

Since 1993, T-Mobil has provided a wide variety of satellite telephony services offered by the company INMARSAT. Satellite telephony services means telephony services in which satellites are involved in the transmission process. These services were transferred to another Deutsche Telekom subsidiary in 1999 as part of a portfolio optimization program for T-Mobil.

In early 1999, T-Mobil began marketing Tegaron Traffic, a navigation service that guides drivers around traffic jams and disruptions. T-Mobil has been working for some time, in cooperation with DaimlerChrysler-Services (debis), to develop modern traffic telematics technology. T-Mobil has transferred its interest in Tegaron to Deutsche Telekom AG at the end of 1999.

During 1999 and prior years, T-Mobil provided a variety of radio paging services under the names Cityruf, Scall and Skyper. The number of radio customers has steadily declined, however, primarily from the substitution of mobile telephony for paging services. As a result, T-Mobil sold its radio paging business with effect as of December 31, 1999.

New Technologies and New Standards

Deutsche Telekom expects that the current trend toward higher volumes of mobile data traffic as compared to mobile voice traffic will continue in the future and that mobile communications systems in the future will routinely support video transmission. Today's GSM networks offer maximum transmission rates of 9,600 bits per second. In contrast, GPRS (General Packet Radio Service), which T-Mobil intends to introduce in Germany in the summer of 2000, will provide much higher transmission rates necessary for more advanced data transmission. GPRS is a mobile communications technology that permits faster transmission of voice and data signals than the mobile communications technologies that are widely used at present. T-Mobil also plans to take a leading role in introduction of UMTS (Universal Mobile Telecommunications System), the next generation mobile communications standard. UMTS is a mobile telecommunications technology that is expected to provide significantly higher transmission rates than even GPRS is capable of providing. The Regulatory Authority has announced that it will auction licenses for the provision of UMTS services in Germany in the summer of 2000. There is no guarantee that Deutsche Telekom will obtain a license for UMTS, although Deutsche Telekom intends to pursue one vigorously.

Broadcasting and Broadband Cable

Deutsche Telekom's broadband cable and broadcasting activities include operating Germany's largest cable transmission network, providing services to other cable network operators and program providers and offering broadcasting services to public and private television and radio stations. The broadcasting and broadband cable business area generated revenues of approximately EUR 1.9 billion, or approximately 5.4 percent of the consolidated revenues of Deutsche Telekom, in 1999. These revenues came predominantly from:

- one-time connection fees and monthly charges paid by cable television subscribers served by Deutsche Telekom directly or by private cable operators wholly owned by Deutsche Telekom or in which Deutsche Telekom owns an equity interest;
- fees based on the number of subscribers paid by other private cable operators, including owners of buildings, real estate management companies and local cable companies;
- fees paid by television and radio stations for feeding programming signals into Deutsche Telekom's cable network; and
- broadcasting fees paid by television and radio stations.

Approximately one-fourth of the revenues from this business area come from the provision of broadcasting services.

Broadband Cable

Deutsche Telekom currently owns a substantial majority of the cable network infrastructure in Germany. Deutsche Telekom provides cable transmission services and, since October 1998, also markets digital program packages. Unlike many cable operators in other countries, Deutsche Telekom does not produce content for its cable network.

Penetration and Coverage

In areas where Deutsche Telekom owns and operates a cable transmission network, cable subscribers are served either directly by Deutsche Telekom or by a private cable operator which provides the connection from the end of Deutsche Telekom's transmission line into the cable socket on the customer's premises. In some areas where Deutsche Telekom does not own and operate complete cable systems, local cable companies establish and operate systems from signal reception to the customer.

As of December 31, 1999, 17.8 million households, or approximately 46 percent of the total number of German households, received cable television service from Deutsche Telekom's network. At December 31, 1999, Deutsche Telekom's cable network passed 26.2 million households, or approximately 68 percent of the total number of German households. The following table sets forth the total number of households connected to and passed by Deutsche Telekom's cable network:

	<u>At December 31,</u>		
	<u>1999</u>	<u>1998</u>	<u>1997</u>
	<i>(in millions, except percentages)</i>		
Households connected(1)	17.8	17.7	17.3
Households passed	26.2	25.9	25.5
Total households	38.8	38.7	38.7
Penetration(2)	67.9	68.1	67.6
Coverage(3)	67.7	67.0	66.0

- (1) Includes households connected through private cable operators.
- (2) Households connected expressed as a percentage of households passed.
- (3) Households passed expressed as a percentage of total households.

The following table provides information concerning customer relationships of households connected to Deutsche Telekom's broadband cable network as of December 31, 1999.

	<u>Millions of</u>	<u>Percentage of</u>
	<u>Households</u>	<u>Total</u>
Direct relationship with Deutsche Telekom	5.4	30.3
Subscription to local cable company in which Deutsche Telekom owns an equity interest	1.4	7.9
Subscription to other private cable operator, in particular real estate management company, owner of building	5.7	32.0
Subscription to professional cable companies with more than 2,000 subscribers	5.3	29.8

Cable Television Service Offerings

Deutsche Telekom's cable network transmits analog and digital programming. In 1999, Deutsche Telekom placed significant emphasis on digital programming through its MediaVision marketing platform, which offers a broad range of digital TV and radio programs from which each subscriber can assemble a tailored program package.

Deutsche Telekom is also seeking to expand the transmission capacity of the broadband cable network. In a pilot project started in 1998 with nearly 700,000 households, Deutsche Telekom has begun to expand the capacity of the network to 862 MHz and to implement back channel capability that will allow customers to receive multimedia services as well as an expanded range of digital cable programming.

The Separation of the Cable Business

To begin placing its cable business on a new economic and regulatory footing, Deutsche Telekom transferred the core of its broadband cable business, along with its non-current assets, to its wholly owned subsidiary, Kabel Deutschland GmbH (Kabel Deutschland) at the turn of the year 1998/1999. Kabel Deutschland in turn plans to create nine regional subsidiaries to operate the cable business of Deutsche Telekom as of July 1, 2000. Deutsche Telekom carries Kabel Deutschland on its books at a net value of EUR 3.5 billion at December 31, 1999. This valuation is based on Kabel Deutschland's assets on that date and not upon Kabel Deutschland's

long-term business plan, which assumes higher revenues and improved margins in the future. These are expected to result, in particular, from the offering of new digital services.

In February 2000, Deutsche Telekom reached an agreement to sell a 55 percent equity interest in the regional cable company for the German state of North Rhine-Westphalia to Callahan Associates LLC, a communications development and operating company based in Denver and London. In March 2000, Deutsche Telekom reached a further agreement for the sale of a 65 percent equity interest in the regional company for the German state of Hessen to London-based Klesch & Company Limited, a leading European consortium of investors. Both of these sales are scheduled to close on July 1, 2000, subject to conditions precedent including receipt of approvals from supervisory boards and from relevant authorities. Negotiations for the sale of majority interests in other regional companies are currently in progress, and Deutsche Telekom currently expects to have sold majority interests in these other companies by the end of 2001.

Supply and Service of Terminal Equipment

Through its terminal equipment business area, Deutsche Telekom distributes an extensive range of telecommunications equipment, ranging from individual telephone sets and facsimile machines targeted at private customers to more complex telephone and facsimile terminals, private branch exchanges (PBXs) and complex network systems targeted at business customers. Deutsche Telekom also provides installation and repair services. In 1999, the terminal equipment business area generated revenues of EUR 1.2 billion (3.4 percent of the consolidated revenues of Deutsche Telekom in that year), as compared to EUR 1.4 billion in 1998. Revenues from the sale of mobile handsets are recorded in the mobile telecommunications business area.

The telecommunications equipment sector has been open to full competition since 1990 and is characterized by falling prices, low margins, rapid technological innovation and intense competition. Deutsche Telekom believes, however, that the supply and service of telecommunications equipment is an integral part of being a full service telecommunications provider and contributes to customer loyalty. In September 1999, readers of a well-known magazine in Germany voted Deutsche Telekom the most popular provider of terminal equipment. Financial results in the terminal equipment business area improved significantly in 1999. This was accomplished through the continuation of measures implemented in 1998 and prior years, including internal cost reductions, streamlining of the product portfolio – as Deutsche Telekom discontinued operations in unattractive market segments – and development of new products. Profits before taxes in the terminal equipment group business area in 1999 were EUR 19 million.

In 1999, Deutsche Telekom purchased approximately 87 percent of its terminal equipment, including accessories, from its ten most important national and international suppliers. The total value of all orders was EUR 567 million. Siemens AG, with a share of approximately 48 percent of all orders, is both Deutsche Telekom's most important supplier and its largest competitor in the terminal equipment market.

With most of Deutsche Telekom's terminal equipment, customers have the choice of purchasing or leasing devices. In addition to the existing standard leasing contracts with a fixed three-year or five-year term, Deutsche Telekom introduced a new, more flexible leasing option in 1998. With this option, customers benefit from shorter contract terms and are able to update their telecommunications equipment to keep up with technological progress.

The terminal equipment business area facilitated the development of Deutsche Telekom's leadership position as a provider of ISDN services in Germany. The product lines T-Concept and T-Easy, which were introduced in 1998, were further developed in 1999 through the addition of ISDN-based features. T-Concept PC, which was also introduced in 1999, combines the advantages of a personal computer with the convenience of ISDN-based telephony.

Value-Added Services

Through its value added services business area, Deutsche Telekom provides toll-free phone numbers, provides state-of-the-art call centers, produces telephone directories, provides directory assistance and manages Deutsche Telekom's network of public telephones. This business area is also responsible for providing customers with comprehensive solutions to their telecommunications-based dialogue marketing needs. In 1999, this business area generated revenue of EUR 1.9 billion, or 5.4 percent of the consolidated net revenue of Deutsche Telekom.

The following table provides statistical information relating to value-added services.

	Year ended December 31,			Year ended December 31,	
	1999	1998	1997	1999/1998	1998/1997
Minutes from public telephones (in millions)(1)	2,084	2,664	4,659	(21.8)	(42.8)
Minutes from toll free numbers and information provider Services (in millions)(1)	4,031	1,466	1,267	175	15.7
Minutes from directory inquiries services (in millions)(1)	269	317	511	(15.0)	(38.0)
Total minutes (in millions)(1)	6,384	4,447	6,437	43.6	(30.1)

(1) Estimated.

Deutsche Telekom offers toll-free, shared-cost, and premium rate numbers to its customers. During 1999, the number of calls made to service phone numbers provided by Deutsche Telekom increased by 47.5 percent. Deutsche Telekom believes that this increase was due to price reductions that it introduced during 1999 and to intensified marketing.

Deutsche Telekom is Germany's largest call center operator, with about 9,000 operators at around 100 locations. Call center solutions provide tele-sales and direct marketing services tailored to the needs of particular customers, including billing and collection services. Deutsche Telekom is establishing state-of-the-art call centers at which it can provide comprehensive services. Deutsche Telekom's call center team is able to handle and evaluate up to 100,000 calls per hour.

Deutsche Telekom markets data-based products and solutions to complex communications problems. In addition, Deutsche Telekom provides information services, principally directory information and operator assistance, and provides printed, electronic and online telephone directories through its subsidiary DeTeMedien. Deutsche Telekom's directory assistance service handles up to 1.0 million calls daily, more than any other directory assistance services provider in Germany. Directory assistance has become highly competitive in Germany. In the wake of increasing competition and price adjustments for the service, the number of calls to the service decreased again in 1999, from 406 million in 1998 to around 325 million in 1999. Deutsche Telekom intends to place substantial emphasis on customer service activities for T-Online and T-Mobil and therefore intends to reallocate an increasing number of experienced operators from its directory assistance service to call centers devoted to these subsidiaries.

The publication of telephone directories is another function of the value-added services business area. Since 1998, Deutsche Telekom's subsidiary DeTeMedien has published a directory on CD-ROM, "Telephone book for Germany - Map & Route", with the telephone numbers of more than 33 million telephone subscribers, a digital map of Germany and special routing functions. In the fall of 1999, Deutsche Telekom Medien GmbH (DeTeMedien) released additional CD-ROM based products for the convenience of Deutsche Telekom's customers.

The value-added services business area is also responsible for marketing telephone cards, which consist of chip based prepaid cards for use in Deutsche Telekom's 100,000 card based pay phones as well as chipless calling cards useable all over the world. To increase the competitiveness of its card services and to improve protections against misuse of telephone cards, Deutsche Telekom formed the subsidiary DeTeCardServices GmbH in 1999.

As of December 31, 1999, Deutsche Telekom operated approximately 133,000 payphones, representing a penetration rate of 1.6 payphones for every 1,000 inhabitants. Approximately 70 percent of these payphones are card operated, and the remainder are coin operated. In 1999, Deutsche Telekom continued its efforts to improve performance in the unprofitable area of payphones and other public communications. Important new initiatives in this regard included pilot programs for the introduction of payphones that can accept both telephone cards and coins and preparations for the introduction of "multifunction" terminals, which are to be introduced in 2000. Another important element in Deutsche Telekom's consolidation strategy has been to optimize placement of public telephones, in order to ensure that the public telephone system both remains cost-effective and provides nationwide coverage. Deutsche Telekom continued its site-optimization program in 1999 and plans to continue it in 2000 as well.

Other Services

Deutsche Telekom's "other services" area primarily consists of multimedia activities and, to a lesser extent, ancillary activities performed by Deutsche Telekom. This business area had revenues of EUR 1.1 billion in 1999, representing 3.2 percent of the consolidated revenue of Deutsche Telekom in 1999. See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Results of Operations—Net Revenues—Other Services."

Deutsche Telekom offers nationwide Internet access for residential customers and for small and medium size business customers through its wholly-owned subsidiary T-Online, and also offers multimedia applications and services for business customers under the T-Mart brand name.

T-Online

At December 31, 1999, T-Online had approximately 4.2 million customers. The T-Online service, which is operated, developed and marketed by T-Online International AG, is Europe's largest online-service and Internet-service provider based on number of subscribers. Through T-Online, Deutsche Telekom offers cost-effective, high-performance Internet access primarily to consumers. T-Online is scheduled to become listed on the Neuer Markt segment of the Frankfurt Stock Exchange in April 2000, with Deutsche Telekom retaining a controlling ownership interest.

In addition to Internet access, T-Online offers customers access to a number of value-added online services. The available applications cover a spectrum that includes database research, information and entertainment, and online banking. Based on internal research, Deutsche Telekom believes that the majority of online bank accounts in Germany is managed through T-Online.

T-Online significantly expanded portal site activities in 1999, making T-Online the gateway to a wide range of information and entertainment services. In May 1999, T-Online launched the Shopping Portal, through which customers have access to electronic commerce. Currently about 200 vendors present products and services from various industries on the Shopping Portal. The Fun & Action portal, which was launched on T-Online's homepage in September 1999, is geared primarily toward younger T-Online customers. This portal offers chat rooms, forums, online games and information tailored for specific target groups. Deutsche Telekom believes that these offers make the T-Online home page more attractive to customers and therefore more attractive to advertisers.

Use of T-Online has continued to grow rapidly. In 1999, subscribers connected to the service a total of some 1.5 billion times, or approximately 44 percent more often than in the previous year. In January 1999, the number of subscriber connections in a month exceeded 100 million sessions for the first time. In October 1999, Deutsche Telekom reduced the T-Online eco online charge from three to two pfennigs per minute – charging three pfennigs per minute for network access via Deutsche Telekom – and cancelled the six-pfennigs dial-in charge billed previously. Since November 1, 1999, Deutsche Telekom offers T-Online pro, a cost effective package for frequent users. It includes unlimited standard Internet access with transmission speeds of up to 64 Kbit/s within Germany at a monthly subscription fee of currently DM 19.90 and a telephone connection charge of currently 3 pfennigs per minute if accessed via Deutsche Telekom's network. In 1999, Deutsche Telekom began marketing T-Online speed 50 and T-Online speed 100. Both products use Deutsche Telekom's T-DSL to provide broadband access to the Internet. T-Online speed 50 provides 50 hours of high-speed access to the Internet for a monthly price of DM 99, while T-Online 100 includes 100 hours for a monthly price of DM 149, online charges of three pfennigs per minute for usage in excess of the 50 hours or 100 hours is included in the basic rate. There is no telephone charge.

Deutsche Telekom intends to introduce new online products during 2000. One planned new product consists of unlimited Internet access, including the telephone connection to the Internet, for a flat rate of less than DM 100 per month without additional online or telephone charges. Subject to regulatory approval, Deutsche Telekom also intends to introduce "T-ISDN XXL," a new product that would give ISDN customers unlimited telephone connection to the Internet on Sundays, without usage-based telephone charges, for a monthly fee of DM 5. ISDN@ctive, another planned new product, would give ISDN customers unlimited narrow-band access to the Internet for an additional monthly charge of less than DM 10.

Deutsche Telekom also intends to promote Internet usage in Germany through special promotional offers. Through a special offer that would provide free Internet access for two years to the first 100,000 T-DSL customers that sign up, Deutsche Telekom intends to begin creating a mass market for broadband Internet access. Deutsche Telekom also intends to provide free Internet access and related software and customer service to schools in Germany.

To further its market leadership position in Germany, T-Online entered into an online banking cooperation with comdirect, the online banking subsidiary of Commerzbank AG, in February 2000. As part of this cooperation, T-Online agreed to take a 25 percent equity interest in comdirect, and Commerzbank will take an equity stake in T-Online of approximately 2.1 percent (after giving effect to the listing of T-Online shares that is planned for April 2000 and to the acquisition of Club Internet).

In addition, T-Online took a significant step in the development of its international business in February 2000, when it agreed to acquire a 99.9 percent equity interest in Club Internet, the online service business of the French Lagardère group, in exchange for shares of T-Online representing an equity interest of approximately 5.8 percent in T-Online (after giving effect to the listing of T-Online shares that is planned for April 2000 and to the acquisition of an interest in comdirect).

T-Mart

Under the T-Mart brand name, Deutsche Telekom offers a comprehensive range of multimedia applications and services for business customers, including complete service, consultation, implementation, training and operation. Introduction of the general T-Mart brand in spring 1998 marked a realignment of Deutsche Telekom's activities in this field. Applications for electronic business and electronic commerce in the Internet as well as solutions for presenting a company profile and for handling business processed via the Internet and/or extranet are examples of T-Mart business services.

Based on an agreement signed with Commerce One in January 2000, Deutsche Telekom's goal is to set up an open business-to-business marketplace, i.e., a virtual marketplace for companies with a commercial portal which will simplify and accelerate the companies' transactions when trading goods and services electronically.

Network Security

Recognizing that the commercial success of an Internet services provider depends on network security, Deutsche Telekom offers convenient solutions that provide maximum security for payment transactions and sensitive data transmissions in the Internet. In 1999, Deutsche Telekom bundled these solutions under the umbrella of its 100 percent subsidiary TeleCash Kommunikations-Services GmbH (TeleCash). Secure Pay Services, one of the products offered through TeleCash, supports the use of credit cards complying with the SET (Secure Electronic Transaction) standard, an internationally recognized method of handling credit card transactions in the Internet. In addition, Deutsche Telekom was the first German company to issue chip cards for digital signatures which affixes a legally binding signature to electronic data on the computer. With the product ServerPass, a content provider in the Web can be uniquely identified, thus providing online customers assurance that they are connected with the desired vendor.

In order to strengthen Deutsche Telekom's position in network security, Deutsche Telekom purchased a 34 percent stake in secunet Security Networks GmbH (secunet), a subsidiary of the TÜV Mitte-Gruppe, in September 1999. Services offered by secunet range from security analysis and consulting on the implementation of products to maintenance and customer care. Deutsche Telekom believes that the investment creates opportunities in the international business area. Deutsche Telekom's stake in secunet was reduced to 25 percent as a result of a public offering of shares by secunet in November 1999.

International

Deutsche Telekom is focusing the further internationalization of its business in four strategic areas:

- access services,
- mobile communications,
- data/IP/systems, and
- consumer Internet services.

From 1993 through March 31, 2000, Deutsche Telekom invested a total of EUR 18.9 billion in acquiring equity positions in international investments and joint ventures. Deutsche Telekom continuously evaluates further international investment opportunities in light of strategic objectives, the potential for return on investment and the prospect for playing a controlling role in management. Deutsche Telekom's emphasis is on expansion in Europe, where it is already present in many markets, and on building its presence in the United States. The company may, however, pursue opportunities worldwide. Deutsche Telekom has engaged, and may continue to engage from time to time, in discussions with other parties that may lead to one or more substantial cross-border acquisitions or business combinations.

International Acquisitions in 1999

Deutsche Telekom took important steps in 1999 to implement its internationalization strategy, including the entry into agreements for acquisitions that expand its European mobile telecommunications presence:

- *One 2 One.* In the fall of 1999, Deutsche Telekom entered into an agreement to purchase One 2 One, the fourth largest provider of mobile communications services in the United Kingdom, for a purchase price of GBP 6.9 billion (including the assumption of outstanding shareholder loans and non-recourse debt). As a result, One 2 One has been fully consolidated in Deutsche Telekom's consolidated financial statements since October 1, 1999, the date on which the purchase of One 2 One was completed. At year-end 1999, One 2 One had approximately 4.2 million customers, representing a share of approximately 17 percent of the mobile telecommunications market in the United Kingdom. This total represented a year-on-year increase of 2.3 million customers. In connection with the acquisition, Cable & Wireless indemnified Deutsche Telekom for certain liabilities.

One 2 One commenced operations in 1993 with the world's first digital mobile network based on the GSM 1800 MHz standard and currently uses this network to offer its mobile services. In 2000, One 2 One plans to begin offering high speed mobile data services based on GPRS and WAP-based Internet services. One 2 One's network currently covers approximately 98 percent of the British population (excluding Northern Ireland) and the company has entered into roaming agreements with providers in approximately 79 countries. One 2 One offers a broad range of prepaid and contract mobile services. In November 1999, One 2 One launched a joint venture company with the Virgin group called "Virgin Mobile" to further increase its market share. Virgin Mobile has around 200 retail outlets in which One 2 One can market products and services.

- *max.mobil.* In 1999, Deutsche Telekom, acting through T-Mobil, increased its shareholding in max.mobil., the second largest Austrian mobile telecommunications company, from 25 percent to 91 percent. As a result, max.mobil. has been fully consolidated in Deutsche Telekom's consolidated financial statements since January 1, 1999. Through December 31, 1999, Deutsche Telekom has invested a total of 13.8 billion Austrian schillings in the equity shares of max.mobil. In Austria, max.mobil. provides nationwide mobile telephony service through its digital GSM network, which covered approximately 97 percent of the Austrian population at year end 1999. In addition, max.mobil. has entered the fixed-line telephony business and has also entered the online service business through a joint venture with T-Online. At year-end 1999, max.mobil. had approximately 1.5 million GSM customers, representing a share of approximately 38 percent in the Austrian GSM telecommunications market. In 1999, max.mobil. generated revenues of 11.2 billion Austrian schillings (EUR 811 million), as compared to 4.5 billion Austrian schillings (EUR 329 million) in 1998.
- *Mobile Investments in Eastern Europe.* In October 1999, Deutsche Telekom entered into an agreement with Media One International to purchase Media One's ownership interests in a group of Central European mobile telecommunications companies at a purchase price of US\$ 2 billion. As part of this transaction, Deutsche Telekom in March 2000 acquired:
 - Media One's 22.5 percent ownership interest in Polska Telefonia Cyfrowa ("PTC"), the leading GSM mobile communications provider in Poland, bringing Deutsche Telekom's total ownership interest in PTC to 45 percent.
 - A 49 percent equity stake in Westel 900, the leading digital cellular phone network operator in Hungary, and a 49 percent equity stake in Westel Radiotelefon, the Hungarian analog cellular phone

network operator. The other shareholder in Westel Radiotelefon and Westel 900 is MATÁV, in which Deutsche Telekom jointly with Ameritech Corporation owns a 59.5 percent interest. MATÁV has an option to acquire Deutsche Telekom's interests in the two Westel companies. MATÁV can exercise this option by purchasing the shares owned by Deutsche Telekom in up to three tranches at any time between July 1, 2000 and September 30, 2001. MATÁV has publicly indicated that it intends to exercise this option. Prior to the exercise of the call option, MATÁV has the right to vote Deutsche Telekom's Westel shares pursuant to a proxy granted by Deutsche Telekom.

Deutsche Telekom has reorganized a substantial part of its mobile telephony business under the ownership of a new holding company, T-Mobile International AG.

In addition, to its acquisitions in the mobile sector, Deutsche Telekom made the following acquisitions in 1999 to strengthen its European position in the areas of access services and data/IP/systems:

- *Hrvatske Telekomunikacije.* In October 1999, Deutsche Telekom acquired a 35 percent equity interest in the state-owned Hrvatske Telekomunikacije, the leading full-service telecommunications service provider in Croatia, for a purchase price of US\$ 850 million. Hrvatske Telekomunikacije operates modern, largely digitized fixed-line and mobile networks and is the leading provider of online and data communications services in Croatia. In 1999, Hrvatske Telekomunikacije had revenues of HRK 5.3 billion or EUR 694 million.
- *SIRIS.* In November 1999, Deutsche Telekom acquired 100 percent ownership of SIRIS S.A.S., a leading provider of fixed-line voice telephony and data communication services in France, for a purchase price of EUR 732 million. Measured in terms of revenues, SIRIS was the second largest provider of fixed-line services in France in 1999. Deutsche Telekom believes that SIRIS, as operator of an optical fiber network linking all major business centers in France, has significant strengths in the voice telephony and data communications markets, particularly among business customers. SIRIS had revenues of approximately EUR 112 million in 1999.

Further steps in the internationalization strategy were taken in February 2000, with the announcement by T-Online International AG of plans to acquire Club Internet, one of the leading Internet service providers and web portals in France, and in March 2000 with Deutsche Telekom's agreement with DaimlerChrysler Systems to enter into a strategic engagement that will result in Deutsche Telekom's acquisition of a 51 percent interest in debis Systemhaus, a leading European systems solutions company that has a global data network.

Prior International Acquisitions and Joint Ventures

The international acquisitions completed or agreed to in 1999 complemented Deutsche Telekom's pre-existing portfolio of investments in telecommunications companies outside Germany.

MATÁV. Deutsche Telekom and Ameritech jointly hold a 59.5 percent equity interest in MATÁV. This interest is held through MagyarCom Holding GmbH ("MagyarCom"), a holding company in which Deutsche Telekom and Ameritech each directly or indirectly holds 50 percent. In 1999, MATÁV had consolidated revenues of HUF 385 billion (EUR 1.5 billion), which represented an increase in euro revenues of 14.2 percent over 1998.

In 1999, MATÁV continued to expand and modernize Hungary's telecommunications infrastructure. By the end of 1999, 79.0 percent of MATÁV's network had been digitized, up from 75.7 percent at the end of 1998. In the area of mobile communications, Westel 900, a fully consolidated subsidiary of MATÁV that is owned in part by Deutsche Telekom, held an approximate 55 percent share of the GSM market in Hungary, with approximately 842,000 customers at year-end 1999, up from approximately 547,000 at year-end 1998.

Deutsche Telekom and Ameritech initially acquired their interests in MATÁV from the Hungarian state. MATÁV currently has 1,037,281,600 common shares and a single Series B share outstanding, which is held by the Hungarian Republic through the Hungarian Ministry for Transport, Telecommunications and Water Management.

Ameritech has an option to put to Deutsche Telekom up to 100 percent of the MagyarCom shares owned by Ameritech. Exercise of this option in full would increase Deutsche Telekom's effective interest in MATÁV

from 29.8 percent to 59.5 percent. The exercise price of the put option is the fair market value of the corresponding MATAV shares plus a US\$ 60 million control premium. Had the option been exercised in full on December 31, 1999, the exercise price would have been approximately EUR 2.3 billion. See note 32 to the consolidated financial statements. Deutsche Telekom and Ameritech manage and operate MagyarCom jointly. In the event of disagreement, Deutsche Telekom has a deciding vote, except with respect to certain fundamental matters. Although MagyarCom has the power to appoint a majority of MATAV's board of directors, the Republic of Hungary retains significant influence over MATAV's activities as the holder of the Series B share, the regulator of the Hungarian telecommunications sector and MATAV's largest customer. The Series B share gives the Hungarian state certain special rights in the election of MATAV's boards and with respect to certain decisions taken at shareholders' meetings. The MagyarCom shares held by Deutsche Telekom and Ameritech and the MATAV shares held by MagyarCom are subject to substantial transfer restrictions.

MATAV's monopoly in the Hungarian market for long-distance and international telecommunications services will expire at the end of 2001. MATAV has expressed a willingness to consider an earlier cessation of its monopoly rights.

Mobile Operations in Eastern Europe and Russia. Deutsche Telekom is well positioned in the markets of Eastern Europe and Russia as a result of investments in mobile telecommunications companies there. For example, in Poland, Deutsche Telekom's affiliate, Polska Telefonia Cyfrowa, achieved a share of over 44.7 percent of the mobile communications market at year-end 1999, with approximately 1.75 million customers. PTC's revenue grew by 48 percent to EUR 614 million in 1999. Deutsche Telekom has held a 22.5 percent stake in PTC since December 1995 and acquired an additional 22.5 percent stake in March 2000. An arbitral proceeding is currently pending which, if resolved adversely to Deutsche Telekom, could have a material adverse effect on Deutsche Telekom's interest in PTC. For further information on this proceeding, see "Legal Proceedings".

Deutsche Telekom has an approximate 84.6 percent interest in a company called Cmobil, which in turn owns an approximate 41 percent stake in the Czech mobile communications network operator RADIOMOBIL. CMobil is in the process of exercising an option which allows it to increase its stake to over 60 percent. This affiliate had revenues of over EUR 297 million in 1999 and increased its customer base to 373,000 by the end of that year.

Deutsche Telekom also holds an approximate 44 percent direct equity interest in CSJC Mobile TeleSystems gAG ("MTS"), a Russian mobile telephone company. Under a series of agreements with Sistema, the holder of most of the remainder of the shares in MTS, Deutsche Telekom and Sistema have together contributed an approximate 10 percent interest in MTS to a joint venture and agreed to coordinate their votes on important matters with respect to this interest. MTS had approximately 386,000 customers and generated EUR 338 million at year-end 1999.

In addition, Deutsche Telekom holds smaller investments in several other Eastern European other mobile telecommunications companies.

WIND. In November 1997, Deutsche Telekom, France Telecom and Enel formed the consortium "WIND" in Italy. WIND obtained a fixed-line telephony license in February 1998 and the third Italian mobile license (dual-band GSM 900/1800) in June 1998. Fixed-line and mobile operations commenced on March 1, 1999. Each of Deutsche Telekom and France Telecom owns 24.5 percent of WIND, with Enel owning the remaining 51 percent. Deutsche Telekom's investment in WIND through December 31, 1999 was approximately EUR 222 million. Deutsche Telekom, France Telecom and Enel have been engaged in litigation concerning their shareholding relationships in WIND since mid-1999. For a description of the litigation, see "Legal Proceedings".

MetroHoldings. Deutsche Telekom, France Telecom and Energis plc, a British operator specializing in corporate telecommunications, plan to establish metropolitan area networks in Great Britain through MetroHoldings Ltd. ("MetroHoldings"), a company in which Deutsche Telekom and France Telecom, indirectly through DTFT Ltd., each owns a 25 percent interest and Energis owns a 50 percent interest. DTFT Ltd. is owned on a 50/50 basis by Deutsche Telekom and France Telecom. As of December 31, 1999, Deutsche Telekom had invested approximately EUR 1.5 million in MetroHoldings through DTFT Ltd. MetroHoldings has built new local metropolitan area telecommunication networks in London, Birmingham and Manchester,

and is currently working on completing additional networks in Leeds and Bristol, thereby creating direct links with business customers.

Multilink. In April 1998, Deutsche Telekom and France Telecom entered into a 50/50 joint venture agreement to offer fixed-line telephony services within Switzerland through Multilink SA ("Multilink"). Deutsche Telekom has invested approximately EUR 10.4 million in the capital of Multilink. On October 22, 1998, Multilink launched its fixed-line telephony services. The company is controlled equally between Deutsche Telekom and France Telecom. Transfers of shares by either shareholder are subject to a right of first refusal on the part of the other shareholder.

Asian Investments. Deutsche Telekom owns a 25 percent stake in Satelindo, an Indonesian mobile and international telecommunications operator, which was initially acquired by T-Mobile in 1995 for total consideration of US\$ 676 million. In Malaysia, Deutsche Telekom owns an approximate 21 percent interest in the Malaysian telecommunications provider Technology Resources Industries Bhd. ("TRI"). The total purchase price was approximately 1.5 billion ringgit (EUR 460 million at the date of purchase). In the Philippines, Deutsche Telekom owns a 10 percent interest in Isla Communications Co., Inc. ("Islacom"), a Philippine telecommunications company, and a 40 percent interest in Asiacom Philippines, Inc., the majority shareholder of Islacom, which were acquired for an aggregate purchase price of approximately US\$ 243 million. As a consequence of the Asian economic crisis, Deutsche Telekom has written down the total book value of these investments to EUR 96.5 million.

Disengagement from France Telecom and Sprint

Through mid-1999, Deutsche Telekom's principal international engagement was an alliance with France Telecom that involved participation, through a 50/50 joint venture, in the Global One joint venture with Sprint, co-investment in several other European joint ventures, and a cooperation program in various areas of research and development. Because of disputes between Deutsche Telekom and France Telecom that in mid-1999 grew out of Deutsche Telekom's formerly proposed business combination with Telecom Italia, and because of MCI WorldCom's planned acquisition of Sprint announced in October 1999, Deutsche Telekom, France Telecom and Sprint have been in the process of disengaging from their alliance relationships. The most significant measures taken in this regard have been:

- The conclusion of a series of agreements in January 2000 among Deutsche Telekom, France Telecom, Sprint and other related parties pursuant to which:
 - Sprint sold to the joint venture between Deutsche Telekom and France Telecom its interest in the Global One alliance for US\$ 1.1 billion and Sprint was repaid by Global One approximately US\$ 276 million in loans owed to Sprint;
 - Sprint agreed to a number of amendments to the agreements governing the investments of Deutsche Telekom and France Telecom in Sprint; and
 - Deutsche Telekom and France Telecom agreed to vote their Sprint shares in favor of MCI WorldCom's planned acquisition of Sprint, subject to certain conditions; and
- The conclusion of a series of agreements in January 2000 among Deutsche Telekom, France Telecom and other related parties pursuant to which Deutsche Telekom agreed to sell to France Telecom its interest in their 50/50 joint venture relating to Global One for US\$ 2.8 billion and for the repayment of approximately US\$ 188.5 million in loans.

In connection with these transactions, Deutsche Telekom publicly disclosed that it does not intend to remain as a long-term shareholder of Sprint or, if the MCI WorldCom acquisition of Sprint is consummated, of MCI WorldCom. Deutsche Telekom expects to dispose of its shares in Sprint (or the shares of MCI WorldCom it would receive in an MCI WorldCom acquisition of Sprint) in an orderly manner in view of market conditions and subject to applicable legal and contractual restrictions. Deutsche Telekom cannot guarantee whether or, in the case of Sprint, at what price or prices, a sale of its interests in Sprint or MCI WorldCom will be consummated.

Deutsche Telekom had been using Global One to offer its customers in the international market – such as companies and operators of other telecommunications networks and services – a range of telecommunications

services. In connection with the agreements relating to separate sales by Deutsche Telekom and Sprint of their interests in Global One, Deutsche Telekom has been released from certain non-compete and exclusivity provisions of the Global One alliance, but Deutsche Telekom is prohibited from offering services in competition with certain identified customer contracts of Sprint and France Telecom until one year after the closing of the relevant sale. Transition arrangements agreed upon in connection with the transactions are designed to assure continuity of service for two years to Deutsche Telekom's Global One customers and to prohibit Sprint and France Telecom from offering services in competition with certain identified customer contracts of Deutsche Telekom until one year after the closing of the relevant sale. To offer its customers international communications solutions independent of Global One, Deutsche Telekom plans to expand its international network through internal growth, cooperative arrangements and acquisitions. Disengagement from the Global One alliance gives Deutsche Telekom the freedom to pursue opportunities that were formerly closed to it under its contractual arrangements.

The alliance with France Telecom was supported by a cross-shareholding established in late 1998, in which Deutsche Telekom and France Telecom each purchased 2 percent of the other's issued share capital. Both companies agreed that they would not sell these shares until after December 31, 2001, except under limited circumstances or as otherwise agreed. France Telecom entered into a separate agreement with Kreditanstalt für Wiederaufbau (KfW) pursuant to which France Telecom agreed that it would not dispose of the Deutsche Telekom shares it purchased from KfW until after December 31, 1999, and that it would be able to sell those shares between January 1, 2000 and June 30, 2001 only under certain circumstances (depending in part on whether KfW has notified France Telecom at the time of any proposed sale by France Telecom that KfW intends to sell Deutsche Telekom shares).

Developments in the disengagement of the alliance may affect other joint undertakings of France Telecom and Deutsche Telekom, such as WIND, MetroHoldings and Multilink.

For a description of litigation relating to the disputes among Deutsche Telekom, France Telecom, Enel and WIND, please refer to "Legal Proceedings".

Network Infrastructure

Deutsche Telekom has invested over EUR 78.7 billion in its telecommunications and cable networks since 1990, including EUR 2 billion in 1999. The total investments made include the installation of a new network in eastern Germany after German reunification in 1990. As a result, Deutsche Telekom's fixed-line network has evolved into one of the most technologically advanced major networks in the world, with fully digitalized national and international switching and 100 percent digital transmission. Deutsche Telekom has introduced asynchronous transfer mode (ATM) technology and wavelength division multiplexing (WDM) technology on the basis of its advanced network. Wavelength division multiplexing is a technology that makes it possible to increase the transmission capacity of an existing fiber optic cable. Compared to 1998, Deutsche Telekom's investments in network infrastructure remained almost at the same level in 1999, as a decrease in investments in the access network and further optimization of network infrastructure procurement resulting mainly from market price movements was compensated by increasing investments in Deutsche Telekom's Internet platform, the roll-out of T-DSL and the extension of the transmission network. In addition, with digitalization, reorganization and increased productivity, the number of employees of Deutsche Telekom engaged in network infrastructure development, maintenance and operation had decreased to less than 50,000 at year end 1999 from over 65,500 at year end 1996.

In the case of Deutsche Telekom's mobile network, unlike its fixed-line network, significant new investments in infrastructure will be needed to improve quality of service while keeping up with demand in a fast growing market. Deutsche Telekom has budgeted total investments of approximately EUR 0.8 billion for improvements to its mobile communications network. In recent years, Deutsche Telekom has increased the number of employees active in mobile network planning, operations and maintenance.

Fixed-Line Telecommunications Network

Domestic Fixed-Line Telecommunications Network. Deutsche Telekom's domestic public switched telephone network and ISDN network consist of approximately 5,200 local networks connected by a long-distance transmission network.

Local Networks. At December 31, 1999, Deutsche Telekom's domestic network consisted of 34.5 million standard telephone lines in service and 13.3 million ISDN voice and data channels and reached virtually all German homes and German businesses.

Deutsche Telekom's domestic network has demonstrated a high degree of reliability, as shown by the following table:

	Year ended December 31,		
	1999	1998	1997
Blocking rate on the public switched telephone network/ISDN(1)	1.4%	1.1%	0.9%

(32)Blocked calls as a percentage of all calls made on the public switched telephone/ISDN network during the periods indicated.

Deutsche Telekom believes that the increase in blocked calls since 1997 has resulted primarily from atypical traffic generated by competitors that do not have their own networks and have relatively few points of interconnection. See "Regulation—Special Network Access and Interconnection—Fixed-Fixed Interconnection". The network's reliability is enhanced by efficient customer service. See "—Sales and Service".

Transmission Network

As of December 31, 1999, the transmission network linking Deutsche Telekom's local networks consisted of approximately 162,500 kilometers of fiber optic cable.

As of December 31, 1999, more than 70 percent of Deutsche Telekom's national transmission network consisted of Synchronous Digital Hierarchy (SDH) transmission links. SDH, which is a transmission standard for networks that use fiber optics, allows for a simpler and more easily managed network with enhanced reliability. Deutsche Telekom is developing its SDH networks further by installing additional high capacity SDH equipment in combination with WDM systems within its national transmission network.

In 1998, Deutsche Telekom put its High Performance Net, a nationwide, flexible, ultra-high-quality transport network, into operation. The network links Germany's economic centers, such as Berlin, Frankfurt, Munich, Düsseldorf and Hamburg, within optical fiber rings totaling over 20,000 kilometers in length and providing transmission rates of 2.5 Gbit/s.

International Network

Deutsche Telekom's international transmission infrastructure consists of both cable and satellite transmission systems, which links Deutsche Telekom's national network directly to approximately 300 other telecommunications service providers worldwide.

Deutsche Telekom is an investor in around 75 fiber-optic submarine cables worldwide. In addition to investments in a number of smaller cables, Deutsche Telekom has substantial investments in the major submarine cables AC-1, TAT-10, TAT-12/13 and UK-G6 and is the largest investor in the SEA-ME-WE3 cable, one of the longest submarine cables systems in the world, which went into operation in August 1999. Deutsche Telekom expects to invest approximately US\$ 120 million in the planned TAT-14 submarine cable, including amounts already invested. Deutsche Telekom expects that the TAT-14 cable will be operational by the end of 2000 with a total transmission capacity of 1280 Gbit/sec.

In October 1998, Deutsche Telekom launched operations of the Trans-Asia-Europe optical fiber cable system (TAE), the first direct optical fiber link between Frankfurt/Main and Shanghai. With 13 countries connected and a total length of 22,000 kilometers, TAE is one of the world's longest terrestrial cable systems.

Deutsche Telekom plans to serve its international customers by seamlessly linking its transport network for international traffic in Germany and its 38 national City-networks with a worldwide platform owned by Deutsche Telekom. The European cities of Paris, London, Amsterdam and Brussels were already connected to

Deutsche Telekom's high-performance network in 1999, and Geneva, Milan and Zurich are to follow. Deutsche Telekom plans to link with this network some 40 points of presence, in 16 countries, by late 2000, and to expand to further cities in 2001. ATM, IP and voice technology will be made available at all of these locations. Deutsche Telekom plans eventually to link in a single network over 93 points of presence in around 40 countries.

Data Networks

Leased Line and Data Transmission Networks

Deutsche Telekom operates leased line networks on a managed and unmanaged basis. Deutsche Telekom also operates a number of switched digital networks used principally for the provision of packet switched, frame relay and ATM data transmission services. In addition, Deutsche Telekom operates an Internet platform.

Deutsche Telekom operates a number of platforms in connection with the provision of leased line services. Deutsche Telekom's data networks support a variety of transmission technologies. Deutsche Telekom's Datex-P data transmission service, which is based on the X.25 protocol, provides transmission rates of up to 1.5 Mbits/sec, while the FrameLink Plus service, which is based on frame relay technology, provides transmission rates of up to 2 Mbits/sec (high capacity). Deutsche Telekom's T-ATM network, which is based on Asynchronous Transfer Mode technology, permits transmission of data at rates of up to 155 Mbits/sec. See—"Data Communications and Information and Communications Systems"

Internet Network

The extremely rapid growth of Internet communications has created enormous challenges for the international telecommunications industry. In 1999, Deutsche Telekom continued to expand its telecommunications networks for transport of national and international Internet traffic. From the end of 1998 to the end of 1999, Deutsche Telekom increased the number of dial-in ports in its national platform by a total of 100 percent. A dial-in port is an interface that connects the telephone network to the Internet and that can be reached by means of a specific telephone number. The transmission rate in the core network was increased in 1999 from 155 Mbit/s to 622 Mbit/s, which is equivalent to about 40,000 "DIN-A4" (i.e., letter size) pages of text per second. As a result, Deutsche Telekom's IP backbone is already one of the world's most powerful Internet platforms.

Deutsche Telekom also made preparations in 1999 for a further increase of transmission capacity in core areas to as much as 2.5 Gbit/s. As in the case of the expansion of core network capacity in 1999, this expansion will involve use of state-of-the-art wave division multiplexing technology. Wave division multiplexing systems permit the multiplication of the potential transmission capacity in optical fiber. In early 2000, Deutsche Telekom began to build up a completely new optical transport network across Germany which can be adjusted to the forecasted high capacity needs as required.

In 1999, Deutsche Telekom expanded its transmission capacity up to 1.05 Gbit/s to the United States, which plays a particularly important role in Internet communications. Deutsche Telekom accomplished this result using its own capacities in submarine cable systems. In 2000, Deutsche Telekom plans to add more than 3.5 Gbit/s of transmission capacity to the United States.

ADSL

In 1999, Deutsche Telekom continued the ambitious ADSL technology (Asymmetrical Digital Subscriber Line) expansion program initiated in 1998. ADSL permits transmission of data through the copper wire pairs that link customers to Deutsche Telekom's networks at faster rates than were previously possible: up to 6 Mbit/s from the network to the customer and up to 768 kbit/s from the customer to the network. ADSL thus makes fast Internet access possible.

Deutsche Telekom made ADSL technology under the brand name "T-DSL" available to its customers for the first time in 1999 and plans to expand the number of local networks where T-DSL is available to more than 200 during 2000. Deutsche Telekom only markets T-DSL together with T-ISDN. Deutsche Telekom currently plans to have introduced T-DSL throughout most of Germany by the end of 2003.

Mobile Telecommunications Network

Deutsche Telekom operates two national mobile telephony networks. At December 31, 1999, Deutsche Telekom's digital mobile network, T-D1, consisted of around 25,000 base stations, 581 base station controllers and 46 switches and was capable of reaching an area comprising 96 percent of Germany and 99 percent of the population of Germany. The T-D1 network operates in the frequency band ranging from 890 to 915 MHz and from 935 to 960 MHz. Deutsche Telekom's analog mobile network, T-C-Tel, consisted of 2,120 base stations and 32 switches. Deutsche Telekom has decided to take its analog mobile network out of service at the end of 2000.

Due to the increasing popularity of digital mobile communications in Germany, Deutsche Telekom expects to spend approximately EUR 0.8 billion on the expansion and improvement of its German digital mobile network during 2000.

Deutsche Telekom has conducted significant research and development efforts relating to UMTS (Universal Mobile Telecommunications System) technology and expects to be in a position technologically to offer mobile telephony based on UMTS if and when these services become generally available on a commercial basis.

Cable Network

Deutsche Telekom's cable network is a dedicated coaxial cable based broadband network currently used solely for the transmission of television and radio signals. Deutsche Telekom estimates that an investment of approximately EUR 2 billion would be required to upgrade the network from 450 MHz to 862 MHz and to make the cable network bi-directional from the head end, where program signals are fed into the cable network, to the customer connection point for 70 percent of its customers, i.e., capable of being used to transmit more TV channels, transmit telephone calls and provide multimedia services and fast Internet traffic to those customers. Deutsche Telekom also believes that an additional amount of approximately EUR 1.5 billion would be required to upgrade the network from the customer connection point to the cable socket on the customers' premises. The cable network is made up of 1,100 local networks. Signals are fed into the network from satellite, terrestrial radio stations and, to a very limited extent, trunk lines to content providers.

Broadcast Network

Deutsche Telekom operates a terrestrial broadcasting network with over 7,000 radio and television transmitters in over 3,000 locations. Deutsche Telekom does not provide content for its broadcast networks.

Information Technology

Deutsche Telekom's subsidiaries DeTeCSM and T-Nova work closely together to promote the continuous development of Deutsche Telekom's information technology (IT) systems and applications. On the basis of its IT competencies, Deutsche Telekom increasingly provides comprehensive solutions to its customers that combine telecommunications and IT expertise.

DeTeCSM, a wholly-owned subsidiary of Deutsche Telekom, has responsibility for operating and expanding Deutsche Telekom's IT infrastructure and applications. DeTeCSM offers a wide range of IT services, including operation of computer centers, client-server and workstation systems and desktop, call center, web and office communication services. Deutsche Telekom consolidated its IT area in 1998 by combining its existing information technology subsidiary Deutsche Telekom Computer Service Magdeburg GmbH with its five other service and computer centers and with other information technology structures within the Deutsche Telekom group to form DeTeCSM. Deutsche Telekom continued this consolidation process in 1999 by bundling the remainder of its IT organization into DeTeCSM. DeTeCSM is responsible for supporting T-Online and T-Mart systems engineering and, since September 1999, for performing important tasks in the IT area for T-Mobil.

T-Nova commenced business operations as a service provider within the Deutsche Telekom group on July 1, 1999. T-Nova is responsible for developing products, services and networks, as well as IT systems, for the support of business processes within the Deutsche Telekom group.

Deutsche Telekom intends to intensify the use of the expertise of DeTeCSM and T-Nova in order to strengthen Deutsche Telekom's position in the growing IT market and to assist in the development of Deutsche Telekom into a full-service telematics service provider.

Sales and Service

During 1999, Deutsche Telekom introduced further measures to attract and retain customers and continued its program to focus on the customer. All of these activities are aimed at optimizing customer service and fostering long-term customer loyalty in a highly competitive market.

Since 1998, the residential customer and business customer branch offices in each geographic region have been bundled under a common management for that region. Deutsche Telekom believes that this arrangement of its branch offices improves customer service and overall operations and enhances mobility in the market.

Deutsche Telekom has hired and maintains close contact with a number of special sales experts to ensure that its sales staff is always able to give its customers top-quality, state-of-the-art advice, even regarding very complex telecommunications requirements-including, for example, highly sophisticated products in the areas of mobile communications, data communications and multimedia. In 1999, Deutsche Telekom created special sales departments, each with its own specific expertise, that will support Deutsche Telekom's sales staff as necessary in difficult sales-related tasks.

Sales Channels

A key element in the optimization of Deutsche Telekom's sales organization in 1999 was the new focus on the international sales force. Deutsche Telekom has combined all of its sales support for international projects under its subsidiary DeTeSystem, thereby further improving the processes involved in international bidding and operations.

Deutsche Telekom operated 563 "T-Punkt" shops throughout Germany at end of 1999. These are one of Deutsche Telekom's most important sales channels for serving its residential customers and more and more small business customers. At every T-Punkt, customers can choose from Deutsche Telekom's extensive range of products, including the type of telephone connection and tariff category, telephones, fax machines and T-Mobil's mobile communications products. During 1999, Deutsche Telekom began implementing a site-optimization program for its T-Punkt shops to improve their cost-effectiveness and increasingly focused the activities of the T-Punkt shops in the strategically key areas of T-ISDN, T-D1 and T-Online. Deutsche Telekom also made preparations for the introduction of T-Punkt Business shops, which are oriented in particular toward mid-sized business customers. The first T-Punkt Business shop opened in January 2000.

Deutsche Telekom also has a broad range of sales partners under contract with a total of some 10,000 sales outlets at the end of 1999. These sales partners sell products and services of Deutsche Telekom, in addition to their own lines of products and services.

In 1999, Deutsche Telekom expanded upon the "customer segment management" department that was formed in 1998, through which Deutsche Telekom seeks to build stronger connections between customers and individual areas of Deutsche Telekom's business. This measure is intended to ensure product development that is focused on the needs of particular customers and classes of customers, particularly in the areas of multimedia, mobile communications and data communications.

Telemarketing is one of Deutsche Telekom's main sales channels. Using Deutsche Telekom's telemarketing hotline, customers can obtain information and order nearly all of Deutsche Telekom's products and services 24 hours a day, seven days a week.

Mail-order business has become an important part of Deutsche Telekom's sales operations. Customers can order by phone, through T-Online, by fax or by mail from Deutsche Telekom's semiannually published catalogue, which provides comprehensive information regarding new products and services. Deutsche Telekom intensified its on-line marketing efforts in particular during 1999.

Deutsche Telekom has increased sales activities in the Internet to a considerable degree. Deutsche Telekom's homepage provides customers with information about company products and services 24 hours a day. Customers may order articles directly from the online catalogue. Special online promotions as well as constant updates on the offers on the start pages round off Internet sales activities. Since October 1999, T-Versand has operated an Internet Call Center, which supports online sales.

T-Service

"T-Service", with its staff of over 32,000, is responsible for assembly, service and repair of the lines and terminal equipment of Deutsche Telekom's customers. As a result of continuous improvements in employee training and in IT systems, Deutsche Telekom is now able to resolve one out of every three service problems without having to dispatch field-office personnel. Since the beginning of 1997, Deutsche Telekom has cut the average time for resolving service problems nearly in half—from about 20 hours to 11 hours. Moreover, in 1999, Deutsche Telekom succeeded in installing new telephone lines when promised in over 99 percent of all cases.

Since mid-1999, Deutsche Telekom processes orders automatically, which results in greater efficiency. In addition, alternative service methods such as remote configuration and remote maintenance were enhanced in 1999.

According to surveys conducted by Deutsche Telekom, business customers' satisfaction with Deutsche Telekom's delivery times for high-speed products and services and with the quality of Deutsche Telekom's efforts to resolve service problems has improved considerably.

Telekom Direkt – Integrated Complaint Management

The ongoing combination of Deutsche Telekom's organizational units for residential customers and business customers makes it possible for Deutsche Telekom to conduct its "Telekom Direkt" complaints management service more efficiently, by allowing Deutsche Telekom to handle customer complaints in an integrated manner. Telekom Direkt analyzes complaints from sales, service and customer-billing areas in order to identify and eliminate problems as quickly as possible. The complaints management units have been serving customers since the end of 1996.

TelekomForum e.V.

Deutsche Telekom continued and sought to intensify its dialogue with its business customers in 1999. One of Deutsche Telekom's most effective resources in this regard is the TelekomForum, a business-customer advisory board founded in 1996. Currently, its members include about 300 of the largest German companies. In the TelekomForum working groups, customers and product managers develop ideas for the improvement of Deutsche Telekom's portfolio of products and services. In this way, some of Deutsche Telekom's customers have direct input into the development and innovation processes at Deutsche Telekom.

Telecommunications Solutions Tailored to Particular Customer Groups

In 1999, as in prior years, Deutsche Telekom's sales marketing organization devised new combinations of products and services aimed at particular customer groups. These solutions consist of complete systems and packages, rather than single products. Deutsche Telekom also continued the "Partnership Management" program that was introduced in 1998, through which it provides information and support services for management consultants, engineering offices, telecommunications and IT consultants and systems houses. Deutsche Telekom also offers telecommunication consulting services to business customers. For each customer using these services, Deutsche Telekom seeks to develop and implement a telecommunications solution that is specially tailored to the customer's corporate goals.

Telekom Seminars

Since 1993, Deutsche Telekom has been offering its business customers seminars designed to help them get the most out of state-of-the-art telecommunications products. Telecommunications technologies and services are developing very rapidly, and these seminars have become more and more popular. The number of participants in these seminars in 1999 was 345, unchanged from 1998, while the number of these seminars increased nearly 20 percent from 1998 to 1999.

Research and Development

Deutsche Telekom views research and development as an important tool for competing effectively and has committed significant resources to research and development activities. At December 31, 1999, Deutsche

Telekom had approximately 4.400 employees (excluding MATAV, One 2 One and max.mobil.) dedicated to research and development activities. Deutsche Telekom's expenditures on research and development amounted to approximately EUR 0.7 billion in 1999 (excluding MATAV, One 2 One and max.mobil.), as compared to approximately EUR 665 million in 1998 and EUR 614 million in 1997. Approximately 40 percent of Deutsche Telekom's research and development expenditures in 1999 were devoted to software development. Deutsche Telekom has a variety of patents and licenses. No single patent or license is material to its business.

Research and development activities focus on the relevant growth areas for Deutsche Telekom. For online services, Deutsche Telekom develops specific portals for customer groups and is represented in key international consortia which are expected to have an influence on the future form of the Internet. In the networks area, Deutsche Telekom offers improved access to information and services through new technologies, such as T-DSL, for example. Deutsche Telekom's research and development activities also support the development of comprehensive telematics solutions by integrating the results of different projects. In the area of mobile communications, Deutsche Telekom has been active in development of the standards for new, future-oriented broadband mobile systems (UMTS). Deutsche Telekom has been a key member of consortia that have developed technologies and applications that serve as standards, including GSM, ISDN, and ATM. Deutsche Telekom's focus on the market is reflected not only in product development but also in mid- to long-term projects such as the optimization of user-friendly speech applications and increasing the carrying capacity of existing network infrastructures.

T-Nova Deutsche Telekom Innovationsgesellschaft mbH launched its activities in July 1999. Deutsche Telekom transferred its technology center, five software development centers and the operations of its development unit T-Berkom to T-Nova and handed the direction of its subsidiary Multimedia Software GmbH Dresden to T-Nova. T-Nova offers group-wide innovations and solutions from a single source – from research and development relating to products, services, networks and software to the support of market introduction as well as operations. Especially important is the integrative development of related information systems that operate and support the group's activities.

Through its corporate venture capital subsidiary T-Telematik Venture Holding GmbH ("T-Venture"), Deutsche Telekom provides capital for seed, early stage and first expansion investments both directly and through venture capital funds, to promising companies involved in the fields of information and communications technologies, including software technology. In April 1999, Deutsche Telekom increased the financing of T-Venture by EUR 102 million to a total of EUR 153 million. In this regard Deutsche Telekom has stepped up its commitment within the venture capital market. In 1999, T-Venture invested approximately EUR 72 million in a number of existing shareholdings and in 22 new shareholdings. In October 1999 T-Venture expanded its venture capital activities in the information technology area in the United States with the formation of T-Venture of America, Inc.

Deutsche Telekom's ventures in Southeast Asia and other foreign regions may expose its intellectual property to less protection than that afforded by Germany and the United States.

Regulation

Liberalization

The legal framework for the regulation of the telecommunications sector in Germany was completely transformed through the German Telecommunications Act, which came into force on August 1, 1996. The Telecommunications Act required the complete liberalization of the German telecommunications market from January 1, 1998, as mandated by the directives of the European Commission. It represented the final step in the liberalization effort that began in 1989.

The Regulatory Framework

The Telecommunications Act allows virtually unrestricted market access by qualified entrants. The principal objectives of the Telecommunications Act are to promote competition in the telecommunications sector through regulatory measures, to guarantee appropriate and adequate telecommunications services throughout Germany and to provide for the regulation of frequencies. The Telecommunications Act aims to achieve these objectives principally by requiring licenses for the conduct of certain telecommunications activities, allocating

frequencies, securing universal service and subjecting enterprises having dominant positions in particular telecommunications markets (so-called "market-dominant providers") to a special regulatory framework.

In general, the regulatory approach under the Telecommunications Act does not differentiate between lines of business. It subjects the operation of conventional fixed-network transmission lines, broadband cable transmission lines, mobile telephone links and satellite links and all telecommunications services for the public to essentially the same regulatory regime.

Regulatory Supervision

Since January 1, 1998, regulatory functions under the Telecommunications Act have been carried out by a new supervisory body, the Regulatory Authority (*Regulierungsbehörde für Telekommunikation und Post*), established within the Federal Ministry of Economics (*Bundesministerium für Wirtschaft*) (the Economics Ministry). The Regulatory Authority has various powers under the Telecommunications Act, including the authority to grant and revoke licenses, control network access and interconnection, and approve or review the tariffs and tariff-related general business terms and conditions of market-dominant providers. It also has the authority to assign and supervise frequencies and impose universal service obligations. Three-member decision panels (*Beschlußkammern*) formed within the Regulatory Authority Decisions are responsible for making decisions regarding the grant of licenses in cases involving scarce frequencies, arrangements for special network access, the interconnection of public telecommunications networks, tariffs and tariff-related terms and conditions, and the imposition of universal service obligations.

The Regulatory Authority is supported by an Advisory Council (*Beirat*) consisting of nine representatives of each of the two houses of the German Parliament, but the matters with respect to which the Advisory Council must be consulted are very limited. The Advisory Council is involved in, among other things, decisions concerning license auctions regarding scarce frequencies and decisions obligating a licensee to provide universal service. The Advisory Council need not, however, be consulted with regard to tariff decisions. The Regulatory Authority is headed by a president and two vice-presidents who are nominated by the German Government upon the proposal of the Advisory Council.

Licensing and Notification Requirements; Allocation of Frequencies

The Telecommunications Act establishes licensing requirements for the following services:

- the operation of transmission lines for mobile telecommunication services for the public (Class 1 licenses),
 - the operation of transmission lines for satellite services for the public (Class 2 licenses),
 - the operation of transmission lines that cross property boundaries and that are used to provide public telecommunications services (Class 3 licenses) and
 - the provision of voice telephony services to the public on the basis of self-operated telecommunication networks (Class 4 licenses).
- Generally, except in the case of scarce telecommunications frequencies, the number of licenses is not limited, and each applicant satisfying basic qualification requirements is entitled to receive a license. In applying for a license, an applicant is entitled to specify the geographic scope and the type of activity subject to license. Conditions and obligations may at any time be attached to a license to promote the achievement of the objectives of the Telecommunications Act. At the end of 1999, 365 Class 3 licenses for the provision of transmission lines and 262 Class 4 licenses for the provision of voice telephony services had been granted, with a substantial number of applications for additional licenses under review.

A number of telecommunications services, such as text and data transmission services over leased lines, voice services for corporate networks and closed user groups, and the simple resale of voice telephony services, are not subject to licensing requirements. However, any person providing telecommunication services has to notify the Regulatory Authority of its operations. As of December 31, 1999, more than 1,200 providers of telecommunications services not subject to licensing requirements were registered with the Regulatory Authority. The operation of a broadband cable transmission network requires a license under the Telecommunications Act. The provision of programming content that is transmitted by means of the broadband cable network, on the other hand, does not require a license under the Telecommunications Act but is regulated under the radio and television laws of the various German Federal States. As a carrier of third

party content, however, Deutsche Telekom has not applied for approval under state laws to provide programming content.

By law, frequencies are to be allocated upon request on a non-discriminatory basis according to objective and verifiable criteria. The Regulatory Authority is required to prepare a frequency usage plan to form the basis for frequency allocation. If, on the basis of this plan, frequencies are not available in sufficient quantity for licensing, the number of licenses within certain areas may be restricted, in which case the Regulatory Authority will award licenses by auction or competitive bidding. If multiple applications are submitted for the allocation of a particular frequency, the Regulatory Authority may require that frequency allocation also be determined by auction or competitive bidding. The Regulatory Authority may exclude a company from taking part in auctions or competitive bids for licenses or frequencies if the success of that company in an auction or bid would endanger competition based on principles of equal opportunity, as was the case with respect to Deutsche Telekom and its competitors in connection with the auction for the fourth German digital mobile communications license. The Regulatory Authority may also deny approval of an application to transfer a license on the same basis, regardless of whether scarce frequencies are involved. The Telecommunications Act provides, however, that the justifiable interests of a company in the application of new technologies must be considered when making decisions concerning whether to exclude that company from an auction or competitive bidding process or to deny approval of a proposed transfer.

During 1998 and 1999, the Regulatory Authority allocated "wireless local loop" frequencies to a total of 18 operators. Deutsche Telekom expects that the allocation of wireless local loop licenses will result in a rapid increase in competition in the local loop. For further information on competition in the local loop, see "Description of Business—Competition".

On February 23, 2000 the Regulatory Authority published licensing requirements and auction rules for UMTS (Universal Mobile Telecommunications Services), the next generation of mobile telecommunication technology. Deutsche Telekom expects that the Regulatory Authority will auction licenses for UMTS in June or July of 2000.

Licenses and frequency allocations under the Telecommunications Act are subject to fees that are provided for in the Licensing Fees Ordinance (*Telekommunikations-Lizenzgebührenverordnung*) and the Frequency Fees Ordinance (*Frequenzgebührenverordnung*). In addition, under the Frequency Usage Fees Ordinance (*Frequenznutzungsbeitragsverordnung*), parties to whom frequencies have been assigned are required to make annual contributions to cover the costs incurred by the Regulatory Authority in planning and administering efficient and interference-free frequency usage.

In applying for a license under the Telecommunications Act, the applicant generally has considerable flexibility in choosing the scope and geographical range of the products and services it wishes to offer. This flexibility is limited, however, to the extent that the applicant is required to provide universal services, as described below under the heading "—Universal Services". In addition, this flexibility may be limited in the case of mobile communications licenses or other licenses involving scarce frequencies. Even if a licensee is granted a license covering all of Germany, it generally may choose to provide only those service and geographic combinations that offer the best business opportunities. Thus, competitors of Deutsche Telekom not subject to universal service requirements are free to pursue opportunities in attractive markets, such as high density urban areas, to the exclusion of less attractive markets. This feature of the Telecommunications Act has resulted in substantially increased competition in lucrative markets within Germany. Local network operators now compete with Deutsche Telekom in various major cities in Germany.

Special Requirements Applicable to Market-Dominant Providers

General

A basic principle of the regulatory structure established by the Telecommunications Act is the distinction drawn between market-dominant providers and other companies operating in a market. Market-dominant providers and their affiliates are subject to special rules and obligations, including most importantly:

- the prior approval or retrospective review of tariffs and related business terms and conditions by the Regulatory Authority, insofar as such tariffs relate to a market in which the provider is dominant. See "—Pricing".

- the obligation to offer competitors, on the basis of unbundling, special network access (including collocation) to essential services and facilities used by it internally on a non-discriminatory basis. See “—Special Network Access and Interconnection”.
- potentially, the obligation to provide universal services in a market or to contribute to the compensation of the provider of such services. See “—Universal Services”.
- the possible inclusion of restrictive conditions in licenses, such as, in the case of scarce frequencies, a condition not to combine with another provider in the same market or the rejection of bids for licenses and frequencies in case of scarce frequency capacity.

In addition, market-dominant providers must maintain segregated accounting systems to allow for transparency in dealings among their various licensed telecommunications services, and between such services and license-free services, in order to prevent, among other things, the cross-subsidization of services. In this regard, the Regulatory Authority may specify the structure of internal accounting for particular telecommunications services subject to license. Furthermore, under general competition law principles, market-dominant enterprises as a rule are required to refrain from abuses of their dominant positions. See “—Competition Law”.

Market dominance under the Telecommunications Act is determined by reference to the German Act Against Restraints on Competition (*Gesetz gegen Wettbewerbsbeschränkungen*). This Act provides, among other things, that a company is rebuttably presumed to have a dominant position if its share equals or exceeds one-third of a relevant market. For information regarding a proceeding on the European Union level relating to this issue, see “—The European Union”. The definition of the relevant product and geographic market and the determination that a company is market-dominant under the Telecommunications Act are made by the Regulatory Authority in agreement with the German Federal Cartel Office.

Deutsche Telekom believes that for some time to come the Regulatory Authority is likely to view Deutsche Telekom as holding a dominant position in the German market for public voice telephony services in the fixed network and in other markets, including most of those in which it had monopoly rights in the past. As a result, Deutsche Telekom expects that the provisions of the Telecommunications Act relating to the regulation of market-dominant providers will be applied to Deutsche Telekom's activities in those markets. Considering that in many markets competitors of Deutsche Telekom are unlikely to reach dominant positions in the near future, Deutsche Telekom expects that for some period of time it will have to compete in significant markets with providers not subject to the requirements applicable to market-dominant providers. These competitors may therefore have more flexibility than Deutsche Telekom in terms of the selection of services offered and customers served, pricing and the grant of access to their networks. The definition of a market in which dominance exists requires a number of judgments, and is subject to change as competitive conditions further develop. As competition unfolds and the basis for regulatory determinations that are unfavorable to Deutsche Telekom diminishes, Deutsche Telekom intends to actively pursue a dialogue with the Regulatory Authority relating to the reevaluation of markets in which Deutsche Telekom is regarded as dominant. Deutsche Telekom takes the view that intensive competition already exists in important markets, particularly in the markets for domestic long-distance and international calls. In addition, Deutsche Telekom believes that the academic literature reflects increasing acceptance of the view that calling services for end-customers are contestable and that sector-specific regulation is no longer justified in markets for these products.

Every two years, both the Regulatory Authority and the Monopoly Commission (*Monopolkommission*) – an independent body that regularly issues reports on competitive conditions in Germany – are required to report to the German federal legislature whether equal and effective competition has been achieved in the relevant telecommunications markets, such that, in their view, special regulatory measures regarding market-dominant enterprises, particularly with regard to tariffs, are no longer necessary. In the first of these reports, which were submitted to the German legislature on December 3, 1999, both the Regulatory Authority and the Monopoly Commission generally concluded that effective competition in the telecommunications sector does not yet exist and that promotion of competition through regulatory intervention continues to be necessary. In its report, however, the Regulatory Authority noted that “in comparison to developments in the area of local networks, the markets for long-distance and international calls are characterized by a significantly greater intensity of competition.” The German government is expected to comment on the report of the Monopoly Commission in the summer of 2000.

On December 13, 1999, the Regulatory Authority announced that Deutsche Telekom would no longer be regarded as a dominant provider in the market for the interconnection of outgoing calls to foreign countries. Going forward, therefore, Deutsche Telekom's activities in this market will not be subject to the special

regulations applicable to market dominant providers. In particular, the prices charged by Deutsche Telekom for this service are no longer subject to prior regulatory approval or retrospective review.

In an official publication of March 8, 2000, the Regulatory Authority determined that no German mobile operator has a dominant position in the market for interconnection of calls to mobile networks. T-Mobil therefore remains unregulated in this market.

Pricing

Under the Telecommunications Act, tariffs and tariff-related business terms and conditions for the telecommunications services of market-dominant providers and their affiliates are subject to special regulatory oversight and control insofar as they relate to a market in which such dominance is determined to exist. Other tariffs are essentially unregulated under the Telecommunications Act. The tariffs of all providers in Germany are, however, subject to European and German law of general application, including competition and consumer protection laws and ordinances. In addition, tariffs for universal services must be set at an "affordable price". See "—Universal Services".

The Telecommunications Act distinguishes between tariffs which require prior regulatory approval and tariffs which do not require prior approval, but which are subject to retrospective review. Prior approval is required for the tariffs of a market-dominant provider in the areas of public voice telephony services, the operation of transmission lines for telecommunications services to the public, and access and interconnection services. All other tariffs including tariffs in respect of mobile telephony, subscription fees for cable transmission services and fees for satellite services may be put into effect without prior approval. However, in markets in which a provider is considered to have a market dominant position, such tariffs are subject to retrospective review.

The Telecommunications Act provides for two basic approaches to prior approvals of tariffs: a price-cap approach and an approach involving individual approvals based on an assessment of the costs of providing a particular service (the "cost-based approach"). The Tariff Regulation Ordinance (*Telekommunikations-Entgeltregulierungsverordnung*) provides that priority is to be given to the price-cap approach. The cost-based approach applies to tariffs for services which under the regulation may not be, or are not, combined in "baskets" together with other services in accordance with the price-cap approach.

Under the price-cap approach, the Regulatory Authority establishes baskets of services and limits tariffs for the blend of services within those baskets through the use of a formula. The formula has the effect of requiring the affected company to reduce, or limiting the extent to which it can increase, the aggregate tariffs for services within a basket. Under the Telecommunications Act and the Tariff Regulation Ordinance, tariffs for voice telephony services and tariffs for transmission lines may not be combined in a single basket. Services may be combined within a basket only if the degree of competition with respect to those services does not substantially vary. Although the Tariff Regulation Ordinance generally provides that priority is to be given to the price-cap approach, tariffs for special network access services (including interconnection) generally were not subject to price-cap regulation through December 31, 1999, but were instead dealt with under the cost-based approach. After December 31, 1999, tariffs for special network access services generally are to be dealt with under the price-cap approach, although the Regulatory Authority has discretion to deal with these tariffs under the cost-based approach. If these tariffs are dealt with under the price cap approach, however, they may not be combined in a basket with services other than network access services.

The Regulatory Authority establishes an initial price benchmark for a basket by ascertaining the tariff level for each service in the basket. The price-cap formula imposed with respect to the basket allows for price increases or requires price decreases from the initial benchmark level based on the general inflation rate, reduced by an amount which reflects expected productivity improvements. Under the Tariff Regulation Ordinance, the Regulatory Authority is required to consider a variety of factors when establishing the price-cap formula, including the relationship of the initial tariff levels to the costs of efficient service provision and the productivity improvements being achieved by other enterprises in similar markets. When making a determination of price-cap benchmarks, the Regulatory Authority may require a company to submit detailed cost information. Under the Telecommunications Act, a market-dominant company must submit certain individual tariffs for approval, and must submit in connection therewith certain information. If a tariff proposal is below the limit allowed by the price-cap formula and all required documents have been submitted, the Regulatory Authority may be expected, under ordinary circumstances, to approve the proposal within two

weeks of submission. Recently, the Regulatory Authority has also taken into account the effect on competition of prices being reviewed under the price-cap approach.

The price-cap approach to tariff regulation has been applied, most notably, to voice telephony service. Currently, the regulations provide for two baskets of services, one for residential and one for business customers, each subject to the same price-cap formula. Each of the baskets currently includes, among other services, subscriber access and local, long distance and international calling services. In the first price-cap period, which ran from January 1, 1998 to December 31, 1999, the price-cap formula called for tariff reductions of 4.3 percent compared to the level of Deutsche Telekom's rates as in effect at the end of 1997. These required tariff reductions reflected required productivity improvements of 6 percent less a projected inflation rate of 1.7 percent, which was the rate of consumer price inflation in Germany in 1997. As of December 31, 1999, Deutsche Telekom's tariffs in respect of the voice telephony services included in the relevant baskets were substantially below the levels required under the price-cap. The composition of the service baskets remains unchanged for the new price-cap period (January 1, 2000 to December 31, 2001). The price-cap formula calls for further tariff reductions of 5.6 percent in the first quarter of 2000 compared to the level of Deutsche Telekom's rates as in effect at December 31, 1999, reflecting required productivity improvements of 6 percent less a projected inflation rate of 0.4 percent, which was the rate of consumer price inflation in Germany in 1999. Deutsche Telekom has fulfilled this requirement through reductions in domestic long-distance and international tariffs that took effect in February and March 2000.

In August 1998, the Regulatory Authority approved a price-cap regulation procedure that allowed new optional tariffs to be approved under the price-cap approach. Optional tariffs enable customers to meet their specific communications needs at lower rates than under the standard tariff, while also enabling Deutsche Telekom to be more competitive in responding to the requirements of special groups of customers. Approval under the price-cap approach – rather than under the lengthier individual approval procedures that characterize the cost-based approach – permitted more rapid introduction of the new rates on the market. In 1998, Deutsche Telekom obtained approval for optional tariffs for both private and business customers. On December 23, 1999, however, the Regulatory Authority decided that in the future it will in general review cost documentation in connection with requests for approval of new optional tariffs, which formerly had not been included in the price cap baskets. This decision is expected to result in a longer approval process for optional tariffs.

In 1997, the former Post Ministry published a discussion draft concerning a possible framework for the price-cap regulation of transmission line tariffs. Renewed discussion of a possible framework for the price-cap regulation of transmission line tariffs may occur in 2000.

Tariffs requiring prior approval which are not dealt with under a price cap are based on the calculation of the costs of efficient provision of the relevant service. The costs of efficient service provision are based on the long-run incremental costs of providing a particular service, with an additional amount in respect of overhead costs (including an appropriate return on capital employed), to the extent such costs are necessary for the provision of the service. The applicant is required to submit extensive documentation as to its costs and the methods and parameters on which its determination of costs is based in respect of the service in question. The documentation is to reflect costs both directly and indirectly attributable to the service in question. The applicant must explain the basis on which indirect costs are attributed to the service, and the attribution must comply with relevant EU directives. Under the Telecommunications Act, applications for cost-based approvals must be approved or rejected within a maximum of 10 weeks of submission.

Under the cost-based approach, costs and expenses not based on the costs of efficient service provision may not be taken into consideration unless they were incurred as a result of a legal requirement or there is some other objective justification for their inclusion. While the Regulatory Authority calculates the cost of efficient service provision on the basis of data derived from Deutsche Telekom's cost accounting system, it subtracts all cost elements which it deems to be attributable to inefficiencies in Deutsche Telekom's existing cost structure. Due to its history as an integral and undifferentiated part of the Deutsche Bundespost operating as a state monopoly, Deutsche Telekom incurs costs which it believes would not be incurred by efficient private sector enterprises. As a result, Deutsche Telekom believes that, in calculating the costs of efficient service provision, the Regulatory Authority should take these costs into account. Discussions continue concerning the appropriate methodology to be used in the calculation of the long run incremental cost of the services subject to cost-based pricing.

As part of the Regulatory Authority's evolving approach to cost-based pricing, it commissioned an independent scientific institute to develop an analytical cost model (cost proxy model) which was intended to serve as a basis for future regulatory decisions concerning, among other things, network access rates and interconnection rates. In February 1999, this scientific institute published a model to be used for calculation of the long-run additional infrastructure costs of the local access network. Deutsche Telekom has criticized this model, which it believes systematically underestimates costs. The Regulatory Authority used the analytical cost model for the first time in connection with its review of access pricing in the local loop. For further information on local loop access, see "—Special Network Access and Interconnection—Local Loop Access". A preliminary version of another analytical cost model, which was developed to calculate the costs of interconnection services, was published in April 1999. Because this model had not been fully developed, however, it could not be used for calculating the new interconnection rates that took effect on January 1, 2000. Deutsche Telekom has also criticized this model, which it believes does not take significant features of the existing network into account. According to public statements made by the Regulatory Authority, this model will be used for the first time calculating element-based interconnection rates, which Deutsche Telekom expects will be implemented in February 1, 2001. For further information on element-based interconnection rates and on interconnection generally, see "—Special Network Access and Interconnection—Fixed-Fixed Interconnection".

Tariffs may not be approved if they (1) contain surcharges which prevail solely as a result of the applicant's market-dominant position, (2) include discounts which prejudice the competitive opportunities of other companies in a telecommunications market or (3) discriminate among customers for the same or similar services in a telecommunications market, unless such surcharges, discounts or discriminatory features are objectively justified.

All tariffs of market-dominant providers in markets in which such dominance occurs are subject to ex-post regulatory examination, even if the tariffs were initially subject to prior approval. The Regulatory Authority must initiate examination proceedings if it becomes aware of facts indicating that such tariffs contain discounts or discriminatory features that are not objectively justified and may ultimately object to such tariffs and declare them to be invalid. In addition, with tariffs not subject to prior approval, the Regulatory Authority may initiate examination proceedings if it becomes aware of facts indicating that such tariffs contain surcharges, discounts or discriminatory features, as described above. The Regulatory Authority may object to such tariffs and declare them invalid. For example, the Regulatory Authority has initiated retrospective reviews of increases in broadband cable tariffs.

In connection with a retrospective review of broadband cable tariffs, the Cologne Administrative Court (*Verwaltungsgericht Köln*) issued a decision on March 18, 1999 in which it ruled that any corporate and business secrets relevant for a decision taken in a decision panel proceeding under the Telecommunications Act must be disclosed by Deutsche Telekom to the other parties involved in the proceeding. Deutsche Telekom filed a successful appeal against this decision. On May 12, 1999, the Münster Higher Administrative Court (*Oberverwaltungsgericht Münster*) ruled that Deutsche Telekom has a legitimate interest in protecting its corporate and business secrets, such that the Regulatory Authority may require disclosure of these secrets only when necessary to protect a special public interest. See "Legal Proceedings".

In two decisions published in September and November 1999, the Regulatory Authority took the position that regulatory approval is required for Deutsche Telekom's offers of services to service providers that purchase services for purposes of resale. This position relates to offers of both local calls and domestic and international long-distance calls. According to these decisions, these offers to resellers are seen as voice telephony services and Deutsche Telekom is seen as dominant in the market for those services. Deutsche Telekom has applied for a preliminary injunction against the implementation of these decisions and has appealed these decisions to the administrative court. For further information on these legal actions, see "Legal Proceedings". Although the Regulatory Authority has stated that the terms of these offers to resellers are subject to regulatory approval, the Regulatory Authority has not to date taken the position that Deutsche Telekom has an underlying obligation to offer services to resellers. Deutsche Telekom believes that the Regulatory Authority is likely to take the view that the terms of offers of local access services to resellers are also subject to regulatory approval.

Special Network Access and Interconnection

The Telecommunications Act imposes specific obligations concerning access to networks and interconnection. The Network Access Ordinance (*Netzzugangsverordnung*) under the Telecommunications Act provides details

concerning these obligations and specifies the manner in which special network access (including interconnection) is to be effected.

General Principles

Every operator of a public telecommunications network, irrespective of the operator's market position, is obligated, upon request, to make an offer to other operators for interconnection to its network. If the parties cannot reach an agreement on such interconnection, the Regulatory Authority will order the interconnection on such terms as it may determine. The contents of all agreements on special network access must comply with certain requirements of the Network Access Ordinance.

Provisions Applicable to Market-Dominant Providers

A network operator that offers telecommunications services to the public and is a market-dominant provider in a particular market must allow every user access to its network or parts thereof. Such access may be granted via connections provided for all users (general network access) or via special connections (special network access), which includes the interconnection of networks. Limitations on access may be based only on the "essential requirements" set forth in the Open Network Provision Directive of the European Union ("EU"), which include preservation of the security of network operations, the maintenance of network integrity, the interoperability of services and the protection of data.

A provider dominant in a market for telecommunications services to the public must also grant to competitors active in the same market access to essential services it uses internally for the provision of such services upon the same conditions it applies to itself, unless the offer of different conditions can be objectively justified.

A market-dominant provider is required to unbundle its services for special network access, and must therefore offer its internally used essential services, including transmission, switching and operational interfaces, in such a way that other users need not purchase services they do not want. The market-dominant provider is not, however, required to unbundle its services to the extent that it can demonstrate that the requirement is not objectively justified in the particular circumstances. In addition, a market-dominant provider is obligated to allow other network operators to use transmission, switching and operational interfaces to its network on its premises on the same conditions it applies to itself ("physical collocation"). However, if the market-dominant provider demonstrates that physical collocation is not objectively justified, it must instead offer network access by "virtual collocation", i.e., on terms equivalent to physical collocation in terms of economic, technical and operational conditions.

A market-dominant provider must adhere to the harmonized technical standards for interfaces and service features made binding by the EU with regard to open network provision.

Agreements on special network access (including interconnection) must be reported to the Regulatory Authority immediately following their execution. Conditions in such agreements must be based on objective criteria, be comprehensible and guarantee equal access.

The Regulatory Authority publishes in its official journal the time and place at which such agreements may be inspected. The Regulatory Authority also publishes the terms and conditions of such agreements if they can be expected to be included in a number of special network access agreements. Such terms and conditions then constitute a "basic offer" which must be included in the general business terms and conditions of a market-dominant provider.

Fixed-Fixed Interconnection

As of December 31, 1999, Deutsche Telekom had concluded almost 100 interconnection agreements with competitors offering long distance and international calling services over the fixed-line network. The current level of interconnection pricing was approved by the Regulatory Authority on December 23, 1999. The rate structure established on December 23, 1999 is based on the distance which traffic travels between the point of interconnection with Deutsche Telekom's network and the point of termination. The average interconnection rate has been reduced by approximately 24 percent compared with the average interconnection rate in effect from January 1, 1998 to December 31, 1999. The new interconnection rates are effective until January 31, 2001.

Deutsche Telekom had requested that the Regulatory Authority take the so-called access deficit into account in its decision of December 23, 1999. To ensure universal access, access fees in Germany have traditionally been set at a level which does not cover the full cost to Deutsche Telekom of providing access service. The shortfall in access revenue, which is called the "access deficit", has instead been offset through higher calling charges. Deutsche Telekom believes that competitors are given an unfair advantage if interconnection prices do not include a charge based on the portion of the cost of providing access service that is not recouped through access fees.

In its decision of December 23, 1999, however, the Regulatory Authority stated that Deutsche Telekom had not adequately documented the costs associated with the "access deficit" and declined to take any portion of the access deficit into account in its calculation of the costs of providing interconnection service. The Regulatory Authority instead based this calculation on an international benchmark. As a result, Deutsche Telekom takes the view that the interconnection rates established by the Regulatory Authority do not cover Deutsche Telekom's costs for providing interconnection. Because of the fundamental significance of the interconnection decision of the Regulatory Authority, Deutsche Telekom has appealed this decision to the administrative court. For further information on this appeal, see "Legal Proceedings". There can be no assurance as to the outcome of this appeal.

As a result of the large number of interconnection applications that Deutsche Telekom receives, it is not always technically feasible for Deutsche Telekom to make an interconnection point available to each applicant immediately after an agreement is reached with that applicant. On December 22, 1999 the Regulatory Authority published an approved proceeding under which Deutsche Telekom is entitled to give certain companies priority with regard to the time period needed to supply an interconnection point. This approved proceeding is applicable until June 1, 2000. In March 2000, the Regulatory Authority announced that it will examine Deutsche Telekom's process for the provision of interconnection points. Some companies that already have functioning points of interconnection with Deutsche Telekom's network have attempted to sublet their interconnection points in part to third parties who have applied for interconnection but not yet been connected to Deutsche Telekom's network. Deutsche Telekom filed a complaint with the Regulatory Authority against sub-leasing of interconnection points, and in series of decisions starting in December 1999 the Regulatory Authority determined that sub-leasing of interconnection points is impermissible. Several competitors have appealed this decision of the Regulatory Authority to the administrative courts. For further information on these appeals, see "Legal Proceedings".

Deutsche Telekom is planning to change the structure of interconnection tariffs with effect as of February 1, 2001. In place of the current structure of interconnection tariffs, in which the cost of interconnection for any given call depends largely on the distance travelled by the call on Deutsche Telekom's network, Deutsche Telekom intends to introduce an element-based tariff structure, in which the cost of interconnection for any given call would be determined by reference to the number of network elements that are used in transmitting the call. Deutsche Telekom currently is discussing different forms of the proposed new tariff structure with the Regulatory Authority and with competitors. Deutsche Telekom's position on this issue has been published by the Regulatory Authority for public comments. Deutsche Telekom currently expects that the Regulatory Authority will reach a decision on the proposed new tariff structure in the second half of 2000.

During 1998, Deutsche Telekom conducted discussions with the Regulatory Authority about the terms of interconnection agreements with carrier network operators who provide national services with only minimal investments in infrastructure. These carriers were, in Deutsche Telekom's view, generating atypical traffic that led to inefficient use of Deutsche Telekom's fixed network. As a result of these discussions, starting in May 1999, the Regulatory Authority issued a series of decisions that permitted Deutsche Telekom to require these carriers to build up new points of interconnection if the volume of traffic they generated at any single point of interconnection exceeded a threshold specified by the Regulatory Authority. Deutsche Telekom subsequently implemented this requirement in all interconnection contracts. One carrier, however, filed a suit against this decision of the Regulatory Authority, and in November 1999 the Cologne Administrative Court ruled that this decision of the Regulatory Authority was inconsistent with the EC Open Network Provision Directive. Both Deutsche Telekom and the Regulatory Authority have appealed this decision to the Appellate Administrative Court, which in February 2000 overruled the decision of the Cologne Administrative Court. For further information on this appeal, see "Legal Proceedings". Deutsche Telekom is now permitted to require special carriers to build up new points of interconnection if their traffic at one point of interconnection exceeds a certain threshold.