5G COUNTRY PROFILE

REPUBLIC OF SAN MARINO

Version 1.1

Acknowledgements: This country profile was developed by the ITU Office for Europe within the framework of the ITU Regional Initiative for Europe on broadband infrastructure, broadcasting and spectrum management. It was elaborated by ITU Office for Europe team including Mr. Iago Bojczuk, Junior Policy Analyst, and Mr. Julian McNeill, Consultant, under the supervision and direction of Mr. Jaroslaw Ponder, Head of ITU Office for Europe. The country profile was prepared as the background contribution to the ITU Regional Forum for Europe on 5G strategies, policies and implementation.

Note: Version 1.1 of this document is an advanced draft for possible additional inputs, comments, feedback. The final version of the document is planned to be released after the ITU Regional Forum for Europe.

1. ICT background and current status of broadband

San Marino has made significant investments in strategic ICT infrastructure in the past several years. The cabling of the country's full territory in fibre-optic networks is well underway by the major telecom providers. In the context of 5G, San Marino gained relevant global attention when it became the 5G test pioneer location in Europe in 2018. The government is currently working with private stakeholders on the construction of a nation-wide public infrastructure for the provision of the next-generation mobile services for commercial users.[1]

In 2018, the Institute for Innovation of the Republic of San Marino, a private law company that is exclusively State-owned,[2] launched a series of projects and initiatives titled "Digital Agenda" orienting the country's digital development plan. According to Delegate Decree n.23 of 7th March 2018, San Marino Innovation should:

1) Study, develop and deploy innovation strategies for the public administration;
2) Gather, foster and evaluate projects and ideas supporting the development of the Sammarinese Digital Agenda;
3) Propose to State Congress the approval of the plan for digital development and file annually a report on the general status of digital development and implementation of the Sammarinese Digital Agenda.

The Sammarinese "Digital Agenda" is coordinated with the Digital Agenda for Europe[3] and is oriented to fostering priority cooperation between business systems, innovators, public administration, research and San Marino services, through the involvement of all the actors involved.[4]

While the country does not have a broadband strategy, the Sammarinese "Digital Agenda" presents a series of actions and initiatives focused on structural interventions that are capable of fostering technological innovation while pursuing the objectives of sustainable socio-economic growth in the country.

Additionally, the country is at the forefront of Distributed Ledger Technology and has also recently adopted several decrees to facilitate ICT development in the areas of new technologies such as blockchain[5] and others.[6]

2. Broadband and mobile telecommunication sectors data

ITU data shows that 60.18% of individuals had access to the Internet in 2017 in San Marino, with significant growth in the 2011-2017 period.[7] In 2009, the ITU data for the country was 54.21% and 48.80% in 2000.

[1] See: https://news.itu.int/how-san-marino-is-leveraging-emerging-technologies/
[2] See: https://www.worldcommercereview.com/publications/article_pdf/1627
[3] See: https://www.europarl.europa.eu/factsheets/en/sheet/64/digital-agenda-for-europe
[4] See: https://www.sanmarinoinnovation.com/agenda-digitale-sammarinese
[5] See: https://www.sanmarinoinnovation.com/sanmarinoblockchain
[6] See: http://www.worldcommercereview.com/publications/article_pdf/1627
[7] See: https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2019/Individuals_Internet_2000-2018_Dec2019.xls

In 2019, the number of fixed-broadband subscriptions per 100 inhabitants was 32.73.[8] While the 2019 ITU Measuring Digital Development ICT Price Trends report does not provide basket cost for the fixed-broadband indicators because the GNI per capita data on San Marino are not available, an unlimited monthly data cap of data traffic costs about 19.65 USD (16.57 EUR) in 2019.[9]

In 2019, the number of active mobile-cellular subscription was 114.44 per 100 inhabitants,[10] while the broadband subscriptions per 100 inhabitants was of 131.42 in the same year.[11] While the penetration of mobile phones has been high since the early 2000s, steady growth has been observed after 2008.[12] Despite the small size of its territory, there are three major Mobile Network Operators (MNOs) in San Marino: San Marino Telecom (SMT), Telefonia Mobile Sammarinese (TMS), and Telecom Italia (TIM) San Marino. Additionally, Italy's major operators such as Illiad, TIM, Vodafone, and Wind Tre are also available in San Marino's territory.[13] Nowadays, 3G and LTE/4G are widely available in the country with 99% of population coverage according to ITU data.[14]

3. Current progress on 5G: consultations and national strategies

As early as 2017, the government of San Marino has been engaging with public-private cooperation agreements to replace 4G to 5G networks in the country, with the goal of becoming Europe's first nation to have a 5G full coverage ahead of others in the region.[15] Despite these early 5G-related initiatives, the country does not have a national strategy on 5G. Since the country's territory only consists of 61 square km and has more relaxed laws on airwaves, some operators claim that it is a far more suitable testing ground for 5G than surrounding Italy.[16]

However, local press reported that the government's strategies on 5G are likely to focus on banking and tourism, two very active sectors in San Marino and with a significant economic return in the long run. Other areas of possible focus include industry 4.0, public security, and smart city.[17]

4. Spectrum assignment for 5G & market development

There is no public information available from the San Mariann regulator concerning 5G spectrum assignment plans in the country. However, the key spectrum to be auctioned is in the 3.5 GHz and 26 GHz bands.[18]

[8] See: ITU World Telecommunication/ICT Indicators Database online (2020): http://handle.itu.int/11.1002/pub/81550f97-en (indicator "i992b")
[9] See: https://www.itu.int/en/mediacentre/Documents/Documents/ITU-Measuring_Digital_Development_ICT_Price_Trends_2019.pdf
[10] See: ITU World Telecommunication/ICT Indicators Database online (2020): http://handle.itu.int/11.1002/pub/81550f97-en (indicator "i911")
[11] See: ITU World Telecommunication/ICT Indicators Database online (2020): http://handle.itu.int/11.1002/pub/81550f97-en (indicator "i911mw")
[12] See: https://www.monacostatistics.mc/content/download/446317/5060895/file/Rapport%20Recensement%202016.pdf
[13] See: https://en.wikipedia.org/wiki/Telecommunications_in_San_Marino
14 See: World Telecommunication/ICT Indicators Database online (2020): http://handle.itu.int/11.1002/pub/81550f97-en (indicators "i271G and i271GA")
[15] See: https://www1.folha.uol.com.br/tec/2017/07/1901927-san-marino-sera-o-1-pais-europeu-a-implementar-rede-de-internet-5g.shtml
[16] See: https://operatorwatch.3g4g.co.uk/2018/08/san-marino-launches-first-nationwide-5g.html
[17] See: https://www.telesintese.com.br/san-marino-e-primeiro-pais-da-europa-com-5g-ativado/
[18] See: https://blog.telegeography.com/a-guide-to-5g-spectrum-auctions-in-western-europe-italy-greece-spain-portugal-san-marino

Local press has reported that TIM, for example, will run on a 3.5 GHz spectrum while it tests 26 GHz transmission in Turin, Italy, with the hopes of rolling out these frequencies in San Marino.[19]

5. Electromagnetic fields levels and the implementation dynamics

As of October 2020, no public information on EMF limits is available in San Marino.

6. 5G commercial launches: announcements, trail cities, and digital cross-border corridors

In July 2017, Telecom Italia (TIM) announced that the Republic of San Marino was in the operator's targets to become Europe's first country with an operating mobile network. On that occasion, both TIM and the Government of the Republic of San Marino signed a Memorandum of Understanding (MoU), describing TIM's engagement in updating the mobile sites of its network in the country with 4.5G.

The MoU articulated the introduction of some of the features of 5G, such as evolved mast towers (MIMO4x4), Carrier Aggregation, superior modulation, and Cloud architecture, as well as introducing "small cells", small, low power masts with low environmental impact in the principal streets and piazzas of the historical centre of the Republic of San Marino, a UNESCO world heritage site.[20]

Furthermore, the technology plan in the MoU included doubling the number of existing mobile sites and installing several dozen "small cells", linked by optic fibre and distributed throughout the whole of the territory of San Marino. Some of the expected services originating from the 2017 MoU established that TIM was set to supply to the San Marino government the new-generation services linked to the Smart City. It also encompassed remote surveillance solutions in extensive areas of the territory, virtual reality to support tourism and, through the introduction of 5G technologies in the production processes used in its manufacturing industry, novel services to develop Industry 4.0 in the San Marino area.[21]

Given San Marino's small territorial dimensions, the early stages of 5G rollout in the country included the deployment of performance tests of network equipment and applications to help refine the definition of 5G standardization[22] and fix any issues before the rollout in neighbouring Italy, one of TIM's most active markets, and in wider Europe.[23] It is within this context that TIM and LG also signed a collaboration agreement focused on the development of 5G in Italy. This partnership aims to enhance the innovation capacity of these private stakeholders in the development of 5G in the region.[24]

[19] See: https://www.rcrwireless.com/20180904/5g/tim-5g-san-marino
[20] See: https://www.gruppotim.it/en/press-archive/market/2017/TIM-Repubblica-San-Marino-MoU-5G-ENG.html
[21] See: https://www.gruppotim.it/en/press-archive/market/2017/TIM-Repubblica-San-Marino-MoU-5G-ENG.html
[22] See: https://www.fiercewireless.com/wireless/san-marino-claims-title-for-first-state-europe-to-get-5g
[23] See: https://eu.smartcitiescouncil.com/article/europes-first-5g-state-san-marino
[24] See: https://www.rcrwireless.com/20181218/5g/tim-nokia-complete-full-5g-coverage-san-marino

In May 2018, TIM conducted a live demonstration of 5G in the 26 GHz band in the country[25] ahead of full commercial launch.[26] The test allowed users to stream live video using a device featuring a Qualcomm Snapdragon X50 5G modem.[27]

In September 2018, the operator announced that it has turned on the first full 3GPP Rel15 standard 5G site in the region of Faetano using the 3.5 GHz frequency band in collaboration with Nokia.[28] As part of the TIM-Nokia agreement, the private stakeholders managed to cover nearly the entire territory, in addition to deploying 8 macro sites operating 3.5 GHz and 26 GHz antennas in the count, with all locations being equipped with massive multiple-input multiple-output (Massive-MIMO) technology as well as beamforming.[29]

In October 2018, the operator activated a 5G antenna in Serravalle Stadio, which also used 3GPP Rel15 standard on the 3.5 GHz frequency band. This corresponded to the site that services the whole Rally Village area and will support the various applications developed by TIM and Nokia during the competition, showcasing 360° high-definition cameras, virtual reality headsets, the potentialities power of "TIM Streaming" broadcasting platform and the 5G-enabled opportunities in "virtual tourism."[30]

In December 2018, TIM signed an agreement with Nokia to foster 5G development in San Marino.[31] As a result, TIM confirmed in late 2018 that it had switched on 5G in San Marino[32] through Nokia's New Radio (NR) interface, becoming the first country in the world to activate a 5G for commercial tests.[33]

[25] See: https://telecoms.com/489917/tim-nokia-and-qualcomm-do-some-5g-stuff-in-san-marino/
[26] See: https://ecfsapi.fcc.gov/file/1040331077123/Analysys%20Mason%20-%20Global%20Race%20to%205G%20Update.pdf
[27] See: https://www.commsupdate.com/articles/2018/05/24/tim-conducts-live-5g-demo-in-san-marino/
[28] See: https://www.gruppotim.it/en/press-archive/market/2018/NS-TIM-Nokia-SanMarino-40918.html
[29] See: https://eu.smartcitiescouncil.com/article/europes-first-5g-state-san-marino
[30] See: https://www.thefastmode.com/technology-solutions/13511-tim-turns-on-2nd-5g-antenna-to-support-san-marino-s-rally-legend
[31] See: https://telecoms.com/494256/tim-flips-on-the-5g-switch-in-san-marino/
[32] See: https://www.gruppotim.it/content/dam/telecomitalia/en/archive/documents/media/press_notes/business/2018/Nota-Stampa-TIM-Nokia-SanMarino-ENG-17122018.pdf
[33] See: https://www.gruppotim.it/en/press-archive/market/2018/Nota-Stampa-TIM-Nokia-SanMarino-17122018.html