

REFORMING EUROPE'S TELECOMS REGULATION TO ENABLE THE DIGITAL SINGLE MARKET



BCG

THE BOSTON CONSULTING GROUP

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EUROPE HAS GONE FROM LEADER TO LAGGARD IN ADVANCED DIGITAL NETWORKS.

- ▶ While Europe was once a leader in the technologies that comprise the backbone of the digital economy, many markets in Asia and North America now enjoy fiber access penetration that is up to 20 times higher and penetration of LTE that is as much as 35 times greater than Europe's.
- ▶ As a result, European consumers and businesses experience slower connections, leading to less value and slower economic growth. Fast connectivity to the Internet is the foundation of a modern digital economy and a key enabler of innovation. Without it, Europe will fall behind on the world stage.

UP TO €750 BILLION IN GDP GROWTH AND AS MANY AS 5.5 MILLION JOBS IN THE ECONOMY OF THE EU ARE AT RISK BY 2020 BECAUSE OF THE LACK OF NEXT-GENERATION NETWORK INVESTMENTS.

- ▶ European investments in telecommunications infrastructure declined by approximately 2 percent a year over the last five years. Investments in other international markets grew roughly 2 percent a year over the same period.

- ▶ Without major changes, we expect revenues of the European telecommunications sector to continue to contract over the next decade, by up to 2 percent a year, further diminishing investments in next-generation networks.

- ▶ By 2020, we estimate that the shortfall in investment needed to meet EU Digital Agenda targets for broadband coverage and penetration will aggregate between €110 billion and €170 billion, leading to an enormous missed opportunity for the broader EU economy: up to €750 billion in GDP growth and as many as 5.5 million jobs.

ONE OF THE ROOT CAUSES OF THE CURRENT SITUATION IS REGULATORY DISTORTION OF COMPETITION IN THREE AREAS.

- ▶ Network owners are hindered in capturing the fair returns needed to fund investments, primarily because of over- and inconsistent regulation of competitive markets stemming from the lack of local assessment of relevant competing infrastructures and from preferential treatment of non-infrastructure players.
- ▶ Current approaches mandate inefficiency in the mobile sector, including the allocation of mobile spectrum, and barriers to consolidation in a highly fragmented industry.

- ▶ The lack of a true digital single market with regulatory harmonization means that different rules and procedures in areas such as consumer protection across the member states hinder the ability of operators to reap cross-country synergies.

THESE TRENDS MUST BE TURNED AROUND IF EUROPE IS TO REMAIN COMPETITIVE IN THE GLOBAL DIGITAL MARKETPLACE – AND MEET THE GOALS OF THE EU DIGITAL AGENDA. DOING SO REQUIRES A SHIFT IN THE APPROACH TO REGULATION ON THREE LEVELS:

- ▶ From sector-specific regulation, enacted at the member state level, to a fully harmonized – and substantially reduced – pan-European regulatory approach, relying mostly on established competition law.
- ▶ From primarily assessing the impact of industry moves such as mergers based on the near-term effect on prices to a both short- and long-term holistic view of all the ramifications for consumers, including the benefits of more investments.
- ▶ From a view of the market that is based on narrow and rigid definitions of networks, services, technologies, and national borders to a paradigm that embraces a full view of the value chain, in a technology-agnostic manner and with a differentiated geographic lens (local versus national versus pan-European) based on the service provided.

WE PROPOSE A FIVE-STRAND PROGRAM TO TACKLE THE REGULATORY ROOT CAUSES OF DECLINING INVESTMENT AND TO UNLOCK THE POTENTIAL VALUE OF THE DIGITAL SINGLE MARKET AND INCREASE SOCIETAL WELFARE.

- ▶ Enacting substantial deregulation of fixed-line wholesale access.
- ▶ Leveling the playing field between network operators and "over-the-top" service providers.
- ▶ Pursuing a policy that ensures the efficient allocation and use of scarce spectrum resources.
- ▶ Permitting healthy consolidation in mobile.
- ▶ Harmonizing rules and procedures to unlock cross-country synergies.

- ▶ This program would pave the way for EU citizens to get the world-leading communications networks they have been promised. It would foster an inclusive, vibrant digital economy by generating up to €110 billion in additional investments by 2020 and substantially closing the gap towards meeting the EU Digital Agenda targets.

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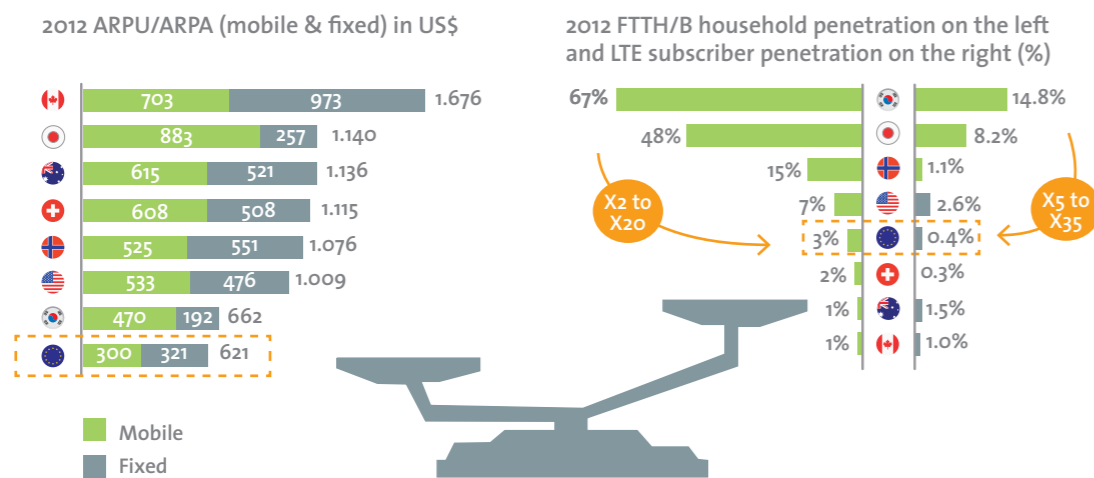
EUROPE: FROM TELECOMS LEADER TO LAGGARD

In a few short years, Europe has gone from leader to laggard in advanced digital networks. While consumers in the nations of the EU generally have some of the lowest access costs for both fixed-line and mobile communications services, they also trail users in many other countries in their ability to access ultra-fast mobile and fixed Internet connectivity. This hurts consumers, who experience slower connections and can have trouble accessing advanced online services. It's bad for businesses and government institutions, which need fast, dependable digital service to connect with customers, constituents, employees, and

suppliers, and access increasingly essential cloud-based software and solutions. It undermines growth as the digital economy becomes an even bigger driver of GDP and jobs.

The importance of the Internet to European consumers was demonstrated in research by The Boston Consulting Group (BCG) last year, which sought to measure the value consumers receive from the digital economy. The results in Europe were substantial—an estimated €3,700 annually per connected consumer in France, €3,000 in Germany, and €2,600 in the UK, for ex-

EXHIBIT 1 LOW COSTS FOR CONSUMERS, LOW ADVANCED NETWORK PENETRATION TOO



Source: Informa fixed- and mobile-broadband subscription forecasts, 2009–2017; IEMR Q3-2012; BCG analysis

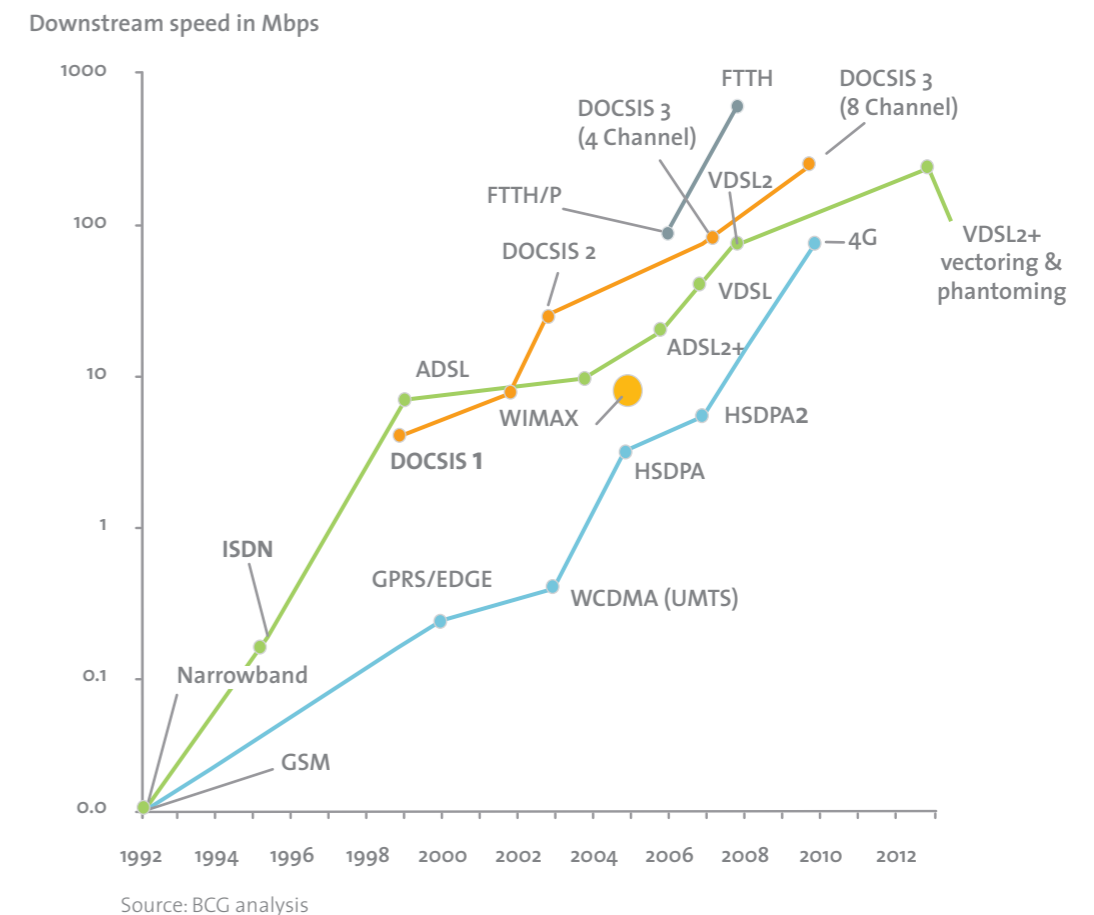
ample. BCG also estimated that the Internet economy will contribute some €880 billion, or nearly 6 percent, to the GDP of the EU-27 in 2016.¹

Failure to invest in next-generation telecommunications technology puts Europe at a competitive disadvantage to the rest of the world. Many markets in Asia and North America enjoy fiber access penetration that is up to 20 times higher and

penetration of LTE that is as much as 35 times greater (see Exhibit 1).

European investment in telecommunications infrastructure has declined by approximately 2 percent a year over the last five years, meaning that some €3.5 billion less was invested in 2012 than in 2008. In contrast, over the same period, infrastructure investment in comparable international markets has increased by about 2

EXHIBIT 2 CONTINUOUS INVESTMENT IN TECHNOLOGY REQUIRED TO DRIVE CONNECTIVITY SPEED



¹ BCG "The Internet Economy in the G-20," 2012

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percent a year.² Technological advancement drives an exponential increase in speed of connectivity across both fixed and mobile networks (see Exhibit 2). Only through continuous investments can the benefits be unlocked.

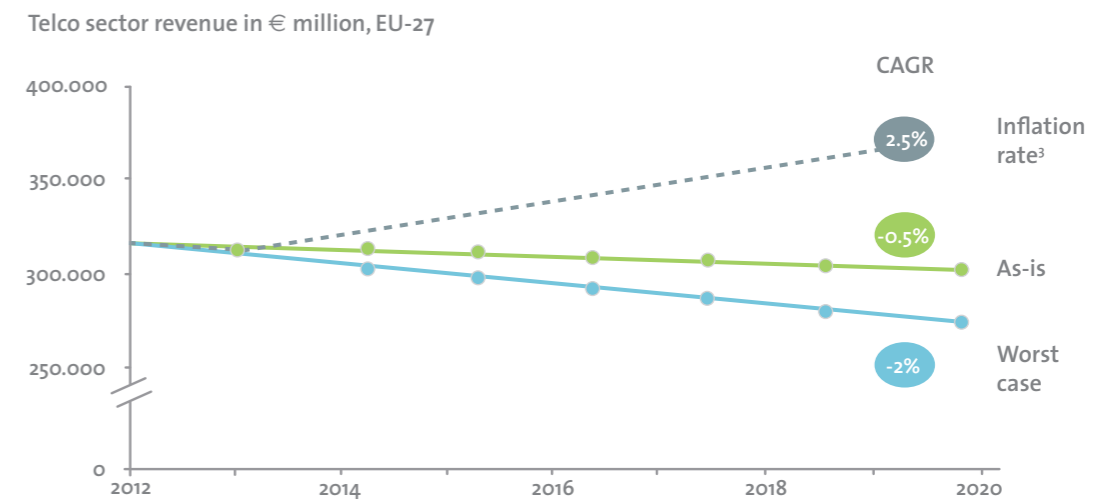
Between 2008 and 2012, European telcos lost nearly €70 billion in aggregate market capitalization while so-called over-the-top (OTT) digital service providers, device manufacturers (OEMs), and cable companies gained more than €200 billion. This

process was accompanied by a substantial value migration from European to foreign players.³

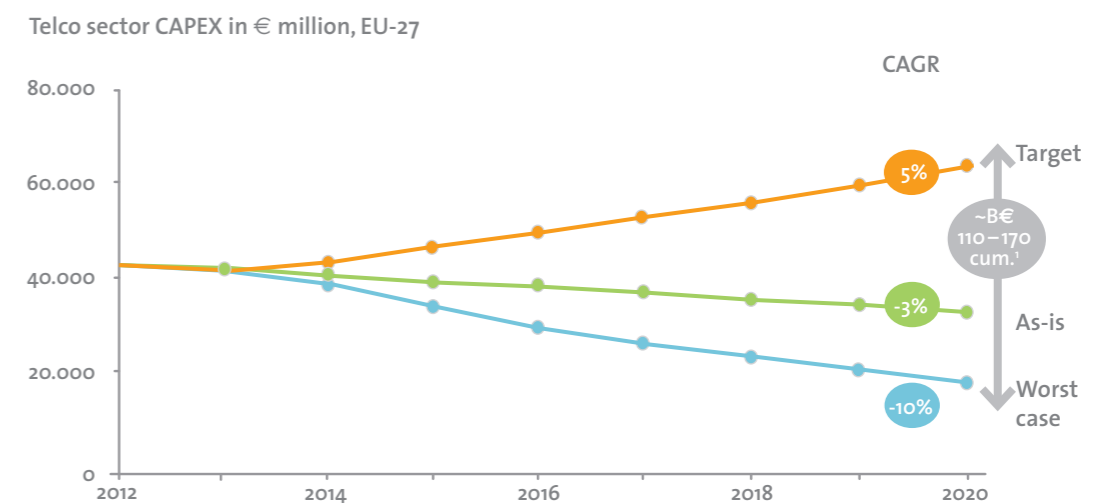
In addition, return on capital for the leading telco incumbents in four major markets – France, Germany, Spain, and the UK – averaged 9 percent from 2007 through 2011, while the average return on capital for leading access seekers (companies that rent infrastructure access from incumbents at regulated wholesale prices) ranged from 13 percent to 21 percent over the same period.⁴

EXHIBIT 4 DECLINING TELCO REVENUES LEAD TO FALLING INVESTMENT

FURTHER DECLINE OF TELCO REVENUES EXPECTED ...



... LEADING TO INVESTMENT GAP OF ~€110-170 BILLION¹ TO DAE² TARGETS



¹ This assumes maintaining infrastructure competition in fixed going forward; if NGA rolled-out in areas without cable competition only, investment gap would be reduced by ~€ 100 billion

² Digital Agenda for Europe

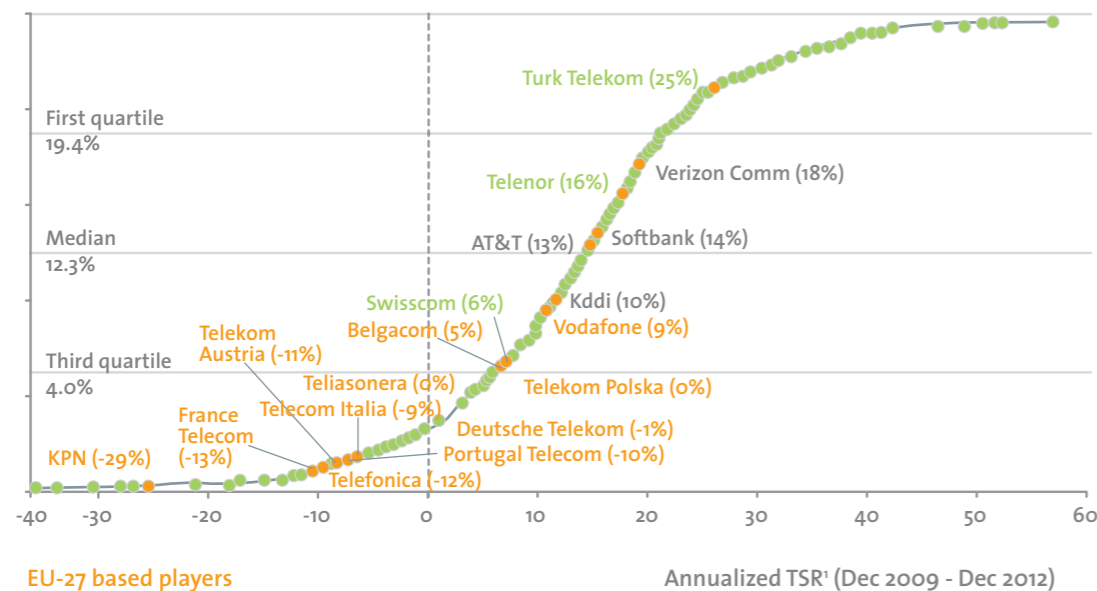
³ European Commission, 2013

⁴ Based on Reuters Consensus Estimate, 2013

⁵ Based on Ovum Service Provider Revenue Forecast, 2012 (incl. France, Germany, Greece, Italy, Netherlands, Poland, Spain, Sweden, UK until 2016)

Source: Reuters Consensus Estimate, 2013; Ovum Service Provider Revenue Forecast, 2012; European Commission, 2013; BCG market model

EXHIBIT 3 MANY EUROPEAN TELCOS HAVE SEEN NEGATIVE TOTAL SHAREHOLDER RETURNS, IN CONTRAST TO GLOBAL PEERS



EU-27 based players
European players with HQ outside EU-27
Players based outside Europe

¹ Total Shareholder Return: combines share price appreciation and dividends paid to show the total return to the shareholder expressed as an annualized percentage

Note: Background curve S&P 500

Source: Compustat 2013, BCG ValueScience Center 2013; BCG analysis

² See Exhibit 19 in the appendix.

³ See Exhibit 22 and 23 in the appendix.

⁴ Incumbents include British Telecom, Deutsche Telekom, France Telecom, and Telefónica. Access seekers include British Sky Broadcasting, Iliad, Jazztel, TalkTalk, and United Internet. See Exhibit 19 in the appendix.

Many European telcos have seen negative returns for their shareholders over the last several years—in stark contrast to their international peers (see Exhibit 3).

These are long-term trends that show no signs of abating. We expect revenues of the European telecommunications sector to continue to contract over the next decade, by as much as 2 percent a year until 2020, representing a cumulative decline of €70 billion to €190 billion. This will further diminish investments in next-generation networks, which means that the EU Digital Agenda targets for broadband coverage and mobile penetration will likely be missed by a wide margin. All told, by 2020, we estimate that the shortfall in investment needed to meet these targets will aggregate between €110 billion and €170 billion (see Exhibit 4).

Fast connectivity to the Internet is the foundation of a modern digital economy and a key enabler of innovation. Without it, Europe will fall behind on the world stage. By our estimates, up to €750 million in GDP growth and as many as 5.5 million jobs are at risk by 2020 (see Exhibit 5).⁵

Telecoms regulation in Europe, especially as it applies to advanced next-generation access networks (NGAs) needs streamlining and restructuring if Europe is

to remain competitive in the global digital marketplace, not to mention meet crucial goals of the EU Digital Agenda. We propose five measures that we believe will reverse the regulatory root causes of declining telecommunications investment and unlock the investments required to build the ultra-fast connectivity that is the lifeblood of the digital economy:

1. Enacting substantial deregulation of fixed-line wholesale access.
2. Leveling the playing field between network operators and "over-the-top" service providers.
3. Pursuing a policy that ensures the efficient allocation and use of scarce spectrum resources.
4. Permitting healthy consolidation in mobile.
5. Harmonizing rules and procedures to unlock cross-country synergies.

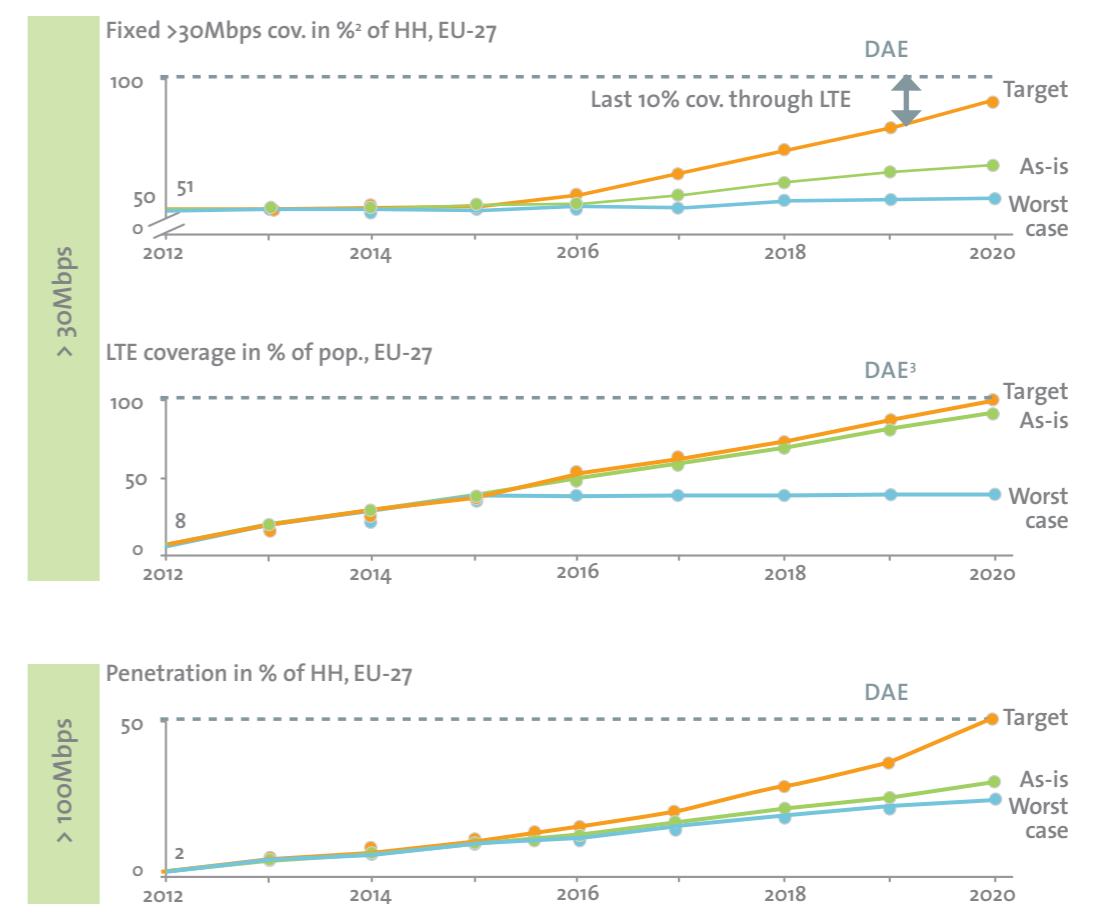
We estimate that these five proposals could, quite reasonably, generate up to €110 billion in additional investments by 2020 and substantially close the gap towards meeting the EU Digital Agenda targets for Internet penetration and use by consumers and business.

This report exclusively examines the regulatory reasons why Europe is falling behind. It offers a strategy and roadmap for reversing the current negative trends and putting the EU and its member states on a path to technological advancement and

economic growth. We state as a prerequisite, however, that delivering the necessary reforms and revitalizing the competitiveness of Europe's digital markets will require all stakeholders, from government and industry alike, to act jointly for their common benefit.

EXHIBIT 5 EU DIGITAL AGENDA TARGETS AT RISK, UNDERCUTTING GDP GROWTH AND JOBS

DAE¹ TARGETS AT RISK TO BE CLEARLY MISSED ...



¹ Digital Agenda for Europe

² Includes cable (technology-agnostic view)

³ No explicit DAE target, though required to achieve the 100% coverage target for >30Mbps

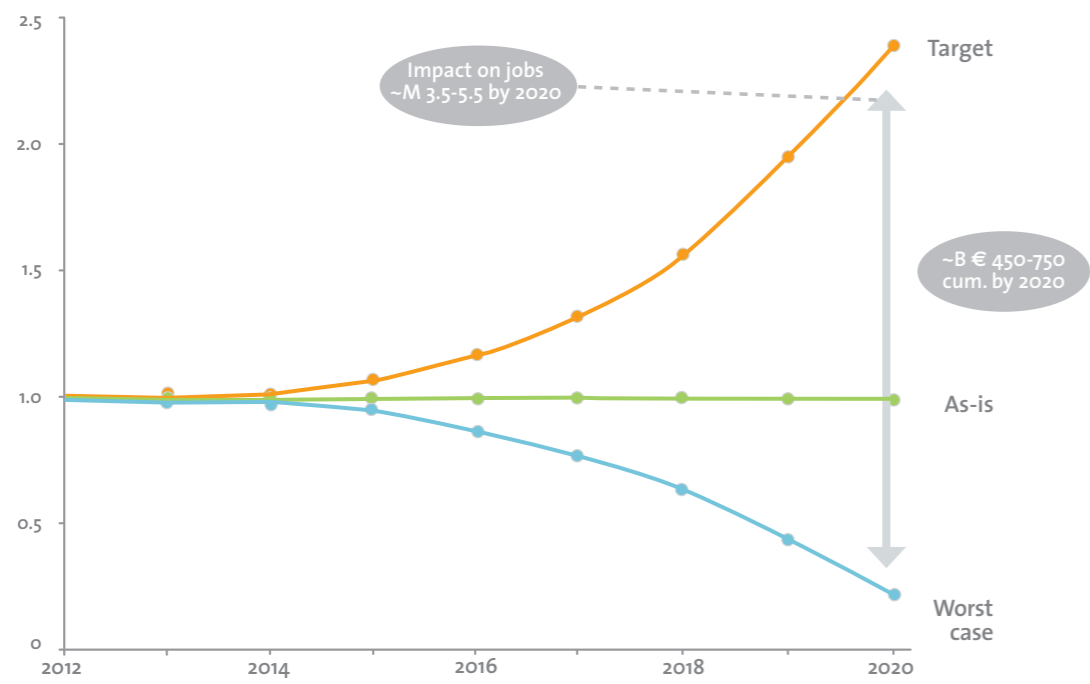
Source: EC Scoreboard, 2013, Analysys Mason, 2012; IEMR Q3-2012; BCG market model

⁵ GDP impact estimate based on increase in economic growth driven by increased penetration with i) standard fixed line broadband; ii) upgrades to >30 Mbps fixed line broadband; and iii) upgrades from 3G to LTE mobile connectivity. Estimate of potential for creation of new jobs based on permanent additional employment created by telecommunications network investments as i) direct jobs; ii) indirect jobs; iii) induced jobs; and iv) network effects. In order to capture the full potential further requirements as a sufficient amount of employees with adequate qualification to have to be met. Both estimates are based on peer-reviewed publications researching the relationship of telecommunications networks penetration and GDP as well as telecommunications networks investments and jobs.

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...PUTTING UP TO ~ 750 € BILLION GDP GROWTH AND 5,5 MILLION NEW JOBS AT RISK

GDP increase p.a. in %, EU-27



Source: EC Scoreboard, 2013; Analysys Mason, 2012; IEMR Q3-2012; BCG market model

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While there are several drivers of lower investments, such as the European economic and financial crisis, we believe that regulation—the focus of this report—is a central one. Regulatory distortion of competition in three areas is discouraging investment in advanced telecommunication networks:

1. Network owners are hindered in capturing the fair returns needed to fund investments in two ways: One is too much and inconsistent regulation of competitive markets. This results from the lack of local assessment of relevant competing infrastructures and from preferential treatment of infrastructure renters. The other is the uneven playing field in the digital-services ecosystem that contributes to a substantial value migration from European telecommunications operators to OTT players and device manufacturers from outside Europe.
2. Current approaches mandate inefficiency in the mobile sector. The problem includes the assignment, and cost, of mobile spectrum, which lead to delays in LTE rollout, and barriers to consolidation in a highly fragmented industry in which up to one-third of European mobile operators are unable to cover their cost of capital.

3. The lack of a true digital single market with regulatory harmonization means that different rules and procedures across the member states hinder the ability of operators to reap cross-country synergies.

We explore the impact of each of these factors in more detail below.

INABILITY TO MAKE A FAIR RETURN

Developed pursuant to a 2002 EU directive, the current patchwork system of national rules mandating network access – and the price at which it must be provided – is intended to foster competition and investment by the outdated strategy of encouraging more retail competitors in any given market. The actual impact today is a dis-incentivization of investment in next-generation networks. There are a number of root causes.

Ex ante regulation. Perhaps most significantly, the current regime favors infrastructure renters with much higher returns on capital over those of infrastructure builders. The latter's pricing flexibility is constrained by the detailed cost-based *ex ante* regulation of wholesale prices. This situation persists despite multiple studies and empirical evidence that the so-called ladder of investment, long a basis for telecommunications regulation in Europe, does not work (this theory posits that more comprehensive

wholesale obligations will result in access seekers incrementally building their own competing infrastructure). Research shows that stricter access regulation (e.g., regulatory unbundling) has a negative impact on investment by fixed-line entrants. When the market is functioning properly, *ex ante* regulation is a much less efficient means of guiding resource allocation than market forces.

Moreover, market definitions are not technology-agnostic – that is, they do not take into account competition for copper-line telcos from companies operating cable or LTE networks. In addition, regulators assess market power on a national basis while the battles for customers occur at the local level and involve service packages and prices based on the particular conditions of an individual city, town, or neighborhood.

Ex ante regulation should be limited only to clear cases of market failure. Instead, it is extensively applied all across Europe, despite more than 55 percent of localities having multiple competing network infrastructures. Copper network owners can make a viable business case for upgrading to NGA in only a few localities to a significant extent because the current rules override market mechanisms for extracting value from such investments. Some EU markets that have promoted more investment-friendly regulatory approaches have proved successful at stimulating significant additional capital expenditures.

An uneven playing field. A thriving digital economy in Europe depends on companies delivering the digital services that

consumers, businesses, and governments demand. Establishing an environment that facilitates delivery of these services, which help create economic growth and jobs, should be a central goal of European policy. However, many of the current regulations are outdated by the technological development, and put this goal at risk. In particular, European telecommunications companies are at a competitive disadvantage to so-called over-the-top service providers (OTTs) because of asymmetric regulation around a number of issues. These include:

- ▶ Privacy and data protection. Telcos are regulated through a binding EU directive, while digital services players are not, when they are providing functionally equivalent services.
- ▶ Switching and data portability. Again, these are regulated for telcos, not for OTT players.
- ▶ Taxes. As new entrants, OTTs often have more flexibility than telcos to maximize tax savings (e.g., VAT, corporate tax) by choosing where to headquarter their European operations.
- ▶ Identification- and safety-related measures. Telcos are subject to strict, country-specific rules for electronic communication services that do not apply to OTT providers offering services that represent reasonable alternatives from the consumer's point of view.

In addition, the current approach to monitoring (and at times discouraging) telco alliances further hampers the ability of European operators to innovate effectively in digital services, despite the fact that the competitive arena for many of the services being developed by these alliances is the global market, and the principle competitors are international Internet players. Several such industry alliances, such as the Oscar and Euro-5 initiatives, have been postponed by the competition authorities' lengthy review processes.⁶ This disadvantages telcos in two ways: It overlooks the fact that telecommunications companies in many instances must join forces in order to compete with large global OTTs, and it extends time to market, which is one of the most critical success factors in digital services.

The overall result is to undercut the incentive and ability of telcos to develop digital services in such areas as big data and cloud computing, among others. This is a missed opportunity for all concerned. More effective regulation would level the playing field for all players and seek to create an environment that encourages innovation as well as partnerships and deals of the kind taking place to a larger extent in other markets between telcos and OTTs – business arrangements that deliver new digital services that consumers and businesses want.

MANDATED INEFFICIENCIES IN MOBILE

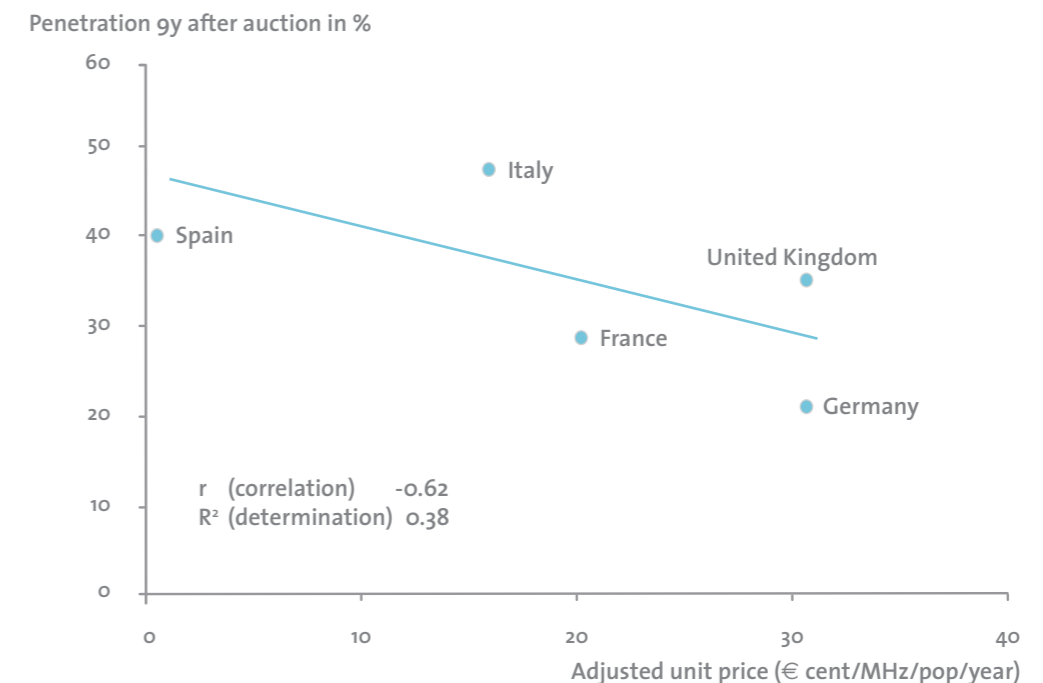
Mobile spectrum policy is another area requiring reform. Few would dispute that the overall goal should be to benefit mobile users and that doing so entails 1) the efficient assignment of a scarce resource, and 2) creating optimal conditions for rapid network rollout. Unfortunately, the current system mandates inefficiency, and sometimes delay.

The current approach to spectrum auctions is highly fragmented, with four different types of auctions taking place across the EU, and in practice, even same type of auctions involving dozens of differing rules and procedures. This approach complicates participation for everyone, is prone to unintended results, and undercuts the ability of operators to develop EU-wide network strategies. One example: There has been an eight-year lag between the time that the first countries auctioned tranches of spectrum for LTE and the most recent to do so. This gap effectively hinders operators in achieving rollout synergies, for instance in equipment purchasing. It also leads to consumers in slow-moving countries having late access to new technologies.

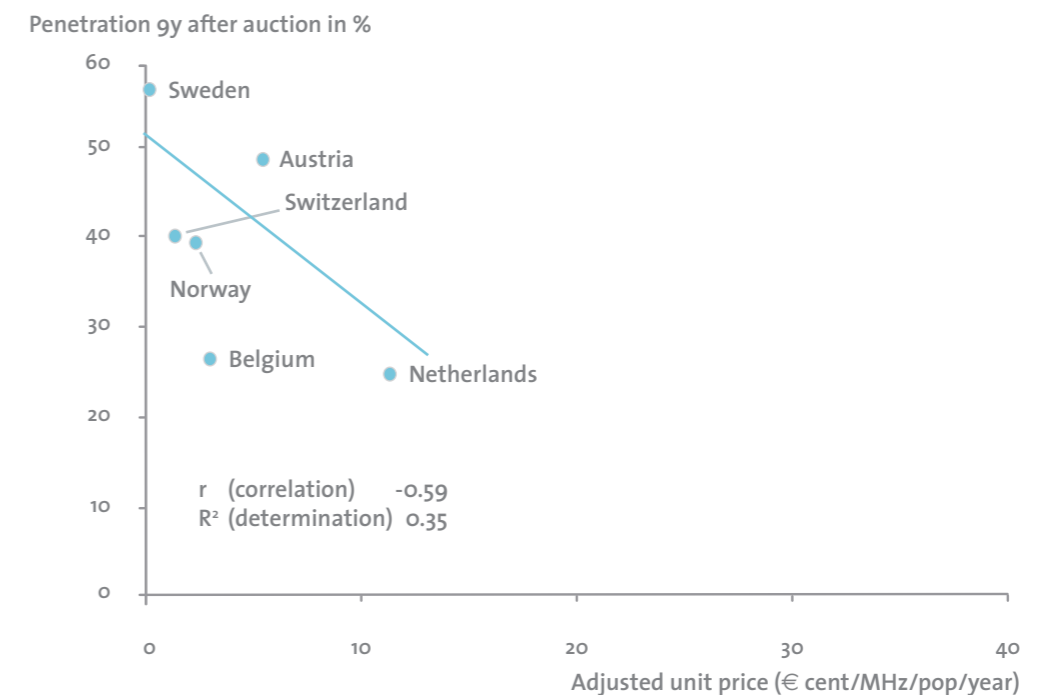
Some governments have used spectrum auctions to maximize proceeds. Their citizens pay a price in delayed access to advanced networks and services. Empirical data from past 3G auctions indicate that higher auction prices lead to slower network rollouts. High-priced auctions leave opera-

EXHIBIT 6 EMPIRICAL EVIDENCE INDICATES THAT HIGHER AUCTION PRICES LEAD TO LOWER PENETRATION

LARGE ADVANCED MARKETS SAMPLE



SMALL ADVANCED MARKETS SAMPLE



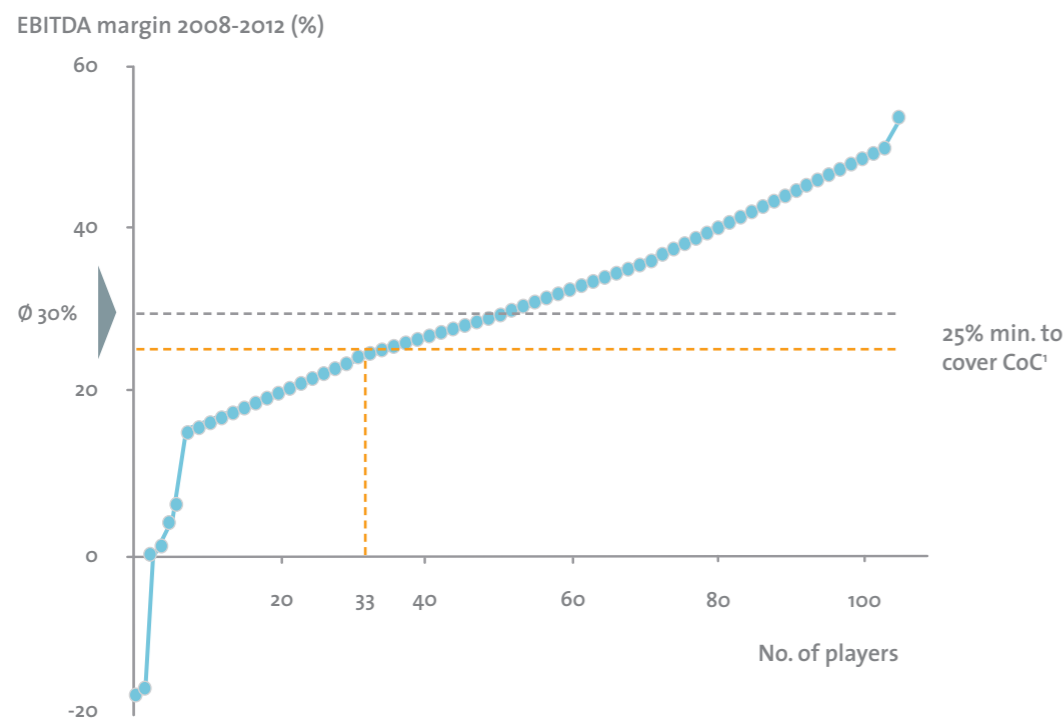
Note: TDD frequencies not included since little value for 3G
 Source: NRAs, Analysys Mason, 2012; BCG analysis

⁶ Oscar is a UK m-commerce joint venture to deliver technology required for speedy adoption of the "mobile wallet" and mobile payments. Euro-5 initiatives include the development of rich communication suite services (RCS, today joyn).

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EXHIBIT 7 TOO MANY UNSUSTAINABLE PLAYERS IN MOBILE MARKET

UP TO ONE THIRD OF MOBILE PLAYERS UNSUSTAINABLE



¹BCG analysis

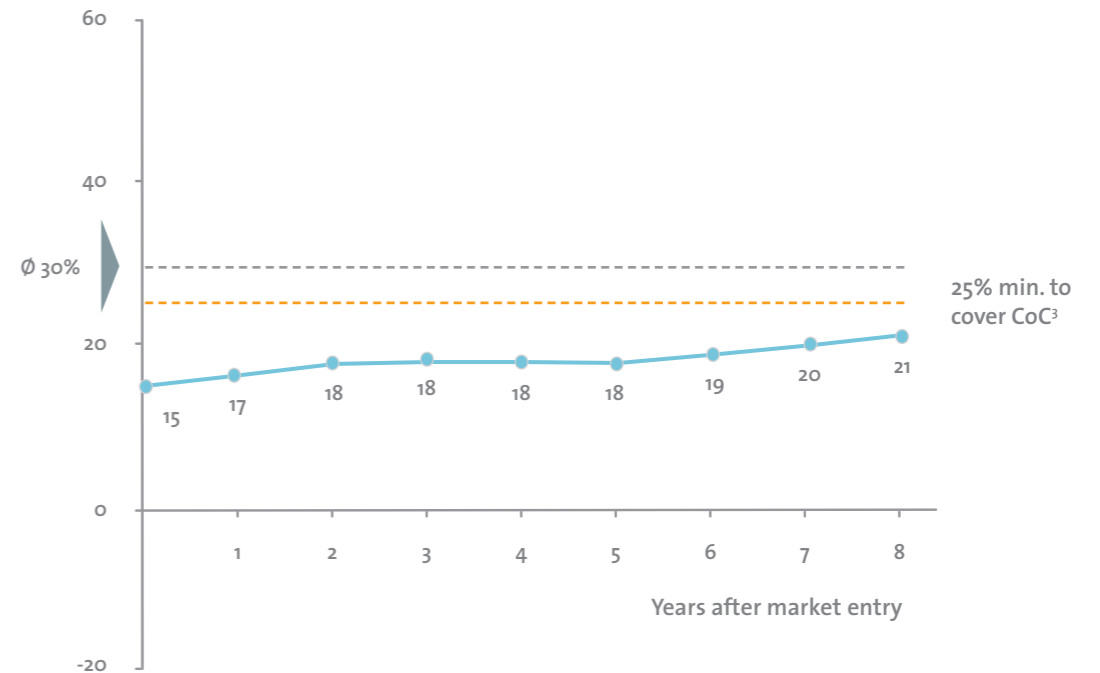
tors with insufficient resources for subsequent investments. For example, Germany and the Netherlands achieved the highest 3G auction prices for a large and small market, respectively, and both had the lowest 3G penetration rate among comparable countries (less than 25 percent in both instances) nine years after the auction took place (see Exhibit 6).

Multiple governments also follow discriminatory approaches to spectrum authorization (reserved spectrum or preferential prices, for example) that frequent-

ly benefit new entrants and disincentivize network investments by incumbents since the new entrants will be competing by offering artificially low prices. The market impact of such preferential treatment can be substantial. One of the most recent cases of a new player entering a European market with significantly preferential terms from a spectrum auction resulted in a decline by up to 7 percent of total market size – that is, the revenues generated by all companies – within two years. One affected operator saw its profits decline by 60 percent and had to recapitalize, clearly not a sign of healthy

NEW PLAYERS DO NOT CATCH UP OVER TIME²

EBITDA margin of new entrants 2003-2012 (%)²



²Analysis based on non-weighted sample of 21 new entrants across EU having entered the market from 2003 to 2012 and respective EBITDA margins 2003-2012; year 9 not depicted, as sample of operators fulfilling the criteria too small

³Estimate of minimum EBITDA margin required to cover cost of capital (CoC) based on BCG analysis

Source: IEMR 2012Q3; BCG analysis

competition.

The current approach to **applying competition law** in the mobile sector is based on the theory that more competitors lead to lower prices. When a significant percentage of companies are operating on an unsustainable basis, however, as is currently the case in mobile, too many competitors can have adverse consequences. Up to one-third of current mobile operators consistently fail to earn their cost of capital (see Exhibit 7). The most significant of these

adverse effects for mobile operators, from both an industry and a consumer perspective, is the lack of ability to invest sufficiently in technological advancement and new infrastructure – which would drive substantial marginal cost and marginal price decreases supporting the rapid take-up of mobile data usage (see Exhibit 8 and 9).

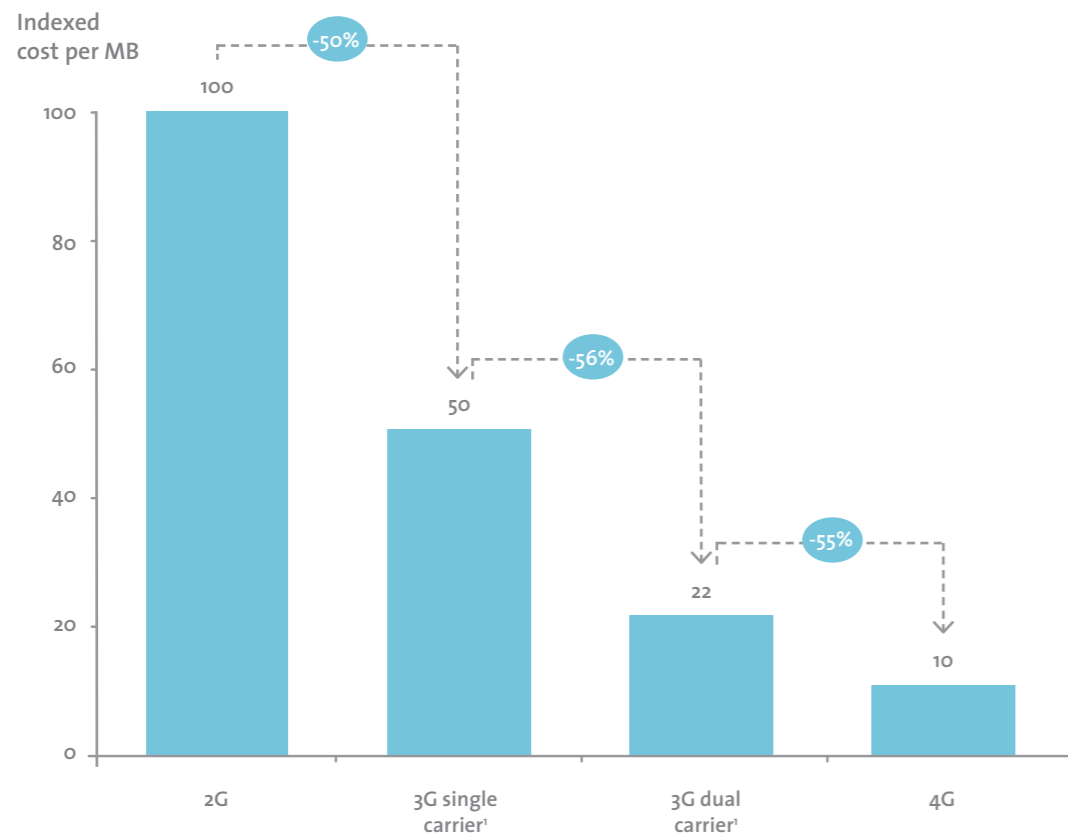
Consolidation in a fragmented market can benefit consumers. Economies of scale and density mean that bigger and healthier

THE INHIBITORS OF INVESTMENT

companies can increase the rollout and coverage of new technologies such as LTE and make new investments in pan-European services and innovation. Instead of allowing healthy concentration, regulatory and competition authorities often sponsor additional entrants. These companies do not have the resources to invest in a broad

NGA rollout. They cannot compete on network quality, so they price aggressively to gain ground, which drives down revenues, cash flows, and the ability to invest among all players. Consumers lose in the long term because companies do not invest in the innovations that could improve quality and lead to lower marginal prices – faster

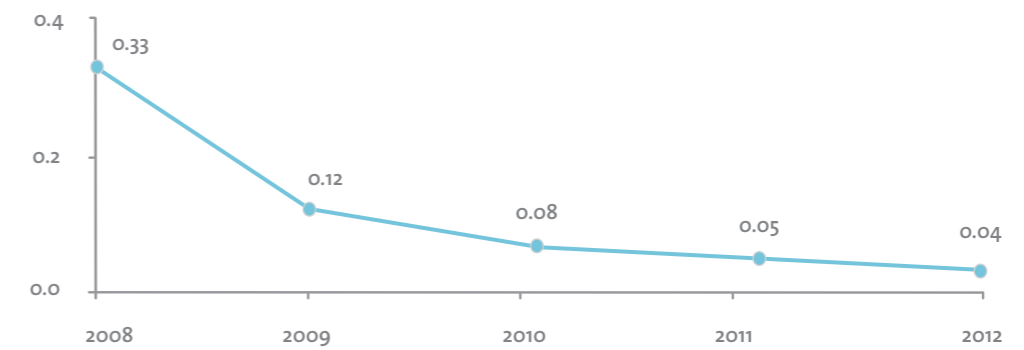
EXHIBIT 8 ADVANCED TECHNOLOGY NETWORKS SIGNIFICANTLY LOWER UNIT COSTS



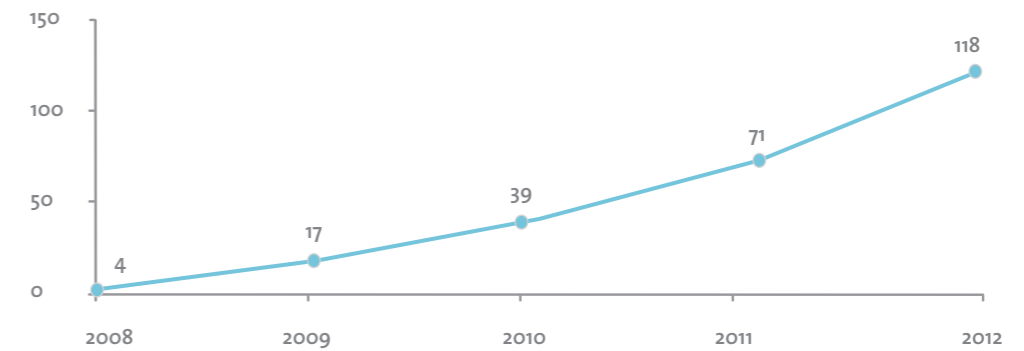
¹ 3G dual carrier is the natural evolution of 3G single carrier allowing the user to connect to two cells at once to increase peak data rates and improve utilization of available resources and quality of service especially in areas with weak radio reception
Source: BCG analysis

EXHIBIT 9 REDUCED COSTS ARE PASSED ON TO CONSUMERS LEADING TO INCREASED USAGE

Mobile data revenue per unit: € per MB¹



Mobile data traffic volume in PB²

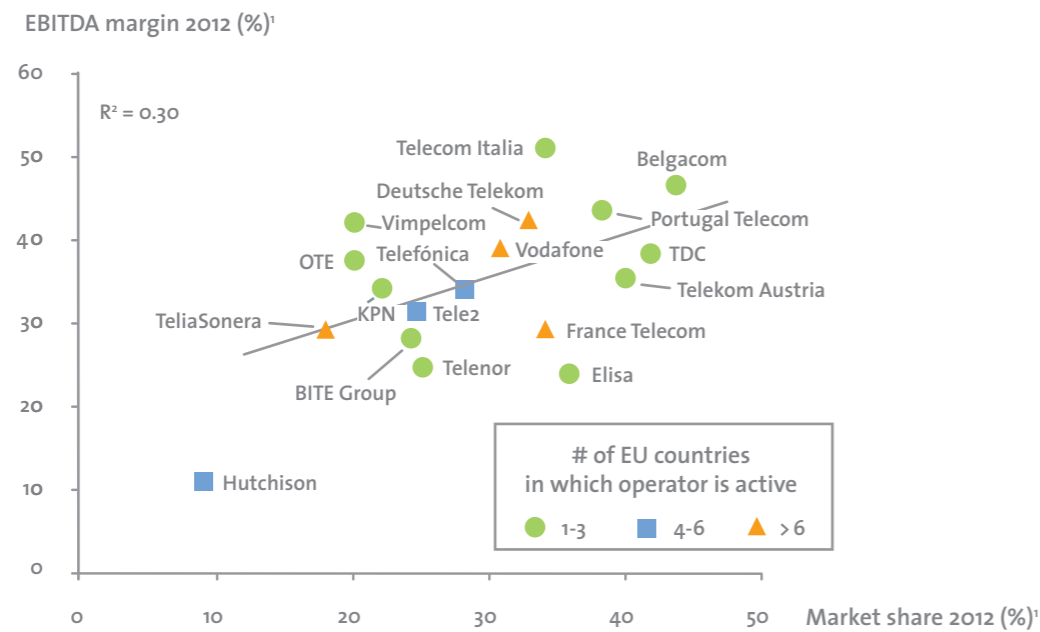


¹ Average retail revenue for Netherlands and France

² Cumulated mobile data traffic for Netherlands and France
Source: Regulators; BCG analysis

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EXHIBIT 10 PAN-EUROPEAN OPERATIONS NO MARGIN DRIVER



¹ EBITDA margin and market share per player calculated based on total of markets player is active in
Source: IEMR 3Q-2012; Thomson One Banker, 2013; BCG market model

speeds and higher network capacity, for example. Europe loses as well because these are the kinds of investments that can contribute significantly to GDP growth and new job creation.

LACK OF A HARMONIZED PAN-EUROPEAN APPROACH

Complying with inconsistent rules and procedures across Europe hinders pan-European operators' ability to reap cross-country synergies, which is evident in the fact that geographic scope is not a factor in the profit margins of pan-European tel-

cos (see Exhibit 10). Sector-specific rules for consumer protection and technical processes (number portability and lawful interception, for example) differ substantially across member states.⁷ Diverging general regulations and procedures (VAT submission, customer data protection) add to disjointed processes and an unnecessarily complex IT landscape. These and other differences create costly variations in current IT processes and systems, with which operators must comply, directly undermining the business case to integrate IT applications across countries – the main driver of cross-country synergies for telcos.

None of these problems are new. But taken together, the impact of the distortions they create in the market is becoming increasingly severe. They are constraining consumer benefits and undercutting Europe's competitiveness and growth.

Fortunately, there are ready solutions at hand.

⁷ See Exhibit 24 in the appendix.

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A STRATEGY FOR IGNITING GROWTH

The logic underlying Europe's current approach to telecoms regulations needs to be rethought. The consumer should remain front and center, of course, but in addition to affordable access to existing infrastructure and services, consumers also benefit from a robust telecommunications and digital services ecosystem populated by strong companies competing to win customers in part by investing in advanced technologies and new services. Consumer protection is essential, but Europe also needs a regulatory emphasis on modernization, efficiency, and healthy competition.

Meeting this challenge requires a three-fold regulatory paradigm shift:

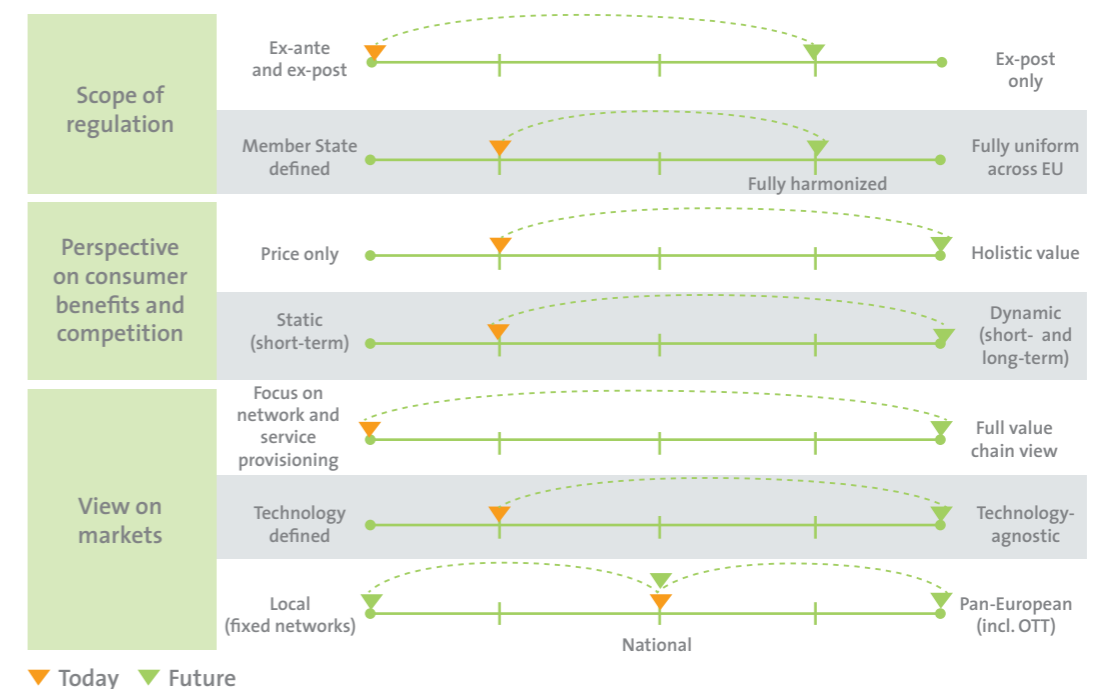
- ▶ From sector-specific regulation, enacted at the member state level, to a fully harmonized – and substantially reduced – pan-European regulatory approach, relying mostly on established competition law.
- ▶ From primarily assessing the impact of industry moves such as mergers based on the near-term effect on prices to a both short- and long-term holistic view of all the ramifications for consumers, including the benefits of more investments.

- ▶ From a view of the market that is based on narrow and rigid definitions of networks, services, technologies, and national borders to a paradigm that embraces a full view of the value chain, in a technology-agnostic manner and with a differentiated geographic lens (local versus national versus pan-European) based on the service provided.

Such a shift at the policy level can lead quite quickly to practical changes that reinvigorate investment in European telecoms network infrastructure and bring the Digital Agenda goals within reach. The importance of an increased focus on investments has been underlined by a recent report by DIW, The German Institute for Economic Research, which argues for €75 billion annually in additional infrastructure investments in Germany alone to boost growth. DIW urges policy makers to create more incentives for private investments in telecommunications in particular.⁸ In the next section, we detail five proposals for reforming telecoms regulation along the lines of the new paradigm, with each measure designed to address one of the areas of current competitive distortion. We have estimated the financial impact of each recommended initiative and the amount of cash flow each potentially frees up, thereby increasing the ability of network builders to invest in next-generation networks.

⁸ Deutsches Institut für Wirtschaftsforschung (DIW), June 2013

EXHIBIT 11 ELIMINATING DISTORTIONS IN COMPETITION REQUIRES FUNDAMENTAL CHANGES IN REGULATION



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The current trends must be turned around if Europe is to remain competitive in the global digital marketplace, not to mention meet the goals of the EU Digital Agenda. We propose five measures for tackling the regulatory root causes of declining telecommunications investment and unlocking the potential value of the digital single market. The following program not only allows for fairer and more efficient competition, it also increases expected cash flows available for investment in next-generation networks.

We estimate that the proposed measures would increase the free cash flow (FCF) available to network builders by a cumulative total of €105 billion to €165 billion by 2020. Not all of this would be used for network investments, of course, and we have assumed that 50 percent to 70 percent would be put to other purposes such as funding price reductions or reducing debt. The remaining amount, some €50 billion to €110 billion, would be available for investment in next-generation network infrastructure.

The individual components of this calculation are detailed below. Together with the rollout cost savings that DG Connect initiatives, such as its pending "less digging = more broadband" regulation, are expected to deliver, this program will significantly close Europe's next-generation network investment gap and pave the way for EU

citizens to get the world-leading communications networks they have been promised (see Exhibit 13).

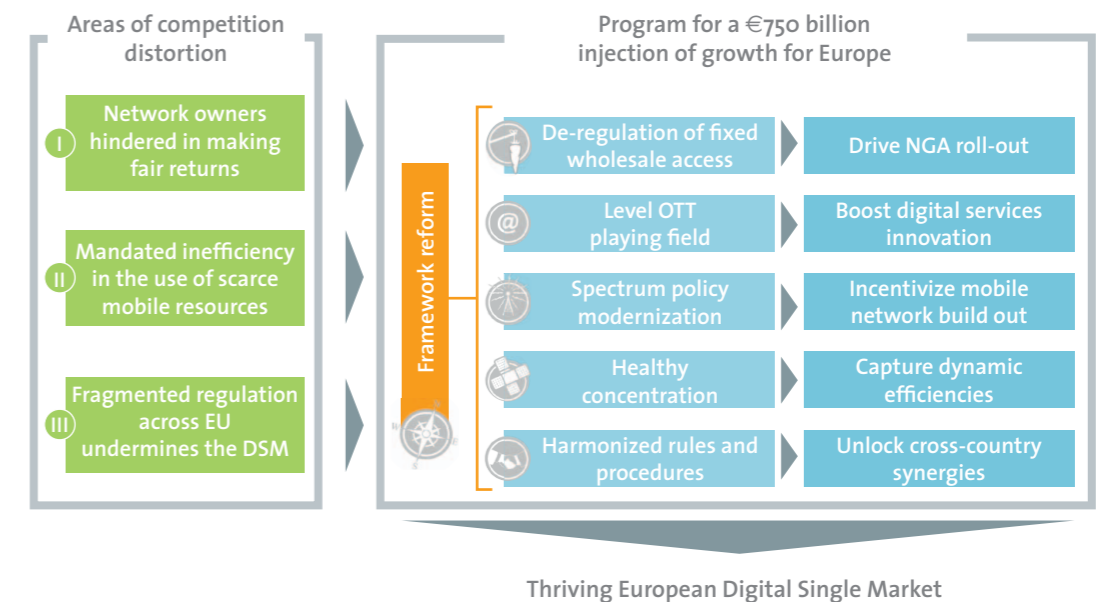
This far-reaching reform will require a close collaboration of all key stakeholders in an open and fact-based manner. These include (but are not limited to) DG Connect, DG Comp, NCAs, NRAs, BEREC, and the telecommunications industry.⁹ We would argue that over the long term few endeavors could benefit consumers and the EU economy more.

1. Substantial deregulation of fixed-line wholesale access.

A key unintended impact today of most ex ante regulation is to disincentivize investment in the next-generation networks that provide more reliable, faster access for consumers and businesses. Assessing competition on a local rather than national level, and in a technology-agnostic way, allows wholesale access obligations to be removed in many localities where there is competition between network providers. In other areas, the owners of monopolistic infrastructure should be obliged to provide a single access product on non-discriminatory terms. This should be structured in such a way as to incentivize NGA investments: The network owner has to have pricing flexibility to be able to realize the premium value that such advanced networks provide.

⁹ NCAs = national competition authorities; NRAs = national regulatory authorities; BEREC = Body of European Regulators of Electronic Communications

EXHIBIT 12 FIVE MEASURES TO TACKLE DISTORTION OF COMPETITION

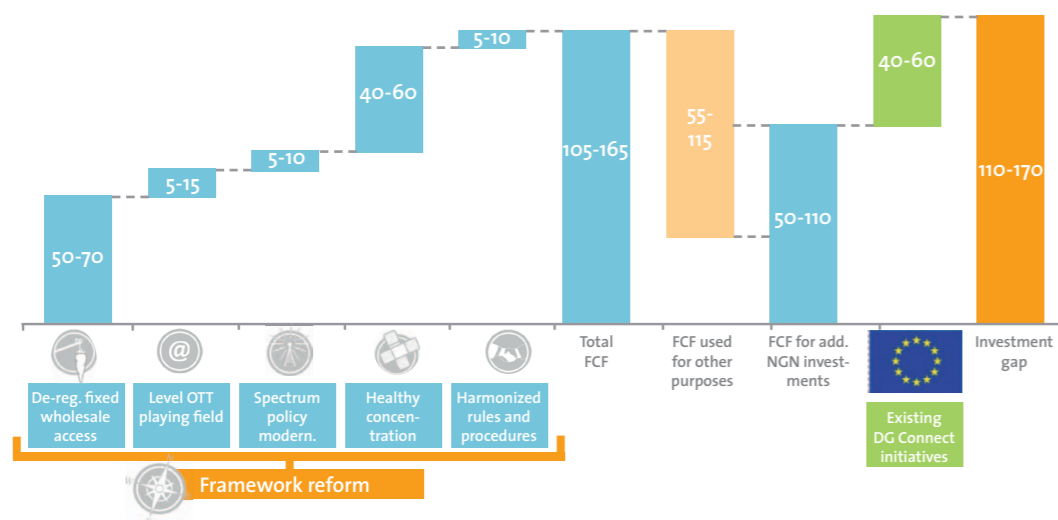


Note: DSM – Digital Single Market; NGA – Next Generation Access Networks; OTT – Over-the-top digital services

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EXHIBIT 13 MEETING EU DIGITAL AGENDA TARGETS BY CLOSING THE INVESTMENT GAP

Cumulated cash flow impact per initiative 2013-2020 in € billion



Note: FCF – Free cash flow
Source: BCG market model

We have quantified the impact of the proposal for change of the fixed network wholesale regulation along four major areas of impact:

Value shift from network renters to network builders. From 2008 to 2011, average unbundled local loop (ULL) rates decreased by approximately 0.7 percent per year.¹⁰ We estimate that our recommendations would lead to ULL rates that stabilize in real terms, that is, they increase at the rate of inflation, or a projected 2.5 percent per year until 2020.¹¹ This would result in a total projected shift in ULL rates of approximately 3.2 percent per year, which translates to an increase in the average monthly unbundling rate paid

by network renters of €0.31 in 2014, rising to €2.29 in 2020. Applying these rates to a base of 40.4 million ULL lines¹², which is expected to remain stable, would allow a value retention of some €5 billion in cumulative FCF for network owners until 2020.

Stabilization of legacy retail prices. We expect the stabilization of wholesale prices through inflation-adjusted unbundling rates to also stabilize retail prices for legacy copper products (less than 30 Mbps). Given the high degree of competitive pressure in the market and multiple competing infrastructures in the majority of localities, we expect the upper boundary of potential nominal retail price increases to be 2.5 percent

per year (the projected rate of inflation) and the lower boundary to be roughly half the rate of inflation. This would result in a delta of the average revenue per account (ARPA) for legacy copper of €0.71 to €0.95 in 2014 and €4.40 to €6.26 in 2020.¹³ We have applied these rates to the 2012 base of 109.6 million legacy copper lines, which is expected to decline to the number of remaining legacy ULL lines, as all fixed networks will be upgraded to > 30 Mbps in the target scenario.¹⁴ This would yield €10 billion to €15 billion in cumulative FCF until 2020. We deducted the impact of the value shift from network renters to owners in order to avoid double counting.

Concurrent stabilization of > 30 Mbps FTTx retail prices. Stabilized legacy retail prices can also support > 30 Mbps FTTx retail prices because customers are willing to pay only a certain premium for a higher speed. We assume the attainable premium to be in the range of €5 to €10 per month, depending on the quality and performance of the respective next-generation product. This would result in a delta of the ARPA for > 30 Mbps FTTx from €2.17 to €2.84 in 2014 and €8.25 to €14.45 in 2020.¹⁵ Applying these rates to a 2012 base of 16.3 million > 30 Mbps FTTx lines, the as-is scenario that is expected to grow by 10.6 percent a year until 2020¹⁶, would yield €25 billion to €35 billion cumulative FCF through 2020.

Increased > 30 Mbps FTTx rollout. We estimate that the effects of the substantial deregulation we propose, the resulting stabi-

lization of legacy wholesale fees, and the incentivization of NGA rollout will result in network builders rolling out > 30 Mbps FTTx to more households. The "as-is" > 30 Mbps FTTx coverage is expected to reach 67 percent by 2020, but we estimate it can reach 90 percent in our target scenario.¹⁷ In our market model, we assume that this can result in a near-doubling of the annual growth rate of > 30 Mbps FTTx penetration, to 20 percent. These NGA lines are substituted for legacy lines with lower prices (see premium assumption above). This could result in an additional €10 billion to €15 billion of cumulative FCF by 2020.

2. Level the playing field for network operators and OTT digital service providers.

Establishing a level playing field for network operators and digital services providers requires close collaboration among multiple EC directorates such as DG Justice and DG Connect, given that the issues concerned range from privacy and data protection to tax policy. Several sector-specific regulations have to be lifted in the process.

Increased network capacity and better quality of service that enable new and improving digital services come at a cost. The ability to set different prices, based on usage and user experience, for both OTT providers and consumers, is required if telcos are to have the necessary incentives to make advanced network investments. Any new regulations need to preserve the ability of operators and OTT players to develop innovative

¹⁰ EU Electronic Communications Market Indicators 2012

¹¹ Average inflation rate EU-27 over last 5 years; European Commission, 2013

¹² Ovum Fixed Voice and Broadband Forecast, 2011

¹³ Ovum Fixed Voice and Broadband Forecast, 2011

¹⁴ Informa World Broadband Information Service, 2013

¹⁵ Ovum Fixed Voice and Broadband Forecast, 2011; BCG market model estimate

¹⁶ Analysys Mason, 2012

¹⁷ Analysys Mason, 2012

¹⁸ Gartner, Ovum, IDC, TIA'S, Magna, Euromonitor, BCG analysis

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network management solutions so they can offer differentiated, value-adding services, while maintaining a non-discriminatory approach.

We estimate that the digital services segment, which is growing strongly, will generate annual worldwide revenues of about €700 billion by 2015,¹⁹ of which 20 to 30 percent are associated with Europe.¹⁹ Leveling

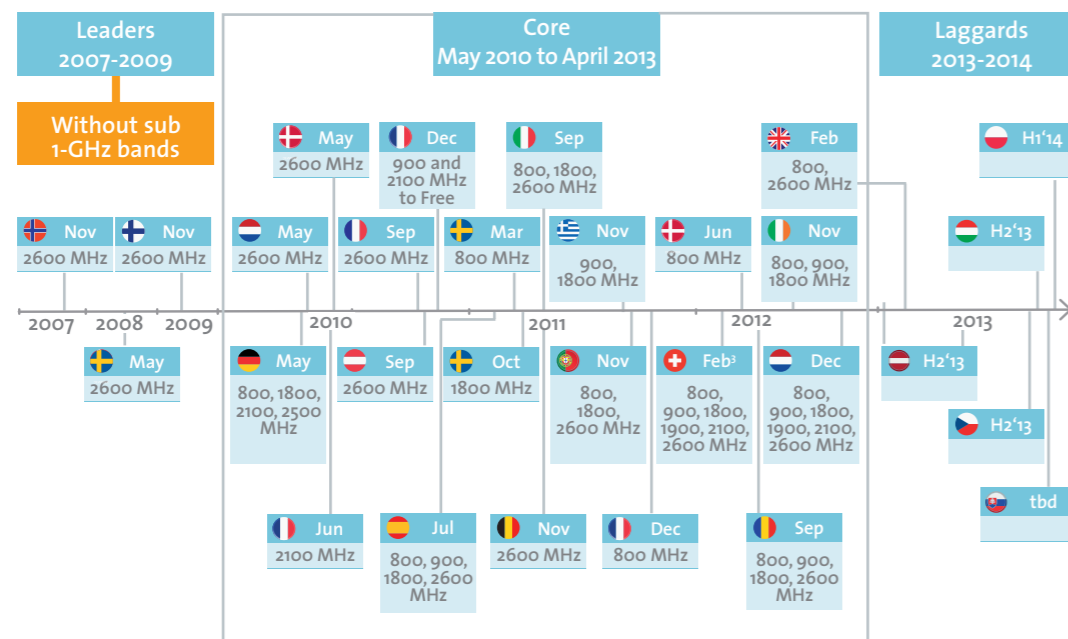
the playing field in the manner we propose would lead to increased revenues and cash flows for European telecommunications companies in two ways: increased value creation of European telcos' own digital services, and growth of innovative network management services.

Telcos' digital services. European telcos today generate digital services revenues

equivalent to approximately 7 percent of the total European digital services market. For example, European telcos' Internet television (IPTV) and video-on-demand (VOD) services alone generate about €4 billion in annual revenues today.²⁰ The creation of a level playing field and the ability of telcos to form digital services alliances more quickly would significantly increase their competitiveness relative to global OTT players. We estimate

telcos would be able to increase their digital services market share by 50 percent to 100 percent through 2020, meaning they would achieve a total market share of roughly 10 percent to 14 percent. By our estimates, these additional revenues would yield a cumulative FCF of some €4 billion to €14 billion at a margin of 5 percent to 10 percent, after taking into account setup and operational costs.

EXHIBIT 14 EIGHT YEAR LAG BETWEEN LEADERS AND LAGGARDS IN AUCTIONING FIRST TRanches OF LTE SPECTRUM¹



¹ Auctions in the 800 MHz band, 2100 MHz band, 2600 MHz band, and all-band auctions. Time for auctioning of spectrum from digital dividend not yet determined for Estonia and Bulgaria

² Norway not a member of the EU, but member of the EEA and thus covered by telecommunication regulations

³ Switzerland not a member of the EEA and hence not subject to EU legislation in the telecommunications space; included for comparison.

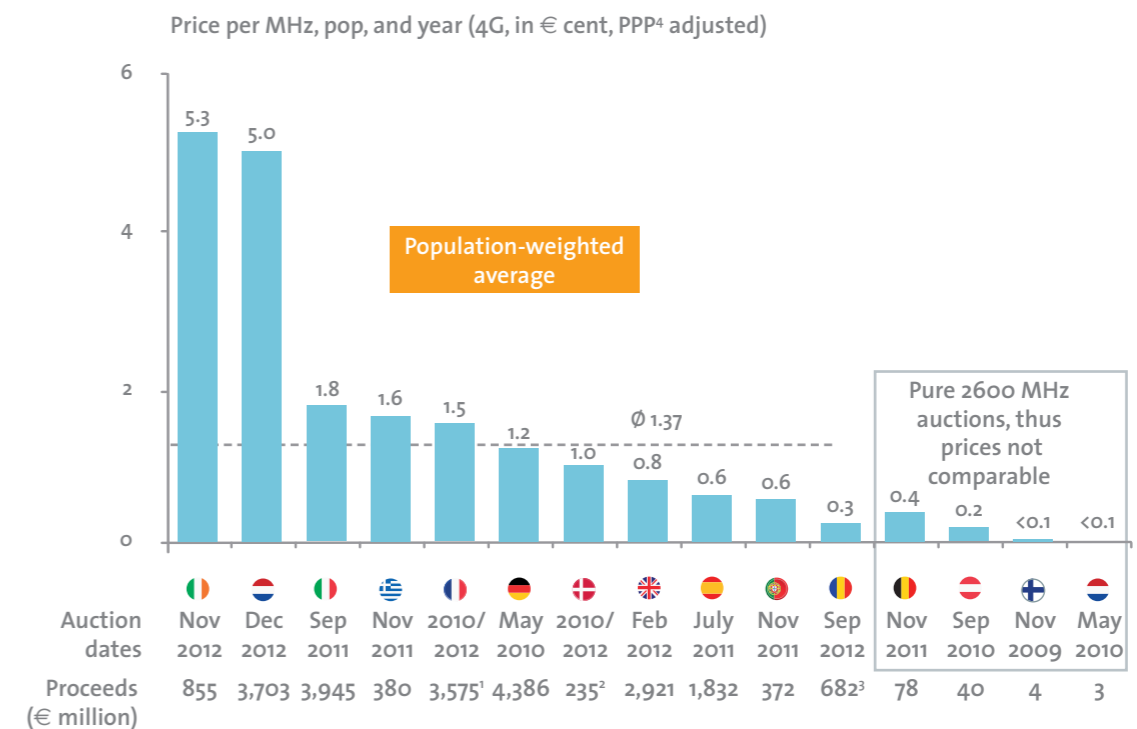
Note: Selected auctions displayed

Source: GSMA, press research; BCG analysis

¹⁹ Estimate based on Cisco VNI Global Mobile Data Traffic Forecast 2013 and Econ Stats 2013

²⁰ Broker reports, BCG market model

EXHIBIT 15 HIGH 4G SPECTRUM PRICES IN RECENT AUCTIONS WILL LIKELY FURTHER DELAY 4G ROLLOUT



¹ 2600 MHz auction Sep 2011 and 800 MHz auction Dec 2011.

² 2600 MHz auction from 2010 and 800 MHz auction from 2012.

³ Floor prices in Romania were high but overall prices low because a high share of 2600 MHz was auctioned

⁴ Purchasing power parity

Source: NRAs; Press research, BCG analysis

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Innovative network management services. Many digital services benefit from differentiated network management services that provide increased security, reduced latency, or higher throughput. For instance, e-commerce sites can boost revenues with faster page loads, and VOD services can increase customer loyalty with improved buffering. Network operators can capture a share of the growing digital services market by developing solutions such as these that benefit digital services providers and their customers.

We estimate that such solutions can capture up to a 15 percent share of the digital market by 2020 and that network

operators will receive approximately a 0.5 percent revenue share.²¹ This translates to cumulative additional FCF of about €1 billion. In addition to its direct financial impact, a broader application of such solutions throughout the industry can help to balance the pressure on networks, as costs for incremental traffic generation are shared among participants.

3. Modernize spectrum policy across Europe to create sustainable infrastructure competition that incentivizes network investments.

Defining spectrum authorization rules on a pan-European basis can help thwart

the tendency of some jurisdictions to seek high auction prices at the expense of quicker network build-out. Europe-wide rules should also mandate equal treatment of all players, irrespective of their incumbent or new-entrant status. To ensure consistent implementation of these rules, new competences and enforcement mechanisms at EU level will need to be put in place. A harmonized two- to three-year time window for upcoming auctions would benefit consumers and network builders by enabling participants to develop EU-wide network strategies. Residents of countries with older, slower networks would benefit earlier from the added capacity and new technologies that additional spectrum for LTE enables.

A modernized and harmonized spectrum policy would have multiple impacts. Total spectrum sale proceeds in the EU-27 over the last seven years amounted to approximately €23 billion²². We expect the proceeds from auctions between now and 2020, based on renewals and the second tranches of new spectrum for LTE, to aggregate between €8 billion and €10 billion. Without pan-European rules that prevent over-pricing, we assume that roughly 20 percent of auctions could be subject to this phenomenon. Based on the actual over-pricing that occurred between 2007 and 2013 (such cases resulted in spectrum prices 3.5 times as high as the European average), a cumulative €1.5 billion in FCF could be saved through 2020.

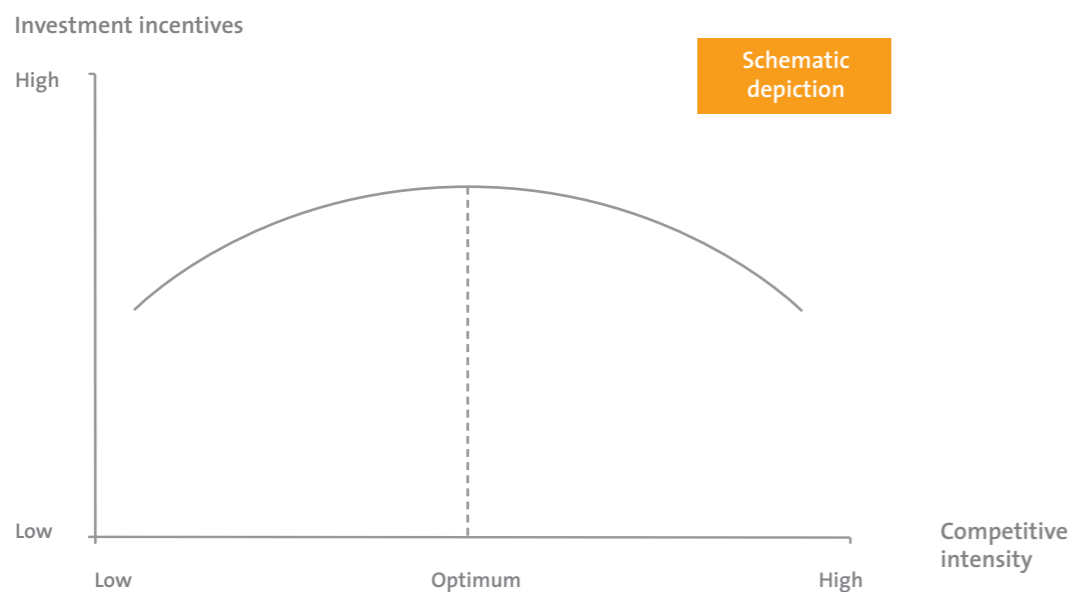
As noted earlier, the most recent case of a new player entering a European market

with significantly preferential terms from a spectrum auction resulted in a decline by up to 7 percent of total market size – that is, the revenues generated by all companies – within two years. For our quantitative assessment, we assume those 7 percent to be the upper boundary in market size decline and half of that – 3.5 percent – to be the lower boundary. Based on an assessment of the upcoming spectrum auctions, we see a high risk of sponsored new entrants in markets totaling approx. 6% of European mobile revenues. Assuring non-discriminatory terms in spectrum auctions could yield an additional cumulative €4 billion to €8 billion in FCF through 2020. Non-discrimination is also critical to maintaining a healthy concentration of competition driven by market forces (see the next subsection).

4. Permit healthy consolidation in mobile.

The mobile sector in Europe is characterized by a high degree of fragmentation – there are more than 100 mobile network operators, with as many as one-third unable to cover their cost of capital. More mergers could be approved that benefit the consumer if a more dynamic and holistic approach was applied to evaluating the impact of these deals, including a quantitative model that complements the analysis of the short-term pricing ramifications by taking into account the value of additional investments. This would help address the current inverse relationship between competitive intensity (the number of competitors) and investment incentives and innovation (see Exhibit 16).

EXHIBIT 16 UNHEALTHY LEVELS OF CONCENTRATION DECREASE INVESTMENTS



Source: Bauer (2009); empirical indication for an inverted u-shape relation of competition and investment/innovations given by Aghion (2005) who includes telcos as part of his sample as well as Byrne (2011); Saavedra (2011); Vives (2008) and Jeanjean (2012)

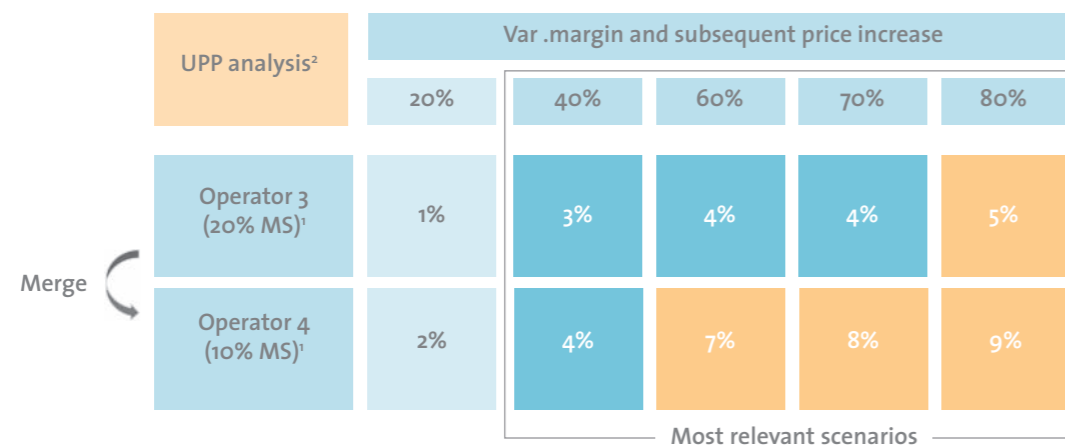
²¹ Estimate based on BCG case experience supporting the development of such solutions

²² BCG auction price database

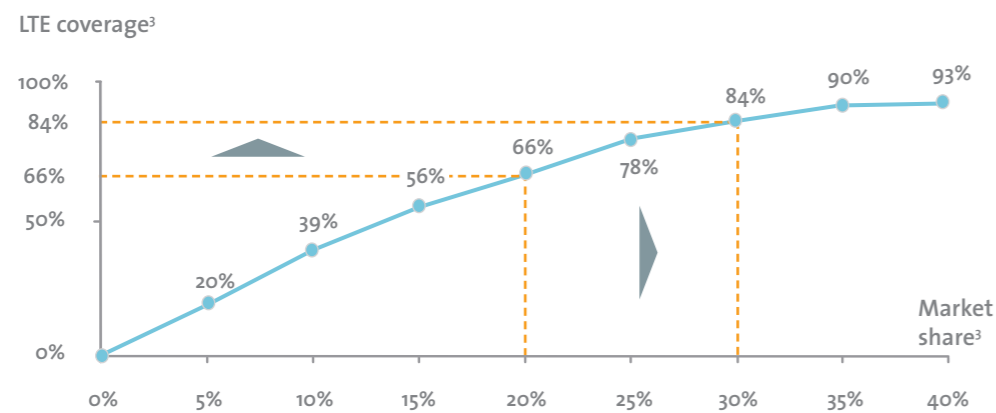
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EXHIBIT 17 POTENTIAL PRICE INCREASES RESULTING FROM MERGERS OFFSET BY TECHNOLOGY INVESTMENTS

MERGERS MIGHT RESULT IN SHORT-TERM PRICE INCREASES ...



...WHICH CAN BE OFF-SET BY TECHNOLOGY INVESTMENTS



¹ Average market structure for a typical 4-player market within Europe: operator 1 40%, operator 2 30%, operator 3 20%, operator 4 10% market share
² Upward Pricing Pressure analysis (UPP) models pot. price increases from a merger due to reduction in competitive intensity
³ Based on Spanish LRIC model, 2012; Eurostat, 2012; BCG market model
 Source: IEMR Q3-2012; LRIC model Spain, 2012; Eurostat, 2012; BCG analysis

The goal should be an appropriate balance between near-term price impact and the ability of the merged entity to make new investments in pan-European services and innovation and to increase the rollout and coverage of new technologies such as LTE, which also benefit consumers (see Exhibit 17).²³ If remedies are required, they should focus on network innovation investment and quality commitments.

We estimate that such an approach would result in an increase of concentration in the average market share of mobile network operators across the EU from about 25 percent currently to 30 percent by 2020. Even with such an increase, European mobile markets would continue to enjoy robust competition – as well as delivering improved customer value. We believe that most merger cases reviewed under the aforementioned conditions should not raise major concerns among the competition authorities.

The financial impact of such consolidation would be two-fold:

Economies of scale. In-country mergers can lead to estimated synergies aggregating 20 percent to 30 percent of the total operating expense of the acquired party (by, for

example, reducing SG&A expenses by eliminating overlapping functions). Total mobile operating expense within the EU-27 was about €150 billion in 2012.²⁴ We calculate that moving from 25 percent to 30 percent average market share per mobile operator translates to the operators being acquired currently accounting for about 17 percent of EU mobile industry operating expense. Applying the synergy potential stated above, and assuming a gradual ramp-up of synergies over three years starting one year after the merger to account for implementation costs, yields a cumulative €30 billion to €45 billion of additional FCF through 2020.

Economies of density and quality. Because of the intensified utilization and pooling of existing networks and customer bases that occur in a merger, it becomes economically viable to increase network coverage to less densely populated areas that previously could not be served economically. We calculate that the potential average market share increase from 25 percent to 30 percent decreases the required population density for breakeven LTE rollout from an average of 93 inhabitants to 78 inhabitants per square kilometer.²⁵ This equals an LTE coverage increase of 5 percent to 8 percent by 2020, assuming an LTE uptake rate of 70 per-

²³ We can illustrate the impact with the example of a hypothetical merger of an operator with a 20 percent market share and another operator with a 10 percent market share. In such a scenario, the maximum short-term price increase for the combined entity would be 6 percent, based on an upward pricing pressure (UPP) analysis. This effect can be more than outweighed by an increased coverage of LTE. While the smaller operator could economically roll out LTE to 39 percent of the population and the larger operator to 66 percent, the combined entity has economic incentive to cover 84 percent. As we have shown before, the cost per MB of data decreases by more than 50 percent from the most advanced implementation of 3G to LTE. Assuming that those cost reductions are passed on to consumers in form of reduced marginal prices – also reasonable, as we have shown in Exhibit 9 – this would reduce marginal prices for customers of the merged entity by 7 percent.

²⁴ Estimate based on Reuters Consensus Estimates, 2013; Ovum Service Provider Revenue Forecast, 2012; BCG analysis

²⁵ Assuming a penetration rate of approx. 70% by 2020; Spanish LRIC model 2012; Eurostat 2012; IEMR Q3 2012, BCG analysis

The Impact of Scale and Standardized IT Networks

Bharti Airtel, the world's fifth largest mobile operator, offers a prominent example illustrating the economic potential of scale and standardization of IT and network operations. By outsourcing large blocks of its IT and network operations to specialists such as Nokia Siemens Networks, Huawei, and IBM, Bharti Airtel became the mobile leader in India and one of the world's top operators. Bharti Airtel applied this business model of a standardized IT and network platform to its African operations bought from Kuwait's Zain in 2010 with substantial success. Its network in Rwanda was built from scratch in only 83 days – the fastest-ever greenfield approach in the region. Bharti Airtel's African operations are expected to generate \$5 billion in revenues and \$2 billion in EBITDA in 2013.²⁶

cent to 80 percent, or €3 billion to €5 billion in additional network investments that are enabled by increased economies of density.

Another form of increased concentration is network sharing, which is a viable complement to, but not a substitute for, in-country mergers. Network sharing (as well as other forms of commercial collaboration) involve substantial transaction costs and cannot provide the same alignment of incentives as mergers. The maximum efficiency gains outlined above can only be achieved through mergers. That said, we still recommend that the competition authorities provide a clear, positive Europe-wide stance for the treatment of network sharing based on commercial agreements. This could lead to a more than doubling of the share of operators pursuing active network sharing arrangements through 2020, resulting in significant additional investment in next-generation mobile networks.

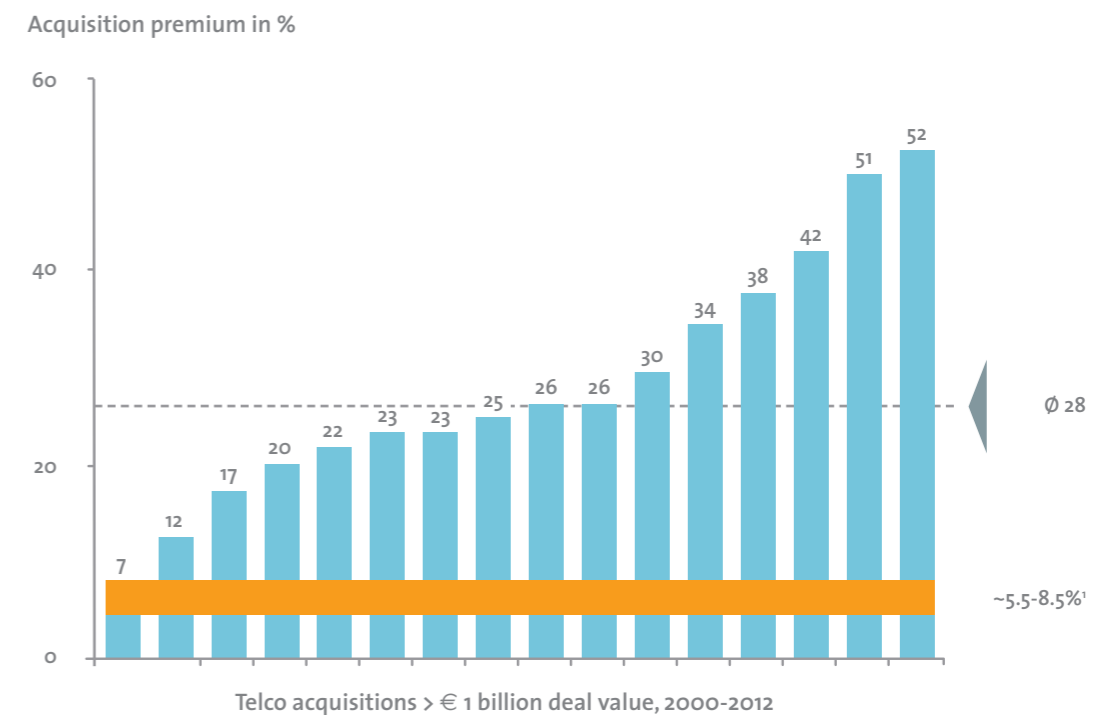
The market share of operators with active network sharing agreements in place within the EU was about 30 percent in 2012. These operators shared on average about 60 percent of their total network scope. However, neither active nor passive network sharing agreements are currently in place in 12 countries within EU.²⁷ We estimate that active network sharing could increase to some 70 percent by 2020. Given that the total operating expense of mobile network operators accounted for approximately €150 billion and capital expenditures for another €44 billion in 2012, active sharing agreements can free up additional FCF of €7 billion to €10 billion through 2020, assuming a savings potential of 5 percent to 7 percent from network sharing.²⁸

5. Harmonizing rules and procedures to unlock cross-country synergies.

A far-reaching and extensive harmonization of rules and procedures is required to enable players with operations in multiple EU countries to capture the full potential of cross-country synergies as well as to decrease the number of hurdles for companies seeking to provide pan-European services. The extent of harmonization required to pave the way for the economical introduction of cross-border IT and network management

platforms is far-reaching and goes beyond national sector-specific regulation. Harmonized rules and procedures for consumer protection across the EU-27 (e.g., contract termination) and technical processes (e.g., VAT submission) would allow telecom operators with pan-European operations to realize additional synergies by standardizing IT processes across countries and implementing cross-border IT platforms (see the sidebar, "The Impact of Scale and Standardized IT Networks").

EXHIBIT 18 INCREASED CROSS-COUNTRY SYNERGIES WILL NOT DRIVE CONSOLIDATION IN ITSELF



¹ Value of max. attainable cross-country synergies as given constant multiples, FCF equals market cap. increase
 Source: IEMR 3Q.2012 Global Mobile Operator Forecast, 2012-2016; Thomson One Banker as of June 04, 2013; BCG market model

²⁶ For more information, see our report "Facing Up to the Future – A New Operating Model for Telcos," 2012
²⁷ OVUM Mobile Network Sharing Deals Analyzer 2012; GSMA Mobile Infrastructure Sharing; IEMR Q3 2012; BCG analysis
²⁸ Estimate based on Reuters Consensus Estimates 2013; Ovum Service Provider Revenue Forecast 2012; BCG analysis

European network operators accounted for some €270 billion in operational expenditures in 2012.²⁹ Given that about 70 percent of companies have European operations outside their home market, which account on average for approximately half of total company operating expenses, the basis for potential cross-country synergies adds up to about €95 billion a year and a cumulative €840 billion through 2020.³⁰ Harmonization of rules and procedures across the EU allows for increased integration of existing IT and network platforms and accompanying process standardization.

We estimate the theoretical maximum cross-country synergy potential at about 10 percent. However, a single, cross-border IT platform must be seen as a theoretical upper boundary of attainable synergies. In practice, in many cases, it will be economically viable to implement a few large but separate platforms, for example, for mobile- and fixed-only areas, or to separate high-volume home country markets. We have therefore assumed only 50 percent of the theoretical potential synergy attainable.

These synergies take time to develop: They are expected to be reaped only over a period of 10 or more years, since the realization is costly and depends on lengthy replacement cycles of the existing network and IT infrastructure (billing and CRM systems, for in-

stance). To account for these effects, we have assumed a gradual ramp-up of 10 percent to 15 percent a year, starting in 2017. This yields total additional cross-country synergies of between 0.7 percent and 1.2 percent of the total cross-country synergy basis, or a cumulative €5 billion to €10 billion of FCF through 2020. It should be noted that, while increased cross-country synergies enabled by harmonized rules will increase FCF available for investment, they will not drive consolidation of the fragmented industry in itself through cross-country mergers. Typical acquisition premiums far outweigh the attainable cross-country synergies (see Exhibit 18).

²⁹ Reuters Consensus Estimates 2013

³⁰ WCIS 2013; BCG analysis

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The European telecommunications ecosystem is complex. It has many stakeholders, some with competing interests. Everyone's position ought to be considered, but there is urgency to move forward with the necessary task of streamlining, modernizing, and harmonizing regulation. The longer investment-hindering distortions remain in place, the farther Europe will fall behind leading international markets in digital infrastructure and services. The big losers will be consumers, businesses, and the EU economy.

On the other hand, the changes necessary to ignite up to €750 billion in GDP growth and create as many as 5.5 million new jobs are within the grasp of the EU Commission's Directorates-General for communication networks (DG Connect) and competition (DG Comp) as well as the European Parliament and Council. They – and others, including the telecommunications industry – need to rise to the challenge. Starting now.

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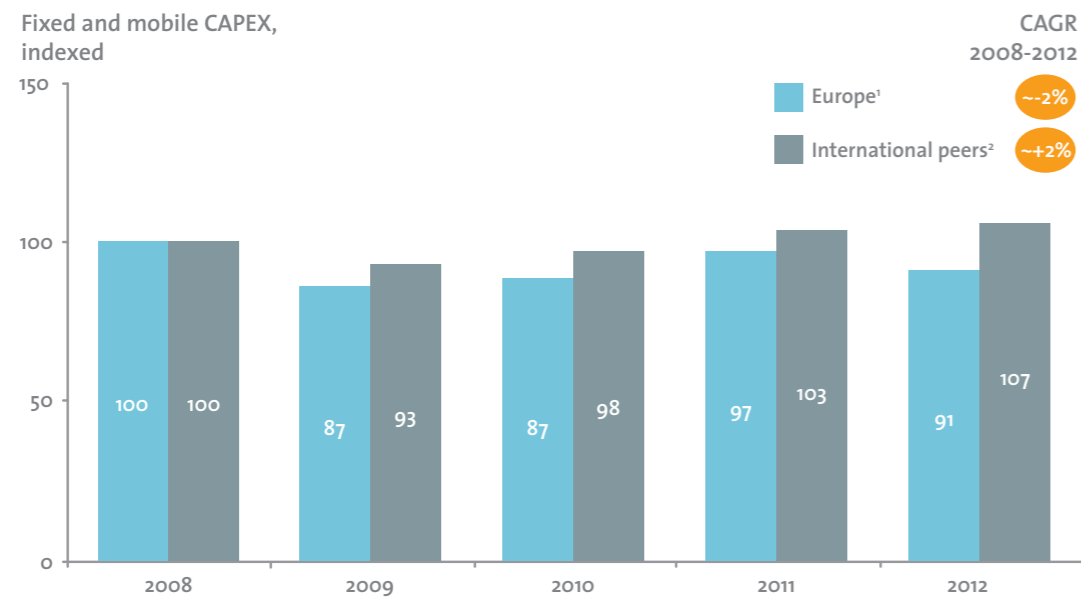
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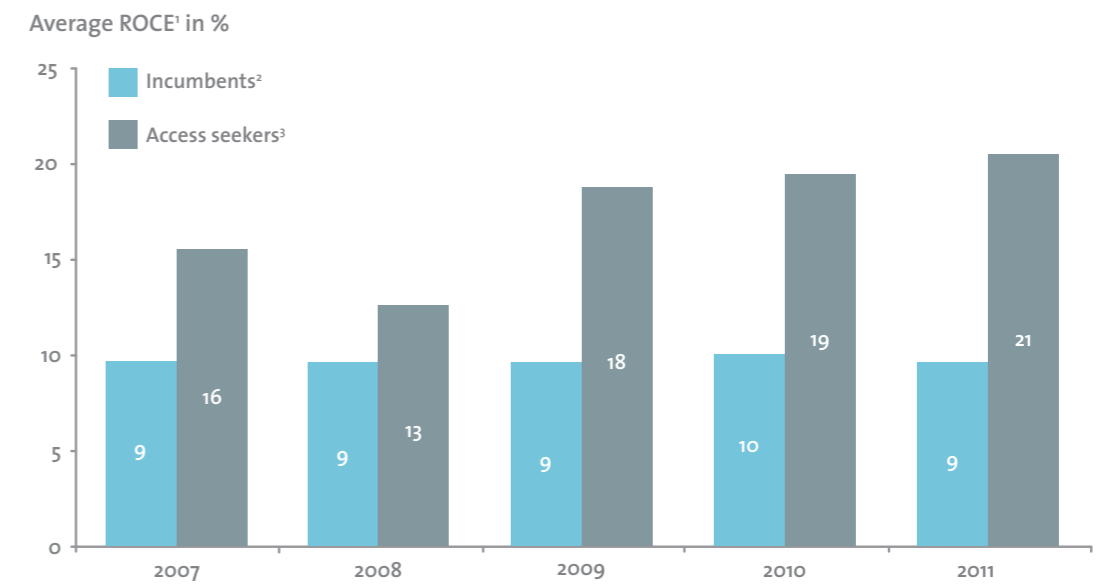
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EXHIBIT 19 EUROPEAN NETWORK INVESTMENTS DECLINING IN CONTRAST TO INTERNATIONAL PEERS



¹ Includes France, Germany, Greece, Italy, Netherlands, Poland, Spain, Sweden, UK
² Includes Canada, United States, Japan, South Korea, Australia, New Zealand
 Source: Ovum Service Provider Revenue and Capex Forecast, 2012; BCG analysis

EXHIBIT 20 CURRENT REGULATORY REGIME FAVORS INFRASTRUCTURE RENTERS OVER BUILDERS



¹ Return on capital employed
² Incumbents include British Telecom, Deutsche Telekom, France Telecom, Telefonica
³ Access seekers include British Sky Broadcasting, Iliad, Jazztel, TalkTalk, United Internet
 Source: Broker reports, 2013; BCG Value Science Center, 2013; Bloomberg, 2013; BCG analysis

EXHIBIT 21 EUROPE SHOWS LOW COVERAGE ESPECIALLY FOR FIBER

FTTx coverage - 2012



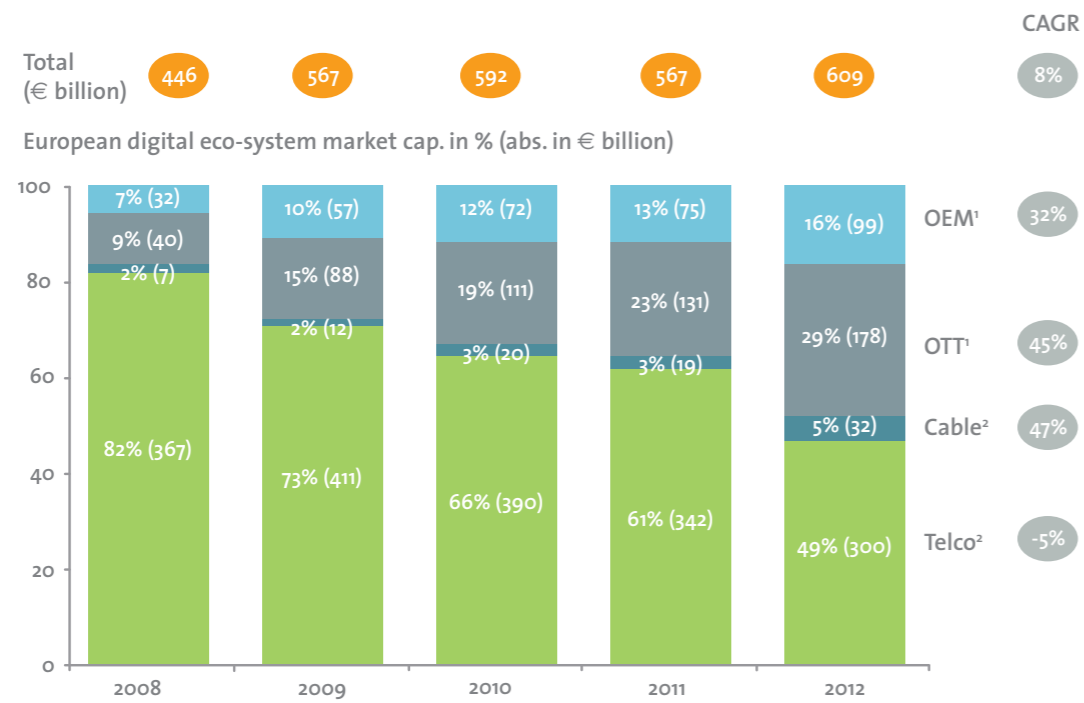
Note: FTTx includes FTTC/VDSL, FTTB, FTTH; Norway, Switzerland and Turkey not part of EU-27 and not included in depicted EU-27 average
Source: Analysys Mason, 2012; BCG analysis

FTTH/B coverage - 2012



Note: FTTx includes FTTC/VDSL, FTTB, FTTH; Norway, Switzerland and Turkey not part of EU-27 and not included in depicted EU-27 average
Source: Analysys Mason, 2012; BCG analysis

EXHIBIT 22 VALUE OF EU TELCOS CONTRACTED OVER PAST FIVE YEARS WHILE OTT, OEM AND CABLE COMPANIES BENEFITED

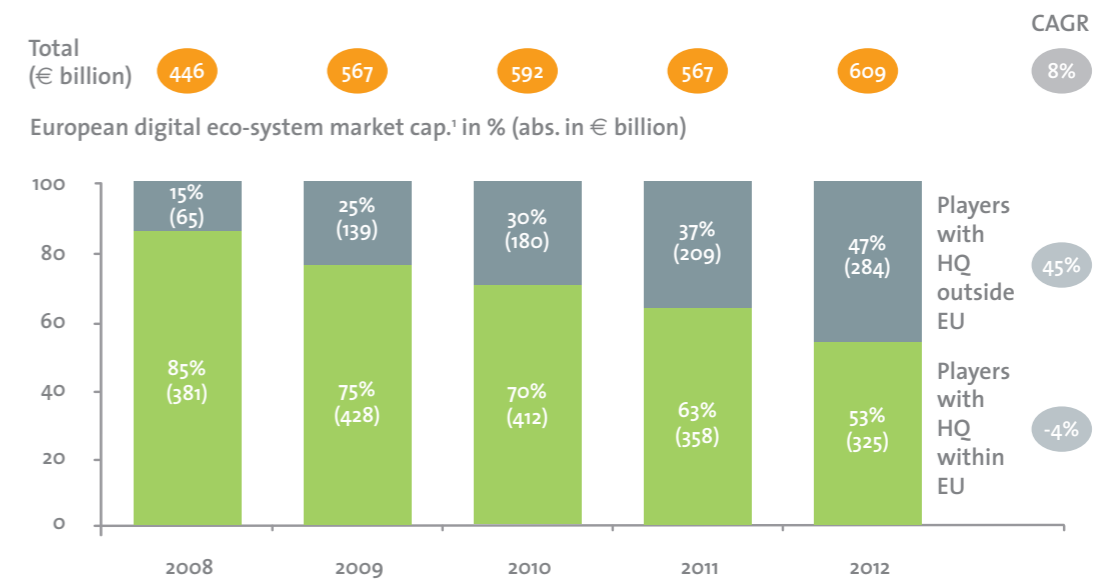


¹ Estimate based on major OEMs and OTTs listed; market cap. estimate based on approximated European revenue share per player

² Estimate based on major European network owners listed; ~50% of top-20 EU cable companies currently not listed and thus excluded

Source: Capital IQ 2013, Google & Ipsos Media 2013; Worldbank 2013; BCG Value Science Center 2013; company annual reports 2011/2012; BCG analysis



EXHIBIT 23 SUBSTANTIAL VALUE DRAIN FROM EUROPEAN TO FOREIGN COMPANIES OVER LAST FIVE YEARS



¹ Estimate includes major European telco and cable network owners, OEMs and OTTs listed; ~50% of top-20 EU cable companies not listed and thus excluded; market cap. estimate for OEMs and OTTs based on approximated European revenue share per player

Source: Capital IQ, 2013, Google & Ipsos Media, 2013, Worldbank, 2013; BCG Value Science Center, 2013; company annual reports 2011/2012; BCG analysis

EXHIBIT 24 EXEMPLARILY DEPICTION OF DIFFERING RULES AND PROCEDURES IN EU

		
Mobile number portability	<ul style="list-style-type: none"> • 3 days to proceed • New provider in charge of process 	<ul style="list-style-type: none"> • 1 day to proceed • Old provider in charge of process
Consumer protection	<ul style="list-style-type: none"> • Defined under Consumer Right Legislation • Automatic renewal of contract after 24 months, no longer period permitted • Defined cancellation process that allows to cancel a 24 months contract after 12 months by paying 25% of remaining fees 	<ul style="list-style-type: none"> • No specific regulation, cancellation terms and conditions are defined by the provider • Contract on-going after minimum term • Cancellation during minimum term possible; usually notice period 30 days and consumer required to pay all or majority of remaining fees
Authorization as provider	<ul style="list-style-type: none"> • One type of authorization • Process without specific requirements 	<ul style="list-style-type: none"> • Three types of authorization with different rights and obligations (provider to choose) • Process without specific requirements

Source: ARCEP; Ofcom; BCG analysis

ABOUT THIS REPORT

The European Telecommunications Network Operators' Association (ETNO) commissioned The Boston Consulting Group (BCG) to author a report on the topic of the European telecommunications and digital services regulation in the context of declining investments. The objective of this work is to contribute to a debate currently high on the agenda of regulators, policy makers, and the industry with a quantitative and fact-based approach. The report reflects BCG's thoughts on the European regulatory framework, supported by market analyses as well as case studies based on publicly available information.

In the process of conducting the study, BCG interviewed more than 50 representatives of key stakeholders, such as European policy makers, regulators, academics, associations, and industry managers, including companies outside of ETNO membership. Their expert view is reflected in this work. The report provides a basis for discussion for the parties involved in the European digital marketplace on a broad set of topics related to future strategic, policy, and regulatory priorities.

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