FINLAND

MARKET OPPORTUNITIES

Report Date: **August 2024**

CONTENTS

1 COUNTRY PROFILE

Overview

High-income, technologically advanced country known for its lakes and forests, top education and quality of life

- High-income, technologically advanced free market economy with strong industrial and service sectors
- High standard of living and well-regarded for its innovation and education systems
- Population values high quality goods and services,
- Consistently ranks high in global competitiveness, business, and innovation indices
- Known for its prudent fiscal policies and stable financial system
- Invests significantly in education, leading to a highly educated workforce and ranking high in PISA assessments
- A favorite location for data centers
- EU member since 1995
- NATO member since 2023

Total area: 130,684 square miles (3.3 times bigger than Virginia)
Population: 5.6 million
Government type: Parliamentary republic
Language: Finnish and Swedish (official)
Capital + major cities: Helsinki (631,695) + Tampere (226,696), Oulu (199,526), and Turku (186,756)
Currency: euro (EUR)

Average annual exchange rates: EUR per USD 1

2019	2020	2021	2022	2023	2024 (Jan-July)
1.120	1.142	1.183	1.053	1.081	1.084

According to the Bank of Finland's interim forecast from March 2024, the Finnish economy is still in recovery mode from elevated levels of prices and interest rates in previous years, which have curbed private consumption and investment. Inflation has slowed substantially, employment has remained robust, and employees' real earnings saw a year-on-year increase in 2023. These factors improve consumers' purchasing power and give insight into future growth opportunities. The Finnish economy will begin to bounce back in the end of 2024 and its GDP is expected to grow by 1.2% in 2025. Economic growth will gather pace in upcoming years as conditions improve both in Finland and its export markets.

Finland has quickly expanded from traditional industries to a modern high tech service society. The service sector accounts for around 70% of GDP. Key service industries include information and communications technology, healthcare, and education. Finland is known for its advanced technology and ICT sector, with companies like Nokia, Oura, Supercell (Clash of Clans), and Rovio (Angry Birds) being notable examples. Finland is strong in R&D investment, education, and ICT infrastructure.

Key economic indicators, Finland

GDP nominal	USD 308 billion
GDP growth	2023: -1.0% 2024: 0.0% 2025: +1.2%
GDP per capita PPP (worldwide ranking)	USD 60,851 (24th)
Inflation	2023: 4.3% 2024: 1.4% 2025: 2.1%
Unemployment	7.4% (2024)

Source: Eurostat, 2024

Finland has a strong industrial base with key sectors including electronics, machinery, vehicles, and other engineered metal products. The traditional paper and pulp and forestry sectors bring a fair share to the table. These industries have been re-inventing their products and services by developing biomaterials, advanced composites, bioenergy, biofuels and even medicine from wood. Companies like Stora Enso and UPM are at the forefront of bioeconomy globally.

Finland is highly dependent on international trade. Exports reached USD 122 billion in 2023, of which USD 82 billion in goods and USD 31 billion in services. Major export destinations include the United States, Sweden, Germany, and Netherlands. In 2023, for the first time ever, exports of goods to the United States exceeded those to Sweden and Germany. Key export categories include machinery, electronics, forest products, and chemicals.

Imports amounted to USD 123 billion in 2023 (goods: USD 82 billion; services: USD 41 billion). The largest exporters to Finland included Germany, Sweden, China, Netherlands, and USA. Imports mainly consist of energy products, raw materials and investment goods, machinery and transport equipment, fuel, and chemicals.

The Finnish labor market is characterized by high education levels and a strong emphasis on technological skills. Unemployment rates are relatively low, though there are regional disparities and structural unemployment challenges. There is a high level of employment in cities, middle and south of Finland, while areas in the north and east of Finland record higher unemployment. The labor force participation rate is high in the working age population, supported by policies that encourage gender equality and work-life balance.

Why Finland?

Finland is among the most stable countries in the world with a top-quality business environment. The country performs high in a wide variety of global rankings, providing good grounds for potential business activities.

- Frequently scoring well in the World Economic Forum's Global Competitiveness Report (second after the US in 2022)
- Second-best investment environment in the world according to Legatum Prosperity Index 2023
- 20th in the World Bank's Ease of Doing Business Index, reflecting a supportive regulatory environment for business operations
- Sixth on the Global Innovation Index 2023 (measuring innovation capabilities and outcomes)
- One of the least corrupt countries in the world; second in 2023 Transparency International's Corruption Perceptions Index
- Second-best logistics performance according to the World Bank's Logistics Performance Index by 2023
- Number six on Global Talent Competitiveness Index 2023
- The Heritage Foundation's Index of Economic Freedom 2024 places Finland 12th, indicating a high degree of economic freedom in terms of property rights, government integrity, and labor freedom
- Ranked the happiest country in the world seven times in a row, based on factors like income, social support, healthy life expectancy, freedom, generosity, and corruption perception
- 12th on the UN's Human Development Index (measuring life expectancy, education, and per capita income indicators)
- Among leaders in environmental sustainability, positioning fourth in the Environmental Performance Index, which ranks countries based on their environmental health and ecosystem vitality
- A top performer in achieving the United Nations' Sustainable Development Goals, particularly in areas such as clean water and sanitation, affordable and clean energy, and quality education
- A leader in the European Union's Digital Economy and Society Index that tracks the digital performance of EU member states
- Ranks highly in the Networked Readiness Index, which measures the propensity for countries to exploit opportunities offered by information and communications technology

2 ROUTE TO MARKET

This document maps four sectors that present specific market opportunities for Virginia exporters. Of course, other sectors provide opportunities as well. Finland has an especially large and interesting SME pool. A company that can provide quality products and solutions with price advantage or unique selling points is likely to find partners in Finland.

Given the current security situation, internationally and in the neighborhood, Finland is heavily investing in military capabilities, equipment, and security products. In the future, Finland will need to tackle an ageing population which sets new requirements for healthcare products and services.

Already, there are substantial investments in renewable energy production, energy efficiency, hydrogen bioenergy, and biofuels as Finland improves its energy self-sufficiency and transitions to green energy.

The traditional automation, machinery, and metal industries continue developing their competitiveness and offering, as well as embedding ICT features into their products, which brings various opportunities for foreign companies.

Finland's market is open and receptive to U.S. goods, services, and investments. There are relatively few barriers to trade. Consumers have high expectations in terms of product innovation, design, quality, and price. Finland is a member of the EU, OECD, and WTO, and applies all international regulations from these bodies. US companies can apply the same business principles as when entering any other EU market. US companies can find routes to the Finnish market via multiple channels.

Finnish companies usually look for long lasting partnerships; yet, they are open to new ideas and partners.

Finns are "fluent in international trade" and have good English language skills. This is not to be confused with complete fluency and it is essential to have everything confirmed in writing.

Routes to market

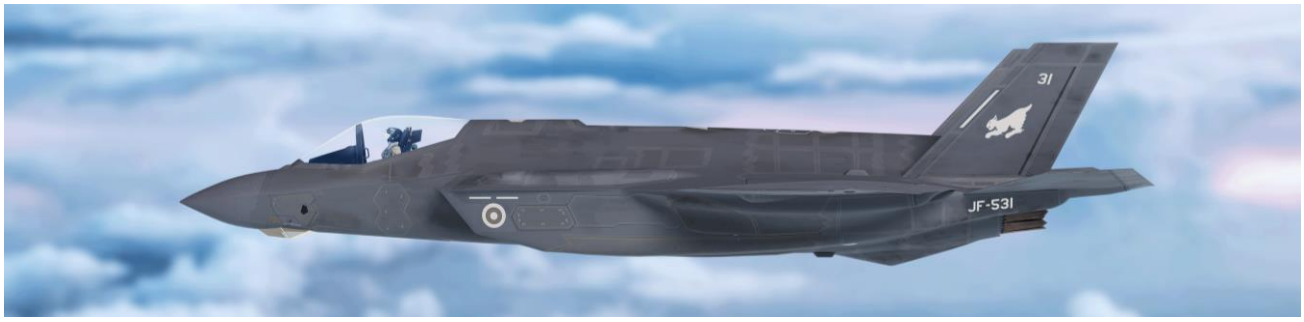
Depending on the nature of business and products/services offered, there can be a variety of routes to the market. In some cases, it is best to sell directly to customers, but for long-term business usually it is preferred to work with a local distribution or sales partner, which can be importers, wholesalers or retailers. Agents are not very common in Finland, but they can be found serving certain sectors, such as the textile market.

Finland will receive a maximum of USD 2 billion in funding for its Recovery and Resilience Plan from the EU's Recovery and Resilience Facility (RRF). The RRF is part of the EU's recovery plan (NextGenerationEU). Finland will receive a maximum of USD 2.8 billion from NextGenerationEU in total. Payment request is based on 20 milestones including for instance:

- establishment of county healthcare services; reforms of healthcare, social welfare, and rescue services
- investments in energy infrastructure and technology
- reduction of greenhouse gas emissions
- precision forestry projects
- continuous learning services
- research funding.

3 TARGET SECTORS

3.1 DEFENSE & SECURITY



Note: An image of the paint scheme of the Finnish F-35, Joint Fighter.
Photo: Finnish Air Force, Image by Finish Defence Sources

Finland shares an 833-mile-long border, a complicated history, and two wars during World War II with its eastern neighbor Russia. After the February 2022 Russian invasion of Ukraine, tensions between Finland and Russia increased. This has led to a growing interest, involvement, and investments in the defense and security sectors in Finland. Along with the Finnish Defense Forces, national organizations, municipalities, and companies have planned and made substantial investments in both traditional and cyber security products and solutions.

After almost 30 years of close partnership with NATO, which was based on its policy of military non-alignment, Finland joined the Alliance in April 2023. Finland also signed a bilateral Defense Cooperation Agreement with the USA in December 2023, which will further strengthen defense and security cooperation.

The 2024 draft budget for the Ministry of Defense's administrative branch is USD 6.4 billion, representing 2.3% of the GDP. Finland will make additional investments in its defense capability, strengthening activities as a NATO country and the budget also considers support for Ukraine. The budget allocates USD 279 million to the Defense Forces to reimburse for the capabilities that have been handed over to Ukraine.

The 2024 budget allocates approximately USD 1.4 billion for defense material procurement, USD 1.6 billion for the F-35 fighter program and USD 261 million for Squadron 2020, which replaces seven Finnish Navy vessels with four modern corvettes expected to be completed by 2029. There is also a new procurement authorization of USD 126 million for the Navy to improve the logistics system performance, the Navy's clearance capacity, and underwater surveillance.

Key defense projects include the F-35 program, which includes acquiring 64 Lockheed Martin F-35A Lightning II multirole fighters. All the fighters are to be delivered by 2029, with first fighters in use in 2026. The total program value is estimated at USD 9.6 billion. About USD 2.9 billion of the project will be covered by industrial participation agreement signed by the Ministry of Defense, Lockheed Martin, and Pratt & Whitney.

The F-35 program includes weapon systems and the Defense Forces have signed a contract with the United States for the procurement of JDAM and SDB I systems for the F-35 multi-role fighters. The USD 96 million procurement contract includes Bomb Rack Unit 61 carriage assemblies, training material, manuals, spare parts, accessories, transport, training, and support services until 2030. In May 2024, the Defense Ministry approved an additional purchase of JASSM missiles enhancing long-range air to surface capability. The missiles will be delivered in line with the schedule for deployment of the F-35 fighters.

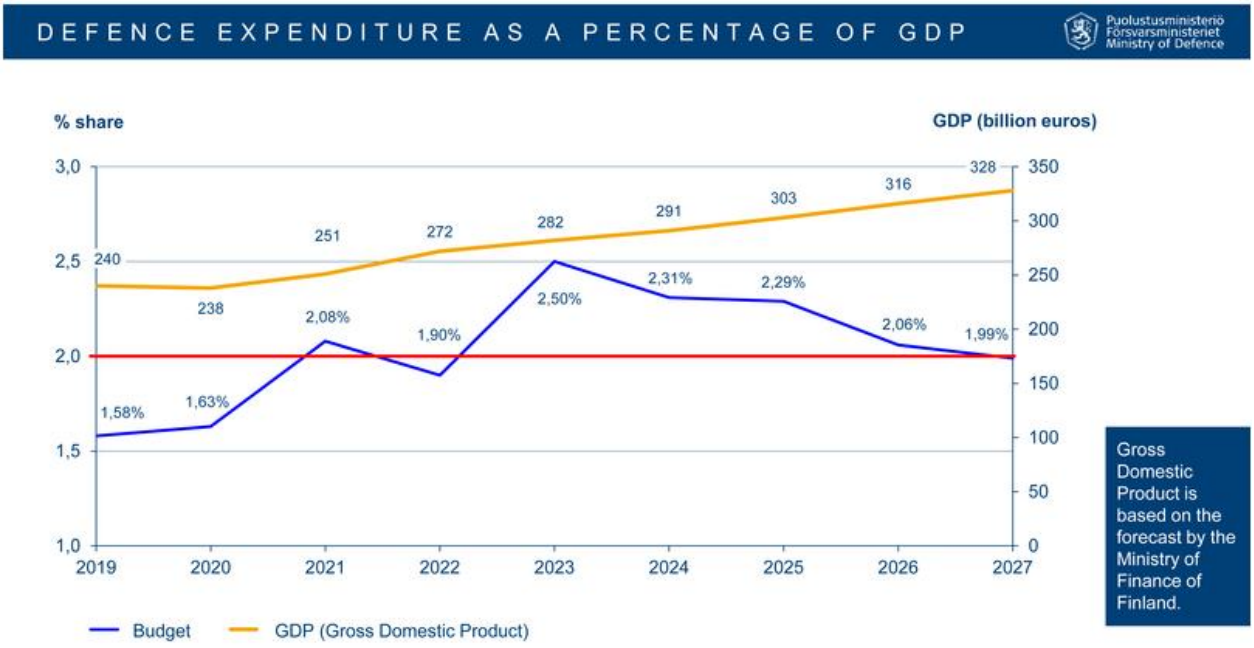
The Finnish Defense Forces signed a service agreement with Patria Aviation to build industrial cooperation capabilities for the F-35 project. The services will include a one-off program related to building capabilities for industrial participation in the F-35 system, machinery, equipment, tools and information systems required for production. The industrial cooperation projects include assembly and maintenance facilities for F135 engines for F-35 fighters to the town of Nokia.

There is also a surge in military construction projects as the F-35 fighters, new navy vessels, and NATO engagement all require new infrastructure and facilities. While construction investments amounted to USD 65 to 85 million annually in past decades, they will reach USD 270 million in 2024 and rise to USD 430-540 million in 2025.

Finland selected David´s Sling Weapon System for building high-altitude capability for ground-based air defense. The total value of the procurement will be USD 340 million comprising the main procurement contract and immediately redeemable option. The weapon system will be delivered by the end of the 2020s.

The Finnish Defense forces have started life-cycle upgrade for their heavy rocket launcher system, which consists of 41 rocket launchers to be upgraded to version M270A2. Lockheed Martin will carry out the work worth USD 486 million.

According to plans of the Ministry of Defense's administrative branch, a spending limit of USD 6.7 billion is expected in 2024 and 2025, followed with a cut to USD 6.2 billion in 2026 and 2027. The share of defense expenditure of the projected annual GDP will remain at 2% during the period. The change is largely explained by annual fluctuations in financing of the F-35 multi-role fighters.



NATO’s Defense Innovation Accelerator for the North Atlantic (DIANA) approved Finland’s proposal to establish one accelerator and two test centers in Finland. The VTT Technical Research Centre of Finland will establish an accelerator in Otaniemi in Espoo in cooperation with the Aalto University and the University of Helsinki. The new accelerator will focus on next generation communications and quantum technology. It will offer mentorship in business development in the defense sector, mostly to SMEs. The test centers will be established at the University of Oulu and the Otaniemi office of the VTT Technical Research Centre of Finland. The test center in Otaniemi will specialize in cyber-secure communications, quantum technologies, and space technologies. The test center coordinated by the University of Oulu will offer companies opportunities to test 6G network technologies.

The Finnish defense materials industry is also at a record phase. According to an MoD report, the value of export licenses of defense material granted amounted to record-high USD 719 million in 2023, which was more than 5.5 times higher value compared to 2022. 355 licenses to 56 countries were granted for permanent exports and transfers of defense material. The exports value reached USD 207 million in 2023, more than a 50% increase year-on-year. 85% of all exports went to Europe, particularly to Sweden, Latvia, and Lithuania, comprising mostly of armored vehicles, ammunition, explosives, and chargers.

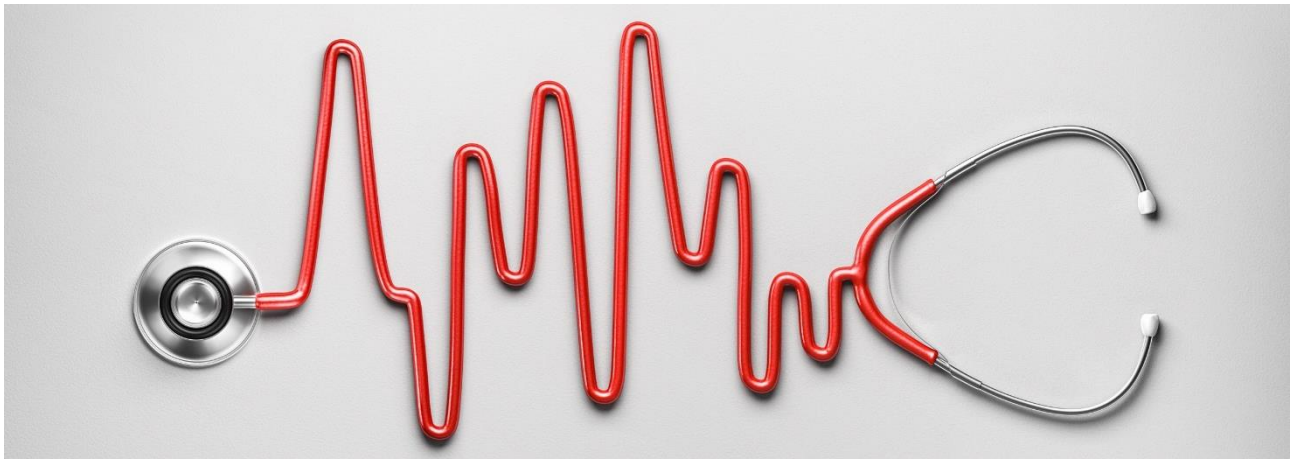
Presented below are three key players in the Finnish defense industry:

Patria Group (www.patriagroup.com), a defense and technology company owned by the State of Finland (50.1%) and Norwegian Kongsberg Defence & Aerospace AS (49.9%), offers life cycle, system upgrade, and aftersales services for defense, security, and aviation, manufactures armored vehicles, armament and autonomous systems, and provides battlefield and critical systems. The company is heavily involved in the Finnish Defense Forces projects, with international operations and global exports.

Insta (www.insta.fi/en) provides automation, defense, software development, and cyber security solutions. Insta's offering for the defense sector includes cyber security, aviation MRO and lifecycle services, C5ISR, training and situational awareness, combat solutions, digitalization and data analytics in defense, expert services and system integrations for defense, pilot safety products, as well as UAV solutions and consultancy. Insta is a long-term strategic partner of the Finnish Defense Forces.

Bittium (www.bittium.com) provides secure solutions for connectivity, tactical communications, as well as biosignal measuring and monitoring. Bittium's defense and security offering includes products and systems for tactical and secure communications by bringing broadband data and voice to all troops across the battlefield. Secure communications offering includes ultra secure mobile devices and cyber security solutions.

3.2 HEALTHCARE & HEALTHCARE TECHNOLOGIES



The Finnish public healthcare system is among the most advanced in the world. Universal health insurance coverage is accessible for all citizens and permanent residents. Finland spends 10% of GDP on health expenses, translating into USD 4,825 per capita annually (compared to USD 13,493 in the US).

Finland has 3.6 doctors per 1,000 inhabitants, below the EU average of 4 doctors. On the other hand, it has 19 nurses per 1,000 inhabitants, significantly above the EU average of 8.5 nurses. Since the COVID pandemic, there has been a shortage of both doctors and nurses, as people working in healthcare moved to other fields.

The healthcare system has certain special features. The main responsibility for organizing and financing healthcare services is under 21 “wellbeing services counties”, and the division into counties is mainly based on the administrative division into regions. The wellbeing regions took over management of healthcare services from the central government in January 2023 and there have been many changes since then.

Another unique feature is the existence of parallel financing and delivery systems: public and private healthcare providers. The private sector mainly provides services in specialized healthcare and occupational health services. The share of private social and healthcare providers, including companies, associations and funds, is about 22% of the entire social and healthcare services. Before the reform, which is still on-going on practical level, there was a large healthcare construction investment boom and some of these projects are still on-going. To apply for these projects, companies need to go through public procurement process.

Finland is the most advanced digital economy in the EU according to DESI 2022 (Digital Economy and Societal Index) and this also extends to healthcare. All Finns have online access to their health records and their e-prescription history, which makes health data unique in terms of quality and volume. The healthcare system has also been accumulating blood and tissue samples in biobanks for years. ICT is used in growing numbers in healthcare and companies specialized in these fields can find good opportunities in Finland. Different measurement and analytical devices are made in co-operation with healthcare, electronics, and ICT sectors.

Finland is one of the few countries in the world that exports more health technology than it imports. The value of Finland's exports of health technology products reached USD 2.8 billion in 2023. The U.S. remained the largest single export destination for Finnish health technology firms, accounting for 33% of total exports valued at USD 935 million. Europe was the destination for 42% of exports, with Germany being the most significant market within the continent, receiving USD 296 million worth of Finnish health tech products. Imports of health technology products were USD 1.8 billion.

The sector achieved a trade surplus of USD 1 billion last year, contributing to a cumulative surplus of approximately USD 18.5 billion over the past two decades. This surplus has fostered job creation and investments in both R&D and industrial ventures within Finland. It is important to note that export figures derived from customs' foreign trade statistics do not include software exports or digital services, which generally account for about one-third of the total export value. This suggests that the overall impact of the health technology sector on Finland's economy is even more significant.

The Finnish market has good settings to develop and launch healthcare products due to high quality of training and education in medicine, electronics, and biotechnology. As an EU member, Finland's legislation concerning medical equipment complies with EU directives. Medical trade is duty-free within the EU. Import duties are collected only on products coming from non-EU countries, with tariffs varying by product.

Finnish-based companies have successfully developed medicines with strong global demand. Bayer, Orion, Pfizer, and Santen have large production facilities here. The country has been able to retain pharmaceutical manufacturing due to specific competences, which includes polymers in hormonal IUDs, septic production of ocular medicines, and hormonal medicines. The pharmaceutical market is closely regulated and monitored by the Finnish Medicines Agency (FIMEA). Medicines are only sold to the public through pharmacies.

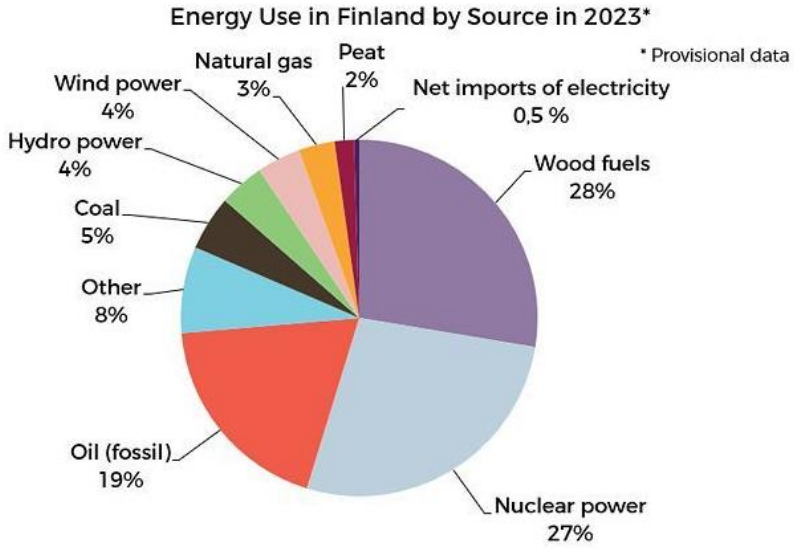
Rapid ageing of the population − the fastest in Europe − and the emergence of a silver economy will make Finland a unique healthcare market in the future. By 2030, 26% of its population will be over 65 years of age, while for instance, the UK will not attain this figure until 2051. The economic potential related to the silver economy in Europe is based on the fact that retirees of the baby boomer generation will be wealthier than their predecessors and they are used to spend. Another factor is the higher education level of future retirees, which may lead to an increasing demand for high quality services.

PLANMECA Planmeca (www.planmeca.com) is a Finnish dental unit and imaging devices manufacturer. Its product range covers digital dental units, CAD/CAM solutions, 2D and 3D imaging devices, and comprehensive software solutions. The company was founded in 1971 and belongs to the globally operating Planmeca Group, with turnover of USD 241 million.

3.3 RENEWABLE ENERGY PRODUCTION & HYDROGEN

Image by Fortum, Loviisa nuclear power

Per capita energy consumption is relatively high in Finland. Underlying causes include the cold climate, sparse population, long distances, and heavy nature of its industry. Finland relies on renewable energy sources. There is strong commitment to environmental sustainability via significant investments in renewable energy, energy efficiency, and a focus on achieving energy independence and security.



Finland's total energy consumption reached 366 TWh or 1.32 million TJ in 2023. 41.9% of total energy was generated from renewable sources (if nuclear power is counted, the share of green or low carbon power sources amounted to 69%). Finland leads the world in utilizing wood-based fuels (recording a 28% share of wood fuels in total energy production, which is among the highest proportions worldwide).

There is still work to be done to phase out fossil fuels and US companies with such experience can find opportunities in Finland. In addition to wind power produced on land, there are many plans to develop more offshore wind farms. The first offshore wind farm built in frozen sea conditions is located in Tahkoluoto and there are plans to expand it in 2026-2029 with 40 (over 15 MW) plants, with full capacity of 600-800 MW. The project has already received USD 32 million energy investment support from the Ministry of Economic Affairs and Employment (MEAE). Another opportunity regarding offshore wind power involves improving Finnish harbors as tall wind power plants require large and strong areas for pre-assembly, assembly, and warehousing services.

Finland utilized 79.7 TWh of electricity and produced 78 TWh of electricity in 2023. Nuclear power accounted for the largest share 41% (32 TWh), followed by hydro power (18.8%, 15 TWh) and wind power (18.1%, 14.1 TWh), while CHP plants produced 13.4 TWh (16.9%). 78.7 % of the total electricity production was generated by renewable sources and if wood fuels (used mostly in CHP) are included, the share exceeds 90%.

Domestic production of electricity grew significantly in 2023, as net electricity imports decreased to a fraction of the previous year's level. The largest increases were recorded by nuclear, wind, and hydro power. The Olkiluoto 3 nuclear plant was connected to the grid in 2022 and there were significant investments in wind power. The share of wind power is expected to surpass hydro power during 2024.

2023	Quantity (TJ)	Year-on-year change (%)	Share (%)
TOTAL ENERGY CONSUMPTION	1,316,379	1,7	100,0
1 Renewable energy	552,000	2,5	41,9
1.1 Hydro power	54,075	12,6	4,1
1.2 Wind power	52,091	25,2	4,0
1.3 Wood fuels	363,550	-1,0	27,6
1.4 Other renewable energy	82,283	0,5	6,3
2 Fossil fuels and peat	392,850	-10,3	29,8
2.1 Oil (fossil)	248,724	-6,1	18,9
2.2 Coal	65,521	-21,1	5,0
2.3 Natural gas	42,999	6,2	3,3
2.4 Peat	22,963	-37,4	1,7
2.5 Other fossil fuels	12,643	-1,0	1,0
3 Nuclear energy	357,129	35,0	27,1
4 Net imports of electricity	6,207	-86,2	0,5
5 Others	8,192	-0,2	0,6

2023	Quantity (GWh)	Year-on-year change (%)	Share (%)
TOTAL ELECTRICITY CONSUMPTION	79,770	-2,3	100,0
1 TOTAL ELECTRICITY GENERATION	78,046	12,9	97,8
1.1 Hydro power	15,021	12,6	18,8
1.2 Wind power	14,470	25,2	18,1
1.3 Solar power	647	64,8	0,8
1.4 Nuclear power	32,737	35,0	41,0
1.5 Combined heat and power (CHP)	13,440	-19,8	16,9
1.5.1 CHP, district heating	6,335	-31,8	7,9
1.5.2 CHP, industri	7,084	-4,9	8,9
1.5.3 Micro-CHP	21	0,0	0,0
1.6 Conventional condensing power	1,732	-39,4	2,2
2 NET IMPORTS OF ELECTRICITY	1,724	-86,2	2,2
2.1 Norway	364	-13,8	0,5
2.2 Sweden	8,332	-45,4	10,5
2.3 Russia	0	-100,0	0,0
2.4 Estonia	-6,972	2,7	-8,7

Source: Statistics Finland

Many cities are looking into opportunities to produce district heating with small modular nuclear reactors (SMR), making Finnish energy production even greener. LUT University and US company Ultra Safe Nuclear Corporation have signed a memorandum of understanding to build a micro modular reactor (MMR) for research and testing to Lappeenranta. Completion of the 15-30 MW reactor is expected by the end of 2020s. Also, Finnish government owned VTT Technical Research Centre of Finland is involved in SMR R&D.

There is a lot of potential for hydrogen production, as the country generates a lot of renewable electricity, especially during summer months, which is now sold cheaply abroad. Hydrogen network projects have been included in the list of important European projects (PCIs). The Finnish Government has mandated Gasgrid Finland to promote the development of the national hydrogen infrastructure, international infrastructure cooperation, and the hydrogen market in the Baltic Sea region. With many planned production investments, high interest rates have postponed investment decisions. US companies providing hydrogen production and transfer technologies and solutions can find opportunities in Finland in the near future. For example, in 2023, US company Plug Power announced plans to build three green hydrogen production plants in Finland (USD 1.1 billion investment).

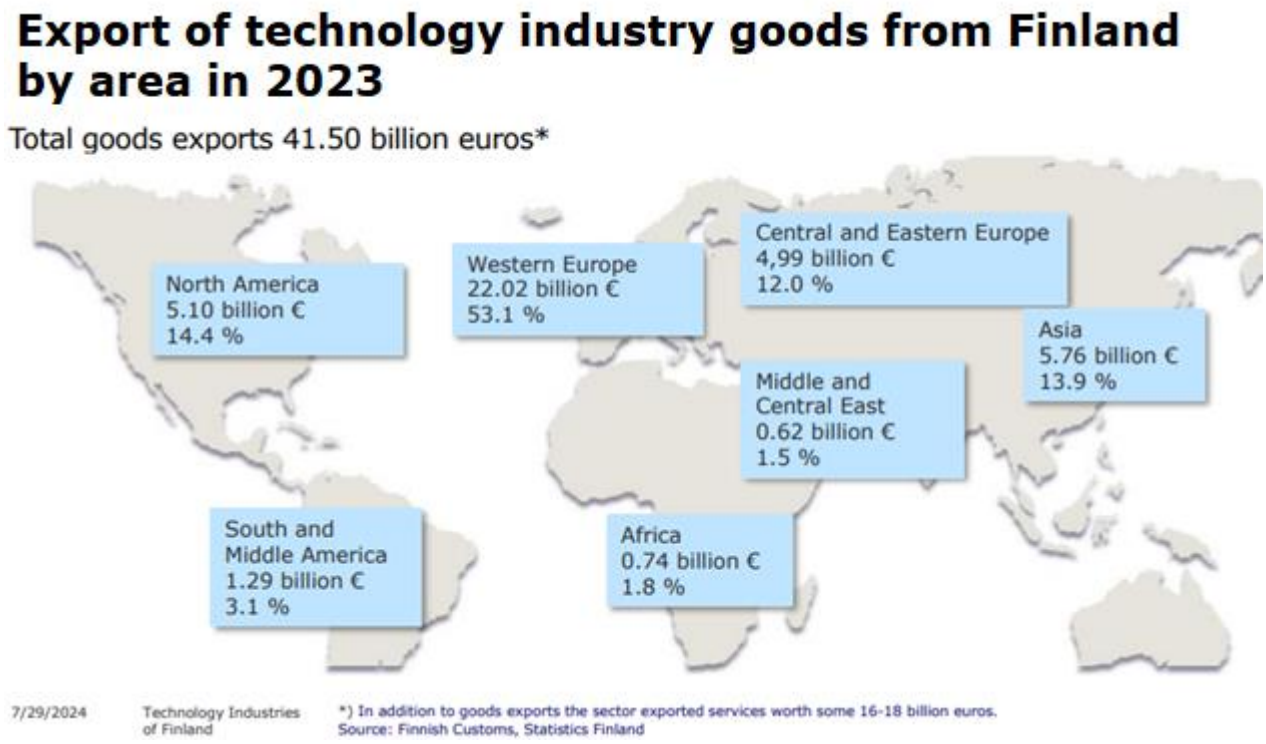
Fortum (www.fortum.com) is one of the largest energy and electricity producers in Finland and the Nordics. In 2022, Fortum launched a 2-year study to research building a large nuclear plant in Finland or Sweden. The study also includes finding out potential and opportunities for SMRs. Fortum is also building a hydrogen production pilot plant in Loviisa to be completed in 2025.

Fingrid (transmission system operator & involved in building and maintaining the main high voltage grid) has a development plan for 2024-2033 which includes USD 4.3 billion investments in the main grid. The high investment volume is due to rising renewable energy capacity, Finland's competitiveness in industrial investments, and enabling the achievement of carbon neutrality targets by 2035.

3.4 MACHINERY & AUTOMATION

Finnish companies are strong in building ship and power plant engines, pulp and paper machines, ore, mineral and material handling equipment, elevators, cranes and lifts, as well as forestry and agriculture machines. A significant volume of machinery, equipment, and solutions are exported and key export markets include Western Europe, North America, and Asia.

Technology and mechanical engineering industries are also among the key fields in Finland. The machinery and metal industries employed 138,800 people and generated USD 41 billion in turnover in 2022. Another strong sub-group includes the electronics, automation, and electricity industries (40,700 employees and USD 23 billion turnover).



Given the long tradition in forestry industries, Finnish companies have developed cutting edge forestry machines and solutions, which they export all over the world. Core products include harvesters, forwarders, and woodchippers. Finnish companies are strong in building paper and pulp machinery, chemical and wood processing, as well as automation solutions. Agriculture machinery, mostly sold to EU countries, consists of tractors, field machinery, harvesters, indoor equipment, transportation, and special equipment.

Due to Finland's geographical size with long distances and its dependency on foreign trade, many Finnish companies operate in automation, material handling, and logistics fields. Solutions and products have been developed for warehouses, terminals, and ports. Many of these companies are multinational with export activities, but there is also a strong SME sector serving larger companies and manufacturing industries, which can provide interesting opportunities.

Finnish companies produce machinery for mining operations, including drilling equipment, crushers, and screening machines. In the construction machinery sector, there is special expertise in loaders and cranes. Companies are known for advanced manufacturing machinery, including automation systems, CNC machines, and robotics. They invest heavily in research and development leading to high-tech solutions in industrial automation, predictive maintenance, efficiency optimization, and the industrial internet of things.

Companies are increasingly utilizing VR and AR to visualize products and streamline production lines. New smart factories and manufacturing operations, equipped with industrial automation, robotics, and IoT, offer cooperation opportunities for companies offering technologies and solutions. To remain competitive, Finnish companies need to further develop these Industry 4.0. capabilities and are on the lookout for upgrades and cooperation opportunities with international partners, research institutions, and tech companies.

Finnish machinery and automation solutions are generally high quality and reliable, as they are designed for demanding northern climates. There is also focus on developing energy-efficient and environmentally sustainable machinery.

Examples of major Finnish players in machinery and automation include the following three companies:

Wärtsilä (www.wartsila.com) develops and manufactures marine and power plant engines as well as vessel propulsion systems. The company employs over 17,000 people in 79 countries and has installed over 79 GW of power plant capacity and there are 41,500 vessels with Wärtsilä's equipment.

Valmet (www.valmet.com) develops and supplies process technologies and automation for the pulp, paper, board, tissue, and energy industries, including automation systems and flow control solutions. Valmet employs more than 19,000 people in production units, R&D, and service centers around the world; its turnover reached USD 6 billion in 2023.

Cargotec (www.cargotec.com) develops and manufactures cargo and load handling solutions. Businesses include Hiab, which is the c-brand for on-road load handling solutions, and McGregor focusing on maritime cargo and load handling. Cargotec headquarters is based in Helsinki with assembly facilities in Brazil, China, Finland, Ireland, Italy, Malaysia, Norway, Poland, South Korea, Spain, Sweden, and the United States.