12th edition

DIGITAL ECONOMY OUTLOOK 2022

Economic study - Report summary

December 2022

FÉDÉRATION FRANÇAISE DES TÉLÉCOMS

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The Digital Economy Outlook in 2022

01 The global digital ecosystem continues to grow in 2021 but shows signs of slowing down in 2022

02 In France, telecom operators confirm they are a driving engine in the digital economy with record investments of €15bn and very competitive rates

03 The French telecom operators’ leadership is worth noting as they are amongst the most heavily taxed operators in Europe

04 Thanks to their spending, telecom operators are also decisive for employment in France, in the telecom sector and beyond

Source: Arthur D. Little

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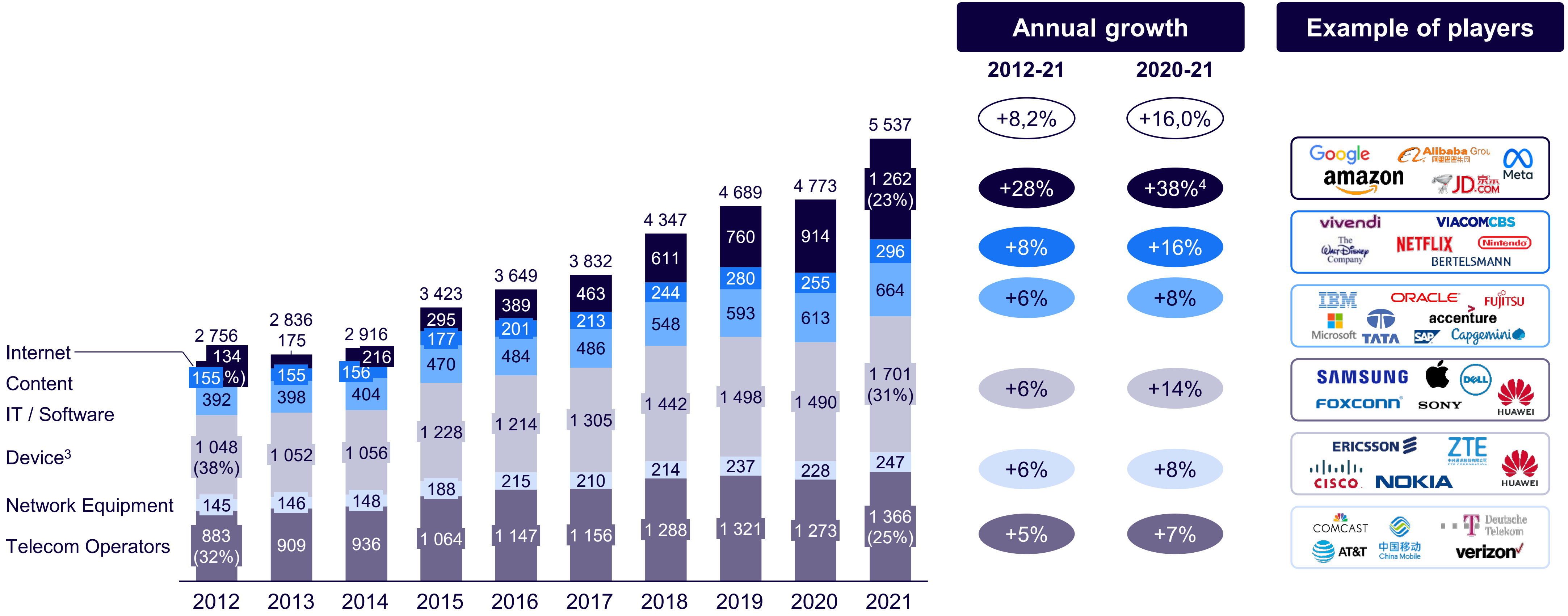
Source: Arthur D. Little

Total Revenue of the global digital ecosystem were boosted by Internet Players with the end of the Covid crisis

Digital ecosystem revenue by category[1]

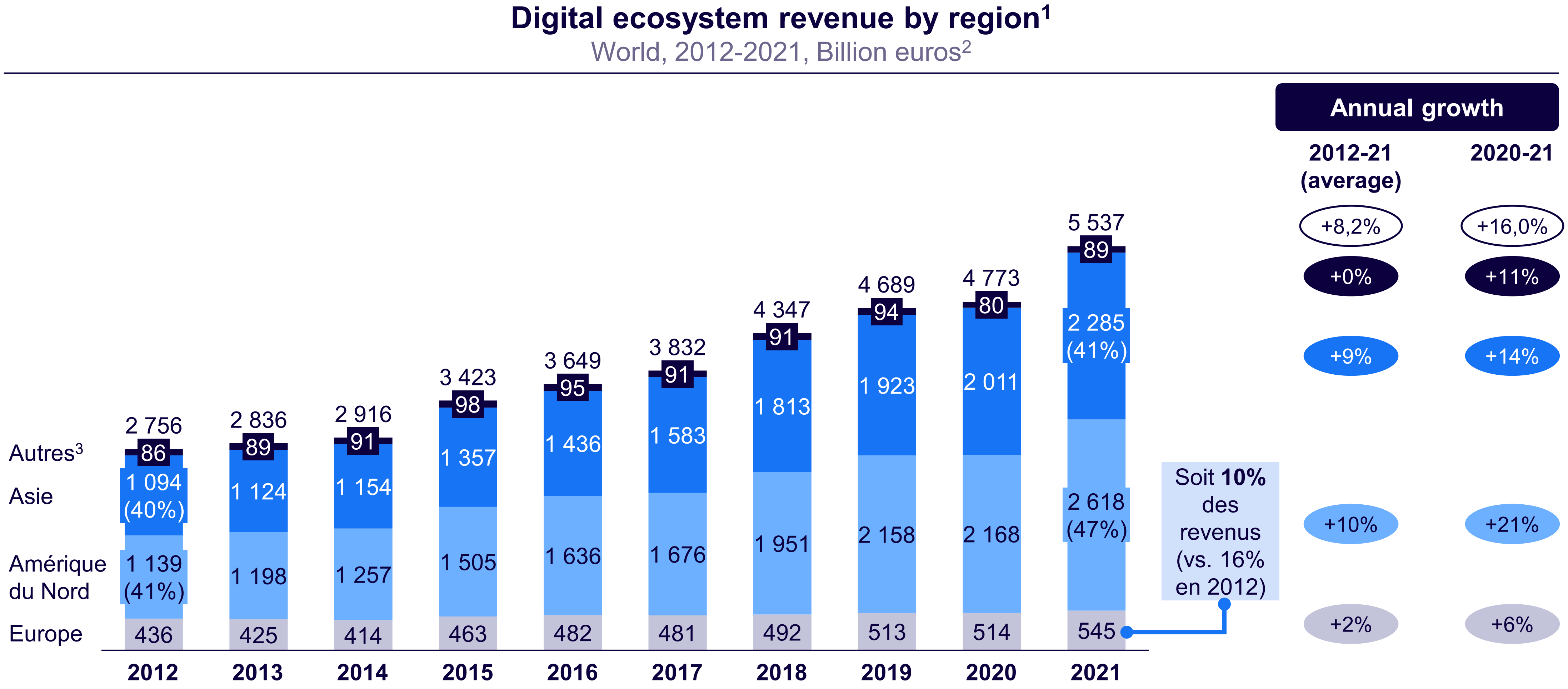
World, 2012-2021, Billion euros[2]



Source: Thomson Reuters Eikon, Arthur D. Little

Note: 1) Panel of 180 companies: By sector, selection of the top 30 companies by their turnover in 2021, 2) Constant 2021 euros, 3) As Huawei (Devices and network equipment) and Altice-SFR (Telecoms) are not listed, revenues were added to the panel of 180 companies in the sample, 4) Soaring revenues in 2021 are explained by strong revenues of internet actors

The domination of American & Asian Digital players contrasts with the stagnation of European Digital players, capturing less than 10% of the total revenue *(vs 16% in 2012)*



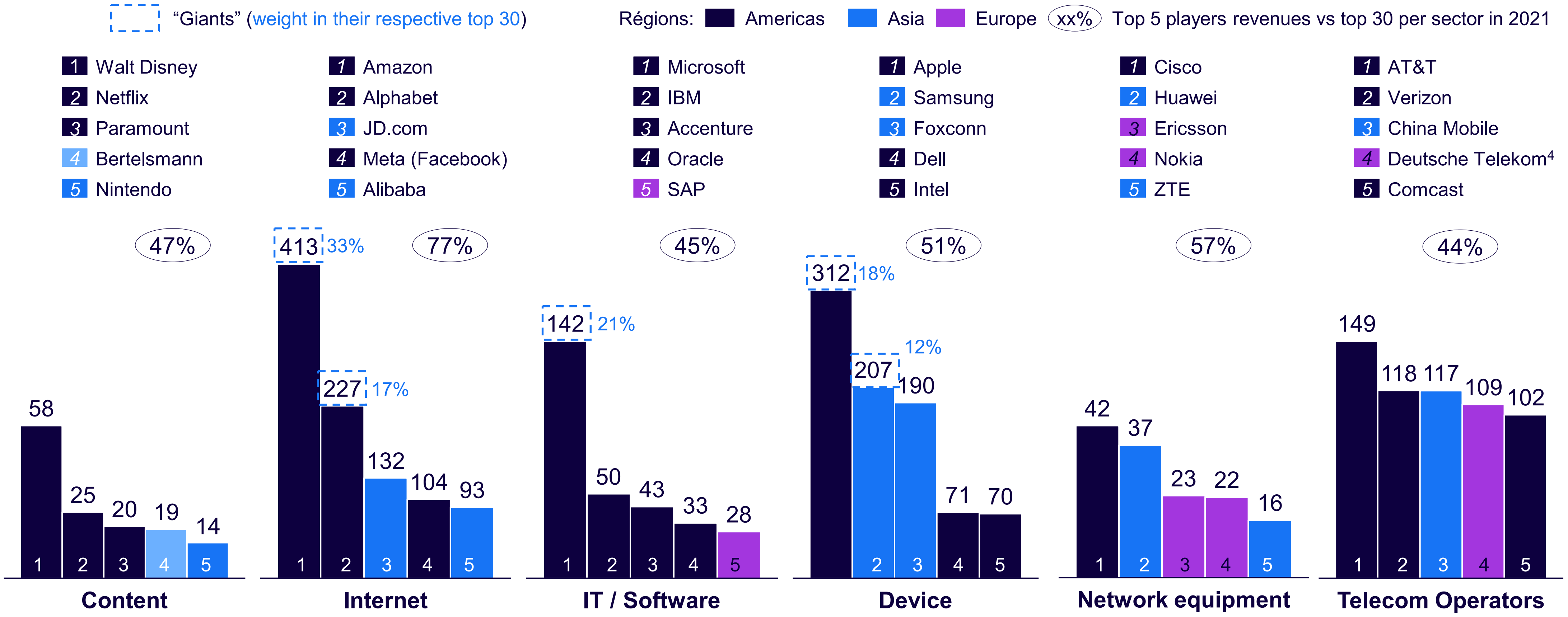
Source: Thomson Reuters Eikon, Arthur D. Little

Note: 1) Panel of 180 companies: By sector, selection of the top 30 companies by their turnover in 2021, 2) Constant 2021 euros, 3) Includes the top 30 players outside Asia, North America and Europe (only Oceania, Middle East, Africa and South America)

We observe the strengthening of super dominant players, predominantly American and Asian, in each category of the Digital Ecosystem

Digital ecosystem[1] top 5 players revenue by category

Per region[2], top 5 player per sector, 2021 revenues in billion euros[3]



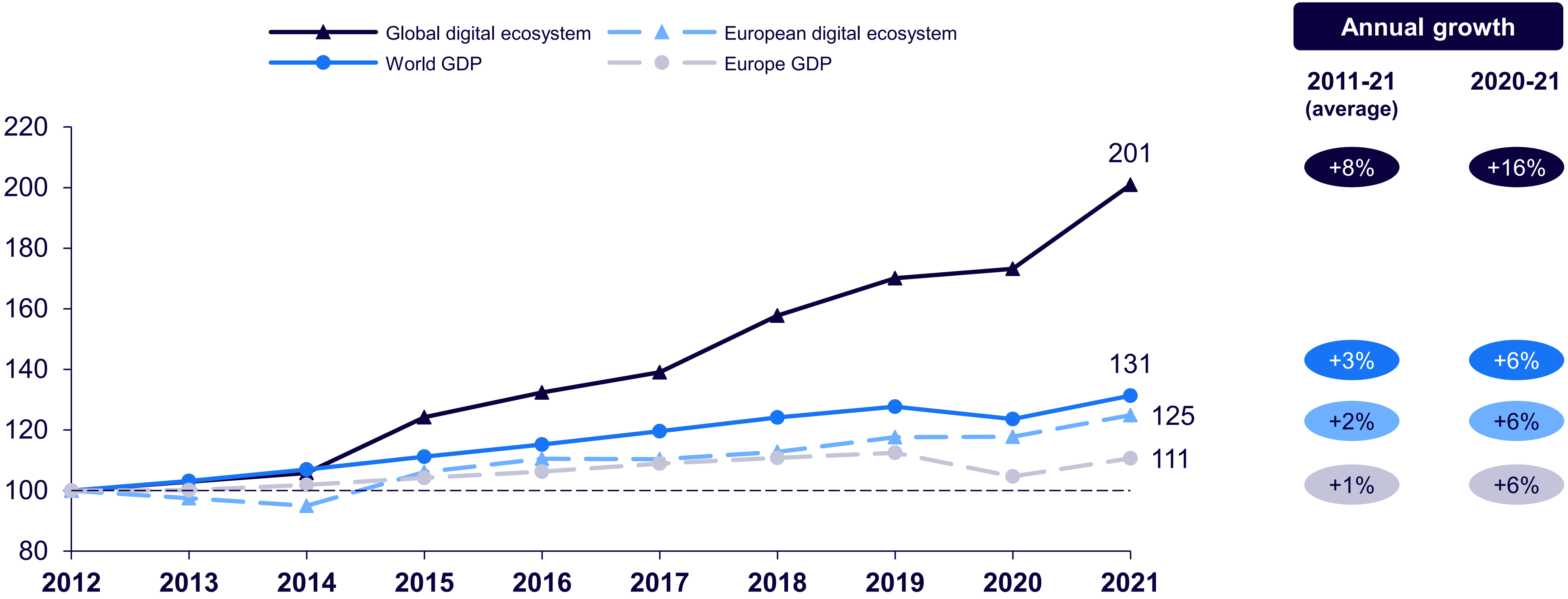
Source: Thomson Reuters Eikon, Arthur D. Little

Note: 1) Panel of 180 companies: By sector, selection of the top 30 companies by their turnover in 2021, 2) Region based on HQ location, 3) Constant 2021 euros

The global digital ecosystem has been growing 2x faster than GDP for 10 years, except in Europe where the growth rates are comparable (1-2% per year)

Revenue growth in the digital ecosystem[1] vs in the economy

World, 2012-2021, base 100 in 2012



Source: Thomson Reuters Eikon, World Bank, Arthur D. Little

Note: 1) Panel of 180 companies: By sector, selection of the top 30 companies by their turnover in 2021, 2) Constant 2021 euros, 3) World GDP based on countries representing 70% of total (same logic applied in Europe)

2022 shows a break in the growth cycle of the ecosystem with a slow down of revenue growth for some of largest players and a correction in their market capitalization

2022 revenue growth below 2021 levels

Companies[1] of the digital ecosystem, % growth

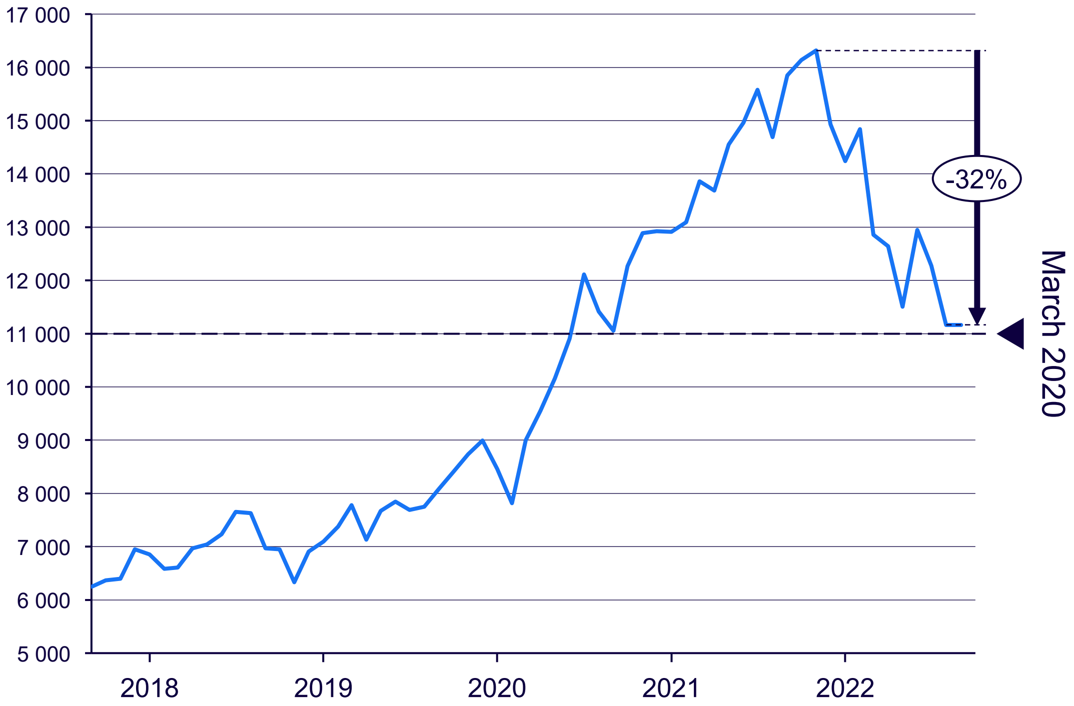
Segment	Company[1]	2021 vs 2020	S1 2022 vs S1 2021
Internet	Amazon	+31%	+7%
	Alphabet	+52%	+18%
	Meta	+47%	+5%
IT / Software	Microsoft	+11%	+21%
	IBM	-16%	+9%
Content	Walt Disney	+4%	+25%
	Netflix	+23%	+9%
Device	Apple	+32%	+2%
	Samsung	+16%	+20%
Network equipment	Cisco	-1%	+3%
	Huawei	-4%	+4%
Telecom Operators	Verizon[2]	+12%	+1%
	China Mobile[2]	+22%	+12%

S1 2022 growth above 2021 S1

S1 2022 growth below/comparable to 2021 S1

A strong correction in market capitalization

NASDAQ index 2017-2022



2022 is a less favorable year for the digital ecosystem, with a slowdown in revenue growth for many players, and stock market valuations returning to their March 2020 level (-32% over 12 months)

Source: Thomson Reuters Eikon, annual reports, Arthur D. Little

Note: 1) Selection of largest company based on revenues per sector, 2) AT&T excluded due to spin-off of Time Warner

The telecom economy in 2022

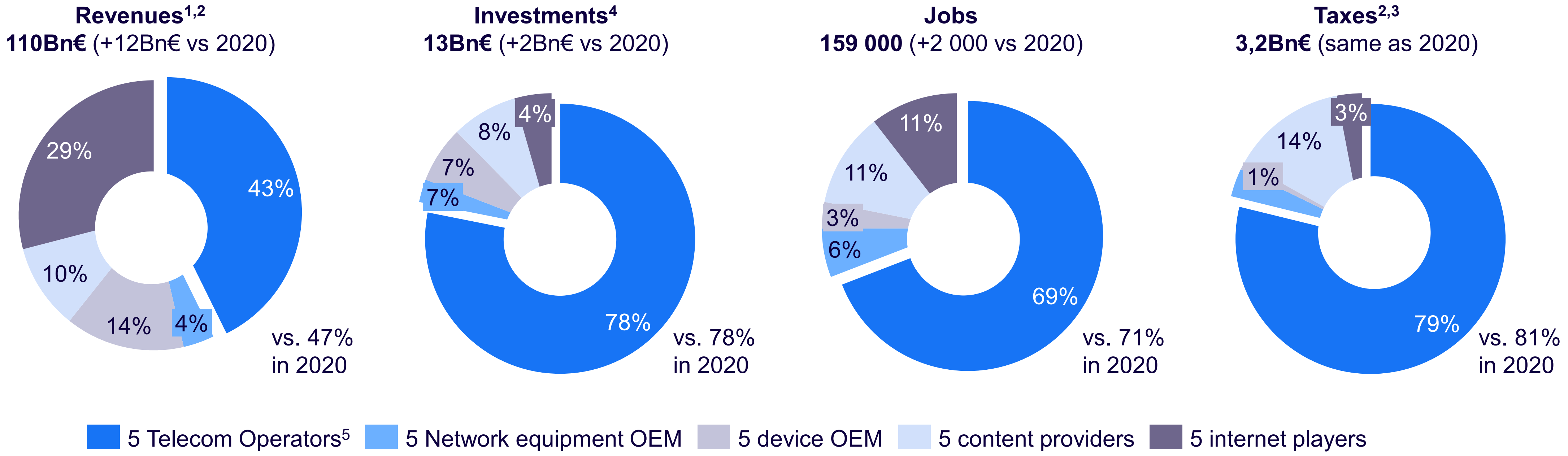
- **01** The global digital ecosystem continues to grow in 2021 but shows signs of slowing in 2022
- **02** In France, telecom operators confirm they are a driving force in the digital economy with record investments of €15bn and very competitive rates
- **03** This French telecom operators’ leadership is worth noting as they are also amongst the most heavily taxed operators in Europe
- **04** Thanks to their spending, telecom operators are also decisive for employment in France, in the telecom sector and beyond

Source: Arthur D. Little

Telecom operators are a driving force in the French digital ecosystem, accounting for 78% of investment, 69% of jobs but only 42% of revenues

Contribution of the top players to the French Digital Ecosystem

France, 2021 (vs. 2020) – based on top 5 players by revenue of each category

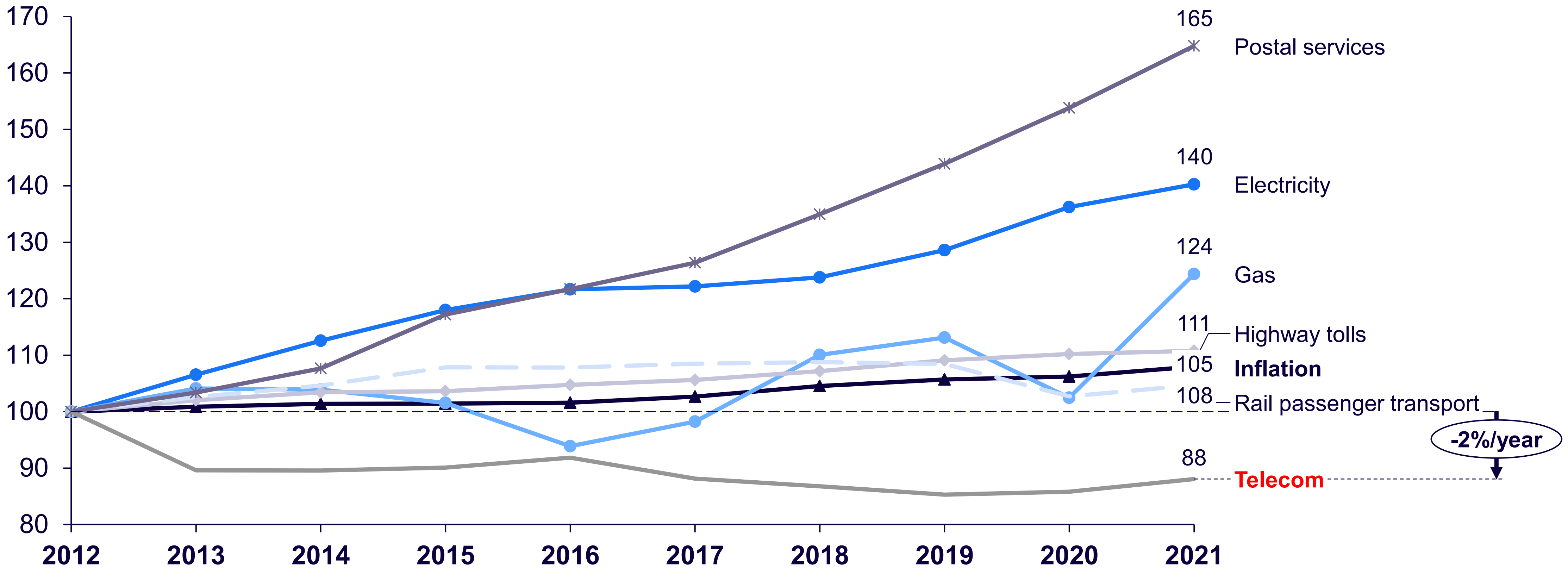


Source: Thomson Reuters Eikon, Diane, Rapports Annuels, Arthur D. Little

Note: 1) Revenues declared or estimated in France, 2) Data adjusted to consider international players revenues in France, 3) Corporate taxes and similar – excluding fines paid by internet actors; 4) Excluding 5G spectrum bids, 4) Based on gross investments in France excluding cessions, 5) EIT bought by BT in 2021

Telecom rates remain at very low levels compared to other regulated sectors in France

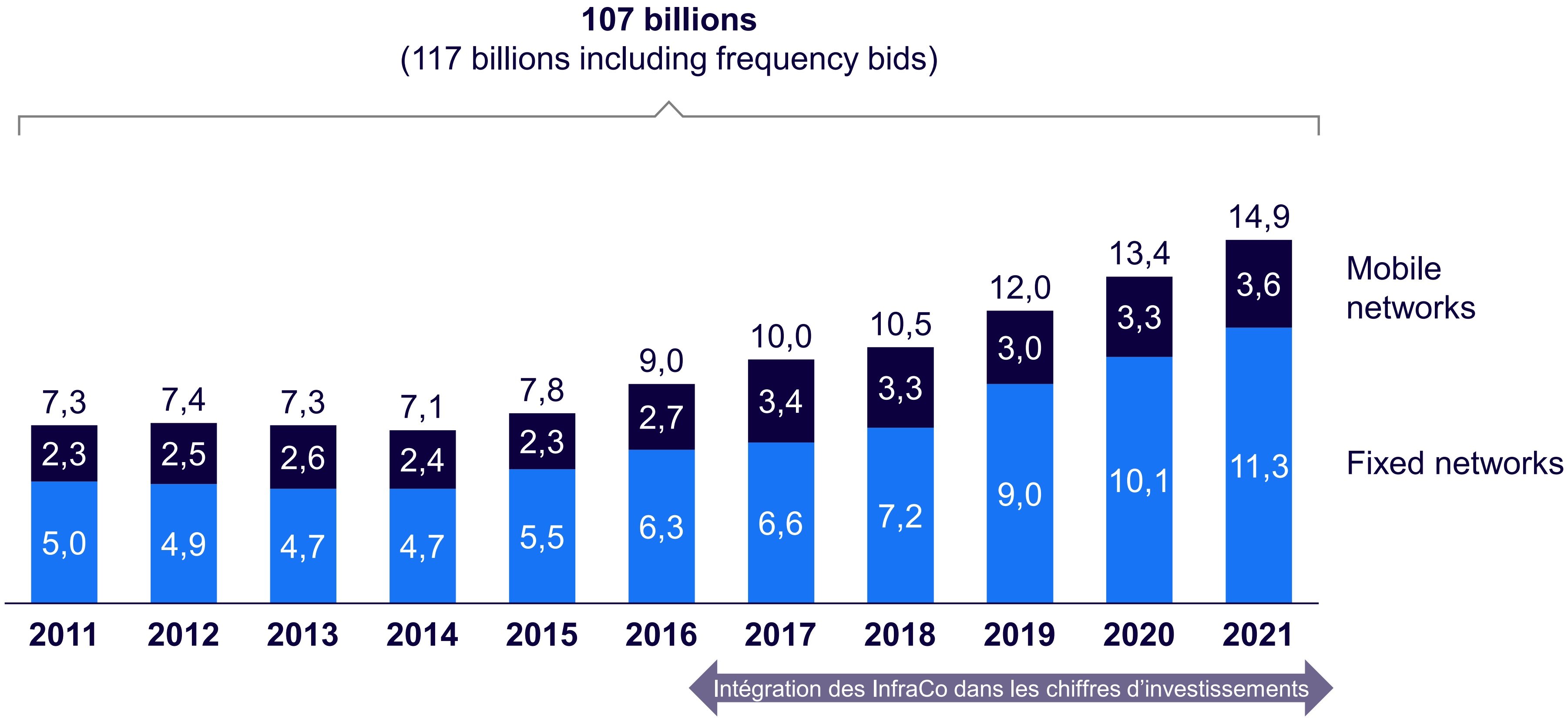
Price evolution on a sample of goods and services in France
France, 2012-2021, Base 100 in 2012



Source: INSEE, Arthur D. Little

The French telecom sector invested a record of 15Bn€ in Network Infrastructures in 2021

Investments in telecom networks
France, 2011-2021, billion euros, all operators (including Infracos)



+ 9,8 Bn€ for frequency bids on the period

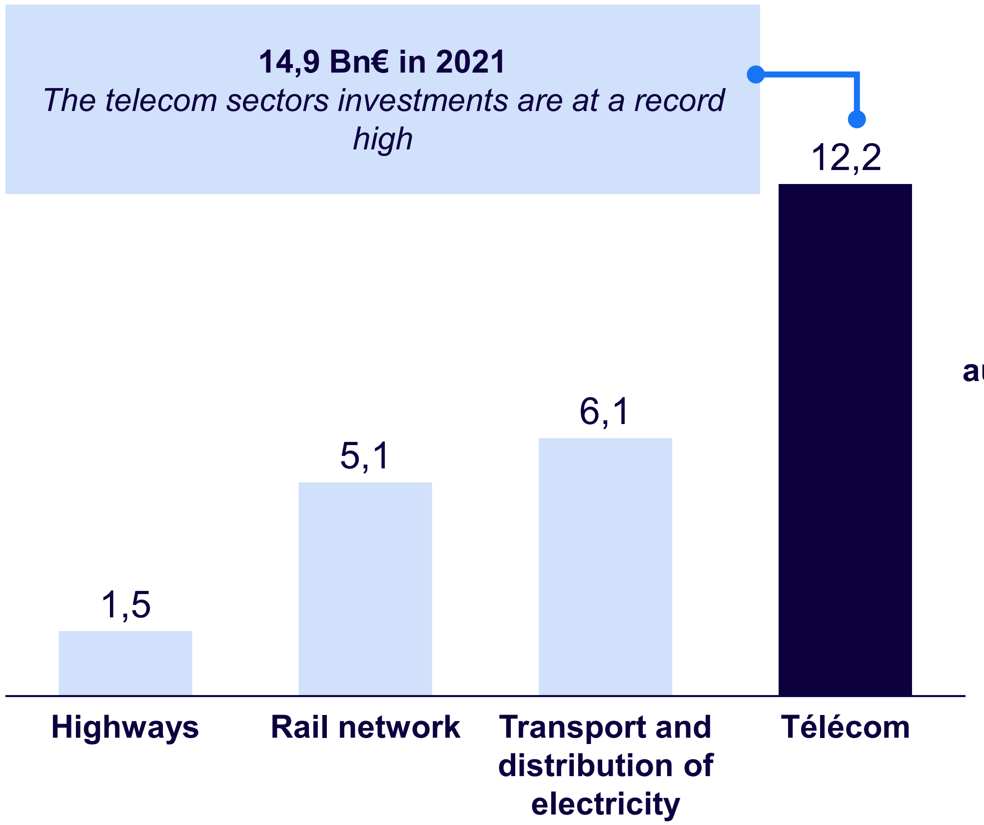
0,9 in 2011
2,6 in 2012
2,8 in 2015
2,8 in 2020
0,7 in 2021

Source: Arcep, Arthur D. Little

French Telecom Players invest more than any other infrastructure sectors, including highways, rail, and electricity transport

Comparison of the telecom sectors average investment vs other infrastructure sectors

France, 2017-2021, 5-year average, Billion euros



équivalent aux investissements suivants, chaque année…

150 hospitals

or

16 700 building energy retrofits

or

676 offshore windmills

or

900 high schools

or

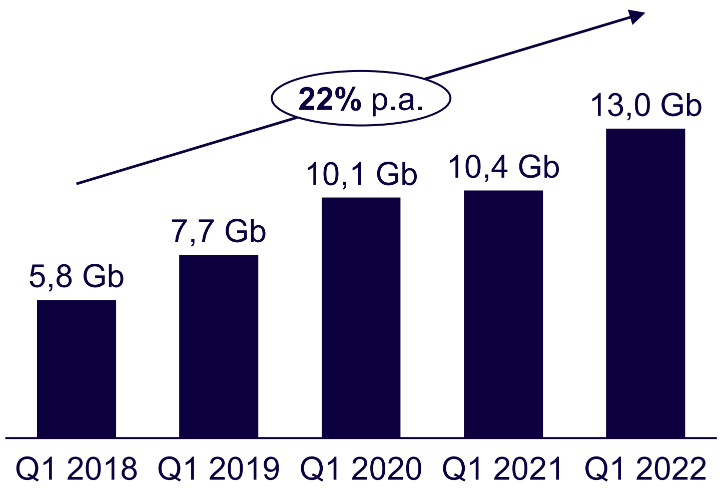
4,5 millions free access bikes
(x225 vs. the actual Parisian bikes)

Source: ARCEP, annual reports, Arthur D. Little

The investments in telecom networks allowed a strong growth in mobile connectivity with more than 13Gb consumed monthly per French Smartphone User

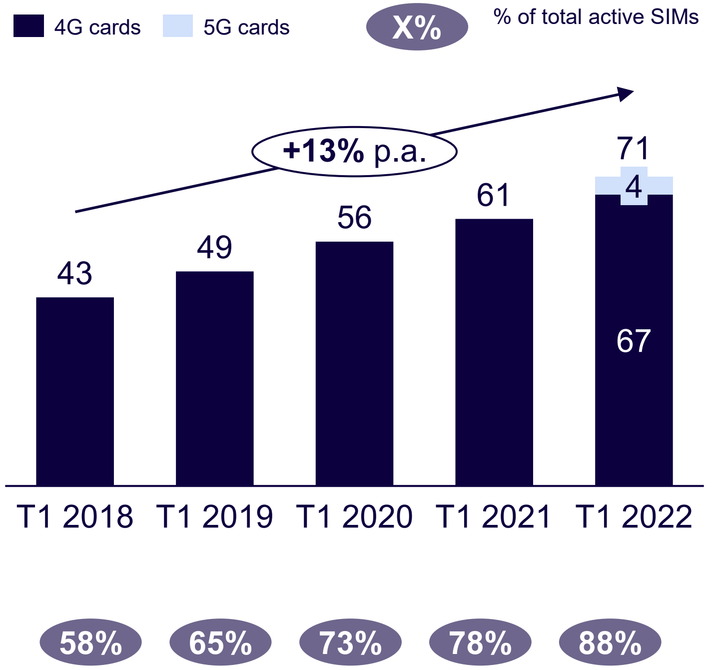
Equipment and connectivity in France – Mobile
France, 2017-2022

Average 4G data consumption*
Monthly average

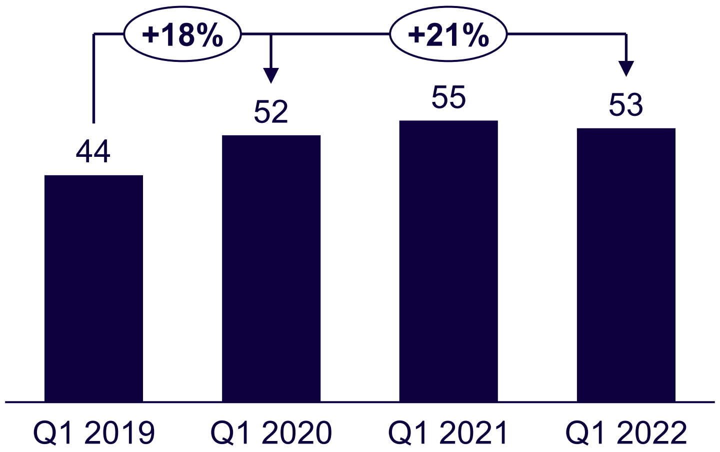


Corresponds to 19h per month on Netflix in standard quality (or 4,5h in HD)

Active 4G et 5G SIMs
Millions active cards, excluding M2M



Mobile voice consumption
Billion minutes per quarter



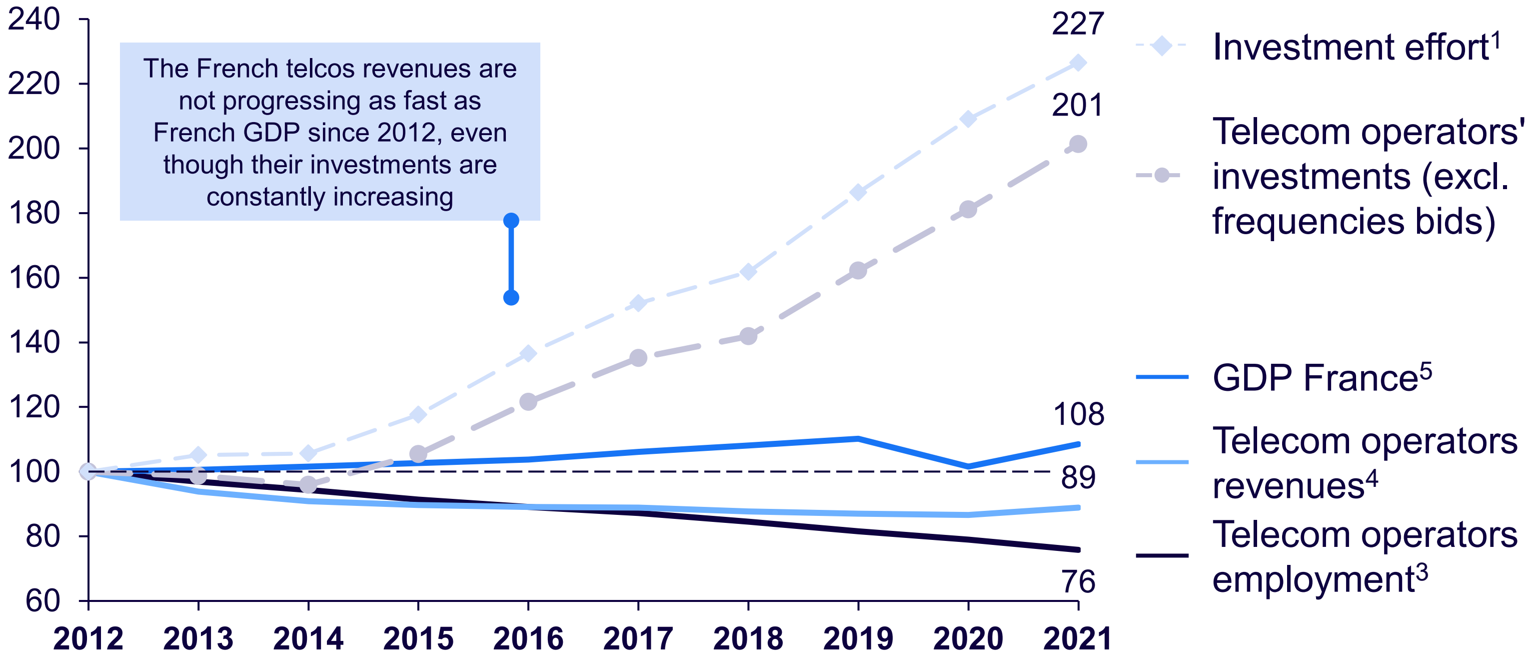
The mobile voice consumption did not go down after lockdown was lifted in France

Source: Arcep, Arthur D. Little
Note: *per active 4G card

French telecom operators investment efforts is outstanding at it occurs in a complex economic environment with decreasing revenues since 2012

Employment, revenues and investments of French telecom operators

France, 2012-2021, base 100 in 2012



Annual growth

	2012-2021 (average)	2020-2021
Investment effort[1]	+ 9,5 %	+ 8,3 %
Telecom operators' investments (excl. frequencies bids)	+ 8,1 %	+ 11,2 %
GDP France[5]	+ 0,9 %	+ 6,8 %
Telecom operators revenues[4]	- 1,3 %	+ 2,6 %
Telecom operators employment[3]	- 2,7 %	- 4,0 %

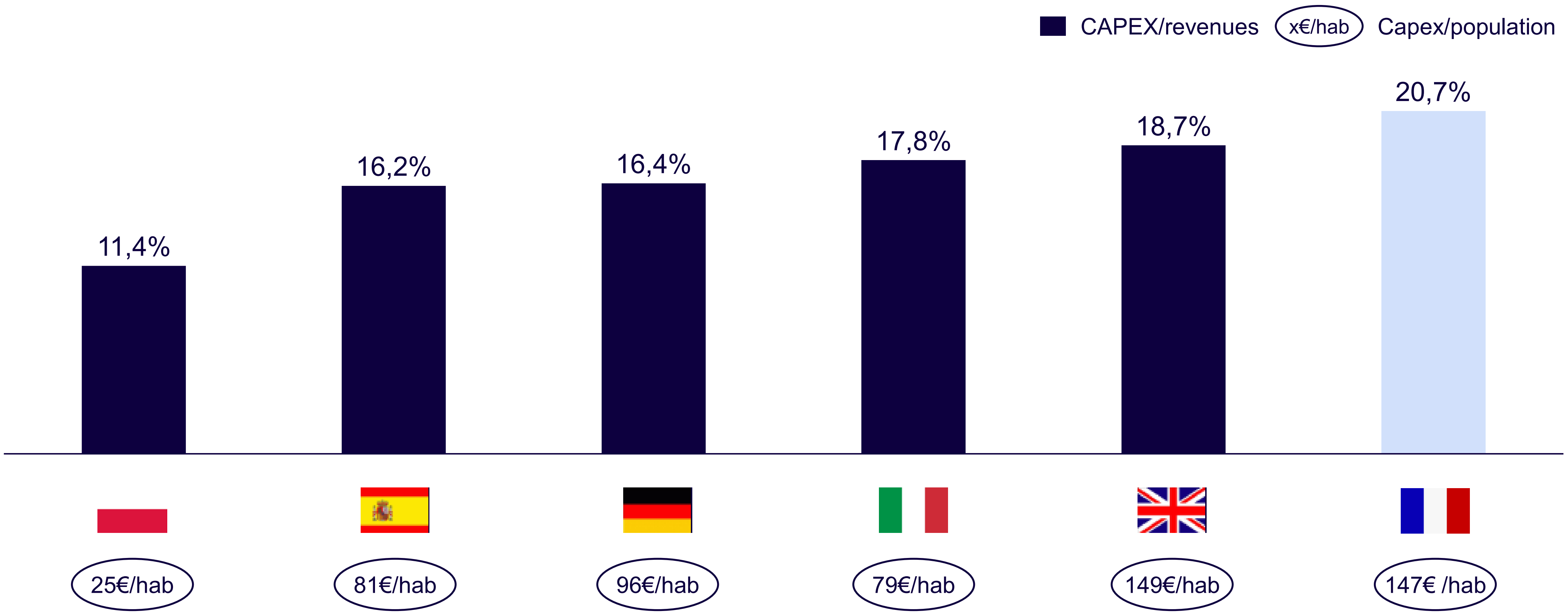
Source: Arcep, DARES, Insee, Arthur D. Little

Note: 1) Investment effort: telcos investments excluding frequencies bids divided by their revenues, 2) Temporary ARCEP figures for 2021, 3) ARCEP, 4) Temporary ARCEP figures for 2021, 5) INSEE GDP data

The investment effort of French Telecom Players is the highest within large European countries

Investment effort rate in European countries (CAPEX/revenues)

UK, France, Spain, Germany, italy, Poland, 2021

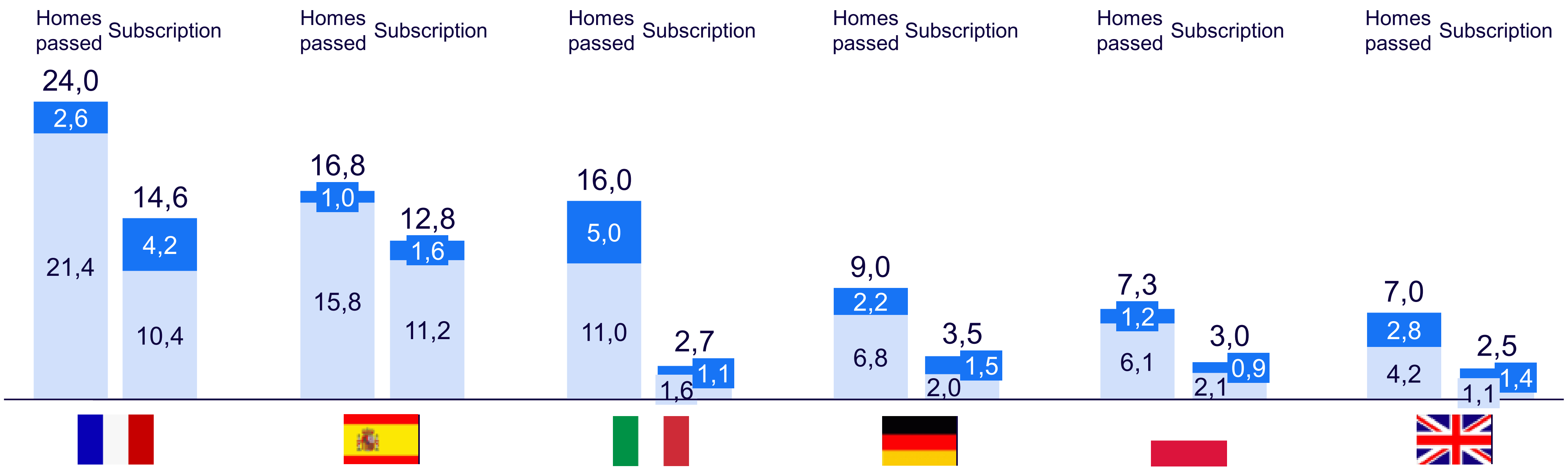


Source: Annual reports, Arthur D. Little

France is #1 in Europe in terms of FTTH/B eligibility and subscriptions (resp. 24m and 15m), with more than 80% eligible households in Q3 2021

FTTH/B homes passed and subscriptions

European countries >35m inhabitants, September 2021, million homes

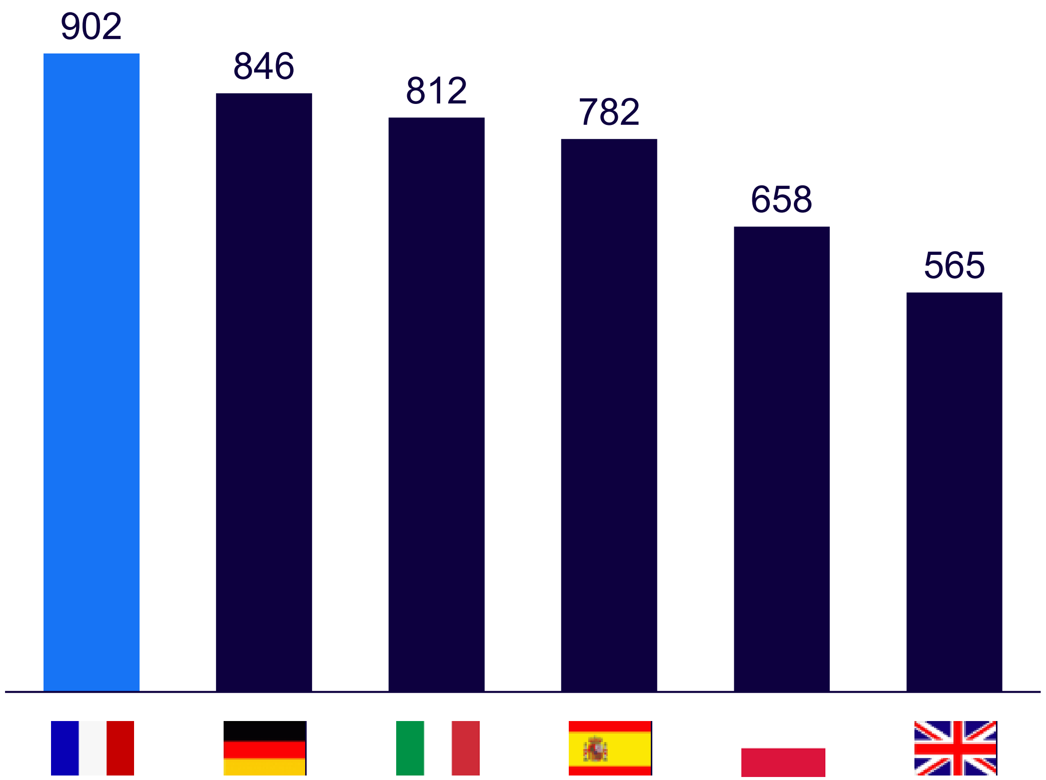


	France	Spain	Italy	Germany	Poland	UK
FTTH/B eligibility in Sept 2021	81%	90%	61%	22%	48%	25%
FTTH/B penetration in Sept 2021	49%	68%	9%	10%	20%	9%

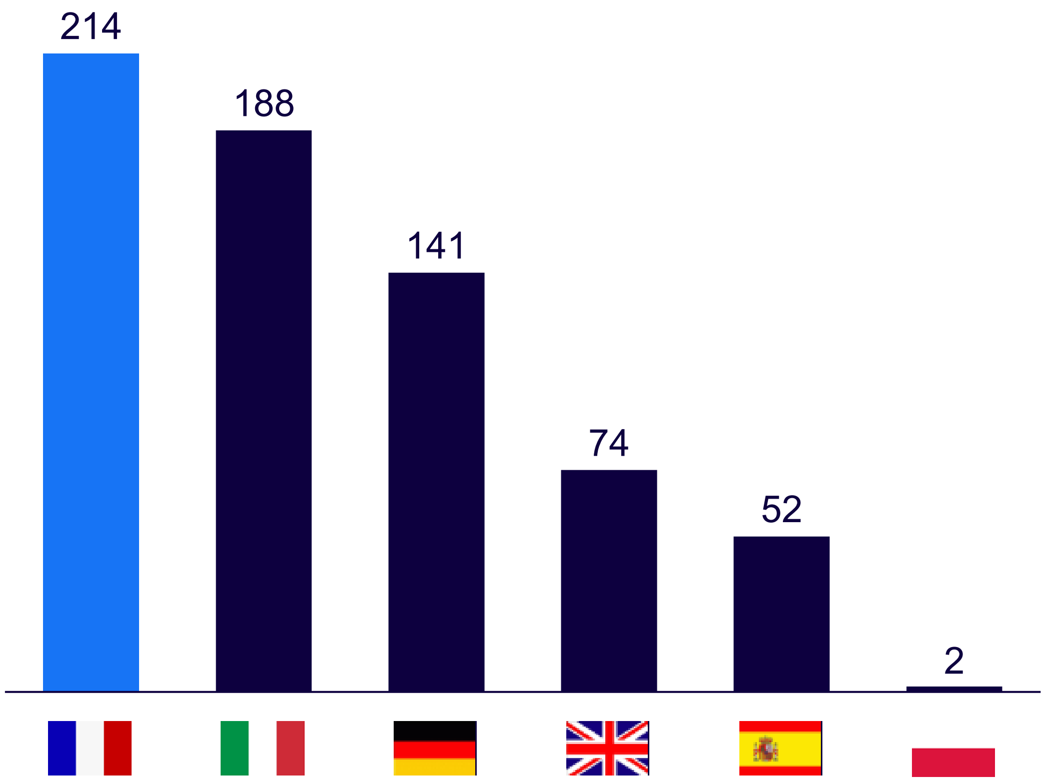
Source: Panorama 2021 of the FttH Council of Europe, Arthur D. Little
Note: 1) Between September 2020 and September 2021, 2) Before September 2020

France is also the European country with the highest density of mobile infrastructure, including for 5G

Density of mobile sites per country[1]
# of mobile sites[1] per million inhabitants



Density of 5G 3,4-3,8 GHz PoP[2] per country
# of PoP[2] 3,4-3,8 GHz per million inhabitants



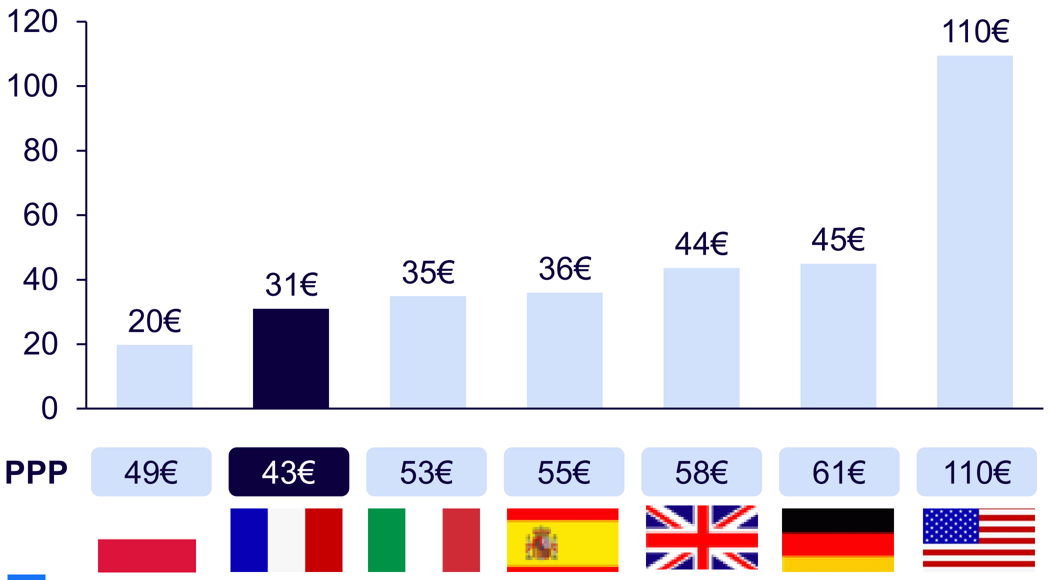
Notes : 1) Mobile sites : towers and masts ; 2) PoP : Point of Presence
Source: 5G EU Observatory, EY, Arthur D. Little

The telecom rates in France are amongst the lowest within large European markets, and the lowest when purchasing power parity is considered

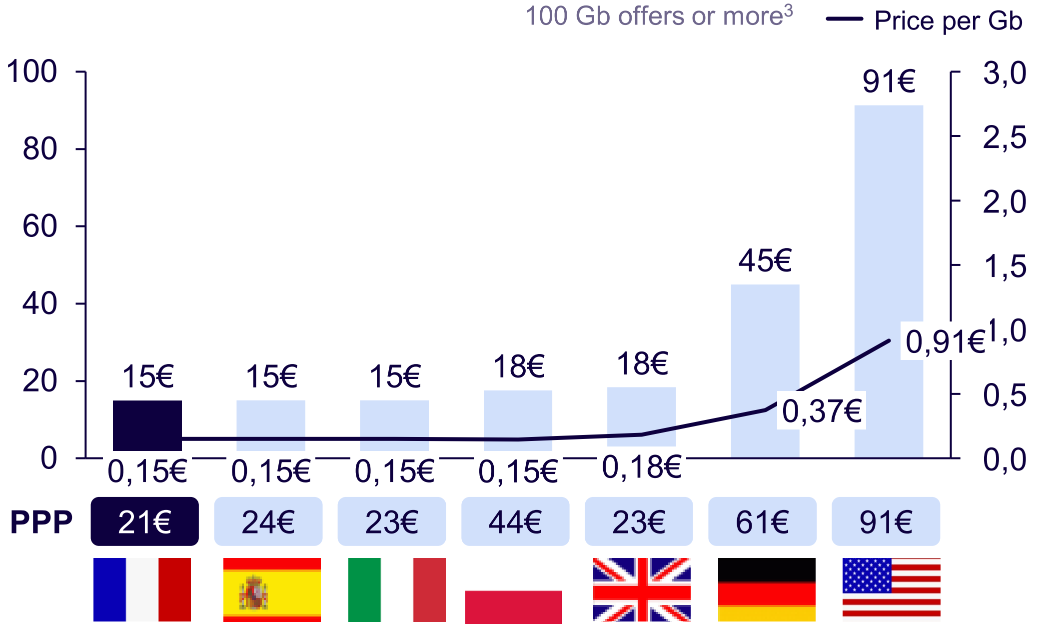
Comparison of leading telcos offers

Country selection, September 2022, € including taxes / months, PPP adjustments made using OECD coefficients

Fixed (Triple Play FTTH only)[1]



Mobile[2]



Excluding promotion, excluding connection costs
Per country, selection of the most competitive offers within telcos with >10% market share

Note: 1) Triple play offers only; unlimited telephony at least to fixed lines; unlimited fibre broadband internet only; television included, excluding additional packs; operators whose market share > 10% excluding promotions, xDSL rates excluded from the benchmark, 2) Unlimited calls (when available or >500 minutes), unlimited SMS/MMS, internet at least 100 GB; offers without terminal, offers without commitment when available; operators whose market share > 10, 3)unlimited data offers excluded
Source: Operator sites, Arthur D. Little

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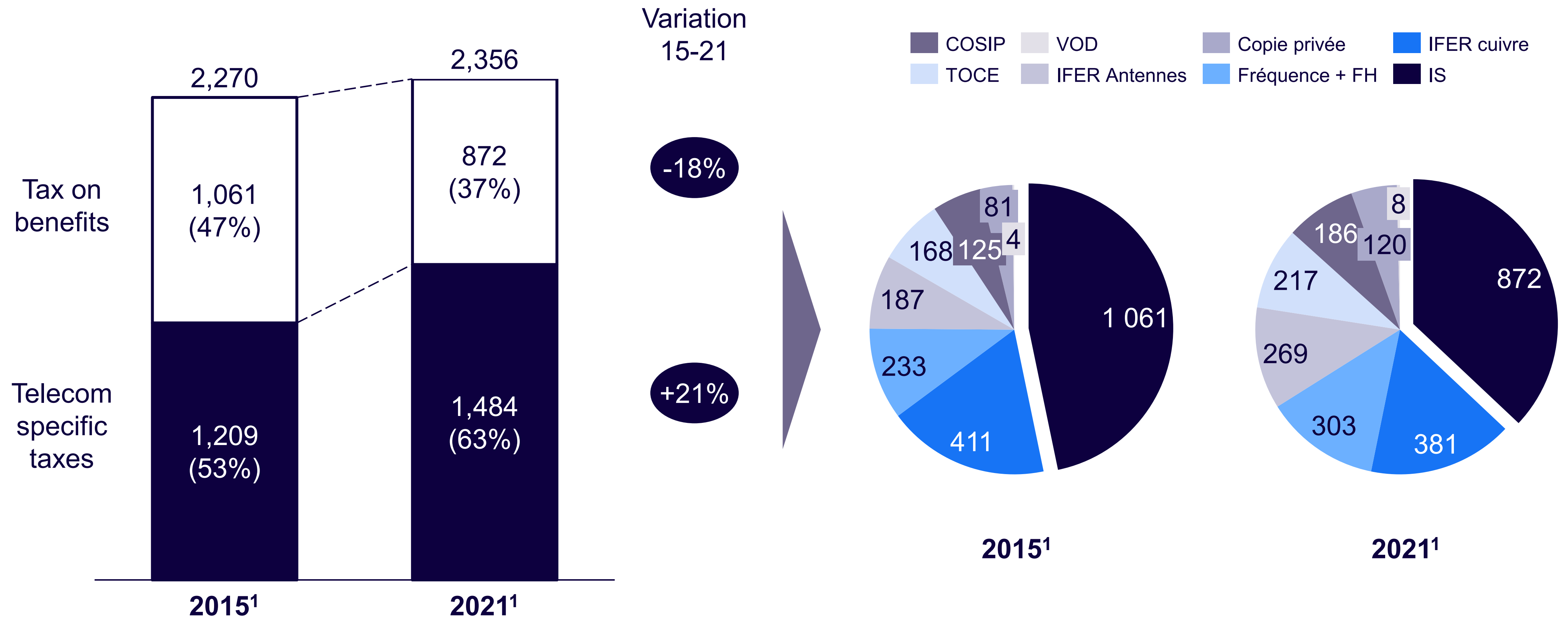
Source: Arthur D. Little

French Telecom Operators suffer from very high specific taxation levels, representing more than 63% of their total corporate taxes paid in 2021

Taxes paid by telecom operators

France, 2015 and 2021, millions euros and % of total taxes paid

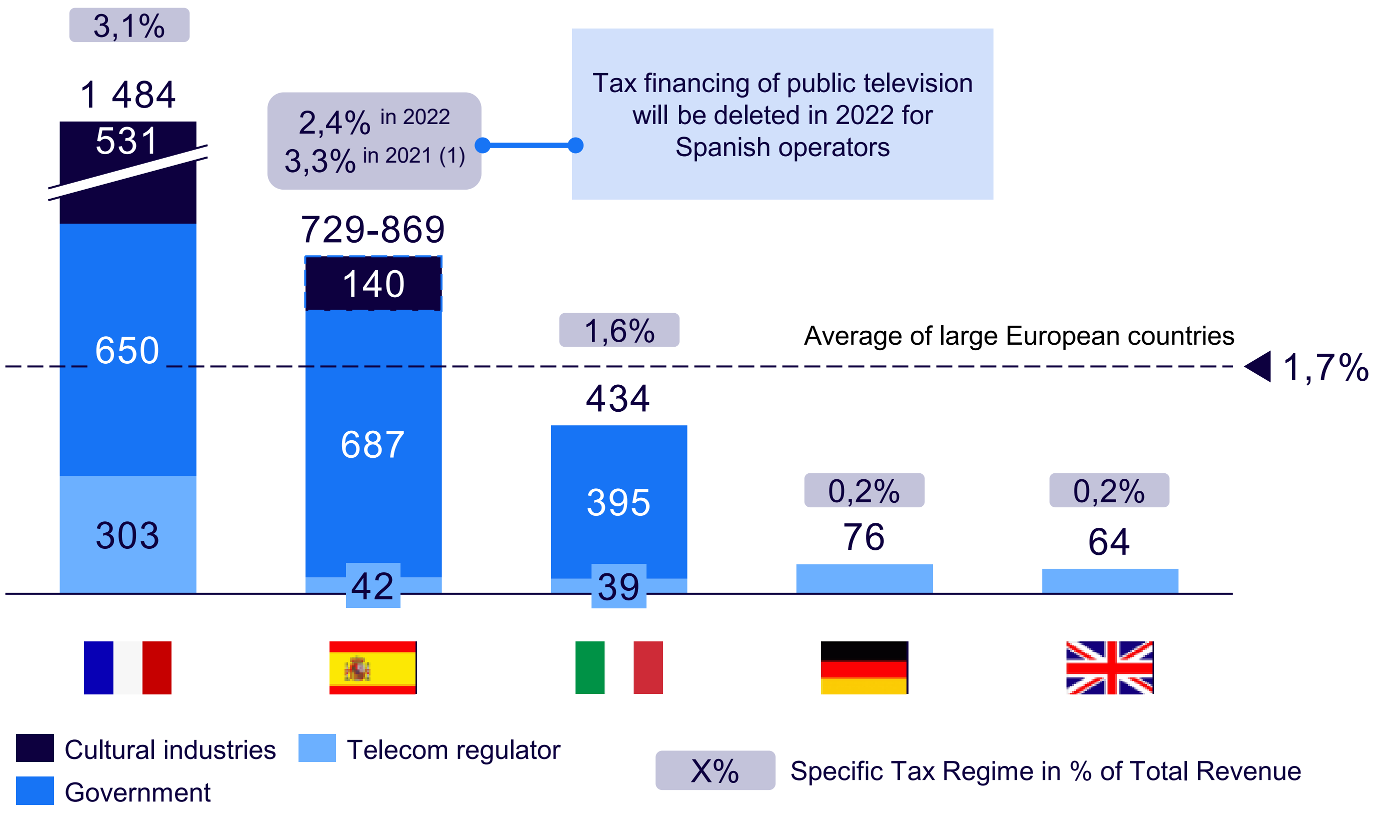


Source: operators, Fédération Française des Télécoms, Arthur D. Little

Telecom specific taxes amount to 3,1% of the French Telecom Operators revenue, one of the highest specific taxation regime in Europe

Telecom specific taxes per country

In m€ et % of revenues, 2021



Tax beneficiaries

Cultural industry

- Financing public TV (suppressed in 2022 in Spain)

Government

- Tax on utilization of mobile and fixed networks
- Tax on network footprint

Telecom regulator

- Frequency management tax
- Regulator financing

Source: Arthur D. Little

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Source: Arthur D. Little

Overall, the French telecom sector generates approx. 400 000 jobs, of which 262 000 are linked to the Telecom Operators spending

+ *Jobs existing thanks to telecom networks in the economy (e-commerce, etc.)*

3 — **Total jobs in the French telecom sector**

400 000 jobs (+/- 50 000)

2 — **Jobs related to the telecom operators' spending**

262 000 jobs

1 — **Direct employment of telecom operators**

123 000 jobs

Jobs in France of the 4 national telecom operators, the alternative operators and infracos

+ *Jobs of telecom operators' suppliers in France (network installation, device OEM, etc.)*

+ *Jobs of suppliers of the telecom operators' suppliers in France*

+ *Telecom jobs existing in France independently from the spending of the telecom operators (exports, etc.)*

Sources and methods

- *Annual reports and estimations based on publicly disclosed data*
- *Estimation based on CAPEX and OPEX breakdown between suppliers and employment ratios*
- *Estimation based on French statistics office ratios and data and ADL proprietary telecom employment database*

source: Arthur D. Little

Through their massive operational and investment spending, Telecom Operators are decisive for employment in France, in the telecom sector and beyond

123 000

Direct employment from telecom operators in France

Jobs in France from Orange, SFR, Bouygues Telecom and Free as well as the other operators[1] (FTEs)

1 ➡ 2,5

Telecom operators are a driving force for employment

For each job within a telecom operators, there are 2,5 other jobs within the telecom value chain

400 000

Jobs in the French telecom sector

Direct and indirect employment of the French telecom sector (FTEs)

262 000

Jobs generated by the telecom operators expense

Jobs of the operators and their suppliers (FTEs)

85%

Jobs within French companies

85% of the 262k jobs generated by the expenditure of telcos are within French companies[2]

2,2x

Jobs creating revenues

The revenue per capita generated is on average 2,2x higher in the telecom industry vs in other service industry

Note: 1) InfraCo: Cellnex, ATC, Axione, Altitude, XP Fibre, … & alternative operators: Adista, Sewan, Colt, Eurofiber, Alphalink, … ; 2) HQ in France, excludes subsidiaries of foreign groups
source: Arthur D. Little

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THE DIFFERENCE