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Research project on Finnish digitalization policy & business opportunities in leading Finnish high tech sectors

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RESEARCH PROJECT ON FINNISH DIGITALIZATION POLICY & BUSINESS OPPORTUNITIES IN LEADING FINNISH HIGH-TECH SECTORS

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Contents

Executive summary

This report is an overview of the Finnish digitalization policy and some of the most innovative high-tech sectors. Its purpose is to serve both policymakers and businesses.

Finland is a highly technologically advanced society, ranking among the first in a variety of indexes, such as digital competitiveness, and is home to some of the leading technology companies. As such, its digitalization policy is ambitious and could serve as a benchmark for others. For example, Finland was the first country in Europe and one of the first in the world to have an AI policy. It is rapidly digitalizing its public administration and its support and funding framework for innovation is very advanced.

Finland also has a robust infrastructure for supporting and funding innovation. Through its multi-stakeholder approach, innovation is supported by cooperation between businesses, innovation hubs, industry unions, universities and research institutions, and governmental organizations.

This study also includes a closer look at sectors identified as particularly promising in Finland. These are cybersecurity, telecom (5G/6G), smart cities & smart mobility, and quantum computing. The aim is to map out the most important players and technologies in these sectors, in order to identify business opportunities and provide this information as conveniently as possible.

In each section, this report has listed the key players in the respective sectors, including providing links to the websites with contact information, in order to make it as easy as possible to start getting acquainted in the various organizations and reaching out to them. In addition, each section makes a listing of relevant funding programmes from the government and other organizations, as well as funding available through the Finnish Recovery and Resilience Plan and flagship programs.

This report is an attempt of making all of this information available in one place, by providing as references a great number of links to various studies, organizations and policy documents. This way it makes it easy to find all the necessary information for businesses and policymakers to explore opportunities for investments, clients and partnerships.

INTRODUCTION

The following report is an investigation into the Finnish digitalization policy and business opportunities in some of the most rapidly growing sectors in Finland.

The first part of the study analyzes the Finnish digitalization policy and describes its latest developments. Instead of making a summary of the policy – since such summaries are already available – this report rather focuses on the work of ministries and government institutions and experts´ views on the latest developments that affect the policy work, and the direction the Finnish digitalization policy is being developed. While the main focus of the first part is Finnish digitalization policy and therefore mainly national, it also has clear connections to the EU policy, e.g., RRF and the Horizon programme.

Sectors identified as particularly promising in Finland and therefore as focus of this study are cybersecurity, telecom (5G/6G), smart cities & smart mobility – and as a promising one in a bit earlier stage of development – quantum computing. Furthermore, health technologies is another pioneering sector in Finland that has many opportunities, but since the embassy in Helsinki together with the NBN network has recently commissioned a market study on this sector via an external consultant, it is ruled out from this study. Nevertheless, the study on health technology sector will also be referenced in this report and a link for the free access to it will be included.

In the second part, this report aims to map out opportunities in various Finnish sectors, in order to facilitate Dutch businesses to make use of these opportunities. The second part will also aim at identifying possibilities for market entrance and strategic partnerships.

Method

The study was carried out as a desk research analyzing publications and policy documents from various sources (see next paragraph). To gain deeper and more detailed information, also expert interviews from these organizations were carried out.

Interviews were carried out as semi-structured interviews, in which some key questions are asked but at the same time this method allows room for discussion as not is not strictly focused on pre-determined themes and questions.

Data sources

To get a comprehensive understanding of the policy work, the challenges policymakers are facing and the way these challenges are being addressed, it is important to take in to account a wide variety of data sources. Publications and interviews from the following organizations will be used as data sources for this study.

- Ministries: Economic affairs & employment, Finance, Transport & Communications
- Inter-ministerial coordination group for digitalization
- Parliamentary working groups: RDI Working Group & information policy working group
- Ministry of Finance High-level Technology Advisory Board
- Business Finland
- Technology Industries of Finland & other unions
- CoE's like the IT Center for Science (CSC)
- Business hubs
- Research and knowledge institutions (at least VTT)

The publications used as sources are referenced as footnotes, however, some of them are regrettably only available in Finnish and Swedish.

Background

Before getting into the policy discussion, it is necessary to lay some basics on the Finnish digital landscape and key figures.

Finland is very advanced in terms of digitalization of society, availability of data, and digitally provided services for citizens, as reforming the society and supporting citizens in their interaction with public administration digitally has been a high priority. Finland is often called “the world’s telecommunications test laboratory.” The advanced nature of the Finnish telecommunications market has led to many services and technologies introducing in Finland much earlier than elsewhere in the world. As a result, many international companies use Finland as a test laboratory for experimental launches of new products and services before going global.

Much of this success can be traced back to the by far most internationally successful and recognized Finnish company, Nokia. Although Nokia eventually failed in its cellphone business, it is still a global leader in the network business (e.g., 5G technology). What is more, as Nokia alumni sought new employment, the collapse of the company´s cellphone business led to the dispersing of the expertise in many Finnish tech companies in various sectors, and the establishing of a wealth of technology startups.

As an indication for Finland´s success, for the second year in a row, Finland ranks first in the EU Digital Economy and Society Index (DESI), a metric for digital performance and digital competitiveness. The great performance is credited to excellence in digital public services and the integration of digital technologies, both enabled by public and private sector cooperation and an active start up-scene.

Although there are a few other cities and regions of the country that are advanced in research and innovation of various technologies, the Helsinki region remains the powerhouse of the country’s innovation, startup incubation, and international business. According to GSER[1], the most comprehensive and widely read startup survey in the world, the Helsinki region is among the top 20 urban areas in the world in the list of emerging startup ecosystems in the Global Startup Ecosystem 2021. The report calculates that over the past 2.5 years, the startup ecosystem has created €5.6 billion in value added for the Helsinki region, with a total of €469 million in early-stage funding.

Furthermore, the Helsinki region is also among the top 20 emerging ecosystems in the world when measuring the ability of cities to produce and retain skilled professionals in their startup ecosystem. In addition, when measuring innovation within early-stage funding and investor activity in the startup ecosystem, Helsinki ranks in the top 10 cities in the world. Helsinki also supports the growth of startups, for example, through the city's startup hub, NewCo Helsinki, The unit helps startups to procure funding, find partners and create networks for internationalisation.[2]

Finnish society is currently undergoing a transition that includes major structural reforms. With the ongoing energy shortage and climate crisis there is more need for green transition than ever. The Finnish population is ageing rapidly and healthcare expenditure is rising. There is a long recognized need to stop the accumulation of government debt and generate more growth through new entrepreneurship.

[1] https://startupgenome.com/report/gser2021

[2] https://www.hel.fi/uutiset/en/kaupunginkanslia/helsinki-region-one-of-the-best-startup-ecosystems-in-the-world

One framework for these changes is provided by digitalization. It challenges the policymakers to question the existing methods and practices and to make them more effective and flexible. In practice, by means of digitalization people and businesses take center stage in the development of public services. Welfare of senior citizens can be improved by means of intelligent health services; children can learn history and geography in a virtual environment; and the need for a private car may be removed by comprehensive public transport services.

In practice, the need to provide digital services to people at all stages of their life is well recognized. These include services to families arises with small children, easy-access services to unemployed people to facilitate entry to the labor market, or enabling a pensioner to lead a healthy life. Digitalization helps create better and more reliable service chains to meet the requirements of good life and varying circumstances.

Finland is already one of the leading countries in the world in public electronic services, and it has an opportunity to "punch above its weight" and benefit significantly through technology compared to other countries. Furthermore, studies show that the digital skills of Finns are the best in the EU. This proves that the prerequisites for success in digitalization are excellent.[3]

Government support is considered proactive and future-focused, with the government setting regulatory incentives and funding basic research. Finland is a member of the EuroHPC Joint Undertaking and will host one of the three pre-exascale supercomputers. Finland is also a signatory of the Declaration on European Blockchain Partnership and the Declaration on Cooperation on Artificial Intelligence. Finland was the first country in Europe and one of the first in the world to have an AI policy.

As "working-level" examples of such proactiveness, the Ministry of Finance has appointed a some strategic groups and advisory boards to ensure the technology and digitalization policies are developed in a meaningful way. For example, the work of the high-level Technology Advisory Board[4] as well as the strategic group steering the AuroraAI programme[5] will be central element of this report.

According to a Ministry of Finance report (*Ethical information policy in the age of artificial intelligence*)[6], the starting point of Finnish technology policy is that market choices are market-driven. The public sector attempts to create the conditions for the emergence of winning sectors, not to choose these conditions itself.

Finland's traditional strengths and areas where significant progress has been made in recent years: [7]

- Strong skill base and internationally acclaimed ICT skills as a result of a world leading education system
- The world's most ambitious carbon neutrality targets and roadmaps for achieving them
- Emergence of new technology startups and significant value creation
- Appreciation of entrepreneurship, especially among young people

[3] Digitalisation - Valtiovarainministeriö (vm.fi)

[4] Finland aims for technology leadership – approves objectives for technology policy for this decade - Valtiovarainministeriö (vm.fi)

[5] Implementation of the national AuroraAI programme - Valtiovarainministeriö (vm.fi)

[6] Eettistä+tietopolitiikkaa+tekoälyn+aikakaudella+-selonteko.pdf (vm.fi)

[7] Suomen teknologiapolitiikka 2020-luvulla : Teknologialla ja tiedolla maailman kärkeen - Valto (valtioneuvosto.fi) – unfortunately only available in Finnish!

- The 2010 reform of the Universities Act improved the competitiveness of universities
- Positive development of the country´s international image
- Digital infrastructure and data resources
- A stable economy and a firm system based on the rule of law
- Highly skilled workforce and digital literacy
- Protection of tangible and intangible property

PART ONE: FINNISH DIGITALIZATION POLICY

1. POLICY CHALLENGES

Finland's challenges to succeed using technology

- Relatively weak competitiveness of Finland as operating environment in attracting international investment
- Legislation and practices in public administration are often too heavy, slowing down innovation and automation
- Difficulty of long-term predictability of the operating environment
- The threat of a sustainability gap to the national economy and competitiveness, the inability of several successive governments to affect development
- Skill shortages, declining working age population and challenges in labor migration
- Strongly reduced support for business investment in research and innovation (drastic cuts were made in 2017, now again witnessing an upward trend)
- Early leakage of ownership of technology companies out of Finland and Europe
- Poor success in commercializing research
- Decentralized responsibility; siloed and splintered digital and data economy projects in public administration
- Lack of wide-ranging understanding of technology in policy-making and public administration
- Limited research collaboration between companies and universities

One of Finland's most significant challenges is the decline in competitiveness vis-à-vis the other Nordic countries. Since 2006, investment rate has fallen from the best in the Nordic countries to the second to last. Furthermore, GDP growth is projected to lag significantly behind the other Nordic countries by 2030. The statistics also show the link between this direction and declining R&D investment.

A report published by the Ministry of Finance in February 2021 (*Unlocking Finland's economic growth – Outlook, priorities and solutions*)[8] highlighted particular concern that the income-generating capacity of Finland´s economy is not sufficient to support the welfare state as in its current form. In addition to economic policy aiming at stopping the accumulation of government debt, the help of technology, data and artificial intelligence is needed to ensure that, for example, high-quality welfare services of the future can be provided despite the declining dependency ratio and the recent low economic growth.

According to a Ministry of Economic Affairs report[9] (*Technology, investments, structural change and productivity – Finland in international comparison*), Finland has not been able to take advantage of technological development and ICT investments as well as its competitor countries. Finland's challenge in productivity growth is also creative renewal. The report states that Finland ranks only moderately when it comes to understanding and adapting to the need for economic and social reforms, the efficiency of SMEs on an international scale, the share of start-ups and the entrepreneurship of managers.

On the other hand, according to a Ministry of Finance report (*Productivity and competitiveness in Finland Which factors affect competitiveness?*)[10], Finland ranks at the other end of the comparison countries in terms of the time taken to set up companies for administrative reasons, but this alone

[8] Talouskasvun edellytykset tulevaisuudessa : Lähtökohdat, suunnat ja ratkaisut - Valto (valtioneuvosto.fi)
[9] Teknologia, investoinnit, rakennemuutos ja tuottavuus : Suomi kansainvälisessä vertailussa - Valto (valtioneuvosto.fi)

[10] Tuottavuus ja kilpailukyky Suomessa. Mistä kilpailukyky koostuu ja mihin sitä tarvitaan? - Valto (valtioneuvosto.fi)

is not sufficient to ensure the commercialization of innovation and creating economic growth through entrepreneurship.

Finland's challenge is to utilize the software design and technology expertise of the platforms in developing business growth. There is a shortage of 7,000 university-level software designers in the labor market in Finland, and by 2020 the shortfall will increase to 15,000. Of course, there are attempts to attract more international talent to Finland, e.g., via various sponsoring programmes, and this has indeed been somewhat successful. However, the challenge still remains especially the language barrier faced outside of work life, as well as the slow visa process, which has frustrated many expats.

As already discussed, although Finnish digitalization and technology policy aims at the country being the world leader in the use and commercialization of technology and digitalizing the society, many policy areas are still too siloed. A report from the high-level Technology Advisory Board[11] calls for a closer interface of education, science, business and innovation, industry, transport and communications, immigration, the economy, welfare and social affairs, climate and the environment, and foreign affairs, defense, and defense, because due to its nature, information and technology policy is cross-administrative and cross-sectoral.

[11] Suomen teknologiapolitiikka 2020-luvulla : Teknologialla ja tiedolla maailman kärkeen - Valto (valtioneuvosto.fi) – unfortunately only available in Finnish!

2. POLICY GOALS

Finland has clear aspirations to become the leading country in digitalizing the society and being the technological frontrunner. According to an April 2022 government resolution on technology policy[12], achieving the world's leading position will require significant development and even a change of direction in several areas.

Therefore, according to the government resolution, policy needs to be developed in the following direction:

- A cross-governmental technology policy that benefits companies and makes public administration more efficient.
- To be more entrepreneurship-oriented and transforming Finland into an attractive target for international investment.
- Strengthening the digital soft infrastructure.
- Cross-border cooperation internationally, and also nationally (that is, between organizations and policy areas).

To that end, in the resolution, the Ministry of Finance high-level digitalization advisory board has set four objectives for the Finnish digitalization policy[13]:

1. Finland will be one of the most competitive nations in the world and the world's best place for technology companies.

2. Finland will be home to many of the world's best-known and most attractive concentrations of technology education, research, skills and investments.

3. Finland will have the world's most favorable public sector towards technology and innovation, which will provide the basis for the wellbeing of individuals and undertakings.

4. Finland will benefit extensively from boldly developing and applying technologies that respond to global challenges.

These objectives are central to this report, as a lot of the policy work focuses on these targets and they are referred to in many policy documents, showing their importance. Therefore, this chapter will focus on these four objectives and the main targets they entail.

[12] Government resolution on technology policy March 2022 (hankeikkuna.fi)
[13] Suomen teknologiapolitiikka 2020-luvulla : Teknologialla ja tiedolla maailman kärkeen - Valto (valtioneuvosto.fi) – unfortunately only available in Finnish!

Objective 1: Finland is one of the most competitive countries in the world and the best place in the world for technology companies[14][15]

Increasing RDI investment and efficient business-oriented targeting will accelerate innovation and the bold application of technologies developed both in Finland and elsewhere, and Finland will permanently return to the top of the world's most competitive countries. This objective is defined by the following aspects.

- Public administration structures and practices, as well as close and long-term public-private partnerships, will accelerate the full exploitation of technologies.
- Ambitious goals, a predictable operating environment, enabling and technology-neutral legislation, and market-based instruments support technology development and application.
- Finland aims to become known for enabling regulation and government action.
- Well-functioning connections attract foreign investment to Finland.
- Taxation and the functioning of the labor market support entrepreneurship and investment.

To that end, the following concrete targets have been set by the advisory board:

Objective	Metric	Current level	Goal by 2030
Increasing international competitiveness	Bringing Finland back to top 3 in WEF Global Competitiveness Index	11	1-3
Recovering exports relative to GDP to level preceding the financial crisis	Exports of goods and services relative to GDP rises to current level of Sweden and Germany	40%	45-47%
Increasing RDI investments significantly throughout sectors	RDI to GDP ratio to same level with top of the world comparison countries	2.8%	5% by 2033, i.e., 0.17% per year
Private sector´s share of RDI to increase to highest level in world, relative to GDP		1.8%	3.67% by 2033
Significantly increasing companies physical investments	Bringing Finland to the level of Sweden and Eurozone	22-23%	25-26%
Making Finland the best country in the world to start a business	1st place in World Bank´s Doing Business index in category founding a business	31	1

[14] Finland aims to become world leader with technology and knowledge (valtioneuvosto.fi)
[15] Government resolution on technology policy March 2022 (hankeikkuna.fi)

Objective 2: Finland has some of the world's best-known and most attractive centers for technology education, research, expertise and investment[16]

- Finland has the best national technology experts in the world and Finland benefits significantly from employment and education-based migration.
- High-quality services are available for integration into Finland, as attracting highly skilled workforce from abroad is crucial in achieving these goals.
- Finland's strong technology profile supports EU and international influence, and Finland becomes a large international player.
- Finnish actors are desirable partners in international organizations, technology clusters and ecosystems.
- Finland's digital green country brand has been built in such a way that Finland offers world-class competitive advantage and inspires international players to invest, and attracts experts in the technology sector extensively.
- International investments in Finnish technology companies will grow.

Here are the corresponding concrete targets:

Objective	Metric	Current level	Goal by 2030
Finland´s human digital capital stays on a high level	DESI index	1	1
Finland´s attractiveness to foreign experts goes up	Global Talent Competitiveness Index	7	1
Finland´s technology clusters grow	Ranking in WEF Global Competitiveness index category 12.02: Clusters	21	1-3
Immigration based on education and work visas increases the number of technology experts in Finland	A: work-based immigration increases B: annual amount of foreign students increases C: amount of foreign students graduating in Finland stay in Finland increases	A: 9,500 B: 5,000 60%	A: 50,000 total increase, from 2030 on at least 10,000 per year B: tripled amount, i.e., 15,000 75%
Number of startups from universities and their ecosystems increases	A: Research-based startups B: Startups from universities incubators	A: 20-30 per year B: unknown	A: At least tripled B: At least tripled
Finnish universities of technology to be more highly ranked and globally attractive	ARWU Engineering, Technology and ICT ranking	1 university in top 150	3 in top 150

[16] Finland aims to become world leader with technology and knowledge (valtioneuvosto.fi)

Objective 3: Finland will have the most efficient public sector, enabling well-being of people and companies[17][18]

- Finland is a safe, inclusive and proactive society that serves the needs of all citizens and companies smoothly and seamlessly, with safe-to-use technology.
- Investments in the preconditions of the data economy are world-class
- Finland is a major player in the development of EU and international regulations on digitalization and the data economy.

Corresponding targets:

Objective	Metric	Current level	Goal by 2030
Automizing public services	TBD	TBD	TBD
Improving customer satisfaction in public services	Developing a new tool to measure all public services in progress	TBD	TBD
Digitalizing public sector	OECD Digital Government index, many categories	6-33	1-3
Digital readiness of companies	Digital barometer	7	1-2
Improving efficiency of the public sector	A: Decreasing public spending in relation to GDP closer to comparison countries B: Dependency ratio C: Faster service time	A: 53.3% B: 133 C: Unknown	A: Below 48% B: 115 C: TBD
Strengthening cooperation of private and public sector and increasing public-private-partnerships	A: Procurement from private sector as percentage of public procurement B: Public funding of PPP	A: 25% in 2018 B: 230 million eur per year	A: 40% B: 600 million eur per year

[17] Finland aims to become world leader with technology and knowledge (valtioneuvosto.fi)
[18] Government resolution on technology policy March 2022 (hankeikkuna.fi)

Objective 4: Finland benefits from development and application of technologies developed to address global challenges[19][20]

- Finland is rapidly developing and implementing technology and comprehensive solutions that will make Finland the world's first carbon-neutral circular economy society while increasing biodiversity and Finland's carbon footprint is growing.
- State-of-the-art expertise in technology research, modeling and impact verification related to the circular economy and climate solutions as well as resilience. The impact assessment is world-class and the sharing of best practices is effective.
- Finland is actively involved in the development of European technological strengths and contributes to the emergence of a functioning and internationally competitive internal market.
- Finland's resilience is growing and Finland has the ability to emerge even stronger from crises.

Corresponding targets:

Objective	Metric	Current level	Goal by 2030
Supporting carbon-neutral innovations increases	Global Cleantech Innovation Index	2	1
Carbon handprint of Finnish exports rises	Carbon handprint of key technology exports [21]	At least 20 Mt CO2e per year	At least triple by 2035
Better emission tracking and reporting	Number of companies tracking their carbon handprint and footprint	Unavailable	100%
Greenhouse gas emissions decrease, CO2e	Annual emissions decrease as per the industry´s low carbon road maps	33 MtCO2 per year	8.5 MtCO2 per year
Circular economy solutions increase	Developing the indicators in progress	Unavailable	TBD
The society´s resilience improves	State of cyber security across sectors[22]	Companies´ average: 3.75	All companies exceed 3.75

[19] Finland aims to become world leader with technology and knowledge (valtioneuvosto.fi)
[20] Government resolution on technology policy March 2022 (hankeikkuna.fi)
[21] Technology Industries of Finland: Low carbon road map PowerPoint-esitys (teknologiateollisuus.fi)
[22] National Emergency Supply Center report on state of cyber security across sectors kyberturvallisuuden-nykytila-eri-toimialoilla2-verkkosivuille.pdf (huoltovarmuuskeskus.fi)

3. ACTION POINTS TO ACHIEVE POLICY GOALS

Achieving world leadership requires long-term cross-government policies and cross-sectoral cooperation towards common goals. Technology policy is closely linked to a number of areas of government, and the close interface between information and technology policy in particular is a key prerequisite for success. Increased strategy and coordination are essential to increase the contribution and effectiveness of RDI in support of technological development and commercialization.

To be able to meet these goals, the advisory board suggests some structural changes and other action points. The following will briefly explain the most important ones, outlined in detail in various publications.[23] [24] [25]

- **Establishing a new role of Secretary of State for Information and Technology Policy to support cross-administrative work**. This is suggested to take place already during this governmental term of office. The goal is to ensure the coordination and implementation of information and technology policy in the Government. The Secretary of State works in a network with other ministries in the Prime Minister's Office and takes care of the consideration of the objectives of technology policy and the progress and monitoring of measures in the state administration horizontally. However, each ministry is responsible for matters within its area of responsibility. The board also suggests the creation of a separate ministry for digitalization at a later stage.

- **Establish a parliamentary information and technology policy committee** at the beginning of the next term to ensure the implementation of information and technology policy beyond parliamentary terms through parliamentary oversight.

- **Streamline structures to improve more efficient funding by develop an operating model for more efficient use of EU and other international financing.** The aim is to create a network in cooperation between the private and public sectors, which will take over all financial resources centrally (as opposed to the currently fragmented system with several actors like Business Finland, Finnvera, TESI, Finnfund, and the Finnish Climate Fund)[26].

  This way the aim is to be able to annually receive also hundreds of millions of euros more EU funding for investments and RDI. According to a study commissioned by the Prime Minister's Office, the best-performing countries in applying for EU funding have a clear framework program strategy with objectives and monitoring systems – this is something that Finland currently lacks.[27]

- Incorporate the objectives of business and innovation friendliness and the strengthening of public-private partnerships into the performance management of the public administration (both at national and municipal level) and start to monitor their development in the annual barometers. Introduce procedures for taking into account the impact of innovation as part of public finance planning and the preparation of the state budget and cost-effectiveness assessment, in a similar fashion as the sustainable development impact is assessed, for which the state budget has its own chapter.

[23] Digitalisaation, datatalouden ja julkisen hallinnon ministerityöryhmä - Valtiovarainministeriö (vm.fi)
[24] Suomen teknologiapolitiikka 2020-luvulla : Teknologialla ja tiedolla maailman kärkeen - Valto (valtioneuvosto.fi) – unfortunately only available in Finnish!
[25] Glimpses of the future (valtioneuvosto.fi)
[26] Government steering Beyond 2020: From Regulatory and Resource Management to Systems navigation http://urn.fi/URN:ISBN:978-952-383-162-9
[27] How can the EU Framework Programme for Research and Innovation increase the economic and societal impact of RDI funding in Finland? https://julkaisut.valtioneuvosto.fi/handle/10024/160567

- **Increasing the technological know-how of public administration and decision-makers** by introducing a permanent modular training program in technology policy to increase the technological skills and understanding of policy makers and public administrations. Traditionally, technological know-how is not part of the induction or training of public administration or decision-makers, which poses a great obstacle for efficient digitalization policy as the highest decision-makers lack the understanding and technology know-how often depends on personal interests. In Estonia, on the contrary, digital know-how has become a requirement for the whole nation and a requirement for every politician and official to understand it.

- **Ensuring technology-neutral and automation-enabling national legislation** by applying the innovation principle[28] as a starting point for legislation. The general principles and framework conditions for pro-innovation regulation should be clearly defined (in a similar fashion as the White Paper on the Fourth Industrial Revolution White Paper of the UK[29]). Incorporate the potential for growth and innovation more closely into the impact assessment of policies and legislation and develop the impact assessment on innovation. Update internal administrative guidelines and legislative preparation policies to ensure, inter alia, information sharing and common learning across borders. Monitor the impact assessment in the Legislative Review Board and assess the implementation of the impact through ex-post monitoring. Ensure adequate resourcing and training to support implementation.

- **Incorporate the potential for growth and innovation more closely into the impact assessment of policies and legislation and develop the impact assessment on innovation**.[30] Update internal administrative guidelines and legislative preparation policies to ensure, inter alia, information sharing and common learning across borders. Monitor the impact assessment in the Legislative Review Board and assess the implementation of the impact through ex-post monitoring.

  The development of regulation to support innovation can be either the dismantling or development of existing regulations or the creation of entirely new regulations (e.g., the Transport Services Act to promote digitalization and innovation in the transport sector). The state should not choose the winners, but allow them to emerge, such as autonomous ships and self-driving cars.[31] Regulation should be technology-neutral and objective allowing innovative operation, while guaranteeing adequate legal protection and legal certainty for those subject to regulation. According to a Digital Leap working group, various sectors still contain legislative aspects that impede digitalization, although efforts have been made to get rid of these [32]

- **Raising the R&D target higher than the current one**, for example four percent in 2028 and five percent of GDP by 2033, and draw up a long-term and cross-administrative growth and innovation strategy to achieve the target. Private companies make more than two thirds of Finland's R&D investments, while the public sector's share of R&D investments is around 30 percent. Of this 30 percent, the majority goes to the higher education sector and public research institutions. Therefore, Finnish state support for companies' R&D activities is the smallest among OECD countries, only 0.05 percent of GDP. This trend has been negative, as the funding was reduced by almost half in the 2010s, but over the past three years increased again.[33]

[28] Innovation principle makes EU laws smarter and future-oriented, experts say | European Commission (europa.eu)
[29] Regulation for the Fourth Industrial Revolution: White Paper (publishing.service.gov.uk)
[30] Innovaatiomyönteinen sääntely : Nykytila ja hyvät käytännöt - Valto (valtioneuvosto.fi)
[31] Liikenteen automaation lainsäädäntö- ja avaintoimenpidesuunnitelma (valtioneuvosto.fi)
[32] Digiloikka-työryhmä: Digitaalisesta taloudesta hyötyjä läpi yhteiskunnan (valtioneuvosto.fi)
[33] Kestävä talouskasvu ja hyvinvointimme tulevaisuus - Valto (valtioneuvosto.fi)

- **Increasing funding for and developing operating models for building and strengthening research and innovation ecosystems at an international level**. A new coordination model between the Academy of Finland and Business Finland will be introduced for the creation and long-term development of strong research and companies jointly funded and jointly used research, development and experimental infrastructure centers and testing platforms. The goal of the national RDI roadmap outlined by the Research and Innovation Council is for Finland to be the most competent and attractive innovation environment in 2030. This goal is achieved by creating ecosystems to support Finland's strong expertise. Ecosystems aim to solve broad and complex problems between several actors.[34]

  The funding must cover the entire innovation path and the different TRL (Technology Readiness Level) phases. This requires coordination and joint emphasis in funding channeled through Business Finland and the Academy of Finland. Funding must also take into account rising university, research institute or company-oriented Deep Tech startups, whose role in R&D development will be significant in the future. According to the high-level advisory board on digitalization and technology, the research infrastructure in Finland is small compared to many countries and under-funded in comparison to, for example, Austria, Sweden, Germany, the UK, and Belgium.

- **Tax reliefs**. From the beginning of 2021, a company has been able to make an additional 50 percent R&D tax deduction for its research and development cooperation projects with research organizations located in Finland or elsewhere in the EU/EEA area. The reports published during the spring and fall of 2021 on ways to increase companies' R&D investments in Finland and competitor countries will contribute to creating the basis for a broader evaluation. In addition, the applicability of similar corporate tax relief models for R&D activities used by for example Israel, should be evaluated.[35]

- **Increasing the innovation activities of SMEs and the ability to utilize digitalization**. A new 50,000 euro development voucher is proposed to be introduced for the implementation of an SME development project with a light application procedure and reporting, for example implemented through ELY centers. The use of the voucher could also be aimed at the utilization of development and experimental networks (cf. EU SME support). EDIH service centers specializing in different fields (European Digital Innovations Hub) will be strengthened with national counter-funding to support the digitalization of SMEs, and a national DIH service network based on them will be created.

- **Based on the pilot carried out by Sitra, a national business program for the data economy will be launched**, which will accelerate the transition of at least 1,000 SMEs to the data economy every year. The majority of new jobs have been created in recent years in small and medium-sized companies. From the point of view of the economy and employment, it is crucial that these companies succeed and invest in Finland. The share of SMEs in Finland's goods exports is modest in international comparison, although exports have developed positively recently. About 15 percent of the technology industry's goods exports come from SMEs. When it comes to adopting digital technologies and operating models, SMEs are significantly slower than large companies. [36]

- **Utilize public procurement in the development and implementation of new technologies** and the operating models they enable, and develop models for sharing the innovation risk. Innovations can also be promoted through public procurement. Innovative acquisitions accelerate economic growth, enhance the operation of the public sector, serve as reference projects for companies in conquering new markets. The total volume of public procurement is 47 billion euros per year (2018), when small procurements and

[34] Kestävän ja kehittyvän yhteiskunnan ratkaisuja tuottava Suomi (tem.fi)
[35] Yritysten t&k-toiminta ja 4 prosentin t&k-intensiteetin saavuttamisen edellytykset ja käytännön toimet | Tieto käyttöön (tietokayttoon.fi)
[36] https://www.stat.fi/til/icte/2020/icte_2020_2020-12-03_tie_001_fi.html

procurements made by public entities from each other are taken into account. The total value of public procurement from competitive markets in 2018 was EUR 31 billion.[37] [38]

- Long-term development work on the transport system is currently being carried out in the 12-year transport system plan for the first time. The plan includes a 12-year program of measures, which includes state and municipal measures and a state financing program for the transport system. This has been executed since 2021, under the name Transport 12.[39]

Recommendations from the high-level advisory board for Finnish policymakers to the EU and international framework[40]

- It is important for Finnish companies to get involved in IPCEI projects in their field. It is in Finland's interest to ensure that the projects do not form "closed clubs" of companies from large member states, which could distort free competition in the European market and weaken the conditions for companies from small member states to succeed. The system must not question free and open competition in the European market, as open competition is the best guarantee for improving competitiveness. Finland must strategically utilize EU financial instruments and partnerships to support the development of new technologies.

- A strong state technology profile and national co-operation support EU influence. It can be seen that the goal of technology neutrality is not always met in concrete legislative proposals. Finland must be ensuring that EU development contributes to the utilization of technology and the success of Finnish companies in the international market.

- The European foundation of the data economy will be created in the coming years, which will require Finland to play an active role. Finland should contribute to a competitive environment for the development, experimentation and operation of the platform economy business, which makes efficient use of large data.

- In comparison to similar countries, Finland receives less EU funding and R&D investments. These should be pursued in a more systematic way.

[37] https://tietokayttoon.fi/julkaisu?pubid=38401

[38] https://julkaisut.valtioneuvosto.fi/handle/10024/163164

[39] : Valtakunnallinen liikennejärjestelmäsuunnitelma (valtioneuvosto.fi)

[40] Suomen teknologiapolitiikka 2020-luvulla : Teknologialla ja tiedolla maailman kärkeen - Valto (valtioneuvosto.fi) – unfortunately only available in Finnish!

4. GOVERNMENT-FUNDED PROGRAMMES

In addition to the initiatives outlined in the previous chapter, there are government-funded programmes lead by different ministries that aim at speeding up the adoption of technological solutions and their concrete use in respected sectors.

Recovery and Resilience Plan[41]

The Finnish Recovery and Resilince Plan[42] will allocate 190 million euros to support the digital transformation. Some of the main areas correspond to the focus areas of this report. The projects funded through RRP include rail transport digitalisation (Digirail project); high-speed internet connections throughout the country; further investments in leading edge technologies: 6G networks, artificial intelligence, quantum computing and microelectronics; real-time economy: digital, real-time business processes, e.g. saving receipts and invoices in a standard, machine-readable format; and investments in research on cyber and information security.

Digitalisation in rail transport will enable more efficient use of rail capacity, and will reduce disruption and improve safety. The project will make rail travel more attractive and improve flexibility in goods transport – while also supporting climate objectives.

With fast internet access throughout the country, it will be possible to work conveniently in the workplace, at home or even at a summer cottage or other secondary residence. Self-employment and studying on a location-independent basis will also be possible. The Programme will bring connections to areas not served by the market.

Businesses especially will benefit from the development of new leading edge technologies, such as 6G and artificial intelligence. The aim is to create expertise in these sectors in Finland, which will generate jobs and open up study opportunities. With top-level expertise, Finland will be able to compete successfully in the global marketplace.

National Transport System Plan for 2021-2032 (includes smart mobility)[43]

The National Transport System Plan for 2021–2032 is a strategic plan for developing the transport system, drawn up in accordance with section 15b of the Act on the Transport System and Highways (503/2005). The National Transport System Plan includes a description of the current state of the transport system and changes in the operating environment; a vision for transport system development by 2050; objectives set for the Plan and their specific strategic guidelines; and an action plan containing measures for the central and local governments to achieve its objectives. The Plan also covers a government funding programme and a summary of its impact assessment.

The National Transport System Plan was drawn up with guidance from a parliamentary steering group and in broad cooperation with stakeholders. For the period of 2021 to 2024, the Plan

[41] Digitalisation – Recovery and Resilience Plan - Valtiovarainministeriö (vm.fi)
[42] Finland's Recovery and Resilience Plan - Valtiovarainministeriö (vm.fi)
[43] https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/163391/VN_2021_77.pdf?sequence=1&isAllowed=y

conforms to the General Government Fiscal Plan and budget decisions for 2021–2024. The budget of the programme is 10.2 million eur.[44]

Wellbeing and health sector artificial intelligence and robotics programme[45]

Healthcare offers prime examples of the new and diverse applications for robotics. Finland has in place programmes that seek to enhance quality, increase efficiency and improve customer experience in the sector. The nationwide programme Well-being and Health Sector Artificial Intelligence and Robotics Programme, or "Hyteairo", launched by the Ministry of Social Affairs and Health to speed up the sustainable introduction and utilisation of robotics and AI, has the aim of taking a leap forward in national wellbeing through robotics and AI.

The programme´s aims are speeding up the utilisation of artificial intelligence and robotics in the well-being sector's services and operating processes; and determining and eliminating obstacles and create the prerequisites for the development and use of artificial intelligence and robotics in the well-being sector. The programme covers the use of robotics and AI in hospitals, logistics, pharmaceutical service, rehabilitation and wellbeing coaching, as well as at home and in assisted living.

Artificial Intelligence 4.0[46]

This programme identifies objectives and measures that will promote digitalisation in Finland. The programme focuses on the development and introduction of artificial intelligence and other digital technologies in companies.

In addition to strengthening digitalisation and economic growth, the programme seeks to encourage cooperation between different sectors, increase investment in digitalisation and improve digital skills, particularly in SMEs. Other key priorities include European cooperation and the green transition.

Vision for 2030: Finland will be a sustainable winner in the twin transition. According to the Artificial Intelligence 4.0 programme objectives, in 2030 Finnish industry will be clean, efficient and digital, delivering competitive solutions that increase customers' carbon handprint for a global, uniformly regulated market.

Finland's Artificial Intelligence 4.0 programme is based on a national AI strategy created in 2017. Finland was among the first EU countries to create such a strategy. The programme combines AI technologies with a wide range of other digital technologies, such as the Internet of Things, 3D printing, robotics, quantum computing and virtual and augmented reality.

The programme will contribute to the recovery of companies and the economy from the coronavirus pandemic. According to the European Commission, digitalisation is one of the key means to generate new economic growth.

This programme is part of the Finnish Recovery and Resilience Plan, and its budget is 574 million euros.[47]

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[44] Liikenne- ja viestintäministeriön budjettiehdotus panostaa liikenteen ilmastotoimiin, kyberturvallisuuteen ja pitkäjänteiseen kehittämiseen - liikenne- ja viestintäministeriö (lvm.fi)

[45] The Well-being and Health Sector's Artificial Intelligence and Robotics Programme (Hyteairo) - Ministry of Social Affairs and Health (stm.fi)

[46] Artificial Intelligence 4.0 programme Finland - Ministry of Economic Affairs and Employment (tem.fi)

[47] Tekoäly 4.0 -ohjelma : Suomi kaksoissiirtymän suunnannäyttäjänä – Tekoäly 4.0 -ohjelman loppuraportti (valtioneuvosto.fi) (page 62)

Development programme to improve the overall state of cyber security[48]

The aim of the Programme is to provide guidance for the cyber security development extending across sectoral borders and government terms. Themes are cyber expertise, cooperation, functional capacity and cyber security industry. The aim is to bring citizens' cyber security skills to a good level as well as to provide Finnish top cyber security experts. This requires the inclusion of cyber security in different levels of education from comprehensive school to workplace training.

In addition to improving the skills, the Programme would intensify cooperation between the public sector and business and industry, in particular. The proposed measures include strengthening collaboration between cyber security operations and research and development activities in the sector. The Programme would also promote the active participation of Finns in international forums as well as closer cooperation with international cyber security actors.

The Programme pays particular attention to the authorities' capacity to provide appropriate measures for ensuring cyber security. It proposes that the authorities' preparedness and their observation capacity for cyber security should be further developed. In key sectors, the cyber security requirements should be harmonised and the information security of critical data resources and digital services should be increased.

Measures are also presented to support the domestic cyber security industry. In order for the branch of industry to emerge, the other elements in the Programme must function properly. At the same time, the aim is to promote the digital information society and the skills it requires. From the perspective of economic growth and employment, the increasing cyber security market is an important opportunity for Finland.

In order for the Development Programme to be implemented, annual funding of EUR 5.9 million for 2022-2025 will be needed as well as an additional allocation of EUR 3.2 million for 2021.

[48] Cyber Security Development Programme: Higher level of cyber security brings growth and jobs - Ministry of Transport and Communications (lvm.fi)

PART TWO: OPPORTUNITIES FOR BUSINESSES

1. OVERVIEW OF FINNISH BUSINESS ENVIRONMENT

The pillars of Finland's peaceful and well-functioning society include transparent government and effective state institutions, an independent judicial system and respect for the rule of law. Finland has firmly established civil liberties and personal freedoms as well as progressive gender equality legislation.

Finland is the only Nordic country that is both a member of the European Union and part of the eurozone. Finnish banks are the most trustworthy in the world, and Finland is also consistently ranked among the least corrupt countries in the world. All these factors combined significantly reduce business risks for international companies and investors operating in Finland.

According to BMI Research, Finland will remain one of the most politically stable countries globally during the forecast period 2016–2025. Finland's success story in becoming a highly industrialized, knowledge-based and innovative economy is based on free trade and openness to investment in the globalized economy. As a result, the Finnish business climate is very international and attractive to foreign investment. International companies benefit from Finland's reliable infrastructure, highly educated workforce and ease of doing business. Furthermore, Finland's corporate tax rate (20%) is among the lowest in the EU.

Finland in global rankings [49][50]

- Finland is the most stable country in the world (Fund for Peace 2019).
- Finland is the 3rd least corrupt nation in the world. (Transparency International 2018).
- Finland has the least organized crime in the world (World Economic Forum, Global Competitiveness Report, 2019).
- Finland is the most secure country in the world. (Global Competitiveness Report, World Economic Forum, Switzerland, 2019).
- Finland has the best macroeconomic stability (Global Competitiveness Report, World Economic Forum, Switzerland, 2019).
- Finland is the 3rd most innovative country in the world (Bloomberg Innovation Index 2019 & Consumer Technology Association (CTA) 2019).
- Finland ranks number 1 in international PCT patent applications (Global Innovation Index 2019).
- R&D expenditure in Finland totaled 2.7% of GDP. This share was one of the highest in Europe (Eurostat 2019)
- Finland is ranked 5th globally in university and industry research collaboration (Global Innovation Index 2019)
- Finland is 1st in "Best business environments in the world" (Global innovation index, 2019)
- Finland is 1st in availability of latest technologies (World Economic Forum Global competitive index, 2017-2018)

[49] Explore Business Opportunities (businessfinland.com)
[50] finnish_solutions_for_cyber_security_web.pdf (businessfinland.fi)

- Finland is 1sst in digital competitiveness in the EU digital economy and society index (World global innovation index, 2019)

Finnish strengths in digitalization

According to a Business Finland publication[51], when it comes to digitalization, the Finnish strengths are:

- DIGITALIZING INDUSTRIES: From forestry to maritime, Finland is leveraging the integration of digital technologies, IoT, and data to transform operations. Cloud services and robotics are optimizing our industries, enabled by active cooperation between public and private sectors, and an active startup scene.

- LEVERAGING THE INTERET OF THINGS (IOT): Finland is an agile one-stop shop for innovative, end-to-end IoT solutions. With key commercial and research platforms already delivering solutions to global multi-billion-dollar corporations, it's one of the most promising value opportunities across industries.

- PIONEERING CYBER SECURITY: Some of the key protocols behind today's strongest encryption systems were invented in Finland in the early 1990s. Finland is still at the forefront today with world-class expertise in cybersecurity software, hardware, and partnerships solutions to protect the digital world.

- CHAMPIONING QUANTUM COMPUTING: Finland's history of quantum science research and product development dates back to 1965. Offering the most accessible and collaborative ecosystem of businesses, research facilities, and public institutions in Europe, we're committed to driving next-generation computing power on a global scale.

- DRIVING SMART MOBILITY AND AUTOMOTIVE ENGINEERING: Finland is revolutionizing how we drive, transport goods, and manage traffic through innovative ecosystems supported by companies and public organizations, like the Finnish MaaS. Manufacturers and suppliers can explore and pilot innovative technologies too, including self-driving vehicle software.

- HOME OF AI: Ranked as one of the most important AI ecosystems in Europe, Finland is home to a wide range of leading companies in the field. We're a nation of early adopters, offering access to advanced research facilities, open data, a vibrant startup community, and an agile testbed for global solutions.

- MAKING MANUFACTURING MORE SUSTAINABLE: Finland is a trailblazer in smart, sustainable manufacturing. Famed for our energy-efficient process industries and machinery production, Finland is home to world-class process engineering, automotive, maritime, and intelligent vehicle production.

Business culture & Finnish-Dutch trade

As a very brief description of Finnish business culture, it should be pointed out that the Finnish and Dutch business cultures are quite similar to each other; especially in terms of punctuality and straightforwardness. In Finland, however, there is perhaps less small talk involved and Finns can be very much straight to the point in their business interactions. However, decision-making is

[51] Explore Business Opportunities (businessfinland.com)

generally slower than in Dutch business climate – slow response to emails does not equate lack of interest!

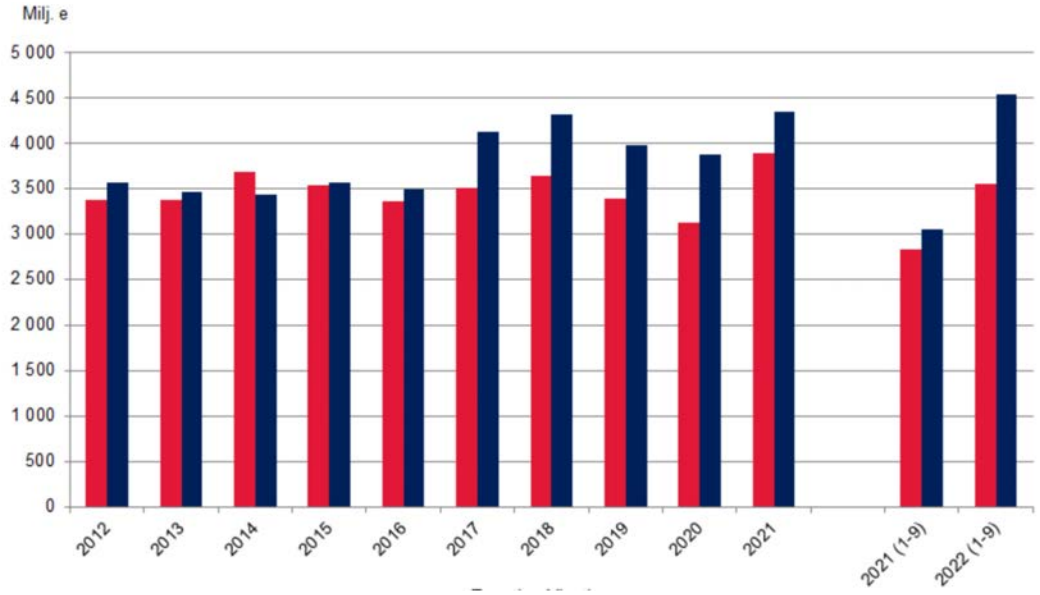
Following schedules, meeting deadlines and planning in advance is very important and it is expected from others. Honesty and holding on to contracts is crucial. At work, Finns expect well-defined targets and processes, while taking authority and responsibilities seriously. Finns are careful and gather background information in advance.

Equality is at the very heart of Finnish society. Regardless of their position in the company, most people are on a first-name basis. Finnish companies generally have a flat organizational structure and informal work relationships are commonplace.

Also another similarity between the Finnish and Dutch business climates is the multi-stakeholder approach. Like in the Netherlands, also in Finland the companies work seamlessly together with the public sector as well as academia and other research institutions. Therefore, many projects are funded and carried out through multiple stakeholders – and as stated in the previous section, a listing of funding and bidding calls can be found at the Business Finland database: Public research and corporate projects (businessfinland.fi)

For more information on Finnish business culture, please see the link[52] in footnote.

As for trade statistics between Finland and the Netherlands, it is clear that the Netherlands is an important trading partner for Finland. Below is a table from the Finnish Customs[53], showing export from Finland to the Netherlands in blue and import from the Netherlands to Finland in red. Both exports and imports are growing, last year accounting for 4,5 bn euros and 3,5 bn euros, respectively. Most important product categories are chemical products, metals, iron ore, and machinery.



Helsinki business & startup ecosystem

It is worth mentioning that although there are strong regional business hubs in Finland like cities of Turku, Tampere and Oulu, the Helsinki region is the economic powerhouse of the country. With two strong universities, the Helsinki University and Aalto University in the neighboring city of Espoo, it is the leading region in innovation and startup generation.

[52] Work environment in Finland - Business Finland

[53] Suomen ja Alankomaiden välinen kauppa vuonna 2022 (1-9) (tulli.fi)

The Helsinki startup ecosystem continues to grow rapidly, for example, from 2015 to 2021 its total worth grew from 7.6 billion euros to 25.2 billion euros.[54] It is now Europe´s 8th largest startup center, therefore considerably punching above its weight.

Private equity investments in the Helsinki region reached their record high in 2021 at 917 million euros, with predictions continuing to grow but official numbers still missing. According to a report from a local startup hub, NewCo Helsinki, Helsinki has the fourth most rapidly growing rate of private equity investments of all startup ecosystems in Europe.[55]

R&D investments[56]

Although R&D investments have not yet reached the record level of 2008, a long downward trend has been turned around and investments are now slightly growing. Technology industries are clearly leading the R&D investments, accounting for just under 2,5 billion euros in 2020.

[54] Helsinki Funding 2021 FIN (newcohelsinki.fi) (pages 5-10)
[55] Helsinki Funding 2021 FIN (newcohelsinki.fi) (page 11)
[56] PowerPoint-esitys (teknologiateollisuus.fi)

2. GOVERNMENTAL FUNDING AND INVESTMENT PROGRAMS FOR COMPANIES

There are many different funding and loan schemes companies entering Finland and investing in Finland can benefit from. Such funding is mainly available through the trade promotion organization Business Finland and its close affiliates TESI and Finnvera, or regional centers for economic development, transport and environment called ELY Centers. Below are brief summaries of such funding and loan schemes, with links for more information.

RDI incentives from Business Finland

Business Finland's[57] innovation funding provides low-interest loans and grants to challenging and innovative projects with potential for global success stories. BF offers funding for research and development work carried out by companies, research organizations, and public sector service providers in Finland. In addition to funding technological breakthroughs, BF also emphasizes service-related, design, business and social innovations. Companies of all sizes can benefit from these incentives, including startups.

Contact information for Business Finland, as well as other organizations mentioned here, can be found through the links in the footnote on this page. Furthermore, Business Finland announces a number of funding calls and bidding calls for various projects. A database for these calls can be found through this link: Public research and corporate projects (businessfinland.fi)

Business aid from local Centers for Economic Development, Transport and the Environment (ELY Centers)

Business aid to companies operating in Finland is coordinated by the Centers for Economic Development, Transport and the Environment (ELY Centers)[58], with 15 regional offices providing advisory, training, expert services and funding for investment and development projects.

Foreign-owned companies in Finland can benefit from several different types of aid, especially in certain regions of Finland. ELY Centers have a ranking[59] of different areas based on how much funding is available, see link in footnote.

Growth capital from TESI

TESI[60] (Finnish Industry Investment) is a 100% state-owned equity investor. TESI's mission is to invest in growth and develop Finland's venture capital industry. It is a profit-seeking limited liability company with an independent Board of Directors responsible for investment decisions. In a single investment project, TESI's share of the total investment is up to 50%. The private investors' share must be at least 50%. The investment criteria are the same as the criteria for private venture capital and private equity investors.

Loans and guarantees from the export credit agency Finnvera

Finnvera[61] is a specialized state-owned financing company and Finland's official Export Credit Agency (ECA). Finnvera strengthens the operating potential and competitiveness of enterprises in

[57] Businessfinland.com
[58] Euroopan rakennerahastot 2021 - 2027 - ely - ELY-keskus
[59] Incentives to Foreign Companies Investing Finland - Business Finland
[60] Financing for promising growth companies - tesi.fi
[61] Frontpage | Finnvera

Finland by offering loans, domestic guarantees, export credit guarantees, and other services associated with export financing. The risks included in financing are shared between Finnvera and other financiers.

Training & employment services from ELY Centers' employment services

The services offered by ELY Centers cover recruitment, improvement of business efficiency and management skills, updating of staff skills, and training of new employees through the so-called TE Offices. See the link[62] in footnote for contact information of these offices.

Regional TE Offices can help you with recruitment. TE offices know the labor force and the job market in the area, and can help you find just the right skilled employees for you.

TE Services plan and implement vocational training in cooperation with employers. In the joint training projects, the TE Centre and the employer share financing and the employer participates in the selection of students. With joint training, the company can:

• Seek skilled workers when the skills required by the company are not completely acquired through other education

• Provide tailor-made basic or advanced vocational training for your staff

• Assist and support workers who have been laid off with finding a new profession

EU-funded support

EU finance is largely channeled through the ELY Centers. It is directed to projects developing the competitiveness, know-how and operating environment of the SME sector, with a special emphasis on start-up businesses and service sector companies.[63] For more information, please see the ELY Centers' website on EU funding: Euroopan rakennerahastot 2021 - 2027 - ely - ELY-keskus

[62] Uusimaa TE Office in short - TE-palvelut

[63] Incentives to Foreign Companies Investing Finland - Business Finland

3. OPPORTUNITIES TO PARTICIPATE IN FINNISH RESEARCH/FLAGHSIP PROGRAMS

Finland has many industry ecosystems and research programs that enable co-creation and innovation opportunities and are open to international companies.The recently established Finnish Flagship Programme provides a new, unique way of doing research, development and innovation in Finland, promoting active collaboration between research, business and society.

Long-term government funding is granted for six large research ecosystems:

• **FinnCERES[64] – Competence Centre for the Materials Bioeconomy**: FinnCERES is a competence centre, jointly formed by Aalto University and VTT Technical Research Centre of Finland in the area of materials bioeconomy. Its work aims to uncover answers to the most fundamental questions about lignocellulose disassembly and re-assembly and to create new, cost-competitive, bio-based materials that are expected to address the main challenges of our century, including resource sufficiency and climate change.

• **6G Flagship[65] – 6G-Enabled Wireless Smart Society & Ecosystem**: 6G Flagship is the world's first 6G research program, a global leader in 5G adoption, and a preferred research partner in 6G development. It promotes high-quality 6G research to create future know-how and sustainable solutions for society's needs in the 2030s. It operates under the University of Oulu, which also funds it together with the Academy of Finland.

• **FCAI – Finnish Center for Artificial Intelligence[66]**: Finnish Center for Artificial Intelligence FCAI is a community of experts that brings together top talents in academia, industry and the public sector to solve real-life problems using both existing and novel AI. FCAI is one of the Academy of Finland's Finnish flagships, hubs of top-level research and impact.

• **PREIN – Photonics Research and Innovation[67]** sPREIN Flagship is a Photonics Research and Innovation platform focusing on light-based solutions from scientific excellence to industrial and societal impact. PREIN partners are worldwide leaders in photonics. This programme of course has connections to many different topics, as photonics and light-based solutions play a central role in all areas of modern life, including in telecommunications, biomedicine, health care, energy and environment, manufacturing, and consumer products.

• **iCAN – Digital Precision Cancer Medicine Platform[68]**. iCAN is a national research flagship providing solutions to the cancer challenge through a discovery and innovation cluster at the interface of precision cancer medicine and digital health. iCAN is executed as a partnership between academic research, healthcare system, life science industry partners and patients. It is a public-private-patient-partnership, forming a competence cluster with significant economic, educational, and societal impact. The active participation of patients at all levels is a key element of the flagship, ensuring impact and benefits to the patients. Partnerships with companies from

[64] About | FinnCERES
[65] Main page - 6G Flagship
[66] FCAI
[67] PREIN – Finnish Flagship on Photonics Research and Innovation
[68] What is iCAN? - iCAN - Digital Precision Cancer Medicine

pharma, biotech, and AI sectors are critical and enable the inclusion of early drug leads, new technologies, and new competencies.

4. SECTOR OVERVIEWS: FINNISH CYBERSECURITY SECTOR

The Finnish cybersecurity market is expected to grow over 2.5 times in the next 10 years. Currently total market value is $727 Mn, and cybersecurity adoption in critical infrastructure is strong. Growth forecast for 2030 is to reach $1.9bn.[69]

Market drivers

- The need to adhere to GDPR regulations
- Growing number of cyberattacks on Finland's services sector which remains one of the biggest contributors to GDP
- Targeted attacks on the manufacturing vertical
- Finland's focus on digitalization
- Collaboration with public and private stakeholders

Market restraints

- While cybersecurity awareness has increased in the country, more needs to be achieved
- Lack of large Finland based cybersecurity companies
- Limited cybersecurity budgets

Five market opportunities in Finland[70]

Business Finland has identified these five sub-sectors as particularly "likely to remain strong in the mid to long term and could be a potential revenue pocket for the cybersecurity companies."

1. Endpoint Security

• Focus towards integrated EPP+EDR offerings, however position as an EDR vendor

• Offer cloud based EDR solutions

• IoT security is an emerging and high growth area

• Partner with cloud security companies for Zero Trust access

2. IAM (identity access management)

• Develop automated responses to threats and to manage the lifecycles of identity and access management users

• With IoT at the center of —connected things, it would be important for employees and consumers to secure digital assets through IAM

[69] https://mediabank.businessfinland.fi/l/sZ_br-fzf8hq
[70] ibid

• Build relationships with niche players in PIM/PAM

3. Threat Intelligence

• Tie TI with the installed base of security products within the enterprise like SIEM, Firewall, Unified Threat Management, IDS/IPS, Secure Web Gateway, etc.

• Gather data across all available sources (web, email, endpoint, network, etc.) and perform analysis for evaluating vulnerabilities.

• Improve investigation, threat identification and response time

4. Cloud Workload Protection

• Work with local CSPs to introduce, integrate, and bundle CWP solutions with their cloud package offerings

• Provide scalability and support different operating systems, cloud platforms, bare metal servers, and server-less environments

• Centralized visibility is a core aspect of cloud workload security solution

5. MSS and PSS (managed security service & product and solution security)

• Build a wide portfolio of offerings, strategic and technology partnerships are important

• MSSPs should focus on developing security platforms to deliver MSS

• Security Advisory, GRC and Technical Services are the three high growth areas in PSS

For listing of companies operating in these subsectors, and more, see the following Business Finland market overview: finnish_solutions_for_cyber_security_web.pdf (businessfinland.fi). Furthermore, the relevant funding programme from Business Finland is called Digital Trust Finland.

In addition to Business Finland, another relevant organization is the Finnish Information Security Cluster (FISC), which is part of the Finnish Technology Industries union. FISC is established by major Finnish information security companies to promote their business and operations in national and international context. Furthermore, it facilitates access to EU funding and EU funded projects in Finland in the field of cybersecurity and promotes extensive public-private-partnership cooperation models [71].

[71] About us | FISC

5. SECTOR OVERVIEWS: QUANTUM COMPUTING

University of Helsinki, Aalto University and VTT are already globally strong players in the research and development of the technology needed for quantum systems, such as devices and sensors, novel quantum materials, and quantum information. Finland is currently building a 3-stage Quantum Computer in a co-development project led by VTT and together with Finnish start-up IQM. The project showcases Finnish expertise and provides an initial platform for both further research, innovation and commercial activities.[72]

Helsinki area provides a complete supply chain for Quantum Computing from R&D to production and a broad spectrum of products and services starting from close-to-fundamental research all the way up to cryogenic measurement systems and tools and complete quantum computers. Thanks to the growing number of startups in quantum, Finland also provides exceptionally intriguing investment opportunities in this field.

The region is famous for bringing together the whole ecosystem in the quantum computing development projects: public and private sector, academia and citizens. High quality computer engineering, physics and micromechanics education gives boost to the growth and development of the companies. It's a great place to pilot and test new quantum computing innovations that lead to globally scalable business solutions.

A current status of quantum computing Infrastructure is largely based on the IQM's quantum computer. In 2021,the 5-qubit computer "Helmi" was developed in jointly with VTT and IQM Finland Oy to demonstrate how to build a quantum computer, how to program one and how to operate one in the future. IQM and VTT are now developing Finland's first commercial 20 to 54 qubit quantum computer from a current 5 qubit computer.

In the following section the most important players in the Finnish quantum computing ecosystem will be introduced. For a more detailed listing of all the players in the Finnish quantum computing ecosystem, please see the business roadmap for quantum technologies in Finland, compiled by the InstituteQ of Finland, a joint organization of the Aalto university, Helsinki university and VTT.

Helsinki Partners[73] is a local trade promotion organization that can help with contacts and information within quantum computing, especially focusing on:

- Dilution refrigerator systems for measurement of quantum chips
- Superconducting chip design and simulation services
- Quantum Computing systems delivered & installed at customer sites
- Superconducting electronic circuits for quantum computers such as amplifiers and quantum processing units (QPU).
- Quantum software and algorithms
- Fabrication of superconducting circuits including 3D integration
- Characterization of the electronic circuits in cryogenic temperatures
- New quantum computing, control, initialization, and readout schemes.
- Cryogenic measurement systems, which allow users to address circuits placed at temperatures below 10 mK.

[72] InstituteQ brings together top expertise in quantum science and technologies | Matter and materials | University of Helsinki

[73] Quantum Computing business opportunities in Greater Helsinki - Helsinki Business Hub

- Control electronics and QPUs

Furthermore, Business Finland has recently started a programme[74] on quantum computing with the aim of developing a globally attractive quantum computing ecosystem in Finland. The goals of the programme are:

- Activate use case companies and develop the capability to create new innovations and solve their business problems through Quantum Computing
- Accelerate the development and deployment of a competitive quantum computing software stack and related services in Finland
- The globally recognized Finnish Quantum ecosystem keeps attracting investments and talents to Finland despite a fierce competition

In addition to the Helsinki Partners and Business Finland, in order to find potential partnerships and explore opportunities in the Finnish quantum computing field, there are a few companies and organizations worth looking into (links with contact information provided in footnotes):

Strongholds in Helsinki Quantum Ecosystem

- Academy of Finland Centre of Excellence in Quantum Technology (QTF)[75]

  As a flagship of Quantum Technologies, the national Centre of Excellence – Quantum Technology Finland (QTF) – brings together scientific and technological excellence and cutting-edge research infrastructures, to harness quantum phenomena in solid-state-based quantum devices and applications.

  With over 120 researchers and coordinated by Aalto University, QTF aims to introduce novel approaches for control of quantum coherence and dissipation, and to develop new and improved quantum circuits and hybrid architectures. Its research combines experimental, theoretical and applied expertise in all-superconducting devices, superconducting-metal interfaces, graphene and other 2D materials, nanowires, and carbon nanotubes.

- VTT Technical Research Centre of Finland has a strong focus on quantum technology[76]

  VTT takes part in QTF and three projects of the Quantum Flagship initiative. The aim of VTT is to transfer quantum physics research from the lab to the market by means of commercial applications and disruptive technologies.

  VTT helps organisations that develop quantum technologies in scaling up, integrating, and interfacing devices towards profitable business cases. It has unique in-house technologies for multi- and cross-platforms: superconductors, semiconductors, and silicon photonics. VTT offers a full spectrum of services from quantum device modelling and development, to

[74] Quantum Computing campaign - Business Finland
[75] Centre of Excellence in Quantum Te - Academy of Finland (aka.fi)
[76] Quantum Technology – VTT's research to revolutionize industries (vttresearch.com)

device fabrication in Micronova cleanroom and system integration for application ready solutions. VTT can provide a rapid route from R&D to small-scale industrial production for integrated quantum technology.

- Bluefors Oy, market leader for providing dry dilution refrigerators[77]

  Bluefors is specialized in cryogen-free dilution refrigerator systems with a strong focus on the quantum computing and information community. The core technology is the dilution refrigerator and functional measurement infrastructure for low-frequency, high-frequency and optical signals within these systems.

  The aim of Bluefors is to deliver the most reliable and easy-to-operate refrigerators on the market which are of the highest possible quality. It offers a wide range of standard systems with options including wiring and superconducting magnets and the systems can be customized to meet the requirements of each individual customer. With novel ways of manufacturing the core elements, it has become possible to make the dilution refrigerators production scalable to match market demand. High quality and reliability have made Bluefors the industry standard for cryogenic measurement systems.

  Having been founded by Dutch entrepreneurs, Bluefors also serves as a great example of a company active in both Finland and the Netherlands, as it will join the Delft quantum technology community and open an R&D facility on the TU Delft Campus in the Netherlands[78].

- IQM Finland Oy, strongest quantum computer hardware company in Europe[79]

  IQM builds and provides scalable hardware for universal quantum computers, focusing on superconducting technology. IQM is developing second generation quantum processors based on proprietary technology that allows us to significantly speed up the clock speed of quantum processors. The aim to demonstrate the fastest qubit reset and readout in the industry along with improved gate speed. IQM develops quantum processors for tailored NISQ and fault-tolerant quantum computing.

  IQM is establishing new standards in chip architecture for superconducting circuits. It drives a common effort with strong players from the commercial and academic sector and welcome new partners especially on the software development.

- AFORE, an AEM company, is a pioneer application specific wafer test solutions[80]

  Afore offers wide range of specialized wafer probers for sensor and semiconductor testing, covering applications from high-vacuum and pressure to motion and magnetic stimulus. Together with Bluefors Oy, Afore introduced the first automated Cryogenic Wafer Prober for 300 mm wafers. AFORE is part of AEM Group, taking pride in providing innovative,

[77] Bluefors dilution refrigerator systems for quantum technology and research
[78] Bluefors to Open an R&D Facility on the TU Delft Campus. - Bluefors
[79] We build quantum computers. | IQM (meetiqm.com)
[80] Afore Oy

engineering-focused solutions and developing strong partnerships with customers and associates to cater to their R&D and manufacturing needs through our global engineering service support network and innovative people.

Through network of sales offices, associates and distributors, AEM and Afore have global market presence spanning Asia, Europe and the United States.

- OtaNano[81] is the national research infrastructure focusing on competitive research in micro- and nanoscience and -technology, and in quantum technologies. OtaNano is an open access research infrastructure, operated by Aalto University and VTT, and is available for academic and commercial users internationally. It is a national platform to develop innovative enabling technologies and apply them to practical micro- and nano-systems.

  OtaNano offers a wide variety of fabrication processes and equipment for micro- and nanostructures, including optical systems, millimeter-wave devices, nanoelectronic and quantum devices, radiation detectors and instruments for space technology. The facilities also cover a comprehensive range of imaging and characterisation equipment, including electron microscopy, nanomicroscopy, and x-ray scattering devices. Soft, hard and biomaterial samples can be studied down to atomic-level resolution. Other key activities include ultra-low-temperature conductivity and high-frequency measurements with a selection of ultra-low temperature refrigerators and advanced sub-Kelvin refrigeration facilities.

[81] OtaNano | Aalto University

6. SECTOR OVERVIEWS: SMART MOBILITY

Smart mobility & Batteries

Finland is home to dozens of startups and established companies building smart and connected autonomous vehicles that operate on land, air and sea. They fall under three main categories: '**Connected and Automated Driving'** for autonomous vehicles, '**Electromobility'** for electrification, and '**Mobility Services'** for commercial and consumer services.[82]

The relevant funding programme from Business Finland is called **Smart Mobility and Batteries from Finland** program[83], of which Dutch companies can benefit from. It complements Finnish Smart Mobility companies' offering by ensuring a global battery development offering and a recycling re-use program right next to their production plants

The program focuses on companies working on mitigating climate change, transitioning to low-emission solutions and the need for smart solutions are reforming the global market of mobility and logistics. The aim is to achieve flexible, efficient and low-emission overall solutions for both people and goods. In terms of passenger transport, business models are renewed by, for example, car and ride sharing, MaaS and the new division of the taxi market. The strong growth of the battery industry is driven by electrification, which covers both traffic and the revolution of energy.

The Smart Mobility and Batteries from Finland program focuses on three operational entities: Smart Mobility Solutions, Smart Logistics, and Batteries and Electrification. The program's estimated funding from Business Finland is approximately EUR 60 million. The aim of the program is to also support Finnish companies to connect with industrial networks in the EU with the help of EU funding.

Testing

Finland offers numbers of public and private test beds and living labs for testing smart mobility solutions and 5G networks in an excellent technical and legislative environment. The transformation and digitization of the vehicle market require constant development in the vehicle testing sector. Finland's test beds are ideal for testing all things new in mobility. For example, Lapland in Northern Finland is known for its state-of-the-art facilities and know-how of automotive winter testing. For decades, several OEMs and Tier 1 suppliers have used these testing resources.

Special tracks exist to test vehicle dynamics and snow-handling capabilities. Plus, a unique test ecosystem and platform is ready to even test autonomous driving. Finland is home to several world-class winter test facilities and service providers.

The country also offers an enthusiastic mobility scene, excellent solution builders, city infrastructure for piloting ideas and communities of citizens eager to try out new transportation and logistics solutions.

[82] https://mediabank.businessfinland.fi/l/CzkJQN7hPkVj

[83] Smart Mobility and Batteries from Finland - Business Finland

Perhaps not very surprisingly, most of the smart city mobility and smart city solutions in Finland are located in largest cities with universities most advanced in the field. For example, companies in this sector can benefit from the Aalto University campus in Otaniemi, Espoo, that works as a testbed called Smart Otaniemi[84], focusing on solutions on mobility, energy, circular economy, data & connectivity, and city design. More surprisingly, these solutions are very much domestically developed and there are not many foreign companies in this sector. According to experts, the sector could benefit from a more international base of companies.

However, the prime example of smart city solutions in use in Finland is the Helsinki Smart Region[85] that also includes areas in its vicinity, the Uusimaa region. Helsinki Smart Region focuses on three themes:

- Citizens' city: The citizens in Helsinki-Uusimaa are active, creating together with companies and cities agile, user-focused services and solutions. The region is a world leader in making data public and using it to create new businesses. Helsinki-Uusimaa is big enough for systematic development of significant technologies and social innovations, and small enough to make it feasible in practice, too. This theme covers areas such as transportation, housing, urban planning, and healthcare.

- Climate neutrality: The Helsinki-Uusimaa Region has set a goal to be carbon neutral by 2030. A transition to a low carbon society requires significant changes to our infrastructure, mobility, and built environment. The Helsinki Smart region is a major operator in developing the most ambitious clean technology in the world, and we have the capacity to develop new service models. Climate neutrality theme covers areas such as circular economy solutions, new forms of energy, bioeconomy innovations and new materials.

- Industrial modernization: The Helsinki-Uusimaa Region produces various configurable products using for example industrial IoT and mobile technologies. We develop leading edge technologies for future industry and processes. In Helsinki-Uusimaa there is a broad innovation activity in different fields of strategic value chains such as self-driving vehicles, smart health, hydrogen technology, and cyber security. Areas covered by the theme include, for example, new industrial processes, health technologies, robotics, and travel.

For a listing of smart mobility projects funded by Business Finland and open for bidding, please see this link: Public research and corporate projects (businessfinland.fi)

At the time of writing this report, the combined value of these projects is 32 million eur.

[84] Smart Otaniemi - Cutting-edge smart city innovations
[85] Helsinkismart

7. SECTOR OVERVIEWS: TELECOM 5G&6G

6G

Finland has a long and successful history in the field of wireless mobile technologies. Numerous successes have shown us the power of cooperation. It has – once again – led us to a global leading position, now in 6G research and development. The world's first large-scale 6G research program, 6G Flagship[86] was launched in Finland in 2018.

The organization called 6G Finland is an active coalition of Finnish 6G R&D organizations to advance the impact of Finnish 6G expertise globally, build new international partnerships, and intensify national 6G development efforts towards sustainable and data-driven society enabled by instant and unlimited wireless connectivity. As both research institutes and companies are active members of the coalition, 6G Finland will become one of the most notable alliances of 6G expertise in the world. Similar coalitions have so far been set up in Japan, the United States, and Germany.[87]

6G Finland is a national contact point of Finnish 6G know-how, and actively participates in 6G discussion both nationally and internationally. The founding members of 6G Finland are Aalto University, University of Helsinki, Lappeenranta-Lahti University of Technology, University of Oulu, University of Tampere, Oulu University of Applied Sciences, Nokia Bell Labs, VTT Technical Research Centre of Finland, the Finnish Defence Research Agency and BusinessOulu that form the core of Finland's 6G expertise. 6G Finland operates as a network to which new members are invited on a content basis.

The 6G flagship research program led by University of Oulu is also open to international companies that are interested in the possibilities of next-generation wireless technologies. The Challenge Finland 5G-SAFE project, coordinated by VTT, conducts research and development on new 5G-enabled road safety services.

Currently, Finland also leads the European 6G flagship initiative, Hexa-X-II[88] funded by EU and plays a significant role in other 6G measures of the EU as well. The motivation for the Hexa-X-II project stems from the ongoing Hexa-X project, which has successfully developed a vision for 6G wireless networks and positioned itself at the centre of 6G development on a global scale, particularly in Europe. The key motivating factors for Hexa-X-II include technology push, society pull, and strategic autonomy.

At the moment, the members of 6G Finland are creating a 6G R&D roadmap on the most important common priorities. 6G Finland also operates as a national contact point for Finnish 6G know-how, and actively participates in 6G discussion nationally and internationally. **Also, importantly, 6G Finland is currently seeking trusted partnerships both nationally and internationally.[89] Their contact information can be found here.**

[86] Main page - 6G Flagship
[87] Finnish Organisations Founded a Coalition to Advance Finland's 6G Competitiveness – 6G Finland

[88] Hexa-X-II - Hexa-X-II
[89] 6G Finland Ready to Build New Trusted Partnerships – 6G Finland

5G

Since 6G is still very much in the development stage and heavily dependent on the collaboration between research, business and public sector, it is also important to note that 5G is a much more established and widely adopted technology in Finland.

In fact, Finland is the leading 5G testbed environment in the world[90]. Finland offers the best available testing environment for 5G network technology and beyond, at a time when the first commercial versions of 5G are entering the market. The 5G standard and implementations will evolve for several years, creating a need for continuous testing as new features are introduced. In addition to operator networks, there are six separate 5G test networks in Finland, each designed for different use cases.

The 5G Test Network Finland[91] (5GTNF) is an open and evolving innovation ecosystem supporting 5G technology research and validation, product development and experiments by pioneering companies. Coordinated by VTT Technical Research Centre of Finland, 5GTNF is a joint effort by industry, academia and the Finnish government, and welcomes collaboration with international partners.

The relevant programme from Business Finland is called “6G Bridge”, which “aims to make Finland the global leader in providing new value with 5G Advanced and 6G technologies for sustainable industries and societies e.g. in smart cities, smart energy, smart ports and smart factories with different ecosystem players.” Business Finland's 6G Bridge program paves the way for 6G and aims to help in maintaining the Finnish forerunner status. The 6G Bridge program aims to make Finland the global leader in providing new value with 5G Advanced and 6G technologies for sustainable industries and societies e.g. in smart cities, smart energy, smart ports and smart factories with different ecosystem players. These provide a concrete and versatile foundation also for the new 6G collaboration – both from the mindset and impact points of view.

For more information, including contact information, please see this link: 6G Bridge - Business Finland

[90] finland_factbook_web.pdf (investmentmonitor.ai)
[91] Home - 5GTNF

8. CONCLUSIONS

This report has made an effort to assist both Dutch businesses and policymakers in getting a better understanding of the Finnish digitalization policy and the many opportunities different Finnish sectors offer.

Finland has until now remained a somewhat overlooked market in the group of Nordic countries, while Sweden for example has caught the attention of many businesses looking to expand to the Nordics. This is rapidly changing as more businesses are looking into the opportunities in Finland, and this report has made an attempt to provide as concrete information as possible to assist in this journey.

This report has shown that Finland is a very potential destination for international companies, as it is a highly technological country, with investments increasing and consistently ranking among the top of the world in indexes for innovation, ease of doing business, etc.

Furthermore, Finland has a robust infrastructure for supporting and funding innovation. Through its multi-stakeholder approach, innovation is supported by cooperation between businesses, innovation hubs, universities and research institutions, and governmental organizations.

Therefore the Finnish markets should be given a thorough consideration, as there are low barriers to enter for Dutch companies, and the opportunities are vast. As it has been stated throughout this report, in many sectors Finland offers the infrastructure, knowledge and potential that are top of the world, together with a strong support network from a broad range of different organizations that offer support to setting up a business in Finland.

In each section, this report has listed the key players in the respective sectors, including providing links to the websites with contact information, in order to make it as easy as possible to start getting acquainted in the various organizations and reaching out to them. In addition, relevant funding programmes from the government and other organizations are listed in each section.

Finally, upon request, the Dutch embassy in Helsinki will be able to provide suggestions on whom to contact within these sectors.

ANNEX 1: Introductions of organizations mentioned

Business Finland

Business Finland is a public organization promoting trade, tourism and foreign investment to Finland as well as providing funds for innovation. It operates under the Ministry of Economic Affairs and Employment. It helps its customer companies grow and globally, develop future-oriented solutions. Furthermore, it promotes collaboration between companies and research groups, so that new endeavors can develop into international business ecosystems. Their self-stated goal is to "develop Finland into the most attractive and competitive innovation environment and the most enticing investment and travel destination in the world."

The Business Finland organization employs 760 specialists in 40 countries outside of Finland and in 16 offices in Finland. Business Finland is a public-sector operator and part of the Team Finland network.

Business Finland finances business R&D projects and public research projects at universities, research institutes and universities of applied sciences.

Its closest equivalent in the Netherlands is RVO.

Finnvera

Finnvera is a specialised financing company owned by the State of Finland and it is the official Export Credit Agency (ECA) of Finland.

Finnvera gives guarantees against political or commercial risks associated with the financing of exports. Political risks are risks that arise from the economic or political situation in a country where a Finnish export company has customers. Commercial risks pertain either to the buyer or to the buyer's bank.

Finnvera's operations are steered by the industrial and ownership policy goals laid down by the State. Among these goals are: increasing the number of starting enterprises; enabling financing for changes encountered by SMEs; and promotion of enterprise growth, internationalisation and exports. In its operations, Finnvera is expected to adhere to the principle of economic self-sustainability.

The company operates under the jurisdiction of the Ministry of Economic Affairs and Employment.

TESI

Tesi (officially Finnish Industry Investment Ltd) is a state-owned investment company that invests in venture capital and private equity funds and directly in growth companies.

Tesi invests in venture capital and private equity funds that develop Finland's most promising growth companies. Tesi's investment focus includes venture capital funds, growth and small-cap buyout funds and mid-cap buyout funds. In addition to Finnish funds, Tesi also invests in international venture capital funds when the fund strategy has a value-add to the Finnish ecosystem.

Tesi makes investments on the same terms and return expectations together with private investors. Investments under Tesi's management total EUR 2.1 billion. The company reports to the Ministry of Economic Affairs and Employment.

Finnish Climate Fund

The Finnish Climate Fund is a Finnish state-owned special-assignment company. Its operations focus on combating climate change, boosting low-carbon industry and promoting digitalisation.

The Fund focuses on combating climate change, boosting low-carbon industry and promoting digitalisation. As a government tool, the Climate Fund contributes to boosting the necessary additional investments in order to achieve carbon neutrality.

Approximately 65% of the Climate Fund's investments relate to climate change and about 35% to climate-related digitalisation. During the launching phase of the Climate Fund, the funding related to digitalisation will be restricted to industrial scape-ups of digital climate solutions and digital platforms enabling emission reductions.

The Climate Fund invests in large-scale targets where the fund's investment is crucial to enable the project's realisation in the first place, on a larger scale or earlier than it would with funding from elsewhere. If this kind of clear added value from the state's participation cannot be identified, the Climate Fund will not fund the project.

The Climate Fund's primary investment targets are industrial scale-ups of climate solutions: the first verification of a new technology and/or its business model at an industrial or commercial scale. The other investment category of the Climate Fund includes physical or digital platforms enabling emissions reductions.

During its launching phase, the Climate Fund can provide capital loans or use special investment funds and other special funding instruments. The company will not award direct grants or subsidies. Depending on the funding category and target, the funding by the Climate Fund can vary between 1 and 20 million euros. The annual financing volume is approximately 80 million euros.

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NL Enterprise Agency is a department of the Dutch Ministry of Economic Affairs and Climate Policy that implements government policy for Agricultural, sustainability, innovation, and international business and cooperation. NL Enterprise Agency is the contact point for businesses, educational institutions and government bodies for information and advice, financing, networking and regulatory matters.

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