Empowering Young Mountain Entrepreneurs

PEAK

Internet Connectivity for Rural and Mountain Enterprises

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www.peakentrepreneurs.eu

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Introduction to PEAK Project

Europe's mountain regions have contributed to shaping not only Europe's history, society and economy, but also its climate and environment. Now under threat from issues concerning low population density, difficulty of access, economic and ecological vulnerability, there is distinctive NEED for a new approach to the environmental preservation, economic regeneration and sustainable development of mountain regions. PEAK – New Heights for Youth Entrepreneurship is a new approach which places young people at the heart of the process.

For centuries, young people have out-migrated from Europe's remote, high-altitude regions, a process that resulted in brain drain and the consequent social and economic destabilization of mountain communities. Mountains occupy 41.3% of European territory and are home to 25.4% of Europe's people and millions of Europeans depend on mountain resources (i.e. fresh water, energy, minerals, forests) for their living so the NEED to promote their safeguarding and sustainable development is strong.

Introduction to Rural and Mountain Connectivity Across Europe

Introduction to Rural and Mountain Connectivity in Europe: Bridging the Digital Divide

In an increasingly interconnected world, access to high-speed internet and mobile services has become a vital component of modern society. From economic growth and education to healthcare and social engagement, connectivity has the potential to enhance the quality of life in communities around the globe. However, rural and mountainous regions across Europe often face unique challenges in achieving equitable access to these essential services.

Rural and mountain connectivity refers to the infrastructure and services that enable broadband and mobile access in remote, less densely populated areas. Due to factors such as difficult terrain, lower population density, and limited financial resources, these regions often struggle to maintain adequate connectivity compared to their urban counterparts. As a result, these communities risk being left behind in the ongoing digital revolution, leading to a widening digital divide between urban and rural areas.

In order to address this disparity, the European Union (EU) and its member states have made significant efforts to promote the expansion of broadband and

mobile services in rural and mountainous regions. Through funding mechanisms, regulatory measures, and public-private partnerships, they aim to foster innovation, encourage investment, and improve accessibility to high-speed internet and mobile services for all citizens, regardless of their geographical location.

This introduction to rural and mountain connectivity across Europe will explore the challenges faced by these communities, the key policies and initiatives that have been implemented to address the digital divide, and the emerging technologies that are shaping the future of connectivity in these regions. By bridging the digital divide, Europe seeks not only to empower its rural and mountain communities but also to create a more inclusive and sustainable digital future for all its citizens.

Introduction to Rural and Mountain Connectivity Northern Ireland, UK

The annual OFCOM report measures progress in the availability and capability of broadband and mobile services in Northern Ireland and highlights the work Ofcom is doing, alongside UK and devolved governments and communications companies, to improve the UK's connectivity. Alongside this Northern Ireland report, we publish separate reports on broadband and mobile availability for the UK as a whole and each of its nations. Our interactive dashboard allows people to easily access data for different areas of the UK and specific types of services.

This data is also available at Scottish local authority, Scottish Parliament and UK Parliament constituency level. We are also releasing the International Broadband Scorecard 2021, which compares the UK's recent position on broadband availability with a number of other European nations. More than half a million homes in Northern Ireland (539,000) now have access to full-fibre broadband connections; over 116,000 more than last year. These connections can deliver much higher download speeds and are also more reliable than older, copper-based broadband.

Among the four UK nations, Northern Ireland (71%) has the highest availability of full-fibre services, compared to England (27%), Scotland (27%) and Wales (27%).

• Northern Ireland's full fibre position is a result of a combination of aggressive commercial rollout and publicly funded schemes designed to improve broadband in rural areas.

• Superfast broadband (at least 30 Mbit/s), is available to 91% of premises in Northern Ireland, 2pp (percentage points) higher than last year.

Thinkbroadband records full fibre coverage at 42.1% of Scotland's premises and 31.09% of the Highlands (England 44.8%, Northern Ireland 88.7%, Wales 42.4%). Superfast coverage (>30Mbps) is at 95.3% for Scotland and 83.6% of the Highlands. Ofgem's figures are lower with full fibre availability of 27% for Scotland and 17% for rural Scotland. Superfast coverage is similar at 94% and 73% for Scotland and rural Scotland respectively.

The labs.thinkbroadband.com/local site provides broadband coverage statistics, availability checker, maps and additionally speeds as recorded by the public and is produced by thinkbroadband. Thinkbroadband uses an independant model which differs to the methodology used by Ofcom, which is reliant on data provided by broadband providers. By running their model they are able to provide a verification for the Ofcom data and are not reliant on quarterly data releases but can update data on a daily or weekly basis as needed.

The largest factor for any differences with the Ofcom analysis is down to the timing of publication. Where Fibre is talked about this refers to fibre based broadband which encompasses VDSL2, FTTC, FTTN, G.fast, cable broadband, FTTH and FTTB. Superfast broadband coverage figures is a subset of the fibre based figures as it adds a speed qualifer of 24 Mbps or 30 Mbps.

Overview of Rural and Mountain Connectivity Scotland, UK

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Introduction to Rural and Mountain Connectivity Ireland

Our everyday lives are becoming far more digital. We are using the internet more, working from home and relying on technology and digital services. People can access the internet at home, work, other places or on the move. This document reports and analyses the connectivity for rural and mountain enterprises in Ireland. It starts with an overview of general Irish internet usage and geographical coverage and then goes into further details from a rural mountain perspective.

Ireland, like most countries there are varied options, some may have a fixed broadband connection (such as cable, optical fibre, satellite, etc.) or mobile broadband connection (via the mobile phone network with minimum 3G) or in some cases, narrowband connection (dial-up access over a normal telephone line or ISDN or mobile narrowband connection of less than 3G). Enterprises may have more than one type of internet connection at home or at work, this chapter covers internet access, types of connection used and future improvements improving connectivity and accessibility.

Internet Use in Ireland 2022

The internet is an important contributor to Ireland's economy and education including rural and mountain areas. The telecommunications infrastructure in Ireland provides Internet access to businesses and home users in various forms, including fibre, cable, DSL, wireless, Fixed Wireless and mobile. In 2019, 91% of households have access to the Internet in Ireland at home, with 88% of individuals reporting that they had used the internet in the three months prior to the interview. As of 2018, 82% of adults aged 16 to 44 years in Ireland were recent internet users; in aggregate, the sixteenth-highest in Europe.

Ireland’s internet penetration rate stood at 99.0 per cent of the total population at the start of 2022. Kepios analysis indicates that internet users in Ireland increased by 388 thousand (+8.5 per cent) between 2021 and 2022. For perspective, these user figures reveal that 50.0 thousand people in Ireland did not use the internet at the start of 2022, meaning that 1.0 per cent of the population remained offline at the beginning of the year. However, issues relating to COVID-19 continue to impact research into internet adoption, so actual internet user figures may be higher than these published numbers suggest (see here for further details). For the latest insights into internet adoption and use around the world, follow regular Global Statshot reports.

Ireland’s total population was 5.00 million in January 2022. Data show that Ireland’s population increased by 41 thousand (+0.8 per cent) between 2021 and 2022.50.3 per cent of Ireland’s population is female, while 49.7per cent of the population is male.

Rural and Mountain Populations

At the start of 2022, 64.2 per cent of Ireland’s population lived in urban centres, while 35.8 per cent lived in rural areas.

Go global: see how Ireland’s current “state of digital” compares with connectivity in other countries by reading our flagship Digital 2022 Global Overview Report, which includes hundreds of slides of global digital data, and our in-depth analysis of what these numbers might mean for you.

Internet Connection Speeds in Ireland in 2022

Data published by Ookla indicate that internet users in Ireland could have expected the following internet connection speeds at the start of 2022:

Median mobile internet connection speed via cellular networks: 27.96 Mbps.

Median fixed internet connection speed: 65.29 Mbps. Ookla’s data reveals that the median mobile internet connection speed in Ireland increased by 12.25 Mbps (+78.0 percent) in the twelve months to the start of 2022. Meanwhile,

Ookla's data shows that fixed internet connection speeds in

Ireland increased by 15.85 Mbps (+32.1 percent) during the same period.

Rural and Mountainous Broadband

Rural broadband is broadband that's available in rural and mountainous parts of the country. (Link) It can be difficult to get a reliable, fast internet service if you live in a remote area of Ireland compared with a large urban area.

Although broadband in rural areas of Ireland can be slow, the broadband speeds you get depends on what type of broadband connections are available in your area and the plan you choose. Broadband available in rural and mountainous Ireland

Who Provides Broadband in Rural and Mountainous Ireland?

If you live in a or mountainous rural area, you can get broadband from these providers:

1. eir
2. Pure Telecom
3. Sky
4. Vodafone

Best Broadband and Internet for Rural and Mountain Areas

The best broadband package for you will depend on what features you're looking for. If you want a reliable connection, with unlimited usage, an ADSL plan is a good place to start.

Satellite broadband is ideal for people in remote areas because it can provide a connection to any home. However, there can be download limits, so if you're a heavy user, or you have a busy household, this may not be the best solution.

Likewise, mobile broadband could be a good option, but you'll need to make sure you have a strong mobile phone signal where you live, to ensure you'll have a reliable internet connection.

How to get Internet in Mountain and Remote Areas

Satellite broadband is set up in a household by installing a satellite dish. It can provide an internet connection to any home, even very remote properties.

Mobile Broadband is provided through a mobile phone signal. Most networks offer mobile broadband via modems, mobile dongles and 4G/5G SIMs.

Dial up or DSL is the best for rural and mountain areas. Since DSL delivers high-speed internet using your landline, it is one of the most widely available forms of internet, making it a better overall service for rural areas. The other options are satellite, wireless internet service provider (WISP) and cellular broadband.

How to boost mountain internet is to choose a directional antenna, like a Yagi, which concentrates transmissions in one direction and, therefore, gets better range. However, if you are located in a mountainous or forested area, you should consider an Omni-point antenna.

Mobile hotspot isn't a great solution for rural and mountain areas in Ireland. If the location where you're going doesn't have cell service, the mobile hotspot is unlikely to help

When Is Faster Broadband Being Rolled Out To Rural Areas?

If you want to see when faster broadband is on its way to you, check out the High Speed Broadband Map on the Gov.ie website.

It's part of The National Broadband Plan that aims to deliver 'quality, affordable high-speed broadband to all parts of Ireland where such services are not available commercially.'

What is SIRO?

SIRO is a joint venture between ESB and Vodafone that's working to deliver a 100% fibre-to-the-building (FTTB) broadband network, using the existing ESB network. SIRO is offered on an open-access basis to all telecoms retailers in Ireland and can deliver speeds up to 1,000Mbps. It's being rolled out to regional Ireland first, here are the counties in the planned roll out. You can find out more about how SIRO works and when you'll get it near you in our SIRO in Ireland guide.

How To Improve Slow Broadband

If you live in a rural area and are having issues with slow internet, consider switching your broadband provider. As well as the potential to improve the speed of your broadband, you may also benefit from an introductory discount and save money too. If you've recently switched, or you can't get a faster plan where you live, try our tips on improving slow broadband, which could make a big difference.

National Broadband Ireland

NBI is rolling out the largest infrastructural project in rural Ireland since rural electrification, stretching across 96% of Ireland's land mass. It will bring high-speed broadband to 23% of Ireland's population. Find out more https://nbi.ie/

Overview of Rural and Mountain Connectivity ITALY

In Italy, less than half of the households living in municipalities under two thousand inhabitants in what so called "inner areas" have access to a fixed broadband connection.

In most cases, people still connect using ADSL, sending and receiving data using the copper pair. According to Istat, this figure is about 10% lower than the average for the country, 45.1% compared to 54.3%. The problems connected with the digital divide, however, are not a private factor and do not respond to the choices of families: the European Commission knows this, and in 2010, with the Digital Agenda for Europe, it set the goal of guaranteeing 85% of the population access to ultra-wideband (characterised by a download speed of at least 100 Megabits per second, Mbps) and to bring the remaining 15% at least a broadband connection, i.e. a connection that allows downloading at a speed of 30 Mbps, using fibre instead of copper.

Overview of Rural and Mountain Connectivity Iceland

The overall situation of electronic communication systems in Iceland can be regarded to be pretty good. The island is only habited on the coastline and on the lowland and that’s where the most companies and homes are located. They have good access to various kinds of tele- and electronic communications. This means that all distance learning facilities in Iceland are quite good. But the island's landscape, with its steep mountains and narrow fjords, do affect the transmission capacity and coverage of the service in some areas, especially the highlands where no one lives but a lot of people like to visit. This situation, lack of full coverage mostly affects travellers and is a big safety issue. The quality of electronic communications in the habitable areas varies between places and some areas are more vulnerable to hazardous weather conditions than others but the construction of optical fibre throughout the country is an ongoing project.

The Icelandic government has recently passed a law (2022) on telecommunications that contribute to the necessary ongoing development and development of the electronic communications market. The goals of the new law on electronic communications include more active competition, more cost-effective investments, the spread of high-speed networks, fibre optic cables and user access to high-quality telecommunications services at an affordable price.

These new laws have already made a difference regarding better

telecommunication service on the highlands of Iceland after a partnership was established between Neyðarlínna (Icel. rescue phone) and the mobile companies Nova, Vodafone and Síminn. This is an important and timely project where relevant parties have joined forces to ensure a good mobile phone connection in remote places in Iceland. This creates increased security, as it will be possible to contact the emergency number 112 as well as other telephone numbers more widely. This is possible through the cooperation of the parties mentioned that use the so-called MOCN technology, (e. Multi-Operator Core Networks) where the same transmitter can connect to the core systems of all the mobile companies and electronic transmitters, and frequencies in remote locations are thus shared.

https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2022/06/16/Ny-log-um-fjarskipti-samthykkt-a-Althingi/

Registered telecommunications companies in Iceland are quite a few, see the following link.

https://www.fjarskiptastofa.is/english/telecom-affairs/register-of-operators/

The Electronic Communications Office of Iceland (ECOI) is responsible for the administration of electronic communications and network security in Iceland. And the wholesale telecommunications market company *Míla*, builds and operates telecommunications infrastructure nationwide. Míla's fibre optic network is open to all companies that provide electronic communications services in Iceland and the

potential speed that Míla's customers can offer to their users in the Capital region via Fiber Optic Mile is 100 Mbps and 500 Mbps. Since February 1, 2017, 1 Gb/s has also been available on Míla's Fiber Optic. Míla is also building urban optical networks across the country that will serve residents and ensure high-speed connectivity. Míla's fibre optic cable and Míla's Light Network will in the years to come be responsible for providing all with access to high-speed connectivity in a comprehensive manner that Mílas's trunk pipes are responsible for connecting to the outside world.

https://www.mila.is/um-milu/frettasafn/uppbygging-fjarskipta-a-islandi

In the ECOI statistics report on the Icelandic electronic communications market for 2020 – 2022 some of the key statistics are the following:

The total number of mobile subscriptions increases between years ('20 – '22), or by 5.0%. There is an increase in the number of contractual subscriptions, however, the number of pre-paid subscriptions decreases. The number of minutes from mobile phones was 1.144 million minutes in 2022, compared to the previous year around 1.137 million minutes, making the increase in minutes between years only around 0.6%.

The number of M2M (Machine-to-Machine) cards on mobile networks decreased between years, from 1,179,191 to 724,095 cards at the end of 2022, but these are mobile cards where devices communicate automatically with other devices.

The volume of data on mobile networks continues to increase although the increase has decreased by 23% between years and, as in previous years, the increase is in connection with the introduction of 4G and 5G. In mobile networks, relatively more data volumes are used on telephones than on other devices exclusively for data use, such as tablets or 4G and 5G network equipment.

The number of Internet connections increased slightly between years, but there is a sharp increase in fibre optic connections alongside a decrease in xDSL connections, by the end of 2022 fibre connections accounted for 82% of all internet connections, and the number of fibre connections is now around 117 thousand connections.

The total data volume on the fixed network increased by more than 12% between years and is about 90% of the data volume for downloads and 10% for uploads.

Subscribers with TV over IPTV were 79,968 at the end of 2022, up from 84,798 the previous year, a decrease of almost 6% from the previous year.

Turnover in the telecommunications market increased in 2022, revenues from home telephones and other revenues were declining, while revenues from fixed networks, mobile telephony, data transmission and Internet services, television services and other media were rising.

Investment in the telecommunications market is mainly in a fixed network, inter alia, due to the construction of fibre and mobile telephony.

As Iceland being an island, telecommunication for ship and aeroplane communication is also very important.

GMDSS (Global Maritime and Safety System) stands for global emergency and safety system for seafarers. This is what ships' emergency communications are based on and is under the supervision of ECOI as well as licence for all radio equipment on board all aircrafts.

https://www.fjarskiptastofa.is/fjarskiptastofa/fjarskiptainnvidir/skipa-og-flugfjarskipti/

The broadband connectivity in the region of FAS is that everyone has available broadband in excess of 30 Mbit/s up to approx 1.5 Gbit/s through either xDSL, fiber optic or 3-5G service, even multiple options for each.

Overview of Rural and Mountain Connectivity Greece

The mountainous regions of Greece lag significantly in broadband connectivity. According to the 2011 census of the Hellenic Statistical Authority (ELSTAT), in the mountainous regions of Greece, only 24% of households had an internet connection. In comparison, lowland areas and semi-mountainous areas had respective rates of around 50% and 40% (Table 1).

Table 1. Population, age group over 65, households, and households without an internet connection by mountainous geographical groups based on the 2011 census (source of data: ELSTAT)

areas	**Non mountainous**		**Semi mountainous**		**Mountainous**	
	N	%	N	%	N	%
population	7861415	74.4	1961039	18.6	746127	7.1
age group 65+	1490072	19.0	404395	20.6	214173	28.7
households	2843932	77.5*	622601	17.0*	204233	5.6*
households without internet connection	1518905	53.4*	356794	57.3*	155403	76.1*

*Percentage of total geographic group

From 2011 until today, there has been a strong consolidation of household internet connections across Europe. However, Greece has taken the smallest steps and is still among the last places when it comes to households' internet connectivity. For 2022, while the average in the European Union was almost 93% (households connected to the internet), in Greece that percentage was 85%, according to Eurostat (Table 2).

Table 2. Percentage of households with internet connection for some EU countries in 2011 and 2022 (source of data: Eurostat)

Country	**2011**	**2022**
Norway	92.24	99.01
Ireland	78.12	93.66
Euro area (EA11-1999, EA12-2001, EA13-2007, EA15-2008, EA16-2009, EA17-2011, EA18-2014, EA19-2015, EA20-2023)	73.58	92.67
European Union - 27 countries (from 2020)	71.55	92.48
Italy	61.57	91.45
Germany (until 1990 former territory of the FRG)	83.25	91.41
Bulgaria	45	87.31
Croatia	61.41	85.52
Greece	50.17	85.49

There are a few reasons why the phenomenon may be due. Firstly, mountainous areas are characterized by an aging population, of which most people are not familiar with the use of the internet. According to the ELSTAT census of 2011, almost 30% of the population in the mountainous regions was over 65 years old (Table 1), while in the lowlands this percentage was below 20%. Also, as can be seen from figure 1, in general, the age distribution in the mountainous areas of Greece is weighted towards the older ages, which suggests an increase in the aging population is more likely in the future. Also, given the general population decline in mountainous areas in recent years, the proportion of elderly people is expected to increase further.

Figure 1. Age distribution of the population in the mountainous regions of Greece (source of data: ELSTAT)

Another reason may be the lower household income in the mountainous regions of Greece. Research has shown that a household is more likely to 'go online' as household income increases, both in rural and urban areas (Michailidis et al, 2011). In Greece, the vast majority of mountainous areas are rural areas. As a result, household income is relatively lower compared to the national average. Panagiotopoulos (2021) report that household income in mountainous areas of Greece is about 10% lower than that of non-mountainous areas.

Finally, the telecommunication infrastructure lags significantly in the rural areas of Greece (Anastasiou et al., 2021) and by extension in most mountainous areas. Telecom companies are reluctant to invest in areas with low demand, resulting in poor quality internet service in most mountainous areas. This phenomenon in turn prevents users from investing in Internet services for their businesses and possibly prevents businesses where the Internet is necessary from setting up in mountainous areas.

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