Networks as a common good

arcep les réseaux comme bien commun

Telconomics

Investor presentation 2022

24 May 2022

Electronic communications market: key facts and figures

2021

Key telecoms market figures for 2021

Operators' revenue
(retail market)

36.1 billion €

+ 2.5% ↗

Investments, including towercos
(excl. spending on spectrum)

14.9 billion €

+ 10.9% ↗

Number of broadband and ultrafast access lines

31.5 million **(of which 58% UF)**

+2.8% ↗

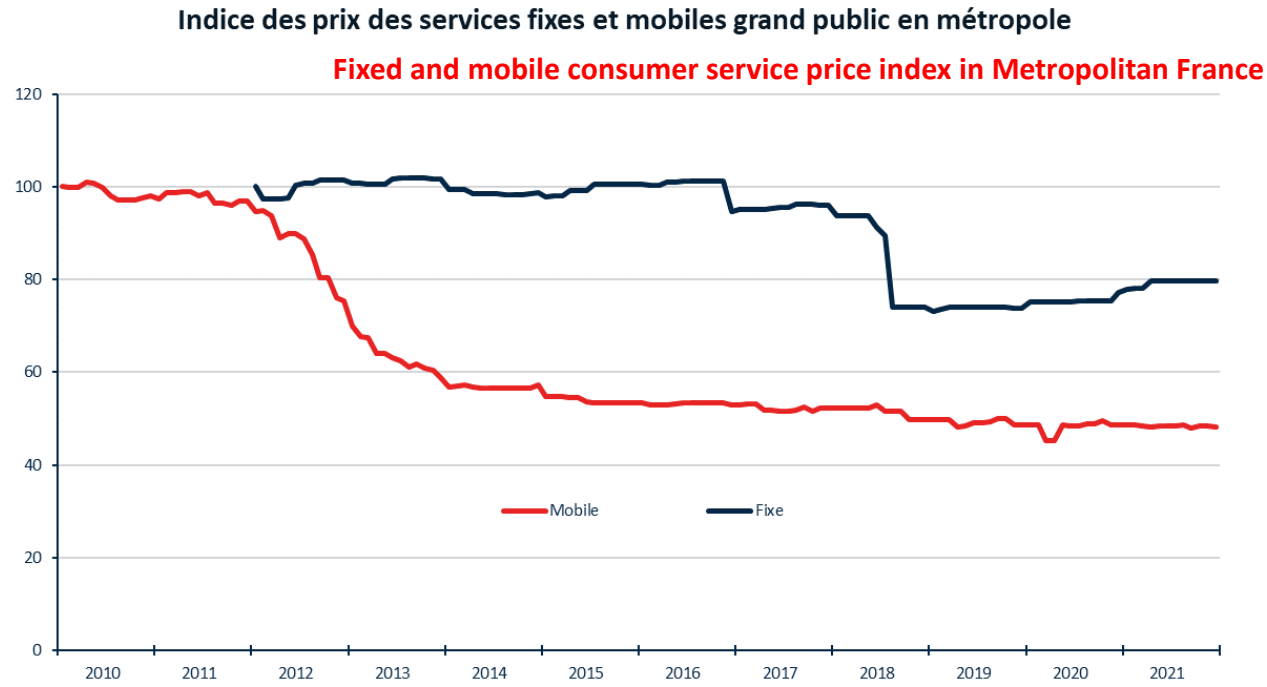
Number of SIM cards

80.4 million **(of which 3 million active 5G)**

+ 2.8% ↗

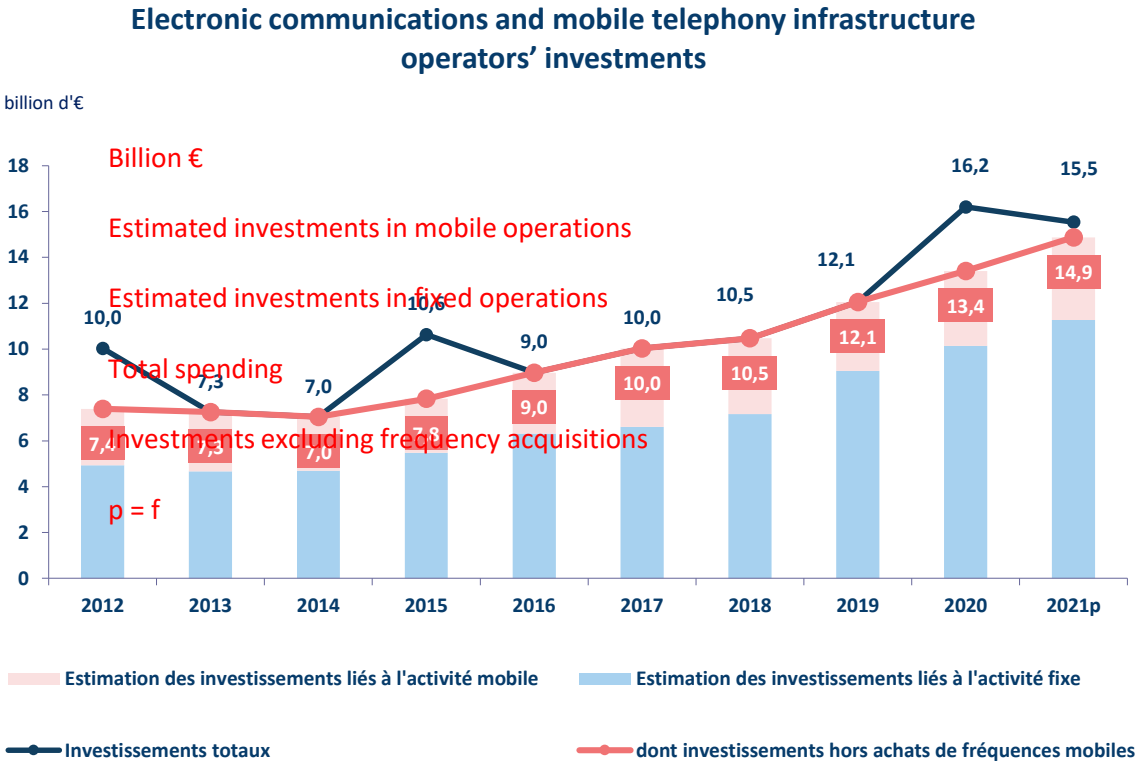
Fixed and mobile service prices

Mobile service prices stable, while fixed service prices rose in 2021 for basic, and especially DSL plans



- Mobile service prices
  - +0.6% in 2021
- Fixed service prices
  - +5.1% YoY

Investment levels continue to climb: 15.5 billion euros in 2021



In 2021:

- Frequencies: 664 million euros in spending on frequencies in the 900 MHz, 1800 MHz and 2.1 GHz bands, reassigned in 2021
- **Excluding spending on frequencies, investments reached 14.9 billion euros (incl. Towercos):** +11% YoY
- Ongoing strong rise in spending on broadband and superfast broadband local loop deployments

Efforts to increase regional connectivity stepped up in 2021

On fixed networks

2021 was a strong year for FttH rollouts, with some 5.6 million additional premises passed, almost as many as the 5.8 million during the record-breaking 2020

Public-initiative networks (PIN) are the chief driving force behind this growth in 2021, and the four national ISPs now market their plans on virtually all of these PIN

On mobile networks

4G rollout efforts continue…

An average of 3,530+ sites upgraded to 4G* per year and per operator since the introduction of the *New Deal* for Mobile in 2018

As of 31 December 2021, more than 98% of all cell sites were 4G-capable, versus 53% at the end of Q1 2018

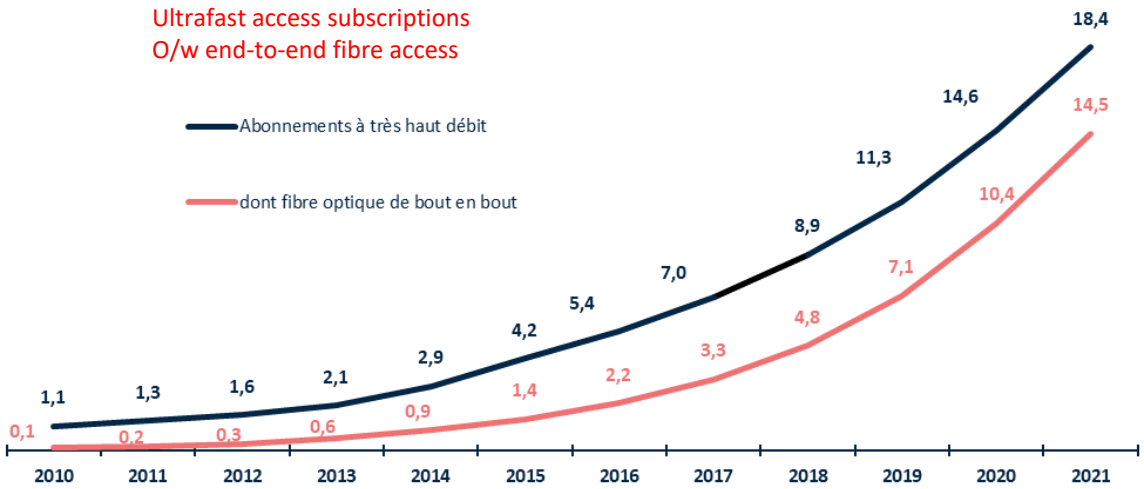
… and being relayed by the launch of 5G

At the end of 2021, after approximately a year of 5G rollouts, more than 28,000 5G sites deployed, including 10,600 using the 3.5 GHz band

* Upgrading 2G/3G sites and installing new 4G cell sites

Fixed internet take-up rates: unrivalled growth for fibre subscription in 2021

Number of end-to-end superfast and optical fibre subscriptions (million)

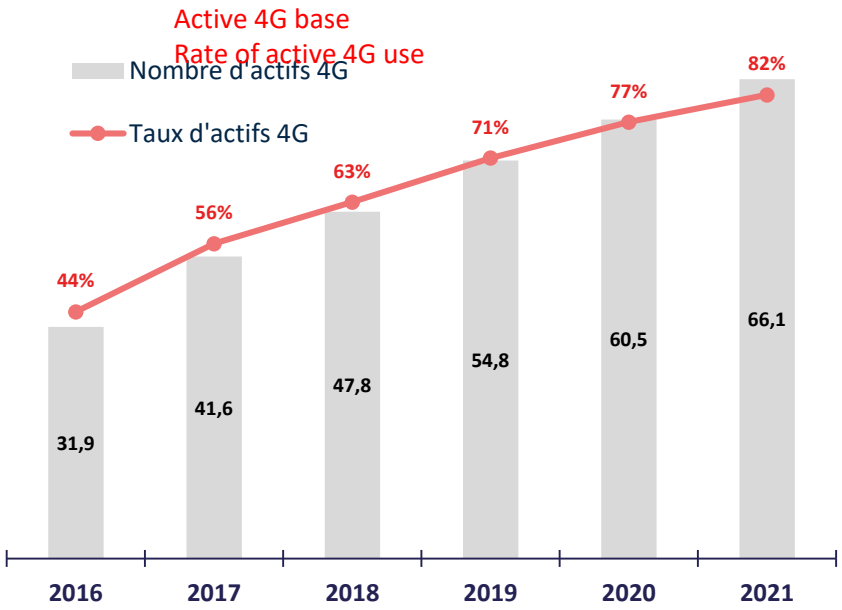


Outstanding rise in superfast access subscription in 2021

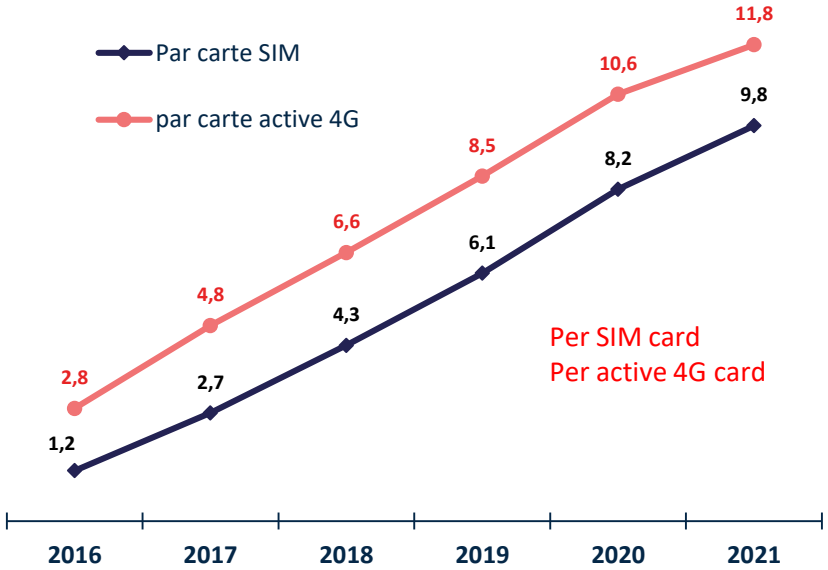
- +3.8 million YoY
  (+3.3 million in 2020)
- Entirely driven by the rise in FttH subscription numbers which reached 14.5 million (+ 4 million YoY)
- **FttH subscriptions outnumber DSL ones for the first time** (14.4 million)

Mobile take-up rates: More than 80% of mobile consumers use 4G and 5G adoption has begun

Number of active cards on 4G networks (million)



Average monthly data traffic (Gb)



<u>3 million active 5G users</u>, or 4% of total mobile users

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Leading operators' milestones in 2021

Orange France

Sale of 50% of Orange Concessions shares

Altice France

Sells remaining 50.01% stake in towerco Hivory (valued at 5.2 Bn€) **to Cellnex**

Iliad

Withdrawal from stock market in October 2021

Bouygues Telecom

Integrates MVNO EIT (2.1M mobile customers under brands NRJ mobile, CIC mobile…) whose takeover was completed in late 2020 for around 700 M€.

Core workstreams for the sector

Underway and upcoming

Fibre

- Preparing new period of market analysis
- Fibre as the infrastructure of reference
- Business market competition

Preparing a new period of market analysis

Preparing for the switchover from copper to fibre
Assessing the current regulatory period and identifying key issues for the upcoming period

Supporting the switchover from the legacy copper network to fibre, following the public consultation on the Orange copper network switch-off plan

- Monitoring the switch-off work begun by Orange (individual early switch-offs, trials)
- Consideration of feedback on the public consultation on the switch-off plan to inform changes to copper network switch-off supervision, for the upcoming regulatory period (2024-2029)

Enforce all decisions from the 6th regulatory period, and prepare the assessment and outlook for the 7th period

- Apply the planned provisions, notably regarding fibre's contribution to businesses and developing competition in that market
- Prepare regulatory assessment and outlook document, to be published in Q2 2022

Fibre as the infrastructure of reference

Ensuring FttH network quality of service

- Hosting an inter-operator working group since 2019
- Creation of a supplementary action plan in 2021
- Launch of an administrative inquiry into Xp Fibre
- Campaign on the status of infrastructure underway as of H1 2022

Safeguarding balance and deployments

- In resolving a dispute stemming from a complaint filed by Bouygues Telecom, specification of the pricing terms and conditions governing access to the last mile of Orange FttH networks in very high density areas
- Ongoing examination of the balanced financial operation of PIN, notably as the PFTHD scheme only subsidised the network's initial construction
- Ongoing investigation of last-mile connection pricing following the public consultation in early 2021

Growing competition in the business market

Bringing fibre to businesses and developing competition in this market

- **Ongoing strategy of developing a dynamic market for activated wholesale fibre solutions:** Arcep estimates the percentage of FttH lines eligible for at least one activated wholesale solution has gone from 7% in Q1 2017 to 90% in Q2 2021

- **Development of wholesale passive solutions with increased QoS** (guaranteed fault repair times of 10 and 4 hours) from every operator on their FttH network, whose quality will be monitored by Arcep. Most FttH networks now offer both of these options

Several operators fuelling a dynamic market

- Major operators that have revived their commitment (Bouygues) or recently entered the market (Iliad)

- Business market specialists increasing their spending on the retail market and on infrastructures for enterprises (Adista, Céleste, Altitude, Ielo, Eurofiber, Linkt)

- Less liquidity than in the consumer market due to longer contractual commitments

Mobile

- New advances in 4G connectivity
- 5G rollouts gathering pace
- Awarding new frequencies for 5G
- Frequencies for businesses
- Mobile network sharing

New advances in mobile connectivity

2021, continued implementation of the *New Deal* for Mobile

- Targeted coverage scheme: more than 1,200 sites in service at the end of 2021 and close to 3,000 areas identified by Order since the scheme's introduction in 2018
- Almost every site upgraded to 4G as of 31 December 2021 with the exception of white areas – 90% of town centres equipped with 4G (vs. 80% at the end of December 2020)
- At the end of December 2021, operators provided between 99.1% and 99.6% of the population with "good coverage" for voice/SMS services, compared to 98.6% to 99.4% at the end of December 2020
- Fixed 4G extension scheme: first sites put into service in 2020, totalling more than 180 sites by the end of December 2021

Next stages of the deployment

- Targeted coverage scheme: 600 to 800 3G and 4G sites per operator* put into service each year, to reach 5,000 sites per operator*
- Coverage of railway lines in 2025, with onboard coverage in trains from very operator in 2030
- In-vehicle coverage on priority transport corridors between 2022 and 2025, depending on the operator, and expansion of the type of roadways to cover by 2027

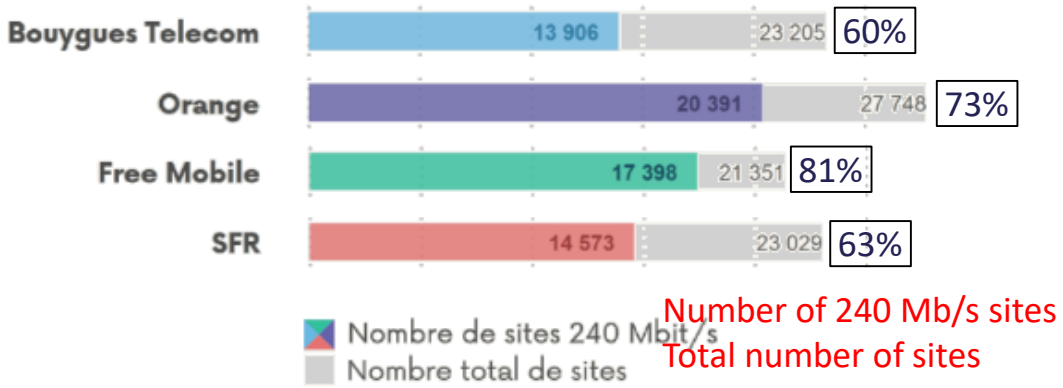
* Some sites are shared

5G rollouts gathering pace

Increasing speeds

Obligations to increase maximum theoretical speeds, to at least 240 Mbit/s

- on 75% of sites expected end of 2022,
- 85% in 2024,
- 90% in 2025
- 100% in 2030

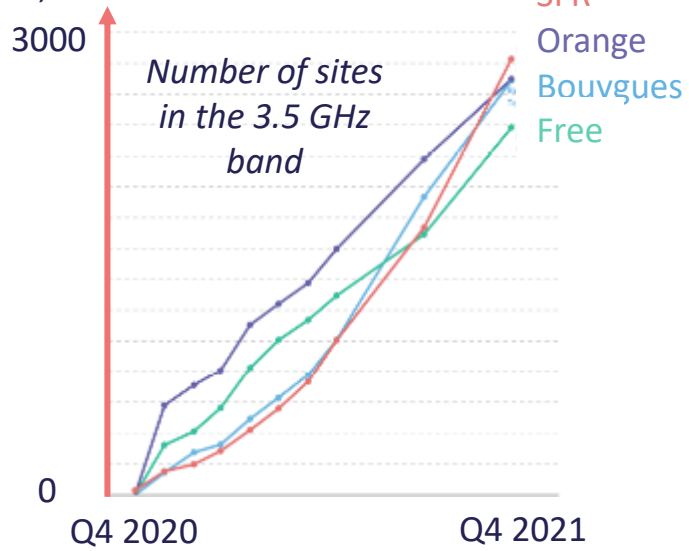


Number of 240 Mb/s sites
Total number of sites

Site deployment

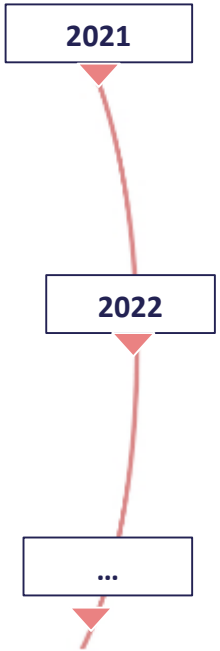
Rollout obligations:

- 3,000 sites per operator deployed in the 3.5 GHz band in 2022,
- 8000 sites in 2024,
- 10,500 sites in 2025



Awarding new frequencies for 5G

5G creates the ability to improve mobile services and make businesses more competitive
The deployment of 5G with the core 3.4 – 3.8 GHz band is already underway,
and use of the 26 GHz band will further improve services



Commercial deployments begin (310 MHz of spectrum in the 3.4 – 3.8 GHz band) in Metropolitan France

- Operators open their 5G networks commercially
- As of Q4 2021: more than 11,000 cell sites open commercially, including close to 2,000 in the 3.4–3.8 GHz band

Award of 700 MHz and 3.5 GHz band frequencies in the overseas territories

- Frequency awards in the departments of Réunion and Mayotte
- Launch of award procedures for Guiana and the Antilles

Preparing the awards procedure for the 26 GHz band in Metropolitan France

- Procedure to be adapted to the frequency band's particular properties: high capacity that enables unprecedented mobile speeds, but limited coverage capabilities
- Consideration of environmental issues

Preparing for future frequency awards

Public consultation on "**Awarding new frequencies for mobile services"**

- Yesterday, Arcep published a public consultation on the award of new frequencies for mobile services.
- The contributions received will help inform Arcep's work on spectrum management, and on defining the award procedure for frequencies that are or will become available.
- A very large target audience of stakeholders: operators, equipment suppliers, local authorities, service providers and manufacturers, consumers, citizens
- Several webinars will be held in June, to give Arcep an opportunity to present this consultation and answer questions from specific target audiences, notably manufacturers and innovators, but also consumer associations and local authorities
- The public consultation includes four entries:
  - **Future uses**, new connectivity and use case expectations: Can 5G satisfy these expectations, what frequencies and technologies are best suited meet coverage expectations, what changes in network architecture are likely?
  - **Businesses' and industrial players' specific connectivity needs:** what technologies, network architectures and business models are best suited to match expectations?
  - **Social and environmental expectations:** what are they and how to incorporate them into the obligations imposed on operators in the terms of their frequency licences?
  - **Questions specific to the different frequency bands**, and their future use.

Frequencies for businesses

Giving businesses the means to be competitive and to innovate

Long-term frequencies already available for ultrafast professional mobile networks

- 2.6 GHz TDD spectrum available for the deployment of mobile networks designed to meet businesses' specific needs
  - 24 sites authorised (as of Q2 2022) in the energy (EDF, Total), transport (hubone), logistics and manufacturing (ArcelorMittal, Butachimie) sectors

The 3.4-3.8 GHz band will open the way for other 5G solutions for "verticals"

  - Mobile operators' frequency licences include an unprecedented mechanism geared to satisfying "verticals'" stated requirements

Trials to enable exploration of verticals' future needs

- Since 2019, **26 GHz frequencies** have been awarded for 14 "5G trial platforms"
  - Port in Le Havre for logistics uses, train station in Rennes for passenger applications and the control centre's internal requirements, velodrome in St Quentin in the Yvelines for special events needs…
  - Since March 2022, **3.8-4.0 GHz band frequencies** have been available to verticals for testing technologies, in a frequency band that gives them access to a large international ecosystem

Mobile network sharing

A local concern

Arcep pays close attention to reports from local officials and citizens, and their questions about the deployment of cell towers that are not being shared between mobile operators.

Network sharing: already a reality in certain cases

- Passive sharing (several operators' equipment installed on the same infrastructure):
  - Already in place nationwide
  - In very rural areas, close to 60% of cellular installations host several operators' equipment
- Active sharing (subject to oversight by Arcep which can request changes to sharing agreement terms in some cases):
  - Widespread in very rural areas and reinforced by the targeted coverage scheme
  - Metropolitan France: implemented by two operators over a very large area, outside urban centres
  - Antilles-Guiana region: agreement between two operators.

Arcep is in favour of increased sharing in rural areas, as soon as it is technically relevant

- A lever for environmental gains
- Opportunities for increased passive sharing with the development of towercos

Focus on the overseas departments and territories

The situation in the French overseas territories

On the mobile front

- **Deployments progressing:** in 2021 the number of 4G sites increased by 6% in the overseas departments*

- **Preparing for the award of new frequencies** (700 MHz and 3.5 GHz bands) to improve existing services and develop new ones (2022-2023)

On the fixed front

- **FttH rollouts proceeding at a good pace:** close to 70,000 lines deployed in 2021
- Reunion has the second highest regional coverage in France, after Ile de France (Greater Paris region)
- Average FttH coverage of 54%

*Guiana, Martinique, Guadeloupe, Reunion, Mayotte, Saint Martin, Saint Barthelemy

Cross-cutting workstreams

- Data-driven regulation
- ”Achieving digital sustainability”
- European regulatory framework

Data-driven regulation: Improving the tools for helping users make informed choices and guiding regulatory actions

"Ma connexion internet": map of available fixed technologies and speeds

- Publication of the complete version in April 2021: speeds available at any given address
- "Carte Fibre" fibre maps incorporated into "Ma connexion internet"
- Improved data processing and more frequent publication

"Mon réseau mobile" incorporating QoS indicators from crowdsourcing apps

- 200,000 new crowdsourced mobile network QoS measurements added in February 2022

Development of "turnkey" tools for elected officials and regional digital development stakeholders

- Departmental mobile internet coverage maps (Metropolitan France and overseas)
- Publication of the Observatory of 5G deployment in Metropolitan France
- Publication of departmental scorecards for superfast and decent coverage

"J'alerte l'Arcep" expanding to include new reports and make the regulator's processing of alerts more efficient

2020 – 2021: Arcep tackles environmental issues

Issues and challenges

Paris Agreement: Limit global warming to below 2°C, or even 1.5°C

European Green Deal: reduce net greenhouse gas (GHG) emissions by at least 55% by 2030 compared to 1990 levels

Digital carbon footprint:

- 3% to 4% of global GHG emissions, and 2.5% of France's national carbon footprint
- 6% to 7% of the national carbon footprint by 2040 if no action is taken

A new regulatory chapter

- **Launch of the "Achieving digital sustainability" collaboration platform" in June 2020:**
  - A collaborative process with all of the digital ecosystem's stakeholders (electronic communication operators, data centres, content and application providers…)

Main achievements in 2020/2021

- **Report on "Achieving digital sustainability"**
- Increase incentives for economic actors, private and public sector players and consumers
  - Including environmental considerations in all of Arcep's actions
  - Consolidate methodologies, organise data collection
- **Study on mobile device replacement and retail sales practices**
  - Importance of extending the life of devices
- **Workshops on the ways and means of incorporating environmental considerations into upcoming 26 GHz band frequency awards**
  - Contributions: Moving towards more local and targeted deployment, achieving the right balance between sobriety and innovation?

Outlook for 2022 and beyond

Continuing the work begun in 2021

- **ADEME/Arcep study on the digital environmental footprint in France**
  - Scale of devices' (65% to 90%), data centres' (4% to 20%) and networks' (5% to 10%) share of the digital carbon footprint
  - Impacts beyond the carbon footprint (e.g. depletion of abiotic fossil and metal resources)
  - Obtain a complete analysis of digital's footprint, and have every stakeholder involved in efforts to reduce it
  - Streamline methodologies and disseminate data
- **Comparative study assessing the energy consumption of a 4G vs 5G network deployment, by the Committee of mobile network technical experts**

Annual "Achieving digital sustainability" report

- A tool for informing public debate and investigations into a low-carbon strategy for digital
- Identifying levers for action, both for economic stakeholders and users
- Iterative development:
  - Publication of the first annual ADS survey on electronic communication operators (April 2022)
  - **Expansion of this survey to the entire digital ecosystem,** notably data centre operators and device manufacturers (in progress)

The digital environmental footprint: a new call to action for Europe

- Arcep's increased involvement in the work done by BEREC:
  - Vice-chair of BEREC in 2022
  - Co-chair of the Sustainability working group, first publications
  - European Commission Initiatives:
  - Eco-design regulation,
  - Directive on consumer rights (notably durability and repairability of products),
  - Energy Efficiency Directive (data centres' transparency on their CO_2 emissions)
  - Study on Green IT and telecoms' transparency on measures to increase data centres' energy efficiency, and options that could be included in a transparency mechanism on telecoms networks and services' carbon footprint, and environmental sustainability assessment criteria

Europe: homogeneous regulatory framework opening up to digital

Revised telecom framework that now delivers a long-term outlook

- Code adopted and transposed, and main implementing texts adopted or underway
- Roaming regulation extended beyond mid-2022: key principles maintained to guarantee continuity
- French regulatory framework confirmed in late 2020
- France in good stead on 5G

A digital strategy that can help create more open ecosystems

- Combination of DMA/DSA/DGA: a regulatory framework for digital for years to come, serving European citizens and businesses
- DMA (agreement in 1H): guarantee the contestability and fairness of digital ecosystems. Arcep and BEREC helped in the discussions that sought to strengthen the European Commission's proposal. Arcep will continue to be involved.
- Fair share (content providers' investments in networks): based on data and impact studies, BEREC will analyse the relevance of such an approach in its future work. It is vital that the Open Internet Regulation not be affected by it.

Thank you for your attention

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