



# **Digital Economy and Society Index (DESI) 2022**

**Ireland**

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## About the DESI

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*Since 2014, the European Commission has monitored Member States' progress in digital and published annual Digital Economy and Society Index (DESI) reports. Each year, the reports include country profiles, which help Member States identify areas for priority action, and thematic chapters providing an EU-level analysis in the key digital policy areas. The DESI Index ranks Member States according to their level of digitalisation and analyses their relative progress over the last five years, considering their starting point.*

*The Commission has adjusted DESI to align it with the four cardinal points set out in the Commission proposal for a decision '[Path to the Digital Decade Policy Programme](#)' which is being negotiated by the European Parliament and the Council. The proposal sets targets at EU level to be reached by 2030 to deliver a comprehensive and sustainable digital transformation across all sectors of the economy. Of the DESI 2022 indicators, 11 measure targets set in the Digital Decade. In the future, the DESI will be aligned even more closely with the Digital Decade to ensure that all targets are discussed in the reports.*

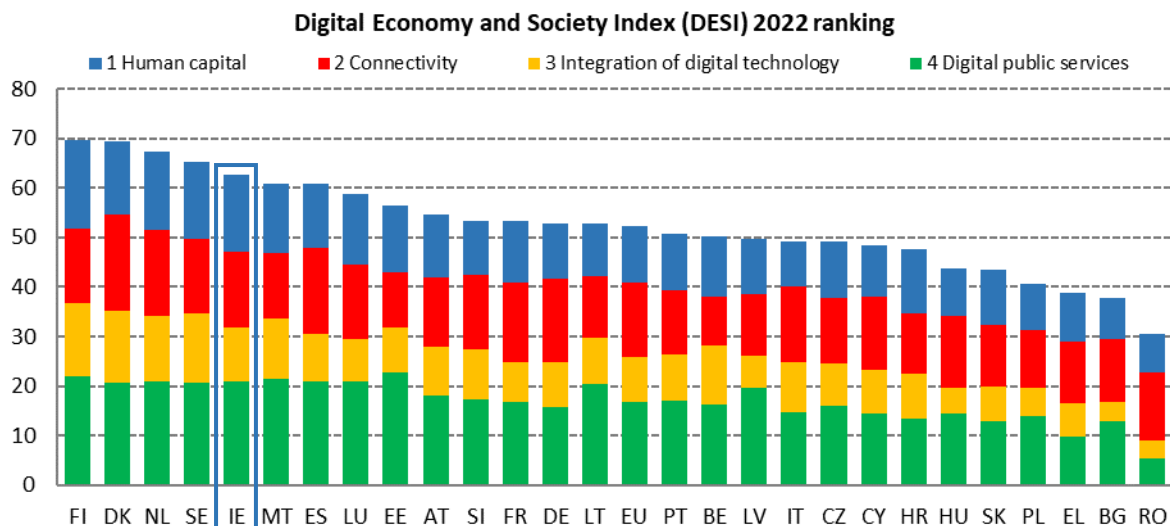
*To date, digitalisation in the EU is uneven, although there are signs of convergence. While the frontrunners have remained unchanged, there is a substantial group of Member States that cluster around the EU average. Importantly, the majority of Member States that had a lower level of digitalisation 5 years ago, are progressing at a faster pace than the rest, indicating an overall convergence in digital in the EU.*

*Reaching the Digital Decade targets depends on a collective effort by all. Each Member State will contribute to this ambitious goal from a different starting point, determined by resources, comparative advantages and other relevant factors such as the population size, the scale of the economy and the areas of specialisation. For example, Member States with large economies or populations will need to perform well to enable Europe as a whole to reach the targets by 2030. Digital frontrunners will need to continue progressing to lead on digitalisation worldwide, while all Member States' digitalisation efforts will be driven by their economic and societal needs.*

*The DESI scores and rankings of previous years are re-calculated for all Member States to reflect changes in the underlying data. For further information, see the [DESI website](#).*

## Overview

	Ireland		EU
	rank	score	score
DESI 2022	5	62.7	52.3



Ireland ranks 5<sup>th</sup> of the 27 EU Member States in the 2022 edition of the Digital Economy and Society Index (DESI). Ireland's average yearly relative growth of its DESI score between 2017 and 2022 is approximately 8.5%<sup>1</sup>, one of the highest in the EU. Ireland performs well regarding the human capital dimension, as the share of people with basic digital skills and digital content creation skills, as well as the share of ICT specialists, including female ICT specialists, is above the EU average. Ireland is a top performer for mobile broadband take-up and scores well for fixed broadband take-up, yet the take-up for at least 100 Mbps fixed broadband and at least 1 Gbps, although increasing steadily, is lower than the EU average. Despite the stagnating 5G spectrum assignments, the 5G coverage has increased significantly and is above the EU average. While enterprises in Ireland take advantage of some digital technologies (for example, social media, big data and cloud), other such technologies are not so widespread (for example, Artificial Intelligence (AI), electronic information sharing and e-invoices). The public services provided to businesses and citizens in Ireland are highly digitalised and a large proportion of internet users engage actively with e-government services.

On 1 February 2022, the government launched a new [National Digital Strategy, 'Harnessing Digital – The Digital Ireland Framework'](#). The strategy supports Ireland's goal of becoming a leader in European and global digital developments, while also placing a strong emphasis on inclusiveness, (cyber)security and safety. The strategy is aligned with EU priorities under the Commission proposal for a Decision ['Path to the Digital Decade'](#). It includes sections covering four dimensions: digital transformation of business, digital infrastructure, skills, and digitalisation of public services. It is also aligned with national priorities, under Ireland's [2021 Economic Recovery Plan](#) and Ireland's Recovery and Resilience Plan (RRP).

Ireland can be considered a forerunner in the EU on the integration of digital technologies, and as such is expected to make a significant contribution to the collective efforts needed to reach the Digital

<sup>1</sup> Refer to section 1.3 of the DESI 2022 horizontal chapter.

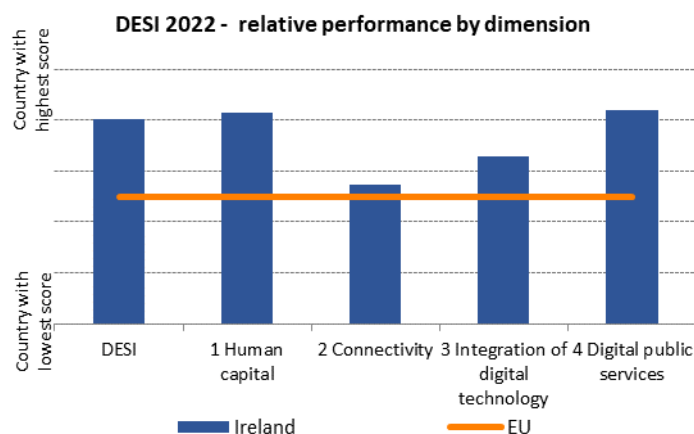
Decade targets, in particular those for adopting digital technologies and for support to unicorns (a start-up company with a valuation of over USD 1 bn). At the same time, Ireland’s own ambition is to keep up with the most digitally advanced nations in the world. Therefore, the country’s performance will need to keep improving to reach some of the more ambitious targets.

Ireland is committed to achieving the target of 80% of adults having at least basic digital skills by 2030, as well as increasing the number of graduates with high-level digital skills by 65% to over 12 400 by the end of 2022 aiming to further increase this number over the coming years. To this end, Ireland is taking measures across the entire system, from schools to further education and training, higher education, and lifelong learning in general. Ireland adopted a new [10-year Adult Literacy, Numeracy and Digital Literacy Strategy](#) in 2021 and a new [Digital Strategy for Schools to 2027](#) was published in April 2022. Moreover, as of 2022, indicators used to observe the demand of high-level ICT skills have been monitored in real time to ensure responsiveness in provision of appropriate education and training.

Ireland has set ambitious targets for connectivity in its National Digital Strategy. It is committed to ensuring that all households and businesses are covered by a Gigabit network by 2028 and that all populated areas are covered by 5G by 2030. To achieve these targets, further efforts are necessary to accelerate the implementation of Ireland’s [National Broadband Plan \(NBP\)](#). It is also important that the remaining 5G spectrum is awarded without further delay and that Ireland finalises the transposition of the [European Electronic Communications Code \(the EECC\)](#).

Ireland is making sustained efforts to support enterprises in their digitalisation efforts. The aim is to increase the use of cloud computing, big data and AI to ensure that 75% of all enterprises take them up by 2030. For example, Ireland appointed an AI ambassador to promote awareness of the advantages of AI. Ireland also strives to ensure that 90% of small and medium-sized enterprises (SMEs) have a basic level of digital intensity by 2030. For example, Ireland has recently launched a new Digitalisation Voucher to help enterprises make use of digital tools. In addition, through dedicated programmes and funds Ireland is expected to contribute to the Digital Decade target of doubling the number of unicorns in the EU. Furthermore, Ireland continues to invest in cybersecurity, in particular through strengthening the capacities of the [National Cyber Security Centre \(NCSC\)](#).

Not only has Ireland set a target of 100% online provision of key public services, but it also aims to ensure that 90% of these services are actually used online by 2030. In addition, Ireland is taking measures to ensure that, by 2030, at least 80% of eligible citizens are using the digital identification solution [MyGovID](#). Ireland continues implementing the ‘once-only’ principle, promotes data sharing across the public sector (including through the [Data Governance Board](#) established in December 2021) and regularly involves stakeholders in the co-creation of digital public services. [Connecting Government 2030: A Digital and ICT Strategy for Ireland’s Public Service](#) was published in March 2022.



The NCSC is currently operating at a heightened state of preparedness as a result of Russia's invasion of Ukraine and resulting recent cyber incidents. The NCSC has contingency plans in place in case of an increase in tensions and is engaging bilaterally with key infrastructure operators across the government and the private sector. As part of a government-wide process, the NCSC has conducted a risk assessment regarding potential cyber activities. The NCSC has assessed that the potential direct risk to Ireland is low, however there is a moderate to high risk that second or third order effects of cyber action elsewhere could have a knock-on effect in Ireland. The government is engaging with EU partners on their risk assessments also to ensure that its own assessments meets international best practices.

The NCSC has also issued a number of guidance and support documents recently, including a Cyber Vitals checklist and a detailed Advisory Note in February 2022. The Advisory Note detailed a cyber-risk assessment and appropriate advice regarding Russia's invasion of Ukraine. The Cyber Vitals checklist offsets out the priority actions that can be taken during times of heightened cyber threats to assist its constituents in preparation. The NCSC held a series of briefings for government departments, public bodies, regulators and operators of essential services on latest developments in relation to unfolding events in Eastern Europe, including steps to be taken to secure network defences, and what to do if they were the victim of a cyber-attack.

#### **Digital in Ireland's Recovery and Resilience Plan (RRP)**

32% of Ireland's RRP is dedicated to accelerating and expanding the country's digital transformation<sup>2</sup>.

The plan envisages support to human capital development by providing high-speed broadband connectivity for primary schools and by funding the access to ICT infrastructure for schools. The plan also includes a reform project encompassing four measures designed to support the digital transformation of education in Ireland at all levels (school, tertiary, lifelong learning): (i) a new Digital Strategy for Schools; (ii) a new 10-year Adult Literacy, Numeracy and Digital Literacy Strategy; (iii) a measure to increase by 65% the number of graduates with high-level ICT skills; and (iv) a measure enabling further and higher education institutions to provide more than 20 000 laptops to disadvantaged students. These projects complement each other, mainstream essential digital skills and are aimed at addressing the digital divide and enhancing digital skills overall.

The plan sets out the building of a low-latency edge platform to maximise the benefit from 5G technologies.

The programme for digital transformation of enterprise in Ireland aims to enhance digitalisation of business and it is expected that by the third quarter of 2022 at least two European Digital Innovation Hubs will have been established.

The national grand challenge programme aims to incentivise and facilitate researchers and innovators to employ research, development and innovation approaches to tackle national and global societal challenges in support of green transition and digital transformation objectives.

<sup>2</sup> Each recovery and resilience plan has to dedicate at least 20% of the plan's total allocation to digital objectives. To this end, the plans had to specify and justify to what extent each measure contributes fully (100%), partly (40%) or has no impact (0%) on digital objectives, using Annex VII of the RRF Regulation. Combining the coefficients with the cost estimates of each measure allows assessing to what degree the plan contributes to digital objectives and whether it meets the 20% target.

The plan also sets out the development of a shared government data centre, an investment in digital capacities, which is also aimed at reducing greenhouse emissions.

Digital public services are also covered in the plan by developing an online response option for the population census and deploying a suite of eHealth projects (ePharmacy and integrated financial management system).

# 1 Human capital

1 Human capital	Ireland		EU
	rank	score	score
DESI 2022	3	62.6	45.7

	Ireland		EU	
	DESI 2020	DESI 2021	DESI 2022	DESI 2022
<b>1a1 At least basic digital skills</b> % individuals	NA	NA	70% 2021	54% 2021
<b>1a2 Above basic digital skills</b> % individuals	NA	NA	40% 2021	26% 2021
<b>1a3 At least basic digital content creation skills<sup>3</sup></b> % individuals	NA	NA	77% 2021	66% 2021
<b>1b1 ICT specialists</b> % individuals in employment aged 15-74	4.9% 2019	5.7% 2020	6.3% 2021	4.5% 2021
<b>1b2 Female ICT specialists</b> % ICT specialists	21% 2019	21% 2020	20% 2021	19% 2021
<b>1b3 Enterprises providing ICT training</b> % enterprises	31% 2019	27% 2020	27% 2020	20% 2020
<b>1b4 ICT graduates</b> % graduates	7.9% 2018	7.8% 2019	8.6% 2020	3.9% 2020

Ireland ranks 3<sup>rd</sup> of the EU's 27 countries on human capital and is thus among the top performers in the EU. Ireland scores above the EU average on all three indicators measuring the basic digital and basic digital content creation skills of the population. 70% of people have at least basic digital skills, 40% have above basic digital skills, and 77% have at least basic digital content creation skills, compared to the EU average of 54%, 26% and 66% respectively. Ireland scores above the EU average on the indicators measuring the share of female ICT specialists and ICT specialists. The proportion of ICT graduates (8.6%) is significantly higher than the EU average (3.9%), yet 53% of enterprises reported hard-to-fill vacancies for jobs requiring ICT specialist skills (the EU average is 55.4%)<sup>4</sup>. Despite this, only 27% of enterprises offer ICT training to their employees.

To respond to the digitalisation needs, Ireland continues its action to boost digital skills across the entire education system: schools, further education and training (FET), higher education, and lifelong learning in general. This primarily encompasses: (i) a new [Digital Strategy for Schools to 2027](#); (ii) 2017-2026 [STEM Education Policy Statement](#); (iii) [Technology 2022 Ireland's Third ICT Action Plan](#); (iv) [Springboard+](#) and the [Human Capital Initiative](#) (HCI Pillar 1); (v) 2021-2025 [Action Plan for Apprenticeship](#); (vi) FET Authority's (SOLAS) initiatives; (vii) [Skillnet Ireland](#)<sup>5</sup> Programmes; and (viii) [eCollege](#), the FET online learning platform, which offers free online courses in areas such as computer programming, web and graphic design.

Ireland is rolling out a series of measures to achieve the target of 80% of adults having at least basic digital skills by 2030, set out in the National Digital Strategy, which is in line with the Digital Decade

<sup>3</sup> Break in series for indicators 1a1, 1a2 and 1a3. Figures are not comparable with those in earlier DESI reports.

<sup>4</sup> [Analyse one indicator and compare countries — Digital Scoreboard - Data & Indicators \(digital-agenda-data.eu\)](#).

<sup>5</sup> Skillnet Ireland is a business support agency of the government of Ireland, responsible for advancing the competitiveness, productivity and innovation of Irish businesses through enterprise-led workforce development.

targets. In September 2021, SOLAS launched a [10-year Adult Literacy, Numeracy and Digital Literacy Strategy](#) which includes commitments to (i) reduce the share of adults in Ireland without basic digital skills from 47% to 20%, (ii) roll out a major national literacy awareness campaign and (iii) set up a one-stop shop for all relevant information on literacy.

Ireland continues to implement the [National Further Education and Training \(FET\) Strategy 'Future FET: Transforming Learning' 2020-2024](#), which sets out a series of reforms within the FET sector to improve the existing capacity in the area of digital inclusion and the provision of digital skills. A wide variety of training programmes to boost digital skills in FET are provided by Education and Training Boards and offered through SOLAS's [Skills to Advance](#) (upskilling while in employment) and [Skills to Compete](#) (labour market activation) initiatives. In addition, in 2021, more than 20 000 laptops were provided to disadvantaged students in further and higher education.

To help address challenges stemming from COVID-19 restrictions, in 2020 SOLAS launched [Mitigating Against Educational Disadvantage Fund](#) (MAEDF) to provide funding to help FET learners who were educationally disadvantaged access and participate in community education. In 2021, the MAEDF was made available with over 600 projects funded.

The [Digital Skills for Citizens Grant Scheme](#), which focuses on providing people who are not online with the opportunity to gain basic skills, is due to conclude mid-2022, following the delivery of the training obligations for pre-funded grants.

Skillnet Ireland helps local SMEs to boost digital skills and prepare them for the digital transformation. For example, in February 2022, EUR 5 m investment was announced in new Skillnet Ireland initiative connecting Irish SMEs with global enterprises.

The new Digital Strategy for Schools to 2027 was published in April 2022. It builds on progress achieved under the Digital Strategy for Schools 2015-2020 with an even stronger focus on further embedding the use of digital technologies in all teaching, learning and assessment activities.

Furthermore, to help address the digital divide caused by the lack of access to ICT equipment, in November 2021 EUR 50 m funding was issued in a once off scheme to all primary, special and post-primary schools in the free education scheme, with a circular outlining the applicable criteria.

In addition, EUR 13.5 m was allocated to support a project whereby primary schools, in areas outside of the National Broadband Plan Intervention Area and where commercial provision is insufficient, will be provided with high-speed connectivity of 100 Mbps or greater.

As labour demand towards advanced digital skills is becoming more pronounced, it is a priority for Ireland to develop more and diverse pathways in the school system, higher education and FET. This is a clear ambition in Ireland's RRP and the National Digital Strategy to increase the number of graduates with high-level digital skills by 65% to over 12 400 by the end of 2022, along with the aim of further increasing digital skills provision in the following years. This measure is aligned with the Digital Decade target of at least 20 million employed ICT specialists in the EU by 2030. In addition, as part of its 2022 work programme, the [Expert Group on Future Skills Needs](#)<sup>6</sup> has approved the undertaking of a regular real-time high-level ICT skills demand indicators study, to help keep pace with rapid technological change, to speed up responsiveness and to inform the provision of education and training.

To boost parity between women and men as ICT specialists, Skillnet Ireland provides dedicated upskilling programmes for women. For example, [Women ReBoot](#) has been helping women with tech sector skills and career experience to (re-)join the tech sector since 2018. In addition, [Women](#)

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<sup>6</sup> Expert Group on Future Skills Needs under Department of Enterprise, Trade and Employment is the chief advisory body on the current and future skills needs of Ireland's economy.



[TechStart](#) aims to equip women with tech sector skills and since 2019 has been providing specialist training and career development support. The [Digital Women's Leadership Programme](#), developed by [itag Skillnet](#)<sup>7</sup> in 2021, aims to encourage and increase the number of women leaders within the tech sector. These programmes will continue to be delivered in 2022.

To support science, technology, engineering, and maths education and public engagement initiatives, in December 2021, [Science Foundation Ireland](#)<sup>8</sup> (SFI) approved funding to 48 projects, with a total investment of EUR 3 862 134, which will run in 2022.

The [Irish Digital Skills & Jobs Coalition](#) was among the first European coalitions to receive a grant to develop a generic services platform website, fully interoperable with the core service platform, the [EU Digital Skills and Jobs Platform](#). The two platforms were connected in 2021. Ireland participated in EU Code Week 2021 with 147 activities with over 7 600 participants taking part, 55% of whom were women.

While technological change is advancing rapidly, Ireland is committed to ensuring that the education and training system responds in good time to emerging high-level ICT needs trends. More generally, on basic digital skills development, having a lifelong learning policy is critical to meeting the 80% basic digital skills target for 2030.

#### **Highlight 2021-2022 - Digital Strategy for Schools to 2027**

A new [Digital Strategy for Schools to 2027](#) was published in April 2022. It builds on the 2015-2020 Digital Strategy for Schools and has even a stronger focus on further embedding the use of digital technologies in all teaching, learning and assessment activities including the further development of digital skills and building awareness and knowledge around the safe and ethical use of the internet.

This will be achieved by (i) the ongoing investment to improve the provision of digital infrastructure, connectivity and digital equipment in schools, (ii) the continued provision of high quality digital content for use by teachers in the classroom, (iii) supporting schools and school leaders to further embed effective digital capacity planning and development, and (iv) enhancing key skills development of teachers to ensure a digitally competent and confident teaching workforce which in turn will support the development of digital literacy skills in student population.

The new Digital Strategy for Schools to 2027 will be financed with a further EUR 200 m investment under Ireland's National Development Plan.

<sup>7</sup> itag Skillnet is a business network for companies of all sizes in the technology sector in the West, North West and Mid West Regions.

<sup>8</sup> SFI is a national foundation for research.

## 2 Connectivity

2 Connectivity	Ireland		EU
	rank	score	score
<b>DESI 2022</b>	<b>6</b>	<b>61.5</b>	<b>59.9</b>

	Ireland		EU	
	DESI 2020	DESI 2021	DESI 2022	DESI 2022
<b>2a1 Overall fixed broadband take-up</b> % households	<b>76%</b> 2019	<b>78%</b> 2020	<b>80%</b> 2021	<b>78%</b> 2021
<b>2a2 At least 100 Mbps fixed broadband take-up</b> % households	<b>25%</b> 2019	<b>31%</b> 2020	<b>37%</b> 2021	<b>41%</b> 2021
<b>2a3 At least 1 Gbps take-up</b> % households	<b>0.26%</b> 2019	<b>3.52%</b> 2020	<b>4.27%</b> 2021	<b>7.58%</b> 2021
<b>2b1 Fast broadband (NGA) coverage</b> % households	<b>96%</b> 2019	<b>96%</b> 2020	<b>96%</b> 2021	<b>90%</b> 2021
<b>2b2 Fixed Very High Capacity Network (VHCN) coverage</b> % households	<b>35%</b> 2019	<b>83%</b> 2020	<b>89%</b> 2021	<b>70%</b> 2021
<b>2b3 Fibre to the Premises (FTTP) coverage</b> % households	<b>35%</b> 2019	<b>48%</b> 2020	<b>62%</b> 2021	<b>50%</b> 2021
<b>2c1 5G spectrum</b> Assigned spectrum as a % of total harmonised 5G spectrum	<b>29%</b> 04/2020	<b>29%</b> 09/2021	<b>29%</b> 04/2022	<b>56%</b> 04/2022
<b>2c2 5G coverage<sup>9</sup></b> % populated areas	<b>NA</b>	<b>30%</b> 2020	<b>72%</b> 2021	<b>66%</b> 2021
<b>2c3 Mobile broadband take-up</b> % individuals	<b>81%</b> 2018	<b>81%</b> 2018	<b>98%</b> 2021	<b>87%</b> 2021
<b>2d1 Broadband price index</b> Score (0-100)	<b>45</b> 2019	<b>63</b> 2020	<b>59</b> 2021	<b>73</b> 2021

With an overall connectivity score of 61.5 Ireland ranks 6<sup>th</sup> among EU countries.

For fixed networks, there was a steady growth in 2021 of Very High-Capacity Network (VHCN) coverage, increasing from 83% to 89%, while the take-up for at least 1 Gbps services remains low. The Fibre to the Premises (FTTP) coverage has increased little from 48% in 2020 to 62% in 2021 which is above the EU average of 50%. In rural areas the increase more than doubled from 20.6% to 43.1%. Looking at Next Generation Access (NGA), rural areas are covered almost to the same extent as non-rural areas with 93.5% and 96.4%, respectively. The fixed broadband take-up slightly increased, with 80% of all households subscribing to a fixed internet access, slightly above the EU average of 78%. However, only 37% of households availed of at least 100 Mbps fixed broadband take-up, below the EU average of 41%. Most notably, at least 1 Gbps take-up is very slow in Ireland with only 4.27% compared to the EU average of 7.58%.

There have been particularly noteworthy developments regarding VHCN. There were just under 372 000 FTTP broadband subscriptions in Ireland, representing an increase of 49.65% from the fourth quarter of 2020 to the fourth quarter of 2021. This increased take-up follows the rolling out of FTTP by SIRO, National Broadband Ireland (NBI) and Eircom. In November 2021, SIRO announced

<sup>9</sup> The 5G coverage indicator does not measure users' experience, which may be affected by a variety of factors such as the type of device used, environmental conditions, number of concurrent users and network capacity. 5G coverage refers to the percentage of populated areas covered by at least one operator as reported by operators and national regulatory authorities.

investments of EUR 620 m, which makes it possible to expand its roll-out from 410 000 premises across 64 towns to eventually pass 770 000 premises across 154 towns.

Ireland's NBP is aligned with the Digital Decade, as well as with the 2025 Gigabit Society's objectives but its implementation is delayed. At this current pace, Ireland will not achieve the 2025 targets as delays have affected the implementation of the NBP. The Department of the Environment, Climate and Communications (the Department) has worked closely with NBI to put in place a remedial plan for 2021 to address the impacts of the COVID-19 pandemic on the project. According to a remedial plan to address COVID-19 related delays which was agreed with the Department in April 2021, NBI was to have almost 60 000 premises passed and available for immediate connection by the end of 2021. NBI is actively working with its network and build partners to address these issues as they arise. As of 1 April 2022, the number of premises passed was over 41 000 while over 62 000 premises could order or pre-order a service across 22 counties. For more than 124 800 premises build is underway demonstrating the project is reaching scale. An Updated Interim Remedial Plan which will recalibrate the targets for 2022 and beyond to take account of the knock-on effects of the COVID-19 pandemic and other delays, with a revised target of 102 000 premises passed by the end of January 2023. The NBP roll-out is currently a 7-year plan under the contract and deployment is due to be completed by the end of 2026. The final goal for the NBI roll-out is still set to reach approximately 544 000 premises.

Ireland ranks 20<sup>th</sup> among the EU Member States on the indicator 5G spectrum, which has stagnated at 29% (the EU average is 56%). The low ranking on the indicator 5G spectrum is due to the lack of spectrum assignments. The still ongoing spectrum award process was launched by the Commission for Communications Regulation (ComReg) back in April 2021, with the [publication](#) of the Multi Band Spectrum Award – Information Memorandum and Draft Regulations for the 700 MHz, 2.1 GHz, 2.3 GHz and 2.6 GHz bands. ComReg will award in total 470 MHz of spectrum using the combinatorial clock auction format<sup>10</sup>. This sets out the timeline but does not currently indicate an end date for the process. Ireland would benefit from finalising the spectrum assignment process without further delay.

Despite the above lack of 5G spectrum assignment, the 5G coverage in the populated areas has increased sharply to 72% compared with the EU average of 66%. The three mobile network operators (MNOs) – Vodafone, Eir and Three – have published the following up-to-date figures for their 5G roll-out: (i) Vodafone is running commercial 5G services in five cities (Dublin, Cork, Limerick, Waterford and Galway); (ii) Eir's 5G network currently covers 322 towns and cities in all 26 counties of the Republic of Ireland, with the enterprise claiming to reach over 70% of the population; and (iii) Three claims to reach 79% of the population. There were 392 000 5G subscribers (i.e. a subscriber who accessed a 5G network at least once in the quarter) in Ireland at the end of the fourth quarter of 2021, this is equivalent to 4.9% of the mobile subscriptions excluding mobile broadband (dongles) and machine to machine (M2M).

During 2021, Ireland ranked first among the EU Member States for the uptake of mobile broadband with 98%. Due to the extraordinary situation with the COVID-19 pandemic, ComReg assigned temporary spectrum rights in the 700 MHz and 2.1 GHz bands to three MNOs, between 9 April 2020 and 1 April 2022. Provision was made for a further temporary licensing framework beyond 1 April 2022. Under the Wireless Telegraphy (Further Temporary Electronic Communications Services Licences) (No.4) Regulations 2021 ([S.I. No. 138 of 2022](#)), made on 28 March 2022, further licences were granted for a period of three calendar months and ComReg may renew these licences for a further period of up to 1 October 2022.

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<sup>10</sup> I.e. a clock auction where bidders can make sealed bids for combinations of spectrum lots across different bands.

### Main market & regulatory developments

According to the Irish national regulatory authority ComReg, the fixed broadband market has been very stable with very little change in the providers' market share between the third quarter of 2020 and the third quarter of 2021 with the most notable being Eir's share falling from 30.3% to 28.2%.

ComReg notified the Commission ([Case IE/2021/2344](#)) about the pricing of access to civil engineering within the market 3a for 'wholesale local access provided at a fixed location' in Ireland. The Commission has examined the notification and additional information provided by ComReg and believes that the notified draft measure affects trade between Member States and falls within the scope of Article 33(1) of the [EECC](#). The Commission has expressed serious doubts as to whether the notified draft measure complies with EU law and believes that it creates barriers to the internal market.

ComReg notified the Commission (Case IE/2021/2343) about market 3b 'wholesale central access provided at a fixed location for mass-market products' in Ireland. The Commission examined the notification and the additional information provided by ComReg and had no comments.

ComReg has found that the urban Wholesale Central Access (WCA) market is competitive and therefore proposed to lift regulation in this market within a sunset period of 6 months. As regards the regional WCA market, ComReg confirmed the regulatory obligation imposed in the market review of 2018, imposing on Eircom the obligations of: (i) access, (ii) transparency, (iii) non-discrimination, (iv) accounting separation, (v) cost accounting and (vi) price control. In accordance with Article 32(9) of the EECC, ComReg may adopt the draft. The transposition of the EECC is still ongoing and infringement proceedings have been initiated ([INFR\(2021\)0054](#)) due to non-communication. On 23 September 2021, the Reasoned Opinion was sent to Ireland and on 6 April 2022, the case was referred to the European Court of Justice. The EECC will be transposed by both primary and secondary legislation. On 14 December 2021, the government approved the General Scheme primary legislation, which will also provide ComReg with enhanced enforcement powers. It is expected to be introduced into the Oireachtas (Irish Parliament) in 2022. The accompanying secondary legislation is at an advanced stage of readiness and will accompany the primary legislation.

Between 1 January 2021 and 31 October 2021, a total of 2 917 complaints were reported by ComReg's Consumer Line from residential and business customers. This is an overall decrease of 61% compared with the total number of complaints reported by ComReg's Consumer Line from the same type of customers in the same period in 2020 (7 547). The complaints being reported to ComReg mainly arise from (a) customer service issues associated with one large service provider and (b) the critical nature of electronic communications services in enabling consumers to continue working effectively in a remote environment.

Regarding caller location information for emergency calls, the Advanced Mobile Location (AML) functionality for emergency SMS on IOS devices has been released by Apple and is now available in Ireland.

It is very encouraging that Ireland's NBP is aligned with the 2025 Gigabit Society, as well as the Digital Decade's objectives. However, it is very important that Ireland addresses the delayed roll-out of the NBP in order to achieve the Gigabit Society's targets, which will not otherwise be reached by 2025.

Overall, Ireland performs very well in mobile broadband take-up (1<sup>st</sup> place among the EU Member States) and the 5G coverage is above the EU average, but it scores very low on the indicator 5G spectrum; it is therefore important that the remaining 5G spectrum is awarded without further delay.

Moreover, it is important for Ireland to accelerate its efforts to reach the targets of the 2025 Gigabit Society and the Digital Decade.

Furthermore, it is important that the EECC's transposition is finalised to: (i) ensure a more consistent internal market approach to radio spectrum policy and management, (ii) deliver conditions for a true internal market by tackling regulatory fragmentation, (iii) protect consumers effectively, (iv) provide a level playing field for all market players, (v) make sure rules are applied consistently, and (vi) provide a more effective regulatory institutional framework.

## 3 Integration of digital technology

3 Integration of digital technology	Ireland		EU
	rank	score	score
DESI 2022	7	43.3	36.1

	DESI 2020	Ireland DESI 2021	DESI 2022	EU DESI 2022
<b>3a1 SMEs with at least a basic level of digital intensity</b> % SMEs	NA	NA	64% 2021	55% 2021
<b>3b1 Electronic information sharing</b> % enterprises	28% 2019	28% 2019	24% 2021	38% 2021
<b>3b2 Social media</b> % enterprises	44% 2019	44% 2019	32% 2021	29% 2021
<b>3b3 Big data</b> % enterprises	20% 2018	23% 2020	23% 2020	14% 2020
<b>3b4 Cloud</b> % enterprises	NA	NA	47% 2021	34% 2021
<b>3b5 AI</b> % enterprises	NA	NA	8% 2021	8% 2021
<b>3b6 ICT for environmental sustainability</b> % enterprises having medium/high intensity of green action through ICT	NA	67% 2021	67% 2021	66% 2021
<b>3b7 e-Invoices</b> % enterprises	20% 2018	19% 2020	19% 2020	32% 2020
<b>3c1 SMEs selling online</b> % SMEs	35% 2019	32% 2020	33% 2021	18% 2021
<b>3c2 e-Commerce turnover</b> % SME turnover	29% 2019	27% 2020	22% 2021	12% 2021
<b>3c3 Selling online cross-border</b> % SMEs	18% 2019	18% 2019	11% 2021	9% 2021

Ireland ranks 7<sup>th</sup> of the 27 EU countries and is thus above the EU average. The use of digital technologies is reasonably widespread among the enterprises in Ireland, which take advantage of social media, big data and cloud. Enterprises score just over the EU average of 66% on the ICT for environmental sustainability indicator. While AI use is as high as the EU average, Ireland underperforms in electronic information sharing (24% versus the EU average of 38%) and the use of e-invoices (19% versus the EU average of 32%). SMEs integrate digital technology relatively well. For example, 64% of SMEs have at least a basic level of digital intensity and the proportion of SMEs selling online increased slightly in 2021 (from 32% to 33%). In addition, although in 2021 the performance of SMEs on e-commerce turnover and online cross-border sales decreased sharply from 27% to 22% and from 18% to 11% respectively, Ireland still scores above the EU average for these indicators.

In April 2021, Ireland signed [the Joint Declaration on the European Initiative on Processors and Semiconductor Technologies](#), showing its commitment to industry and innovation. This could contribute to the Digital Decade target of the EU achieving 20% of the world production value in semiconductors. The Declaration also set out the intention to roll out a second Important Project for Common European Interest (IPCEI) on Microelectronics. Discussions are currently ongoing on including one Irish proposal in this IPCEI.

Through the National Digital Strategy, Ireland's RRP, and the SME and Entrepreneurship Growth Plan that was published in January 2021, Ireland intends to further accelerate digitalisation across

enterprises, in particular SMEs, with an emphasis on cloud computing, big data and AI. The target of 75% of enterprises using cloud, big data and AI by 2030 and the target of 90% of SMEs having a basic level of digital intensity by 2030, as set out in the National Digital Strategy are in line with the Digital Decade targets.

The government set up a Digital Transition Fund (DTF) worth EUR 85 m running from 2022 until 2026 to support around 800 enterprises, especially SMEs, in their digital transformation. This concerns, for example, the digitalisation of processes and products or the use of digital technologies to develop new business models, in order to boost enterprises' competitiveness and export potential. Ireland also committed to establishing several European Digital Innovation Hubs (EDIH), to serve as a first stop for enterprises seeking upskilling, innovation, and advisory services in the areas of AI, high performance computing and cybersecurity, act as SME incubators and provide access to infrastructure, technologies and test beds. It is intended that one of the Irish EDIHs will specialise in AI. A competitive process to identify EDIH candidates has concluded and, further to the Commission's evaluation process<sup>11</sup>, it is anticipated that the Irish EDIH network will be operational in the third quarter of 2022.

Ireland plans to roll out an awareness-raising campaign to encourage all enterprises to digitalise, including a new digital portal open to all enterprises with information on available support. Scoping for that portal will be done during 2022 with input from the Enterprise Digital Advisory Forum with a view to launch in 2023. [Enterprise Ireland](#)<sup>12</sup> (EI) launched a [Digitalisation Voucher](#) support as part of the Temporary aid framework (with applications open until the end of the first half of 2022) to help enterprises prepare a plan for the adoption of digital tools and techniques. By 26 April 2022, EI had supported 227 SMEs. A new [Advanced Manufacturing Centre](#) that will provide state-of-the-art facilities for enterprises to develop new technologies is due to open in the third quarter of 2022. A National Clustering Policy and Framework is currently being developed to maximise the potential of clustering as a policy tool to fulfil national enterprise policy objectives including supporting the green and digital transition. In March 2022, the government also agreed to the development of a new White Paper on Enterprise Policy. This is motivated by a number of factors including: the effects of the pandemic; geopolitical developments and changes in the international trading environment which may not be to Ireland's advantage; vulnerabilities in Ireland's enterprise sector and wider economic model; and the need to integrate climate change commitments into enterprise policy over the decade ahead. Given that clustering policy will likely be central to any updated enterprise policy, these pieces of work will be aligned and are due for delivery by the end of 2022.

Ireland continues to implement the [National AI Strategy](#), launched in July 2021. An AI ambassador has been appointed to help increase public trust in AI and promote awareness of the advantages of AI. To accelerate the adoption of digital technologies (including cloud, big data, and AI), the government has established an Enterprise Digital Advisory Forum that includes government and industry representatives, as well as the AI ambassador. A [Top Team on Standards for AI](#) continues its involvement in developing the AI standards.

The National Digital Strategy includes a target to ensure that at least 35% of State funding for start-up and early-stage enterprises is invested in innovative digital businesses from 2022, with the ambition of nurturing potential digital unicorns, which could in turn contribute to the Digital Decade target of doubling the number of unicorns in the EU.

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<sup>11</sup> Two Irish EDIH proposals have a successful evaluation result, i.e. are invited for grant agreement preparation (which is not a formal commitment for funding). Two additional proposals have received a Seal of Excellence.

<sup>12</sup> Enterprise Ireland is an agency responsible for the development and growth of Irish enterprises in world markets.

In addition to support via the DTF and EDIHs, further support available through the network of [Local Enterprise Offices](#) (LOF) and EI could also help achieve the target of doubling the number of unicorns. The LOF network supports the development of unicorns through [Priming Grants](#) (available to micro enterprises within the first 18 months of starting up; this is the first financial support provided in the development of unicorns) and the [Start Your Own Business Programme](#) (guides in business planning). EI supports the development of unicorns through (i) a EUR 500 m [Disruptive Technologies Innovation Fund](#) (on 8 November 2021, a fourth call for applications was launched), (ii) the [Innovative High Growth Potential Start-ups Fund](#) (helping high growth potential start-up companies with their start-up and development costs), (iii) the [Competitive Start Fund](#) (accelerating the growth of start-up companies that have the capacity and ambition to succeed in global markets) and (iv) the [Commercialisation Fund](#) (helping third-level researchers translate their research into innovative and commercially viable products, services and companies). Furthermore, in February 2022, an [Irish Innovation Seed Fund](#) worth EUR 90 m was announced. This fund will provide capital to innovative Irish start-up companies at their seed stage, in particular in areas such as regional development, climate change and female entrepreneurship.

SFI continues to fund six [SFI Centres for Research Training](#), bringing together research bodies and industry to develop innovation training programmes in data and ICT skills, and 16 [SFI Research Centres](#), dedicated to advanced research in areas which include AI, cloud computing, multimodal interaction, virtual/augmented reality, robotics, and the Internet of Things. To strengthen the research and innovation (R&I) system, a new National Strategy for R&I is currently being developed and publication is expected in the third quarter of 2022.

In 2021, SFI supported the Empower, a new academic and industry research programme, designed to future proof EU data flows and accelerate innovations in data protection internationally. This programme will develop systems to protect citizens and work to their advantage while streamlining data exchange in the European business ecosystem. This programme represents research of almost EUR 10 m focused on data platforms, data governance and ecosystems. It brings together multidisciplinary research in data governance from across the participating SFI Research Centres.

To help achieve the Digital Decade targets in digital infrastructure, it is expected that at least 18 nodes will have been deployed by the end of 2024. These nodes will be interconnected with a high-speed low-latency backbone and will connect with government and commercial datacentres and cloud providers to facilitate data processing at the appropriate location (edge nodes, regional nodes, or the cloud).

Ireland is a partner in the EU's Joint Transnational Co-funding ERA-NET on Quantum Technologies (QuantERA II). In 2021, Ireland allocated EUR 510 000 in funding to EuroHPC activities, in particular to support the EuroHPC Competence Centre (EuroCC) and other EuroHPC R&I projects pursued by [ICHEC](#)<sup>13</sup>. The same amount has been allocated for this purpose for 2022. Under EuroCC, ICHEC has continued its Academic Flagship and SME Accelerator programmes and as of 2022 has also launched an HPC Innovation Hub, an Enterprise Accelerator Programme, and an Advanced Digital Skills Programme.

Ireland continues to support the development of blockchain technology. The implementation of [FINTECHNEXT](#) (2019-2023), a collaborative research programme between University College Cork and Fexco, supported by SFI, is continuing to deliver applied and funded research dedicated to disrupting

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<sup>13</sup> Irish Center for High-End Computing.



key fintech verticals. The [FinTech Fusion](#) project (2019-2022), led by the [ADAPT Research Centre](#)<sup>14</sup>, aims to increase the impact of ICT technologies on RegTech (regulatory compliance), InsureTech (insurance sector) and PayTech (payments) processes. Currently, several leading enterprises in the financial services sector are collaborating to deliver a new platform, the first of its kind in the European financial services industry, to support the verification, tracking, direct access to, and management of, regulatory, professional and education qualifications. [Blockchain Ireland](#)<sup>15</sup> has compiled a [proposal for Ireland's Blockchain, crypto and WEB3 strategy](#) and submitted it to the government in May 2022. Ireland is a member of the European Blockchain Partnership and the European Blockchain Services Infrastructure.

The NCSC continues to lead the implementation of the [2019-2024 National Cyber Security Strategy](#) in Ireland. Following a capacity review in 2021, a number of the NCSC capability-building measures have been agreed (for example, additional staff, infrastructure and an associated budget). It is expected that in 2022, the NCSC will begin a graduate training programme, with four computer science graduates recruited each year on 3-year contracts.

Given its standing in the DESI as well as the multitude of measures undertaken, Ireland is well placed to make a significant contribution to the Digital Decade targets for the digital transformation of business.

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<sup>14</sup> ADAPT is SFI Research Centre for AI-Driven Digital Content Technology.

<sup>15</sup> Blockchain Ireland is an organisation of state agencies, corporates, academics and industry professionals working together to share insights and expertise and to promote the growth of Blockchain technology in Ireland.

## 4 Digital public services

4 Digital public services <sup>16</sup>	Ireland		EU
	rank	score	score
DESI 2022	6	83.5	67.3

	Ireland			EU
	DESI 2020	DESI 2021	DESI 2022	DESI 2022
<b>4a1 e-Government users</b> % internet users	67%	67%	92%	65%
<b>4a2 Pre-filled forms</b> Score (0 to 100)	NA	NA	59	64
<b>4a3 Digital public services for citizens</b> Score (0 to 100)	NA	NA	80	75
<b>4a4 Digital public services for businesses</b> Score (0 to 100)	NA	NA	100	82
<b>4a5 Open data</b> % maximum score	NA	NA	95%	81%

Ireland ranks 6<sup>th</sup> of the 27 EU countries in digital public services and is thus well above the EU average. In 2021, the share of e-government users increased significantly from 67% to 92%. Ireland also performs well in digital public services for both businesses (100) and citizens (80), and scores high in open data (95%). However, its performance regarding pre-filled forms is below the EU average.

Ireland intends to go beyond the Digital Decade target of 100% online provision of key public services by ensuring that 90% of applicable services are used online by 2030, as set out in the [Civil Service Renewal 2030 Strategy](#) (CSR2030 Strategy), launched in May 2021, in the [Connecting Government 2030: A Digital and ICT Strategy for Ireland's Public Service](#), published in March 2022, and in the National Digital Strategy. The CSR2030 Strategy will be implemented through a series of 3-year action plans. The first of these, the [Civil Service Renewal 2024 Action Plan](#), published in December 2021, is aligned with the Digital Decade targets and identifies user-centric digital services that are available 24/7 as priority actions.

Connecting Government 2030 Strategy aims to deliver digital government for all, while taking a 'user first' and 'business first' approach in digitalising public services and ensuring interoperability across all levels of government and across public services. It addresses the digitalisation of public services dimension of the National Digital Strategy, is aligned with the targets set out in the CSR2030 Strategy as well as addresses the Digital Decade targets. It replaces the previous Public Service ICT Strategy and 2017-2020 eGovernment Strategy.

In 2021, Ireland continued to review and improve the user-friendliness and quality of the services provided by the government services portal [Gov.ie](#). In November 2021, Gov.ie was selected for audit by the National Disability Authority (NDA) as provided for in the Web Accessibility Directive<sup>17</sup> and a liaison was appointed from the Gov.ie content team. The NDA report found that the Gov.ie website

<sup>16</sup> There is break in the series for indicators 4a2, 4a3, 4a4 and 4a5. As a result, no comparison of indicator and dimension results is possible over time.

<sup>17</sup> Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies (OJ L 327, 2.12.2016, p. 1).

has been designed with accessibility in mind and has a very good level of accessibility. A number of suggestions were actioned and additional enhancements made, which increased the accessibility score from 39% to 96%.

Ireland is committed to applying the 'once-only' principle and to ensuring that inclusiveness is inherent to the digital transition, a key ambition of the National Digital Strategy. Therefore, Ireland is taking measures to contribute to the Digital Decade target of at least 80% of Union citizens using a digital identification (ID) solution: the National Digital Strategy includes a goal of 80% of eligible citizens using [MyGovID](#) by 2030. MyGovID is an eID scheme offered to the people in Ireland for facilitating their interactions with public organisations. It is the sole authentication mechanism for public bodies and provides a fundamental element for the 'once-only' principle. It also offers the possibility to interact with public organisations via a smart device. Approximately 38% of the adult population of Ireland have and use a verified MyGovID account, which represents very substantial growth over the last three years. According to the 2021 [eGovernment Benchmark](#), Ireland improved its score on cross-border eID services from 0% in 2020 to 6% in 2021 (EU average is 21.7%). However, Ireland has not yet notified MyGovID scheme to the Commission under the eIDAS Regulation<sup>18</sup>. New services such as the unique/universal business identifier and base registries, as well as the [Data Governance Board](#) (established in December 2021 under the 2019 [Data Sharing and Governance Act](#) and aligned with the 2019-2023 [Public Service Data Strategy](#)) will help to further progress the implementation of the 'once-only' principle, the common delivery of services, as well as a consistent approach to data sharing across public bodies. In addition, work on the environmentally-sustainable shared government data centre is ongoing with detailed design complete and the procurement for construction beginning.

A number of measures are being taken that will help achieve the Digital Decade target of 100% of Union citizens having access to their online medical records. For example, an upcoming Health Bill will set out the legislative basis for an electronic Summary Care Record to be held centrally, which will facilitate better care and treatment by ensuring that health service providers have online access to a centralised patient records system 24/7. As outlined in the National Digital Strategy, through the national contact tracing system and the national vaccination system, the health service in Ireland set up a direct online link with every citizen in the country for the first time. As part of the 2021-2030 [National Development Plan](#), key deliverables include the roll-out of the individual health identifier, electronic patient record systems, corporate systems, modernisation and improvement of technical infrastructure, which are supported by the [Sláintecare](#) report and the [eHealth Strategy](#). It was agreed with the Department of Health / Health Service Executive that, given the impact that the COVID-19 pandemic and the ransomware attack had on the original eHealth plans, a new eHealth plan would be created that would have a 2030 focus so that it would meet the Digital Decade targets. First-cut plans are now being developed and will be published towards the end of 2022 and ultimately be part of the National Digital Roadmap. Further eHealth developments include targeted investments in electronic health records (by hospital site), shared care record, a national ePharmacy programme, national medical imaging system and a patient portal to enable the sharing of data between systems and healthcare organisations. Legislation and a technical solution to support the shared care record (which will be a key component of the 2030 target) are being developed. The technical solution will use the integrated health exchange protocols.

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<sup>18</sup> Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (OJ L 257, 28.8.2014, p. 73).

The government's roll-out of digital COVID-19 certificates provided an opportunity to showcase the convenience of digital means and help citizens understand the value of having a 'government' record in their private life. Following the success of this experience, Ireland intends to use similar principles for other credentials, such as the driving licence.

Ireland involves stakeholders in the co-creation of digital public services. For example, each year the Office of the Government CIO at the Department of Public Expenditure and Reform partners with students of Trinity College Dublin to assess online services and document their results and recommendations based on real world experience. In addition to public surveys, Ireland plans to launch a public consultation in 2022 to allow the public to provide its opinion about the prioritisation and redesign of public services. New structures are being developed to create a closer working relationship with industry, academia and the public enabling a more comprehensive approach to the design and delivery of services. For example, a Digital Strategy Implementation Unit within the Office of the Government CIO has been established to oversee the delivery of the digitalisation of public services dimension of the National Digital Strategy and implementation of the Connecting Government 2030 Strategy. The National Digital Strategy and the Connecting Government 2030 Strategy commit to progressing with the implementation of the priority actions from the [2019 Cruinniú GovTech Report](#) making it easier for start-up companies and SMEs to work with the government to improve digital public services. The 2021 [eGovernment Benchmark](#) highlighted Ireland as being fully transparent in designing services with a score of 100%. The 2021 [Future Tech Challenge](#) is a pilot competition to accelerate innovation and technology adoption in the public service through collaboration with the private sector. It will continue in 2022 and is currently at the planning stage.

Cyber security is fundamental in the digitalisation of the public sector. For example, the [Cloud Services Procurement Guidance Note](#), published in February 2021, outlines key elements of the security considerations for the provision of cloud services. The Connecting Government 2030 Strategy commits to designing and building systems that are aligned with best practice in security and cyber defence and to applying the [Public Sector Cyber Security Baseline Standards](#). The standards were published in November 2021 and aim to improve the resilience and security of ICT in public service bodies.

It is important that Ireland continues to maintain its forerunner position in digital public services and showcase measures in the context of the common EU efforts to reach the Digital Decade targets.