Arthur D Little

"The Economics of Telecoms" Report

2014 edition

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FÉDÉRATION FRANÇAISE DES TÉLÉCOMS

2015, a turning point for telecoms?

What remains…	…and what changes
Usage keeps increasing… and is not monetized yet	Usage is increasing thanks to 4G and fiber, which are now becoming a reality
Prices are the lowest in Europe and telecom revenues are still decreasing	The revenue decline of telecom operators is slowing down
Competition is tough and operators' results are under pressure	Telcos have reacted and adapted their commercial and operational models
The sector is subject to strong regulation and taxation…	Public authorities in France are aware of digital challenges and opportunities
…and operators suffer from an asymmetrical situation vs. OTT, which have the lead in usage	A new European governance is being set up, with a key priority placed on digital issues

A new framework adapted to the digital era is required to support investment in the telecom sector

Source: Arthur D. Little analysis

Key messages

1 Telecoms are a key engine of the digital transformation of the economy

2 Europe is the only region of the world that is not benefiting from the strong growth of the digital economy

3 In France, the telecom sector is suffering hardship

4 Tomorrow's demand is stimulated thanks to infrastructures, services and trust in the digital economy

Key messages

1 **Telecoms are a key engine of the digital transformation of the economy**

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Investment and innovation in the telecom sector play a major role in the digital transformation of the economy

Telecom operators, basis of the digital transformation of society

1 A macroeconomic multiplier

Multiplier effect of telecom investment on the economy

– **1€ invested in telecom yields 6€ of GDP and 3€ of tax revenues for the state** (see 2013 Arthur D. Little study “The Economics of Telecoms”)

2 An accelerator of transformation

Leverage effect on the whole digital ecosystem

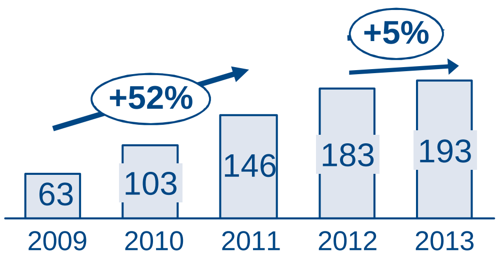
– **Trigger of new usages**
– **Distributor of new services**
– **Multiplier of digital markets**

Source: Arthur D. Little analysis

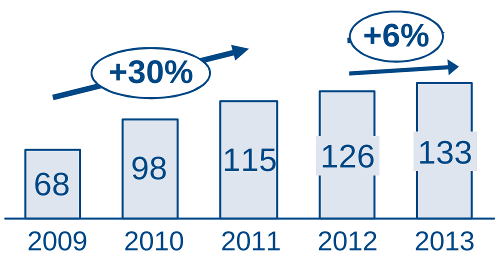
Digital yields new and strongly growing usages and markets

Example of traditional usages
France

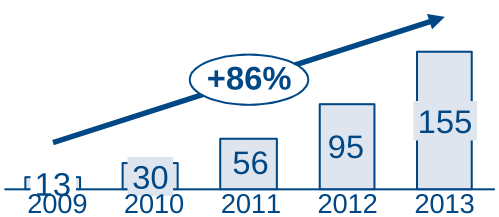
Number of texts sent
In billions



Number of emails sent
In billions

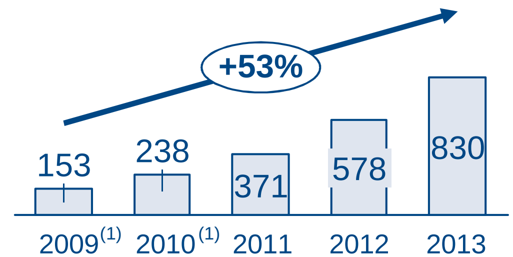


Volume of mobile data consumed
in petabytes

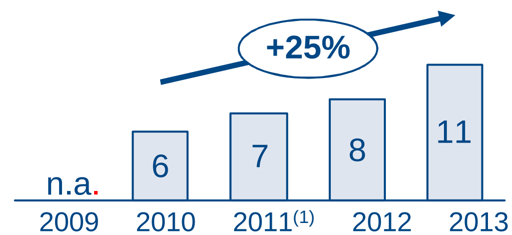


Example of new usages
France

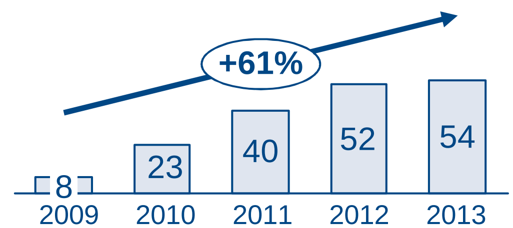
Number of apps downloaded in the App Store
In million units



Number of users of catch-up TV
in millions (2)



Revenues from music streaming
in M€



Source: ARCEP, SNCD, SNEP, IFPI, Arthur D. Little analysis

(1) Extrapolated figures
(2) # of persons who have watched catch-up TV in the last 30 days

The multiplication of connected services generates benefits to consumers and companies with the support of telecom operators

Usage trends in France

			Description	France positioning
1		**Connected devices**	**Multiplication of connected devices**, changing day-to-day life of consumers	**1st global market** in terms of IPTV penetration (2014) and **large smartphones penetration**
2	 	**Delinearized content**	**Multiplication of delinearized content** via video platforms and catch-up TV	**73% of French people** use catch-up TV (2014)
3	 	**Services with strong productivity impact**	**Development of new services** yielding economic benefits to companies	**41% of companies** use cloud services (2014) but SMEs are lagging behind
4	Mon. Service Public.fr	**Connected civil services**	**Generalization of online public services** to simplify procedures	**1st European country** for e-administration in Europe (2014)

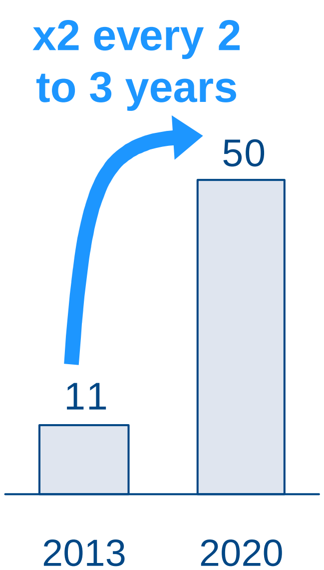
Source: Ovum, CNC, Markess, ONU, Arthur D. Little analysis

The whole economy is going to step into the digital era over the next 10 years

Increase in generation and use of data
World, 2013-2020

Connected devices

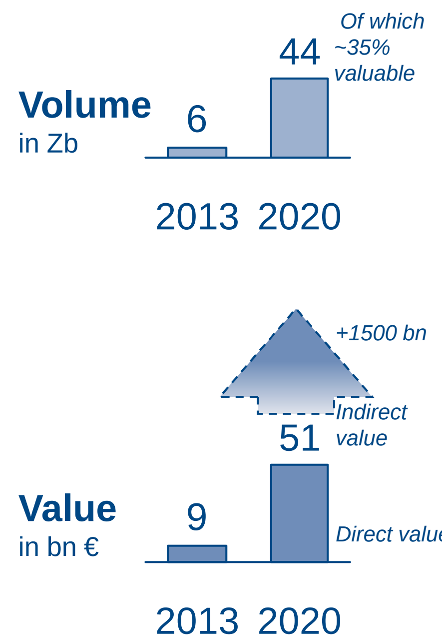
Bn of objects



New digital usages

	Examples of traditional sectors impacted
Connected cars	Automotive, …
Smart house	Building, …
Wearables	Insurance, healthcare, …
Connected gadgets	Consumer goods, …
Digital payments	Banks, …
Connected cities	Transport, utilities, public services, …

Digital data



Source: Cisco, IDC, Gartner, Arthur D. Little analysis

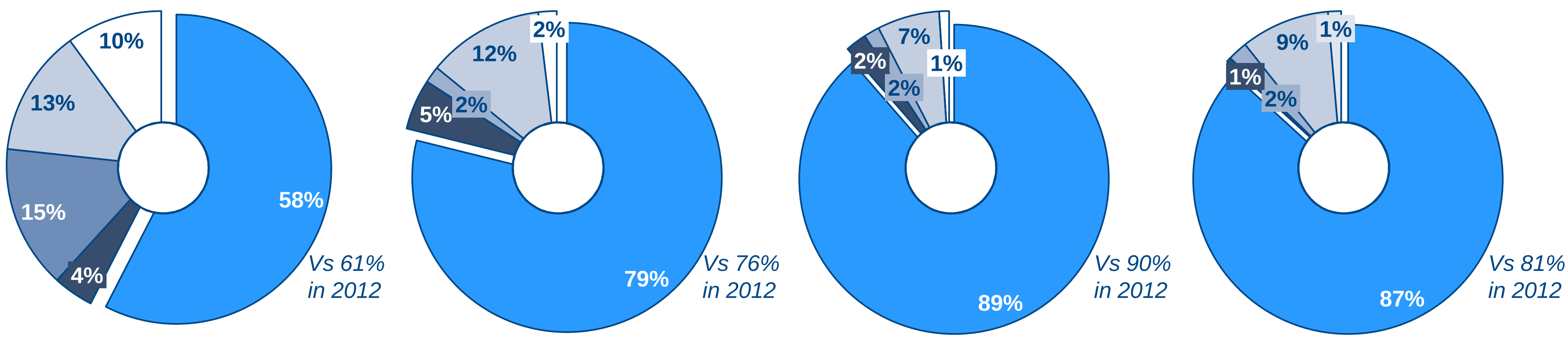
Note: direct value only linked to markets and services based on data; indirect impacts relative to the potential of other sectors of the economy (distribution, transport, …)

Telecom operators are central to the digital sector – accounting for 58% of revenues and 89% of investments

Relative size of sub-sectors in the digital ecosystem

France, 2013

Revenues(1)(2)	Direct jobs	Investments(3) :	Taxes(4)
66 bn€	**159,000**	**8 bn€**	**4.0 bn€**
-4.3% vs. 2012	*-6.5% vs. 2012*	*-3.6% vs. 2012*	*-9.1% vs. 2012*



5 telecom operators(5)	5 equipment vendors	5 device manufacturers	5 content players	5 Internet OTT players
Orange, SFR, Bouygues Telecom, iliad, numericable	NokiaSiemensNetwork, Ericsson, Alcatel-Lucent, Cisco, Huawei	Samsung, Nokia, LG, Apple, RIM	France Télévisions, TF1, Canal+, Radio France, M6	Google, Amazon, Yahoo, Facebook, Microsoft

Source: ARCEP, Diane, Reuters, annual reports, Arthur D. Little analysis

(1) Revenue declared in France or released in the press
(2) Adjusted data to account for the estimated revenues of international players in France
(3) Excluding operators' licences; if French data not available, estimation to the pro rata of employment in France
(4) Income tax and taxes
(5) Utilization of ARCEP figures if available

France and Europe have to leverage telecom operators to enhance the development of digital supply and demand

1 Telecom market growth

2 Digital usage growth

3 Digital ecosystem growth

4 Global and local players growth

Regenerate a virtuous circle

Europe has to stimulate telecom growth again, like other regions of the world: growth of sector revenues, stabilization / reinforcement of investments in very high broadband networks, support to usages, …

Expand digital usage

Digital usages expand with telecom operators: operators are the underlying driver of new usage development, requiring more bandwidth / coverage (video, Internet of Things …)

Multiply digital markets and the ecosystem

Demand of digital services grows in the regions with stronger "telecom growth" (for example, cloud markets, video, online streaming music, …)

Support local digital industry

If **digital offers** grow naturally, **local players take off when they are supported by telecom operators,** which accelerate their penetration (see examples of music streaming: Deezer, Spotify, Wimp)

Source: Arthur D. Little analysis

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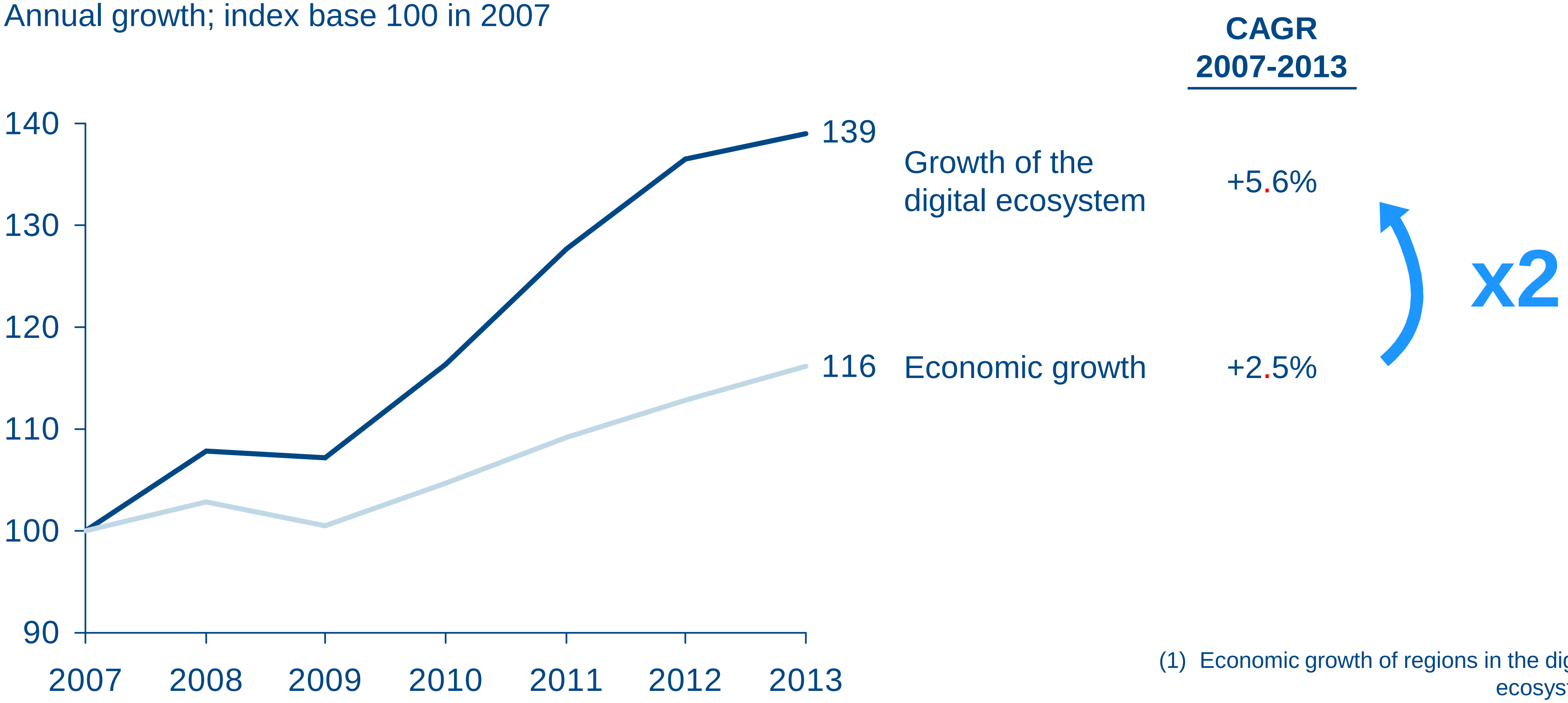
The digital ecosystem grows more than twice as fast as the overall economy…

Economic growth(1) vs. revenues of the digital ecosystem(2)
Worldwide, 2007-2013

Annual growth; index base 100 in 2007

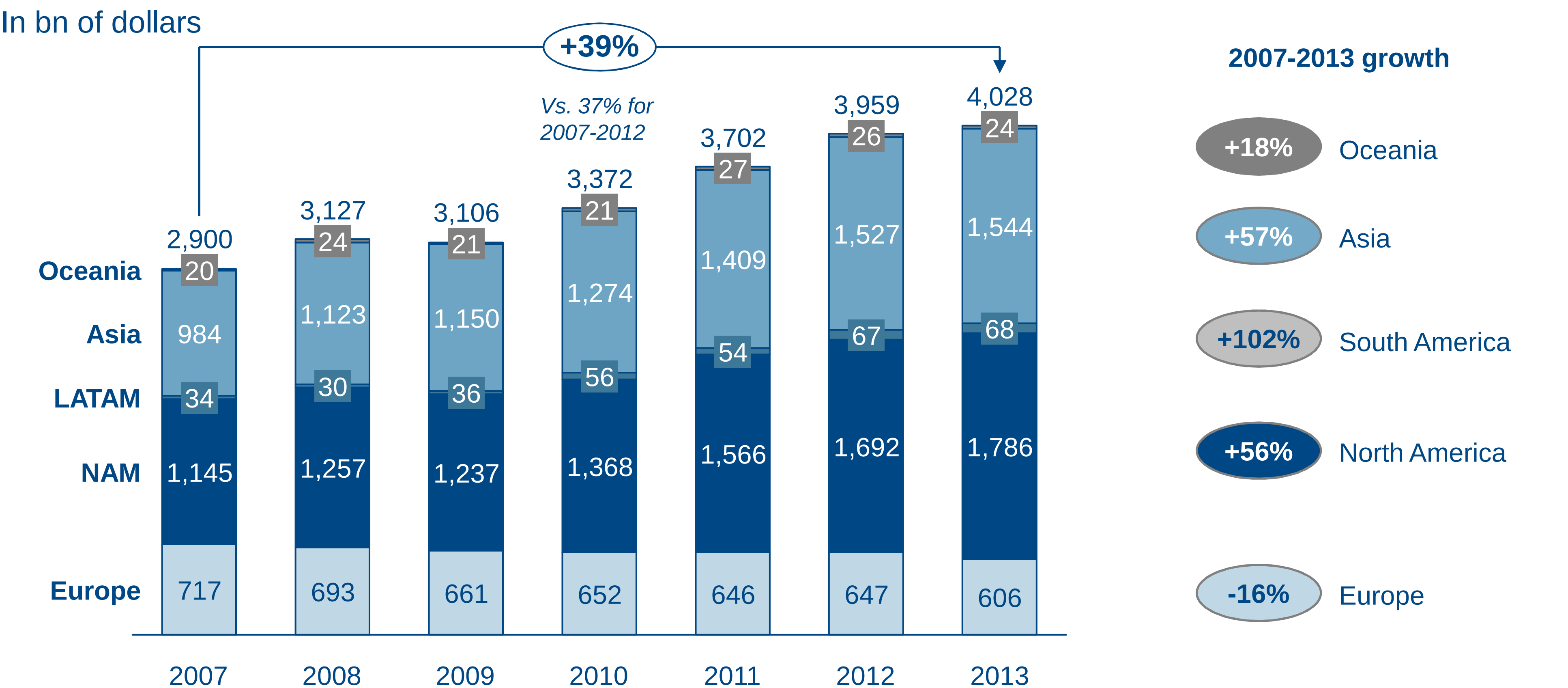


Source: IMF, Thomson Reuters, Arthur D. Little Value Growth Tracker, Arthur D. Little analysis

(1) Economic growth of regions in the digital ecosystem
(2) Digital ecosystem: top 30 players by 2013 revenues in each category

… but Europe is the only region not benefiting from digital growth

Revenues of the digital ecosystem(1) by region
Worldwide, 2007-2013



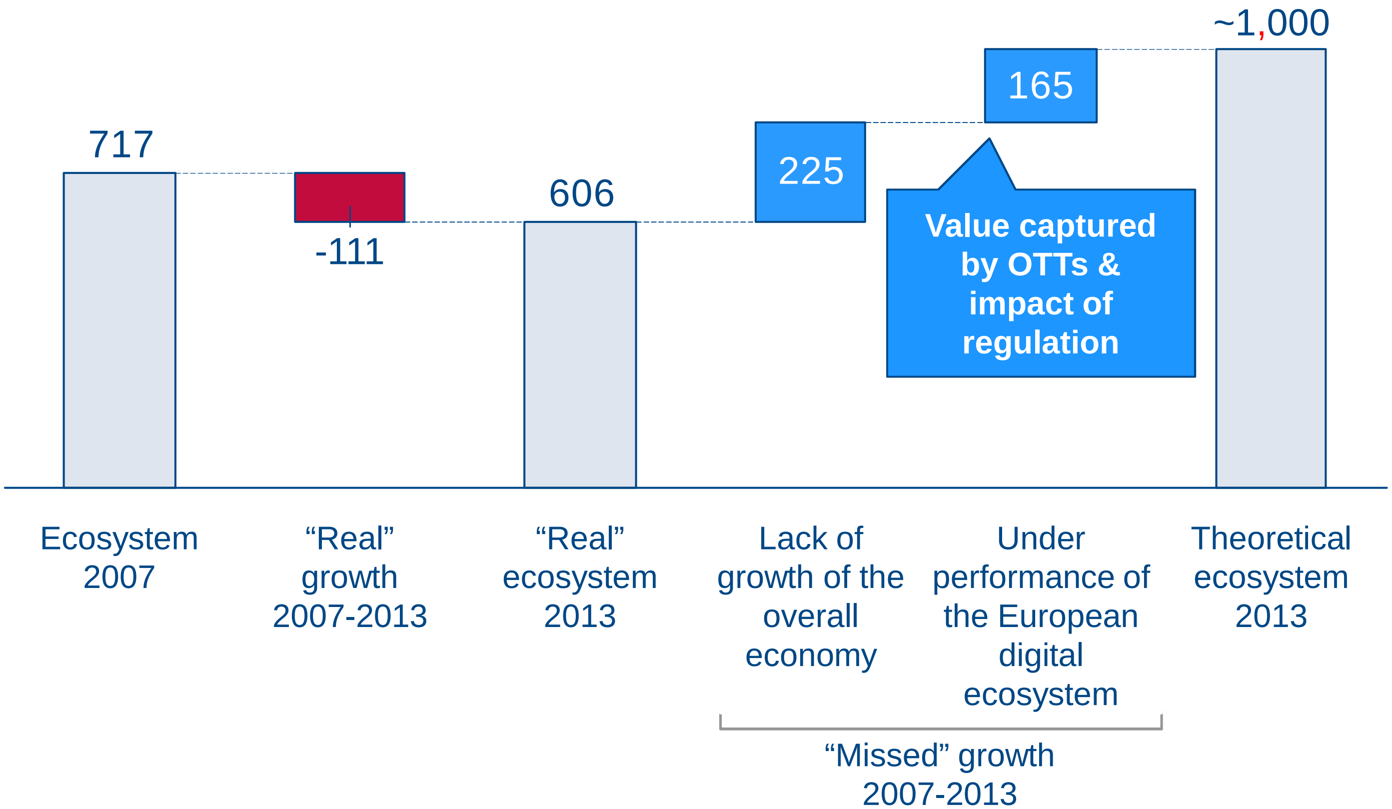
Source: Arthur D. Little Value Growth Tracker based on Thomson Reuters data, Arthur D. Little analysis

(1) Top 30 players of each category based on 2013 revenues (telecom operators, device manufacturers, OEMs, software players, content players, Internet players)
(2) Allocation of players according to headquarter location

After a successful development of telecoms, Europe has not managed to capture the new "digital growth"

Realized and "missed" growth
Europe, 2007-2013

In bn of dollars



If Europe had grown as fast as the global average:

– The European ecosystem would not weigh 606 bn USD …

– but **1,000 bn USD** (1) i.e. around **400 bn USD more or around 300 bn € more**

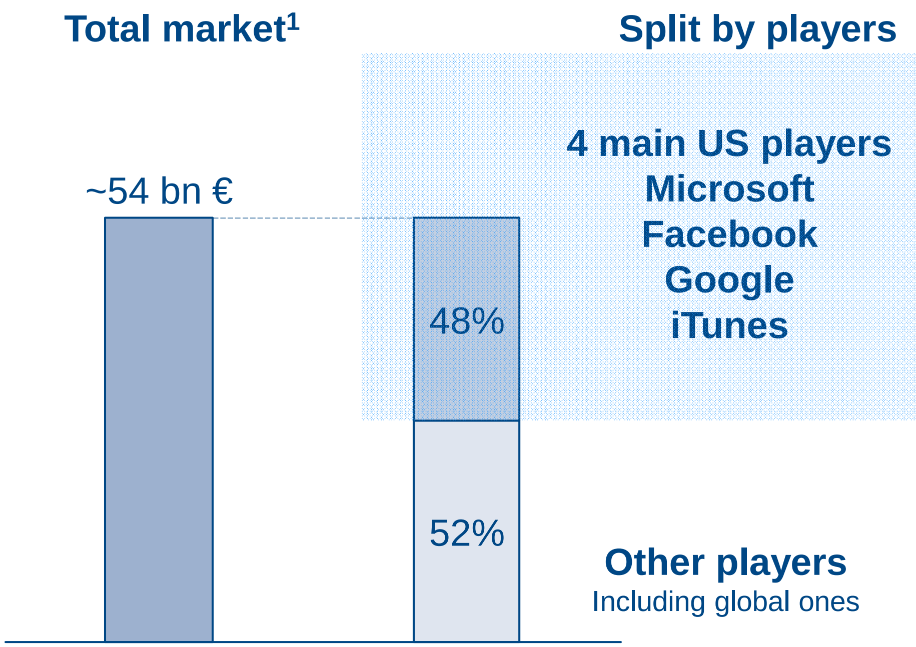
Source: Thomson Reuters, Arthur D. Little Value Growth Tracker, Arthur D. Little analysis

(1) 996 bn € rounded to 1,000 bn €

The market of innovative digital services is growing in Europe but is largely captured by non-European Internet players

Digital services market (excluding e-commerce and devices)
Europe, 2013

- Cloud
- Online advertising
- Digital video
- Digital music



- **The 4 main non-European players capture ~50% of digital value**
- **3/4 of the added value realized in France by GAFAM players does not contribute to French GDP** (see 2013 Arthur D. Little study "The Economics of Telecoms")

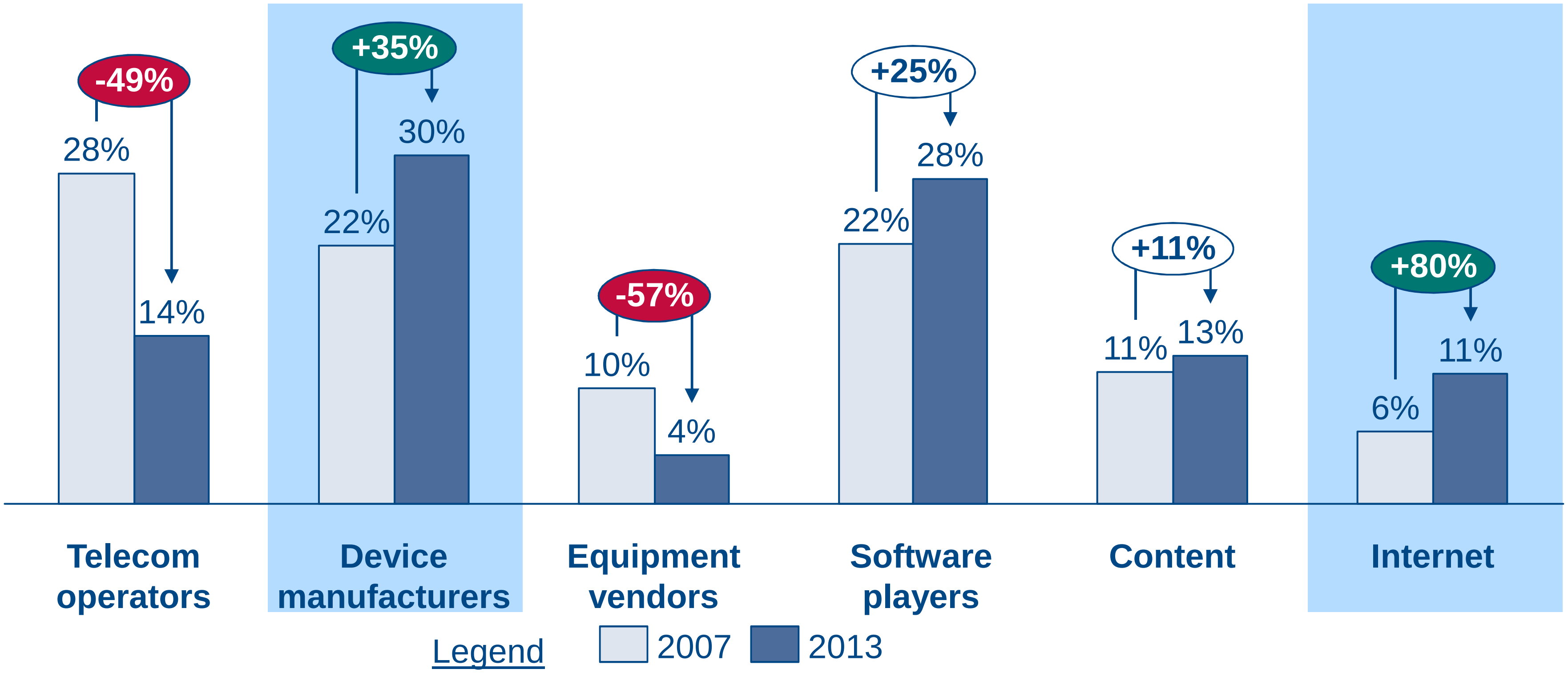
Source: companies, eMarketer, IFPI, Arthur D. Little analysis

Note: excl. devices; for added value, see "The Economics of Telecoms", 201" report for the Fédération Française des Télécoms

The value created is being captured more and more by device manufacturers and Internet players… to the detriment of telecom operators

Cash-flow generation (Free Cash Flows)
Worldwide[1], 2013

As a % of the yearly total

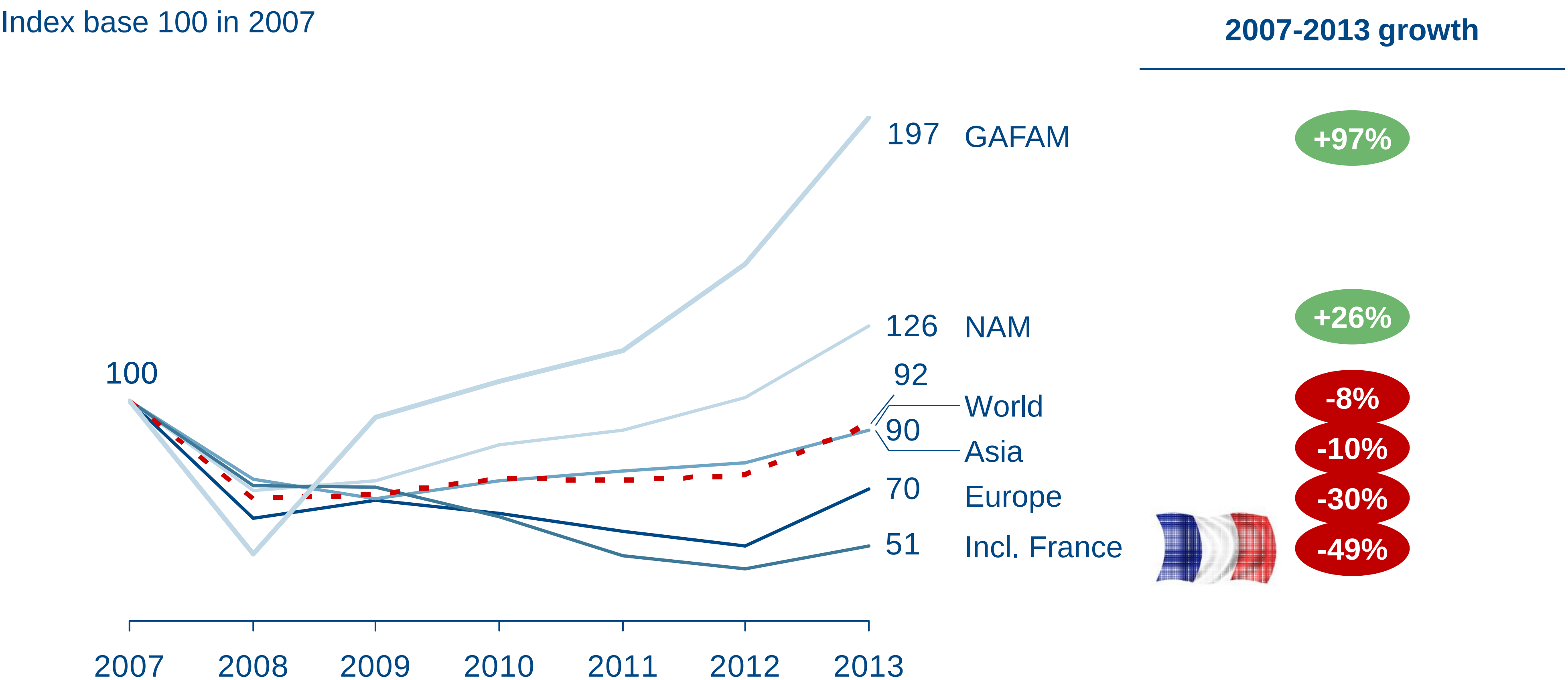


Source: Thomson Reuters, Arthur D. Little Value Growth Tracker, Arthur D. Little analysis

(1) 180 players analyzed, i.e. top 30 global players by category

Despite the global stock market recovery, the valuation of European telecom operators has not recovered its 2007 level

Evolution of market valuation – Telecom operators & large Internet players (GAFAM)
Worldwide[1], 2007-2013



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

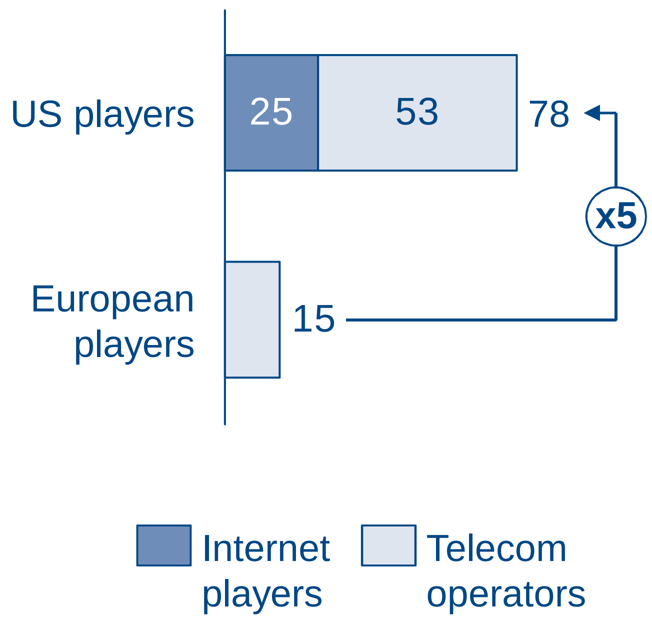
(1) Note: Top 30 global players, geographical data relative to headquarter location

US players have the capacity to pre-empt the next wave of innovation in the digital ecosystem

Acquisitions (GAFA & telecom operators)
US & Europe, 2013-2014 (sept.)

>60 transactions

In bn€



- **Strong capacity from US players to conduct acquisitions**
  - In technological platforms
  - In applications and services
  - In infrastructure
- **Need to renew Europe's acquisition capacity to weigh in on the next wave of digital innovation**

Source: Arthur D. Little analysis

Note: based on acquisitions with public deal values, including: Google, Amazon, Apple, Facebook; AT&T, Verizon, Sprint, Comcast; BT, DT, Orange, Telefonica, Telecom Italia

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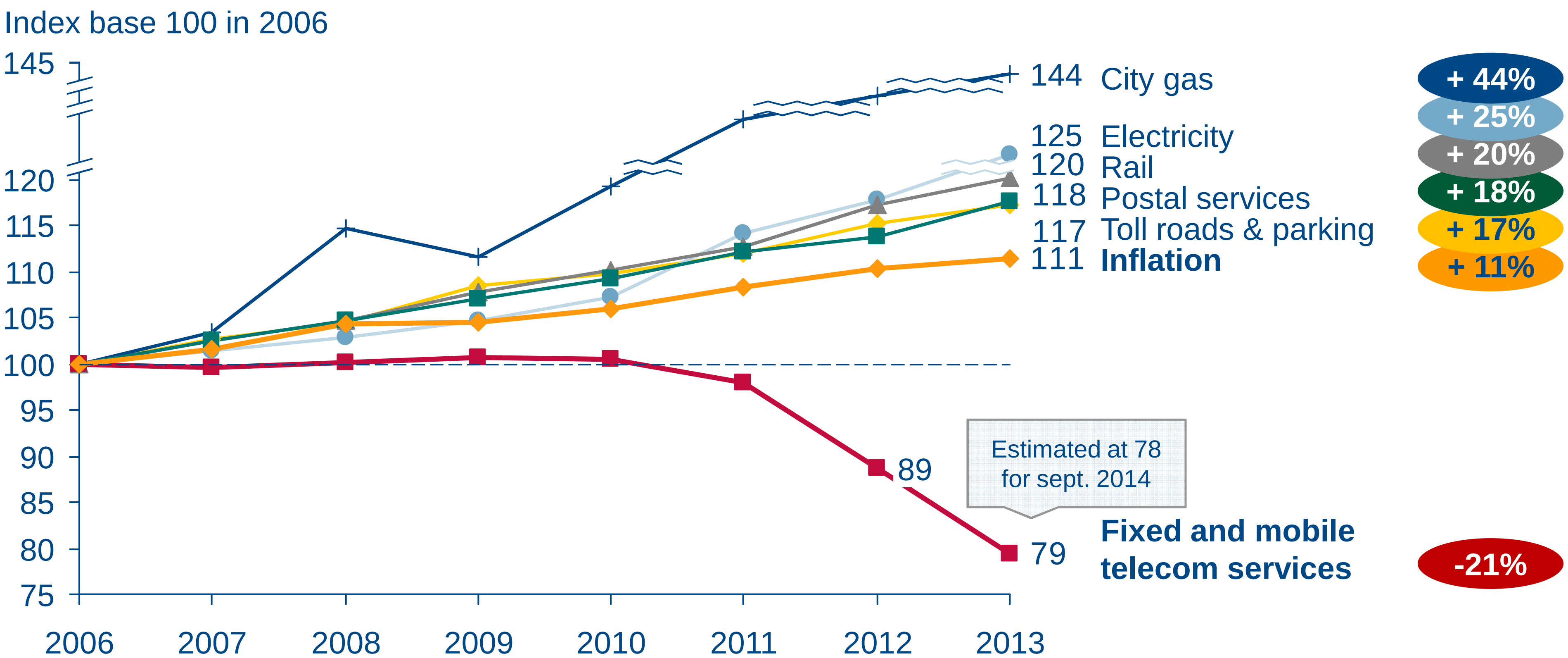
In France, the decrease in telecom prices is an exception when compared to other regulated sectors that are at the heart of everyday life

Consumer price index evolution on selected products
France, 2006-2013



Source: INSEE, 2006 index calculated by Arthur D. Little

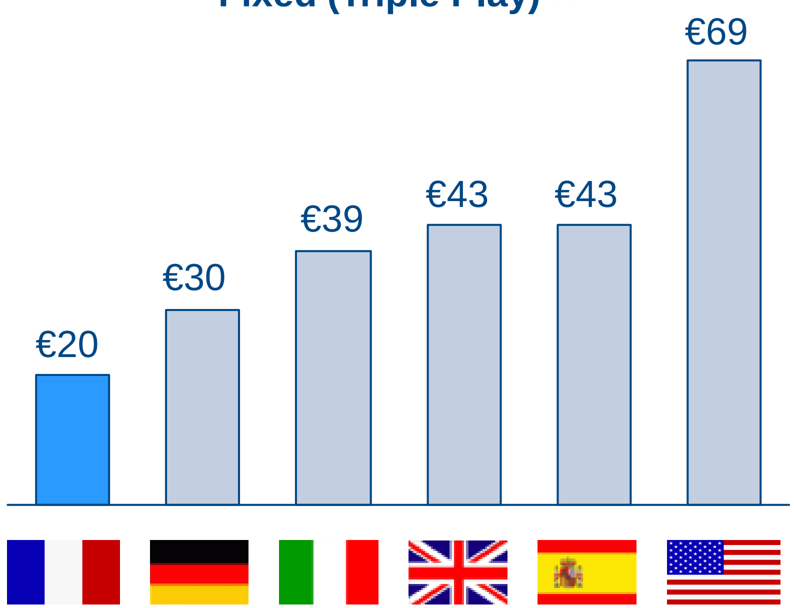
In ADSL and mobile, French telecom operators offer the cheapest services vs. other large countries

>80 offerings compared

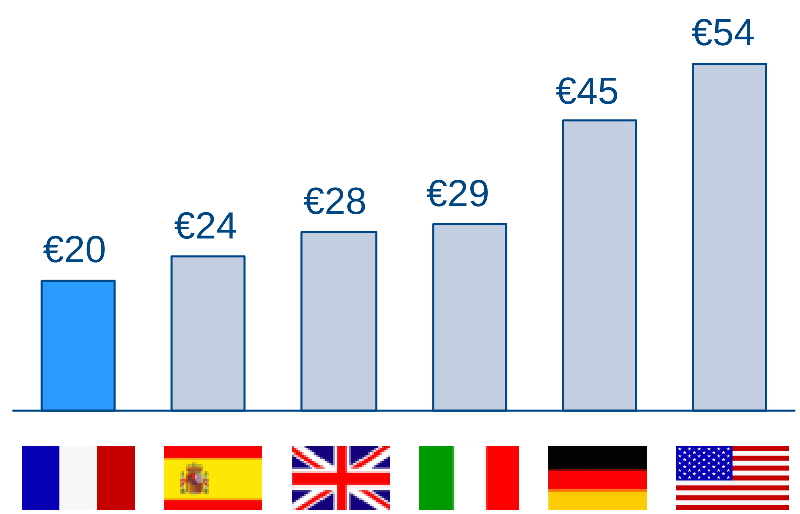
Offer benchmark – Main operators
September 2014

In € / month incl. taxes

Fixed (Triple Play) (1)



Mobile (2)



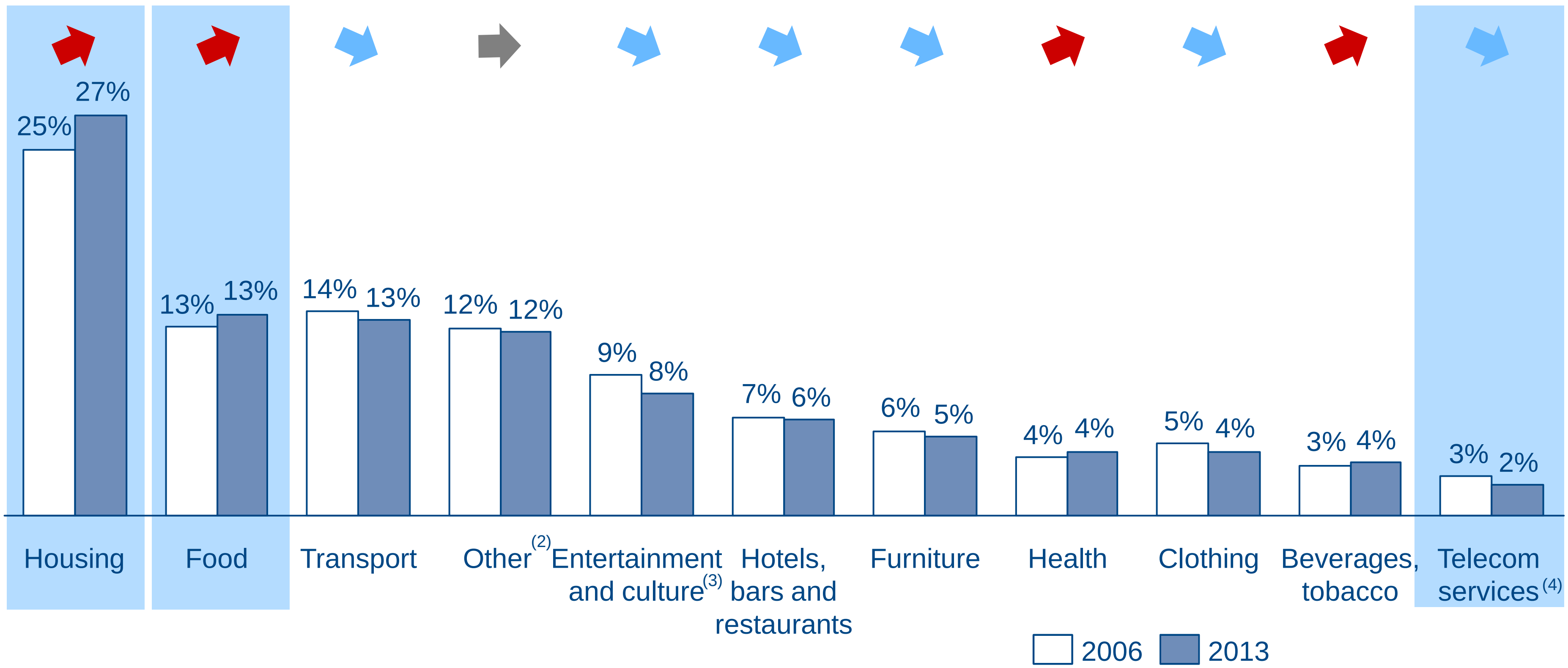
	Fixed						Mobile					
2013 ›	€32	€40	€37	€37	€46	€70	€20	€49	€33	€39	€45	€75
2012 ›	€32	€40	€43	€56	€48	€77	€20	€67	€38	€42	€50	€78

Source: operators, Arthur D. Little analysis

(1) Triple play offers only; unlimited calls to fixed lines at least; unlimited high-speed Internet via xDSL or fiber; TV included, except for additional packages; operators with > 15% market share; (2) Unlimited calls (min. 500 minutes), unlimited SMS/MMS (min. 1,000 SMS,) 2 Go Internet at least; offers excluding device, free of engagement when available; operators with > 15% market share

The share of telecoms in French household spending is low and has decreased over the past few years, contrary to other key areas

Telecom share[1] in total household spend
France, 2006 vs. 2013



Source: Euromonitor, Arthur D. Little analysis

(1) Households' final spend, excluding social transfers funded by non-lucrative public administrations and institutions (ISBLM); (2) Including education costs and other products and services; (3) Including audio-visual, photo and information-processing equipment; (4) Including telecom services spending; rounded figures

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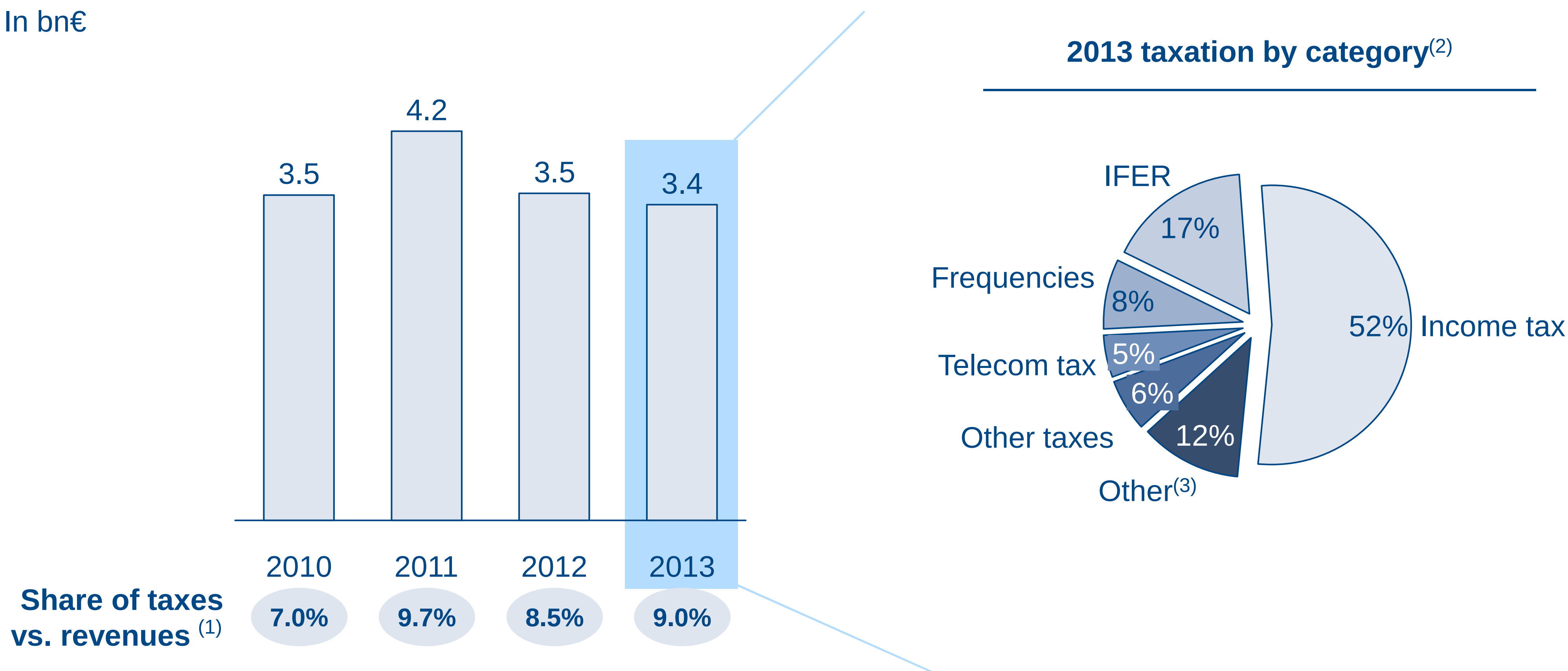
Telecom operators are subject to specific taxes, which represent more than a third of their total taxation

Telecom operators' taxation (est.)
France, 2010-2013



Source: operators, FFT, Arthur D. Little estimations

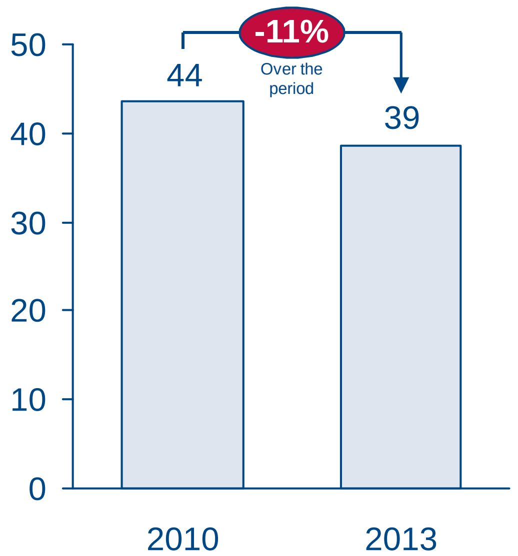
(1) Retail market revenues in France
(2) Perimeter: top 4 companies' taxes & FFT members' specific taxes;
(3) CVAE: contribution to company added value; C3S: company solidarity social contribution

The performance of the main French telecom operators has deteriorated heavily in the last years

Economic performance of the largest French telecom operators(1)

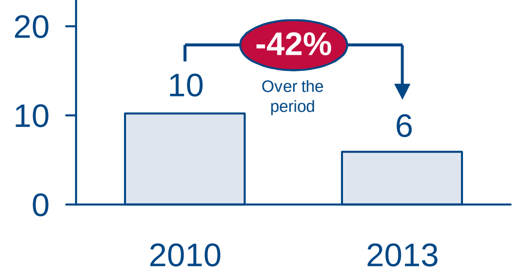
Revenues
France, 2010-13

Bn EUR



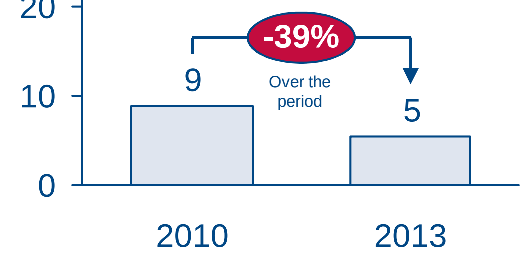
Operating profit
France, 2010-13

Bn EUR



Cash flows(2)
France, 2010-13

Bn EUR

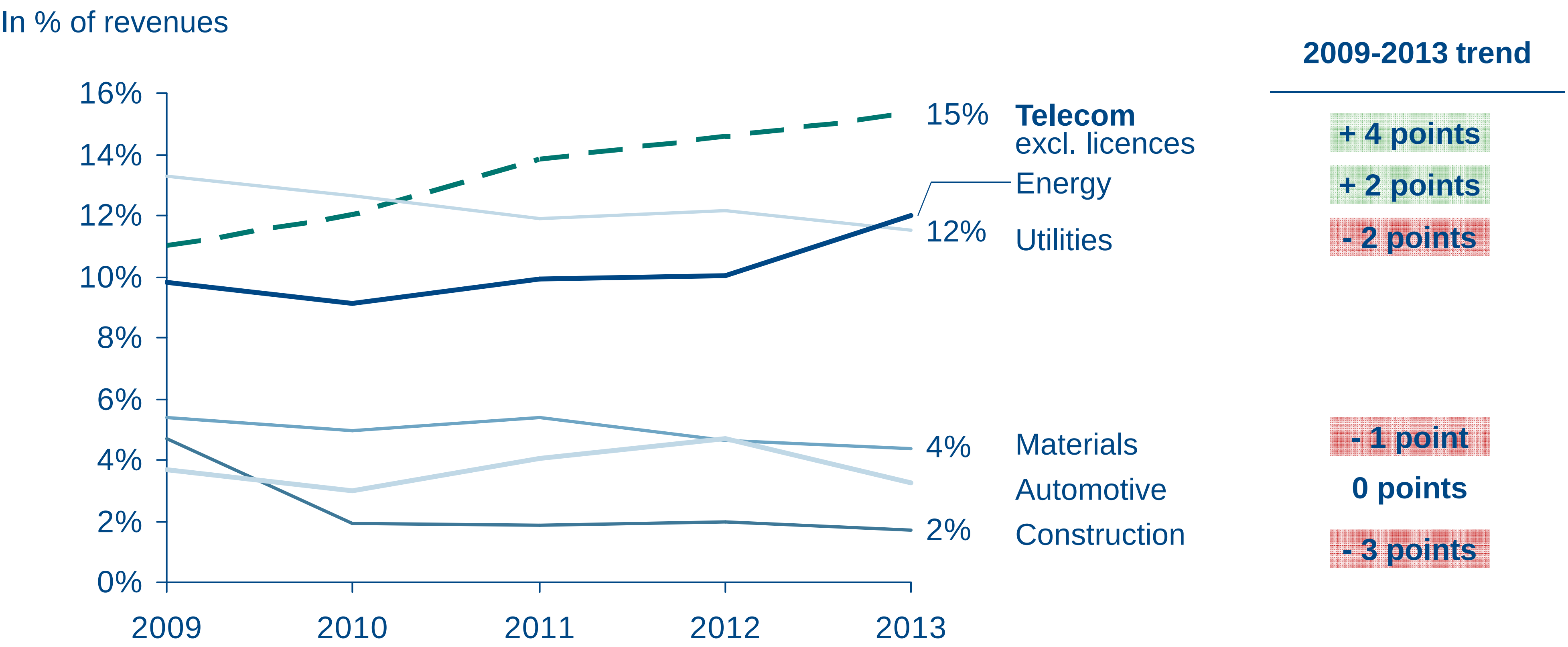


Source: Capital IQ, operators, Arthur D. Little analysis

(1) 4 main French telecom operators incl. Orange, SFR, Bouygues Telecom and Free; (2) Estimated operational CF (EBITDA – CAPEX)

However, telecom operators have sustained investment heavily up to now

Relative investment – Telecom vs. other sectors
Sample of CAC 40 companies, 2009-2013



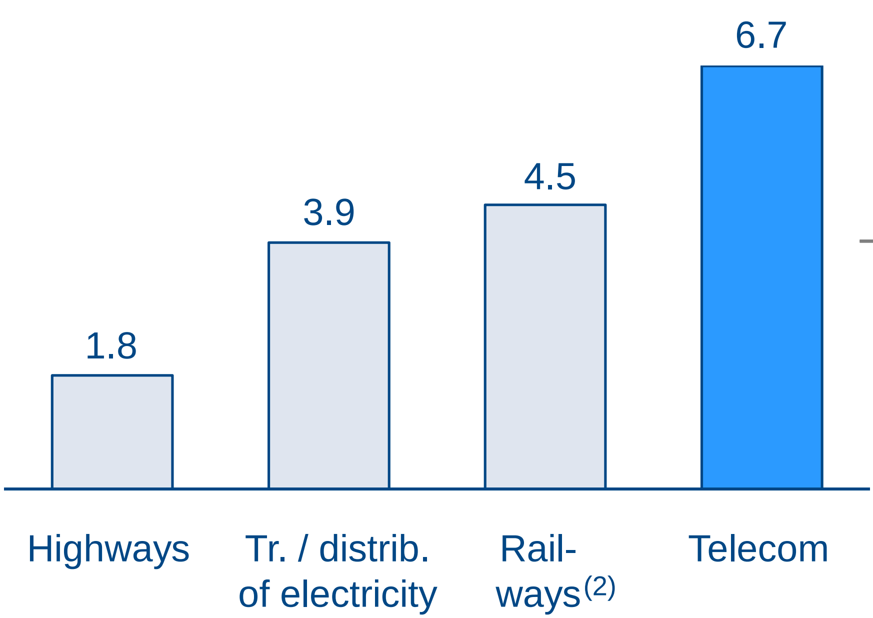
Source: Companies, Thomson Reuters, Arthur D. Little analysis

On average, telecom operators invest ca. 7 billion euros each year, which represents a considerable weight in the economy

Telecom investment vs. other sectors

Investment
France, 2008-2013, average over 6 years

Bn EUR



500 high schools

Or

230 TGV trains

Or

18 A380 Airbuses

Or

17 Millau viaducts

Or

28 Quai Branly museums

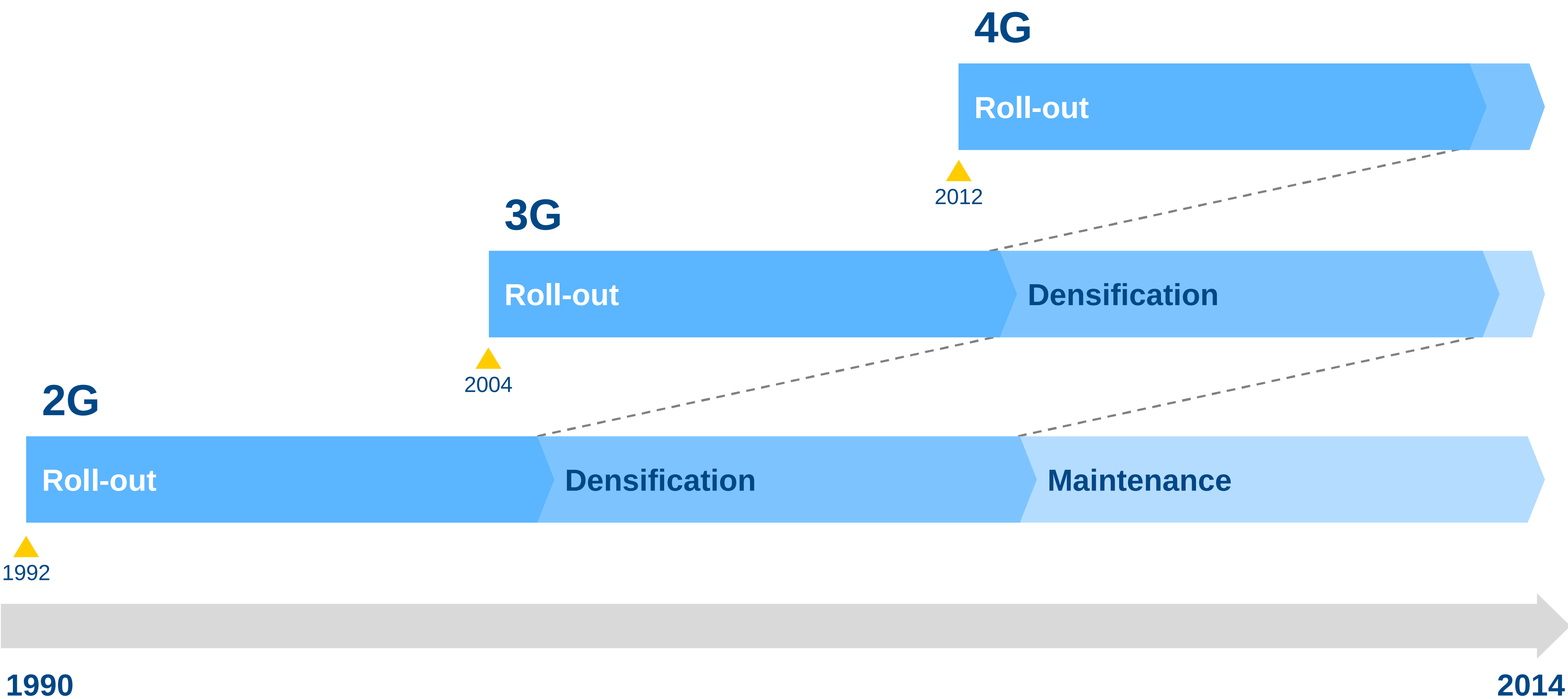
Source: Thomson, Arthur D. Little analysis

(1) Telecom: ARCEP figures; Electricity: RTE and ERDF; RFF; Highways: ASFA (Sanef, SAPN, ASF….)
(2) Mean over 2008-2012

Telecom operators’ investment relates to long technological cycles that overlap through time

Illustrative

Technological cycles
French example

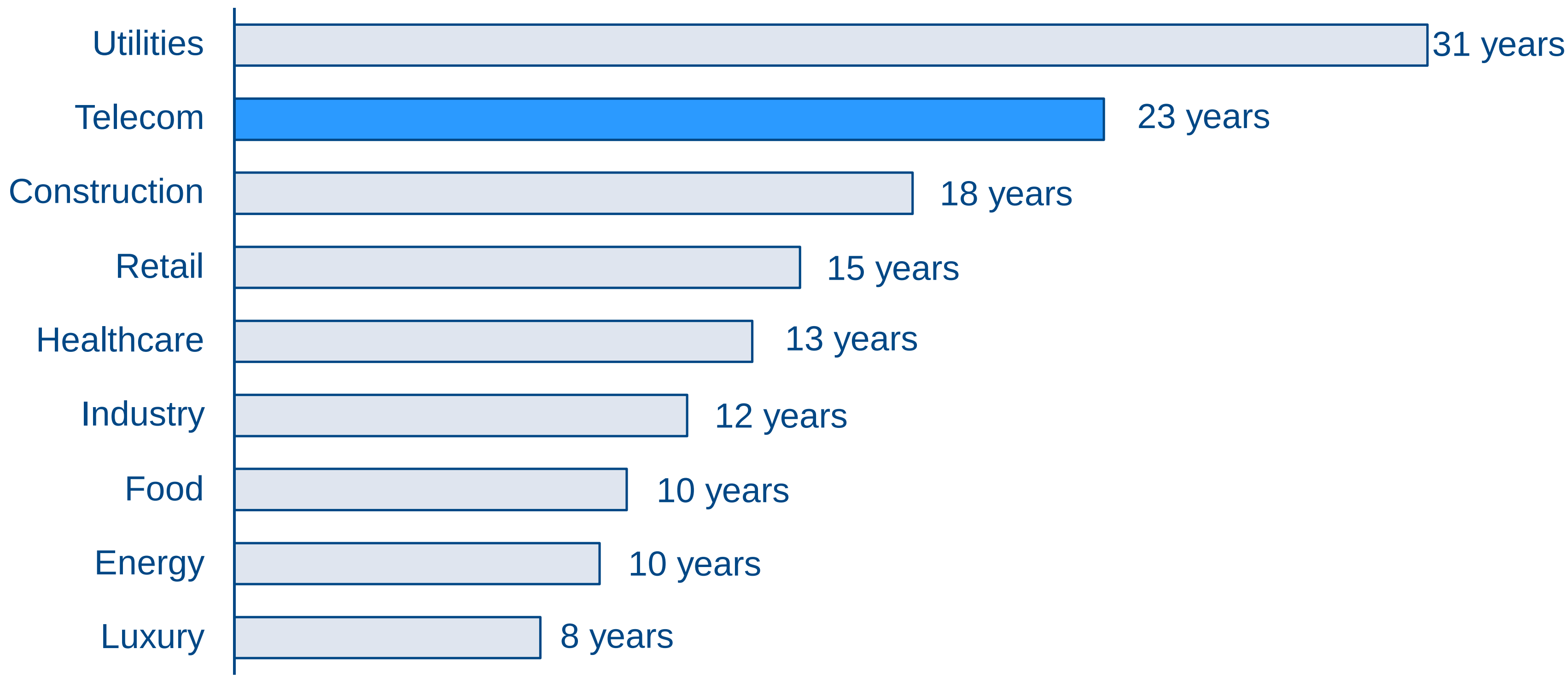


Source: Arthur D. Little analysis

As a consequence, the telecom sector is based on heavy investments that are amortized on a long-term basis

Minimum period before invested capital return – by sectors [(2)]
Selection of CAC 40 companies, average over 2011-2013

Estimated theoretical duration to generate a positive return on invested capital
(1 / return of invested capital [(1)]), in years



Source: Arthur D. Little “Value Growth Tracker”
Based on Thomson Reuters

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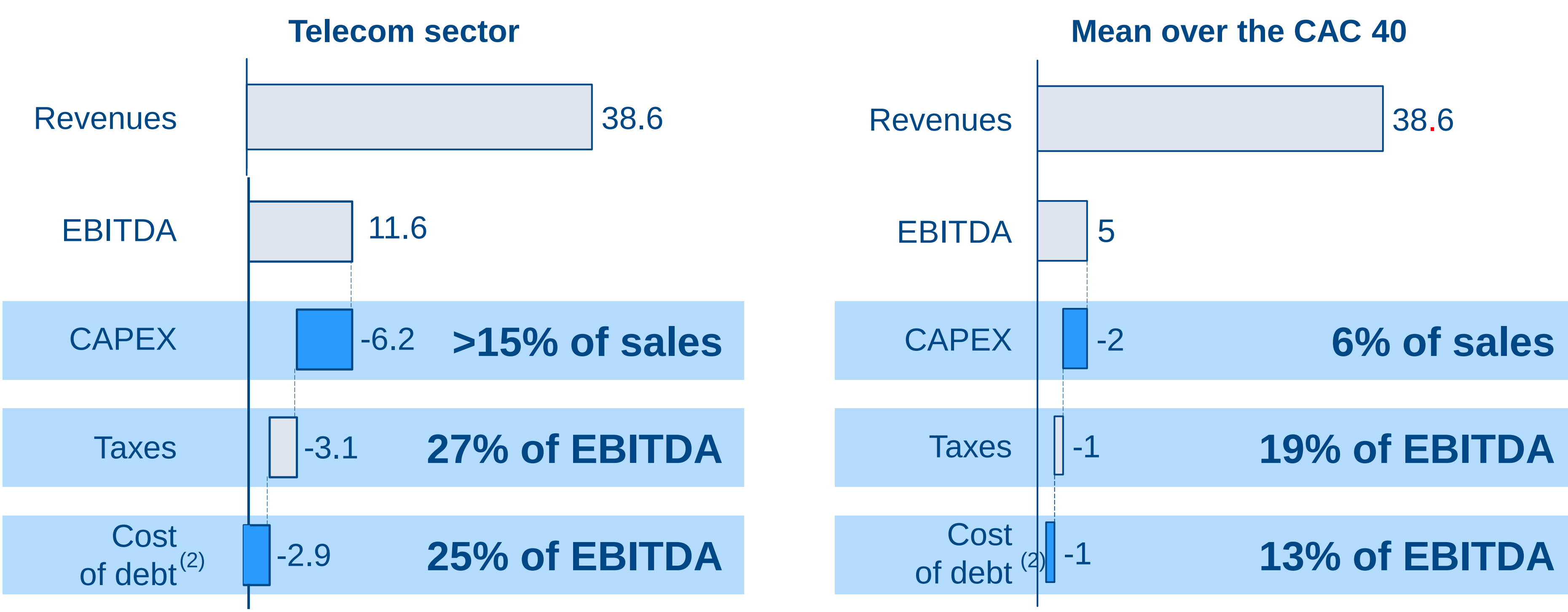
(1) ROIC (*return on invested capital*) expresses the link between income and invested capital. ROIC= EBIT x (1 – tax rate) / (Equity + net debt) (2) Utilities: EDF (GDF Suez out of scope, exceptional income in 2013), Veolia; Construction: Saint Gobain, Vinci; Telecom: Orange, Vivendi, Bouygues; Retail: Carrefour ; Healthcare: Sanofi; Manufacturing: Renault, Michelin, Schneider Electric; Luxury: LVMH, L'Oréal; Food: Danone; Energy: Total

Telecom operators need to generate high margins to face investment and the high fiscal burden, which are typical of the sector

Comparison between KPIs of the telecom sector and CAC40 (1)

In bn€ and in % of revenues



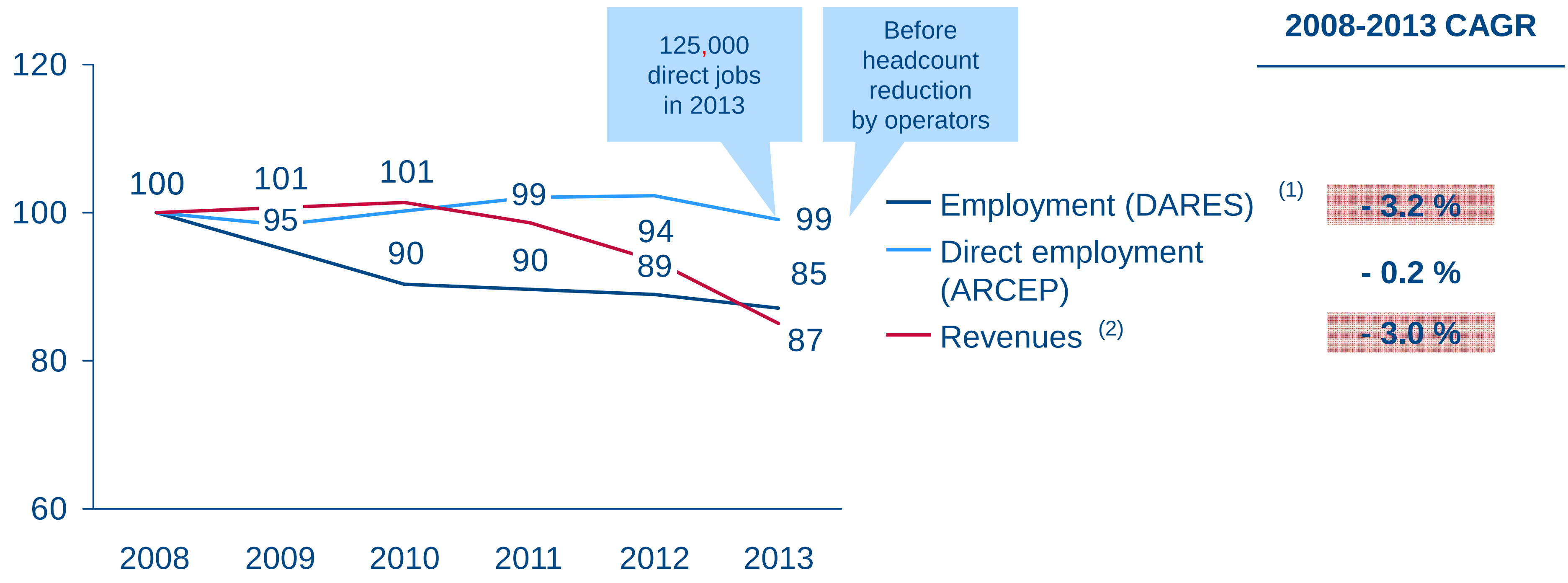
Source: Thomson, operators, Arthur D. Little analysis

(1) Average split estimated based on available data of financial statements of the top 4 French telecom operators (Orange France, SFR, Bouygues Telecom, Iliad) and of CAC40 companies
(2) Interest on debt calculated as a pro rata of Orange France revenues

Because of the decrease in the top line, the number of jobs in the telecom sector has started to decrease in France

Direct employment and revenues of telecom operators in France
France, 2008-2013

Index base (100) in 2008



Source: ARCEP, Arthur D. Little analysis

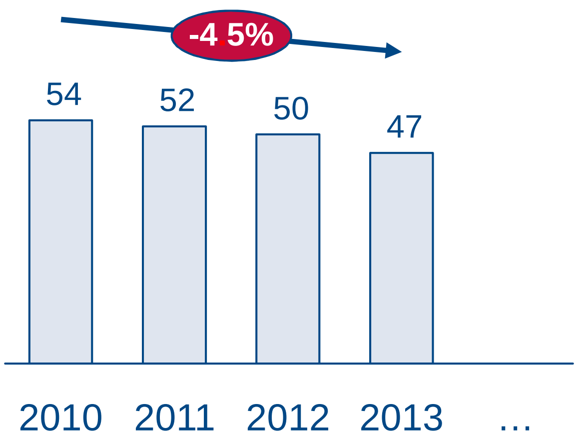
(1) Incl. a part of direct employment
(2) ARCEP figures (retail market)

The telecom market decline in France could jeopardize investment in next-generation infrastructure

Potential impact of telecom market drop on investments
France

Annual revenues
France, 2010-2013

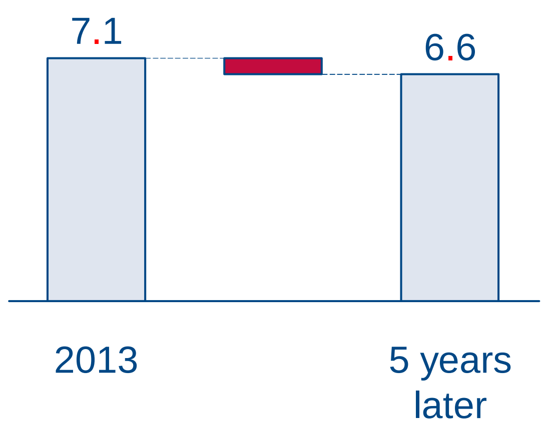
Bn EUR



If the market kept falling…

Annual CAPEX
France

Bn EUR



… then investment would decrease…
(-500 m€ per year on average)

Example of potential impact
France

Bn EUR

Fiber
- **…the equivalent of Marseille, Lyon, Toulouse, Nice every year**

or

4G
- **…the equivalent of 750,000 people in non-dense areas (i.e. >75% coverage), every year**

Source: Arthur D. Little analysis

Key messages

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Our challenges

Restore a logic of growth and step in a "virtuous circle"

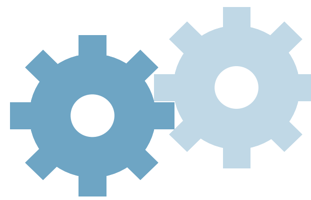
Do not shoot for incremental improvement… but aim at an ambitious scenario

Stimulate both European digital demand and supply

Arthur D. Little simulation – Without any action to revitalize the digital ecosystem, outlook for the sector will be (at best) stabilization… or decline

- Growth rebound in the telecom sector
- Continuation of productivity efforts to remain competitive
- Investment acceleration in next-generation broadband networks
- Reduction of the specific taxation of telecom operators

"Optimization" scenario



- Gradual stabilization of telecom revenues
- Increased optimization efforts by telecom operators
- Reduced investment by telecom operators
- Sustained specific taxation of the telecom sector

"Trend" scenario

- Telecom sector still decreasing
- Sustained optimization efforts by telecom operators
- Pressure and decrease of investment in the sector
- Sustained specific taxation of the telecom sector

Source: Arthur D. Little

Arthur D. Little simulation – 5 key impacts on the digital ecosystem and the economy

	Description of the estimated impacts
1 Fibre & 4G coverage	■ **Coverage of households** with fiber and 4G in France by 2025
2 Digital usages	■ **Increased digital usage** by Internet users – cloud, musical streaming and video, …
3 Ecosystem size	■ **Growth of the European digital ecosystem** (cloud, music, video, advertising, data; excluding e-commerce)
4 GDP impact	■ **GDP growth thanks to superfast broadband investment** in France by 2025; and also based on generated fiscal revenues
5 Digital bonus	■ **Economic surplus generated** by broadband: more usage and more speed with constant prices through time

Source: Arthur D. Little analysis

Arthur D. Little simulation – The digital bonus refers to economic benefits transferred to customers

2013

At the same price

2025

– More volume and usage

– More speed

Arthur D. Little simulation – Leveraging telecom operators allows development of the economic and digital competitiveness of the country

2025 outlook, France	Fiber coverage	Digital usages	Digital ecosystem	GDP impact[1]	Digital bonus impact
	% households	% companies, cloud example	Bn EUR, France	Bn EUR, cumulated	Bn EUR
					
"Ambition" scenario	84%	90%	40	240	580
Impacts of the "ambition" scenario (illustrations)	**A rate 35% higher than South Korea today**	**A generalization of new usages for companies**	**A digital market with strong growth (x5 vs. 2013)**	**A GDP increase of 20 bn € on average[2], every year**	**30x more speed and quality by 2025**

Source: Arthur D. Little analysis

Note 1: excl. impacts in terms of fiscal revenues
Note 2: on average, excl. gradual increase effect
~35 Bn € yearly at the end of the period, i.e. around ~1.5% GDP growth increase (vs. 2013 GDP)

Arthur D. Little simulation – The "ambition" scenario yields improved economic benefits vs. the other scenarios

2025 outlook, France	**Fiber coverage** % households	**Digital usages** % companies, cloud example	**Digital ecosystem** Bn EUR, France	**GDP impact[1]** Bn EUR, cumulated	**Digital bonus impact** Bn EUR
					
"Ambition" scenario	84%	90%	40	240	580
"Optimization" scenario	**-19 points**	**-20 points**	**-6 bn EUR**	**- 20 bn EUR**	**- 110 bn EUR**
"Trend" scenario	**-25 points**	**-40 points**	**-10 bn EUR**	**- 10 bn EUR**	**- 130 bn EUR**

Source: Arthur D. Little analysis

Note 1 : excl. impacts in terms of fiscal revenues

3 key figures by 2025

"Ambition" scenario

+1.5 points

of GDP growth per year generated thanks to the telecom sector

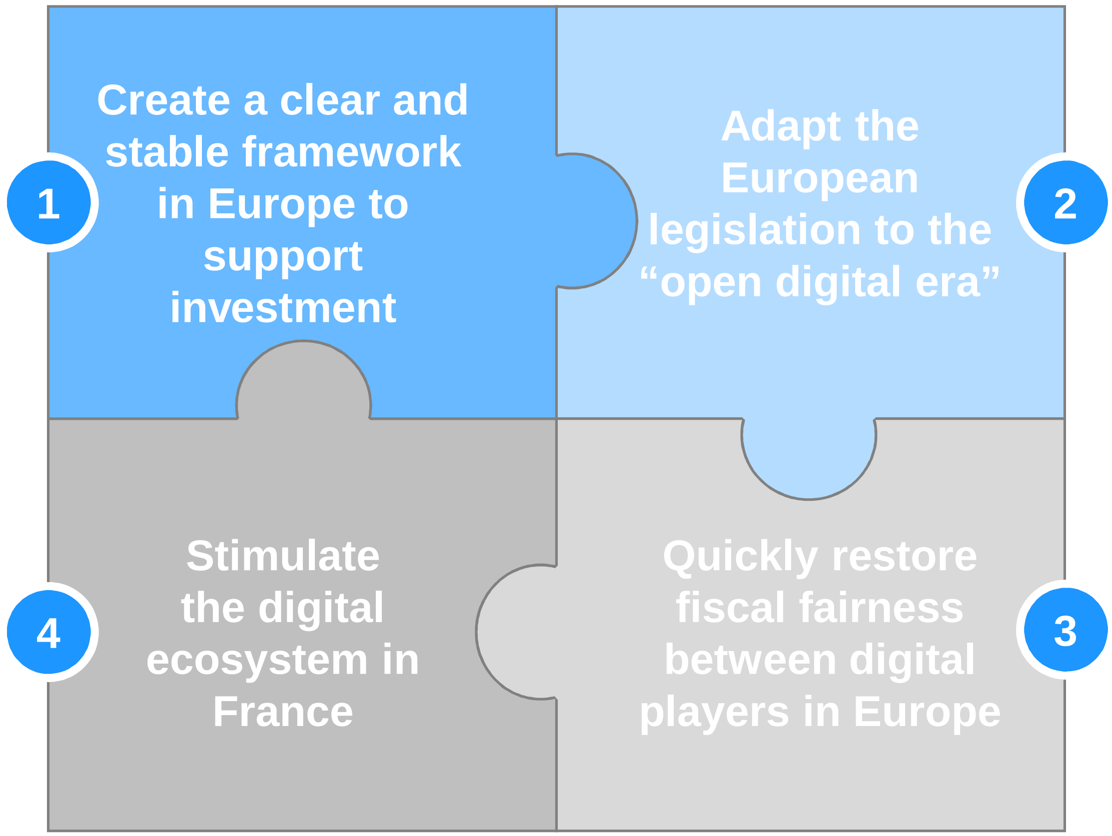
x5

growth of the French and European digital ecosystem (cloud, video and online music, advertising, …)

30x more

quality and usage for consumers in 2025 (Digital Bonus)

Proposals of the *Fédération Française des Télécoms* – Four key levers to restore the European leadership in the next 10 years



Source: Fédération Française des Télécoms

12 proposals from the Fédération Française des Télécoms

1 Create a clear and stable framework in Europe to support investments	■ Design the telecom / digital regulatory framework with a 10-year industrial perspective ■ Deploy a Smart Europe incentive plan to stimulate big data, connected devices and security ■ Create an EU label for secured data storage
2 Adapt the European legislation to the “open digital era”	■ Regulate service platforms to favor transparency, fairness and non-discrimination ■ Rethink competition laws ■ Favor cooperation between digital players
3 Quickly restore fiscal fairness between digital players in Europe	■ Anticipate the implementation of the measures recommended by the BEPS program of OECD ■ Accelerate the implementation of the VAT directive ■ Proactively relaunch the ACCIS project
4 Stimulate the digital ecosystem in France	■ Decrease the specific taxation of telecom operators to foster investment capacities ■ Create a digital tax credit mechanism for SMEs ■ Stimulate local supply through open innovation and enhanced digital education

Source: Fédération Française des Télécoms

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