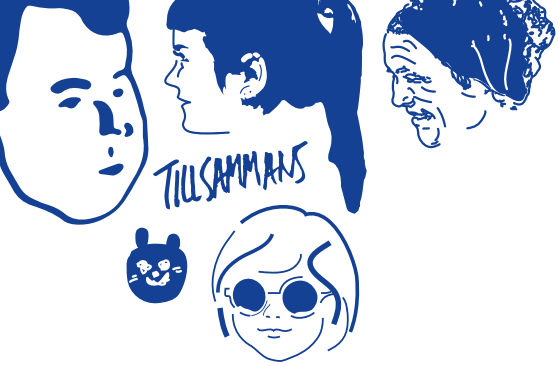

Suomi Finland 100

The Government's common drivers for change

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The Government's common drivers for change

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The Government's drivers for change cards

To the reader

The Government's drivers for change cards highlight key changes and uncertainties in the future operating environment for decision-makers and citizens.

Finland is enmeshed in the transition of the global operating environment, both in its positive and worrying developments. Not only major global megatrends but also regional developments will have direct impacts on both Finland's international status and the well-being and security of Finnish people.

During the following government terms, the place of Finland and Finnish people in the world will increasingly be determined by continuously advancing interdependency. The accelerating technological revolution and the transformations of competence and work are shaping society and also carry the risk of increasing inequalities. In the crosscurrents of geopolitics, climate change, digitalisation and a transforming democracy, clashes between different values will be accentuated. A successful Finland must be able to both exert influence on and adapt to these issues in its policies.

The change in the operating environment is tackled through 15 drivers for change cards. The big picture formed by these cards is based on the expert views of public officials. The drivers for change cards were produced and formulated in cooperation by all Finnish ministries, and they are underpinned by strategy work carried out in the ministries. The cards lay the foundation for the ministries' futures reviews to be published in summer 2018. The futures reviews will contain state-of-play and development analyses concerning the status of our society and issues on which political decisions need to be made for the backdrop of societal discussion and negotiations within the Government.

Each card presents a key future change, its outlook until around 2030, and alternative future scenarios associated with it. Rather than predicting what will happen in the future, the purpose of the futures work is to help us prepare for different trends and take a critical look at the decisions we make today from the perspective of these potential changes. The drivers for change are associated with a great number of uncertainties, and we must take a critical but serious attitude to them.

Fifteen drivers for change

The drivers for change cards are based on the categories of the PESTE method. They describe Finland's political, economic, social, technological and ecological status and outlook. In practice, however, many phenomena and changes cut across entire society, and their categories are fluid. The 2030s world will be networking and yet fragmented, and the society will have diversified.

1. Changes in the international system	4. Transformation of the global economic system	7. Population structure and urbanisation	10.Technologial revolution	13. Climate change
2. Developments in the EU and national states	5. Developments in the Finnish economy	8. Changes in values and attitudes	11. Digital capabilities in public administration	14. State of the environment
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The drivers for change cards probe Finland's future until the 2030s

The international system is facing structural and value-based challenges.

Changes in the international system refer to alterations in the global power balance. Emerging regional power centres are challenging the strong role of the United States. At the same time, the traditional international status of states will be called into question by different networks of many levels, a variety of actors and new operating methods. The international treaty-based system is groaning under the pressure for change. Escalating competition for natural resources, climate change and other changes in the state of the environment will be seen in very concrete terms in many areas, and they will exacerbate the risk of regional conflicts and create global instability.

> *What could act as a new form of global control? How could it be implemented? How could technologies help us perceive and control global relations of influence? What is the most efficient way for Finland to safeguard its international influence in the future? What types of networks should a country like Finland create, in addition to traditional exertion of influence through foreign policy?*

The EU will face one crossroads after another, and the roles of national states are changing

The EU's development *will have a significant impact on Finland and the other EU Member States. A moderate outlook for 2030 is that the EU will continue more or less as before and focus on implementing and developing reform programmes. The priority objectives will be updated regularly, problems will be intervened in as and when they come up, and new legislation will be adopted as needed. Programmes aiming to reform structures and operating methods will progress slowly. The EU's importance and influence in world politics may diminish, and the development of its competitiveness will be sluggish for a long period.*

> *How can we guarantee the Member States' unity and the ability of the EU and its operating models to renew themselves? How will European values evolve? How will Europe evolve as a security community?*

Structures will be shaped by information flows and ownership. Plurality in democracy and participation will increase.

At its best, democratic decision-making is based on citizens' broad and equal participation, an open administration and interaction with civic society. If the citizens no longer find the means of traditional democracy adequate, this may fuel societal frustration. New models should be created for participation and interaction that are based on openness, peerness and a customer relationship as well as on reinforcing the individual's and community's individual action.

Everyone has access to information; on the other hand, the immense explosion of information is impossible to control or process. At the same time, communication is undergoing a revolution. In practice, anyone can communicate information to an almost unlimited number of recipients.

> *Could today's political events be about a crisis of democracy? When this crisis has been resolved, will we move on towards a completely new era of democracy? How could we influence this development? How can we support the citizens' possibilities of distinguishing between essential and inessential information and their ability to verify the origin and accuracy of information in the information society of the future?*

World politics and economy will determine the direction of Finland's economic development, Finland will continue to struggle with structural problems.

The economic growth of Finland as a small open economy depends to a significant degree on developments in the world economy and global trade. The interdependency based on competition between the United States and China will be the most decisive factor in global economic development also in the 2030s. China is growing into the largest economy of the world that is on par with and partly exceeds the United States, but the general globalisation development is already slowing down. Digitalisation, robotics, artificial intelligence and other technological advancement will continue to change global value and earnings chains and influence the development of the world and Finnish economy. Economic growth will remain slow in the 2030s.

> *In which sectors will economic growth take place in Finland? What means and objectives will Finland have for operating as a part of the global world?*

The ways in which work is done and the meaning of work will be reinvented.

The transformation of work *refers to a deep technological, economic, societal and human change that will extend across generations. At the very core of this transformation are automation, robots and artificial intelligence, creative destruction as well as the development of sharing and platform economies, which will change the structure of the labour force, contents of work and the relationship between employers and employees. Rather than a fast transition from one way of doing work to some other way, however, this is about a long-term change towards a more diverse and pluralistic world of work. As work transforms, people will become included in society through more diverse objectives and meaningful activities.*

> *How should new, meaningful ways of being part of society be supported, and how will safety nets be organised when work is performed on global platforms, in temporary networks and without a conventional employer-employee relationship?*

Depopulation and regional inequality will go hand in hand.

The development of the population structure and urbanisation *will determine Finland's viability and future. In the 2030s, any population growth in Finland will to a great extent rely on net immigration. Urbanisation and the concentration of the population to the largest urban centres will require environmentally and socially sustainable solutions as part of responsible urban development, and the strengthening of business activities and housing construction that rely on these solutions. There will be increasing interaction between the competitiveness and welfare of regions and companies' success in the global market.*

> *Will the entire area of Finland be viable, and will all regions have enough population with a sufficient functional capacity and ability to work? How will responsible urban development be realised?*

Common values will be preserved, but how widely will they be held?

Changes in values and attitudes reflect changes in society – and also cause them. The values held in Finland and most parts of Europe are kin to the secular and liberalised world, but disparate views are also expressed. Values and attitudes play a crucial role in solving the big questions of society's future, including sustainable development or the questions of work and competence. The majority of citizens keep in mind our common interest and shared values, including tolerance, equality and freedom of expression.

> *Can and should everyone get their voices heard through different channels? How will the values of an increasingly pluralistic society evolve and who will be listened to?*

Growing inequalities will challenge our society on many fronts.

The welfare society has looked after its weakest members, and Finnish people's well-being and standard of health have kept improving. Most people continue to feel well, but inequalities are growing, and these gaps are large by international comparison. For example, there are differences between socioeconomic groups, genders, the mainstream population and minorities, and geographic areas.

> *How can economic, social, cultural and welfare-related polarisation that threatens positive societal development be halted in time?*

Technological development will speed up changes in all areas of life.

An almost unlimited access to information, automation, robotics and artificial intelligence are transforming the world in the same way as the Industrial Revolution did, but in a considerably shorter period of time, and the technological revolution has multiple impacts on society. In relative terms, these impacts will hit all sectors over a very short time. Technology is also a key to achieving ecological sustainability. The revolution is real, but its rate will be uncertain and vary in different fields and organisations.

> *What will the new division of labour between sectors, or between humans and machines, be like when the technological revolution challenges the conventional restrictions to and manners of doing things? How will consumer values and choices change when new technologies are introduced?*

Critical infrastructures are society's lifeline.

The reliability of critical infrastructure *will be under increasing pressure as the digital economy and hyper-connected operating environment evolve. Climate change and the repair backlog will also heap pressure on built infrastructure. The Industrial Internet and robotisation will be an increasingly important part of vital societal functions and critical infrastructure. Infrastructures will rely on intelligent electricity grids and autonomous systems. Artificial intelligence is a key factor in controlling the vulnerabilities of critical infrastructure.*

> *As a consequence of the technological revolution, critical infrastructure in Finland needs to be re-thought. What should we control, own and be able to do ourselves in the future, and on what scale? How can we safeguard the reliability of critical infrastructure in the era of artificial intelligence?*

Digital capabilities in public administration will be crucial for controlling the transformation.

In a digital operating culture, electronic services and back office processes will increasingly be central to all activities. In the 2030s, the transformation will have both enabled and required an upgrade of customer-centrered and interadministrative processes in public administration. Many areas of the public administration's work will be based on networks, openness and agility.

> *Will we be able to capitalise on digitalisation in Finland? Will we be able to find the right partners, use platforms, secure information and draft statutes that will enable the change?*

Climate change will be a game changer.

As a result of climate change, changes in such phenomena as rains will cause increasing droughts in some areas, while others will experience more frequent flooding. Climate change is a particular threat to nature in northern areas. It will change the living environment and shift the ranges of species northwards in Europe. New alien species will make their way to Finland, changes will take place in the water cycle processes, and the operating preconditions of forestry and farming will change. In addition to climate change mitigation, adaptation to changes in the weather and the climate will be essential.

> *What impacts will climate change have in Finland? How can we mitigate it and adapt to it? What happens if we fail to implement the Paris Agreement? What happens if the northern boreal forest zone will be the only inhabitable area left on the globe?*

The environment and nature will be vulnerable, and competition for natural resources will escalate.

While emissions into air and water systems have reduced, the status of the Baltic Sea or the inland water bodies and ground waters is not yet good in all respects. We have failed to halt the loss of biodiversity in Finnish nature. Hazardous chemicals continue to be used on a large scale, and the emissions of hazardous substances and small particles are still excessive in terms of environmental and human health. The status of the built environment in Finland is mainly satisfactory, even if the growing repair backlog continues to be a problem.

> *What will the state of our environment be like? How can we ensure that our children will also be able to enjoy an attractive environment and rich biodiversity? What will happen if we fail to manage the environmental risks?*

Sustainable use of natural resources is no longer something we can take for *granted; the global consumption equals 1.6 times the Earth's natural resources. The increased demand and reduced supply will drive a global competition for natural resources. The depletion of non-renewable natural resources will guide us toward more resource efficient use of materials.*

> *How can Finnish high-level competence be used to promote bioeconomy and circular economy? How can we bring about a sea change, transitioning towards production and consumption based on renewable natural resources?*

1 Changes in the international system

The emphasis of the world economy will shift to the east, and the USA's predominant role in world politics will be challenged by strengthening regional power centres, especially China. The global desirability of the Western development model and values will be questioned. Europe's importance in the global economy and world politics will diminish.

Globalisation and an increase in the significance and number of non-state international actors will spark feelings of insecurity and backlashes: a rise of nationalism and protectionism, military preparedness, stricter control. These trends will challenge the multilateral treaty-based system, including climate conventions and global trade agreements. However, the most successful actors will adapt to the increasing interdependency.

Escalating competition for natural resources, climate change and other changes in the state of the environment will be seen in very concrete terms in many areas, and they will exacerbate the risk of regional conflicts and create global instability. As a counterbalance for the forces of disintegration, shared problems and interdependency will generate pressures to strengthen the mechanisms of global control.

Vision 2030

While the foundation of the international system has survived, regional centres have gained strength. These centres create parallel regional systems that party question and partly support the UN-based system. A key question is if attempts to solve shared problems will primarily be based on the great powers' independent actions, agreements between them or genuine joint efforts.

In 2030, global conflicts are increasingly diverse – armed conflicts between different groups but possibly also conflicts between states where all means and actors are deployed. Managing and resolving conflicts will be ever more difficult. Weapons of mass destruction have made a 'comeback' on the global scene, and there is a risk of them also ending up in the hands of non-government actors.

The United States is still the world's foremost state as measured by political, economic and military indicators. Rather than continuing as a hegemonic power that makes all decisions alone, however, it will increasingly be forced to negotiate with regional powers at different levels.

The Western countries remain the key allies of the United States. Regional arrangements in South America have gathered momentum.

China has a stronger global role, and its foreign policy is bolder and more confident. Many emerging states that wish to gain a foothold in global decision-making are grouped around it. India is also a significant regional power.

Significant risks are associated with the development in Russia, and it is likely that the Russian economy will have deteriorated further by 2030: instability may grow and lead to unpredictable policies and conflicts between the country's regions.

The direction for the EU foreign policy will be set by France and Germany. While Brexit will diminish Britain's international position, the country will be actively involved in Europe's security policy development through NATO and probably support the common EU foreign policy in many questions of substance.

The development in Turkey involves great uncertainties and risks, and the country may drift further from the Western camp. Regional impacts of climate change and other environmental changes, drawn-out conflicts and regional demographic pressure will exacerbate uneven development and conflicts in the Middle East and North Africa, and Europe's neighbouring areas will remain unstable. Powerful waves of migration will continue to head for Europe. In Africa, unbalanced regional development will continue. It is likely that the African Union will have significantly increased its importance by 2030.

Alternative future scenarios

Key dimensions of international order will be oscillations between unipolarity and multipolarity on one hand, and competition between great powers and multilateral cooperation on the other. From this perspective, the scenario for international order could be one of the following:

A world of competition between the USA and China. The USA remains the only superpower, while China continues to be its main challenger. The countries will compete in political, military and economic forums, with a negative impact on the international treaty-based system.

A world of regional spheres of interest. The emerging powers will grow into regional centres of political and economic power that compete against each other. The USA will be the strongest and most global actor; many regional great powers, including China, India, Iran,

Russia, Brazil as well as South Africa and Nigeria will challenge the traditional power centres, for example within the UN.

A shared world for all. In a globalising world, there will be no alternative to multilateralism. The great powers will support and strengthen the international treaty-based system, as they all find they benefit from it.

A world of cooperation led by the USA. A strong United States will maintain and support a rule-based international system. While other actors are forced to adapt to the USA's hegemony, they also benefit from international exchanges and rules. In addition to these options, we should remember that countless individual events and developments, especially within the great powers, could significantly alter the big picture of world politics. What would happen if the status of the Communist party were questioned in China? And what if the other great powers catch up with the USA on the technology front while internal conflicts in that country exacerbate? What will happen if weapons of mass destruction are deployed widely?

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2 Developments in the EU and nation states

In recent years, tensions between EU integration and emerging focus on national states have put the EU's operating capacity and value base to test. The wave of migration, the rise of nationalist and Eurosceptic populism and Brexit have been a wake-up call for the EU to consider its future. On one hand, deepening integration has been proposed, for example in terms of the economic and monetary union. On the other hand, some Member States have brought up curbing the Commission's role and returning competence to the national level.

Recent election results indicate that the growth of populism in Europe has crested. In the aftermath of the referendum on EU membership in Britain, support for the EU among Member State citizens has increased, also in Finland. This had not been anticipated. Expectations placed on the Union's activities are mounting: for example, the EU is expected to do more to combat terrorism and unemployment, protect the environment and control migration.

A key question is whether the Member States can work together to respond to the citizens' mounting expectations, hold on to the shared values and renew the EU. In terms of the credibility and acceptability of the EU's actions, it is essential that the Union is able to hold firm to its shared values, including the rule of law. Fighting inequalities both within and between the Member States is another challenge. If this fails, increasing inequalities may lead to various crises and disruptions and encourage the citizens to look inwards.

Globalisation and interdependency highlight the EU's significance in responding to cross-border challenges and promoting shared interests.

Vision 2030

The EU has invested in promoting growth and employment as well as bolstering security.

Europe's relative status in the global economy has diminished, but less than was feared. A deepening of the Internal Market has strengthened the EU's competitiveness and made it possible to promote Europe's interests more efficiently at the global level. Key content areas have been digitalisation and the service, platform and sharing economy, robotisation, education and competence as well as innovative energy solutions. The EU is a global pioneer in climate and environmental policy.

The EU has continued to promote free trade, and the significance of the trade agreements negotiated by it has gradually grown. Protectionist thinking and opposition to globalisation have been a challenge to this development.

The significance of defence cooperation within the EU has increased, and the more intensive defence cooperation may also have served as a driver for integration of a kind. NATO development affects the pace and direction of the EU's defence cooperation. Security has been examined as a large entity in the EU that includes such areas as combating hybrid threats and terrorism.

Implementing the EU's commitments is fraught with challenges, but step by step, common solutions have been found for such questions as migration.

Some Member States have made faster progress than others in specific areas of cooperation. In the early phase, at least, progress at different rates has been possible within the framework of the current Basic Treaties. The participating Member States vary depending on the area the cooperation concerns. The fear of marginalisation has put small Member States under greater pressure to join in the closer cooperation. The economic and monetary union has been deepened, possibly within fewer Member States than today.

Reaching consensus on the needs to amend the EU's basic treaties and on the ways in which these amendment can be implemented have been extremely difficult.

Alternative future scenarios

A Union of two tiers: Member States will lose their unity over questions that are crucial for the functioning of the Union. As a result, they will gradually become divided into two groups. The core group will enter into more intensive and efficient cooperation, whereas some of the Member States will remain on the outer orbit of the EU, to which new Member States will possibly also accede.

Highlighting the interests and competence of national states in an intergovernmental union will lead to increased bilateral cooperation and decision-making in the Union. The Community approach and the Union's structures will degenerate, and decisions will increasingly be made by consensus in the European Council. More and more Member States will start voicing their wishes for exemptions or special arrangements granted to individual states. In some respects, competence will be returned to the Member States. Shared European values will start losing their significance in the Union's activities. Cooperation between Member States will be seen essential, however, in order to respond to cross-border problems and to promote

shared interests at global level. The possibilities of the EU, whose operation will be based on the smallest common variable, for acting successfully at the global level will dwindle.

In a dysfunctional Union, Euroscepticism and nationalism will grow across Europe, also in the largest Member States. Rather than pulling together to develop the EU, the Member States will more frequently rely on national solutions. Once Britain has actually left the Union, a few other Member States will also announce their intention to withdraw. Some Member States may become mired in long-standing economic or political crises. Migration to Europe will grow. As effective common solutions for controlling migration cannot be found and the Member States are incapable of managing the EU's external borders together, the Member States will restrict the freedom of movement in the Union area. This will pull the rug from underneath the Internal Market. An internally divided and discordant Europe will be marginalised at the global level.

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3 Plurality of democracy and participation

The foundations of democracy and the future of the political party system are being actively discussed in the Western countries. It is obvious that democracy must be developed and updated to meet the demands of today's world and the future. Democracy indicators show that Finnish people are generally satisfied with the functioning of democracy and that their level of satisfaction is high by international comparisons. On the other hand, only six per cent of Finnish people are members of a political party, and a decline has been observed in trust felt for the administration. Factors that support democracy in Finland include a free civic society, a high level of education and lack of corruption. The polarisation of civic participation, on the other hand, may become a factor that undermines democracy.

The Finnish information society is underpinned by a high-quality education system, highly educated population, appreciation of science and research as well as free media. The information society is facing great changes, however: everyone has access to information, but the immense explosion of information is impossible to control or handle. Communication is also going through a revolution. In practice, anyone can communicate information to an almost unlimited number of recipients. As critical skills in the new information society will emerge making distinctions between essential and inessential information and an ability to verify the origin and accuracy of information.

Vision 2030

Finland continues to rank as one of the world's top countries in international comparisons related to democracy. However, this has required development work with the aim of activating citizens to participate and to maintain interest in politics. Assisted by new technologies, the citizens are heard across a broader front and more often, not only through different online channels for consultations and participation but also through such means as municipal referendums. An effort will be made to increasingly use alternative methods of deliberative democracy, including facilitated citizens' debates, in public service design.

A key challenge to information society will be the fragmentation of information sources used to form a world view. As a solution, methods and applications will be developed that support coping with the limitless flood of information. The question of power by information has been highlighted as an increasingly crucial security policy issue.

Changes in the development of politics, inclusion and democracy may be unexpected and rapid, both nationally and globally. Populism and nationalism, which started to raise their heads in the 2010s, will ebb and flow.

The media literacy of Finnish people is improving continuously, and responsible communication is a key civic skill. The school system improves children's and young people's skills in receiving and using information. Science policy supports wide access to research-based knowledge in society.

Alternative future scenarios

Estimates of alternative means of controlling globalisation vary from the creation of a genuine international democracy to returning to focus on national states. It has also been suggested that today's political events are about a crisis of democracy; when this crisis has been resolved, we will move towards a completely new era of democracy or a totally different control system.

Finland can be a forerunner of renewing and global participation. Political parties will develop their activities to a direction where citizen have genuine possibilities for promoting issues they find important through the parties. At the same time, new types of informal and network-based civic activities and new channels of organised participation will have been developed in addition to and in connection of conventional methods of participation. To solve the challenges of an interdependent world, effective bodies competent to make decisions will be needed. Finland will be actively involved in developing the forms of global participation.

Lack of political trust may undermine the stability and legitimacy of the democratic system. A continuous decline in the voting rates and party membership may indicate that the citizens and the parties are losing touch with each other. If the conventional democratic means are not experienced as sufficient, societal frustration will spread, and extremist organisations may gather more supporters. The direction in which democracy will develop will be essentially influenced by whether or not political parties and the administration are willing and able to involve citizens in decision-making more openly and closely than today. The manner in which new technologies can be used to expand the selection of means of participation will also play a key role.

The revolution of the media may lead to a degeneration of the current professionalism in communication. New operating models and funding sources cannot be found for quality journalism as the old ones run out. In a world that operates on an ever faster pace,

the risk is that there will be no willingness to commit resources to building a large knowledge base and long-term research activities, as their time span appears to be too long. Signs can already be seen indicating that individual opinions and strict ideological views can gain major visibility and challenge research-based knowledge and expert views. The spreading and mainstreaming of false information may in the future have negative impacts on the citizens' health and safety and even put them at risk. As an important way of influencing this development emerges fostering educational and scientific institutions that represent education and culture and improving the operating conditions of quality media whose competitive advantage will be the standard of the information they disseminate.

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4 Transformation of the global economic system

The growth of the Finnish economy depends on global economic development which, in turn, is linked to world politics. Competitive interdependency between the United States and China will be the determining factor of global economic development also in the future. China is surpassing the USA as the world's largest economy, but can China challenge the USA? Globalisation development has slowed down, but digitalisation, robotics, artificial intelligence and other technological advancement will continue to change global value and earnings chains and influence the development of the world economies – increasingly also in the service sectors.

Decisions related to external economic relations and foreign policy are significant and have long-term impacts on Finland as a country dependent on exports. The future development of the EU and Russia will be extremely important for Finland.

Vision 2030

The change in global value chains will have reduced the global goods trade and GDP growth by 2030. In developed countries, the outsourcing of functions to abroad will decline, and intermediate products will be more frequently bought in the home country rather than imported. The liberalisation of international exchanges continues on the basis of multilateral agreements. On the other hand, global economic growth has been disrupted by increasing protectionism, which hampers the free movement of goods, services, people, capitals and technologies between countries. As it gathers momentum, the rise of nationalism and populism, especially in Western countries, fuels protectionism. The greatest concerns include structural problems in the global economy, particularly the slow improvement in the productivity of work and increasing income gaps.

The world's fastest economic growth takes place in the developing markets of Asia, Africa and Latin America, which also offers opportunities for Finland. While economic growth in China will slow down over the longer term, the Indian economy is expected to keep growing strongly. The general structure and oil dependence of the Russian economy will not enable fast growth. This situation may be changed by essential alterations in the price of oil and structures that improve its competitiveness. Such changes are not on the horizon, however, at least not regarding the structures. Additionally, a moderate increase only is predicted in oil prices.

Economic development in Europe is challenged by the ageing population and structural problems, as a consequence of which the long-term growth outlook is modest. In Euro-zone countries, continuing banking sector problems are a systemic risk. The increased political uncertainty will contribute to slowing down economic growth, which will be significantly vulnerable to various phenomena that are reaching crisis proportions. Due to such factors as climate change and dwindling natural resources, the greatest waves of migrants and refugees, which so far have remain within fragile states, will much more definitely direct themselves towards the affluent Western countries and also Finland.

Alternative future scenarios

In the El Dorado of world economy, economic integration continues, the world economy grows regardless of conjectural cycles, and the multilateral trade system is going from strength to strength. The economy is underpinned by innovations, especially in the field of digitalisation and robotisation. A climate agreement and the global application of smart technologies lay a firm foundation for sustainable economic growth and lower-carbon societies.

The USA and the EU continue to enjoy a position of economic power based on treaty-based world trade. Following a protectionist era that gathered momentum in the 2010s, the Trans-Pacific Partnership is again valid, boosting the economies of the entire area covered by the treaty. The economies of China and other Asian countries are also growing. While the increase in goods trade has slowed down globally, altered value and earning chains have strengthened the global trade of services. Developing countries have also succeeded in updating their services and benefiting from the agreement on service trade that has entered into force. Integration between Middle and South American countries is advancing and supports the economic development and democratisation of the area. Trade between African countries has grown.

More than one half of Finland's trade still takes place in the EU's Internal Market, but markets outside Europe and trade agreements concluded by the EU are growing in significance. The deepening of the European Internal Market will lead to the elimination of barriers to online trade, the creation of a European unemployment security fund, and harmonisation of goods legislation. New market areas will also improve Finland's export development.

The sun rises in the East and sets in Europe. The annual fluctuations in global economic growth are large, and regional differences are accentuated. Asia and especially China are drivers of growth, as the USA mainly relies on protectionist economic policy and has withdrawn from the most important free trade agreement. In addition to China, the Indian

economy and the country's role in the world economy are also increasing, as these two countries are able to develop their economies through robotisation, digitalisation and the platform economy more methodically than the Western countries.

The WTO's importance is declining, and its dispute settlement system works but poorly. The EU's political competence is diminishing, as the Union has been unable to deepen its Internal Market. The European Parliament and national parliaments are finding it difficult to adopt new trade agreements, as promoting national interests is paramount in the negotiations. Political conflicts hamper the development of internal trade in Africa. Africa is also affected by extreme phenomena caused by climate change. Fragmented trade systems do not serve Finland's interests, and Finnish companies are encountering tougher competition.

If the doors have been slammed shut, global economic growth slows down and becomes substantially fragmented. The United States concentrates on its own economy and job creation. The bubbles of the Chinese economy have burst, slowing down economic development. India fails to seize its opportunity as China grows weaker. The negotiations on many multilateral agreements will have been tabled due to the power politics of key countries. The EU is left behind in the competition for welfare due financial market dysfunction caused when problems that have been smouldering for years come to a head. The regions within the EU will keep drifting further apart, causing tensions in the Eurozone.

Only the largest international companies and a declining number of countries are able to capitalise on the fast development of technologies and improve their competitiveness. This results in growing inequalities in the world. Economic growth in Finland stagnates and the standard of well-being decreases as the EU's Internal Market is floundering, the USA trades bilaterally, growth in China slows down, and Russia focuses on bolstering its position of political power rather than modernising economic structures.

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5 Developments in the Finnish economy

In a small open economy such as Finland, conjectural cycles to a significant degree depend on developments in the world economy and global trade. Due to strong trade connections, global economic development is a highly significant factor for Finnish exports.

The economic growth predicted to take place over the medium term is slow compared to historical figures. At the same time, the working-age population is declining as the population ages. The development of productivity will be poor as a consequence of an economy dominated by services.

Public finances have been showing a deficit for a long period, and age-related expenditure, for example, is expected to grow significantly already in the 2020s. Over the long term, the imbalance between public revenue and expenditure, or the sustainability gap, is estimated to be some three per cent of the GDP, amounting to approximately EUR 7 billion. Economic growth and public economy sustainability will depend on our ability to renew structures and operating methods and draw on new competence.

A competitive operating environment for companies will be built through growth policies. The objective is that business sector will renew and that profitable high added value companies will operate in Finland, generating economic value, jobs and affluence.

Vision 2030

Before the first decade of the new millennium, the Finnish economy grew by almost three per cent year, while in the 2000s, this figure has been one and a half per cent annually.

The sluggish growth of the Finnish economy can be expected to continue in the next few decades. The working age population will decline, and the predominance of services will result in poor productivity development. The Finnish economy will be vulnerable to negative shocks.

In 2030, the traditional drivers of the Finnish economy will either have petered out or reinvented themselves completely. To ensure a moderate recovery of the economic growth, the building of a new, sustainable foundation for production, developing high-level expertise, and understanding and grasping changing value and earning chains have been required.

The government focuses on building and developing a level playing field. Key methods for this will include renewing structures, for example through education and research and innovation systems, increasing market insight and competition, ensuring improved efficiency in the public sector, as well as immigration policy that supports employment.

Alternative future scenarios

Finland embarks on a path of new, sustainable economic growth boosted by the global market economy, with more entrepreneurs, new operating models and success stories. This growth takes place within the limits set by the environmental bearing capacity. Solutions based on bioeconomy and circular economy also increase the added value of the current products, the demand and supply of labour are well matched, and skills are up to date in all respects. Structural reforms have successful responded to the dependency ratio weakened by the ageing of the population, and Finland becomes a model country of economic activity and innovation use. The regions are able to draw on their strengths. Sufficient well-being can be guaranteed to all citizens. Economic well-being also guarantees resources for well-functioning public services, including an efficient and effective legal system.

Sluggish economic growth continues and an effort is made to fix it through public economy adjustment measures. A stronger economic growth may be achieved, but only in narrow sectors, and the unbalanced structure of the economy exposes it to various disruptions. Economic growth is based on international demand for investment goods, which exacerbates conjectural cycles. There is no significant increase in the employment rate, the labour market becomes polarised, and regional differences also grow in Finland. As a result, well-being is unevenly divided, and economic growth only benefits some of the citizens. Innovation activities do not bring significant competitive advantages in the private global market, and the willingness of companies to invest in Finland is haphazard; innovation drain directed to abroad is a problem.

The Finnish economy collapses under global shocks, or those affecting the neighbouring areas, including a deep financial crisis in the Eurozone. Crises fuel protectionism in the world economy, and the liberalisation of international exchanges peters out or relies on agreements that favour larger countries. Finland closes its doors, and Finland's production structure no longer is a good match for the demand structure in the world economy. Public sector funding is at risk, and indebtedness grows explosively. Deficits restrict Finland's room for manoeuvre, and not even all statutory duties can be fulfilled. Implementation of policy measures is hampered, and an effective rule of law is at risk.

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6 Transformation of work

The transformation of work is a great and cross-generational technological, economic and societal change. Rather than a fast replacement of one way of doing work by another, this is about a prolonged transition towards a more diverse and pluralistic world of work. The underlying factors of this transition include such megatrends as digitalisation, globalisation, demographic change, urbanisation and climate change. At the very core of the transformation are automation, robots and artificial intelligence, creative destruction as well as the sharing and platform economy development, which will change the structure of the labour force, contents of work and the relationship between employers and employees. The introduction of advanced technologies is expected to support economic growth. In future visions, machines can perform such a large share of human work cost-effectively that a smaller labour input is needed to achieve economic growth.

As work transforms, people can become included in society through increasingly diverse objectives and meaningful activities. The transformation of work will enable a focus on solving wicked problems in cooperation with other people and using machines. A precondition for this will be a critical discussion about the changing and developing ways in which work is managed and organised, the quality of the world of work, diversification of jobs, up-to-date competence in work now and in the future, as well as sources of livelihood and inclusion in society.

Vision 2030

The first primary principle is that the number of both routine and expert tasks will be reduced as work is replaced by technology. The second primary principle concerns the diversification of work into multi-form work, which means not only more self-employment or short-term jobs but also the diversification of work content and the blurring of professional images in paid employment.

In the future, an employee may work for several employers at the same time, or without a conventional employment relationship. This development will change society's key structures and processes, including the tax base, the role of labour market and lobbying organisations and our entire social security system, as well as extensively challenge legislation on these issues.

The transformation of work will put a question mark on paid employment as a key source of livelihood and on the regularity, coverage and effectiveness of society's safety nets that support it. A review of the manner in which incomes are accumulated and income redistribution mechanisms work will be necessary. This is a precondition for giving everyone a possibility for a good life. The current system will be developed with the aim of increasing its flexibility (e.g. social security accounts) or coverage (basic income models), or combining these two departures in European cooperation.

Competence, education and learning lay the foundation for coping with the transformation of work. At the same time, competence and learning as separate investments have been replaced by lifelong learning. The transformation of work means that individuals need to continuously update their skills. Studying increasingly becomes an element of work and something we do throughout our careers in shorter bursts than before. Future competence will consist of individual thinking and learning skills as well as skills related to interaction in the community and operating in different environments. Learning communities and organisations will support lifelong learning through work and an inquisitive culture of learning.

The most extensive and fundamental change brought about by the transformation of work will be that work will lose some of its meaning as a traditional instrument of social inclusion, and work – as it is understood today – will no longer be a natural source and redistributor of incomes and livelihoods. As a consequence of the transformation of work, finding our individual life paths and thus places in society around us have become clearly more challenging.

Alternative future scenarios

The consequences of the transformation of work will challenge the entire foundation of the welfare society, which has relied on the impacts of economic growth for growing well-being. Not only the economy and work but the entire society will be reshaped.

This transformation is associated with plenty of uncertainty, however, and it must be approached critically. The most critical uncertainties and alternative developments are related to changes in the job structure, such as the creation and loss of jobs as well as employment rate trends. Another key uncertainty is linked to the polarisation of work, or increasing income gaps, which may often be associated with the possibility that jobs with a medium level of pay will disappear.

More hopeful future visions bring us **towards a diverse platform economy**. The current service economy will develop into a direction where Finnish companies and employees create new work, value and competence on global platforms. Platform economy innovations and solutions will be widely used in society, and investments will be made in creating new competence and an effective legislative environment for the platform economy. Society's safety nets, including social security, will be reformed to ensure that platform economy actors, those who work alone or employ themselves, will be encountered better and more flexibly, and that the building of an extensive and flexible competence base extending throughout a person's life will be reinforced.

Threat of inequalities in the labour market. In this vision of the future, there will be a deep divide between the well-paid jobs of a small elite and an increasing number of low-pay service jobs, thus weakening the position of the employee. At the same time, the advancement of technologies will have very different impacts on different jobs, and the employees' competence levels will show larger variations – as work becomes individualised, there will be a risk of labour market polarisation. Technological development may make it possible for super or hyper productive people or organisations to stand out more clearly from others.

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7 Population structure and urbanisation

According to the current population forecast, Finland relies on net immigration for its population growth. A decrease in the number of births combined with an ageing population, longer life spans and unemployment are having a negative effect on the dependency ratio in Finland. This will put public finances under more pressure and exacerbate the need to increase the working age population by developing Finland's immigration and integration policy, encouraging the immigration of foreign labour and promoting immigrants' inclusion in the labour market.

The less favourable economic dependency ratio will be a particular challenge in sparsely populated areas, as having a population with a good functional capacity and work ability is a precondition for their vitality. The forthcoming regional government reform will also have an impact on this development. A key question in terms of regional development will be solving the challenge of providing services in the face of urbanisation. The competitiveness and welfare of regions will increasingly depend on companies' success in the global market. A strong structural change in the Finnish economy, especially in ICT and forestry, have widened the well-being gaps between and within the regions in recent years.

Currently, 70 per cent of the Finnish population live in cities and their satellite zones. Population growth concentrates in the urban sub-regions of Helsinki, Tampere, Oulu and Turku. Urbanisation has been driven by young people who are drawn to urban areas by a specialised education and labour market. Urbanisation and the concentration of the population to the largest urban centres will require environmentally and socially sustainable solutions as part of responsible urban development, and the strengthening of business activities and housing construction that rely on these solutions.

While the traditional social mix in housing estates has effectively curbed segregation in Finland, the divide between the living areas of people with low and high incomes has widened in the 2000s due to a number of factors. Ethnic and socioeconomic segregation are visible in Finnish cities.

Vision 2030

The ageing of the Finnish population will progress at a rapid rate in the decades to come. At the end of 2014, the demographic dependency ratio, or the number of children and pensioners per one hundred people in working age was 57.1. It is predicted that the threshold

of 60 dependants will be exceeded in 2017 and 70 dependants by 2032. The average growth of the dependency ratio hides major regional differences: in Kainuu, for example, the dependency ratio is expected to be over 90 in 2030, meaning that the working age population will not be large enough to keep the region going.

In 2015–2030, the population will grow in one out of three municipalities. The greatest growth in numbers will take place in four of the largest growth areas. Population growth will exceed ten per cent in the Helsinki metropolitan area, the area affected by the growth corridor between Helsinki and Tampere, the largest urban sub-regions in Southwest Finland and the coastal area of Ostrobothnia and parts of Lapland. A population decline will be seen in approximately two municipalities out of three located in central, eastern and northern Finland as well as on the margins of the large urban sub-regions in southern and western Finland. However, viable municipalities can also be found in rural areas where the demographic development is positive, for example boosted by investments associated with the bioeconomy and the circular economy as well as growth in tourism. Immigration may also change the dependency ratio. Especially in the Helsinki metropolitan region, the foreign-language speaking population is growing.

The development of such innovations as autonomous cars and the mobility as a service concept are also bringing about a major transformation in mobility and transport. This may have the impact of linking growth zones to the transport flows of central cities. The diversification of work as well as the reduction in location specificity enabled by digitalisation, especially in the form of remote work or studies, will increase multi-local and part-time living.

Alternative future scenarios

Population growth will be centralised to growth zones. Global megatrends of demographic development and the economy will be key drivers of development, reducing the possibilities of influencing the citizens' living environments and employment by political decisions. The emergence and development of growth zones are linked to the trends of international economy and technology, which will exacerbate regional polarisation. Growth zone development will be quite likely if companies can obtain sufficient agglomeration benefits and there is a high level of immigration. Regional central cities will act as a counterbalance for the Helsinki metropolitan region. While this development will be possible in the next few years, it will not necessarily reach all 18 regional centres. If the central cities grow in significance, this will also increase the counties' role and boost the viability of the areas surrounding the cities. This, on the other hand, will support a more even regional distribution of growth. Over the long term, such development may result in a sit-

uation resembling a federal state where the counties and their central cities are competing against each other and focus on promoting their own interests above anything else.

Uncontrolled urban development. The global operating environment reaches a crisis point, acting as the driving force of development. This will have direct and indirect impacts on Finland: economic growth will slow down, political tensions will be inflamed, large-scale migration will gather momentum and the number of asylum seekers will grow rapidly. As a result of the sudden and uncontrolled change, urban development will suffer a crisis, as housing construction and infrastructure development can no longer keep up with the rapidly expanding needs. The strong growth of migration will exacerbate regional segregation, and the means of social policy will be inadequate to resolve the situation. The uncontrollable nature of the situation will have a negative effect on the population's health and well-being and increase insecurity and complexity in society. In this situation, society's stability and security will be central to all decision-making. This development is not particularly likely, but some of the features described above may become reality, even at a rapid pace, as a sum of different variables.

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8 Change of values and attitudes

The development of values reflects changes in society – and on the other hand, causes changes in it. The basic values do not change at a particularly fast pace. Over the long term, value development is characterised by reciprocity between different value types. Finland and a large part of Europe are pluralist while stressing respect for human dignity and human rights, freedom, equality and rule of law as fundamental values. Values have become secularised over a longer time span, but on the other hand, this development has recently been opposed by many other conflicting values, for example those based on extreme ideologies or populist views.

An increasing number of parties influence values and attitudes in a world where everyone can make their voices heard through different channels and set up groups of like-minded people around different issues. While activation is a resource, knowledge shared on networks, for instance, may be based on incorrect information, or a skills gap may emerge between generations in using these tools.

Values and attitudes play a critical role in solving major societal challenges. The significance of work as a shaper of identifies and an instrument for participation in society is transforming. Belief in education may erode, on the other hand, if it can no longer offer social advancement. Resolving environmental questions and the social acceptability of actions related to this in different sectors of life will require internalisation of sustainable development. The choices that consumers are prepared to make will play a key role.

Vision 2030

An effort will be made to curb the polarisation of values and attitudes in Finland. The majority of citizens will incorporate the common good and shared values in their thinking. When they are making choices, however, such concerns as economic advantage rather than other values may more frequently be a decisive factor. The majority of citizens see tolerance, equality and respect for a person's individual and cultural identity as important values in their personal actions. Most respect the freedom of expression as well as different opinions and customs and understand differences. Extremist movements are around, but their importance has remained relatively small. Trust in institutions and the legal system will still be strong in 2030, but extensive conflicts and factors of uncertainty will affect the way the climate of values develops.

Belief in society remains strong, and most Finnish people wish to take part in looking after the common affairs. A prerequisite for this has been maintaining a stable welfare and economic situation and carrying through reforms that support development and prevent exclusion in educational structures and the labour market. New, emerging forms of economy, including the sharing economy, advanced services and a culture of experimentation will gradually gain ground. Urbanisation and focus on services still have a strong impact on the development of values and lifestyles. An increasing share of citizens are transitioning from material values towards values that emphasise intellectual and human capital.

Environmental issues and sustainable development are important factors for the values and choices of an increasing number of citizens. A larger share of consumers will take both ecological and ethical perspectives into account when making their choices, and consumers' choices will also persuade companies to invest in sustainability. Bringing about large-scale, systemic changes is challenging and slow, however.

Alternative future scenarios

As pioneers into the 2030s. Polarisation of values and attitudes have petered out following the agitation in the late 2010s. The significance of common interests has been perceived extensively, and belief in society is growing stronger. The common denominators of values and attitudes are tolerance, equality, inclusion and respect for people's individual and cultural identities. Different opinions and customs are accepted, and the general atmosphere is encouraging and understanding for those who are different. There will be widespread trust in people, institutions and the legal system.

The transformation of educational structures and the world of work will inspire enthusiasm towards building a new world, especially among the younger generation. Europe and Finland will be pioneers and value leaders in their areas of strength, which include innovation environments, education and environmental issues, and forerunners in the participation of citizens.

The 2030s will be an era of responsible civic participation. Its primus motor will be adaptation and responding to ecological challenges and the limits of growth. People are willing to take positive action for the environment. Political decisions and consumers' ecological and ethical choices support the transition to a low-carbon and energy-efficient society. Companies invest in sustainability, and new forms of emerging economy, including the sharing economy and advanced services, will grow rapidly. Society's operating and regulatory environment supports their evolution and efforts to develop them in Finland.

In the 2030s marked by conflicts, authoritarian and nationalist values and attitudes will gather strength around the world, and the political field will be in a turmoil. Society and societal discussion will become polarised, conflicts exacerbate, radicalisation increase and the threat of violence grow. Growing inequalities will fuel tensions, and belief in the power of education will erode. Population groups that turn their backs to democratic decision-making will multiply. Conflicts of values between the generations will increase, and class-based value formation will emerge strongly as a result of the clash of opinions between generations.

Belief in the rule of law and the legitimacy of government institutions will erode. The administration's messages will not reach the citizens who, due to their deficient media literacy and criticality, seek support for their views among like-minded people, for example on the social media, rather than in news broadcasts based on information. Societal reforms will be experienced as a threat, and citizens will prefer to trust value-related protectionism. Legal policy will become polarised, and a fear of crime and attitudes that stress punishment will gather force. Equality will not be experienced as meaningful.

Without a major environmental crisis, consumers' environmental awareness and behaviour will not support a transition towards a low-carbon and energy-efficient society. Sustainable choices and saving the world will be regarded as issues that someone else is responsible for, and technology is expected to solve the problems later. The risk of humanitarian crises will grow, and the consequences of these crises will be serious.

Rather than trusting the sharing economy, citizens will continue to consider ownership important. In addition to consumers, companies and policy-makers will also focus on market forces and business targets at the cost of environmental values.

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9 Inequalities

The strength of the Finnish society lies in our concern for everyone's welfare. A skilled population with a good functional capacity and high level of well-being is the foundation of a successful society. Participation in decision-making and communal activities support fairness and promote stable social conditions.

Over the long term, Finnish people's standard of well-being and health have improved continuously, but the distribution of well-being and health among the population has started showing a trend towards increasing inequality. The difficult economic situation of recent years has been reflected on the risk of exclusion, even if the recession did not increase income inequality and poverty. The number of excluded young people, in particular, has grown, and the impacts of socioeconomic background on such areas as learning outcomes has increased.

In the future, combating inequality and the exclusion associated with it will be key goals in keeping peace in society, improving national health, curbing costs and raising the employment rate.

Vision 2030

The majority of people enjoy a good level of well-being, but inequalities have increased, and the gaps are large compared to many reference countries. For example, there are differences between socioeconomic groups, the genders, the mainstream population and minorities, and geographic areas. Economic, social and cultural polarisation threaten positive societal development. As a result of technological development, digital inequality becomes one of the dimensions of social exclusion.

The reasons for exclusion can be traced back to societal factors at multiple levels and down to family related and individual factors. Exclusion is usually associated with a cumulation of risk factors. Key risks include unemployment, lack of education, poor health, loneliness as well as lack of prospects and feeling disadvantaged. Complex life situations or transition phases, in particular, may heighten the risk of exclusion.

Jobs and services are becoming centralised to the largest urban sub-regions, where there is a shortage of affordable housing. Expanding urban sub-regions need versatile housing solutions. A strong transition has taken place from institutional care to flats with rental

agreements in housing for special groups. Residential segregation may also lead to inequality as well as to widening social and health gaps. Migration will add its own challenges to organising housing.

The impact of childhood living conditions on lifestyles, social skills and choices of educational pathways is significant. Deprivation is passed on from parents to their children. Young people with a low standard of education, those who have been taken into care and youth with an immigrant background are at a particular risk of exclusion.

Inclusion in the labour market and working are the most sustainable ways of preventing inequality, but as a result of the transformation of work, a division and changes will also take place in the labour market.

Preventive work is in a key role in efforts to narrow well-being gaps. Early intervention is essential, as well as providing people holistic support for independent coping, including guaranteeing equal access to early childhood education and care and education. No single sector can be successful alone; this will take cross-sectoral cooperation.

Alternative future scenarios

The role of cross-sectoral work in halting exclusion has been understood. Drawing on research-based knowledge and through outreach social work, timely measures have been successfully targeted at risk situations, including young people who drop out, transitions to the labour market and changing skills requirements. Regardless of their backgrounds, children and young people have access to early childhood education and care, education and training, and leisure activities. Systemic changes have reduced the incidence of slipping through the cracks, and a good life course is supported. People have received support in pursuing healthy lifestyles, and the results are seen as improvements in their well-being and health.

Majority of the population feels well, but the means for addressing exclusion development have not been adequate. Socioeconomic, regional and gender-related health and well-being gaps have widened, and the distance between the opposite ends of the scale is growing. Housing, communality, access to services and employment will be increasingly different in growth centres and other parts of the country, even if digitalisation has increased the diversity of work and social networks. Measured by the indicators of health, employment and economic deprivation, population groups with an immigrant background differ from the mainstream population. Part of the population has become excluded from the labour market and society's digital development, at least temporarily.

Deprivation and exclusion from the labour market have become cumulated in a significant part of the population as their health, economic situation and competence have deteriorated. Large segregated communities have developed in some districts of municipalities and cities where the residents mainly are Such groups as older or poorly educated people, or those with an immigrant background. A structural change in the world of work has resulted in semi-deserted housing estates for those facing economic hardship and, on the other hand, extremely expensive residential areas. A large share of people have been permanently excluded from digital services and the latest competence.

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10 Technological revolution

We are continuously surrounded by technological development where things change at an accelerated pace. Almost unlimited utilisation of information, automation, robotics and artificial intelligence as well as clean technologies are transforming the world in a manner reminiscent of the Industrial Revolution. It is possible, however, that this time the technological revolution will happen considerably faster and that its impacts on society will be multiple as they affect all sectors within a very short period in proportion. Technology will play a key role in achieving ecological sustainability, and it will also be applied to data efficiency.

The technological revolution will challenge and change established operating models. While the revolution is real, the rate of the change is uncertain and varies from sector to sector. In particular, this uncertainty is associated with changing consumer values and choices, for example with how consumers will take up new technologies. The revolution will challenge the conventional division of labour between sectors. Through permissive legislation, the revolution can be turned into a resource. Competitive advantage and competitiveness can be created by exploiting the transformation. Research and development policies can provide preconditions for coping with the change and improve companies' and other organisations' possibilities for innovating.

Building up and preserving trust in new technologies and practices will be essential. In information security, there will be a move towards a comprehensive concept of digital security, in which data protection will have an important role.

Vision 2030

Robots already support people's daily routines today and fill in gaps in work duties. This change will accelerate over the next 10 to 15 years. More automation or robotics products will be introduced constantly: different implementations of robotic process automation and physical robots will change the character of work and services, while artificial intelligence will enable completely new services and operating models that are more cost-effective or otherwise better optimised than before.

Information will have become a strategic commodity. From opening up data, society is moving on to data exploitation, and the operation of many platform services will already

be based on data. 5G technologies will be standardised and commissioned by 2020. The Internet of Things will expand further.

A revolution of renewable energies and clean technologies will take place at a fast pace. The energy production system in Finland is highly decentralised, and this tendency continues. New energy technologies will be introduced. The use of solar and wind power, heat pumps and battery technologies will increase. The integration of electric cars in energy systems will change both consumption and infrastructures. Electricity grids will become smarter.

The need for fast, reliable and secure data communications will increase significantly. The majority of services will rely on the utilisation of data, which will highlight the importance of data protection and information security. The exploitation of big data and data analytics will direct service development, and service design will have become a critical success factor. The platform economy will transform conventional business models. Artificial intelligence will be used to support decision-making. The first automated cars will appear on our roads in the mid-2020s.

The technological revolution will be global, driving a need for international cooperation, making collaboration between sectors essential, and increasing interdependencies.

Alternative future scenarios

Well-being and success from technology use. If the technological revolution is fully exploited, new business and customer-oriented operating models will be created in Finland that will also be exported. The society's operation will be increasingly carbon neutral and resource efficient, and automation and cleantech solutions will be used. Finnish companies are pioneers of the platform economy and, encouraged by a strong economic growth, they will invest boldly in business and exports that rely on data.

Finnish people and the Finnish business sector will have access to high-speed fixed and wireless broadband connections. Finland will be a pioneer of numerous automation and Internet of Things services. Significant amounts of data-intensive industries and data centre activities will be located in Finland.

Technology has helped to promote social and regional equality. New technologies and data are used ethically across the entire value chain. Finland is a forerunner in the ethics of artificial intelligence and technology in general. Information security issues have been resolved through networks of trust and new technologies as well as solutions based on artificial intelligence. Finland attracts technology experts widely from around the world,

and the Finnish education system produces world-class experts. The standard of citizens' technology skills is good. Education is provided for experts of artificial intelligence application and data analytics.

The potential of the technological revolution will be lost. If new operating methods, including the sharing and platform economy, are opposed, Finland will have to adapt to the revolution without the benefits it could bring. Finnish expertise will drain abroad, and innovations will give our country a wide berth. Finland will turn into an exploiter of innovations developed by others, and the benefits of the platform economy, for example, will drain away from the country, even if the new practices increase operational efficiency.

The Finnish education system fails to lay a foundation for top expertise and is left behind other countries. The distance to the pioneering technology countries will grow. Robots and automation will eliminate jobs, but rigid structures prevent the creation of new jobs. The EU may institute structures that slow down the technological revolution and legislative restrictions. The risk lies in the uncertainty created by excessively detailed regulation of technologies and the slowness of legislative work. New companies will be established in countries that allow experimentation and risk-taking. A climate of attitudes that favours experiments and reforms is essential for making it in the global competition. Major crises and information security and cyber threats undermining trust in societal actors as well as disinformation and fake media may break the trust in new operating methods suddenly and without a warning.

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11 Digital capabilities in public administration

Key capabilities in the public administration's digital operating culture are change management, competence in using digitalisation, establishing partnerships, exploitation of platforms, knowledge creation, securing information and the creation of enabling statutes. The role of the administration in society is experiencing pressures for change: a need for stronger regulation in digital environments on one hand, and a need to make space for various actors on the other. The significance of good governance as a creator of stability is stressed.

In a digital operating culture, matters are more and more frequently dealt with electronically. The change will both enable and require the modernisation of customer-centred and cross-sectoral processes in the public administration. In a digital culture, the public administration's operation is based on networks, openness and agility. New operating models and information that produces added value will be created on the interfaces of organisations and networks.

Vision 2030

A epistemically coherent digital operating environment has been created for public services in Finland, which has improved the operation of the public administration and increased its efficiency. While changes in the legislation and practices have been difficult, they have been carried through with adequate success. Challenges remain in harmonising the digital operating culture. In matters where cooperation between the public administration and other parties is effective, the customer journey is consistent.

A digital operating culture is gaining ground in public administration. Citizens may continue to experience the operation of the public sector as bureaucratic and rigid, but open data and interfaces enable all parties to participate in the development of digital services that benefit everyone. New, so-called digital sharing economy services have been created in the digital operating environment, and they are being used by citizens and other actors. The operation of networks is based on trust, and they may share information, competence or services.

Alternative future scenarios

A smoothly running digital administration. The Finnish public sector has managed to create a securely open digital operating environment that is functionally, technically, epistemically and also legislatively coherent. Service platforms are versatile ecosystems that link a great number of different service applications, terminal devices and communication services. Citizens, companies and partners use the services aptly in all matters related to their life events. For the service provider and in terms of productivity, automated self-services in which the applications anticipate the customer's needs are essential.

Citizens and other actors are part of the service provision, as they can manage the majority of applications and decisions concerning themselves as a self-service. The citizens have the right to access and share their information, which is completed with new data as they use the services. Information flows between actors operating as a close-knit network.

The public administration's digital operating culture supports sustainable development, and its resources are used efficiently. System investments have been successful. Impact investments have been used to channel private capitals to these activities, producing both financial profits and large-scale benefits related to well-being or the environment.

Robotisation, artificial intelligence, new forms of managing information and analytics as well as various combinations of these elements promote the ability of citizens and other customers of the administration to use the services and manage their own affairs. Numerous routine tasks of the public administration are performed using solutions based on artificial intelligence and robotisation. For more demanding administrative tasks, advanced artificial intelligence solutions developed for this purpose can be used to support decision-making.

Leadership has changed/evolved from conventional management of hierarchies to an ability to master increasingly complex operating environments in which various value networks are active. Public administration development tasks are taken care of across networks formed to manage various ecosystems. Information is open and easy to find, and it can be used systematically in decision-making. A high level of trust in the administration has been maintained.

Public administration incapable of renewal. There has been no development in the digital operating culture. The public sector has been incapable of renewing its competence or adopting new practices – a rigid hierarchy with precise competences is still going strong. The administration's customers are controlled strictly, with a low level of trust on both sides. Productivity has not improved, and the public sector services are produced inefficiently. The citizens are up against a complex field of service interfaces where information

still does not flow, and skills are not utilised across organisation boundaries. Silos remain and become more rigid. Agencies digitalise their own processes, but the overall effectiveness of the activities does not improve. Agile steering required by a digital service economy has not been implemented. Trust in the public administration is clearly eroding.

Legislation has been left behind the digital revolution in the real world, and shortcomings arising from lack of regulation have exacerbated. Digital service downtime of just a few days may result in far-reaching and serious consequences for society. Public services are continuously targeted by hackers, and there is a high risk of the services being taken over by criminals.

Rather than resources, information and information networks have become a threat to the protection of privacy and functioning of society. As a result of various negative developments, the use of digital services collapses, and the society may become paralysed.

Artificial intelligence built to support the public administration bypasses humans in ethical and moral decision-making, resulting in so far undetermined ethical and legislative problems.

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12 Reliability of critical infrastructure

The development of the digital economy and a hyper-connected operating environment will create increasing pressures to manage and safeguard society's functions. New phenomena, including artificial intelligence, robotisation, digitalisation, virtual communities and cyber technologies will also enable and challenge the reliability of vital functions and critical infrastructure. In the future, better capabilities for managing the national and international chains of expertise required to maintain reliability will be needed. The correct level, form and contents of self-sufficiency must be identified, understood and implemented in practice. What should we control, own and be able to do ourselves in the future, and on what scale? As the technological revolution is unfolding, we must rethink Finland's critical infrastructure, making room for such elements as artificial intelligence at its centre.

The central government's financial situation may lead to reduced maintenance of critical infrastructures, including civic engineering (water supply and sewers), transport systems and buildings, which will result in infrastructure decay and a continuously increasing repair backlog. The public sector's ability to regulate critical infrastructure will be hampered as the private sector is in charge of some of its parts, or because the private sector does not have a strong commercial interest in modernising it. While the public administration bears a significant responsibility for creating the preconditions for competence and delivering security in a digital operating environment, private sector actions will also be required to safeguard the reliability of society's vital functions and critical infrastructure. The society will grow more vulnerable without the strong participation of the private sector. For example, should the Industrial Internet and the controls of industrial information security fail, this will have a direct impact on the reliability of critical infrastructure, such as energy production.

Vision 2030

The Industrial Internet and robotisation will be an increasingly important part of vital societal functions and critical infrastructure. Infrastructures will rely on intelligent electricity grids and autonomous systems. Artificial intelligence is a key factor in controlling the vulnerabilities of critical infrastructure. It also has a central role in managing society's internal and external security and, for example, in the social and health sector. Efforts to produce a satisfactory definition of artificial intelligence's role in the central government administration and legal system have not been successful. The built environment and its quality have a major impact on society and national economy. The current levels of repair and

alteration investments are partly insufficient, as a consequence of which the decay of built property is accelerating. Inadequate maintenance of buildings, transport routes and civic engineering systems increase the risks and repair costs further.

The future operating environment will enable the creation and actualisation of diverse forms of participation and communality but also give rise to negative opposing forces. Both in Finland and abroad, increasing numbers of communities and individuals will emerge who focus on causing damage or risk to society by attacking information systems, thus setting higher requirements for protecting critical infrastructure. Others, on the other hand, will turn their backs to information systems and virtual communities.

Alternative future scenarios

The status of national built property is mainly good. A trust in the reliability of the information society's critical infrastructure and vital functions and, for example, the confidentiality of an individual's personal data prevail in Finnish society. Society's open value networks are based on trust and a community spirit between the actors. The networks are underpinned by blockchain or similar technologies that enable bilateral exchanges of goods and services. Banking and central government taxation have adapted to the new platform and sharing economy and support it. The maintenance of control over information security is shared between the public and private sectors.

The ability and willingness to safeguard critical infrastructure decline. Critical infrastructure is always controlled by an actor, which may be a Finnish or a foreign company, a fund or the public sector. In a difficult economic situation, the public sector encashes critical infrastructures that should justifiably be kept in central government hands. Alternatively, the central government does not have the capabilities for seizing the control of infrastructures from private stakeholders when the situation so requires. If, for example, maintaining privately managed buildings or road networks becomes financially non-viable as the costs increase, this may put Finland's national interests at risk. A factor that contributes to this is Finland's status as a target for investments – the infrastructure owner will continuously assess if a commercially operated and maintained infrastructure is economically feasible. The repair backlog of built property continues to grow. National interests may also be put at risk for such reasons as a changing international security policy situation, or if the economic position and sustainability of the central government deteriorate strongly for some reason.

Rise of counter-cultures and opposition by individuals. Communities and individuals start using the possibilities of the digital world and also abusing gaps in information security. They increasingly operate in closed networks and communities outside society, the purpose of which is to cause damage or risk to society in order to promote their own interests. There is a strong reaction against the central government's role and for protection of privacy, and cybercrime flourishes. A significant number of individuals turn their backs to new technologies and strive to return to the traditional analogue world. New types of groupings, networks and consortia emerge to facilitate the return to a more traditional world. This development makes it more difficult for the central government to identify individuals who have chosen to decline society's new digital structures. This will hamper keeping up basic services and the stability of society.

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13 Climate change

The current climate change due to human activities is mainly caused by the proliferation of greenhouse gases, in particular carbon dioxide, in the atmosphere. If the emissions keep growing at their current rates, the advancing greenhouse effect will increase the world's average temperature by anything between under two to six degrees by the end of the century. Climate change will have stronger impacts on Finland than many other European countries. Finland is committed to international and EU targets that aim for reducing greenhouse gas emissions, improving energy efficiency and increasing the share of renewable sources in energy production. This will also offer new business opportunities. As extreme phenomena related to weather conditions and water levels become more common, adaptation and preparation for the consequences of climate change will be needed.

Vision 2030

Greenhouse gas emissions caused by humans have warmed the climate since the beginning of the Industrial Revolution. It is estimated that the temperatures will rise everywhere, however especially on the Northern hemisphere. The extent and duration of the rise in temperatures will to a great extent depend on the emissions development. According to the World Meteorological Organisation, 2016 was the warmest year on record, and the trend is for further increases. Carbon dioxide remains in the atmosphere for a long time, and for this reason, the emissions should be cut immediately while also adapting to growing weather and climate related risks.

The **impacts of climate change** will depend on the scale and pace of the changes and vulnerabilities to climate factors. The melting of glaciers and thermal expansion of sea water will cause sea levels to rise. As the weather and climate related risks escalate, the lack of ground frost will affect the roads, for example, and changes in rainfall amounts will cause increasing droughts in some areas while others will be exposed to more frequent flooding.

In particular, climate change threatens the nature of northern areas, changing habitats and readjusting the ranges and numbers of species in Europe northwards. New invasive alien species will make their way to Finland (diseases and pests), changes will take place in processes related to the water cycle (flood risks, management of storm waters) and water quality, and the operating preconditions of farming and forestry will change. Climate change and other changes in the status of the environment are already a contributing factor in the current waves of migrants and refugees. In the future, considerably higher levels of immigration can be expected in Finland.

Climate change may have positive impacts on some sectors of the Finnish economy over the short term. Globally, the harmful impacts will clearly outweigh the benefits, and the harshest impacts will hit developing countries and the poorest population groups.

Mitigation, or means of reducing emissions, have been developed at an accelerating pace, and active climate policy is implemented in many countries. Parties to the Paris Agreement are striving to limit the rise in average temperatures to well below two degrees compared to the pre-industrial era. Preparedness for emission reductions with gradually more stringent targets will be needed in all sectors. Consumer choices will also be important. The easiest and cheapest way of reducing greenhouse gas emissions often is saving energy and increasing energy efficiency. Renewable energy also has great potential. As a whole, natural resources and materials should be taken into use and used economically and sustainably to reduce emissions and create more carbon sinks. The greatest potential for reducing greenhouse gas emissions in the non-traded sector is found in transport. Specific measures will be required to achieve this, which include replacing fossil fuels, improving energy efficiency in modes of transport and transport systems, as well as improved land use planning.

Communities will be increasingly vulnerable to extreme weather phenomena as climate change progresses. In addition to mitigation, adaptation to changing climate conditions and increasing weather and climate risks will be essential.

Alternative future scenarios

If the recently announced measures under the Paris Agreement are implemented in full, their impacts on emissions and the warming of the climate will be significant. However, the pledges made by the countries so far will not be enough to turn global emissions development to the pathway set as the objective of the Paris Agreement, or at most two degrees. Currently, particularly the actions of President Trump's administration in the USA, Brexit and political turbulence in Europe are creating uncertainties related to the implementation of the Paris Agreement. On the other hand, the growth of the cleantech market, reduced coal use in China and the business sector's demands for more ambitious climate policy are hopeful factors.

Climate change progresses slowly. The pledges under the Paris Agreement are implemented: the average global temperature is successfully kept to the 1.5 to 2 degree pathway by 2100. Progress has been made in adaptation to extreme weather conditions. The change is taking place on commercial terms, and the Government's policy measures enable the creation of new cleantech solutions and services as well as the wider introduction of existing solutions. In the construction sector, high energy efficiency has been achieved, and the share of renewable energy sources is high. Low-emission energy sources have been introduced in

transport. All states have committed to climate change mitigation, and this is also reflected in citizens' values and consumer choices. Old and new pledges are implemented in full.

Struggling with climate change. The average global temperature is on a pathway to an increase by 3 degrees before 2100. The melting of polar ice caps accelerates, and the sea level is rising. The negative impacts start being felt by large numbers of people. Methane from the permafrost in Siberia is released into the atmosphere. Extreme weather conditions become more common, and problems with food production and sourcing clean water escalate to a crisis level. There are increasing numbers of environmental refugees around the world. Negotiations on and the implementation of climate agreements continue. Commitment is at a low level, however, and implementation remains slow.

Climate disaster. The average global temperature is 4 to 6 degrees higher than in the pre-industrial era. Climate change progresses faster than any predictions estimated. Extreme weather phenomena are becoming harsher. The only inhabitable areas on the globe mainly consist of the northern boreal zone, and countries such as Finland will see an immense flood of refugees. Conflicts will occur. Trust between people erodes, higher walls are raised between countries, and global political decision-making is in a crisis. In the 2020s and 2030s, countries to a great extent failed to keep their pledges, and climate agreement negotiations were marginalised. Any late attempts to reduce the greenhouse gas contents in the atmosphere will be inadequate to turn the tide of this development.

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14 State of the environment

Measured by many indicators, the state of the Finnish environment has developed positively in the last few decades and, for instance, emissions into air and water bodies have decreased. Despite this positive development, the state of the environment continues to be fraught with great challenges and worrying developments. The Baltic Sea is still afflicted by eutrophication, and particularly the status of the Archipelago Sea and the Gulf of Finland gives rise to concern. Neither is the ecological status of all inland waterways and ground waters good in all respects. While oil emissions into the Baltic Sea have reduced, the more frequent oil and chemical transports heighten the risk of a significant environmental catastrophe. Emissions of hazardous substances and small particles have remained at excessively high levels in terms of environmental and human health. Halting biodiversity loss in Finnish nature has not been successful, and the number of threatened species has increased further. The status of the built environment in Finland is mainly satisfactory, even if the growing repair backlog continues to be a problem. All in all, to achieve a large-scale improvement in the status of our environment, comprehensive thinking and numerous measures pulling in the same direction will be required.

Vision 2030

The greatest global environmental problems are climate change, loss of biodiversity, nutrient emissions and land use changes. Loss of biodiversity is a significant threat to the stability of societies everywhere in the world: the biggest losers, however, are poor people, and the harshest negative effects hit areas with high rates of population growth. The situation of the world economy will exacerbate the difficulties and thus influence environmental problems and their solutions.

In Finland, considerably more efficient measures will be needed to halt biodiversity loss. The situation is particularly worrying in wetlands, water bodies, shores, rocks and fells. Positive development has been achieved over the last few decades in forestry, including sparing retention trees in fellings, the wider spread of less invasive tillage practices and safeguarding small areas of key habitat. However, a significant increase in fellings may result in loss of forest biodiversity if this issue is not adequately addressed in forest management and the development of networks of protected areas.

Political decisions and practical measures are reflected in an improvement in the status of water bodies and air quality, even if the situation of the Baltic Sea, inland water bodies and

ground water is still not good in all parts. Our challenge thus continues to be implementing effective measures to reduce nutritional loading and emissions of harmful substances as well as to restore water bodies. In the Gulf of Finland, oil and chemical transports carry an inherent risk of a significant environmental disaster, for which we must prepare. In addition to traditional factors, new risks, such as microplastic litter, threaten the aquatic and other environments.

It is estimated that emissions of pollutants in the air will have declined from their current levels in Finland by 2030. Hazardous chemicals continue to be used on a large scale, and the emissions of hazardous substances and small particles are still excessive in terms of environmental and human health. In addition, new measures are required in order to study the environmental and health impacts of new and partly unknown substances, for example endocrine modulators and nanomaterials, to carry out their risk assessments and to control their use. Hazardous substances in products may also prevent their reuse and recycling.

A good built environment with different functions, natural environments and transport connections promotes residents' well-being and health and offers a high-quality living environment. The status of built property in Finland is mainly satisfactory, even if the growing repair backlog continues to be a problem. The majority of Finns today live in urban areas, and urban living increases in popularity. The significance of a versatile local environment of a high quality grows. Finnish people appreciate the nature in their living areas.

Alternative future scenarios

A good environment and rich biodiversity. Environmental loading is kept under control. The level of preparedness is higher, and the risks are managed. Finland's actions for ecosystems and biodiversity are successful and produce significant added value. A good built environment with different functions, natural environments and transport connections promotes residents' well-being and health and offers a high-quality living environment. The building stock is looked after to maintain its usability and operating condition.

The state of the environment and nature presents challenges, but progress has also been made. Long-term environmental loading caused by humans (drug residues, microplastics, hazardous substances, particles, nutrients) is growing and partly exceeding the bearing capacity of nature and humans. However, progress is also being made regarding the state of the environment, including reduced transport emissions and the improving status of the Baltic Sea. Risk management is at a reasonable level. The societal and economic preconditions for protecting biodiversity and using nature sustainably are deteriorating, however.

The state of the environment and nature is developing negatively. The management of environmental risks partially fails. Short-sighted economic thinking outweighs the goals of sustainable development. Environmental loading is out of control. Substances and products are taken into use whose environmental and health impacts are not adequately known. Uncontrolled land use turns favourable results achieved through protection and sustainable use into a clearly more negative direction.

The state of the environment and nature collapses. Climate change progresses rapidly and enhances the impacts of other environmental problems. The management of environmental risks fails badly. Ecosystems collapse globally. Ocean ecosystems deteriorate due to overfishing, pollution and the acidification of seas in areas that are essential for food production. The loss of tropical forests progresses catastrophically. Through deterioration of aquatic environments and the soil, this leads into losses of areas suitable for food production in highly populated areas. Finland must prepare for serious consequences – global population movements and mounting political and military tension.

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15 Sustainability of natural resources use

Global consumption equals 1.6 times the world's natural resources every year. If everyone lived like the Finns, we would need more than three globes a year. In the future, we cannot take it for granted that natural resources can be used as freely as today. As the world's population grows and becomes more affluent, consumption needs will also grow, and the demand for food, water and energy will increase. The increased demand and reduced supply will drive a global competition for natural resources. Renewable natural resources that are plentiful in proportion to the Finnish population, a high technological standard and a high level of education offer plenty of possibilities for responding to different challenges to change when used wisely.

Vision 2030

The strategic importance of natural resources, clean water and clean technologies associated with them has grown. An increased demand for raw materials and higher prices have provided an incentive to develop the efficiency of their use, recovery and reuse. This may sometimes mean a balancing act between natural resources use and environmental protection. The uneven distribution of natural resources will fuel additional conflicts and uncontrolled migration. Developed and developing economies have seen the consequences of unsustainable use of fossil raw materials and energy sources. In addition to international negotiations, solutions and practical measures aiming to solve problems are more frequently created at the regional and local level, or initiated by individual citizens.

The depletion of non-renewable natural resources will guide us toward more resource efficient use of materials. Closed circulations and side-streams are favoured in production methods, and wastes and residues are increasingly used to produce new products and energy. Finland's high level of expertise facilitates the promotion of sustainable, clean solutions and services associated with them.

The growth of forest resources will continue in Finland in the next few decades if we keep investing in sustainable and methodical forest management. Active inputs in the management and protection of water and marine resources and fish stocks will improve the status of water systems and create possibilities for the sustainable utilisation of aquatic natural resources. Digitalisation will help to improve the usability of natural resources data. New innovations in data use will improve the productivity of the bioeconomy and circular economy, creating new business. The Finnish bedrock contains rich ore deposits,

however often with low ore contents. Finland depends on many exported mining industry raw materials, and their availability may be fraught with significant economic and political risks. The metal side-streams of industrial processes will increasingly be used and reused.

Alternative future scenarios

In an economically, socially and ecologically sustainable society, a broad consensus on the necessity of change prevails, and a genuine systemic transition towards production and consumption based on renewable natural resources has been made. Technological advances will revolutionise energy supply, mobility and food production. Energy efficiency has been improved in all sectors, and electricity generated from renewable sources can be stored for a long period with a good rate of efficiency. Food production is characterised by self-sufficiency in energy, closed nutrient circulations and economical water use. Innovative products that address consumer needs will increase the exports of Finnish food production. New protein sources, including insects, are a normal part of the diet. Rather than wastes, society creates raw materials for circular economy processes. Nature-based solutions are being used extensively to resolve issues related to flooding, drought, health and well-being, for example, creating successful business, new jobs and export potential. The clean nature and well-managed and responsibly exploited natural resources will increase interest in Finland, and tourism based on these elements will grow. In addition to strongly developing metropolitan areas, viable hubs emerge in rural areas, which are based on specialised and innovative bioeconomy business and regional and local sustainable development operating models.

A transition towards a sustainable society means that attitudes have changed and Finland has managed to launch a systemic change in time. Materials are recycled better, and the efficiency of their use and cost-effectiveness of recycling have improved. Finnish natural resources are used sustainably and responsibly. High added value products processed in Finland and know-how related to the management and sustainable use of natural resources will be successful export products. Renewable materials will be used to replace products made from fossil materials, including plastics or other limited commodities. Rather than non-renewable energy sources, wind, solar and bioenergy will be used, and new bio or waste based energy products will be developed. New generations' consumer habits and relationship with goods and services will continue to change: private motoring will decline, and the significance of services in the economy and the sharing economy will keep growing. The sustainability, recyclability, repairability and upgradability of goods and devices will emerge as significant drivers of consumer behaviour.

Crises exacerbate as competition for natural resources results in global political crises, instability of societies and human distress. Uncontrolled migration and refugeeism will increase significantly. The great powers are prepared to defend their interests with extreme use of power and force. Essential changes are delayed as giving up lifestyles based on abundant consumption continues to be a struggle. National interests are put first, and international agreements are not complied with. Living environments and ecosystems sustain irrevocable damage as the environment's bearing capacity fails and the situation reaches crisis proportions. Animal and plant diseases as well as pests increase uncontrollably and put food and forest production under a serious threat, and the dwindling water reserves have become polluted. Different extreme weather events also threaten the crops and trees. Finnish natural resources gradually end up in foreign ownership. Finland mainly produces raw materials and products of first-stage processing, and the added value derived from products with a high degree of processing and innovative services are exploited outside the country's borders due to a lack of competence and capitals.

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