits and photonics, skilled workforce, and expanding research infrastructure.

In June 2023, Intel announced its intention to invest USD 4.6 billion in construction of a semiconductor integration and testing facility near Wroclaw, a project generating some 2,000 jobs. However, in September 2024 Intel decided to postpone this project until 2026 due to the company's global financial situation.

According to the Poland in the Game for the Future: Policy for the Semiconductor Sector 2025+, a strategic document published by the Polish Ministry of Digital Affairs in late June 2025, **the country aims to attract at least three large investors from the semiconductor sector over the next decade**.

Top Opportunities for US Exporters

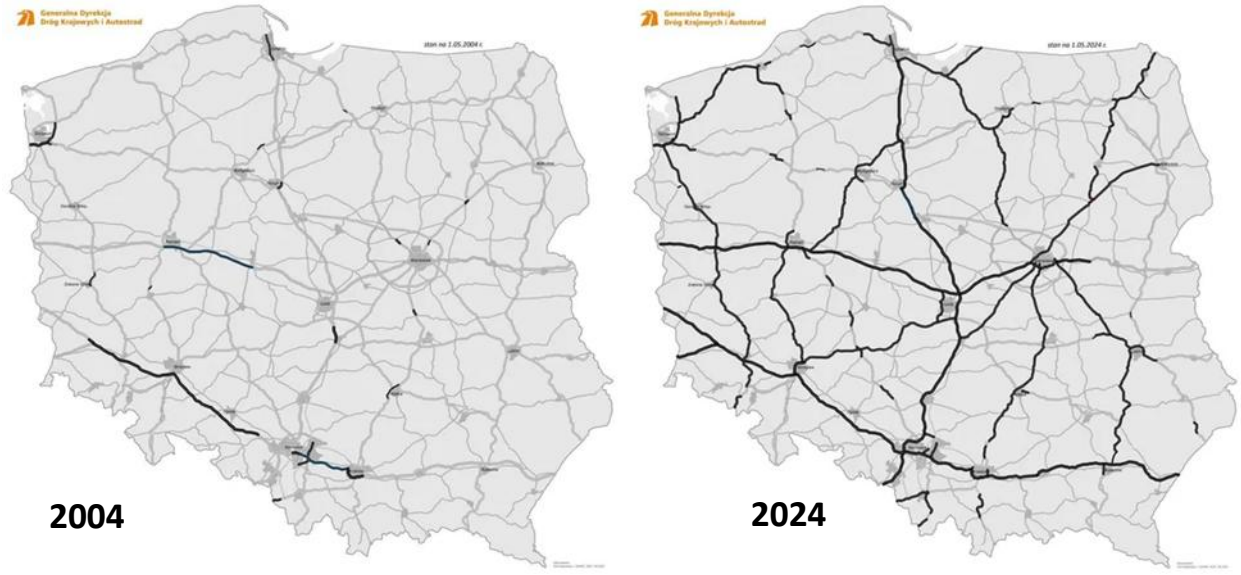
The top opportunities for US exporters in digital technologies in Poland in 2025 reflect Poland's rapid digital transformation ambitions, despite recent challenges related to US export restrictions on advanced AI chips.

- **Artificial Intelligence (AI) and Machine Learning Solutions**: AI software platforms, machine learning tools, data analytics solutions, and AI-powered automation technologies. Current US export controls limit Poland's access to advanced AI chips, capping imports at 50,000 units annually (potentially up to 100,000), which may temporarily constrain hardware-dependent AI development.
- **Semiconductor and Chip Manufacturing Technologies**: chip design tools, semiconductor manufacturing equipment, and packaging technologies
- **Digital Infrastructure and Cloud Services**: cloud platforms, cybersecurity software, and network infrastructure equipment
- **Quantum Computing and Emerging Technologies**: quantum hardware, software, and related research collaboration
- **Smart City and IoT Solutions**: IoT devices, smart infrastructure software, and AI-enabled urban management tools
- **Cybersecurity and Network Defense**: advanced cybersecurity solutions, threat detection, and electronic warfare technologies

3.7 INFRASTRUCTURE & INTELLIGENT TRANSPORTATION SYSTEMS

Poland has been actively embracing the development of transportation infrastructure. **Since joining the EU in May 2004, the length of motorways and expressways increased more than sevenfold**, from 720 km to 5,206 km in 2024 and is expected to reach 5,486 km in 2025 and 5,937 km by 2026. Poland aims to **further expand its expressway network to reach 8,000 km by 2033, including 2,100 km of motorways**.

Poland's highway network: May 2004 vs May 2024 – 20 years in the EU



Source: Directorate for National Roads and Motorways (GDDKiA)

EU funds and policies have played a crucial role in financing and facilitating this significant infrastructure development. **Intelligent Transport Systems (ITS) solutions have become an important part of highway and road infrastructure.**

Virginia companies wishing to consider entering the Polish market are encouraged to analyze the below presented selected projects to assess what solutions are in demand.

e-TOLL (etoll.gov.pl/en) – electronic toll collection based on the Global Navigation Satellite System for user position location with the use of virtual gates. Users choose the method of transmission of location data to the system: mobile device application, external location system, factory mounted in their vehicle, or using On-Board Units (OBU). Introduced in June 2021, e-TOLL replaced the previous viaTOLL system and is now the only mandatory toll payment method for heavy vehicles and buses.

CANARD (www.canard.gitd.gov.pl) – Automatic Road Traffic Monitoring Center, aims to improve road safety by automatically monitoring and recording traffic violations, especially speeding and running red lights; the system includes 474 speed cameras, 41 mobile recording devices, 71 devices for sectional speed monitoring and devices recording entry through red lights, installed at 50 intersections, as well as at 5 rail-road crossings. In February 2025, CANARD signed a contract for the supply and installation of 70 new TraffiStar SR390 speed recording devices

National Road Traffic Management System (NRTMS/KSZR) is an ongoing large-scale initiative to create a single, integrated, and coherent traffic management system across the national road network, especially along the key TEN-T corridors (Baltic-Adriatic and North Sea-Baltic). The project is coordinated by the General Directorate for National Roads and Motorways (GDDKiA) and is co-financed by the European Union.

Integrated Intelligent Transport Systems shall be deployed on approximately 3,100 km of roads, with the first phase covering about 1,100 km. These services include real-time information on traffic conditions, travel times, incidents, weather, dynamic detours, and smart parking. The system uses cameras, sensors, variable message signs, traffic counting stations, automatic incident detection, CCTV, meteorological sensors, and lane control systems. All data is processed in dedicated traffic management centers, including a central National Traffic Management Centre (KCZR), which operates 24/7.

16 airports offer commercial passenger service; the commercial airports handled over 59 million passengers in 2024. Warsaw Chopin Airport is the largest, with 21.3 million passengers in 2024, followed by Kraków John Paul II (11.1 million passengers), Gdańsk Lech Wałęsa (6.7 million), and Katowice Wojciech Korfanty (6.4 million).

With existing airports, including Warsaw Chopin Airport, reaching capacity limits, **Solidarity Transport Hub (STH)**, a new greenfield airport is being built to serve both civil and military purposes. It is developed by the Polish state company Centralny Port Komunikacyjny (CPK, www.cpk.pl) and integrates air, rail, and road transport. It will handle 40 million passengers annually. Situated between Warsaw and Lodz, the airport is being built on approximately 37 km² and the project will also involve the construction of more than 1,600 km of new railway lines, which are expected to allow passengers to reach Warsaw from STH within 15 minutes. The airport is named in honor of the Solidarity (Solidarność) trade union, a significant force in Poland's history; the Solidarity movement played a pivotal role in the end of communist regime in Poland.

In May 2025, CPK launched a competitive dialogue procedure to select the general contractor for the passenger terminal of the new CPK Airport. With an estimated value over PLN 5 billion (USD 1.26 billion) the contract is expected to be signed in 2026. Construction starts with foundations in 2026. The tunnel and underground rail station are due by 2029, with the airport opening by the end of 2032 alongside the first section of the Warsaw – Lodz High-Speed Rail line. In April 2025, CPL invited bids for the design, delivery, installation and commissioning of the Baggage Handling System (BHS) for CPK Airport; three leading European companies were invited to submit offers: Vanderlande Industries, Siemens Logistics, and BEUMER Group Poland. As Poland's largest infrastructure investment, the project is set to transform the country's connectivity, integrating air and rail travel into a modern transport hub.

Besides investment into rail passenger transport the government also **plans more efficient railway use in freight transport**. 17 intermodal projects in Poland will receive funding of approximately USD 196 million from the National Recovery and Resilience Plan; 12 projects relate to investments in terminal infrastructure and 5 projects for the procurement of rolling stock and handling equipment for intermodal operations.

Top Opportunities for US Exporters

- **Military Infrastructure**: rapid construction machinery (UBM), modular shelters, defense bases
- **Energy Infrastructure**: grid modernization, substations, transmission lines, smart grid tech
- **Railway Infrastructure**: high-speed rail, new lines, signaling, airport-rail integration
- **Road Infrastructure & ITS**: expressways, traffic management, road safety, real-time info systems
- **Smart City & Logistics Hubs**: smart city development, logistics automation, IoT connectivity