



# The future of telecommunications services: Outline of four scenarios

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## Introduction

This report sets out four different scenarios for future development in the European telecoms sector up to 2010. It describes a plausible hypothesis about the future based on a combination of different relevant variables. This does not consist of projecting the present into the future but elaborates on alternate visions of future outcomes for the telecommunications industry over the next five years.

A scenario is a coherent description of trends, drivers and factors that may influence and change the shape of analysis over a given period of time. To a certain extent, the purpose of creating scenarios is to help minimise risks and/or be prepared to adjust policy formulation, strategy processes or work organisation in private companies, and possibly social partner relationships.

Thus, scenarios can act as a navigation tool and an early warning system for current realities. While scenario-analysis may be a valuable tool for insight and future literacy as well as a catalyst for strategic discussion, it should not be regarded an end in itself.

This outline of four scenarios includes one reference scenario and three alternative scenarios to cover a five-year perspective of possible employment and company trends in the telecoms sector:

- Reference scenario: Surprise free scenario
- Alternative scenarios:
  - The disruptive scenario: Information society
  - The steadily progressive scenario
  - The standstill scenario

## The scenario development process

### Objectives

In the fast-changing telecoms sector - where technology and services evolve rapidly - scenario analysis is used as a vehicle to develop a medium-term vision of organisational changes and workforce evolution.

The four exploratory (not normative) scenarios illustrate trends and uncertainties that may drive change in this sector. They describe how these changes may influence and shape production, skills and qualifications, employment structure, restructuring measures, and the sector's competitiveness. Thus, these scenarios look at the future of the telecommunications services sector five years from now. Taking into account the rapid evolution of telecommunications and the technologies involved, scenarios looking five years ahead offer a more realistic vision than scenarios based on a longer time period.

## **Methodology**

Used for policy and strategic analysis to describe a possible future, a scenario has to fulfil the following criteria:

- It should be coherent in terms of logical thinking.
- It should be plausible, but it does not have to be the most probable.
- It should be relevant in terms of significance.

In this case, the scenario-building process has been designed in two-stages:

*Stage 1* is devoted to developing exploratory scenarios based on:

- desk research;
- team knowledge and expertise in the telecoms sector as well as observations on recent industry developments.

At this stage, the scenario-building process followed a different path:

- identifying and classifying key variables relevant to the sector's future;
- defining uncertainties<sup>1</sup> and key dimensions;
- develop hypotheses on the basis of these key dimensions;
- explores hypotheses to elaborate on exploratory scenarios.

In order to determine the key dimensions and issues at stake in the telecoms sector, the main drivers and important dimensions of change were examined by experts in the industry. Once identified, these drivers and dimensions are fleshed out into a set of four plausible and concrete scenarios.

*Stage 2* examines the possible impact and implications these scenarios may have on the various players - such as telecommunications operators (incumbent and alternative), regulatory institutions and policymakers - and their position in the sector. Face-to-face interviews are carried out with representatives of several telecommunications operators; subsequently, players active in the sector help to validate these. Key to any foresight exercise is that these scenarios provide internally consistent pictures of future possibilities and prove useful for envisaging the implications of any uncertainties

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<sup>1</sup> In this report, uncertainty is defined as a dimension, a factor, or an event that is crucial for the studied topic, not easily controlled and can lead to a variety of qualitatively different outcomes when it occurs.

### Construction of the scenarios

The *Surprise-free scenario* takes into account major changes affecting the industry in the medium term, for example, trends in demand and usage of telecommunications services, and employment. It also looks at more qualitative factors, such as :

- skills and qualifications;
- internal restructuring measures;
- outsourcing;
- organisation of the industry.

Three alternative scenarios - *The disruptive scenario: Information society*, *The steady progress scenario*, *The standstill scenario* - are all based on various combinations of structural variables that have been identified and hierarchically classified. In comparison to the *Surprise-free scenario*, they then examine the implications of the different hypotheses on employment, by exploring whether the impact will be the same (equal), positive or negative for different functions (technical, commercial, support) and types of operators (incumbent, alternative).

In choosing these variables, a lot consideration was given to providing as many contrasting views as possible of potential future trends.

A sketch of the four scenarios was established based on 10 variables classified in three key dimensions:

1. demand and usage;
2. regulation and policy;
3. technological and industrial developments.

Two or three different options for each variable make it possible to develop voluntarily contrasted scenarios (see Table 1).

Table 1: List of variables

Key dimensions	Variables	Options by 2010
<b>Demand and usage</b>	Tendency to increase telecommunications expenses	<ol style="list-style-type: none"> <li>1. High – households and firms increase the relative share of their telecommunications expenses in their budgets</li> <li>2. Low – expenses in telecommunications services of households and firms have a relatively stable share within budgets</li> </ol>
	Acceptance of information and communication technologies (ICT)	<ol style="list-style-type: none"> <li>1. High – there are no social barriers to a wide distribution of ICT in society (firms and individuals)</li> <li>2. Limited – there is some reluctance to a wide distribution of ICT, however limited to specific usage (regarding security and personal data protection for example)</li> </ol>
<b>Regulation and public policy</b>	Changes in labour market regulation	<ol style="list-style-type: none"> <li>1. Far-reaching – labour market regulation undergoes major changes so that operators profit from greater work organisation flexibility</li> <li>2. Smooth – some changes in labour market regulation facilitate the adaptation of new work organisation schemes</li> <li>3. Constrained – operators have limited possibilities of introducing changes to work organisation</li> </ol>
	Policy orientation	<ol style="list-style-type: none"> <li>1. <i>Laissez-faire</i> prevails in the definition of telecommunications policy</li> <li>2. National governments adopt interventionist policy in the ICT sector</li> </ol>
	Transition towards common competition law	<ol style="list-style-type: none"> <li>1. Quick transition – competition law becomes essential component of regulation in the telecommunications industry</li> <li>2. Progressive transition – transition is fully achieved for a few segments of the industry</li> <li>3. Slow – sector-specific regulation remains prevalent in the medium-term</li> </ol>
	European harmonisation	<ol style="list-style-type: none"> <li>1. Country-specific regulation quickly disappears in favour of harmonised policy</li> <li>2. Significant national specificities remain in telecom regulation</li> </ol>
	Universal service (US)	<ol style="list-style-type: none"> <li>1. US is defined as telephone services, regardless of technology</li> <li>2. US is extended to broadband</li> <li>3. US remains restricted to PSTN<sup>1</sup>-based telephony</li> </ol>
<b>Technology and industrial strategy</b>	Unification of networks	<ol style="list-style-type: none"> <li>1. Communications networks become fully unified</li> <li>2. Communications networks remain segmented, but are interconnected</li> <li>3. Organisation of networks remains strongly segmented with some barriers to full interconnection</li> </ol>
	Consolidation process	<ol style="list-style-type: none"> <li>1. New entrants in the market challenge the current organisation of the sector (non-telecommunications companies entering the business, such as computer services companies or retail firms)</li> <li>2. Current operators prevail, but consolidated at European level</li> <li>3. Current operators prevail, and the sector remains structured on a national basis</li> </ol>
	Integration of content	<ol style="list-style-type: none"> <li>1. Open model: multiple suppliers intervene in the sectors</li> <li>2. Partnership model (e.g. Vodafone live): suppliers control the end-user part of the chain but resorting to partners to provide content</li> <li>3. Integrated model: limited number of strongly integrated enterprises</li> </ol>
	Tariffs	<ol style="list-style-type: none"> <li>1. Operators adopt a hand-to-made tariff policy</li> <li>2. Operators use a mix of flat rate and usage-based fees</li> <li>3. Operators fully convert to bundles</li> </ol>

Note: <sup>1</sup> PSTN: Public switched telephony network.

Source: IDATE, 2005

Combining these variables leads to four industry-specific scenarios that are outlined in Table 2.

Table 2: *Industry-specific scenarios*

Categories	Variables	Surprise free scenario	Information society scenario	Steady progress scenario	Standstill scenario
<b>Demand and usage</b>	Tendency to increase telecommunications expenses	Low	Low	High	Low
	Acceptance of ICT	Low	High	High	Low
<b>Regulation and policy</b>	Changes in labour market regulation	Constrained	Far-reaching	Smooth	Constrained
	Policy orientation	Interventionist	<i>Laissez-faire</i>	<i>Laissez-faire</i>	Interventionist
	Transition towards common competition law	Slow	Progressive	Quick	Progressive
	European harmonisation	Country specific regulation	European regulation	European regulation	Country specific regulation
	Universal service	Restricted to telephone services	Extension to broadband	Restricted to telephone services	Restricted to PSTN <sup>1</sup> -based telephony
<b>Technology and industrial strategy</b>	Unification of networks	Strongly segmented networks	Unified network through IP <sup>2</sup>	Segmented but interconnected	Unified network through IP <sup>2</sup>
	Consolidation process	Current operators at national level	New entrants	Current operators at European level	Current operators at European level
	Integration of content	Partnership model	Open model	Limited number of consolidated enterprises	Limited number of consolidated enterprises
	Tariffs	Flat rate and usage - based fees	Flat rate and premium services	Flat rate for different service categories	Flat rate for different service categories

Note: <sup>1</sup> PSTN: Public switched telephony network; <sup>2</sup> IP: Internet Protocol.

Source: IDATE

## Industry-specific scenarios

### *Scenario 1: Surprise-free scenario*

This scenario looks at the current development of the telecoms sector until 2010. The sector continues to grow but at a slower pace in Europe. Expenditure for telecommunications services will not increase significantly. New services like broadband will develop but remain limited to specific usage. National regulation remains important and incumbent operators play a dominant role in the European market as they maintain their competitive advantage. Employment in the sector continues to decline as support functions, such as network maintenance, logistics, etc, are outsourced.

### *Scenario 2: Information society scenario*

In this scenario, telecommunications usage expands rapidly as a result of multiple innovations in services and equipment, widespread broadband coverage and acceptance from customers. Networks are unified through Internet Protocol (IP) and strong pan-European network operators emerge from incumbents and the largest alternative operators. In this rapidly evolving transition, operators have to adapt their workforce as network management is more centralised. Marketing and commercial support becomes key to attracting customers and developing market share.

### *Scenario 3: Steady progress scenario*

Telecommunications services and multimedia content are developing rapidly in this scenario. Expenses in the sector increase exponentially with numerous value-added services emerging. A *laissez-faire* attitude from policymakers and the EU regulator have favoured a quick transition towards a competitive market and the emergence of various types of service providers. Both technicians and commercial staff are required to maintain reliable and efficient networks in order to provide customized telecommunications services. Service quality management is the key to ensuring customer satisfaction.

### *Scenario 4: Standstill scenario*

In this scenario, telecommunications service operators essentially provide basic services (commodities) and highly advanced services to a limited number of customers. The role of these operators is limited to the transportation of data through broadband networks. This scenario leads to a highly concentrated industrial structure with powerful groups able to invest in networks. The EU regulator and policymakers have partly failed to ensure a competitive market which provides diversified and competitive value-added services. In terms of employment, the numbers of technicians increase slightly since good transmission capabilities, network interoperability and international cooperation are required. On the other hand, commercial activity is reduced to basic offerings and can be outsourced or supplied by third parties (service providers).

### **Surprise-free scenario**

The surprise-free scenario is based on average trends driving change in the telecoms sector in recent years; changes as they are perceived by operators on the basis of face-to face-interviews; and analysis of official statements of operators.

The surprise-free scenario adopts the following hypotheses:

#### *Economic and social developments*

- Expenditure for telecommunications services of households and firms increase at the same pace as gross domestic product (GDP). For example, the IDATE Use-IT survey shows that, in France, costs for ICT services should increase by 2-3% a year on average until 2010.
- There is some reluctance for a wide distribution of information and communication technologies (ICT), however limited to specific usage (regarding security and personal data protection for example).

#### *Regulation*

- Operators have limited opportunities to introduce changes in work organisation; labour flexibility remains a concern for employers.
- National governments adopt partial interventionist policy in the ICT sector.
- Sector-specific regulation remains prevalent in the medium-term.
- Significant national specificities determine regulation in the telecoms sector.
- Universal service remains restricted to telephony services.

*Technology and industrial organisation*

- Organisation of networks remains strongly segmented with some barriers to full interconnection.
- Current operators prevail, and the sector maintains a national structure, especially in the larger European countries.
- Partnership model (e.g. Vodafone live) prevails with suppliers still controlling the end-user part of the chain but resorting to partners to provide content.
- Operators use a mix of flat rate and usage-based fees.

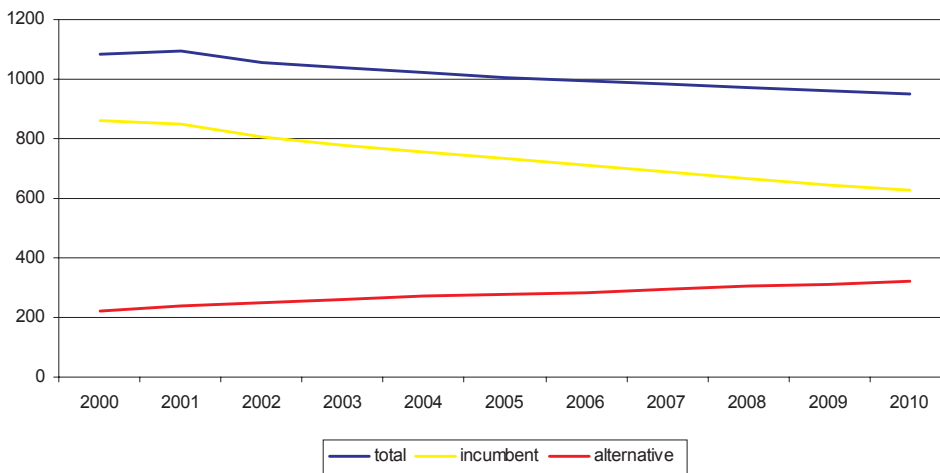
*Key player implications*

- Telecom incumbents maintain a dominant position in the market. They have consolidated their fixed and mobile telephony and Internet activities in order to introduce attractive bundled services mixing telephony, Internet access and multimedia for fixed and mobile devices. As far as the business market is concerned, telecom incumbents are able to propose high speed access services, remote and computer-related services.
- A limited number of alternative telecommunications operators emerge but face fierce competition from telecom incumbents. Alternative carriers are not able to introduce convergent services and thus concentrate on specific services or on particular market segments with a 'low cost' strategy.
- National regulators still have a strong influence on the sector.

In this scenario, employment continues to change in the telecommunications industry until 2010 following the same pattern as in recent years:

- Total employment steadily decreases as incumbent operators continue to streamline their staff while alternative operators only replace existing jobs.
- Technical positions decrease while commercial jobs increase sharply.
- Support functions like logistics and network maintenance will be outsourced. For example, German mobile operator E-Plus outsourced its computer activities including the transfer of 180 employees in November 2004, and Dutch incumbent KPN outsourced key elements of its data centre, end user services and software activities.
- The sector will see few job creations and only in new companies as the industry is based on existing operators and service providers. In particular, companies in the retail sector will develop services based on broadband access and mobile services through virtual network operator agreements with existing operators (e.g. Mobile Virtual Network Operators). In the business segment, equipment manufacturers, integrators or software companies will include traditional telecommunications services in their portfolio. They will offer IP telephony services and manage telecommunications infrastructures of large companies or public administrations.

Figure 1: *Total staff*



Source: *IDATE, 2005*

### Information society scenario

This scenario foresees a rapidly and drastically changing telecommunications industry and is built on the following hypotheses:

#### *Economic and social developments*

- Telecommunications expenses for households and firms are stable; usage, however, develops largely as a result of innovations in services and widespread broadband coverage and acceptance.
- Operators can easily adapt their workforce and find a balance between internal human resources and subcontracting or outsourcing.

#### *Regulation*

- Some laissez faire prevails in regulating the market and sector-specific regulation is progressively dismantled; the only obligation consists in introducing broadband access in the perimeter of universal service.

#### *Technology and industrial organisation*

- Networks are unified through IP and some strong (pan-European) network operators emerge from incumbent operators and the largest alternative operators. Content is key and various service providers work hard to differentiate themselves from their competitors. Tariffs are a mix of flat rates (possibly paid directly to network operators) and payments for premium services.
- This transformation is mainly brought about by a rapid transition to an all IP-network industry. This would quickly affect traditional voice services and transform the economy of incumbent operators, requiring them to adapt their workforce organisation.

New types of operators enter the market, challenging its existing structure.

There is a technological transition to full IP networks, which means that telecommunications access is becoming a commodity again.

- In this scenario, there is a clear separation between network operations. Operators have to ensure the maintenance of networks and appropriate dimensioning so that various kinds of services can flow through IP.
- Technical staff decreases significantly as network management is more and more centralised. They tend to be divided into supervisors and local intervention teams, which can react very rapidly in case of problems; these employees will have a high level of know-how.
- On the other hand, services will be delivered by a large number of service providers (ISPs but also virtual operators) whose main objective will be to develop (not necessarily innovative) new services and to market them to different audiences (mass or niche markets). Marketing and commercial support will be a key to the success of those suppliers. Given the importance of these functions, outsourcing and subcontracting are limited to technical aspects, and the installation of new equipment will be subcontracted whereas its maintenance will be outsourced.

#### *Key player implications*

- National regulators' influence decreases as they are progressively dismantled due to the policymakers' laissez-faire attitude.
- European telecom incumbents prevail in the market, the most important alternative operators, however, have acquired a strong market position. IP generalisation through networks leads to reduced investment and maintenance costs. Thus, alternative operators are able to provide innovative services at minor costs involving lower risks. In addition, network homogenisation will favour outsourcing of processes, thus companies providing these services will enjoy economies of scale.
- Operators focus on building partnerships with several service providers in order to offer high quality services and generate high revenues from these premium services. In particular, they will seek to establish agreements with large software editors (e.g. Microsoft, SAP, Oracle, Siebel, etc) to develop services for business customers, and with media companies or companies in the field of electronic B2C commerce.

Table 3: *Impact on employment*

	<b>Technical</b>	<b>Commercial</b>	<b>Support</b>
Incumbent operator	-- (but high level of qualification)	++	-- (but high level of qualification)
Alternative operators	-- (but high level of qualification)	++	-- (but high level of qualification)
Service providers	- (staff subcontracted)	+	+ (staff outsourced)

#### **The steady progress scenario**

In this scenario, the industry is increasingly structured around service providers.

Regulation evolves towards content control. This scenario requires a quick transition to a common competition law as the neutral role played by infrastructure no longer justifies specific regulation for telecommunications.

The options which could support this scenario are the following:

***Economic and social developments***

- Expenditures in telecommunications increase following the development of numerous value-added services
- Value-added services develop both in the business market and in the consumer market (e.g. videotelephony services).

***Regulation***

- Operators progressively adapt their workforce (without replacing people who retire and proposing changes in qualifications); public policies are mainly oriented towards supporting usage (e-administration). Sectoral regulation is progressively removed for networks with different time schedules according to each country (when competition in network is considered as satisfactory) but maintained or reinforced for content.

***Technology and industrial organisation***

- Networks remain diverse but full interoperability is required; the main differentiator between providers is price (which consists mainly in flat rates for different classes of service).
- Regarding infrastructure, IP replaces existing networks. Service quality management is a key to ensuring customer satisfaction; fully-staffed call centres remain.
- The supply chain is organised around numerous service providers which can focus on specific markets (by customer type or by application/service). Looking at the local loop, service provider uses available and/or best-suited solutions (copper-pair, cable, fibre optics, cellular, fixed wireless, etc). However, service to the customer can be limited as, for example, cellular networks will hardly be compatible with broadband applications.
- Service providers will compare network operators' wholesale offers (quality, price). On the commercial side, service providers will produce their best to gain 'value added' customers, i.e. customers with higher 'Average Revenues per Users' (ARPU). Customer care is a key and particular attention is paid to develop and deliver customised services.

***Key player implication***

- Telecommunications regulation is not justified anymore as basic services are provided.
- Incumbent operators are challenged by new alternative operators but also by new entrants of the multimedia services sector. The latter rely on a partnership strategy involving other players to develop segmented service markets.
- Technical functions will be maintained as operators need skills to build reliable and efficient networks and strong developments would occur for marketing and commercial purpose.

Table 4: *Impact on employment*

	<b>Technical</b>	<b>Commercial</b>	<b>Support</b>
Incumbent operator	+ (mainly through internal developments)	+	+
Alternative operators	+ (mainly through internal developments)	+	+
Service providers	nm	++	+

### **The standstill scenario**

Under this scenario, the telecommunications market remains concentrated around network operations with the supply of basic services. Regarding fixed networks, services are mainly 'Voice on Internet Protocol' (VoIP), broadband Internet access and basic TV broadcasting. Regarding cellular networks, voice services remain the major contributor to revenues while non-voice revenues are mainly made of SMS and MMS. Mobile multimedia services are only niche markets.

Options which could support this scenario are the following:

#### *Economic and social developments*

- Expenses in telecommunications remain stable or decrease and usage is largely oriented towards basic communications needs.
- A vast majority of customers require basic services only while a limited number of customers demand highly advanced services and need a very close (and customised) relationship with the provider.
- Demand is pulled by the business market; private households only use networks for broadband internet and TV, in particular, continues to be broadcasted through cable, satellite and microwave networks.

#### *Technology and industrial organisation*

- Technical support is particularly important as one of the primary objectives of telecommunications operators to ensure good transmission capabilities; there is a need for interoperability and international cooperation is necessary. On the contrary, commercial activity is limited to basic offers and can be outsourced or organised by third parties (service providers).
- Networks remain diverse, requiring just a minimal interoperability; the main differentiator between offers is price, which consists of flat rates for different classes of services.
- Operators will be cautious with regard to investments. New technologies are introduced according to clearly identified usage and demand. In this context, IP is used only for dedicated applications (mainly business applications) and not for all services. As a consequence, the 'industrialisation' of some job positions, such as customer care, is not so important. Furthermore, competition in the local loop will largely depend on infrastructure replication; in particular, telecommunications operators could invest in new fibre optic networks not to be subject to unbundling (as some US operators plan to do). UMTS would be an alternative transportation network, mainly offering new frequencies to saturated GSM networks and primarily used to transmit voice.
- This scenario leads to a highly concentrated industrial structure with powerful groups which can invest heavily in networks. The only way of increasing revenues is to acquire competitors or to invest in new activities in the content or software industry.

#### *Implications for players*

- Major telecom incumbents maintain a strong market position as they control telecommunications networks to provide basic services. The telecommunications service market becomes again a service access market.
- No alternative telecommunications services providers have emerged except through partnerships for a reduced number of highly advanced services. The priority mission of telecommunications operators is to ensure good transmission capabilities for their customers.

- The EU regulator has a limited role focused on basic telecommunications services. Policymakers consider that all European citizens now have access to broadband basic services so further regulatory rules in the sector are not necessary. But local authorities will be submitted to pressure from companies working on their respective territories to have access to new and low priced services to compete against non-European companies. This will lead to public investments in networks and services which will be operated by installators, integrators or software companies.
- In this scenario, pressure on employment for incumbent operators could be limited; they could keep important staff for technical functions as this is the key to their activity. On the other hand, innovation in services or applications is not so crucial and they can outsource a large part of commercial support staff. Alternative operators would have a similar approach while service providers would not develop much. In addition, this will lead to less investment in research and development (R&D), thus a decline in R&D employment. The most important part of R&D will be done by manufacturers outside Europe.

Table 5: *Impact on employment*

	<b>Technical</b>	<b>Commercial</b>	<b>Support</b>
Incumbent operator	+	– (largely outsourced)	=
Alternative operators	+	– (largely outsourced)	=
Service providers	nm	--	--