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Annual Report of the Electronic Communications Office of Iceland (ECOI) 2022

Fjarskiptastofa

Table of Contents

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A word from the managing director

There is no doubt that a fundamental change took place in the Icelandic telecommunications market in 2022.

A new Electronic Communications Act was passed and came into force on 1 September 2022. The new Electronic Communications Act replaces an older act that dates back about 20 years, and the new Act contains many improvements. Among these is an added emphasis on the construction of telecommunications networks, and the fact that there is a major emphasis on the security of telecommunications networks and protecting consumers. The Act is intended to encourage more efficient construction of telecommunications infrastructure through cooperation and partnerships between market participants, where appropriate. The provisions of the Act will be applied with respect to the construction of 5G mobile networks, where market participants will be authorised to work together on the construction of mobile networks beside the country's major trunk roads.

This year, Síminn sold Míla to the French asset management company Ardian. This enables the group to separate its network operations from its retail activities, ensuring that the companies are no longer vertically integrated. Míla will thereby be able to work as an independent party in the telecommunications wholesale market, as the integration of wholesale and retail aspects have for some time been seen as a source of suspicion and have even been the subject of administrative proceedings.

As the year ended, it was reported that Ljósleiðarinn had bought Sýn's fixed-line network and now intended to offer basic network and network access services at a national level.

This development means that there are now two independent companies offering access to basic networks and access networks at a national level in competition with each other. This is a major and important step in the development of competition in the telecommunications market at a national level, as competition in the field of telecommunications networks has hitherto been confined to the Reykjavík area and its neighbouring municipalities, plus the Eyjafjörður area where Tengir offers its services. Much remains unclear about this development, such as how the financing and ownership of Ljósleiðarinn will be dealt with in the long term. It also remains to be seen how important it is for Míla for the company to be able to offer wholesale services for mobile networks in addition to fixed-line network services.

Development of the operations of the Electronic Communications Office of Iceland

There has been a great deal of developments within the Electronic Communications Office of Iceland. Budget allocations have more than doubled and so has the number of employees working at the institution. This growth is due to the increased emphasis placed by the government on cybersecurity and telecommunication security.

Emphasis on physical and structural security in telecommunications and other important infrastructure has also increased greatly recently. A dedicated "Digital Security" organisational unit was set up in 2021 and given the task of ensuring compliance with the provisions of cybersecurity laws and telecommunications laws that concern cyber and information security operating systems and risk management of important infrastructure, including telecommunications. The activities in this field include monitoring to ensure that in important infrastructure an efficient cyber and information security operating system is introduced and that there are procedures to promote the safe and smooth operation of its services, as well as the implementation of integral and targeted risk assessments regarding the efficiency of infrastructure. In the opinion of the Electronic Communications Office of Iceland, this systematic work is a foundation for the increased resilience and improved cybersecurity of important infrastructure and digital development in the future.

The function of the Computer Emergency Response Team, CERT-IS, is now being fully developed and its operations organised. The principal task of CERT-IS is partly to improve situational awareness and partly to organise incident responses. Field teams have been set up for every defined field of important infrastructure. People are on call/standby 24 hours a day, every day of the year, to respond to any cyber attacks that may occur. Major threats to the Icelandic network region are monitored, and alerts will be sent out if necessary. Work is underway to develop the processes and information systems of the squad, which will allow it to provide even better analysis of potential threats and issue alerts about them. We are focusing on working together with our neighbouring countries in the field of cybersecurity. And this list is far from exhaustive. A great deal of experience has already been gained with respect to cybersecurity issues. However, we must keep in mind that this field is constantly changing, and that terrorist groups and hostile regimes are always seeking new and more high-tech ways to cause damage. The dividing line between cybersecurity and national defence is becoming increasingly blurred.

Advanced persistent threat groups (APT groups) are well-organised attack groups employed by hostile parties to conduct espionage and criminal activities to an unprecedented degree through persistent, targeted and highly developed methods to try to access important systems for the purpose of stealing information and causing damage. Clearly a great deal of vigilance is required if such hostile endeavours are to be successfully resisted. For more information, see the annual summary from the CERT-IS cybersecurity squad regarding the squad's activities.

Efforts were made to streamline the issue of licences during the year. Each year nearly 2,000 telecommunications licences are issued to marine navigators (GOC and ROC). Since those who need these licences also need various other licences and services from the Icelandic Transport Authority, the issuing of licences was relocated there. This reduces the institution's workload and simplifies the service processes that concern seafarers.

Public safety and national security

Article 78 of the Electronic Communications Act now contains provisions regarding the obligations of the Electronic Communications Office of Iceland to attend to public safety and national security as part of its activities, especially concerning the evaluation of the security organisation, measures and risk management of telecommunications companies. The institution is also authorised to require a specific risk assessment to be performed if circumstances warrant, both for telecommunications companies and digital infrastructure. After the Russian invasion of Ukraine, the institution impressed on the country's major telecommunications organisations the importance of carrying out such risk assessments on specific grounds. The part of the risk assessment findings that have attracted the most attention is that countermeasures must be considered if all submarine cables to our country are cut. That issue is now being considered by the administration.

In this context, and in the context of the activities of CERT-IS, it is becoming increasingly evident that telecommunication security and actions to respond to cyber threats are a matter of national security and public safety in one way or another. There is also an important connection to the country's defences, as cybersecurity is one of the principal foundations of the NATO defensive alliance, and the security and resilience of telecommunication infrastructure (and other essential infrastructure such as electrical power systems) is relevant to the country's security and defences and part of NATO's seven baseline requirements, which specifically refers to resilient civil telecommunication systems as the first line of defence. Considering the increased tension between states and the ongoing war in Ukraine, we must assess whether it will be necessary to have a greater focus on roles and division of tasks among parties at the national level with respect to the security of important infrastructure associated with the defence of the country. The current form of the defensive alliance mainly involves logistics for a navy, air force and possibly an army. The nature of cyber threats and the way in which actual cyber conflicts occur make them different to conventional warfare. States employ groups of various kinds to plan and carry out cyber attacks on other states. This lowers the threshold for attacks and makes nations with weak defences even more exposed to attacks of this kind. In light of international developments and increased tension between the superpowers, it is important for the Icelandic authorities to form a clear vision for the future and formulate policy regarding responses to cyber threats, and regarding the protection of critical infrastructure in our society in the context of national security and public safety.

In this context it would also be appropriate to consider steps which other nations have taken regarding digital sovereignty. Digital sovereignty and cybersecurity are closely related concepts. Digital sovereignty refers to a country's ability to control and administer digital infrastructure, data, and networks without relying on outside parties. Cybersecurity on the other hand involves ensuring that digital infrastructure and services function efficiently, through practices such as secure administration and resources and preventing data theft and vandalism and unauthorised access to data.

Digital sovereignty is important to safeguard national security and protect a country's critical infrastructure and data. This involves protection against both administrative and cyber threats such as malicious access, intrusions and cyber attacks. Efficient cybersecurity measures are vital for safeguarding digital sovereignty, as they help to prevent threats from materialising, for instance preventing parties with malicious intent from disrupting a country's digital infrastructure, stealing the country's sensitive data, or disrupting its networks.

Digital sovereignty and cybersecurity are also interdependent. A country with strong digital sovereignty is more likely to be capable of establishing successful preventive cybersecurity measures. On the other hand, a state with a weak digital sovereignty may find it difficult to establish successful cybersecurity measures, as its digital infrastructure and data may be controlled by outside parties who may have different priorities and interests than the state in question.

It is also important to consider Iceland's unique position as an island state in this context. We must bear in mind that we are highly dependent on foreign suppliers regarding digital services. The country's connections to other countries through submarine cables and the location of important Icelandic databases may

constitute weaknesses in terms of digital sovereignty. Iceland could also be a more vulnerable target for cyber attacks from parties with malicious intent due to our dependence on submarine cables and the high technological level at which the country functions.

The resilience of telecommunication infrastructures must be improved

It is anticipated that by the middle of this decade nearly all households and companies in the country will enjoy broadband connection through fibre-optic cables, as well as 5G services. Specialised, nationwide radio systems, e.g. GSM, 3G and longwave, will be shut down this decade. General mobile networks, 5G and later 6G, will replace specialised systems. Telecommunications are becoming increasingly important for society. Experience shows that telecommunication services can fail during disasters such as storms. We cannot rule out that armed conflict could have an effect on the functionality of the country's telecommunications. It is therefore important to constantly improve the resilience of the country's telecommunications. The Electronic Communications Office of Iceland is of the opinion that various actions must be considered in this regard. These include the development of two separate but interconnected and secure basic networks with separate infrastructures, which cover the entire country, the connection of mobile network transmitters to separate basic networks through at least two separate infrastructure systems where applicable, the protection of telecommunications locations, both fixed-line networks and mobile networks where applicable, against operational disruption, with efficient back-up systems, including reserve power and back-up connections, and the development of an independent high-speed telecommunications network for the government and emergency services. Measures should be taken to ensure that such systems, or components of these, will function in emergency situations if electrical power and other telecommunications fail.

Trust services

The Electronic Communications Office of Iceland recently assumed the task of monitoring trust services. Trust services are growing increasingly popular, for example as a secure means of identification for access to information systems, electronic signature of various kinds of documents, confirmed timestamping and seals for various legal instruments and a range of other purposes. The number of service providers who offer trust services of some kind is increasing in this country, and foreign parties are looking to gain access to the market in Iceland. Foreign parties are also seeking to obtain the services of the Electronic Communications Office of Iceland regarding the monitoring of trust services based on a pan-European regulatory system. One of the principal items of focus for the present government is digital transformation. Trust services of various kinds form a definite basis for digital transformation. However, the Electronic Communications Office of Iceland notes that knowledge and understanding of the nature and implementation of trust services, for instance in administration, is rather limited. Consequently it is a cause for concern that when this issue was transferred to the Electronic Communications Office of Iceland, supervision was seriously underfunded (and still is). The current

supervision is therefore only part of what is needed, and it is possible that supervisory tasks will be delayed if the situation does not change. This in turn could influence the progress of digital transformation and delay it.

Revolutionary technology

When we look to the future, e.g., to the end of the decade, revolutionary technological development will influence society, including telecommunications and cybersecurity. It is anticipated that functional quantum computers will be available before the middle of the century, and possibly in the present decade. Such computers have an enormous processing capacity and can perform tasks that humankind has hitherto been unable to manage. This will result in various positive technological innovations and products. On the other hand, it is anticipated that the encryption technology that is currently available will not be compatible with the processing capacity of quantum computers. Various nations have already begun preparations in this regard, among other things by formulating policy for the encryption of data and the development of trust services (which is partially based on encryption). In Iceland, we need to address these issues promptly, so that when the protection provided by current encryption no longer works, we will have an updated regulatory system, new algorithms and processes in place to replace the older technology. The same can be said about the development of artificial intelligence, which is now at a developmental stage with functioning artificial intelligence available in many fields. It is not a question of if but when various tasks that have been performed by humans will largely be performed by various forms of technological equipment that is controlled by artificial intelligence. The states of the world are considering how to respond to this, and among other things the EU has announced that there will be a regulatory system for artificial intelligence. The content of this regulatory system addresses risk classification for artificial intelligence in particular, and states that artificial intelligence that concerns the interests of individuals or human life and limbs shall be subject to particular regulatory measures. However, this regulatory system does not provide answers to many urgent questions about societal developments and the position that humans will occupy in future times when artificial intelligence has become truly "intelligent". The interactions between developments in telecommunications, where high-speed telecommunications networks are ubiquitous, quantum computers and artificial intelligence mean that technology will play an even more important role in the life of humans than before. This technology can be used for either good or evil. In our cooperation with other similar-minded nations, we in Iceland must discuss these developments, take a stance on them, prepare society for them, and then do our best to thrive in this inescapable future.

General information about the Electronic Communications Office of Iceland

There has been a great deal of development within the Electronic Communications Office of Iceland in recent years, not least in the year 2022. This growth is due to the increased emphasis placed by the government on cybersecurity and telecommunication security. The number of full-time equivalent units has been increasing steadily since 2021 and that trend continued in 2022 when four new full-time equivalent units were added. The most important development was the expansion of the CERT-IS cybersecurity team and the strengthening of the institution's capacity to take action in the field of digital security.

A new Electronic Communications Act was passed and came into force on 1 September 2022. The new Electronic Communications Act replaces an older act that dates back about 20 years, and the new Act contains many improvements. Among these are an added emphasis on the construction of telecommunications networks, and the fact that there is a major emphasis on the security of telecommunications networks and protecting consumers. The Act is intended to promote more efficiency in the development of telecommunication infrastructure through cooperation and partnerships between market participants, where appropriate, and the institution's activities will certainly be conducted with this in mind.

During the year, work was also done to streamline the institution's list of tasks, and as part of those efforts the task of issuing of GOC and ROC telecommunications licences was transferred to the Icelandic Transport Authority on 1 April 2022. Nearly 2,000

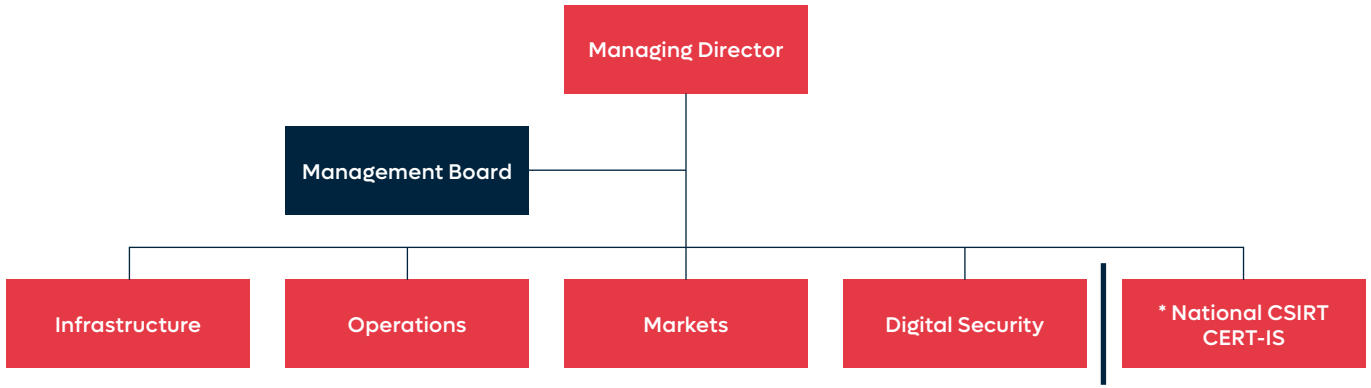
such telecommunications licences are issued each year. Since those who need these licences also need various other licences and services from the Icelandic Transport Authority, the issuing of licences was relocated there. This reduces the institution's workload and simplifies the service processes that concern seafarers.

Work continued on maintaining the Electronic Communications Office of Iceland's certifications with regard to equal pay policy and security of control systems (ÍST 85:2012 and ISO/IEC 27001). The institution also achieved level 4 in Green Steps in government operations and plans to complete level 5 by obtaining environmental certification.

The Managing Director of the Electronic Communications Office of Iceland is Hrafnkell V. Gíslason.

The executive board is comprised of the Managing Director and heads of divisions.

The institution had 27 full-time equivalent positions at the beginning of the year 2020 and that number had increased to 37 at the end of the year 2022.



*The national CSIRT shall be organisationally separated from the supervisory role of Fjarskiptastofa in the field of digital security.

The policy and objectives of the Electronic Communications Office of Iceland

The Electronic Communications Office of Iceland's vision for the future

The Electronic Communications Office of Iceland wishes to be an innovative partner in the development of a secure digital community, as the functionality of modern societies depends on strong and secure telecommunications systems and ongoing innovation in this field.

The values of the Electronic Communications Office of Iceland

The values of the Electronic Communications Office of Iceland form the frame for the institution's activities, and staff members can refer to them for support when it comes to prioritisation and focus on communications both inside and outside the institution. These values are grounded in the institution's role and they serve as incentives that support the vision for the future.

We show **INTEGRITY** by

- respecting both external and internal interested parties
- living up to the trust that is invested in us
- promoting social responsibility

We show our **PROFESSIONAL KNOWLEDGE** by

- providing services in a professional manner
- acting professionally in all aspects of our work
- continually seeking to obtain more knowledge

We seek to be **PROGRESSIVE** by

- seeking new methods and solutions
- being willing to cooperate and work in partnerships
- having a clear vision for the future

Policies which the Electronic Communications Office of Iceland has established for its activities:

- Human resources policy
- Security policy
- Policy regarding means of communication
- Equal pay policy
- Policy on the handling of personal data
- The Electronic Communications Office of Iceland's policy on the security and functionality of telecommunications infrastructure
- The Electronic Communications Office of Iceland's policy on the structure and implementation of surveillance of operators of digital infrastructure

ISO/IEC 27000 certification for the management of information security at the Electronic Communications Office of Iceland

The Electronic Communications Office of Iceland takes information and operational security very seriously. The institution has worked according to an information security management system based on ISO/IEC 27001 for several years. The institution received accredited ISO/IEC 27001 certification in 2020. When the management system was originally introduced, it was assumed that the CERT-IS cybersecurity team would be outside its scope. In 2020 it was decided to expand the scope of the management system so that it would also apply to the cybersecurity team.

Equal pay certification of the Electronic Communications Office of Iceland

The Electronic Communications Office of Iceland was awarded equal pay certification in February of 2021. The institution's main objective with the equal pay certification is to combat the gender pay gap and to promote gender equality in the labour market.

The institution has introduced its quality system the equal pay standard ÍST 85:2012, which is a management standard for equal pay systems. This includes the establishment of objectives focused on ensuring that the equal pay system is subject to monitoring and that it is consistent with the institution's policy.

This involves, among other things, performing a wage analysis at least once a year, and the benchmark shall be that the gender discrepancy in the relevant population is no more than 5%. In 2022, this percentage proved to be 2.23%. In addition, the wage model is presented to employees once a year.

This certification ensures that we use professional work methods that will prevent direct and indirect discrimination based on gender.

Environmental issues, sustainability and the social responsibilities of the Electronic Communications Office of Iceland

The Paris Agreement, which has been ratified by many states, stipulates that the objective shall be to keep global warming below 2 degrees Celsius and as close to 1.5 degrees as possible. The Icelandic government has signed and ratified the Agreement and the Icelandic government has set a target for the country to have achieved carbon neutrality no later than 2040.

According to the Climate Act, the Government of Iceland, governmental institutions and companies that are majority-owned by the state have an obligation to establish a climate policy for themselves with defined objectives regarding a reduction in greenhouse gas emissions and carbon offsetting. The Electronic Communications Office of Iceland has established such a policy for itself, which is consistent with these objectives set by the government.

The year 2022 marked a turning point in the field of sustainability and climate issues at the Electronic Communications Office of Iceland. The institution achieved levels 2-4 in Green Steps with regard to government operations, and fully intends to complete level 5 by achieving the requirements for complying with the ISO 14001 environmental certification.

The Electronic Communications Office of Iceland's environmental and climate policy

The Electronic Communications Office of Iceland's environmental and climate policy was published in May 2021. The purpose of this policy is to make a targeted reduction in the effects of the CO2 emissions generated by the institution's activities, set a good example for other institutions and companies, and communicate results to have a direct and indirect impact on the country's climate obligations.

The policy is based on the following: the Environment Agency's guidelines regarding climate policies of public entities, the Icelandic government's commitments about the Paris Agreement, the Icelandic government's climate action plan, the statement issued by the directors of the institutions of the Ministry of the Environment, Energy and Climate regarding reductions in greenhouse gas emissions and carbon neutrality, the United Nations Sustainable Development Goals and Green Steps.

By the year 2030 the institution will reduce its CO2 emissions by a total of 40% relative to the year 2019 which are generated by the following activities:

- International and domestic flights, by encouraging teleconferences and different work procedures
- Employees' commutes to and from work, through added support for eco-friendly transportation methods
- Driving in connection with the activities of the Electronic Communications Office of Iceland, by replacing the institution's own vehicles and setting requirements for car hire firms and taxi services to provide non-fossil fuel vehicles
- Waste, through efforts to ensure less waste and more sorting
- Energy use, through energy-efficiency measures
- Employee meals

The Electronic Communications Office of Iceland also aims to achieve carbon neutrality in its activities by carbon-offsetting all remaining emissions through established methods.

This policy is subject to annual review with regard to changes and developments that have an impact on climate issues. The Electronic Communications Office of Iceland's environmental and climate policy applies to all activities of the institution, its employees, buildings, installations and projects.

In order to support the goals of this policy, the Electronic Communications Office of Iceland works according to an approved action plan which includes measures to reduce CO2 emissions caused by aviation and other transportation, by encouraging the importance of teleconferences, flexible work hours and remote working, and also by making transportation agreements with employees. All measures that concern matters such as eco-friendly purchasing, monitoring of water and energy consumption, less food waste and even better sorting of waste produced by the institution.

The environmental and climate policy is supported by the introduction of Green Steps and green accounting.

Introduction of Green Steps

Green Steps in government activities is an Environment Agency project that aims to achieve a targeted reduction in the environmental impact of government institutions. The introduction of Green Steps in the activities of the Electronic Communications Office of Iceland has been successful, despite the fact that the global pandemic did not make it easy.

In 2022, various actions were taken in connection with the introduction of Green Steps. Among these are:

- providing rechargeable batteries instead of lithium batteries for most small appliances such as cordless keyboards and mice
- examining food waste on a regular basis
- reducing the use of packaging
- organic sorting of waste is now an option, and in fact waste is now sorted into 8 categories
- requesting eco-friendly taxis and rental cars where available

Green accounting

The Electronic Communications Office of Iceland, which is a part of Green Steps, keeps track of its purchasing and waste production regarding environmental and climate goals. The institution's carbon footprint is calculated using the results of its green accounting and of the travel habits survey which the employees are invited to complete every year.

Options are being considered regarding how to simplify management and the supply of information in the context of green accounting and the Electronic Communications Office of Iceland's carbon footprint. Monitoring of the volumes involved in

- the purchase of fuel
- electricity and hot water consumption
- travelling in connection with the activities of the Electronic Communications Office of Iceland, both by airplane and car
- employees' commutes to and from work
- disposal and sorting of waste

The Electronic Communications Office of Iceland's largest emission factor by far is that resulting from flights. The Electronic Communications Office of Iceland stresses the importance of cooperating with its sister organisations and international connections such as ITU, EU institutions and BEREC. Mutual knowledge acquisition, both at the domestic and international level, is a vital part of the institution's activities. The number of flights taken by employees decreased significantly in the Covid years of 2020 and 2021.

In 2022 this number increased dramatically again, which is also explained by the fact that the number of employees of the Electronic Communications Office of Iceland has increased by nearly half since the beginning of 2021, which is mostly accounted for by the staff of the CERT-IS cybersecurity team and the field of digital security.

It is anticipated in the Electronic Communications Office of Iceland's environmental and climate policy that the institution's carbon footprint will decrease by 40% from the year 2019 until the year 2030. Increased teleconferencing, which is largely a consequence of the COVID-19 epidemic, will help to achieve these goals, as teleconferencing has proved its value. Therefore, the Electronic Communications Office of Iceland is part of an eco-friendly work group within BEREC, which among other things works towards finding ways in which to measure and reduce the carbon footprint of the telecommunication sector. This participation has hitherto only taken place through teleconferences.

The Electronic Communications Office of Iceland's objectives to reduce emissions may be ambitious, and yet they are in line with the framework established by the government and will be reviewed whenever circumstances change.

Organisation and operation of divisions

Infrastructure

The Infrastructure Division is responsible for organising telecommunications resources (frequencies and numbers) and the allocation of authorisations for these resources. The Division also monitors frequencies, which includes measuring, responding to and resolving interference issues. By mapping and analysing the current and planned telecommunications infrastructure and related infrastructure, the Division promotes the construction of infrastructure in cooperation with government authorities and market participants. The Infrastructure Division also has a response and coordination role about the telecommunications sector in the event of disruption to operations, such as can occur during natural disasters. The Division also works towards increasing the resilience of telecommunications networks, in cooperation with the government and market participants. The Head of the Division is Þorleifur Jónasson. Other members of staff are Bjarni Sigurðsson, Hjalti Pálmason, Hörður R. Harðarson, Lilja Bjargey Pétursdóttir, Óskar Sæmundsson, Páll Sveinn Guðmundsson, Sigurður Ísleifsson, Sigurjón Ingvason and Þorgeir Sigurðarson.

Operations

The role of the Operations Division is to ensure continuous and streamlined operations, and to ensure that the operations are in accordance with the accredited quality processes of the institution. We strive to make the institution a place where people like to work. This includes efforts to ensure that the institution is a workplace where good health is promoted and we emphasise the importance of equality and balancing work and home life. The Head of the Division is Hrefna Ingólfsdóttir. Other staff are Ásta Guðrún Jóhannsdóttir, Birna G. Magnadóttir, Hanna G. Daníelsdóttir and Sigrún Davíðs.

Markets

The Markets Division, which combines legal and practical tasks, coordinates the institution's administrative matters and directs competition and consumer affairs. This Division performs market analyses and imposes obligations on the market participants which have a significant market share. The Head of the Division is Björn Geirsson. The staff of the Division are Anna María Reynisdóttir, Arnar Stefánsson, Birgir Óli Einarsson, Guðmann Bragi Birgisson, Hulda Ástþórsdóttir, Óskar Hafliði Ragnarsson and Snorri Þór Daðason.

Digital Security

Digital Security is where monitoring is performed to ensure that parties meet the minimum requirements in the field

of cybersecurity. These are requirements that concern the organisation of cybersecurity issues and the risk management frameworks of telecommunications companies, digital infrastructure and providers of digital services. This involves investigating the risks and incidents that occur, carrying out preventive audits and general and specific risk assessments. The Division also has a coordination role towards other supervising authorities in the field of cybersecurity for the purpose of promoting a coordinated implementation of cybersecurity laws. In addition, the Division has a monitoring function with regard to trust services and confers upon parties full accreditation for providing trust services. Unnur Kristín Sveinbjarnardóttir is Head of the Division and other staff are Anton Björn M. Helgason, Arna Hrönn Ágústsdóttir, Arnar Freyr Guðmundsson, Björn Þór Rögnvaldsson, Margrét Valgerður Helgadóttir, Pétur Sævald Hilmarsson and Sigrún Lilja Sigmarsdóttir.

The CERT-IS cybersecurity team

The principal tasks of the CERT-IS cybersecurity team concern situational awareness of the state of cybersecurity issues and responding to cyber incidents when they occur, and the organisation of CERT-IS is set up to reflect these main points of focus. By having the cybersecurity team as an independent organisational unit, we can guarantee that information and incidents will be handled independently and entirely separate from other divisions. The Director of CERT-IS is Guðmundur Arnar Sigmundsson, the manager of the incident response programme is Magni R. Sigurðsson and the manager of the situational awareness programme is Kjartan T. Hjörvar.

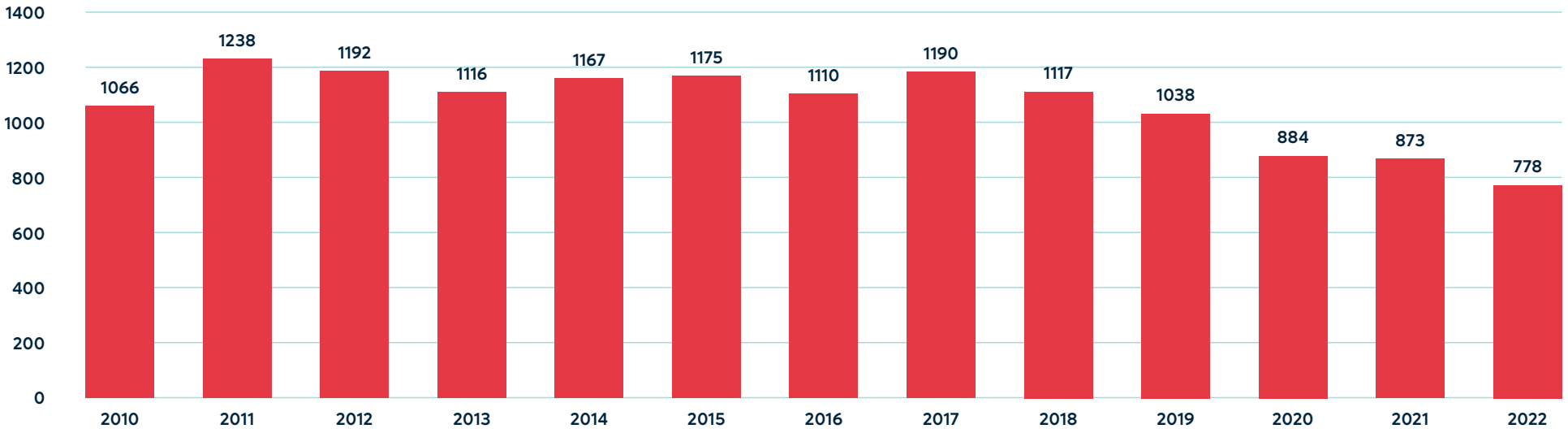
The Staff Association of the Electronic Communications Office of Iceland is a dynamic association of staff members with the main purpose of maintaining good morale and cultivating a good atmosphere at work. The Staff Association works efficiently with the institution and arranges events of various kinds at regular intervals each year, with different emphases depending on the season. The Staff Association also arranges trips abroad for educational and informational purposes, on average every two years.

Activities of the Electronic Communications Office of Iceland in 2022

Case handling time and case workload

In 2022 there were 778 cases on the Electronic Communications Office of Iceland's case list, which is a similar number of cases as in the previous year, but somewhat lower than in earlier years as can be seen on the following bar graph. It can be assumed that the COVID-19 epidemic resulted in fewer cases being referred to the institution than usual. Cases added to the list vary widely in nature, and included consumer complaints, interference complaints, complaints regarding the basic running of the institution itself, as well as cases concerning employees' day-to-day duties, such as market and cost analyses, frequency allocations, the issuing of permits, and inspections of telecommunication equipment in marine vessels, to give but a few examples.

Number of cases filed with the Electronic Communications Office of Iceland in the years 2010-2022

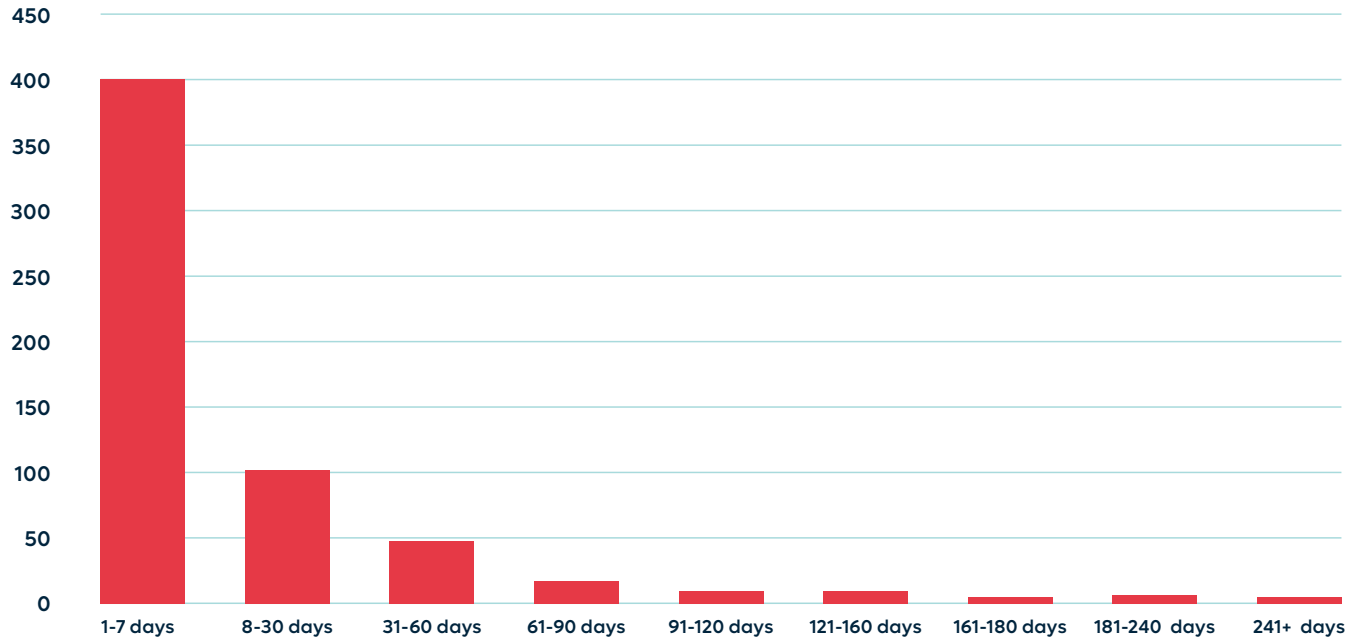


Pursuant to Article 16 of the ECOI Act No. 75/2021, the institution is required to resolve complaints as soon as possible, and within four months at the latest, unless there are exceptional circumstances. In an ever-changing and fast-paced competitive market, it is important that disputes are resolved quickly and conclusively, without compromising quality standards.

Consequently, the time it takes to process complaints lodged with the institution is monitored closely. Unresolved cases added to the list more than four months ago are designated yellow and cases older than eight months are designated red.

Out of the 778 cases created in the year 2021, 598 fall into these two categories. That is a significantly lower number than the number of cases received under normal conditions, yet quite similar to the number of cases received in 2020. When these numbers are added up in mid-2023, 588 of them have been handled and closed in the time indicated on the following bar graph.

Handling time for closed cases – cases created in 2022



There are therefore 10 unresolved cases, and most of them were created in the latter part or towards the end of 2022. The graph indicates that the vast majority of cases are resolved, about 97% of them, within the 120-day time limit required by law.

Cases that are filed with the institution by market participants or their customers have reduced in number in recent years. The number of disputes that telecommunication companies have submitted to the institution for resolution has dropped and a form of equilibrium, or predictability, has been established regarding the implementation of rules and obligations. This can possibly be traced to the fact that monitoring of market participants has in later years increasingly been in the form of cases regarding the running of the institution, which are in general larger in scope and more complex than the resolution of cases. Such cases regarding the running of the institution involve, among other things, resolving disputes that the institution would potentially have received as multiple submitted cases, each of which concerns a separate issue. Questions or disputes that arise after a decision has been made regarding such cases may however often be answered with reference to this decision, without requiring a case or administrative decision to be formally filed.

Various key figures from the activities of the Electronic Communications Office of Iceland in 2022

Frequency Allocations

Radio and TV stations	35
Backbone links (number of links)	25
Mobile station systems on VHF and UHF	50
MF and HF	1
Short-term radio broadcasting	45
Temporary licences	145

Codes allocated

Number of allocated codes	2.723.440

Interference complaints

Interference complaints	96

Issue of licences for radio equipment

Aircraft	84
Marine vessels	411
Mobile surface stations on very high frequency - VHF	118
Mobile surface stations on ultra high frequency - UHF	1
Mobile surface stations on medium frequency - MF	1
Handheld stations on very high frequency - VHF	219
UHF handheld stations	88
VHF land-based master stations	1
UHF land-based master stations	0
Emergency locator transmitters (PLB)	7
Paging systems	1

Radio equipment inspections on ships and open motor boats

Boats shorter than 24 m, inspected by inspection agencies and the Icelandic Transport Authority	1156
Boats longer than 24 m and ships	164
Pleasure craft inspected by owners	71

Inspections of boats and ships - by region

Reykjavík	34
Northwest	20
Northeast	42
South	43
Southwest	25
Ships registered abroad	5
Ships inspected abroad/not by the ECOI	4

Allocation of registration numbers MMSI

Numbers for ships	300

Issue of licences for users

Telecommunication licences, marine vessels (GOC) (Jan-March)	35
Telecommunication licences, marine vessels (ROC) (Jan-March)	13
Amateurs, Icelandic	15
Amateurs, international	0
Amateurs, misc.	30

Registered land stations

Fixed stations

VHF stations	343
UHF stations	5
MF-SSB stations	23
Paging devices	16

Mobile stations in cars

MF-SSB stations	460
VHF stations	7047
UHF stations	122

Handheld stations and beacons

VHF stations	7745
UHF stations	1956
Markers (beacons)	44
PLB emergency buoys (406 MHz)	109
Miscellaneous equipment	157

Stations on marine vessels

Medium frequency stations MF	8
Medium frequency and shortwave stations MF/HF	181
VHF stations	3069
Emergency radios GMDSS	606
Radar transponders SART	123
Radar transponders SART-AIS	134
Navtex	201
Emergency buoys, free-floating (406 MHz)	345
Emergency buoys in lifeboats and on board (406 MHz)	2481
Inmarsat B	0
Inmarsat C	212
Inmarsat M	4
Automatic identification systems (AIS)	1863

Overview of publications

A list of all publications from the Electronic Communications Office of Iceland can be found on the institution's website:

ECOI´S PUBLICATIONS

Comparative statistics on the use of electronic communications in eight countries

A statistical report is published annually in cooperation with the Electronic Communications Office of Iceland and its sister institutions in the Nordic countries and in the Baltics. The report gathers comparative data on the use of the main electronic communications services and on developments over recent years in the eight countries. Overall, the use of electronic communications is very similar in these countries and their citizens use comparable technologies in a similar way. Despite this, there are variations in the usage and development of specific services.

The Nordic comparative report can be found on ***THE INSTITUTION'S WEBSITE UNDER PUBLICATIONS.***

Statistical reports from the Electronic Communications Office of Iceland

Twice a year, the Electronic Communications Office of Iceland gathers data from telecommunication companies registered in Iceland on various metrics relating to telecommunications operations and services. The institution processes this data into statistical reports that summarise the main metrics and companies operating on the Icelandic telecommunications market. The reports are published twice a year: in the second quarter for the whole preceding year and a mid-year status update in the fourth quarter. The aim is to improve information provision and increase transparency on this market. The ECOI's reports are equivalent to those published by its sister institutions in neighbouring countries.

THE REPORTS CAN BE FOUND ON THE INSTITUTION'S WEBSITE.

Among the principal statistical information about the Icelandic telecommunications market in 2022 are the following:

In the telephone market, the trends of previous years continue as both users and minutes decrease in number from one year to another, and this reduction in customers and minutes can be seen in both households and companies. Landline subscribers decrease by 7.4% between years and minutes decrease by 14.1%. Síminn and Vodafone are the largest companies in the landline market, with a market share of over 85% at the end of 2022.

The total number of mobile phone subscriptions increases between years, by 5.0%. There has been an increase in mobile subscriptions, whereas pre-paid subscriptions have decreased in number. The number of mobile phone call minutes was 1,144 million minutes in 2022, compared with 1,137 million minutes in the previous year, which means that the increase in the number of minutes between years is only about 0.6%.

M2M cards on mobile telephone networks decreased in number between years, from 1,179,191 to 724,095 cards at year-end 2022; these are mobile phone cards whereby devices are in automatic communication with other devices, hence the term "Machine-to-Machine" or "M2M".

The volume of data on mobile phone networks keeps increasing although this increase has abated somewhat as it was about 23% between years and as in the preceding years the increase is connected with the introduction of 4G and 5G. Relatively higher volumes of mobile network data are used by phones than by other devices that have a solely data application, such as tablets or 4G or 5G network equipment.

Internet connections increased slightly between years, whereas fibre-optic connections increased greatly with a corresponding

decrease in xDSL connections: at the end of 2022 fibre-optic connections accounted for over 82% of all internet connections and the number of fibre-optic connections is currently about 117 thousand connections.

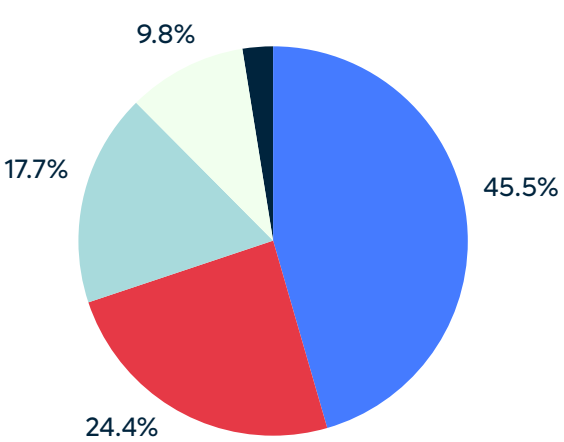
The total volume of data on fixed-line networks increased by over 12% between the years and about 90% of the amount of data is from downloading and 10% from uploading.

Subscribers with Internet Protocol television (IPTV) were 79,968 at year-end 2022, compared with 84,798 in the previous year, and have therefore decreased by about 6% from the previous year.

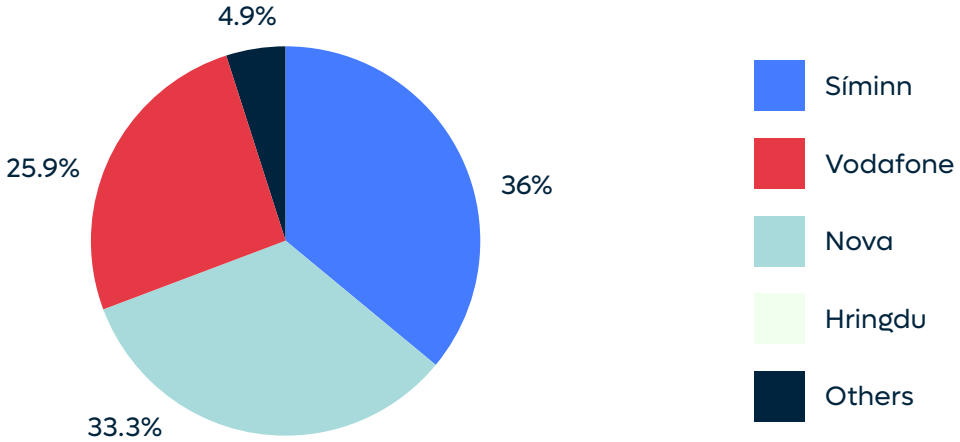
Turnover in the telecommunications market increased in the year 2022; income from landlines decreased but income from fixed-line networks, mobile phone operations, data transmission and internet services, telephone services and other mass media services has increased.

Investment in the telecommunications market is mostly in fixed-line networks, such as in connection with the installation of fibre-optic cable and mobile phone operation.

Number of internet connections
Market share by company



Mobile phone subscriptions
Market share by company



The electronic communications market

The electronic communications market is constantly changing in step with technological developments and changes in the legal environment, both in Iceland and on an international level.

New Electronic Communications Act

On 1 September a new Electronic Communications Act no. 70/2022 that was passed by Parliament in the summer of that year came into force and replaced the older Electronic Communications Act no. 81/2003. Even though changes have frequently been made to the older Electronic Communications Act over time, this was the first time in nearly two decades that the Act was completely revised and the body of laws was reissued in its entirety. This legislation was based on the EU electronic communications regulatory framework or the so-called Code, which is the Directive of the European Parliament and of the Council no. 2018/1972/EU.

Due to the developments in the field of telecommunications technology in recent years and decades, or since mobile phone technology and internet services arrived on the scene, telecommunications infrastructure has become among the most important infrastructure of every modern technological society. Critical infrastructure has become intertwined and interdependent, such as how telecommunications are used to control other infrastructure, such as for hydraulic and electrical power, air transportation and, increasingly, road transportation. Various important service components that are essential for the general public and previously tended to be independent of telecommunications, now rely on telecommunication services. Among these are the fund transfer systems of banks and the requirement for electronic identification for access to various types of services, such as in the interactions between individuals and tax authorities, online health care services, banks and insurance companies, etc. It is therefore important for society that telecommunication networks are secure and efficient, that telecommunication services are available to all, and that competition in the supply of those services will ensure that they are of high quality and affordable for consumers. The new Electronic Communications Act is intended to guarantee that these objectives are achieved.

In European telecommunications regulatory framework, it is still assumed that monitoring of the telecommunications market will be in the hands of a specifically appointed and independent monitoring institution for the purpose of establishing and strengthening competition using the instruments that they have at their disposal, along with supervising the fair allocation of the rights and quality that is the foundation of telecommunications technology, such as the allocation of frequencies, numbers and codes. This monitoring authority is intended to ensure strong consumer protection and to act as a certain safety net for the public by ensuring that all members of the public and companies have access, at affordable prices, to certain minimum components of telecommunication services called universal service.

Access to land

The construction of installations that are considered important societal infrastructure, such as transportation systems, water and electrical power systems as well as general telecommunication networks, is dependent on obtaining authorisation to use land for such a purpose. In laws concerning infrastructure of this kind there are usually authorisations for expropriation of land, contingent on meeting certain conditions, if negotiations with the landowners regarding use of the land prove unsuccessful.

The Electronic Communications Act contains a specific provision regarding access to land that entails general limitations on constitutionally guaranteed ownership rights, which the holders of the rights will usually have to suffer without compensation. This rule means that landowners must provide telecommunication companies with access to land for the construction of general telecommunication networks, provided that such use does not result in permanent impairment to the use of the relevant land or irreparable damage or disruption thereto, which would then have to be compensated in full. This is a measure that does not go as far as expropriation, whereby the property rights and tenure to the land is removed from the landowner and transferred to the party requesting the expropriation, upon fulfilment of all requirements for expropriation. There is a special rule in the Electronic Communications Act whereby it is assumed that in some cases the landowner can continue to have conventional use of the land, such as for pasture or agriculture, even though telecommunications cables have been installed underground.

A telecommunication company that intends to use land in this manner needs to consult the landowners to find the optimal solutions regarding, among other things, the choice of installation routes, the timing of construction projects and clearing up of the site after construction is completed. Such consultation will significantly reduce the risk that the land use by telecommunication companies will reduce the potential for landowners to use the land, or more disturbance to the land than is necessary.

Last summer, the Electronic Communications Office of Iceland made decision no. 8/2022 concerning the dispute between Ljósleiðarinn ehf. and certain landowners in Þykkvabær regarding the installation of fibre-optic cable on a number of plots in the region, including through jointly owned land at the beach ridge at Rangársandur. The dispute was over whether the land use would result in impaired potential for land use, the company's choice of utilities route and whether it had fulfilled its consultation obligation. The Electronic Communications Office of Iceland concluded that Ljósleiðarinn ehf. had a right to access the land at Þykkvabær with the utilities route which the company had chosen. However, the institution found fault with the way the company conducted consultation with the landowners, although these faults were not considered to be serious enough that the company should lose the right to use the land. The findings of the Electronic Communications Office of Iceland were materially confirmed by the Appellate Committee for Electronic Communications and Postal Affairs, cf. Appeal no. 5/2022, with a specific amendment stating that the dispute about compensation for impaired land use should be appealed to the expropriation compensation evaluation committee. The Electronic Communications Office of Iceland is of the opinion that the aforesaid decisions set a precedent and provide elucidation regarding the implementation and interpretation of the provisions of the Electronic Communications Act regarding access to land that is at present to be found in Article 34 of the new Electronic Communications Act.

Sale of Míla and the role of the Electronic Communications Office of Iceland

In September of last year, the process of selling Míla hf. from Síminn Group to the French asset management company Ardian was completed with an agreement between the merging party and the Competition Authority. This sale had the effect of breaking up the vertical integration of the telecommunications activities of Síminn Group that has been in place since telecommunications services were liberalised in this country and the groundwork was formed for a wholesale market for telecommunications services.

This must therefore be one of the most important developments in the Icelandic telecommunications market in many years.

Vertical integration of wholesale and retail services within the same company or group that has significant market power has generally been considered to involve a risk of barriers to competition or a biased competitive position for companies in the associated market. This also applies to the telecommunications

market, where companies within Síminn Group have had to take particular care to ensure that their market activities are within the framework of the laws in light of their market position. Thus Síminn Group at the time made a settlement with the Competition Authority regarding the resolution of cases concerning, among other things, the aforesaid integration of the Group for the purpose of reducing its harmful impact on competition. In the same way, many of the Electronic Communications Office of Iceland's decisions have addressed Síminn Group's behaviour in the market. It is natural and reasonable that, when opening the market to competition, there should be a focus on the former exclusive rightsholder and the party that is in a dominant position in the market in that part of the regulatory framework that is specifically intended to open the market to competition.

Both the Competition Authority and the Electronic Communications Office of Iceland have a specific role regarding the telecommunications market and by law these two institutions shall establish joint rules regarding the handling and resolution of telecommunications issues. In relation to the merger case that resulted from the sale of Míla hf., the Competition Authority invoked Article 9 of the Regulations and requested the involvement of the Electronic Communications Office of Iceland, among other things by submitting a request for comment regarding whether the merger called for the case to be examined in more detail by the Competition Authority. The Competition Authority also invited all interested parties and other concerned people to submit comments regarding the merger with a notification on its home page.

In general the Electronic Communications Office of Iceland is of the opinion that the sale of Míla hf. out of Síminn Group could have a positive impact on competition in the telecommunications market. However, Síminn hf. and Míla hf. entered into a detailed service agreement regarding guaranteed trade on a long-term basis. The implementation of the contractual cooperation of the companies will be a key deciding factor regarding whether there will be a reduction in the negative impact of the vertical integration of the two companies' operations despite the change in ownership of Míla hf. In its report to the Competition Authority, the Electronic Communications Office of Iceland reviewed the situation in the relevant telecommunications submarkets where Míla operates, and Míla's IP-MPLS system was, in the opinion of the Electronic Communications Office of Iceland, part of those markets. The institution assessed the effects which the intended cooperation between the two companies could have on competition and developments in the telecommunications market with reference to certain provisions of the cooperation agreement. The report therefore stated that the Competition Authority should further examine certain aspects of the service agreement in this regard.

It is appropriate to state that in Article 6 of Act no. 75/2021 on the Electronic Communications Office of Iceland, there are provisions whereby the institution shall encourage competition in the field of telecommunications, among other things by acting against disruption or limitations to competition in the telecommunications market, and the aforesaid report from the institution was compiled as part of this role of the institution.

Actions of Icelandic telecommunication companies in support of Ukrainian citizens

Since the Russian invasion of Ukraine in February last year, the Icelandic government has marched in step with allied and partner states in their efforts to provide support to Ukraine. The Electronic Communications Office of Iceland takes part in the work of BEREC, the Body of European Regulators for Electronic Communications, which is an area of cooperation for European monitoring parties in the field of telecommunications. Shortly after the invasion began, BEREC encouraged European telecommunication companies to support Ukrainian citizens and lighten their burden, and by then many telecommunication companies in Europe had already introduced various measures for that purpose.

Subsequently, the Electronic Communications Office of Iceland requested information from Icelandic telecommunication companies whether they intended to take steps in support of Ukrainian refugees, and if so, what support they had provided. Judging by the responses received from the companies, they reacted favourably to the appeals for support from representatives providing accommodation for arriving refugees. The following are descriptions of some of the support provided by the Icelandic telecommunication companies:

- Pre-paid SIM-cards for refugees and accessories for mobile phones
- Cost of phone calls to Ukraine has been waived
- Roaming costs for customers of the telecommunications companies located in Ukraine have been waived

The Electronic Communications Office of Iceland keeps track of these and other measures implemented by the telecommunications companies in connection with the armed conflict, and will continue to monitor the situation as needed. In addition, the institution continues to follow developments closely and works in close cooperation with its European sister institutions regarding the distribution of information, coordination of efforts and cooperation in the field of telecommunication and cybersecurity.

Data transmission speeds in universal service

In the spring of 2018, there were various amendments in the legislation governing universal service in telecommunications. The content of universal service had not been altered since it was defined in the time leading up to the establishment of European telecommunications regulations in 2002. Since then there has been great technological progress, for example through the advent of high-speed mobile network services and the installation of fibre-optic cable for local loop networks. The legislation had proved insufficient to keep up with the technological developments, in addition to which it was limited to specific telecommunications technology and quality requirements. Thus, universal service was confined to landline connections and a minimum data transmission speed of 128 kb/s which, at the time when the amendment was made, could in no way be considered an acceptable network connection.

The government wanted to shape more flexible legislation governing universal service, which could more efficiently follow technological developments as they take place, without requiring a revision of the Electronic Communications Act. Two principal actions were taken for this purpose. On one hand, universal service was made technologically neutral. This meant that universal service could be provided with wireless telecommunication technology such as high-speed mobile communication service, and wired, such as in fibre-optic connections to households and places of business. It may be said that principally due to this change it was not considered necessary to renew the universal service obligations of Míla hf. as announced in August of last year after the open consultation had taken place. However, an important change was made that instead of requiring a specific data transmission speed, as in the older Electronic

Communications Act no. 81/2003, data transmission service that is part of universal service should include so-called serviceable internet service, which would be defined in more detail in the minister's regulation. It was considered that the service would have to be of sufficient quality to be consistent with the defined service components listed in the regulation or its appendix.

When this amendment was made, it was anticipated that new European telecommunication legislation would call for a total revision of the Icelandic telecommunication legislation in the near future. Due to this and in light of the fact that the universal service obligation of Míla was in effect at the time and it was not clear what effect the amendment to the provisions of universal service would have on the supply of universal service, it was decided to wait with establishing a new regulation on universal telecommunication service, including regarding the service components that were to be the focus in serviceable internet service. After the new Electronic Communications Act came into force last year, one of the first actions taken was the issuing of a new and revised regulation on universal telecommunication services, cf. regulation no. 1100/2022.

In Article 6 of the new regulation, there is a list of the telecommunication service components with which the quality of serviceable internet service must be consistent. It was decided not to define in the regulation what minimum data transmission speed should be available; instead, the Electronic Communications Office of Iceland was assigned the task of assessing on a case-by-case basis whether it was necessary to designate a universal telecommunication service provider. The institution had done this before, cf. its decision no. 9/2020, when it designated Neyðarlínan ohf. as a universal service provider with the task of supplying homes with telephone connections and internet services in special cases. At that time the minimum speed of data transmission service was set at 10 Mb/s, and the service could be provided in a technically neutral manner. The aforesaid universal service nomination of Neyðarlínan ohf. remains in effect until the end of 2024.

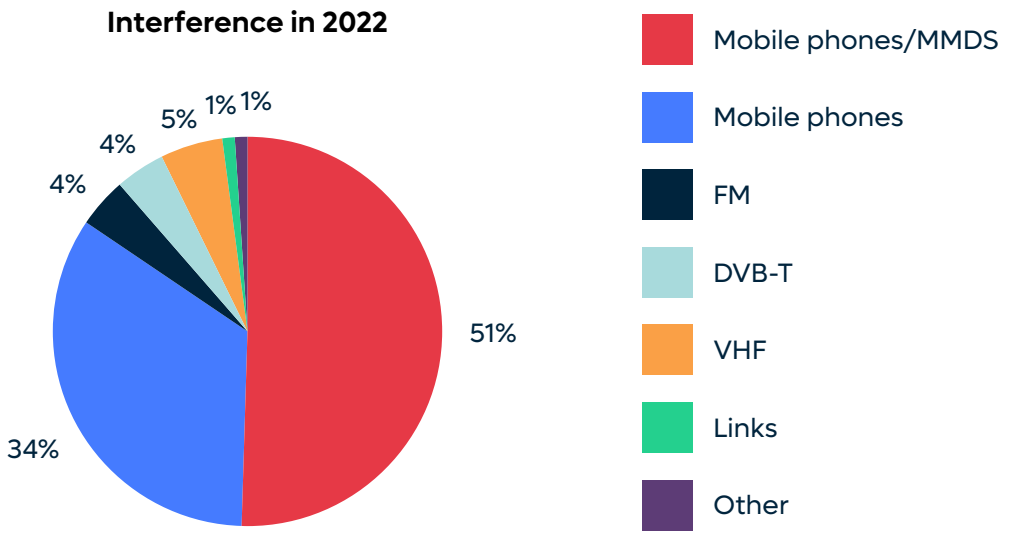
Monitoring the airwaves – The Electronic Communications Office of Iceland's interference monitoring

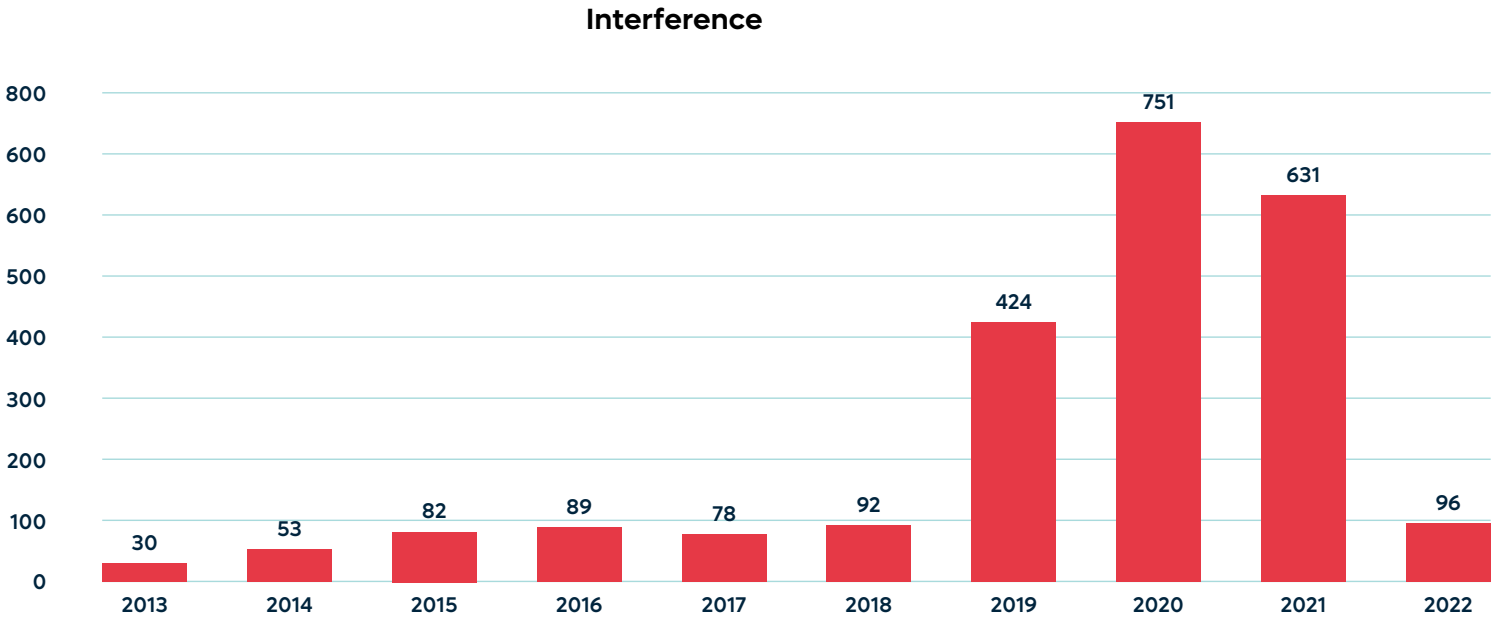
The frequency spectrum is a limited natural resource, and it must be used in an efficient manner to have a telecommunications network that can function without interference. Technologically, communications devices are rapidly advancing and it is therefore necessary to manage the frequency spectrum efficiently. This is a key point in ensuring the interoperation of various radio systems without them interfering with each other. Spectrum monitoring serves as the eyes and ears when it comes to the organisation and allocation of frequencies. Permission to use a frequency under a frequency authorisation is not a guarantee that the frequency will be used as described in the ECOI's authorisation. Frequencies are used twenty-four hours a day, seven days a week, all year round. Most telecommunication companies that provide services on an allocated frequency range maintain 24-hour monitoring of the services.

In 2022 the task of disconnecting most MMDS antennae in the Reykjavík area was mostly completed. Consequently the number of interference cases that need to be dealt with is decreasing in number. In late 2021/early 2022 the contractors that had been assisting the ECOI with disconnecting the microwave antennae stopped working on that task, but work will continue concomitantly with other projects to complete the disconnection of those that remain. The remaining microwave antennae are not a source of serious interference and there is no reason to prioritise their removal.

Overview of radio interference in 2022

Interference caused by microwave antennae (MMDS) account for about 51% of the interference dealt with, as the cause of the interference can be traced to obsolete but still functioning microwave antennae. Other mobile phone interference accounted for 34% whereas interference with other systems was about 15%.





Access to telecommunication services

The authorities emphasise the importance of achieving a level of access to telecommunication services that is among the best available in the world. This is reflected in the goals of the authorities that are stated in both the budget for 2020–2024 and in the proposed parliamentary resolution for an Electronic Communications Plan for 2019–2023.

Access to broadband is still increasing, and this is especially due to the effects of the Telecommunications Fund project for providing fibre-optic connection to the rural areas of the country.

The remainder would then be rural areas with a high population density. Today, nearly all of these places have high-speed connections based on xDSL technology. The government considers that evidence of market failure has not been demonstrated with regard to the rollout of fibre broadband in rural population centres. Pressure from local authorities and residents is likely to result in market-driven efforts to improve high-speed connections in these areas over the following years, either through the installation of fibre-optic cables, the development of powerful 5G services, or a combination of these solutions.

Nearly all homes and workplaces in Iceland have access to mobile network services with voice communications and high-speed network. The high-speed mobile network can certainly vary in quality and it is likely that there will be a difference in quality between urban and rural areas. This difference in quality will be revealed with the planned quality and access measurements that are scheduled for autumn 2023.

The situation is somewhat different when it comes to access to mobile network services along Iceland's highways. Accessibility goals have not been fully realised there. Market participants and the authorities face the challenge of improving mobile network access in Iceland along the country's highways. This is also especially important in connection with the development of 5G mobile network service in the long term, and the ECOI has been cooperating with market participants in the preparations for the reissue of frequency authorisations which are scheduled for implementation in 2023 to establish cooperation and shareability to expedite and ensure access to high-speed mobile network service along the major trunk roads in the country.

Reliability of telecommunication networks and their resilience

Digitalisation is indicative of the development of our society and the change is very rapid. All residents, companies, public institutions and critical societal infrastructure require access to secure and powerful telecommunication networks and services. Telecommunication networks play a key role when it comes to digital services, and are in fact the foundation on which digital service is based. The Electronic Communications Office of Iceland therefore considers that it is necessary to ensure that the foundation is reliable and has a high capacity.

There has recently been operational disruption to telecommunication systems where telecommunication services for the public have become temporarily unavailable. There have been vociferous calls for the authorities to prevent such situations from occurring again. In the Electronic Communications Office of Iceland's risk assessment for the National Security Council in 2022, it was stated clearly that there is a certain market failure with regard to the security of telecommunications, due to the fact that telecommunication companies in Iceland are not prepared to, nor do they have a legal obligation to, take the utmost measures to ensure the resilience of telecommunications in all situations, such as against large-scale, rare events.

The Infrastructure Division of the Electronic Communications Office of Iceland is working on the presentation of a plan regarding ways in which to promote the development and continuing proliferation of telecommunication networks in Iceland with the aim of achieving a higher level of reliability and resilience of the telecommunication networks in the country.

Similarly, the Division is working in cooperation with the Icelandic Civil Defence towards the completion of a contingency plan for operational disruption due to natural hazards as well as an internal process to address operational disruption within the telecommunication networks. Channels of communication have been established to ensure a minimal response time in incident management.

The Electronic Communications Office of Iceland's market analyses of the telecommunications market 2022

Market analyses of the telecommunication market form a significant part of the institution's operations. They constitute the most important policy instrument for the ECOI to safeguard competition and thereby support fair pricing, innovation, and improved access to services across the country. They are used to safeguard competition by analysing the position of market participants and by imposing appropriate obligations where competition is not considered adequate. The market analyses are the basis for decisions on whether to impose, maintain, change or lift specific regulatory obligations on telecommunication companies that have been designated as having significant market power.

The production of market analyses can be divided into three phases:

1. Defining the relevant service markets and geographical markets
2. Analysing all markets, determining whether there is active competition in these markets, and making a decision as to

whether there are one or more companies with significant market power

3. Making a decision as to whether restrictions should be imposed, amended, or withdrawn with regard to companies with significant market power

The ECOI carries out analyses of the markets specified in the recommendations from the EFTA Surveillance Authority (ESA) in accordance with the Electronic Communications Act and with Iceland's obligations pursuant to the EEA Agreement. Furthermore, the Electronic Communications Act requires the ECOI to define these markets in accordance with the circumstances specific to Iceland. The ECOI's market definitions may therefore be expected to vary from those in the recommendation. In addition, the ECOI is permitted to review additional telecommunications markets over and above those specified in the recommendation. The ESA recommendation currently in force was issued on 11 May 2016 and lists considerably fewer markets than in previous ESA recommendations on the same subject, published in 2004 and 2008, respectively. In general it was considered that not all the markets in the recommendation from 2008 still met the requirements for imposing restrictions in advance. The markets that must be reviewed under the current ESA recommendation from 2016 are the following wholesale markets:

Market 1: Voice call termination on individual public telephone networks provided at a fixed location

Market 2: Voice call termination on individual mobile networks

Market 3:

a) Local access provided at a fixed location

b) Central access provided at a fixed location for mass-market products

Market 4: High quality access provided at a fixed location

The Post and Telecom Administration's analyses of the following wholesale markets, based on the ESA recommendation from 2008, remain in effect:

Market 6: Terminating segments of leased lines (PTA Decision no. 8/2014)

Market 7: Voice call termination on individual mobile phone networks. (PTA Decision no. 20/2015)

In addition to this, the analysis of the following wholesale market based on the ESA recommendation from 2004 remains in effect:

Trunk line segments of leased lines, previously market 14 (PTA Decision No. 21/2015)

Main tasks in the field of market analysis in 2022

During the year, analyses were performed on wholesale markets in accordance with the institution's annual plan. In October 2021 the Electronic Communications Office of Iceland completed its analysis of markets 3a, local access at fixed location, and 3b, central access at fixed location for mass-market products, cf. the Electronic Communications Office's decision no. 5/2021 of 19 October 2021. In that analysis it was revealed that the ECOI would in 2022 reassess whether there was reason to reconsider the geographical definition of these markets, depending on whether Ardian's purchase of Míla would go through. This finally happened in September of 2022. Therefore, the ECOI began reviewing the aforesaid market analysis after this, which will be completed in the autumn of 2023.

Main tasks relating to monitoring of obligations in 2022

Cost analyses and pricing

In 2022 the Electronic Communications Office of Iceland's decision no. 9/2022 regarding Míla's wholesale tariff for access to rectifier equipment. A cost analysis was also carried out regarding the tariff for access to copper local loops, and a draft for a decision was submitted for consultation with interested parties at the beginning of 2023.

Follow-up of access obligation

In the Post and Telecom Administration's decision no. 5/2021, certain obligations were imposed on Míla ehf. Among them was an access obligation that entails that if a telecommunication company wishes to place a new cable in a pipe or utility route that is not being used to its full potential, then Míla must agree to such a request. According to this obligation, Míla must compile a database with detailed information about the location and condition of pipes in utility routes and provide the institution and relevant telecommunication companies with access to that database.

In October 2022, the ECOI requested and obtained information from Míla in connection with this obligation, including whether measures had been put in place for receiving requests from network operators regarding access to pipes or utility routes, whether such requests had been received, and whether the telecommunication company had at its disposal a database that could be used for looking up the requested information from relevant network operators.

Cyber and data security

Cyber and data security are becoming an increasingly important part of the issues concerning response and security for society and the ECOI plays a key role in this regard. The institution operates the CERT-IS cybersecurity team, monitors the organisation of security measures and the function of critical infrastructure, and is a member of the Cyber Security Council. The Council is a government consultation forum and its purpose is to follow up on the introduction of the government's policy on cyber and data security. The institution also cooperates with various parties that work on cybersecurity issues.

Activities of the CERT-IS cyber emergency response team

The activities of CERT-IS are based on the Electronic Communications Act and laws relating to the security of networks and information systems supporting critical infrastructure. They are generally divided into two subcategories. On one hand, CERT-IS provides coordination and incident management with regard to network security of providers of essential services, and on the other hand it maintains a proper situational awareness of cybersecurity issues for the Icelandic network domain.

In addition to these two main objectives, the team works in close international cooperation with cybersecurity teams, and as such is Iceland's point of contact in terms of technological coordination and incident management involving the principal neighbouring states and other friendly states.

CERT-IS is an organisational unit within the Electronic Communications Office of Iceland, although due to certain legal obligations it shall have a degree of independence when it comes to accounting, computer systems and work facilities. In light of that fact, CERT-IS has issued an independent annual statement for the year 2022 which can be accessed for further information about its activities on ***THE TEAM'S WEBSITE***.

Activities of Digital Security

Digital Security is one of the new divisions within the Electronic Communications Office of Iceland, established when changes were made to the institution's organisational structure when the Act on the Electronic Communication Office of Iceland came into force on 1 July 2021. This Division's activities involve monitoring minimum requirements regarding cybersecurity and risk control framework on the basis of the Electronic Communications Act and the NIS Act.

In addition to monitoring based on the latter Act, the Division has the role of a consulting coordination authority towards other monitoring authorities on the basis of the NIS Act, for the purpose of promoting the coordinated implementation thereof. This entails maintaining a specific policy regarding how to construct and implement monitoring of the security of network and information systems supporting critical infrastructure.

Monitoring generally involves audits and inspections of the functionality of the organisation of security issues with individual parties. This concerns preventive measures, as an organised and efficient cybersecurity framework is a key factor in defending against the threats that the parties' systems and services must face. However, monitoring also involves investigating any incidents and risks that may arise and have an impact on the services provided by telecommunications companies and the companies that are subject to the institution's monitoring based on the NIS Act. The Division also carries out general and specific risk assessments.

The Division has published its policies regarding monitoring of the security and efficiency of telecommunication infrastructure and digital infrastructure and works in accordance with those policies. Regarding telecommunications, the Division works in accordance with the institution's policy of 2020. This policy includes two main objectives, i.e., the performance of integral risk assessments for critical infrastructure and self-assessments of the relevant parties' organisational structure about cyber and data security. The performance of risk assessments was completed at the end of 2021, and a report in that regard was communicated to the National Security Council. The institution then began carrying out a self-assessment immediately after the new Electronic Communications Act came into force on 1 September 2022. The Division also performed a specific risk assessment of the ways in which the Russian invasion of Ukraine in February of 2022 could have an impact on the various kinds of telecommunication services that are provided in Iceland. The findings of that risk assessment were also communicated to the National Security Council. In addition, the Division began preparations for the implementation of the first penetration test on the systems of the relevant parties, as part of its preventive monitoring. In February 2022, Parliament passed a law whereby the Electronic Communications Office of Iceland has an obligation to consider the public interest and national security in its monitoring activities on the basis of the Electronic Communications Act. It was due to this new role that Digital Security decided to perform the specific risk assessment and set up the penetration test, as stated above.

As regards monitoring on the basis of the NIS Act, the Division works in accordance with the Electronic Communications Office of Iceland's policy of October 2021. Thus the Division also carried out a self-assessment of the security organisation of digital infrastructure operators in 2021, which has been the basis for the Division's subsequent risk-based monitoring. The findings of self-assessment audits form the grounds for the prioritisation of audits by the Division. Therefore the Division has embarked on defined and in-depth assessments of the organisational cybersecurity structure of four parties. These assessments apply to organisational measures and technical measures in the field of cybersecurity. The Division completed two assessments and began work on two other assessments. The Division also acquired specific information from the operators of digital infrastructure after the Russian invasion of Ukraine.

In October 2021, the task of monitoring of Act no. 55/2019 on Electronic Identification and Trust Services for Electronic Transactions was transferred from the Consumer Agency to the Electronic Communications Office of Iceland, and this monitoring is one aspect of the Division's activities. Many of the tasks that are based on this Act involve awarding providers of trust services a fully validated position in that field. The year 2022 was the first time when a party was awarded a fully validated position based on the requirements stipulated in accordance with the aforesaid Act regarding fully validated trust services, cf. the institution's decision no. 11/2022. Fairly extensive work has been devoted to verifying compliance with the Act and the EU regulation that applies to this field, the so-called eIDAS Regulation. The Division also received new applications for consideration at the end of 2022. In addition to awarding parties a fully validated position, the institution has an obligation to investigate incidents that occur and to keep a trusted list in this country.

Finally, it is worth mentioning that the Division also acts for the Electronic Communications Office of Iceland on the basis of Article 13 of Act no. 54/2021 on Icelandic domain names, which was passed in Parliament on 27 May 2021.

Consumer affairs

One of the principal tasks of the Electronic Communications Office of Iceland is to protect the interests of consumers in the telecommunications market, and to safeguard protection for them in their dealings with telecommunication companies. The institution publishes information for consumers, participates in measures to protect personal data and privacy and works on safeguarding the maintenance and security of public telecommunications networks.

The institution provides information on its website, ***FJARSKIPTASTOFA.IS***, which has a special area dedicated to consumers. There, consumers can submit messages, complaints and inquiries to the institution if they are of the opinion that a telecommunication company is in violation of the obligations required by law or of general authorisations and operation licences. Hundreds of such messages are received each year, although only some of them enter the formal complaints process.

In 2022 the Electronic Communications Office of Iceland had about 27 complaints to address, and as in previous years most of them, about 19, concerned unsolicited communications. Among other common causes for complaint are disputes about the amount of bills from telecommunication companies and number and/or service portability without the consent of the rightsholder.

Unsolicited communications are addressed in Article 91 of the Electronic Communications Act, and the provision specifies a high degree of legal protection for the end users of telecommunication services regarding the marketing activities of the relevant parties. The provision includes rules regarding direct marketing in the form of automated call systems, faxes, e-mail messages and any form of electronic messages. There is also a passage on the so-called do-not-call-list in telephone directories in paragraph 6 of the provision, where it is stated that it is prohibited to call an end user for marketing purposes if it is indicated in the directory that the user does not want to receive such telephone calls. As the provision is intended to protect the privacy of users of telecommunication services, the concept of direct marketing has been interpreted in a broad sense by the institution. An example of this is that telecommunications do not have to be initiated with the view of making profit to be considered direct marketing.

One decision was made this year regarding unsolicited communications, i.e. case no. 13/2022 — Unsolicited communications from Jehovah's Witnesses in Iceland. The institution received two complaints regarding unsolicited communications in the form of telephone calls, where both complainants were listed as do-not-call in the telephone directory. During the case, the religious organisation maintained that the telephone calls in question could not be considered to fall under the definition of direct marketing as their activities were exclusively religious in nature and had nothing to do with commercial trade. It was the assessment of Electronic Communications Office of Iceland that telecommunication for the purpose of disseminating and presenting roles, ideas and

activities espoused by the relevant party could be considered direct marketing. The institution deemed that the telephone calls in question had involved a presentation of the religious opinions and activities of Jehovah's Witnesses and would therefore be considered direct marketing. The institution therefore concluded that the religious organisation had violated the provision in the Electronic Communications Act regarding unsolicited communication.

In addition to routine tasks relating to consumer issues it may be mentioned that the institution takes part in cooperative efforts involving Nordic and Baltic telecommunication monitoring parties in the field of consumer protection in telecommunications. The institution hosted, organised and oversaw the annual 2022-2023 teleconference for this forum, and began preparations for the arrival of their colleagues in Reykjavík next year.

Other projects worth mentioning include the institution's staff members' extensive efforts in connection with the entry into force of the new Electronic Communications Act no. 70/2022. The Act includes provisions where added emphasis is placed on consumer protection, consumers' access to information and price and quality comparisons when it comes to telecommunications services, and standardisation of commercial terms. It is therefore appropriate to mention some of the major innovations introduced with the intent of strengthening consumer protection.

New provision on packages

A new provision was added to the new Electronic Communications Act regarding packages (bundles). Packages of services have become increasingly common in recent years and can result in benefits for consumers but can also make it difficult and expensive to replace service providers and service channels. This provision has been introduced with the aim of limiting difficulties for consumers when it comes to changing service providers and service routes, and thereby preventing customers from being locked into contracts.

Price comparison of telecommunications service

The Electronic Communications Office of Iceland now has the obligation to ensure that price comparison services are available to end users or to assign to an independent party the task of providing such comparison. Such comparison shall enable end users to compare prices and quality in the telecommunications market. The objective is to improve price transparency for consumers and promote improved consumer protection and heightened price awareness among the general public. It is anticipated that price comparisons will be displayed on the website of an independent party that will be up and running in 2023.

Information requirements for contracts

Before a consumer commits to a contract or deal, the telecommunication company that offers the telecommunication service shall provide information about the principal content of the contract. Among the information which the telecommunication company shall provide are the chief characteristics of the service, activation, subscription or use-related fees, the term of validity of the contract and how legal action can be brought to resolve disputes between the consumer and the telecommunication company. This information shall be considered an integral part of the contract. However, it should be mentioned that monitoring of the implementation of Act

no. 16/2016 on Consumer Contracts is the responsibility of the Consumer Agency.

Compensation system

The new Electronic Communications Act includes provisions on a compensation system that shall be in place for consumers regarding delays and/or mistakes in number and service portability. During the year, the institution issued new rules on number and service portability in public telecommunication networks, whereby the telecommunication companies shall, among other things, establish work procedures for themselves regarding the arrangement of such compensation. These work procedures shall consider, among other things, the format of requests, the time required for processing claims for compensation, and the amount of compensation in each separate category. The rules also include a requirement that the work procedures should be specified in the terms and conditions issued by the relevant telecommunication company.

Administrative determinations of the institution in 2022

In 2022 the institution made 15 formal administrative determinations. The Appellate Committee for Electronic Communications and Postal Affairs made a decision on 4 cases where complaints had been filed with the Committee regarding the institution's determinations.

The ECOI has maintained statistics on the outcome of administrative rulings since 2007, when the current setup of the institution was adopted. This table shows the decisions up to and including 2022:

Year	PTA decisions	Appealed decisions	Appeal proportion	Total rulings	Rescinded decisions	Upheld decisions	Upheld - proportion /appealed
2007	27	9	33%	9	1	8	**89%**
2008	33	7	21%	7	1	6	**86%**
2009	23	5	22%	5	0	5	**100%**
2010	41	10	24%	10	3	7	**70%**
2011	35	5	14%	5	2	3	**60%**
2012	40	7	18%	7	1	6	**86%**
2013	33	4	12%	4	0	4	**100%**
2014	42	5	12%	5	2	3	**60%**
2015	37	10	27%	10	2	8	**80%**
2016	24	4	17%	4	0	4	**100%**
2017	32	13	41%	13	1	12	**92%**
2018	28	4	14%	4	1	3	**75%**
2019	31	7	23%	7	3	4	**57%**
2020	18	4	22%	4	0	4	**100%**
2021	20	1	5%	1	0	1	**100%**
2022	15	4	27%	4	0	4	**100%**
Total	**479**	**99**	**21%**	**99**	**17**	**82**	**83%**
Of total	**100%**				**3,5%**		
				Average percentage upheld*			**82,8%**

*Using weighted mean

A summary of the determinations issued by the Electronic Communications Office of Iceland and the Post and Telecom Administration can be found on the institution's ***WEBSITE.***

Registered telecommunications providers at the end of 2022

Name	Issued/registered	Type of operation
1819 - Nýr valkostur ehf.	20.6.2014	Directory enquiries services
Advania Ísland ehf.	17.4.2002	Data transmission services
Alza ehf.	1.9.2017	Data transmission services via wireless and fixed-line networks
Alþingi (the Icelandic Parliament)	23.3.2015	Transmission of radio and/or television signals
Astrocast SA	29.9.2020	Data transmission service via wireless networks
Austurljós ehf.	5.3.2015	Data transmission networks and services
Ábótinn ehf.	28.3.2003	Data transmission networks and services
Árvakur hf.	26.1.2015	Directory enquiries services
Ásaljós	18.8.2015	Operation of fixed-line telecommunications network
Bláskógaljós	20.12.2019	Operation of fixed-line telecommunications network
Bloomberg Finance L.P.	19.7.2007	Line rental services and general telecommunications network
Boðleið Þjónusta ehf.	1.12.2015	Voice telephony services, mobile telephone services and operation of a fixed-line telecommunications network
BT Solutions Limited, Iceland branch	28.7.2014	Data transmission services
Century Link Iceland ehf.	1.12.2015	Operation of fixed-line electronic communications network and data transmission services
Cisco International Limited	6.7.2022	SMS and VoIP cloud services
Colt Technology Services AB	29.9.2015	Data transmission services
Cronus ehf.	1.10.2019	Transmission of radio and/or television signals

Name	Issued/registered	Type of operation
Cubic Telecom Limited	9.8.2018	Operation of fixed-line and wireless electronic communications networks, data transmission via wireless electronic communications networks
Dalaveitur ehf.	14.2.2017	Operation of fixed-line telecommunications network
DCN Hub ehf.	10.12.2012	Mobile and data transmission services
DIDWW Ireland Limited	26.2.2019	Data transmission and voice telephony services
Digriklettur ehf.	1.4.2019	Operation of fixed-line telecommunications network
DVD-Margmiðlun ehf.	6.2.2004	Operation of radio broadcasting broadband system
EchoStar Mobile Limited	1.7.2020	Mobile network satellite service
Municipality of Eyja- og Miklaholtshreppur	29.9.2015	Operation of fixed-line telecommunications network
Factor ehf.	30.5.2013	Data transmission network and data transmission services
Farice ehf.	2.9.2003	Submarine cable
Ferðaþjónustan Húsafelli ehf.	23.4.2018	Data transmission services via fixed-line networks, operation of fixed-line telecommunication network
Fjarskiptafélag Reykhólshrepps	9.8.2018	Operation of fixed-line telecommunications network
Fjarskiptafélag Skagabyggðar	8.6.2016	Data transmission network
Fjarskiptafélag Skeiða- og G ehf.	8.3.2013	Data transmission network
Fjarskiptafélag Svalbarðshrepps ehf.	14.2.2017	Operation of fixed-line telecommunications network
Fjölnet ehf.	26.10.2001	Voice telephony, data transmission services and telecommunication network
Flóaljós	17.1.2020	Operation of fixed-line telecommunications network

Name	Issued/registered	Type of operation
Flugleiðahótel hf. / Icelandair Hotels	23.6.2021	Transmission of radio and/or television signals
FOSSA Systems S.L.	21.4.2022	Data transmission services
Gagnaveita Helgafellssveit ehf.	18.8.2015	Operation of fixed-line telecommunications network
Gagnaveita Hornafjarðar ehf.	13.2.2013	Electronic communications network
Gagnaveita Suðurlands ehf.	9.12.2013	Data transmission services
Gagnaveitan ehf.	8.6.2011	Electronic communications services
Garmin (Europe) Limited	5.7.2022	Data transmission services, satellite services
GlobalCall ehf.	4.9.2008	Voice telephony services
Globalstar Europe Satellite Services Ltd.	21.2.2010	Satellite services
Halló ehf.	23.5.2014	Directory enquiries services
Hátíðni ehf.	17.8.2020	Voice telephony services, operation of wireless telecommunication network, data transmission service via fixed-line networks and wireless networks and transmission of radio and/or television signals
Hitaveita Drangsness	28.3.2019	Operation of fixed-line telecommunications network
Hitaveita Egilsstaða/Fella ehf.	11.9.2018	Operation of fixed-line and wireless telecommunications network, data transmission service via wireless and fixed-line networks and transmission of radio and/or television signals
Hitaveita Tálknafjarðarhrepps	24.6.2015	Data transmission services via fixed-line network
Hljóðsmárinn ehf.	24.10.2017	Transmission of radio and/or television signals
Hópkaup ehf.	28.4.2015	Directory enquiries services
Hótel Laki ehf.	10.4.2017	Operation of fixed-line telecommunications network

Name	Issued/registered	Type of operation
Hrafnshóll ehf.	30.1.2019	Operation of fixed-line telecommunications network
Hringdu ehf.	9.11.2010	Voice telephony and data transmission services
Hringiðan ehf./Vortex Inc.	3.12.1998	Voice telephony, data transmission services and telecommunication network
Hrunaljós	17.1.2020	Operation of fixed-line telecommunications network
Húnanet ehf.	23.10.2017	Operation of fixed-line telecommunications network
Municipality of Hvalfjarðarsveit	31.3.2014	Electronic communications network
I CALL ehf.	5.12.2022	Voice telephony and mobile phone service, data transmission service.
Icelandair ehf.	14.2.2014	Electronic communications network
Internet á Íslandi hf.	3.2.1998	Electronic communications network, voice telephony and data transmission services
Isavia ohf.	30.12.2010	Voice transmission service for aircraft and operation of fixed-line electronic communications network
Isavia ANS ehf.	21.2.2020	Operation of fixed-line telecommunications network
Já hf.	21.11.2007	Publication of telephone and address directories, directory enquiries services
Kukl ehf.	20.3.2009	Voice telephony, data transmission services and telecommunication network
Icelandic Coast Guard	1.1.2011	Management and leasing of NATO fibre-optic cable
Leaf Space Iceland ehf.	16.2.2022	Data transmission service via satellite
Leiðarljós ehf.	14.2.2017	Operation of fixed-line telecommunications network
Lindin, kristið útvarp	26.1.2015	Transmission of radio and/or television signals

Name	Issued/registered	Type of operation
LíF í Mýrdal ehf.	15.9.2014	Operation of fixed-line telecommunications network
Ljós og gagnaleiðari ehf.	10.8.2009	Data transmission network
Ljósfesti ehf.	19.12.2016	Operation of fixed-line telecommunications network
Ljósleiðarinn (formerly Gagnaveita Reykjavíkur ehf.)	23.3.2007	Data transmission networks and services
Optical fibre for Borgarbyggð	18.10.2019	Operation of fixed-line telecommunications network
Ljóspunktur ehf.	24.10.2017	Operation of fixed-line telecommunications network
Loopup Spain SL	5.10.2021	Data transmission services
Lýsir ehf.	20.12.2019	Operation of wireless electronic communications network
Magnavík ehf.	1.4.2004	Data transmission services
Martölvan ehf.	26.11.2007	Voice telephony, data transmission services and network
Míla ehf.	4.4.2007	Electronic communications network
Netpandan ehf.	5.9.2022	Data transmission services via fixed-line network
Netvöktun ehf.	9.8.2018	Voice telephony services, operation of a fixed-line and wireless electronic communication network, data transmission services via fixed-line and wireless networks
Neyðarlínan ohf.	6.10.1999	Voice telephony/emergency service response line
Nordic Networks ehf.	24.11.2016	Submarine cable and data transmission services
Nova hf.	12.7.2006	Voice telephony and data transmission services
OnAir S.A.R.L.	29.4.2008	Mobile communication services on aircraft (MCA)

Name	Issued/registered	Type of operation
OneWeb communications s.a.r.l.	20.5.2021	Data transmission service via satellite
Opin kerfi ehf.	25.2.2011	Data transmission services
Origo hf.	12.12.2011	Data transmission services
Orkufjarskipti hf.	26.10.2001	Electronic communications network
Premis ehf.	24.10.2017	Voice telephony and mobile telephony services, operation of wireless and fixed-line tele-communications network and data transmission services via fixed-line and wireless networks
Protegion ehf.	5.3.2018	Operation of fixed-line telecommunications network
Rafal	2.5.2022	Data transmission service via wireless networks
Rafey ehf.	18.8.2015	Operation of fixed-line telecommunications network
Rangárljós	29.8.2016	Operation of fixed-line telecommunications network
Refinitiv Norge A/S	1.9.2017	Data transmission services via fixed-line network
Ríkisútvarpið ohf.	29.7.1997	Electronic communications services Radio and television
Sensa ehf.	19.12.2016	Data transmission services via fixed-line network
Síminn hf.	30.7.1998	Voice telephony, GSM, data transmission network etc.
Snerpa ehf.	17.8.2000	Electronic communications network, voice telephony and data transmission services
Splitti ehf.	8.7.2019	Voice telephony and mobile services, data transmission via fixed-line and wireless electronic communications networks and directory enquiries services
Starlink Internet Services Limited	17.12.2020	Data transmission service via satellite
Studio Norn ehf.	14.10.2020	Transmission of radio and/or television signals

Name	Issued/registered	Type of operation
Sumarsól ehf.	1.12.2015	Directory enquiries services
Svartsteinn ehf.	24.1.2022	Data transmission service via fixed-line network and mobile network
Swarm Technologies Inc.	17.8.2020	Satellite service for IoT and M2M devices
Sýn hf.	27.3.2007	Voice telephony services, mobile telephony services, data transmission services and electronic communications network
Tech Support á Íslandi ehf.	3.3.2017	Voice telephony, data transmission services via fixed-line and wireless networks
TELE Greenland A/S	24.6.2008	Submarine cable
Tengir hf.	20.9.2002	Optical fibre network
Tismi BV	5.3.2015	Voice and mobile telephony
TRS ehf.	29.3.2004	Data transmission services
Truphone Limited	22.11.2017	Mobile telephony and data transmission via wireless electronic communications networks
TSC ehf.	18.1.2002	Voice telephony, data transmission services and telecommunication network
Twilio Ireland Limited	12.7.2019	Voice telephony and mobile services, data transmission via fixed and wireless electronic communications networks and operation of fixed-line and wireless electronic communications networks
Tölvun ehf.	25.4.2003	Data transmission networks and services
Tölvuþjónustan ehf.	10.12.2020	Data transmission services via fixed-line network
Vengo ehf.	18.10.2019	Data transmission services via fixed-line network
Verne Global hf.	29.9.2020	Data transmission services via fixed-line network
Vonage Business Limited (áður NewVoiceMedia ltd).	17.8.2020	Voice telephony and mobile telephone service and operation of fixed-line telecommunication network

Name	Issued/registered	Type of operation
Vonage B.V.	8.9.2022	Voice telephony services
Yellow Mobile B.V	18.7.2017	Voice telephony and mobile telephone service, operation of fixed-line and wireless telecommunication network and data transmission service via fixed-line networks and wireless networks
Zendensk International Limited	9.8.2018	SMS and VoIP cloud services
Þekking - Tristan hf.	16.1.2004	Data transmission networks and services
Þorvaldur Stefánsson	14.10.2014	Maritime data transmission
Örugg afritun ehf.	18.10.2019	Data transmission services via fixed-line network
Öryggisfjarskipti ehf.	6.10.2008	Telecommunications services and network/TETRA


Fjarskiptastofa