

# Annual Report 2000

Regulatory Authority for  
Telecommunications and Posts  
– RegTP –

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Our Annual Report for 2000 highlights three key trends:

- ⇒ **the continued boom in the telecoms market,**
- ⇒ **the benefits of liberalisation, and**
- ⇒ **the bottleneck still created by the local access market.**

These three key trends characterise both the past year and the foreseeable future.

The boom in the telecoms market is continuing, with new, innovative products and services, and a constant increase in customer bases and market volumes.

Our efforts to open up the markets and create a level playing field are benefiting the whole economy, in the form of price cuts, job creation, and the promotion of technical innovations.

The real bottleneck still, sadly, lies in the local access market, where competition remains underdeveloped. This sector will therefore continue to be a particular focus of our work.

Matthias Kurth  
President  
Regulatory Authority for  
Telecommunications and Posts

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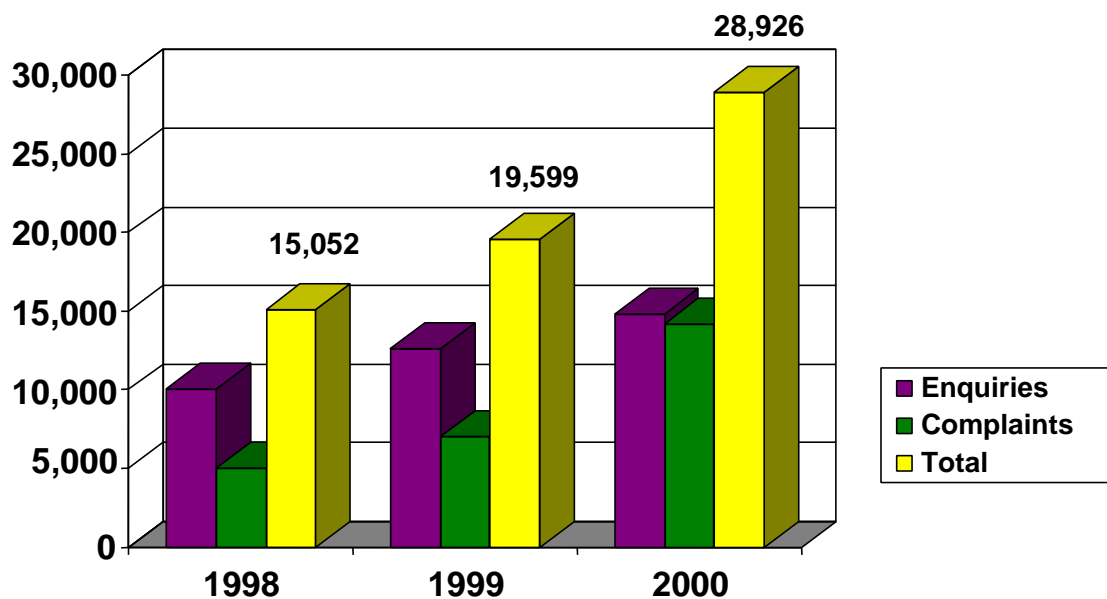
## Consumer Representation

### Telecoms

The RegTP has always seen one of its roles as acting as an advocate for consumers. Its work in this capacity is reflected in particular by the level of complaints and enquiries handled by its Consumer Representation Section last year – almost 29,000.

The number of representations dealt with by the Section has increased each year:

**Consumer Complaints and Enquiries**



Last year saw another sizeable increase in the number of people contacting the Section. There was a sharp increase in the level of complaints in particular in the second half of the year: overall, complaints made up 50 per cent of all representations, compared with 37 per cent in 1999. The Section dealt with a considerable number of enquiries from Internet users following the RegTP's direction requiring Deutsche Telekom AG (DTAG) to offer unmetered wholesale Internet access. It also had some 4,500 complaints about the wholesale access rates charged by DTAG to Internet and online service providers. This is reflected in the breakdown of the issues raised.

Last year's top five issues were:

- |   |       |
|---|-------|
| 1. Prices<br>(in particular Internet access, flatrate access)       | 18.0% |
| 2. Bills<br>(difficulty in understanding bills, bills not arriving) | 14.1% |
| 3. Numbering<br>(allocating numbers, porting numbers)               | 10.0% |
| 4. Contracts  | 9.2%  |

## 5. Information 8.4% (providers, customer information, unfair competition)

The bulk of the complaints from customers not understanding their bills were about charges for calls to 0190 premium rate services, with most customers claiming not to have made the calls charged. Increased Internet use has also meant an increase in the number of complaints about overcharging for Internet calls.

The Section handled not only a large number of enquiries about allocating numbers, but also queries about the legal rights of customers wishing to keep their number when changing operator or, more often, changing from an analogue to a digital line.

Many consumers mistake the Section for a customer services centre for their telecoms suppliers, and contact the Section to make complaints about breaches of contract (products, deadlines, prices, etc) and poor customer service (eg complaints not being dealt with, helpline numbers being constantly engaged or unavailable). There has also been an increase in the number of complaints of anti-competitive practices (for instance in winning customers) and about unsolicited direct marketing faxes. Here, the Section advises customers about the options available to them.

The complaints statistics are used to keep suppliers updated on how they fare. The recent increase in the number of consumers contacting the Section means that the RegTP has representative statistics on the issues and the companies complained about. The complaints against each company are weighted by the company's customer base to give the percentage of unsatisfied customers for each company.

### **Conciliation**

Under Section 35 of the Telecommunications Customer Protection Ordinance (TKV), a customer claiming that his rights have been infringed may call on the RegTP to conciliate in a dispute between himself and his voice telephony or public telecoms network access provider. The RegTP's Conciliation Service was set up in May 1999 and, since then, has been contacted by 726 customers seeking to resolve disputes out of court.

The Service encourages companies and consumers to reach agreement before it takes on its role as conciliator. This aims to minimise the administrative work associated with the large number of requests the Section receives. The main causes of disputes are

- difficulty in understanding charges on telephone bills,
- complaints about the quality of telecoms and customer services, and
- suspected double charging.

Around 40 per cent of the disputes could be resolved without the parties having to go to court. Another positive sign is that 57 per cent of the conciliation compromises formulated led to an amicable solution. Experience has shown

that the outcome of the conciliation process largely depends on the extent to which both sides actively contribute towards resolving their difficulties and are willing to accept a compromise. The increase in the number of people contacting the Service is seen as signalling the increased acceptance and use by consumers of this route to settle disputes with their telecoms suppliers out of court.

### **Favourable Status List**

Section 14 of the TKV requires all voice telephony providers to supply customers with a free, standard itemised bill on request. Despite this, the Consumer Representation Section is still having to deal with complaints and enquiries about itemised bills. The RegTP's favourable status list has proved useful in solving consumers' problems. 34 companies are currently listed, and a number of others have applied to join in response to a notice published in the RegTP's Official Gazette 17/2000 and on its web site at [www.regtp.de](http://www.regtp.de). It makes sense for the RegTP to maintain the list in view of the interest from providers and the numerous enquiries from consumers. A second call for applications was published on 22 November in Official Gazette 22/2000.

### **Universal Services**

In accordance with Sections 18 and 19 of the Telecommunications Act (TKG), the RegTP will require a company to provide universal service only where supply in the relevant product market is found to be inadequate. This has not happened so far. All the same, DTAG – even though it no longer holds the voice telephony monopoly – is required under Section 97(1) of the TKG to give the RegTP one year's notice of the scope of any planned changes to its universal services. The RegTP's assigned role is to leave the supply of universal services to market forces, and to take regulatory action when – and only when – supply is inadequate. So far, the RegTP has limited its activities to, for instance, helping customers to assert their rights for network access (telephone lines) or entry in public directories.

The RegTP has also been active on the issue of public payphones, provision across the country being classed as a universal service. Here, there has been a recent turnaround in call patterns, with a clear decrease in payphone usage. DTAG confirmed its commitment to meet the universal service requirement, but – in order to guarantee nationwide access while also achieving cost efficiency in both urban and rural areas – it devised a concept for a pilot scheme introducing a less sophisticated, "basic" telephone. At the same time, DTAG pledged not to remove a payphone without the local community's agreement while the scheme was running. The RegTP's Advisory Council at its meeting on 8 February 1999 noted with approval DTAG's criteria for ensuring nationwide provision of payphones. The criteria took effect on their publication under Communication 127/1999 in Official Gazette 6/1999. Following a change in DTAG's timetable, the period of applicability was extended first to October 2000 and then up to publication of new criteria. Following successful completion of the pilot scheme, DTAG announced its plans to upgrade the basic telephones over a period of twelve months, during which its pledge would still stand.

## Postal Sector

The RegTP last year received 382 written proposals and numerous telephone enquiries from postal service customers, with the Consumer Representation Section handling nearly 1,200 enquiries made by e-mail or telephone.

The top issues raised were

- delivery problems, letter delivery times, lost letters around 45%,
- fixed facilities being closed, or branches transformed into agencies around 28%,
- services provided by different Deutsche Bundespost successor companies (eg telephone directories, postal banking) around 13%,
- dissatisfaction with other Deutsche Post AG (DPAG) services (eg redirecting post) around 14%.

Around half of the letters received concerned universal service quality standards, and qualified as public petitions within the meaning of the Postal Universal Service Ordinance (PUDLV). The RegTP has a policy of replying to these petitions in writing. This route has proved to be a faster and simpler way of helping customers than any official, legal alternative.

The other half of the letters concerned consumer protection issues, and in most cases the legal relationship between postal service providers and customers. Here, the RegTP endeavours, wherever possible, to assist both sides in reaching an amicable solution. (This is the scope of the Postal Services Ordinance (PdIV) to be issued as provided for in the Postal Act (PostG) by the Federal Government; the draft Ordinance is available on the Internet at [www.bmwi.de](http://www.bmwi.de).)

## Universal Services

The PUDLV, which took effect on 1 January 1998, defines the content and scope of universal postal services, including minimum quality standards (eg number of fixed facilities, delivery time targets) and criteria for "affordable pricing".

The PUDLV does not require any particular company to provide a universal service, not even DPAG. Rather, it serves as a yardstick for deciding whether or not universal services are in appropriate and adequate supply in the market. Should this not, or no longer, be the case, the RegTP may call on one or more companies to provide universal service.

The services designated as universal services in the PostG and PUDLV are currently in appropriate and adequate supply. The minimum quality standards established in the PUDLV for fixed facilities and, in particular, letter delivery times are maintained. No formal proceedings – as provided for by the PostG in

the case of insufficient universal services – have had to be initiated; nor, most importantly, has any company had to be charged with providing universal service.

### **Fixed Facilities**

The PUDLV stipulates a minimum total number of fixed facilities and a minimum density of outlets.

Required are a minimum of 12,000 fixed facilities until the end of 2005, with at least 5,000 being manned by the company's own staff until the end of 2002.

### **Trend in the Number of Fixed Facilities**

	<b>Total</b>	<b>Manned by own staff</b>
<b>31 December 1997</b>	15,331	10,095
<b>31 December 1998</b>	14,482	7,946
<b>31 December 1999</b>	13,948	5,956
<b>31 March 2000</b>	13,884	5,556
<b>30 June 2000</b>	13,858	5,807
<b>PUDLV minimum</b>	<b>12,000</b>	<b>5,000</b>

These figures do not include the 300 or so facilities which are run by other postal operators in mostly the parcel sector, but which do not offer the full range of universal services. The minimum targets are achieved and, to date, no company has had to be ordered to retain or reinstate a facility. The key requirement in respect of the density of outlets is that "in principle it shall be guaranteed that in urban areas, customers are not farther than 2,000 metres from their nearest fixed-location facility".

The RegTP checks compliance with the requirements at random or in response to public petitions. In three instances, the RegTP was able to secure the opening of a branch or agency after discussing the factual and legal circumstances with DPAG, the only operator that until 31 December 2002 can be formally obliged to provide a universal service.

One such check was made in Hanover-Waldheim following a petition from a citizens' action group. The RegTP found that people in the centre of Waldheim were 2,620 metres away from their nearest fixed facility, and that some people on the outskirts of the town were more than 3,000 metres away. This meant that Waldheim did not meet the minimum distance or minimum density target. As a result of these findings and of discussions with the RegTP, DPAG on 20 November 2000 reopened a fixed facility in Waldheim, thus guaranteeing appropriate and adequate provision of fixed facilities and obviating the need for formal proceedings by the RegTP.

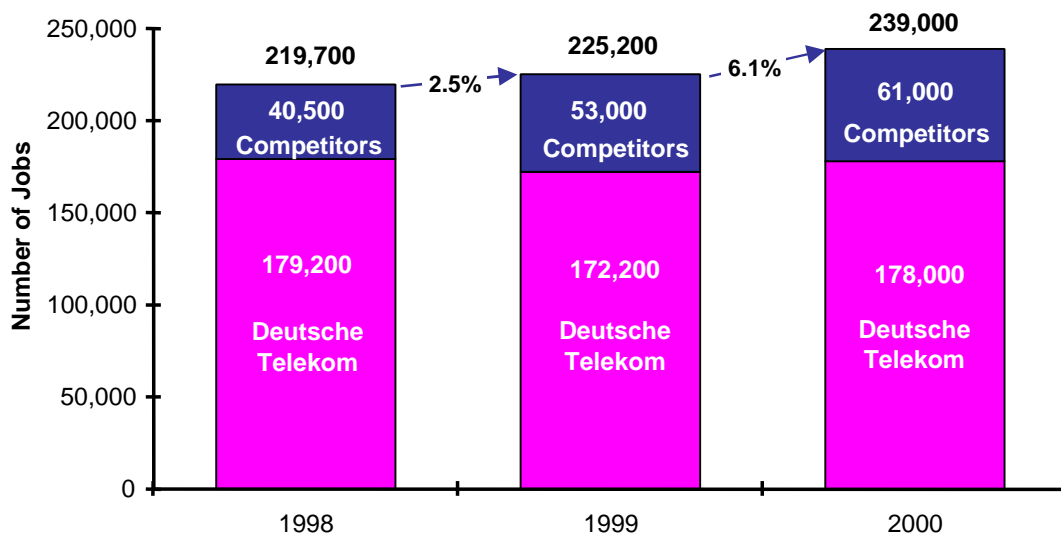
## Employment Trends

### Jobs in the Telecoms Market

The growth in jobs has continued, with the number of people working in the telecoms services sector reaching 239,000 at the end of 2000. The number of staff employed by Deutsche Telekom's competitors (licensed, licence-exempt, and cable television (CATV) service providers) increased to 61,000. This represents a rise of 8,000, or 15 per cent, on the previous year.

Staff numbers at Deutsche Telekom (DTAG and its German subsidiaries) totalled around 178,000. The increase on the previous year is due almost exclusively to acquisitions by the Deutsche Telekom group which did not become effective until the fourth quarter. Without these acquisitions, the number of jobs within the group decreased from 172,200 at the end of 1999 to around 165,000 one year later. This shows a continuation of the downsizing process ongoing since 1994, and is determined above all by job cuts within the parent company, DTAG.

### Job Trends in the Telecoms Market



The number of staff employed by the mobile operators (Class 1 licence holders) last year increased to 26,300. Staff numbers at DTAG's fixed line competitors (Class 3 and 4 licence holders) totalled some 30,500.

### Jobs in the Postal Market

DPAG's average staff figures show further downsizing, with a decrease on the previous year of some 4,450. DPAG currently employs around 240,000 staff,

<sup>1)</sup>**Density** = Number of jobs per one million inhabitants (job density).

## Telecoms Market Watch

### Growth in the Telecoms Services Market

The German telecoms market has witnessed phenomenal growth in the three years since full liberalisation. Mobile ownership, Internet access, fixed line penetration and call volumes have all shown strong growth. At the same time, the prices for fixed, mobile and Internet calls have fallen. Overall, these price falls have been more than compensated for by the growth in call volumes.

Revenues for telecoms services in 2000 exceeded the DM 100 billion mark. The increase in revenues is mainly due to growth in the mobile market. The increase in mobile revenues outweighed the decrease – as a result of falling prices – in fixed call revenues. There was also noticeable growth in revenues from carrier services – the services provided by one operator to another – and data services (including Internet access).

At the end of 2000, 362 companies held an unrestricted transmission path and/or voice telephony licence. The continued increase in the number of licence holders signals the competitiveness of the telecoms market. At the beginning of 2001, there were over 180 telephony suppliers; at least 90 operate their own core or access network<sup>1</sup>, whilst the remainder are engaged in reselling activities. These resellers purchase call minutes from network operators and offer and invoice for them under their own name, much like mobile service providers. This means consumers in Germany are enjoying an expanding range of telephony services.

Consumers now frequently make their calls via more than one operator's network, thanks to the interconnection agreements between the operators. 120 agreements are in place for interconnection between DTAG and its competitors, who are also cooperating between themselves in order to become less dependent on DTAG.

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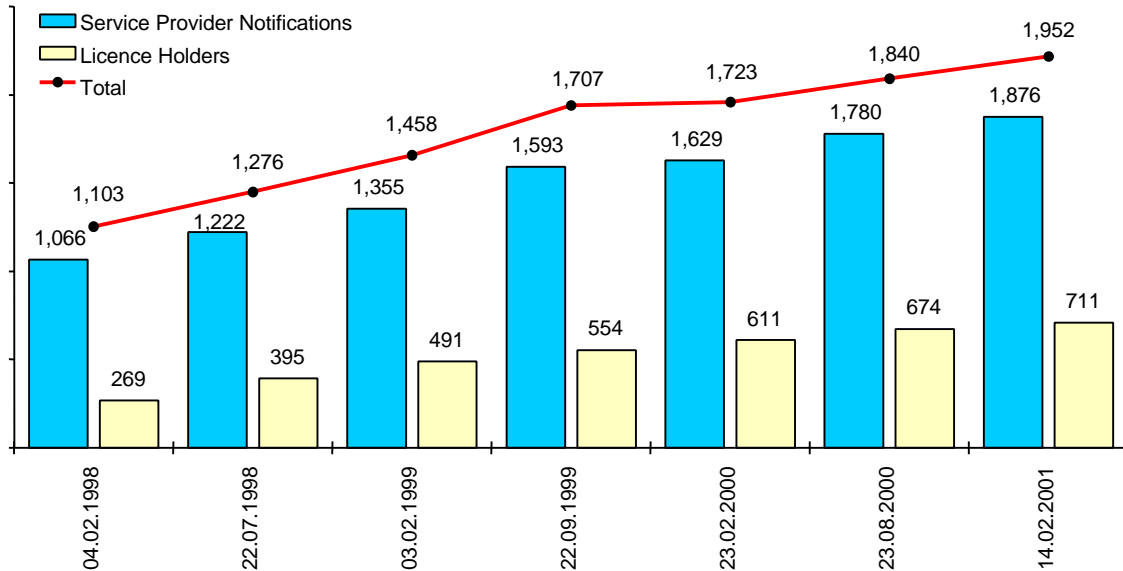
<sup>1</sup> On 1 January 2000, the number of companies allocated a carrier preselection code stood at 149. Some of these, however, have yet to enter the market or do not offer voice telephony services.



### Telecoms Service Providers

The intensity of competition in the German telecoms market is reflected in the consistently high number of providers. Currently registered with the RegTP are more than 1,900 service providers.

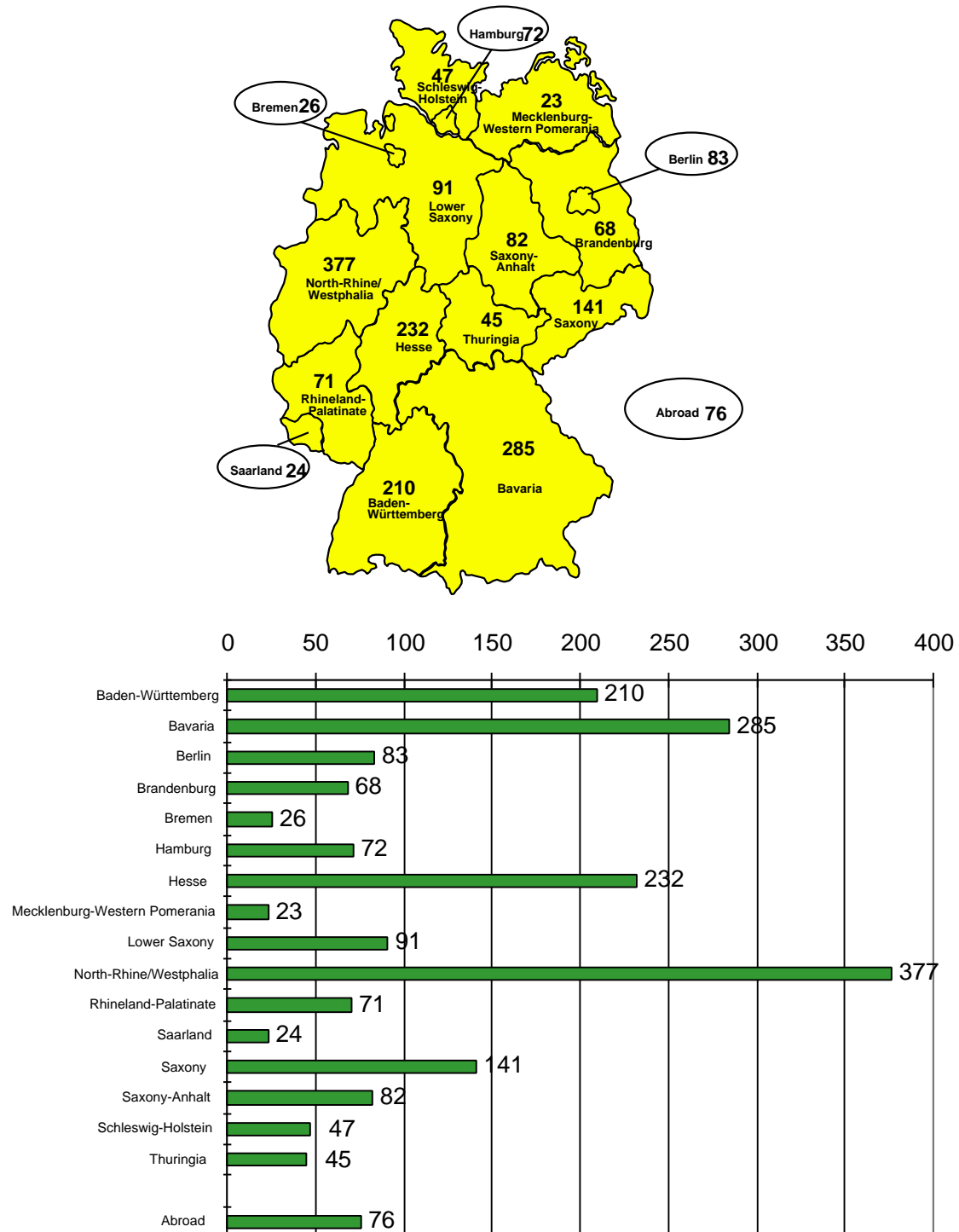
### Growth in the Number of Telecoms Service Providers



Holders of more than one licence are counted once only. The total number of licence holders shown relates to holders of Class 1 to 4 licences.

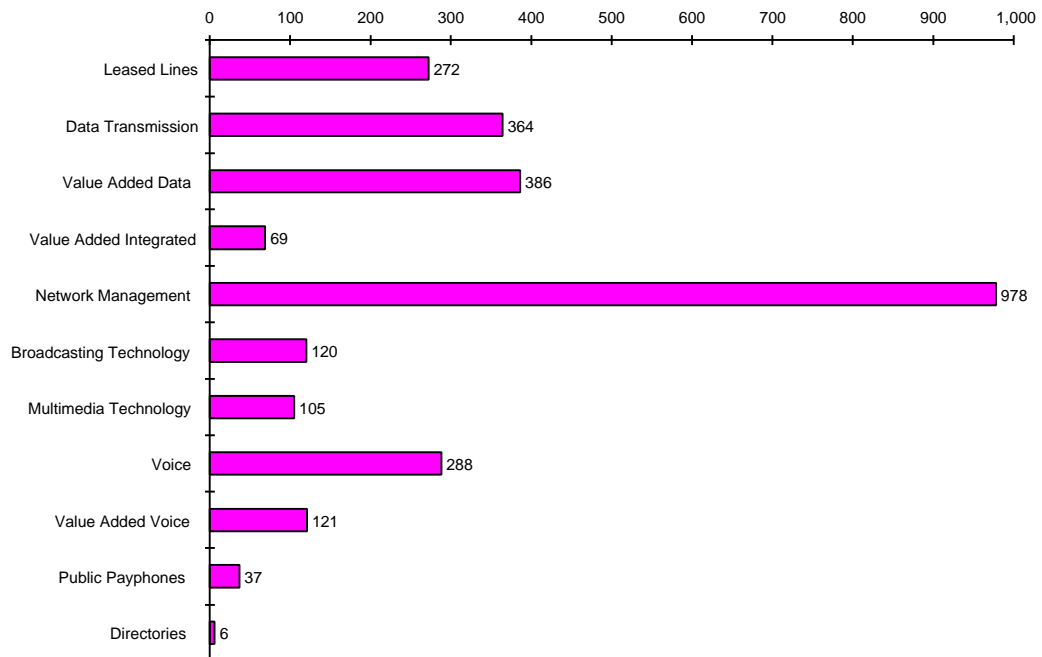
Section 4 of the TKG requires anyone providing a telecoms service to register with the RegTP. Most of the new providers registered offer voice telephony or Internet (access) services. Lists of providers and licence holders are available on the RegTP's web site at [www.regtp.de](http://www.regtp.de) ("Telecoms Regulation" ⇒ "Telecoms Service Providers").

## Regional Breakdown of Telecoms Service Providers

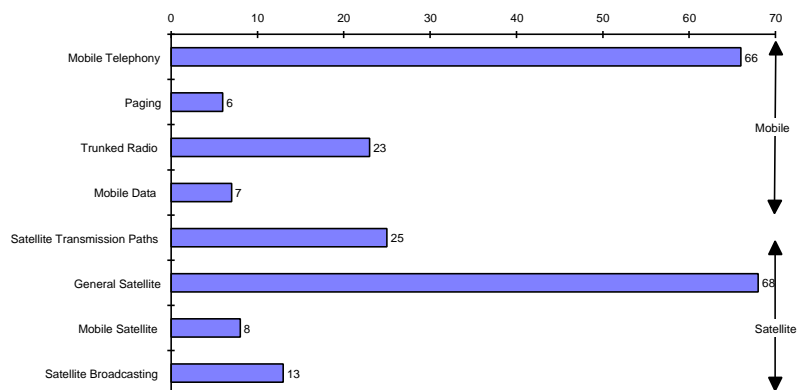


Network management services – the majority being Internet access services offered by Internet Service Providers (ISPs) – by far outweigh the other services.

## Fixed Telecoms Services



## Mobile and Satellite Telecoms Services



## Growth in Fixed Line Services

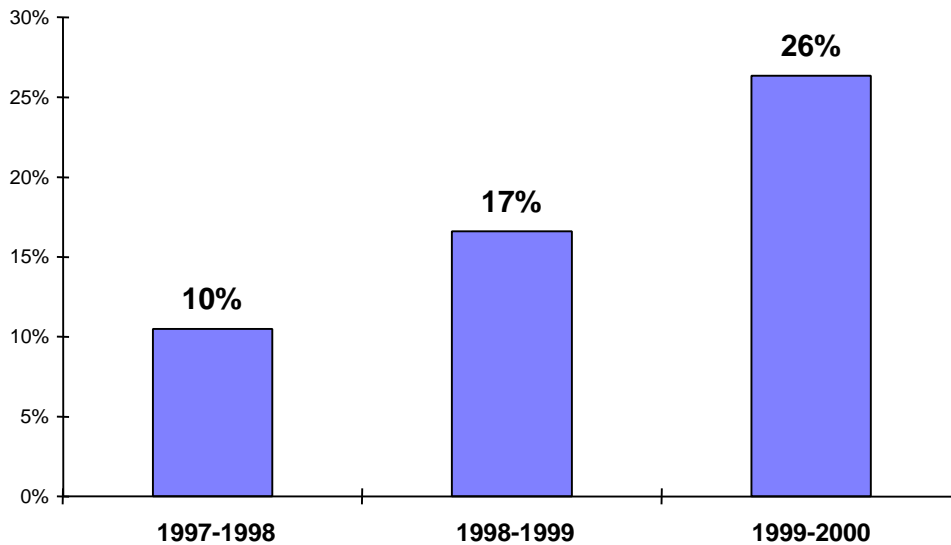
(Fixed Networks, Voice Telephony)

### Call Volumes

In the first half of 2000, the average daily volume for fixed calls was 746 million minutes. The total call volume for 2000 is therefore estimated at 290 billion minutes.

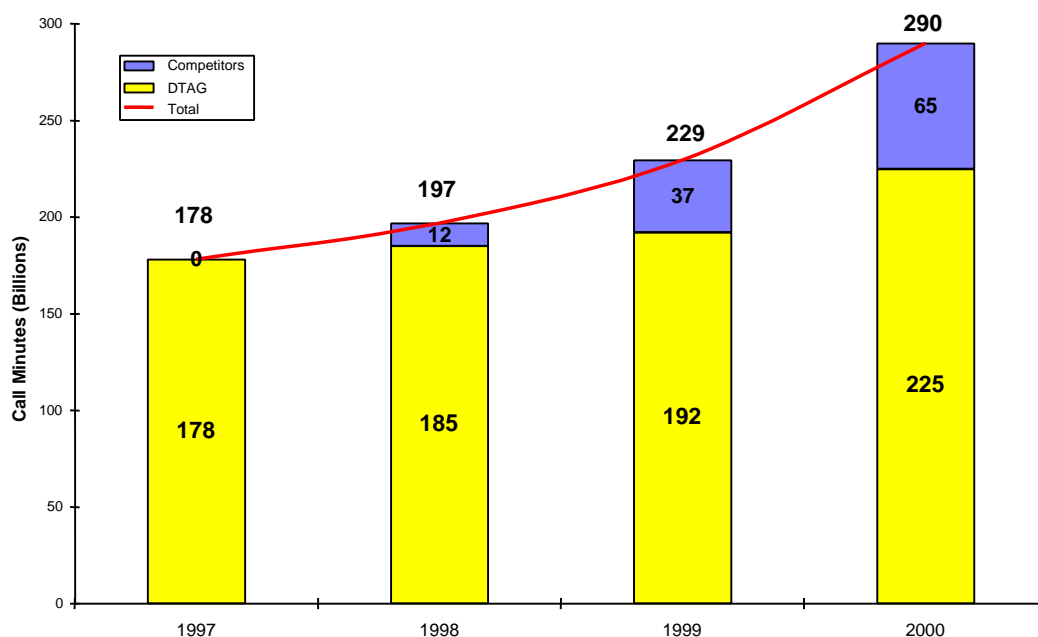
Fixed calls have shown a growth in volumes of over 60 per cent over the past three years. The following chart illustrates this upward trend:

### Annual Growth Rates in Fixed Network Traffic



These phenomenal growth rates have been fuelled by both calls to ISPs, which tripled over the year, and calls to mobiles. Based on trends in the first half of the year, the total call volume for DTAG's competitors in 2000 is put at 65 billion minutes.

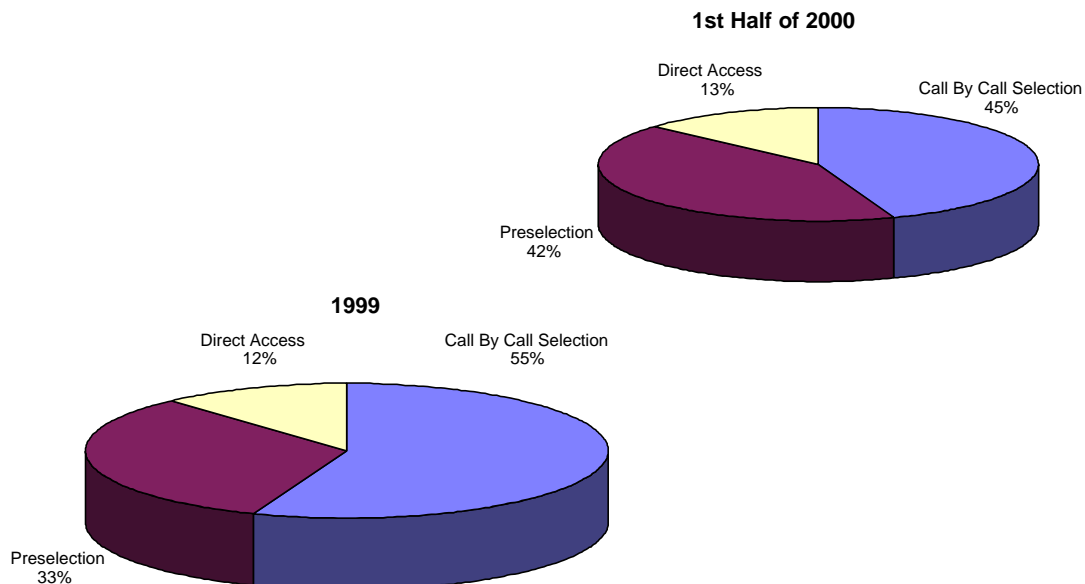
### Call Minutes (1997-2000)



In the first six months of 2000, DTAG's competitors increased their call volume to 29.2 billion minutes, or 22 per cent of the total call volume. 4 per cent of the calls carried by alternative operators over this period were local calls, 53 per

cent national calls, 26 per cent Internet calls, 8 per cent international calls, 5 per cent calls to mobiles, and 4 per cent other calls, such as calls to directory enquiries. 45 per cent of the calls were made using call by call carrier selection, 42 per cent using preselection, and 13 per cent using direct access, compared with 55, 33, and 12 per cent respectively in 1999. The number of customers choosing an alternative carrier as their preselected or direct access operator showed an increase of at least 10 per cent on the previous year. One of the reasons for this was cheaper pricing, including packages offering lower per minute call prices for a monthly fee. Many calls are still made, however, using call by call selection.

### Customer Access to Alternative Operators

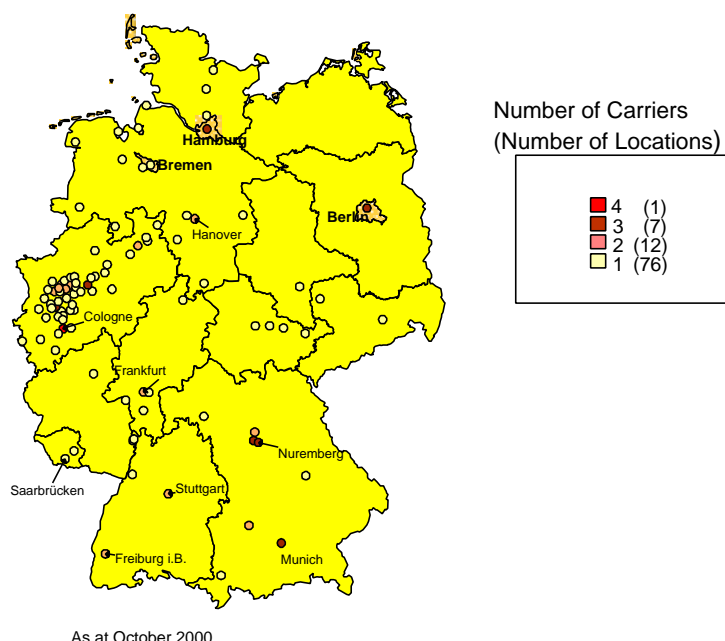


These figures are based on call volumes. Consumer surveys, however, are based on whether or not consumers actually use call by call selection, etc, as it is unlikely that they can say exactly how many of their calls they make using each of the options. Such surveys may therefore show different indirect access calling patterns, which, however, also represent something different.

### Competition in the Local Access Market

Some 100 companies now aim to provide both call services and access lines, with more than half actually active last year. At the end of September 2000, 52 companies besides DTAG were offering access services. One third of Germany's population can now choose between two or more access operators. 60 cities with more than 100,000 inhabitants now have a choice of supplier. In many cases, however, this choice is recent and may not be available throughout the city. 51 per cent of Germany's 188 towns with more than 50,000 inhabitants have a choice between DTAG and one or more alternative access operators.

### Number of Alternative Carriers in Cities with a Population over 50,000



A recent RegTP survey on market shares shows, however, that the number of lines already operated by DTAG's competitors is still relatively small.

At the end of September 2000, the number of fixed lines operated by the alternative access operators was around 650,000. This represents a market share of 1.3 per cent. This is expected to have increased to some 1.5 per cent of the 50 million or so fixed lines in Germany by the end of 2000.

### Market Shares of Alternative Access Operators

Segment		Market share
Lines	Analogue + ISDN <sup>2</sup>	1.3%
	ISDN	3.0%
As at end of September 2000		

DTAG's reports of demand from competitors suggest that 60 per cent of Germany's population will soon have a choice of access supplier. Added to this are competitors with their own copper or optical fibre infrastructure. Alternatives for bidirectional access via, for example, Wireless Local Loops (WLLs), broadband cable (CATV) networks, and Powerline Telecommunications (PLT) systems, are only just emerging. At the end of September 2000, cable modem service, providing bidirectional Internet access via CATV networks, was available to 260,000 German homes, and had been taken up by an estimated quarter of these households. Commercial rollout of PLT systems is not due until later this year.

<sup>2</sup> Integrated Services Digital Network

Alternative access operators therefore rely heavily on being able to use DTAG's local loops. The RegTP has required DTAG as the dominant operator to allow its competitors access to this "bottleneck" on request. Two thirds of the access lines operated by the competitors use local loops leased from DTAG. By the end of 2000, alternative operators had leased more than 321,000 loops to provide telephony services and high-speed Internet access (Digital Subscriber Line (DSL) access), having rented collocation space and concluded local loop agreements with DTAG. At the end of 2000, 95 such agreements were in place. The dependence of the competitors on DTAG is made clear in particular by the fact that they need physical access to the lines at the technical facilities located on DTAG's sites.

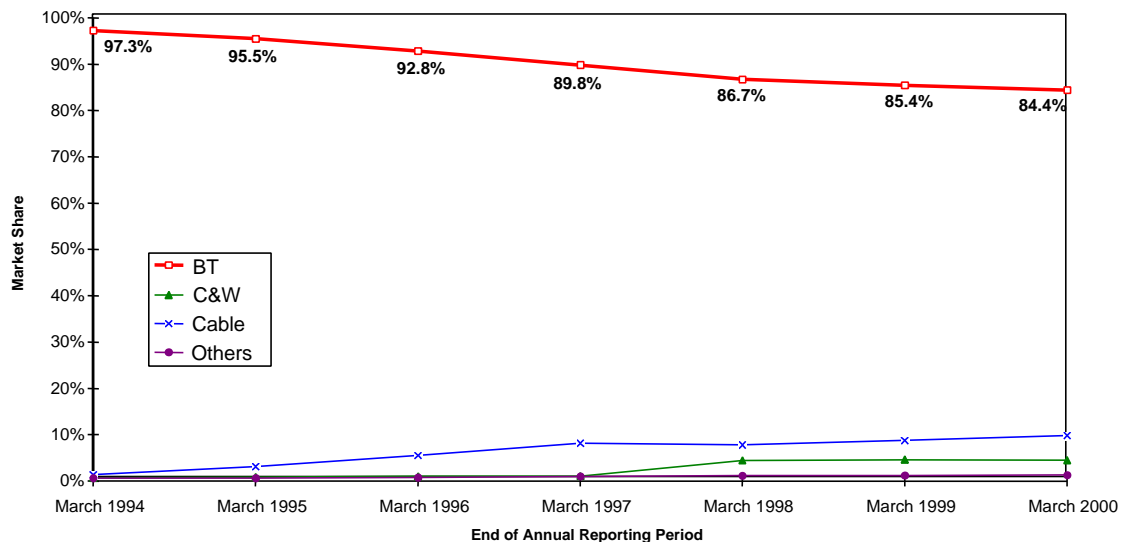
### **International Comparisons**

Internationally, Germany compares favourably in terms of competition in the local access market, given the relatively short time the market has been liberalised. By mid-2000, regulations providing for fully unbundled loops were in place in four European Union (EU) countries – Austria, Denmark, Germany, and the Netherlands. In addition, high-speed access has been introduced in Spain.

The European Commission on 12 July 2000 submitted its "Proposal for a Regulation of the European Parliament and of the Council on unbundled access to the local loop" (COM (2000) 394). An amended proposal was adopted by the Council of Ministers on 3 October 2000. The Regulation requires dominant operators in the EU to provide by 31 December 2000 full unbundled access and also shared access to their local loops.

Growth in the market shares of competitors in Germany is comparable even with that in countries such as the UK where the telecoms market has long been open to competition. UK was the first EU country to liberalise its telecoms market: in the mid-1980s the market was opened up, but for a duopoly only; then from the early 1990s, following the duopoly review, cable operators were allowed to offer switched communications, including voice telephony, over their networks. Cable and other new network operators in the UK have now had 10 years to establish themselves as alternative telephony suppliers. However, as the following chart shows, BT's share of the local market was only slightly smaller three years after liberalisation of the German market than in 1994, three years after full market liberalisation in the UK:

### BT's Market Shares of Telephone Lines in the UK



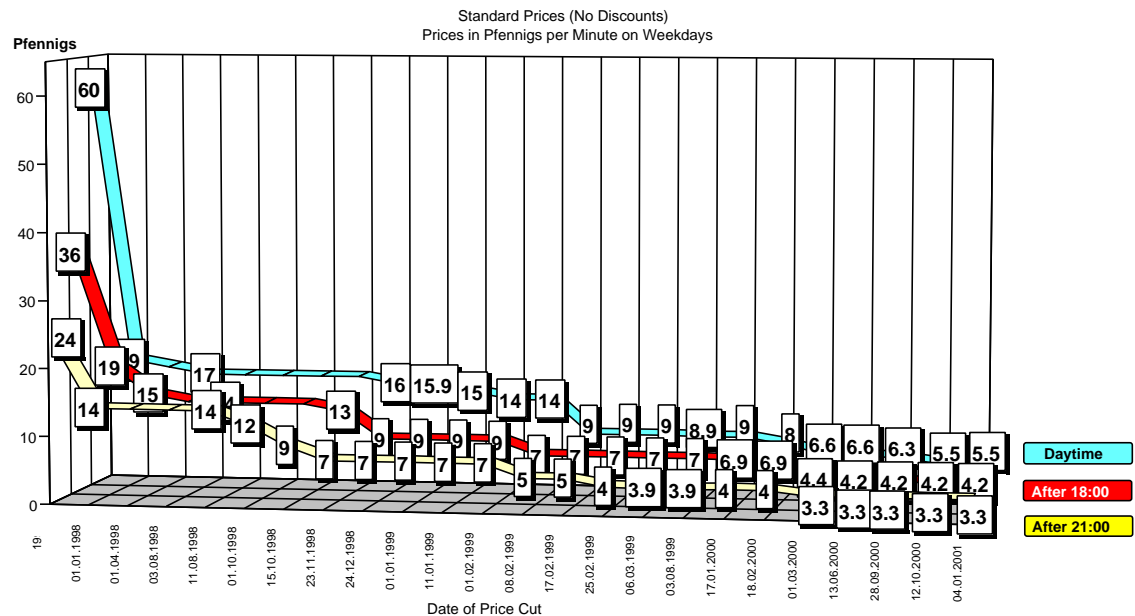
Sources: Market Information 1994/95 to 1998/99, Oftele, January 2000; Market Information Update, Oftele, July 2000

### Price Trends

Since the voice telephony market was fully deregulated on 1 January 1998, there has been a dramatic fall in the prices for national calls as a result of competition. Between the end of 1997 and the beginning of 2001, prices for national weekday calls fell by up to 92 per cent, depending on the time of day. Recent months have also witnessed a further cut in the prices for national, Internet, international, and fixed to mobile calls. At the beginning of 2001, prices for national calls using call by call carrier selection, for example, showed a decrease of up to 39 per cent on the previous year.



## Minimum Prices for Fixed National Calls using Call by Call Selection



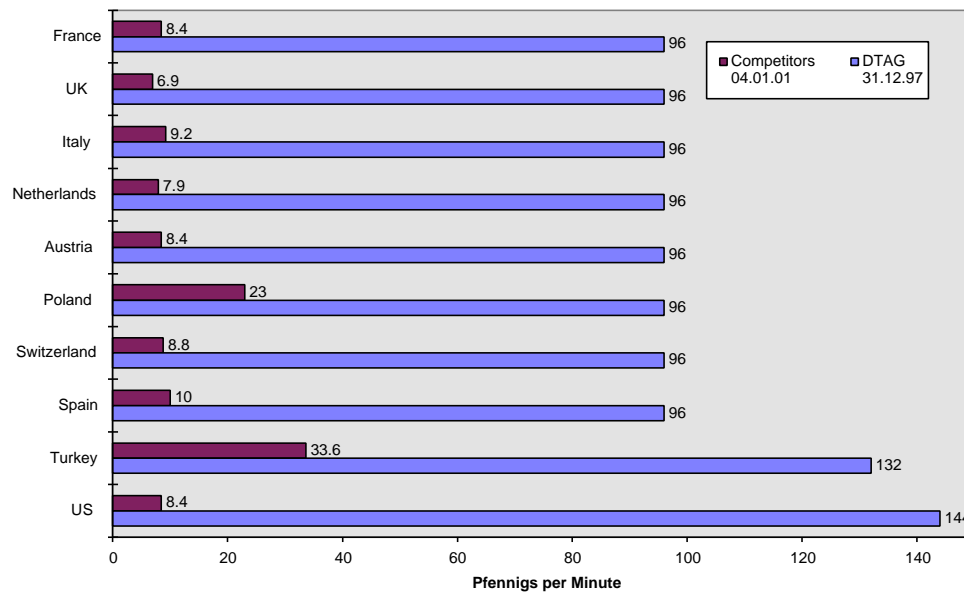
Registered call by call, preselection, and direct access packages offer even lower prices.

Competition has also brought the consumer huge savings in costs for international calls, with prices falling steadily. Since market liberalisation in January 1998, prices for calls during peak, daytime hours to eight of the 10 major destination countries have fallen by between 89 and over 94 per cent<sup>3</sup>. The following chart, based on the prices for calls using call by call selection and preselection, illustrates this downward trend:

<sup>3</sup> Lowest price offered by a competitor.

## Prices for International Calls to 10 Major Destinations

Standard Prices (No Discounts) - Peak Weekday Hours



## Mobile Market

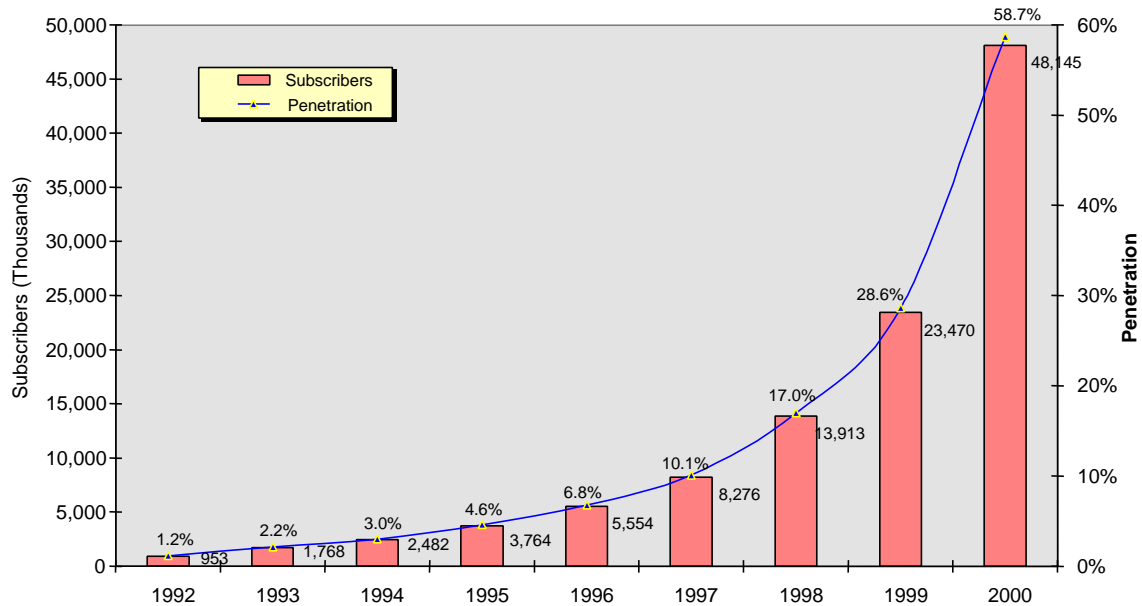
### Subscribers and Penetration

Annual growth in the mobile market again showed an increase on the previous year. The total subscriber base (D1, D2, E1, and E2) increased from 23,470<sup>4</sup> million to 48,145 million during the year. This represents a net growth of 105 per cent, compared with 68.7 per cent in 1999. Mobile penetration<sup>5</sup> amongst the German population stood at around 59 per cent at the end of 2000. In terms of the number of subscribers, Germany now tops the European league table, ahead of Italy and the UK. In terms of penetration, Germany is gradually catching up the leading countries – Austria, Finland, Iceland, Norway, and Sweden – where penetration had exceeded 70 per cent by the end of 2000. In spite of a future decrease in annual growth rates, penetration in Germany is this year expected to reach the peak levels currently achieved in a number of other western European countries. Subscriber numbers and penetration have shown exponential growth since 1992:

<sup>4</sup> This figure includes subscribers to the C network, which was switched off on 31 December 2000.

<sup>5</sup> Penetration rate = percentage of the population owning a mobile.

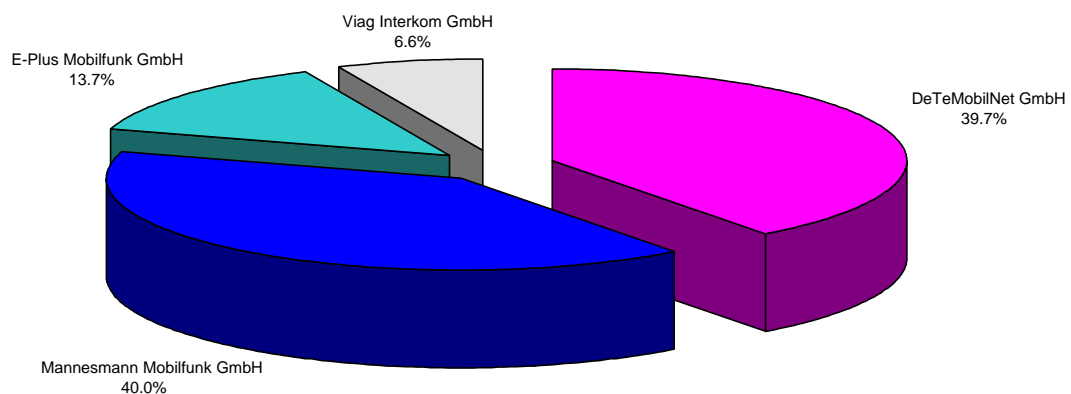
### Mobile Subscribers and Penetration



Growth in 2001 is expected to show a marked decrease on the previous year. The market is slowly nearing saturation point, estimated at 80 per cent penetration, or some 65 million subscribers.

The following chart shows the mobile operators' market shares in 2000<sup>6</sup>:

### Mobile Operators' Shares of Total Subscriber Base (31 December 2000)



<sup>6</sup> Network subscribers irrespective of the end customer's contracting partner (service provider or network operator).

### **Trends in Services and Prices**

Mobile operators and service providers focused last year's marketing strategy on pre-pay packages. By the end of the year, prices for pre-paid packages had fallen below, and in some cases well below, the DM 100 mark. As a result, pre-pay subscribers accounted for between 75 and 80 per cent of all new connections, and now make up around half of all mobile subscribers. Text messaging (Short Message Service, or SMS) is particularly popular, especially among younger users. The uptake of Wireless Application Protocol (WAP) services – launched last year to give mobile Internet access to specially optimised web content – was slower than expected by the operators: WAP phones were not readily available at first, and also the small number of users were disappointed by the range of services and in particular the data rates (9.6 kbit/s). The number of WAP users increased from around 400,000 in mid-2000 to an estimated 2.5 million at the end of the year. But despite the increase in the number of subscribers with WAP phones, the number of customers regularly using WAP services is much smaller. WAP services are set to become more and more attractive thanks to the launch of, for example, the General Packet Radio Service (GPRS) and High Speed Circuit Switched Data (HSCSD), which can boost data capabilities by transmitting data via packets or combined channels.

The Federal Statistical Office reported a further decrease in the price index for mobile telephony. Prices of mobile telephony services have fallen by 38 per cent since the end of 1997. On average, overall prices fell by around 14 per cent during 2000.

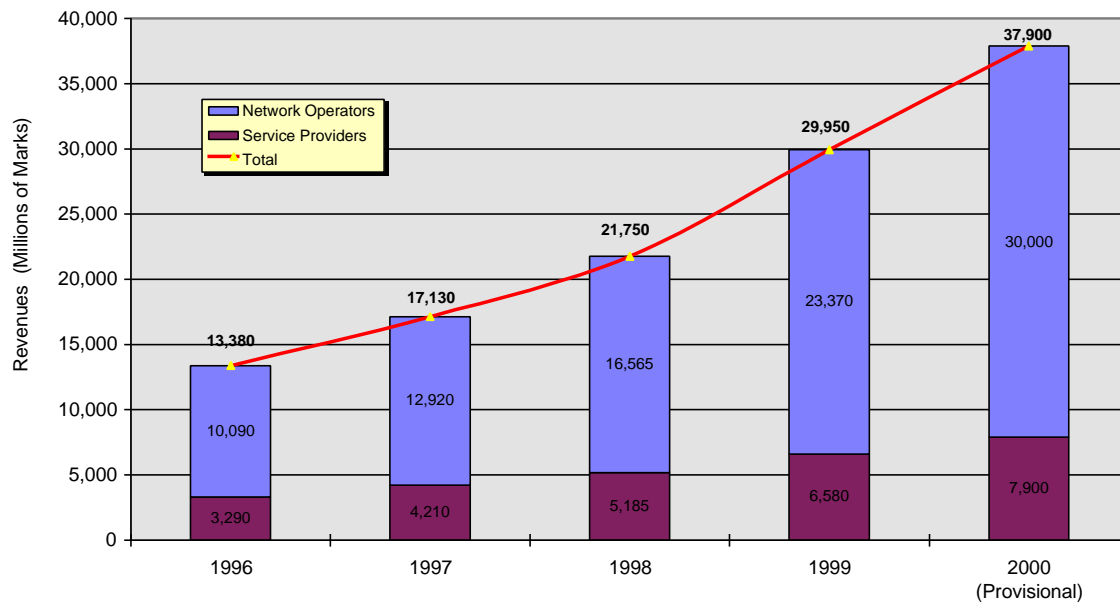
### **Revenues**

Operator and service provider revenues showed another increase. Initial estimates put the total revenues of the four operators alone – Deutsche Telekom MobilNet GmbH (D1), Mannesmann Mobilfunk GmbH (D2), E-Plus Mobilfunk GmbH (E1) and Viag Interkom GmbH & Co. (E2) – at over DM 30 billion. Total turnover is expected to have grown by 25 per cent. The following chart shows the increase in revenues of the mobile operators and service providers<sup>7</sup>:

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<sup>7</sup> Revenues: total revenues generated by companies in the mobile market, ie revenues earned through end customers (equipment and services) plus revenues earned through other companies.

## Growth in Mobile Revenues

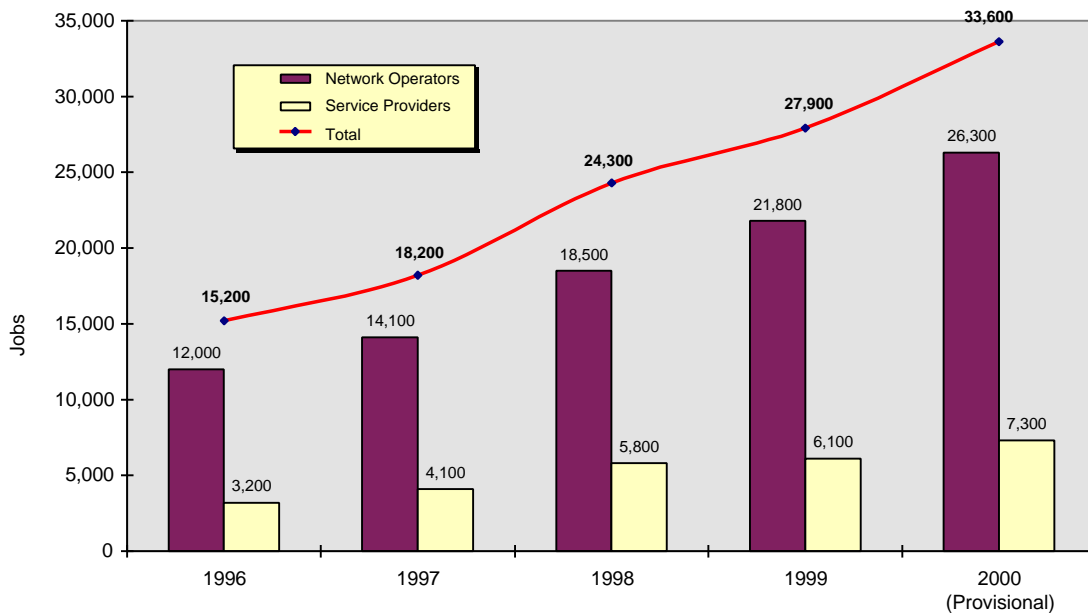


A comparison between revenue and subscriber growth shows that the growth rate for revenues is much lower than that for subscribers. This is due partly to the fall in prices, but much more to the decrease in average revenues per subscriber. One of the reasons for this is the marked increase in the number of pre-pay subscribers.

### Jobs

The number of staff employed by the mobile operators and service providers rose from 27,900 to 33,600 during 2000. This represents an increase of 20 per cent. Overall, the growth in jobs fell short of expectations, given the strong subscriber growth during the year. The following chart shows the breakdown of jobs between network operators and service providers:

## Growth in Jobs in the Mobile Market



The somewhat slower rate of growth in jobs was due to the intense competition between network operators, accompanied on the one hand by price cuts and, on the other, by company rationalisation.

### Investment

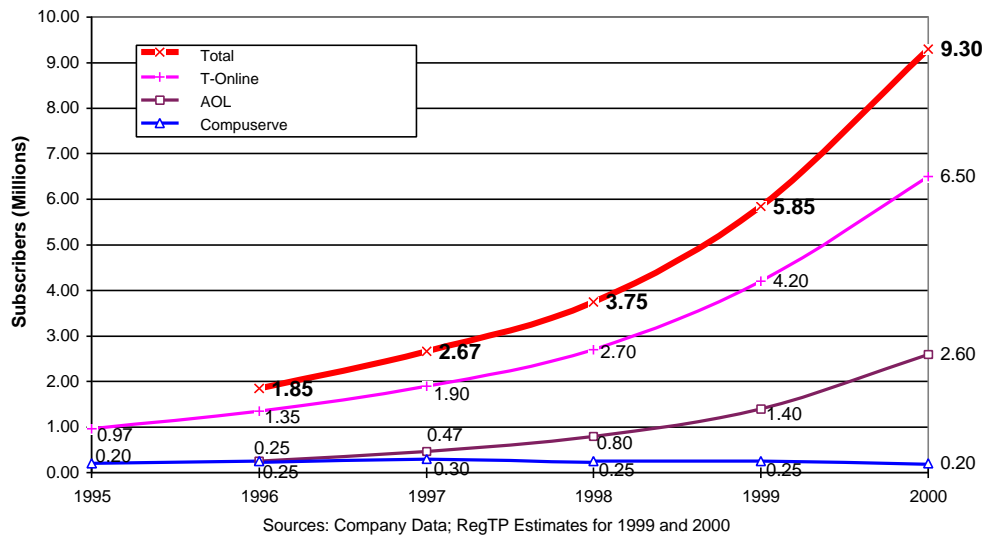
Between them, the four operators invested some DM 5.8 billion in network build-out and new data transmission methods. This represents an increase of around DM 0.8 billion on the previous year. Overall, almost DM 14 billion has been invested in the mobile market over the past three years. Vital base station rollout has accounted for much of this investment. Higher investment levels are expected in future, with third-generation (3G) networks set to cost operators several billions of marks a year.

## Internet/Online Market

### Subscriber Growth

Germany's three largest online service providers (T-Online, AOL, and Compuserve) together had some 9.3 million subscribers at the end of the year.

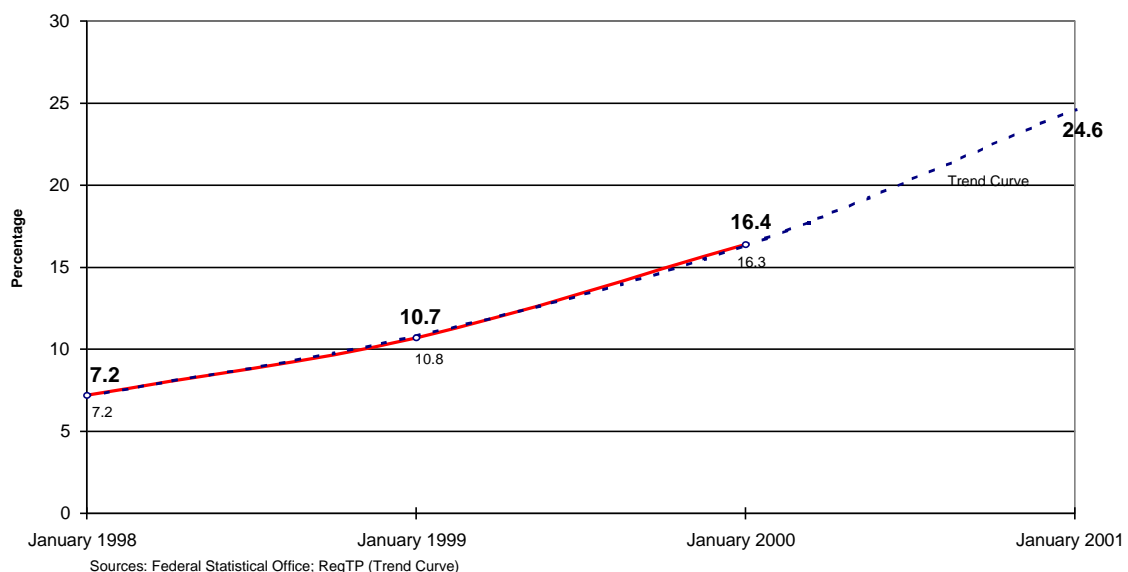
### Internet Subscriber Growth



### Internet Use

A noticeable proportion of consumers use a dial up connection to access the Internet. Others use leased lines and, more recently, broadband DSL. According to the Federal Statistical Office, 16.4 per cent of German homes had access to the Internet or online services at the beginning of 2000. Trend data suggest an increase in the proportion of homes with Internet access to 24 per cent at the end of 2000.

### Percentage of Homes with Internet Access



The RegTP estimates that almost 24 million people now use the Internet at

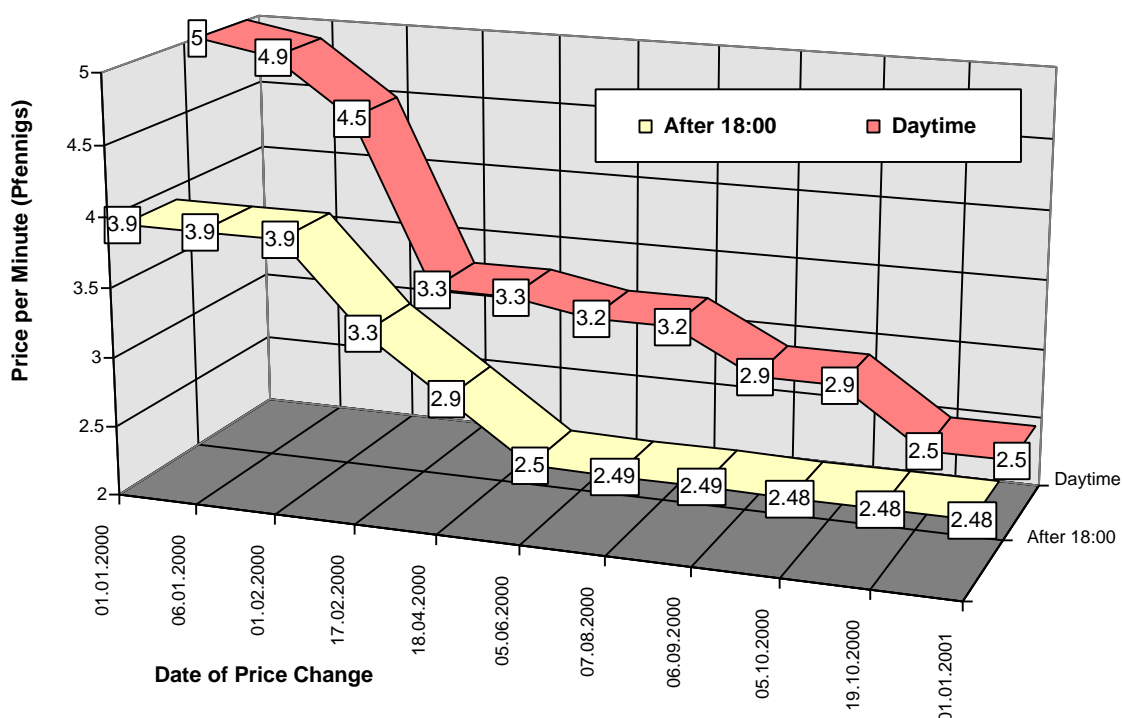
home, at work, or in Internet cafés, compared with around 14.4 million at the end of 1999<sup>8</sup>. This represents an annual increase of some 70 per cent. Germany remains first in Europe in sheer number of users. But there is still considerable potential in terms of penetration, where Germany is not among the leaders (ranked 11<sup>th</sup> in Europe in a mid-2000 study by ACNielsen). Vital for realising this potential is competition on the playing field as created, and to be ensured, by regulatory decisions. The importance of this sector cannot be overestimated.

### Internet Packages

The phenomenal growth in the number of subscribers is due not least to the fall in prices both for pay-as-you-go calls and for unmetered packages.

Pay-as-you-go Internet access entails no registration, no monthly subscription, and no minimum usage. Last year saw a dramatic fall in user costs: prices for daytime calls fell by 50 per cent from 5 to 2.5 pfennigs per minute, and for evening calls by 35 per cent from 3.9 to 2.48 pfennigs per minute. Call prices for users registering with an ISP are even lower.

### Minimum Prices for Pay-As-You-Go Internet Access



Customer acceptance of these price cuts is reflected in the increase in the number of users. The pay-as-you-go option is attractive in particular to new users not wanting to tie themselves to any one provider too soon. But unmetered packages – offered mainly by city carriers – are also popular.

<sup>8</sup> Source: Gesellschaft für Konsumforschung (GfK).



## **DSL Internet Access**

The newest sensation in Internet access is DSL, which offers high speed Internet access over the standard copper loop. At the end of last year, 12 licence holders besides DTAG were offering DSL service on the basis of their local loop agreements. 78 of Germany's 188 towns with more than 50,000 inhabitants – representing 30 per cent of the German population – have a choice of DSL service provider in at least some parts of the town. Overall, DSL is now available in towns comprising 8 per cent of the total population. The number of alternative providers offering DSL, initially mainly for business users, will increase to some 23 by spring 2001<sup>9</sup>.

## **Mobile Radio Licences**

### **Licence Class 1**

#### **Universal Mobile Telecommunications System/International Mobile Telecommunications-2000 (UMTS/IMT-2000)**

3G mobile communications will enable the convergence of the Internet and mobile radio as two major growth markets. The award of 3G licences aims above all to make mobile multimedia communications a reality, providing high speed, mobile access to the Internet and high bit rate, video based communication, entertainment and information services. The Rulings by the President's Chamber of 18 February 2000 on the award conditions and the auction rules for the 3G licences underpinned the intensive preparations for the auction. Seven of the 11 applicants that qualified at the end of May 2000 actually competed in the auction. Bidding was launched on 31 July 2000 and ended on 18 August 2000. The six winning bidders, among them the four GSM<sup>10</sup> network operators, together paid almost DM 100 billion for licences each carrying 2 x 10 MHz (paired) and, except for one bidder, 1 x 5 MHz (unpaired) spectrum:

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<sup>9</sup> Asymmetric Digital Subscriber Line (ADSL) is generally available with current data rates below 1 Mbit/s downstream. Symmetric Digital Subscriber Line (SDSL) and High Data Rate Digital Subscriber Line (HDSL) providing up to 2 Mbit/s is offered for mainly business users.

<sup>10</sup> Global System for Mobile communications

Winning bidder	Spectrum package	DM
E-Plus 3G	2 x 10 MHz paired plus 1 x 5 MHz unpaired	16,491,800,000
Group 3G	2 x 10 MHz paired plus 1 x 5 MHz unpaired	16,568,700,000
Mannesmann Mobilfunk	2 x 10 MHz paired plus 1 x 5 MHz unpaired	16,594,800,000
MobilCom Multimedia	2 x 10 MHz paired plus 1 x 5 MHz unpaired	16,491,000,000
T-Mobil	2 x 10 MHz paired plus 1 x 5 MHz unpaired	16,704,900,000
VIAG Interkom	2 x 10 MHz paired	16,517,000,000
	Total	99,368,200,000

The winning companies and consortia are thus entitled to operate in Germany a mobile radio network to a 3G standard.

### Paging

The RegTP in its Official Gazette of 23 February 2000 published a consultative document, setting out the key elements of its concept for the award of a new paging licence, and seeking the views of interested parties. This was followed by the publication on 12 July 2000 of a draft determination by the President's Chamber on the choice of award proceedings and the conditions and rules for the award. After analysing the comments received, the President's Chamber decided on tendering out a new paging licence and laid down, in consultation with the Advisory Council,

- the choice of the award proceedings as provided for by Section 11(1) sentence 1 of the TKG,
- the determinations and rules according to Section 11(6) sentence 2 subparagraphs 1 to 4 of the TKG, and
- the tendering conditions as referred to in Section 11(6) sentence 5 of the TKG,

which pave the way for the award in 2001 of a paging licence in the band at 460 MHz.

### Trunked Radio

On 22 November 2000 the RegTP published under Section 10 of the TKG the draft determination by the President's Chamber on the award of licences for the operation of trunked radio networks, inviting comments on its proposals by 22 December 2000. The RegTP's plans retain the concept of regional licence areas, but lift the restriction on the number of licences that can be granted, as it is presumed that there is adequate spectrum available in the band at 410–

430 MHz. The draft determination therefore proposes to repeal the general principles of 16 October 1991 for awarding licences to set up and operate trunked networks, which limit the number of licences. The draft also provides scope for awarding open standard licences as requested by the applicant (for a maximum licence area of 15,000 km<sup>2</sup>).

## **Licence Class 2**

### **Satellite Communications**

The demand for satellite licences remains constant. The RegTP has been actively involved in the work of an international group on harmonising satellite licensing procedures in member countries of the European Conference of Postal and Telecommunications Administrations (CEPT).

## **Class 3 and 4 Licences**

### **Transmission Paths and Voice Telephony**

Class 3 and 4 licences are generally granted upon application with no restrictions. Class 3 licences may, however, also be granted on request with limitations on the use of the transmission paths (for receiving and/or distributing broadcast signals only). The following figures relate solely to the licences still on issue.

To date, 990 "unrestricted" and 356 "restricted" Class 3 licences (for transmission paths) have been granted, and 376 Class 4 licences (for voice telephony).

	1996	1997		1998		1999		2000	
	2 <sup>nd</sup> half	1 <sup>st</sup> half	2 <sup>nd</sup> half	1 <sup>st</sup> half	2 <sup>nd</sup> half	1 <sup>st</sup> half	2 <sup>nd</sup> half	1 <sup>st</sup> half	2 <sup>nd</sup> half
Class 3	14	65	117	98	141	99	125	203	484
• Unrestricted	14	20	33	41	106	71	84	184	437
• Restricted	0	45	84	57	35	28	41	19	47
Class 4	3	10	29	52	70	62	36	60	54

These 1,722 licences are held by 620 companies. Mergers, licence transfers, and similar circumstances have led to a decrease in the number of holders, compared with the number of companies initially granted a licence.

The number of companies currently holding a Class 3 licence is 566, compared with 575 original holders. 308 hold an unrestricted licence, and 271 a restricted licence. 177 companies also have a Class 4 licence.

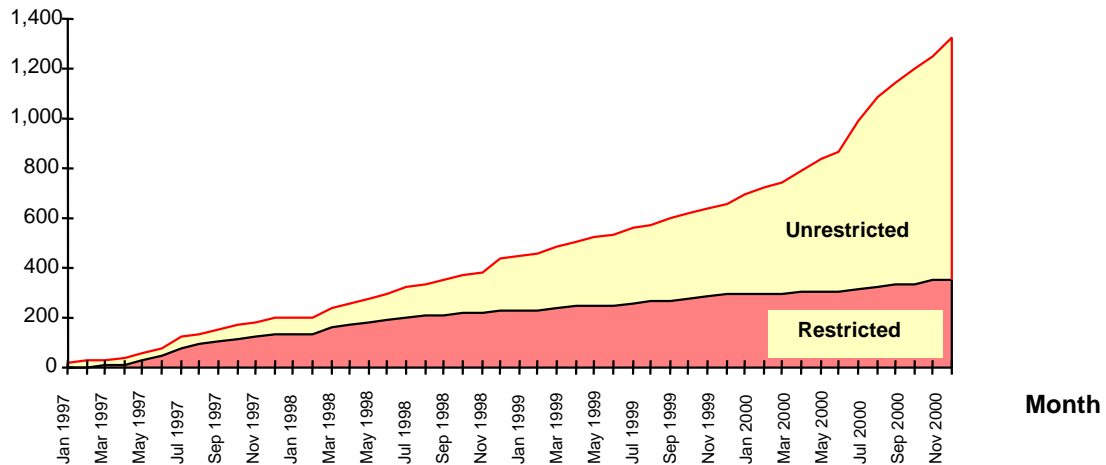
362 companies hold an unrestricted Class 3 licence and/or a Class 4 licence. 21 Class 3 and 63 Class 4 licences have been granted for nationwide operation.

The following charts illustrate the continued boom in the telecoms market, which has experienced dynamic growth since the infrastructure and voice telephony monopolies were lifted.

## Licence Class 3

Total number of licences granted (modifications included),  
excluding broadcasting licences

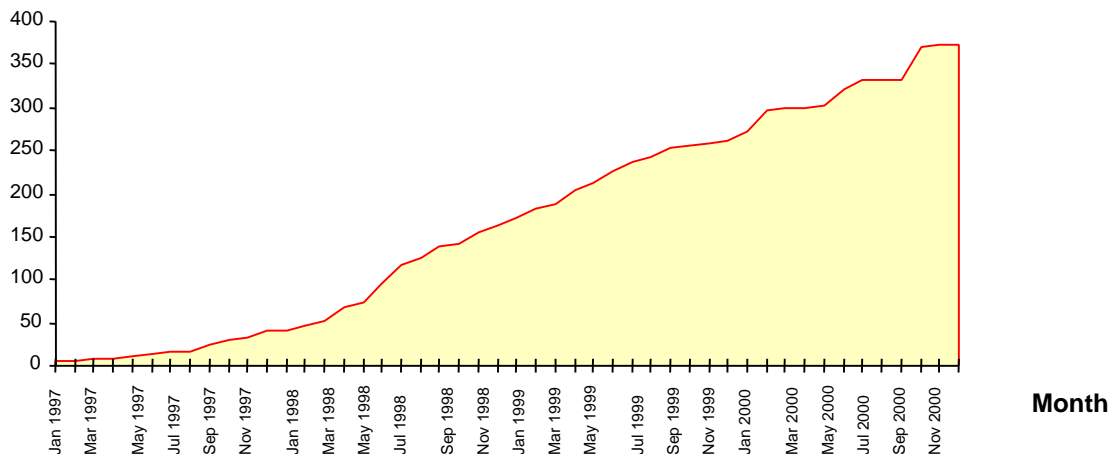
### Licences



## Licence Class 4

Total number of licences granted (modifications included)

### Licences



## Rights of Way

At the end of 2000, a total of 83 towns in Germany fell within the responsibility of the RegTP as provided for by Section 50(4) of the TKG. This means that the authorities responsible for constructing and maintaining public ways in the towns had merged under Section 37 of the Restraints of Competition Act (GWB) with a city carrier. Here, it is the task of the RegTP – undertaken by 39 of its 46 Regional Offices – to grant approval to licence holders wishing to use the public ways to install

new or modify existing telecoms lines. Around 4,800 such approvals were granted during 2000, compared with approximately

400 in 1997  
1,900 in 1998, and  
2,900 in 1999.

## Number Management

The RegTP took over responsibility for managing and allocating numbers in Germany on the opening up of the telecoms market to competition. Number management first involves structuring the national numbering space. This covers all the subranges in the national public telephone network/ISDN range, from the national prefix 0, through 012 for innovative services or 0700 for personal numbers, to 118xy for directory enquiry services. Also part of the national resource managed by the RegTP are the so-called "technical numbers" such as carrier portability codes, National and International Signalling Point Codes (NSPCs and ISPCs), charging reference branches, Closed User Group Interlock Codes (CUGICs), and manufacturers' codes for carriers and service providers.

However, structuring alone is not enough. Allocation rules that every user must observe are needed for the different types of number. These rules set out, for example, who is eligible to apply, what conditions must be met when the allocated numbers are used, and what happens to numbers recovered. The following sets of allocation rules came into effect in 2000: for International Mobile Station Equipment Identities (IMEIs), equipment manufacturer codes for telematic protocols, numbers for public trunked networks, Individual TETRA<sup>11</sup> Subscriber Identities (ITSIs), International Mobile Subscriber Identities (IMSIIs), and numbers for public cellular mobile services.

Once the framework is in place, allocation can begin. Service providers apply to the RegTP for, say, blocks of 1,000 local numbers to suballocate to their customers. By 31 December 1999 a total of 6,570 blocks of local numbers had been allocated for 2,636 call areas and 72 operators, compared with 3,088 blocks for 710 areas and 53 operators one year earlier. Allocations at the end of 2000 stood at 50,861 blocks for 5,200 call areas and 89 operators.

	Allocated blocks	Local call areas	Operators
31 December 1998	3,088	710	53
31 December 1999	6,750	2,636	72
31 December 2000	50,861	5,200	89

Demand for numbers for value added services – 0700 personal numbers, 0800 freephone numbers, 0180 shared cost service numbers, and 0190 premium rate numbers – has also increased steadily:

<sup>11</sup> TETrarestrial Trunked RAdio

Service	Numbers allocated in 2000	Total numbers allocated
0800	31,117	136,674
0700	26,374	59,609
0180	19,919	90,616

There is also a strong demand for technical numbers, with an exceptionally large increase in the number of allocations for NSPCs.

Technical resources		
Allocations	2000	Total
NSPCs	520	1,193
ISPCs	63	191
Portability codes	32	125
CUGICs	5	15
Charging reference branches	68	85
Equipment manufacturer codes for telematic protocols	8	8
Notification of International Carrier Codes (ICCs)	3	9
Mobile Country Codes (MCCs), Mobile Network Codes (MNCs), Network Colour Codes (NCCs)	4	16
Data Network Identification Codes (DNICs)	4	16

Numbering resources		
Numbers	Number of blocks allocated in 2000	Total number of blocks allocated
User groups	5	7
International Virtual Private Networks (IVPNs)	16	26
Innovative services	0	3

## Frequency Management

### World Radiocommunication Conference 2000 (WRC-2000)

The RegTP was represented in the German delegation, led by the Federal Ministry of Economics and Technology (BMWi), at WRC-2000 held in Istanbul from 8 May to 2 June 2000. RegTP staff acted as Deputy Head of Delegation and headed two CEPT negotiating teams. In all, the Conference was attended by over 2,300 participants from some 180 delegations and numerous international organisations.

The main issues on the agenda were extension bands for UMTS/IMT-2000, replanning the broadcasting satellite bands, allocations for High Density Fixed Services (HDFS), and new allocations to the radionavigation satellite service.

The additional bands identified at the Conference for the terrestrial component of UMTS/IMT-2000 were 806-960 MHz (in Europe 862-960 MHz), 1710-1885 MHz and 2500-2690 MHz, and for the satellite component 1525-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, 2483.5-2500 MHz, 2500-2520 MHz and 2670-2690 MHz.

The bands at 862-960 MHz and 1710-1885 MHz are currently used in Europe by GSM systems, and hence will not be available in the short to medium term for UMTS/IMT-2000. Europe will therefore use in the short term the band at 2520-2670 MHz and in the long term the whole of the band at 2500-2690 MHz as the terrestrial component extension, while a number of American countries will begin with the band at 1710-1885 MHz.

The RegTP will be involved in integrating these decisions into the European scheme that will then underpin the RegTP's national regulations.

As a result of replanning the broadcast satellite bands (11.7-12.5 GHz and 17.3-18.1 GHz), Austria, Germany, Liechtenstein and Switzerland achieved their aim of being accorded a shared footprint and orbital position (18.8°W) together with the equivalent of 10 channels each.

WRC-2000 provided additional allocations for the radionavigation satellite services – 1164-1215 MHz, 1260-1300 MHz and 5010-5030 MHz for downlinks, and 1300-1350 MHz and 5000-5010 MHz for uplinks – and thus the necessary room for Europe's new system, Galileo. In order to safeguard Germany's interests, the RegTP submitted to the International Telecommunication Union (ITU) immediately after the Conference its own national filing for the new system under the name of GALILEO-Nav-2004.

The allocations made to HDFS cover the bands at 32, 52, 58 and 65 GHz, as identified at WRC-97. In particular the designation of the band at 31.8-33.4 GHz provides further spectrum of interest for fixed links in Germany. Allocation of the bands at 37-40 GHz and 40.5-43.5 GHz increased the bandwidth capacity available above 30 GHz for HDFS to more than 13 GHz.

Thanks to its active involvement in the European preparations for the Conference, Germany was able to attain almost all of its objectives, which had gained broad consensus at national level and been presented in a total of 322 European proposals. The decisions taken at WRC-2000 now need to be transposed into national regulations and – where coordination at European level is necessary – into Decisions of the European Radiocommunications Committee (ERC). In particular the decisions on UMTS/IMT-2000 and the fixed services will favourably shape tomorrow's licensing options.

### **Temporary Use Assignments**

Temporary use assignments are granted to visitors of state wishing to use their own radio equipment when travelling within or through Germany. Assignments are made in cooperation with the Federal Foreign Office and foreign embassies, following checks by the RegTP on the availability and compatibility of the

frequencies to be used. On average, 90 such assignments are granted each year.

### **Publication of Administrative Principles for Frequency Usage**

At the beginning of the year the RegTP published its administrative principles on the use of frequencies, as the basis for the frequency usage plan to be drawn up by the RegTP in accordance with Section 46 of the TKG.

The loose-leaf publication comprises tables which detail all the frequency usages in Germany in the range from 9 kHz to 275 GHz, and which are updated as and when required. The tables show which bands have been allocated to which services, and which subbands designated for which types of radio application. The publication also sets out the general frequency usage conditions, giving a brief description of each frequency application, and information on relevant type approval specifications, frequency assignment procedures, licensing requirements, usage periods, national and international planning, and other recommended usage parameters. Also included are the provisions for using frequencies for other purposes such as industrial, scientific, medical, and domestic applications.

Orders for the publication can be faxed (RegTP, Dienststelle 125a, fax +49 228 14-6125) or e-mailed (Wolfgang.Becker@regtp.de). Copies are priced at DM 75.00 (€ 38.35) (plus postage and packaging) each, with payment preferably on delivery.

### **Powerline Telecommunications (PLT)**

Last year the RegTP received an increasing number of enquiries from manufacturers and operators regarding the possible use of subbands in the frequency range from 9 kHz to 30 MHz and the assignment of frequencies for telecommunications over unshielded powerlines.

The RegTP felt prompted to give the public and all interested circles an opportunity to present their ideas regarding PLT systems, with the aim on the one hand of accommodating the wishes of the potential operators of PLT systems and, on the other hand, of safeguarding the interests to be protected of the spectrum users. In its first consultation of 23 August 2000, the RegTP requested information from PLT system manufacturers and operators about their ideas. In a second consultation of 20 December 2000, the RegTP invited current and future users of radio applications in the frequency range from 9 kHz to 30 MHz to present their views on the introduction of PLT systems. The combined aim of the two consultations was to provide the RegTP with, amongst other things, information about all the key planning parameters and in particular about the required frequency bandwidths, and to help to find practicable solutions for implementing PLT. This was seen as necessary to enable a decision by the RegTP that would safeguard all the various interests. In the light of the results of the two consultations, the RegTP will decide on an appropriate updating of its administrative principles for frequency usage.



### **Multimedia Wireless Systems (MWS) at 40.5-43.5 GHz**

Multimedia Wireless Systems (MWS) are terrestrial Point to Multipoint (PMP) radiocommunication systems that provide Fixed Wireless Access (FWA) direct to the end user for multimedia services and bidirectional text, graphics, voice, image, data and video communications. MWS applications include Internet access, video conferencing, virtual banking, telemedicine, telelearning, online entertainment, digital video distribution, home shopping, teleworking, virtual libraries, and telematics.

In view of its plans to make radio spectrum available for MWS, the RegTP published a first, general consultation, and announced a second on spectrum demand. The aim of the two consultations is to identify public demand in terms of the type and conditions of usage in the available frequency band. This information will be used in the RegTP's decision making process on the national frequency usage provisions, which will in turn provide input for further discussions at international level.

In its first consultation, the RegTP invited comments from interested parties on the potential applications and associated spectrum demand within the scope of the current international framework. The second consultation will aim to identify the exact frequency requirements. In light of these results, the RegTP then plans to split the available spectrum between the various applications and to detail the conditions for frequency usage.

### **Frequency Assignment**

#### **Fixed Point to Point Links**

Frequencies continue to be in great demand, and will be even more so with the upcoming connection of PMP central stations for FWA and the preparations for connecting 3G networks via fixed point to point links. At present, 39,917 fixed links are operated in Germany. Of these, 7,282 were new assignments in 2000.

Demand was heaviest in the following bands:

	<b>Total number of assignments</b>	<b>Number of new assignments in 2000</b>
7 GHz	1,533	194
15 GHz	3,356	820
18 GHz	2,820	577
23 GHz	11,782	1,654
26 GHz	4,306	1,417
38 GHz	12,329	2,074

Improvements in particular in the major operators' systems last year led to a decrease in the total number of fixed links operated, although there was an increase in the actual transmission capacity available.

#### **Fixed PMP Links**

Frequencies for PMP links for FWA were awarded by tender in late 1999. In the first half of 2000, frequencies were then assigned for those regions with an

adequate supply of spectrum. The following assignments were made during 2000:

	2.6 GHz band	3.5 GHz band	26 GHz band
Assignments by tender		<b>91</b>	<b>519</b>
Assignments by application	<b>273</b>	<b>265</b>	<b>363</b>

Most system operators have now completed their trials, and by the end of 2000 startup of operations had been notified for 250 coverage areas.

### **Tendering Process in 2000**

Following the first tendering process in 1999, a total of 162 frequencies in various coverage areas remained available. The RegTP launched a second process to tender out this spectrum. Of the 162 assignable frequencies there were

- 12 in the band at 2.6 GHz  
(in 12 coverage areas),
- 47 in the band at 3.5 GHz  
(in 41 coverage areas), and
- 103 in the band at 26 GHz  
(in 90 coverage areas).

The 12 frequencies in the band at 2.6 GHz are available for use until 31 December 2007 only, after which they will be needed for UMTS/IMT-2000.

Tendering was officially launched on 10 May 2000, the deadline for applications being 21 June 2000. The requirements to be met by the applicants largely mirrored those in the first tender. In all, 14 companies submitted a total of 503 separate applications for the 162 frequencies. The President's Chamber on 12 December 2000 decided on the award of the frequencies in the individual coverage areas.

### **Satellite Communications**

Last year the RegTP made new assignments for 1,230 transmitting earth stations, mostly Very Small Aperture Terminals (VSATs) and Satellite News Gathering (SNG) stations. Coordination with fixed link systems sharing the same bands was necessary for 95 assignments, or 2,547 individual frequencies. The total number of transmitting earth stations for which individual assignments have been granted now stands at around 10,000. Receive-only satellite earth stations can be operated in Germany without individual frequency assignment.

The RegTP submitted to the ITU in Geneva on behalf of the Federal Republic of Germany three new filings for non-geostationary systems (TERRASAR, GALILEO-NAV-2004, and BIRD) and two for DFS successor systems (DFS-III)

with additional frequency bands. It also initiated 14 publications for existing German satellite network filings. To date, Germany has filed 30 geostationary and 13 non-geostationary satellite systems with the ITU.

Last year the RegTP also authorised operation of the CHAMP, EUROPE\*STAR 1 (45°E) and EUROPE\*STAR 3 (47.5°E) satellite systems, and transferred the rights required to use the orbital locations and frequencies. EUROPE\*STAR is the first commercial satellite communications system to be operated by a private company under a German filing with the ITU.

### **Broadcasting**

The RegTP in 2000 processed the following assignments and modifications for broadcasting services:

- 227 assignments for the very high frequency (VHF) band,
- 31 assignments for analogue television,
- 154 assignments for the high frequency (HF) band,
- 234 modifications for the HF band,
- 3 assignments for the medium frequency (MF) band,
- 77 assignments for commercial terrestrial digital audio broadcasting (T-DAB) operation,
- 83 assignments for test T-DAB operation, and
- 12 assignments for test terrestrial digital video broadcasting (DVB-T) operation.

### **Tendering for T-DAB**

The award procedure for T-DAB frequencies is now complete – and thus the legal framework for the commercial launch of T-DAB services in place – in Baden-Württemberg, Bavaria, Berlin, Brandenburg, North-Rhine/Westphalia, Rhineland-Palatinate, Saxony, Saxony-Anhalt, and Thuringia. The launch of commercial service in Lower Saxony coincided with the opening of EXPO 2000 in Hanover. Award proceedings are underway in the other federal states and are due to be completed shortly.

Last year frequencies were also assigned for trials involving new, innovative broadcasting applications based on digital audio broadcasting (DAB).

### **Upcoming Award of DVB-T Frequencies**

The digitisation of terrestrial TV broadcasting on the basis of DVB-T relies on the necessary frequencies being awarded. In view of this, the RegTP played a decisive role in the Federal Government's digital broadcasting initiative. This meant that a consensus could be reached on the recommendations presented at an EXPO 2000 symposium by the Federal Minister of Economics and Technology, smoothing the way for the launch of commercial DVB-T services as early as 2001.

## Mobile Communications

The RegTP in 2000 dealt with

- 14,000 cases (such as new assignments, modifications, withdrawals and handbacks) for Private Business Radio (PBR), 3,300 of these being new assignments; PBR systems carry the internal communications of industrial and commercial users, administrations, and public safety organisations;
- 2,100 cases, including 1,100 new assignments, for mobile data and telemetry and telecommand;
- 32,300 cases for Citizens Band (CB) radio, 6,100 of which were new assignments;
- 7,700 cases, including 7,500 new assignments, for equipment for radio controlled models; and
- 5,300 cases, 2,700 of which were new assignments, for other Private Mobile Radio (PMR) applications such as paging and radio microphones.

Since radio frequencies do not stop at international borders, coordination with neighbouring administrations is usually necessary before German operators can use the mobile spectrum. Last year the RegTP completed 4,314 cases of cross-border coordination for German stations, and 3,461 for foreign stations. The application of preferential frequency agreements with neighbouring countries enabled a substantial reduction in the number of coordinations required for GSM networks.

## Temporary Use Assignments for Foreign Users

The RegTP assigns frequencies for temporary use by foreign visitors wishing to operate radio transmitting equipment for a limited number of hours or days at, for example, sporting, cultural and media events, or for state visits. Around one third of the assignments made each year are for the Formula 1 Grand Prix races at the Hockenheimring and the Nürburgring.

The RegTP made the following assignments in 2000:

	<b>Number of assignments</b>
<b>Public events, state visits</b>	<b>2,126</b>
<b>Motor sports (excluding Formula 1)</b>	<b>1,243</b>
<b>Formula 1 Grand Prix</b>	<b>997</b>
<b>Total</b>	<b>4,366</b>

## Experimental Radio Services

Last year the RegTP dealt with some 700 frequency assignments for experimental radio services, in particular for new digital trunked systems and initial trials for 3G mobile systems.

A total of 160 new assignments were granted for

- digital trunked systems in the bands at 380-400 MHz and 410-430 MHz (TETRA),
- UMTS system development within industry,
- planning tools for UMTS networks,
- MWS in the band at 40.5-43.5 GHz, and
- Short Range Devices (SRDs).

### Civil-Military Frequency Matters

Last year the RegTP

- dealt with 36 queries from the military (German armed forces, North Atlantic Treaty Organisation (NATO), foreign armed forces stationed in Germany) about the availability of frequencies in civil bands,
- granted 73 fixed term assignments for use by the military of 605 civil frequencies (for example for visiting ships, military exercises, and out-of-area operations), and
- made 35 open-ended assignments providing for the military use of 311 civil frequencies.

602 military frequencies were also assigned, in consultation with the military users, for temporary civil applications (such as experimental radio and temporary use assignments). In addition, 668 civil and 260 military sites were coordinated under the joint procedure.

### Radio Operator Licences

The RegTP last year awarded 6,756 flight and 8,323 maritime radiotelephony operator licences. The number of Class 3 radio amateur licences issued totalled some 1,000, but overall there was a slight decrease in the number of licences and assignments granted for amateur radio:

Class	Number of licences/ individual call signs	Number of additional call sign assignments				Total number of call signs assigned
		Club stations	Repeaters/ beacons (including experimental stations)	Special assign- ments (AFuV <sup>12</sup> , Section 16)	Training	
1	42,941	2,309	27	30	548	45,855
2	33,206	153	971	2	95	34,427
3	3,428	10	1	-	33	3,472
<b>Total</b>	<b>79,575</b>	<b>2,472</b>	<b>999</b>	<b>32</b>	<b>676</b>	<b>83,754</b>

<sup>12</sup> Amateur Radio Ordinance

## Telecoms Technical Regulation

The convergence of telecoms, information technology (IT) and other media, global trade relations, technological advances and special customer needs are bringing about a sea change in telecoms, transforming it into a truly global market. And no sooner do technologies appear on the market, than they merge to form something new. It is therefore vital for the RegTP to be quick to take on board the development and varied potential of new technologies, and to exploit the scope for achieving the regulatory aims set in the TKG and the new Radio and Telecommunications Terminal Equipment (R&TTE) Act (FTEG). The foundation for this is laid by the RegTP's experts who play an active role in national and international standardising bodies, presenting papers and assuming various tasks and functions, such as chairing study and working groups. And the deliverables of these bodies – national and international standards, international agreements – mirror the aims, in particular to

- protect the interests of the consumers and safeguard fundamental rights (telecoms secrecy, personal data, billing data),
- maintain public safety and order, and communications infrastructures in the event of disasters or criminal attack,
- guarantee the mutual compatibility of telecoms services, and nationwide access to modern, low-cost telecoms services,
- ensure the efficient use of the scarce spectrum and numbering resources, and
- protect persons and telecoms networks.

The RegTP's current activities are focused on UMTS/IMT-2000 and beyond, satellite communications, customer protection, end-to-end communications, aligning EMC and spectrum management requirements, Usage Provision 30 as the key pillar for guaranteeing compatibility between radio and CATV applications, regulating the return channel in existing distribution networks, media convergence, new radio technologies, analysing the impact of new draft EU Directives, implementing the R&TTE Directive and FTEG, and telecoms security.

### National and International Activities

Experts from the RegTP are involved in national and international working groups at, for example, the ITU, the European Telecommunications Standards Institute (ETSI), the CEPT, the International Standards Organisation/International Electrotechnical Commission (ISO/IEC), the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the German Standards Institute/German Electrotechnical Committee (DIN/DKE), and the European Commission. They actively contribute towards safeguarding national regulatory aims and producing widely accepted and recognised standards.

The RegTP was represented during the year in

- 21 project teams and working groups at the ERC, CEPT and European Committee for Telecommunications Regulatory Affairs (ECTRA),

- 58 bodies in the ITU Radiocommunication Sector (ITU-R),
- 14 bodies in the ITU Standardization Sector (ITU-T),
- 62 bodies at ETSI, including the Third Generation Partnership Project (3GPP) and the Telecommunications and Internet Protocol Harmonization over Networks (TIPHON) project,
- 26 other international meetings (eg EU workshops),
- 93 national meetings (eg DIN/DKE, Technical Telecommunications Regulation Committee (ATRT)).

The RegTP also hosted 32 international meetings, attended by delegates from 39 countries worldwide.

### **UMTS/IMT-2000 and Beyond**

ITU-R is continuing its work on IMT-2000, in cooperation with the two 3G partnership projects (ETSI's 3GPP and the Third Generation Partnership Project 2 (3GPP2)), and on the new generation systems. A difference of opinion among the ITU's Member States has delayed approving the planned Recommendation establishing the regulatory framework for the global circulation of mobile radio equipment.

Work on the draft 3GPP<sup>13</sup> standards is running to schedule. Release 2000, with the focus on interworking between the Internet and IMT-2000 and beyond, is at the drafting stage. Also being developed by ETSI are the harmonised standards for use by 3G manufacturers to assess conformity under the R&TTE Directive.

### **Transposition of Directive 99/5/EC**

The R&TTE Directive took full effect throughout the EU on 8 April 2000, freeing up market entry for manufacturers. The old type approval regime has been replaced by a system giving manufacturers full responsibility for conformity assessment. This considerably speeds up and simplifies market access routes for new products.

The Directive was written into national law through the FTEG, which entered into force on 9 February 2001. To bridge the gap, the RegTP, in consultation with the BMWi, drafted transitional provisions for publication in its Official Gazette 12/2000 of 28 June, and provisionally recognised notified bodies. This meant that the R&TTE Directive could also be implemented on time in Germany.

An open workshop organised by the RegTP on the new Directive and its consequences attracted some 200 participants. A compilation of the questions addressed at the workshop, together with the experts' answers, was put onto

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<sup>13</sup> 3GPP defines the UMTS component of IMT-2000.

the RegTP's web site, and a special e-mail address ([FTEG@regtp.de](mailto:FTEG@regtp.de)) set up to tackle any further queries. By the end of the year, the RegTP had handled some 70 e-mail queries from home and abroad. The transitional provisions, the Directive, the draft FTEG, and up-to-date information about application of the Directive and the new regime are available on the RegTP's web site at [www.regtp.de](http://www.regtp.de).

### **Advice of Charge (AOC)**

The majority of German carriers reintroduced on 14 November 2000 AOC services for indirect access calls. This service – where a caller is informed of the charge payable at the end of his call – is now reavailable to customers preselecting or selecting on a call by call basis an alternative operator. Hotels, hospitals, and public authorities are able to obtain the reliable information on call charges that they need to directly bill others for calls made. The service is available to all analogue and Euro-ISDN line customers who have activated AOC with their access network operator.

### **Security**

The two particular points of focus here are the technical implementation of legal interception measures, and security in terms of telecoms secrecy and data protection. As regards the first, the national technical provisions for legal interception are being aligned with the relevant ETSI standards; these standards contain various options that can be chosen to match national frameworks and then transposed into national technical directives and specifications. Second, activities are also focused on compliance with the national legal provisions ensuring telecoms secrecy and protecting data, which is decisive to the future growth of the ever more important Internet and Internet Protocol (IP) technologies.

### **Return Channel Systems in Existing Distribution Networks**

The transition from analogue to digital transmission, which is increasingly accompanied by new, interactive multimedia services, is spreading to more and more parts of the telecoms world. Operators are now installing return channel capability in the traditional distribution networks typically used, for instance, for cable and satellite broadcasting. This enables broadband cable subscribers to use their cable connection for not only radio and TV channels, but also a wide variety of telecoms applications, ranging from voice telephony and data transmission through to Internet access, online banking and e-mail. One of the standardisation tasks of technical regulators is to harmonise – as far as possible at European level – the technical parameters for these new return channel systems in order to guarantee efficient and interference-free frequency usage.

Last year marked a success in this respect: for the first time ever, a limit for the maximum permissible radiated disturbance power of the return channel in CATV networks (in the band at 5 MHz to 30 MHz) was incorporated into the EN<sup>14</sup> 50083 series of EMC standards (prEN 50083-8/A1 and prEN 50083-2/A2), applicable to cable networks for TV, sound and interactive services. This limit is

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<sup>14</sup> European Standard



based on that set in Usage Provision 30. Still outstanding, however, are special restrictions designed to protect safety of life services, also included in Usage Provision 30.

The RegTP was also actively involved in ETSI's work on harmonised standards for interactive satellite equipment in the entire band allocated to the Fixed Satellite Service (FSS), the Ka band at 27.5 GHz to 30.0 GHz. The draft harmonised standard, ETSI EN 301 360 V1.1.1 (2000-08), provides the regulatory basis required under the R&TTE Directive for placing on the market interactive satellite terminals. A second draft harmonised standard, ETSI EN 301 489-12, lays down the EMC protection requirements for various types of satellite equipment such as VSAT, SNG, Satellite Interactive Terminals (SITs), and Satellite User Terminals (SUTs).

### **Cable and Radio Intercompatibility**

Reaching a consensus on a solution to guarantee compatibility between radio and CATV applications proved a hard challenge, but one which was met in close cooperation with DFS Deutsche Flugsicherung GmbH (the German air navigation services organisation), safety organisation representatives, CATV operators, and the federal states' regulatory authorities for broadcasting. The need for a solution emerged in the light of individual cases of interference from broadband cable networks to the aeronautical service, which meant that DFS could no longer guarantee compliance with the aeronautical safety standard targets.

A specially formed body of experts worked out a strategy designed to resolve the interference. The agreed approach enables a gradual transition over two years from the current situation to the future requirements of Usage Provision 30<sup>15</sup> of the draft Frequency Band Allocation Ordinance (FreqBZPV). This guarantees coexistence among radio applications in cables and terrestrial applications.

As a first step in the transitional period, the RegTP's Radio Monitoring and Radio Inspection Service systematically scanned some 2,000 km<sup>2</sup> around German airports for potential sources of interference. As a result, cable operators took action as and where necessary to implement frequency offsets, cease operation of extended superband channel 24, and bring their systems into line with the radiated disturbance power limit. Work is underway on the technical parameters designed to guarantee continued protection for the safety of life services (compliance with Usage Provision 30) once digital CATV applications are introduced.

### **International Bodies**

Experts from the RegTP attended the ITU's World Telecommunication Standardization Assembly (WTSA), which takes place every four years. The main highlights of WTSA-2000 were the adoption of conditions under which associates from industry can participate in ITU work, the creation of a Special Study Group on IMT-2000 and Beyond to deal, for instance, with integrating the

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<sup>15</sup> See "Return Channel Systems in Existing Distribution Networks".

Internet into existing telecoms infrastructure, and the principles for compensation between interconnecting providers carrying international Internet traffic, an issue of key importance to the developing countries in terms of the digital divide.

The RegTP is actively following ETSI's efforts to continuously redefine itself to meet the ever changing requirements in the telecoms sector, in the wake of the convergence of networks and services. The RegTP heads up the Administration Interest Group that enables ETSI to keep pace with new EU Directives and adapt its structure and work programmes accordingly.

### **Market Surveillance under the Electromagnetic Compatibility (EMC) Act**

The RegTP is tasked by law to inspect and test electrical products on the German market, under the EMC Directive (89/336/EEC), the Terminal Directive (91/263/EEC) and the German implementing regulations – the EMC Act (EMVG) and the Telecommunications Type Approval Ordinance (TKZulV).

Some 65,000 new equipment types, or 250 million items of electrical or electronic equipment and components, are placed on the German market each year. This represents around 30 per cent of the market in the whole of the European Economic Area (EEA).

The inspections and tests aim to verify

- compliance with the CE marking requirements,
- the plausibility of the EC conformity declarations,
- compliance with the relevant EMC protection requirements, and
- compliance with the essential requirements of the R&TTE Directive.

Last year the RegTP inspected a total of 24,305 products, and found fault with the CE marking or conformity declaration of 3.2 per cent, or 778, of these items. The RegTP also tested 5,070 items from 1,119 series of equipment and 107 one-off products. Its results showed that 27 per cent – 301 series and 11 one-off products – did not meet the EMC protection requirements.

A scaled procedure was again used to assess compliance with the protection requirements set out in Section 3 of the EMVG. This provides greater differentiation in dealing with breaches of the EMVG. Initially, a temporary ban on distribution is pronounced and the offending party given the opportunity to state his case. Only when all the records have been examined is it decided whether to lift the ban or to make it definitive. Over the year, 120 sales bans were imposed on account of noncompliance with the protection or CE marking requirements. Of these, 50 led to invocation of the safeguard clause, 47 were lifted after the hearing, and 11 cases are still pending. Recorded under the provisions of the TKZulV were 34 cases of violation and 28 definitive bans on sales. In addition, 175 bans were imposed on the sale of flashing mobile 'phone antennas that caused interference to other public telecoms networks. In

338 cases the Cost Ordinance was applied to recover the costs of investigating interference associated with breaches of the EMVG and the TKZuIV.

### Results of Tests on Serial Products

<b>Breakdown by product group</b>						
Product group	Number of series tested*)	Number of products tested*)	Number of non-conforming series*)	Number of non-conforming products*)	Series quota	Product quota
1 Domestic appliances	289	1,335	48	231	<b>17%</b>	<b>17%</b>
2 Power tools	259	1,159	64	290	<b>25%</b>	<b>25%</b>
3 Lighting equipment	112	523	44	204	<b>39%</b>	<b>39%</b>
4 IT/office equipment	123	536	36	156	<b>29%</b>	<b>29%</b>
5 Consumer electronics	142	658	38	174	<b>27%</b>	<b>27%</b>
6 Telecoms equipment	60	285	13	63	<b>22%</b>	<b>22%</b>
7 Radio equipment	78	366	43	203	<b>55%</b>	<b>55%</b>
8 Industrial equipment	18	39	7	27	<b>39%</b>	<b>39%</b>
9 Medical devices	1	4	0	0	<b>0%</b>	<b>0%</b>
10 Scientific equipment	5	21	1	3	<b>20%</b>	<b>20%</b>
11 Installation materials	29	132	7	33	<b>50%</b>	<b>50%</b>
12 Miscellaneous	3	11	0	0	<b>0%</b>	<b>0%</b>
<b>Total</b>	<b>1,119</b>	<b>5,069</b>	<b>301</b>	<b>1,384</b>	<b>27%</b>	<b>27%</b>

\*) As a rule, five items of each equipment type, or series, are tested.

## Results of Tests on One-Off Products

<b>Breakdown by product group</b>						
Product group	Number of cases	Number of products tested	Number of non-conforming cases	Number of non-conforming products	Case quota	Product quota
1 Domestic appliances	14	19	1	1	7%	5%
2 Power tools	2	3	0	0	0%	0%
3 Lighting equipment	1	1	0	0	0%	0%
4 IT/office equipment	66	68	8	9	12%	13%
5 Consumer electronics	0	0				
6 Telecoms equipment	3	3	0	0	0%	0%
7 Radio equipment	0	0				
8 Industrial equipment	4	4	0	0	0%	0%
9 Medical devices	0	0				
10 Scientific equipment	4	4	1	1	25%	25%
11 Installation materials	2	2	1	1	50%	50%
12 Miscellaneous	3	3	0	0	0%	0%
Total	99	107	11	12	11%	11%

### Radio Compatibility

The RegTP last year again launched and progressed numerous compatibility studies aimed at ensuring that the spectrum can be used efficiently and with minimum interference. There were three particular points of focus:

- Top priority was given to investigating the risks of interference to radiocommunication services through unintentional radiation from cable networks and powerlines. One example is the interference caused to the aeronautical service by the radiated disturbance power of CATV systems. Another is the possibility of interference to primary radiocommunication services through the unintentional radiation of electromagnetic fields over powerlines upon the planned introduction of PLT. Here, the RegTP's aim is to ensure a balance between the various interests of the cable operators and the PLT industry, and the interests to be protected of the radiocommunication services.
- The RegTP conducted a series of compatibility studies parallel to the work on developing and standardising 3G mobile systems. Its objective was to put in place the technical framework conditions for the timely and practicable licensing of terrestrial UMTS services in Europe.
- Studies on the mutual compatibility of DVB-T and other radiocommunication services were made in preparation for the introduction of DVB-T.

Other activity highlights included

- compatibility studies in advance of the introduction of Bluetooth, the 2.4 GHz radio networking technology, and other applications,

- participation in CEPT and ITU work on specifying limits for the unwanted emissions of radio applications,
- compatibility studies to accompany the development of MWS, and
- investigations into the compatibility of radar applications.

### **EMC Standardisation**

The RegTP's international activities have focused on the harmonised standards to be applied under the EMVG and the FTEG, as the national regulations implementing the R&TTE Directive. These include in particular the series of EMC standards for radio equipment and for non-SOLAS<sup>16</sup> maritime radio equipment.

### **EMC of Installations**

The RegTP published on its web site the results of the PLT project aimed at studying the radiation characteristics of PLT systems. Work focused, amongst other things, on coordinating the German measurement specification (Reg TP 322 MV 05) with the UK administration. The specification will be used in conjunction with Usage Provision 30 for making in situ measurements on telecoms installations with a view to preventing, investigating and clearing radio interference to the installations. Internal work on developing and trialling the specification is now largely complete.

In the context of European harmonised EMC standards for telecoms installations, both the measurement specification and Usage Provision 30 were presented within European standardising bodies and now serve as the working basis for a joint group dealing with the EMC of wire based telecoms networks.

### **Protection against Radio Frequency (RF) Fields**

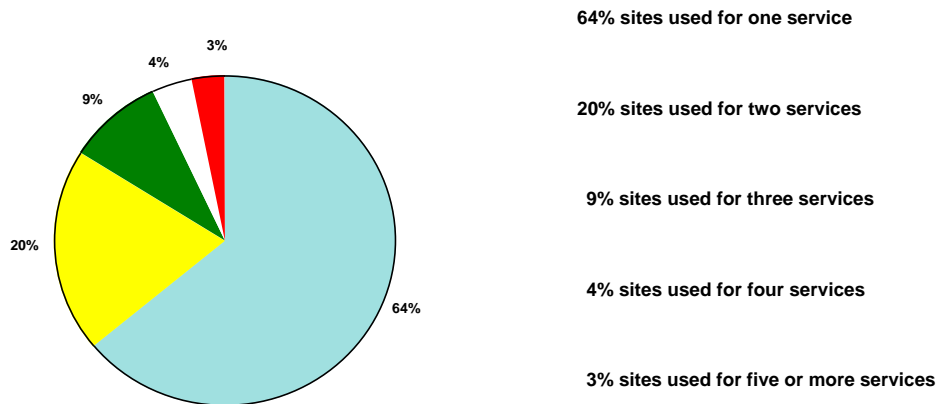
The RegTP carries out transmitter site certification to make sure that the fixed radio transmitters in operation comply with certain defined personal safety and cardiac pacemaker limits, aimed at protecting persons exposed to electromagnetic fields. The RegTP's procedures follow the limits recommended by the International Commission on Non-Ionising Radiation Protection (ICNIRP), and the DIN VDE<sup>17</sup> 0848 cardiac pacemaker limits. Last year the RegTP issued some 18,800 site certificates, assessing around 69,600 radio systems. The number of shared mobile transmitter sites has continued to increase: 36 per cent of the sites accommodating mobile base stations (in the C network, and the D and E networks) are shared, ie used for more than one type of service.

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<sup>16</sup> Safety of Life at Sea Convention

<sup>17</sup> Association for Electrical, Electronic & Information Technologies

## Mobile Transmitter Site Sharing in Germany



### Quality Systems

The RegTP's Accreditation Office is responsible for accrediting and recognising test houses, product certification bodies, and quality system certification bodies in the statutorily regulated field of telecoms and in the field of EMC. Independent experts determine whether the test houses are properly equipped to carry out certain tests or types of test for electrical or electronic equipment, and whether certification bodies are able to properly certify compliance with the applicable standards or statutory requirements.

At present there are 55 test houses with RegTP accreditation for one or more technical areas (most notably for EMC, telecoms, and radio), and 29 competent bodies recognised under the EMVG. Additionally, two certification bodies operating quality system certification have been accredited for the statutorily regulated field of telecoms. Annual reviews and comprehensive five-yearly assessments are necessary to ensure that the accredited and recognised bodies continue to perform to the required levels.

The Accreditation Office last year assessed the technical competence of test houses and certification bodies seeking designation as a Conformity Assessment Body (CAB) for the purposes of the Mutual Recognition Agreements (MRAs) concluded between the European Community and Australia, Canada, New Zealand, and the US. To date, the Office has made 118 such assessments.

### Quality System Certification

The RegTP certifies quality systems to the DIN EN ISO 9000 series of standards. Certified quality systems have long given the holders a competitive edge. A number of statutory requirements have been introduced in recent years, however, particularly with a view to protecting the customer. These oblige certain groups of service provider to prove compliance with defined requirements of due care. It is becoming more and more usual to prove

compliance by the presentation of a certificate issued for an approved quality system. Customers in the public sector in particular tend to make contract award dependent on proof of a certified quality system. Such certification also gives entrepreneurs greater legal certainty. Last year the RegTP issued first certifications for six companies, renewed certification for seven companies, and carried out its surveillance procedures in another 12 companies.

## **Radio Monitoring and Radio Inspection Service**

### **Investigating and Resolving Radio Interference**

The RegTP's Radio Monitoring and Radio Inspection Service again played an active role in keeping the spectrum clear of undue interference. Last year the Service handled some 9,200 cases of interference to sound and TV broadcasting services, 2,000 cases affecting PBR, 700 affecting amateur radio, and 400 involving CB radio.

The Service also tested samples of electrical and electronic products marketed in Germany for compliance with the protection requirements of the EMVG. A large number of the serial products tested were found to exceed the limits, and formal complaints were made. The test laboratory in Kolberg was granted accreditation (German Accreditation Council (DAR) registration number **DAT-P-111/00-00**) with effect from 12 December 2000, confirming the laboratory's competence to carry out EMC tests.

### **Data Protection**

Last year the RegTP again made numerous random and investigative checks on compliance with the legal provisions designed to ensure postal and telecoms secrecy and protect data. Another focus of activity was providing advice and information on data protection legislation for both consumers and the industry. The RegTP also stepped up its checks on the implementation by telecoms service providers of their security concepts. The RegTP was, in addition, involved in amending the Telecommunications Data Protection Ordinance (TDSV). The amended Ordinance, which took effect on 21 December 2000, introduces a number of key innovations. New, for example, is the overhaul of the decentralised procedure for ensuring that calls to church and social service organisations providing anonymous counselling may not be identified in the caller's itemised bill. Under the new scheme, the RegTP keeps a central register of the organisations to and from whom calls may not be shown in an itemised bill. This makes things significantly easier for both counsellors and public telecoms service providers. Service providers are required to call up the list on a regular basis and incorporate any changes in their procedures in order to guarantee protection for callers nationwide.

The RegTP, in cooperation with the Federal Commissioner for Data Protection, also drafted a set of guidelines designed to aid service providers in meeting their information obligations vis-à-vis their customers. The guidelines –

prompted partly by the stricter requirements in the new TDSV – were distributed to service providers in November 2000 as a consultation document.

## Digital Signature

### Operation of the RegTP's Trust Centre

In its capacity as competent authority, the RegTP has been carrying out the tasks prescribed by the Digital Signature Act (SigG) since its enactment. One of these tasks is to issue certificates for the signature keys of the approved certification authorities. The RegTP's national certification authority, or root, set up for this purpose, was ready for service on 23 September 1998. It went live on 21 January 1999 when the first certificate from a certification authority was placed in the public directory along with the RegTP certificates. The RegTP continues to issue and manage signature key certificates for the approved certification authorities, storing them in the directory for public retrieval at any time.

### Licensing Certification Authorities

Another of the RegTP's core tasks under the SigG is to certify the certifier, as it were. The first licence to operate a certification authority, granted on 22 December 1998 to *DTAG, Produktzentrum TeleSec* in Siegen, was followed by licences for *DPAG, Geschäftsfeld Signtrust* and the German Federal Chamber of Notaries. Prior to licensing, the RegTP examined each applicant's security concept in respect of its IT, operational, legal and conceptual content (organisational structure, deputisation, separation of roles, infrastructure, etc), as well as the operator's reliability and specialised skills in above all IT and legal affairs.

### Publications

The RegTP also published the following information in the Federal Gazette, as required by the Digital Signature Ordinance (SigV):

- the competent authority's public key for 2000, and the telephone number and web site from which certificates issued by the RegTP can be retrieved,
- licensed certification authorities,
- technical components for which confirmation has been issued, and
- suitable algorithms and associated parameters for 2000.

### Monitoring Compliance with the Legislation

The RegTP is entitled to take action against any person not, but professing to be, authorised under the SigG to operate a certification authority (deceptive impression). The action taken may even extend to a general ban on operation. The RegTP has had to investigate accordingly on several occasions, and the



trend is upwards. The number of cases in which companies have wrongfully claimed – in press reports and elsewhere – that their products and services are compliant with the Act, is increasing steadily. Thus cases of potential deceptive impression are regularly having to be investigated.

### **Evaluation of the Digital Signature Act**

On signing into law the Information and Communication Services Act (IuKDG) in summer 1997, the Bundestag tasked the Federal Government to monitor the development of the new services over two years, and to present a report – covering also the SigG – on the practical experience acquired and any need for change. The evaluation report for the SigG was drawn up during the year under the aegis of the BMWi. Experts from the RegTP and the Federal IT Security Agency (BSI) delivered a joint paper with a systematic presentation of their practical experience in implementing the provisions of the SigG and SigV.

### **Amendment of the Digital Signature Act and Alignment of Legislation**

As negotiations drew to a close on the Directive of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures, work led by the BMWi was already underway to amend German legislation. The RegTP was tasked in drafting the amendments to provide expert input and participate in the specialist debate on implementation. The RegTP provided valuable input, not least as a result of its practical experience in implementing the SigG and its systematic analysis made for the evaluation report. The RegTP was also involved – at the BMWi's request – in the work on aligning national legislation with the Directive. The RegTP helped to identify which written form requirements in, for instance, administrative provisions would need to be amended. It also provided expert opinions regarding proposed legislation, taking due account of IT feasibility and the technical and legal applicability scheme.

### **Working Group Activities**

In addition to the tasks arising directly from the operation of the root certification authority and the implementation of the SigG and SigV, priority is given to activities further afield that have consequences for the root's technology and German legislation. The scope of these activities depends on the importance attached by other countries or the EU to the basic technology used for electronic signatures. Of particular importance within this context is monitoring and participating in the work on standards (ISO/IEC, DIN/DKE, ITU, European Committee for Standardization/Information Society Standardization System (CEN/ISSS), European Electronic Signature Standardization Initiative (EESSI), ETSI, etc), specifications (Industrial Signature Interoperability Specification (ISIS)) and Directives (the EU Directive on electronic signatures) that also impact on the technology employed in the RegTP's trust centre and on the regulatory aims as defined in the SigG. With a view to interoperability, the RegTP realised its goal of providing for the certification of keys it does not generate itself (non-root keys) for applicants using other signature products. A specification for an interface to certify these non-root keys was therefore

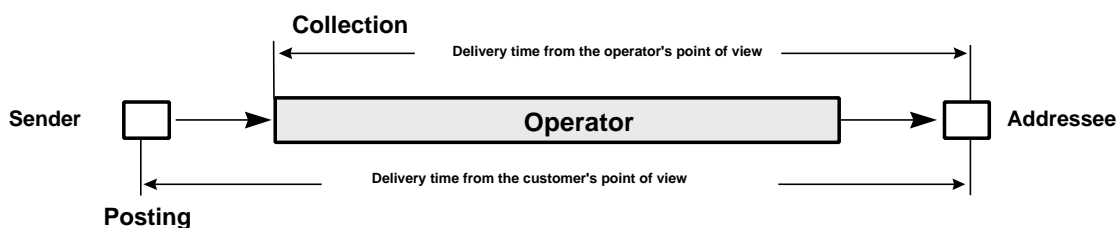
developed and implemented in conjunction with potential operators. This enables the root authority to adapt to the rapidly evolving chipcard market.

## Postal Market

Last year revenues in the German postal market totalled more than DM 43 billion, almost half the amount generated from telecoms services. Around two thirds of the market – mainly courier, express, and parcel services, but also some letter post services – is now open to competition. Nearly two thirds of the revenues were generated by DPAG, the other third being shared by a large number of mostly courier, express and parcel service providers. Earnings from licensed services (conveying letters weighing up to 1,000 grammes) is estimated at DM 20 billion. DPAG commands almost 98 per cent of this market, even though some parts are open to competitors, and still has a share of some 95 per cent of the market for conveying letters with identical contents (*Infopost* items, large mailings).

### Letter Delivery Times

The PUDLV requires, on average over the year, at least 80 per cent of domestic letters posted on a working day – excluding large mailings with 50 letters per mailing – to be delivered on the first working day after posting (D + 1), and 95 per cent by the second working day after posting (D + 2). The RegTP monitors the quality of the letter post service by measuring the delivery times achieved by DPAG (as the dominant company with approximately a 98 per cent market share). Measurements are made on a continuous basis, using test letters to determine delivery times across the country. Each year, some 300,000 test letters are sent. The results can be used to calculate the delivery times as seen by the customer (from the sender to the recipient) and the operator (from the operating system of the provider (DPAG) to the recipient).



### Delivery Times from the Point of View of the Customer and the Operator

RegTP measurements	Delivery times from the customer's point of view		Delivery times from the operator's point of view	
Period	D + 1 [%] (1)	D + 2 [%] (2)	D + 1 [%] (1)	D + 2 [%] (2)
1998 (annual <i>Æ</i> )	86.0	98.8	94.8	99.5
1999 (annual <i>Æ</i> )	86.0	98.8	95.0	99.5
2000 (annual <i>Æ</i> )	86.7	99.0	95.6	99.6
<b>PUDLV minimum</b>	<b>80.0</b>	<b>95.0</b>		

(1) Proportion of letters delivered within one working day of posting.

(2) Proportion of letters delivered within two working days of posting.

The PUDLV targets relate to the delivery times of domestic letters posted on a working day, from the point of view of the customer only. The targets (80 per cent D + 1 and 95 per cent D + 2) are comfortably met at present (86.7 per cent D + 1, and 99 per cent D + 2).

### Prices and Price Level for Letters

The prices charged by DPAG at 31 December 2000 for the main products within the scope of its restricted statutory monopoly were as follows:

-	<b>Postcard</b>		DM 1.00
-	<b>Standard letter</b>	£ 20 g	DM 1.10
-	<b>Compact letter</b>	£ 50 g	DM 2.20
-	<b>Large letter</b>	< 200 g	DM 3.00
-	<b>Maxi letter</b>	< 200 g	DM 4.40

**2000 price level:**

**DM 1.58.**

Price level	=	$\frac{m_1}{M} \times P_1$	+	$\frac{m_2}{M} \times P_2$	+	.....	+	$\frac{m_n}{M} \times P_n$
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where  $m_1, m_2, \dots, m_n$  = quantity of products/services 1 ... n

$M$  = total quantity ( $m_1 + m_2 \dots + m_n$ )

$P_1, P_2, \dots, P_n$  = prices for products/services 1 ... n

Taken are the quantities of the products and services sold and paid for in full in Germany.

The price level for 2000 in itself says very little: only when compared with that of other years or other companies in Germany or abroad can conclusions be drawn. Comparing prices with those in previous years does not help, because they have not changed since September 1997. Nor can a comparison be made

with the prices charged by other companies in Germany, since DPAG's restricted statutory monopoly prevents others from offering these products. What is feasible, however, is an international comparison. And the price level lends itself well, because various products with different pricing and weights can be covered. This weakens methodical differences that may distort results when prices are compared for one product only, for instance a standard letter up to 20 grammes.

<b>Prices/weights for letters up to 50 g</b>	<b>D</b> [DM]	<b>UK</b> [£]	<b>A</b> [Sch]	<b>GR</b> [Dr]	<b>F</b> [FFr]	<b>USA</b> [\$]	<b>B</b> [BFr]
<b>Standard letter (up to 20 g)</b>	1.10	0.27	7	120	3.00	0.33	17.00
<b>Compact letter (20-50 g)</b>	2.20	0.27	8	160	4.50	0.55	32.00
<b>Compact versus standard letter</b>	<b>+100%</b>	<b>+0%</b>	<b>+14%</b>	<b>+33%</b>	<b>+50%</b>	<b>+67%</b>	<b>+88%</b>

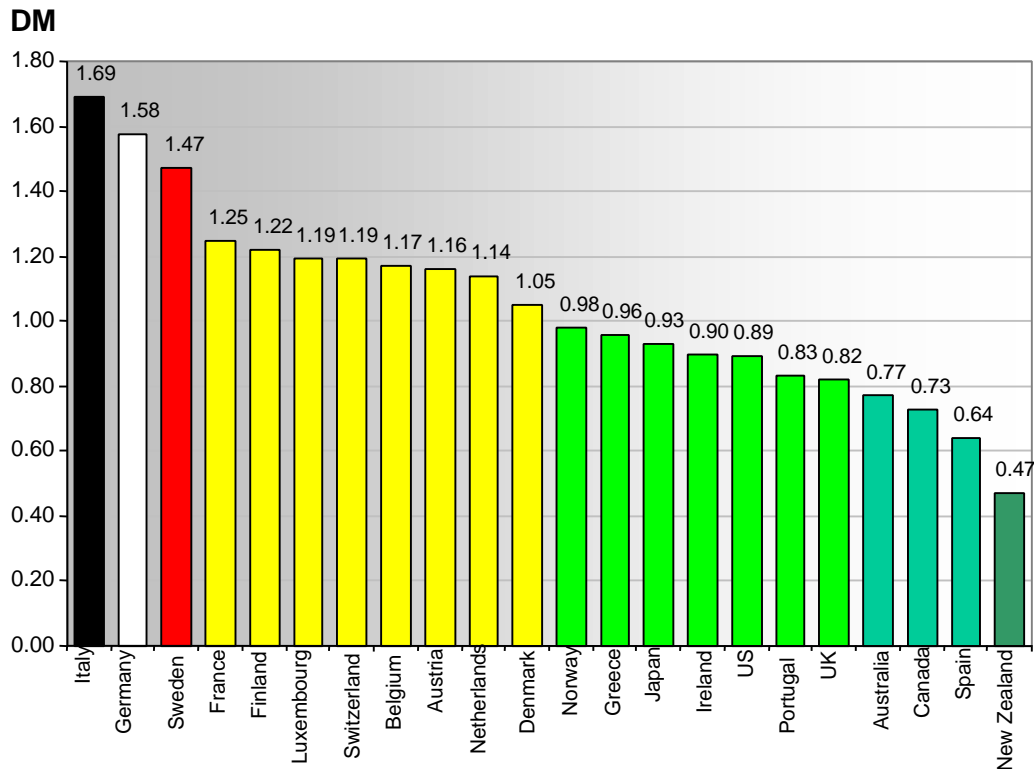
As at 31 December 2000

### **International Price Comparison Method**

1. All the EU countries, together with Australia, Canada, Japan, New Zealand, Norway, Switzerland and the US, were selected as the peer countries.
2. The products selected as the peer products were those in each peer country that most closely matched DPAG's standard, compact, large, and maxi letters. The fastest delivery option for standard letters – with, as in Germany, no guaranteed delivery times, but (if anything) expected, non-binding delivery times – was selected.
3. The June 2000 price in local currency for each peer product selected was weighted with the quantity of the product sold and paid for in full, as for the German price level. All the individual weighted prices were added together to give the price level in local currency.
4. The price level in local currency for each peer country was then converted into marks, using the (1999 average) consumer price parities calculated by the Federal Statistical Office on the basis of a "German basket".

The results are shown in the chart below.

## Price Level for Letters



### Market Access

Postal services are provided in accordance with the Basic Law (GG) as a private sector economic activity by DPAG and other private operators. This means that everyone has the basic right to offer postal services in the market. This applies without exception to conveying letters weighing more than 1,000 grammes, parcels, newspapers, and magazines, and to courier services as defined in the PostG. No special authorisation, or licence, is required for these commercial activities. By contrast, a licence is required to convey letters up to 1,000 grammes. There is an unlimited number of licences, and every operator meeting the prerequisites has a legal right to a licence. Certain other letter post services fall within the scope of the restricted statutory monopoly held by DPAG and defined in the transitional provisions of the PostG.

### Postal Licences

#### Licensable Services

Until DPAG's restricted statutory monopoly ends, licences may be granted for the following services only:

- A** conveying on a profit basis letters weighing between 200 and 1,000 grammes, and/or letters costing more than five times the price payable on 31 December 1997 for corresponding postal items in the lowest weight category ( $\Rightarrow$  letters  $\geq 200$  g or  $> \text{DM } 5.50$ );
- B** conveying on a profit basis letters with identical contents and weighing over 50 grammes, with at least 50 letters per mailing ( $\Rightarrow$  letters with identical contents  $> 50$  g and  $\geq 50$  letters);

- C** conveying on a profit basis letters delivered by the sender to a document exchange and collected by the addressee from the same or another exchange operated by the same service provider, with the sender and addressee using the service under a permanent contract (⇒ document exchange service);
- D** services distinct from universal services, with special features and of higher quality (⇒ higher quality services);
- E** conveying on a profit basis letters collected on the sender's behalf from the sender and taken to the nearest DPAG acceptance point or another within the same community (⇒ mailing at DPAG acceptance point);
- F** conveying on a profit basis letters collected on the addressee's behalf from DPAG PO boxes and delivered to the addressee (⇒ collection from DPAG PO boxes).

### **Higher Quality (Category D) Services**

The PostG does not clearly state which features a service must have to qualify as a higher quality service, and therefore does not provide any clear and readily comprehensible decision criteria. In view of this, the RegTP established standardised criteria for deciding when a service qualifies as a higher quality service, as outlined in the PostG, and published the criteria in its Official Gazette 8/1999 of 12 May.

### **Market Study on Higher Quality Services**

The RegTP took the occasion of a market study on competition law to conduct a survey at the beginning of the year to find out which features customers value most in letter post, and in particular higher quality, services.

The top five features cited as important or very important were, in order of priority,

1. reliable or guaranteed delivery,
2. value for money,
3. fast delivery,
4. collecting letters from customers, and
5. timed delivery.

Other valued features included providing changes of address, redelivering items, assuming liability, and redirecting letters. Features which by themselves may seem less practical, but which play a key role in adding to higher quality services as a whole, such as money-back guarantees, and diverting or recalling letters, are also seen as important.

The list of top five features shows that speed – a focus in standard services – is a priority, but not the priority. Speed alone in an otherwise simple standard service is obviously not enough to accommodate the various customer needs.

Those surveyed placed most value on quality, in other words reliable and safe delivery. Overall, the survey showed that the standard service provided by DPAG under its statutory monopoly may well seem adequate to meet basic needs, but that customers do in fact want more, and that there is considerable demand for a wider range of services. What is remarkable is the creativity of the new operators, and customer acceptance of the rainbow of features offered.

### **Licensing**

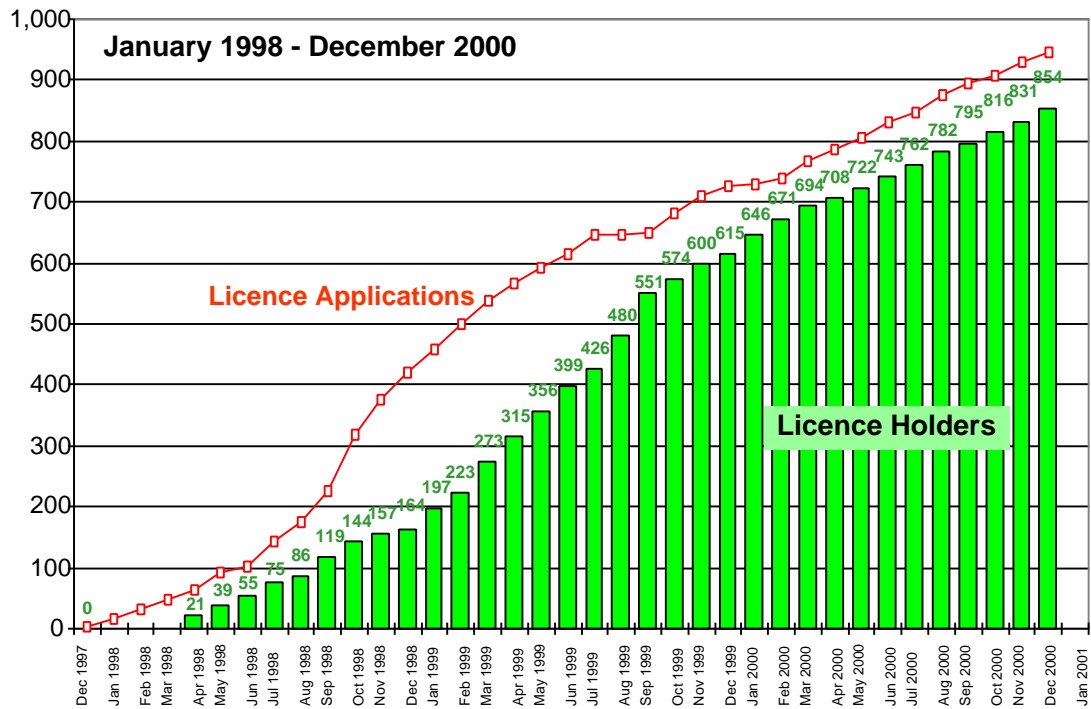
The RegTP published in its Official Gazette of 12 May 1999 a Communication on how to apply for letter post licences. The aim was to make clear the prerequisites for a letter post licence, in particular so that applicants might provide correct and complete information from the outset. Only when all the necessary information and documents are submitted can a licence be issued within the six-week period specified in the PostG. This step – and in particular the transparency created – has proved its worth: most licence applications now received can be processed without any problem.

### **Applications and Licences**

<u>As at 31 December 2000</u>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>Total</b>
<b>Applications processed</b>	<b>388</b>	<b>300</b>	<b>259</b>	<b>947</b>
<b>Licences granted</b>	<b>382</b>	<b>289</b>	<b>183</b>	<b>854</b>
<b>Licences denied</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

- 1) To date, three licences have been denied as there were grounds (Federal Central and Central Trade Register entries) for assuming that the applicants did not have the reliability and efficiency necessary to exercise the licence rights.
- 2) One licence extension has been denied as there is currently no legal basis for the planned service (overlap with the restricted statutory monopoly).

## Growth in Licence Applications and Holders





## Regional Breakdown of Licences

Breakdown of licences according to federal state (As at 31 December 2000)				Licensed activity <sup>1)</sup>					
Federal state	Applica- tions	Li- cences	Licence density <sup>2)</sup>	A	B	C	D	E	F
Baden-Württemberg	65	63	6.1	47	47	19	47	53	53
Bavaria	65	57	4.8	37	32	20	40	46	46
Berlin	31	27	7.9	19	17	11	23	23	23
Brandenburg	59	51	19.8	20	26	12	48	39	40
Bremen	3	3	4.5	3	3	2	3	2	2
Hamburg	30	27	15.9	15	10	0	5	22	25
Hesse	47	45	7.5	27	27	17	34	41	40
Mecklenburg-Western Pomerania	45	43	23.8	19	18	8	41	35	33
Lower Saxony	117	109	13.9	74	72	43	90	96	91
North-Rhine/Westphalia	210	186	10.3	104	105	53	144	142	136
Rhineland-Palatinate	31	29	7.2	13	13	4	23	23	22
Saarland	12	8	7.5	6	6	6	6	6	6
Saxony	89	74	16.3	42	43	21	67	55	53
Saxony-Anhalt	62	57	21.1	42	36	26	54	50	50
Schleswig-Holstein	42	40	14.5	35	32	21	34	33	33
Thuringia	39	35	14.1	18	22	11	33	28	27
<b>Total:</b>	<b>947</b>	<b>854</b>	<b>10.4</b>	<b>521</b>	<b>509</b>	<b>274</b>	<b>692</b>	<b>694</b>	<b>680</b>

1) See "Licensable Services" for details.

2) Licence density = number of licence holders per one million inhabitants.

### Use of Licence Rights

A licence authorises its holder to perform the activities specified in his application, in accordance with the PostG and the associated ordinances. The licence does not, however, oblige the holder to take up the activity as such; whether or not, and when, he does so depends entirely on his business plans.

At the end of 2000, 621 of the 854 operators licensed were actually active in the market. 146 out of the remaining 233 are not or no longer operating, 69 holders have surrendered their licences for various reasons, 10 companies have been dissolved, and six are at present the subject of insolvency proceedings. Two licences have been revoked, because facts came to light which justified the assumption that the holders did not, in particular, have the efficiency and reliability necessary to exercise the licence rights.

### Checks after Licence Grant

Licences are granted on application if and when the requirements are met – ie if there are no grounds for denial at the time the licence is issued – and are valid only for as long and as far as they are met. Compliance with the requirements is monitored by the RegTP through its system of checks: first, each licence holder undergoes a regular check at least once a year; second, additional checks are made if occasioned internally or externally. Both types of check are made on site, normally by staff from the RegTP's Regional Offices, but if necessary by specialists from the RegTP's headquarters. If faults are found, the licence holder is given a certain period of time to take remedial action. If the holder remedies the faults on time, and informs the RegTP accordingly, a follow-up check is made three months later, focusing on whether or not the faults have actually been eliminated for good.

If the holder does not remedy the faults within the given period, proceedings may be instituted, which could ultimately result in all or part of the licence being revoked. This is done in line with the principles of the Administrative Procedures Act (VwVfG).

### Results of Checks after Licence Grant

To date, the RegTP has carried out checks on 339 providers offering postal services that require a licence.

All in all, the regular checks have produced a positive picture, and no deliberate breaches of licence have been found. The 339 licence holders that have undergone checks employ some 13,400 staff, with around 2,050 working full and 2,500 part time. About 8,200 of the 8,800 staff in insignificant employment are liable to social insurance contributions. This means that over 95 per cent of the total hours in this area are worked by staff liable to social insurance contributions, the minimum requirement being 80 per cent.

<b>Number of staff employed by the licence holders checked</b>	
Full time	2,047
Part time	2,529
Insignificant employment (liable to social insurance contributions)	8,215
Insignificant employment (not liable to social insurance contributions)	589
<b>Total</b>	<b>13,380</b>
Proportion of hours worked by staff not liable to social insurance contributions	2.7%
Proportion of staff not liable to social insurance contributions	3.5%

Checks made in the light of special circumstances led, amongst other things, to the discovery of several operators offering postal services without the required licence. Administrative fines proceedings were initiated against these providers.

## Legal Proceedings

DPAG was of the opinion that the RegTP acted unlawfully in granting licences for higher quality services, and therefore applied firstly to an administrative court for rescission of the licences, and secondly to civil courts for injunctions to prevent the licensed companies from providing such services. For many of these mostly start-up companies, the financial risk attendant on the legal proceedings poses a threat to their economic liability and survival.

### Administrative Court Proceedings

To date, DPAG has challenged the granting of more than 600 higher quality service licences before Cologne administrative court. For various reasons, including resolution of the matter because the competitor has discontinued business, the number of cases has fallen to around 500. DPAG has now also announced its intention to withdraw the actions concerning same day delivery.

Cologne administrative court has already ruled on six test cases, determining that same day delivery – but not next day delivery – qualifies as a higher quality service. Both DPAG and the RegTP have successfully applied to the higher administrative court in Münster for admission of appeal against the rulings unfavourable to them.

Cologne administrative court on 20 June 2000 dismissed an action brought by a licence holder contesting the RegTP's inclusion on the licence certificate of a service area criterion (provision in a minimum area of 2,500 km<sup>2</sup>). The court dismissed the challenge on the grounds that the criterion listed under "Notes" did not actually obligate the licence holder. Although the court found the action to be inadmissible, its statement of reasons drew attention to the fact that same day delivery qualifies as a higher quality service even where the service area criterion is not met.

### Civil Court Proceedings

According to the RegTP's current information, the status of the proceedings is as follows:

- Proceedings pending
  - before regional courts (proceedings at first instance): 23
  - before higher regional courts (proceedings on appeal): 8
  - before the Federal Court of Justice  
(proceedings on appeal on points of law): 3

In the majority of cases, the regional and higher regional courts ordered that the proceedings be held in abeyance pending a final ruling by the administrative court or a ruling by the Federal Court of Justice. 15 actions and appeals were either withdrawn by DPAG as it had little or no prospect of success, or declared resolved after the defendant had discontinued business or the two parties reached a settlement.

- Proceedings completed: **53**  
(Judgments and rulings of the regional and higher regional courts)

The conclusions drawn by the courts continue to differ in the absence of a ruling by the Federal Court of Justice or the Federal Administrative Court determining which services are of higher quality and therefore not covered by DPAG's statutory monopoly. The judgments and rulings do, however, show the following tendencies:

- in the vast majority of cases where the competitor holds a licence from the RegTP, it is the competitor that wins;
- in the vast majority of cases where the competitor does not hold a licence from the RegTP, it is DPAG that wins;
- the legal basis for the service area criterion is being increasingly called into question.

### Development of the Market (Licensed Services)

Last year the RegTP ran another market study, covering the 629 operators licensed up to 30 September 1999:

- **525 holders of a licence** granted under the PostG after 1 January 1998, and
- **104 holders of an old-type licence** to convey large mailings (granted as an exemption from the statutory monopoly before the PostG took effect).

The operators were asked for their revenue and sales figures for 1998, 1999 and 2000 (forecast), and their staff numbers as at 1 November 1999. 625 of the operators sent a written reply.

### Market Study Results

#### Revenues and Sales from Licensed Services (including DPAG)

1998		1999		2000 (forecast)	
Revenues [DM]	Sales [volume]	Revenues [DM]	Sales [volume]	Revenues [DM]	Sales [volume]
19.2bn	15.05bn	19.6bn	15.45bn	20.2bn	15.9bn

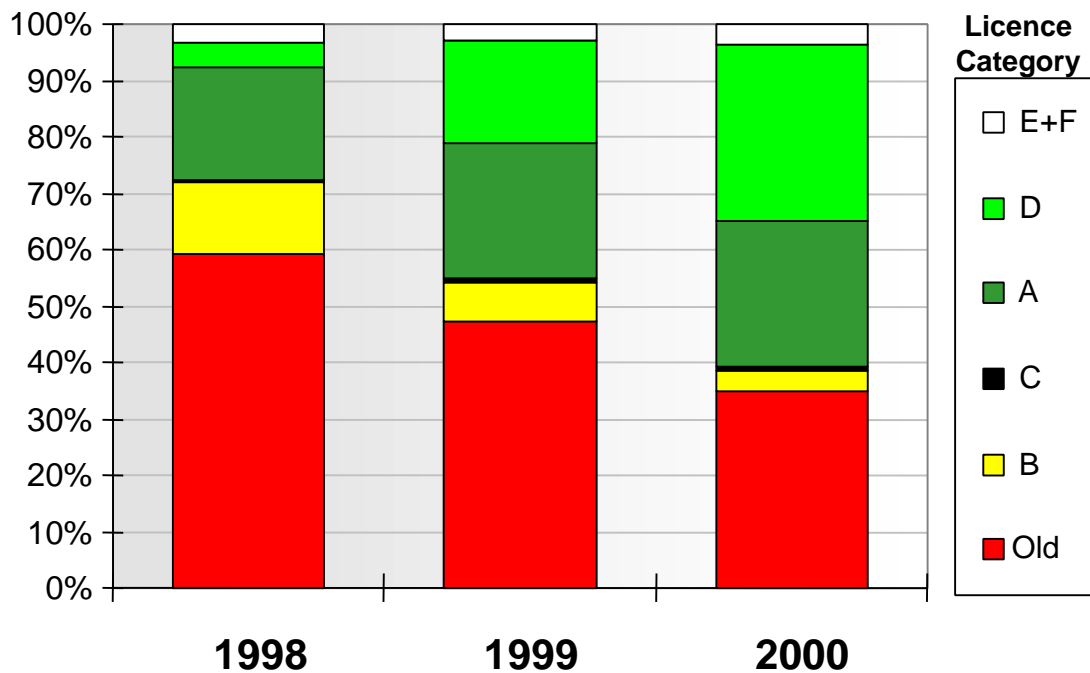
#### Company Size by Revenues (excluding DPAG)

Revenues	DM 1 to DM 1,000	DM 1,001 to DM 10,000	DM 10,001 to DM 100,000	DM 100,001 to DM 1m	Over DM 1m
1998	2	18	44	41	14
1999	14	62	156	106	30
2000 (forecast)	4	23	101	177	53

### Breakdown of Revenues by Activity [DM million]

Licensed activity	Forecast		
	1998	1999	2000
<b>A</b> Letters > 200 g or > DM 5.50	30.5	60.9	100
<b>B</b> Letters with identical contents > 50 g	19.1	17.2	14
<b>C</b> Document exchange	0.3	1.6	3
<b>D</b> Higher quality services	6.7	45.6	120
<b>E</b> Mailing at DPAG acceptance points	2.5	3.9	9
<b>F</b> Collection from DPAG PO box facilities	2.5	3.7	5
Old-type licences (large mailings)	90.3	119.7	134
<b>Total [DM million]</b>	151.9	252.6	385

### Breakdown of Licences by Category



Note:

The trend among services is away from simple transport (mostly category B and old-type licences) and towards added value (notably category A and D licences).

**Market Shares for Licensed Services  
(Including Statutory Monopoly Services)**

*Forecast*

	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>Total revenues</b> [DM million]	19,200	19,600	20,200
<b>Revenues for holders</b> (excluding DPAG) [DM million]	151.9	252.6	385
<b>Market shares for holders excluding DPAG</b>	<b>0.8%</b>	<b>1.3%</b>	<b>2.0%</b>
<b>Markets shares for DPAG</b>	99.2%	98.7%	98%
<b>Revenues from category D licences</b> [DM million]	6.7	45.6	120
<b>Market share for category D licence holders</b>	<b>0.03%</b>	<b>0.24%</b>	<b>0.63%</b>

**Licence Holders' Shares in the Market for Letters with Identical Contents > 50 g  
(Old-Type and Category B Licences)**

*Forecast*

	<b>1999</b>	<b>2000</b>
<b>Total revenues</b> [DM million]	<b>2,575</b>	<b>2,750</b>
<b>Revenues from old-type and category B licences</b> [DM million]	<b>136.9</b>	<b>148</b>
<b>Market share for old-type and category B licence holders</b>	<b>5.3%</b>	<b>5.7%</b>

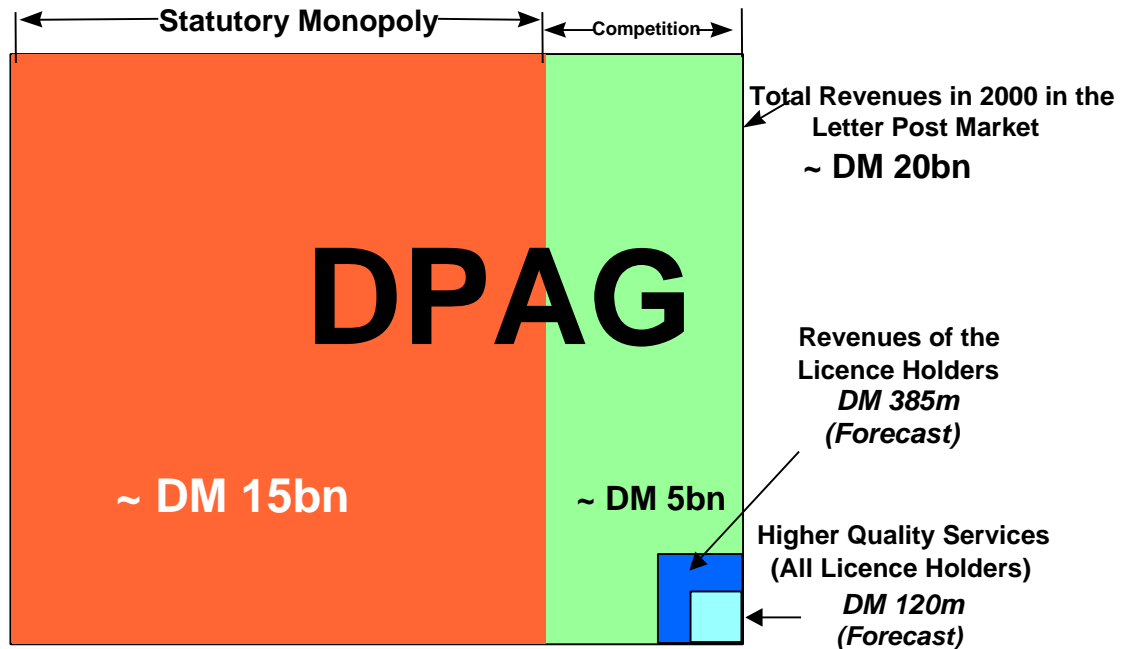
**Note:**

The figures relate solely to letters with identical contents over 50 grammes which, however, account for less than 50 per cent of total revenues from letters with identical contents. The licence holders' share of the total market for letters with identical contents (*Infopost* items, direct mail) is put at around 2.5 per cent.

## Market for Licensed Postal Services in 2000

*(Forecast)*

**(Areas correspond to revenues)**



## Ruling Chambers

### Ruling Chamber 1

President's Chamber

(Telecoms and Postal Licensing and Universal Services, and Scarce Radio Spectrum Resources)

### UMTS/IMT-2000

Following on from the Ruling of 10 May 1999 on the procedure for the award of licences for 3G, the President's Chamber on 18 February 2000 issued two Rulings underpinning the opening of the market for UMTS/IMT-2000 services:

- the determinations and rules for the award of licences for UMTS/IMT-2000, and
- the rules for conduct of the auction for the award of the licences.

These Rulings set out the basic framework for the 3G auction, including the

- qualification requirements for admission to the auction, and launch of the qualification stage (the deadline for applications being 28 April 2000),
- definition of the relevant product and geographical market,

- licence conditions, including the coverage obligations (25 per cent of the population by 31 December 2003, and 50 per cent of the population by 31 December 2005),
- frequency usage conditions for the future licences,
- basic package of spectrum (10 MHz paired), and
- minimum bid.

The President's Chamber confirmed at the end of May 2000 that 11 applicants had qualified as bidders, seven of whom actually participated in the auction launched on 31 July 2000.

### **Award of Additional Frequencies to Bridge the Last Mile**

The President's Chamber last year tendered out and awarded an additional 162 frequencies for FWA. In the three proceedings held since 1998, the Chamber has awarded FWA spectrum for more than 250 coverage areas. In the latest tender, 14 companies submitted a total of 503 separate applications for the spectrum available. Overall, at least two competing companies have been awarded frequencies to set up fixed PMP links for FWA in each rural district and town in Germany. The spectrum enables operators to use radio links as the last mile connection to customers in order to provide voice telephony and other high bit rate telecoms services.

### **Ruling Chamber 2**

(Rates Regulation, Rates subject to Approval for Transmission Paths (Licence Class 3) and Voice Telephony (Licence Class 4))

Last year Ruling Chamber 2 ruled on 45 rates proposals, and summoned a total of 205 parties to attend its public oral hearings.

### **Rates for Transmission Path Offerings**

The Chamber ruled on one price proposal for digital carrier and standard leased lines and two proposals for analogue standard leased lines. It also made two determinations concerning the charges for international facilities providing access to border repeater stations or submarine cable termination points, which is classed as special access but bears a close similarity to carrier leased line provision. In addition, it dealt with the prices proposed for fast repair services.

The Chamber also handled eight cases in the field of broadcasting, including three price proposals each for analogue and digital broadcasting. Those for digital broadcasting followed on from two investigations into market dominance in respect of coverage in Bavaria and in Baden-Württemberg and Rheinland-Palatinate.

The proposed prices – in most cases accompanied by unusually complex cost statements – had to be assessed against costs of efficient service provision (Section 27(1) subparagraph 1 of the TKG). In accordance with the Chamber's determination of 8 September 1999, a further substantial reduction was made in the prices for standard and carrier leased lines, bringing them more into line with efficient operator costs. Cuts were made in the prices for all types of



standard and carrier leased line, including high bit rate lines, in both the access and the core network.

In those cases where the proposed rates did not meet the criteria of Section 24 of the TKG and therefore did not qualify for approval, the Chamber again determined prices lower than those proposed. These included some of the prices for digital standard and carrier leased lines and the charges for fast repair services. The Chamber's two determinations on the prices for international facilities first set prices lower than those submitted for approval and then cut these prices even further, resulting in an overall reduction of more than 50 per cent for the various options. The prices determined for DAB coverage in Bavaria, Brandenburg, Saxony, Saxony-Anhalt and Thuringia were between approximately 10 and 19 per cent lower than those originally proposed.

In assessing the prices for digital standard and carrier leased lines, the Chamber applied a new methodology for leased line international price comparisons – as provided for by Section 3(3) of the Telecommunications Rates Regulation Ordinance (TEntgV) – which was published after public consultation under Communication 112/2000 in the RegTP's Official Gazette 4/2000 of 23 February.

### **Price Cap Regulation**

The now defunct Federal Ministry of Posts and Telecommunications (BMPT) in its Communication of 9 December 1997 set out the price cap regime applicable to DTAG's telephone call prices as from 1 January 1998. The regime defined the baskets of services, and fixed the benchmarks and secondary provisions to be applied in assessing and approving proposed prices for voice telephony services offered under Section 6 of the TKG. The regime was published on 17 December 1997 in the BMPT's Official Gazette.

Before expiry of the first price cap period, Chamber 2 ruled in December 1999 that the basket structure would remain unchanged, and that in the second price cap period (from 1 January 2000 to 31 December 2001) DTAG's *BusinessCall 500*, *BusinessCall 700*, *City Plus 600/800* and *Select 5/10* would be added to the business basket, and *City Plus 600/800* and *Select 5/10* to the residential basket. The Federal Statistical Office's June 1999 consumer price index for all private households was up 0.4 per cent on the previous year. Consequently, the price cut target for the second price cap period was fixed at 5.6 per cent. The new regime was published in the RegTP's Official Gazette of 12 January 2000.

For the second price cap period the average price for the services grouped in each basket had to be cut in the first quarter of 2000 by 5.6 per cent. DTAG's prices proposed in this quarter met the target.

The Chamber assumes that the benchmark used to check for the discounts prohibited under Section 24(2) subparagraph 2 of the TKG – the interconnect rates plus 25 per cent to allow, for example, for billing and distribution costs – should enable DTAG to cover at least its Long Run Incremental Costs (LRICs) as referred to in Section 3(2) of the TEntgV. The Chamber does, however,

reserve the right to review this benchmark to take account of any new findings on quantifying in particular distribution costs.

## **Individual Rates Regulation**

### ***T-ISDN-XXL* Trials**

DTAG's scheme – initially open to ISDN line customers only – offers special prices for certain national and international calls for a monthly charge of DM 12.83 (net), or DM 14.89 (gross). One particularly attractive feature is that on Sundays and national holidays scheme members can make national calls and surf the Internet completely free of charge. Otherwise, the call charges are the same as for DTAG's *AktivPlus*. The scheme was approved on 27 April 2000 for a trial period only, and subject to the following conditions:

1. The scheme is approved for the period to 31 December 2000 only.
2. The trial period begins no earlier than 1 June 2000.
3. DTAG must submit a new price proposal for the scheme, together with verifiable cost statements, by 30 September 2000.
4. DTAG must give the RegTP a monthly report on customer numbers and actual usage once the scheme is introduced.
5. The minimum term of contract may be no more than one month.

The scheme was approved for a trial period on the grounds that the advantages of introducing the offer as soon as possible outweighed the lack of reliable forecasts and the potential competitive disadvantages. One key deciding factor was that DTAG was the first to react to the increasing demand for special low-cost call plans, and to the demands voiced by consumers and in the political arena for creative, innovative and modern telecoms services. There have been repeated calls for affordable, all-inclusive payment options, aimed to promote widespread use of the Internet. The scheme – offered for a limited period only and to selected customers only – is unlikely to have a major impact on competition.

### **Extension of the *T-ISDN-XXL* Trial Period**

The key motive behind the Chamber's approval of the *T-ISDN-XXL* scheme for a trial period was – in view of the lack of reliable forecasts of the target group's calling behaviour – to gather the information required to provide a sound basis for determining the degree to which the proposed price is cost based and qualifies for approval. The Chamber decided that a period of seven months would be needed in order to gain a realistic idea of long term calling patterns that is not, in particular, distorted by the unusually high usage conceivable in the early days of the scheme.

At the end of the trial period, the RegTP had three reports on customer numbers and calling behaviour between June and August. These reports showed that, contrary to the original forecast, Internet usage on Sundays and public holidays – when calls are free of charge – was negligible. In addition, there were striking differences between the reports and DTAG's original forecast in terms of the durations of *City* and national calls. Overall, the monthly usage patterns varied considerably. The Chamber therefore decided that it was

necessary to extend the trial period to 31 April 2001 in order to guarantee that all the findings from the trials could be taken into account.

### **Rejection of the *Talk2Friends* Scheme**

The Chamber on 10 November 2000 denied DTAG's request for approval of its *Talk2Friends* scheme for customers with an ISDN multi-terminal line. The proposed scheme would offer *Talk2Friends* members – for a monthly charge of DM 4.99, including Value Added Tax (VAT) – unlimited calls between 12:00 and 20:00 daily from a designated multiple subscriber number to other *Talk2Friends* numbers within the same *City* zone. Calls at other times, to other numbers within the same *City* zone, and to numbers outside the *City* zone would be charged at either the standard rate or another special rate of the customer's choice. *Talk2Friends* would apply only to lines with DTAG as the preselected carrier.

The Chamber's decision to reject the scheme was underpinned by three key considerations:

1. Approval of the scheme would have led to anti-competitive discounts: in light of past behaviour among customers of flatrate schemes, actual usage was expected to have exceeded the average usage forecast by DTAG to such an extent that the proposed monthly charge of DM 4.99 would not have covered DTAG's true costs. The fact had to be taken into account that the flatrate offer would have been especially attractive in particular to above average *City* callers. In addition, typical effects of flatrate schemes – such as members making longer calls, more calls and calls in the special hours only – were excluded from DTAG's calculations.
2. The fact that both the calling and the called customer had to be *Talk2Friends* members would have resulted in a characteristically new obstacle to effective competition in the local access market. Competing operators would not have had the slightest chance of offering customers a comparable rate, since – in contrast to DTAG with a share of well over 90 per cent of the market for subscriber lines – the calling and called customer would only rarely have the same alternative line supplier. Moreover, the disadvantages for smaller operators would have snowballed as members tried, in their own economic interest, to persuade friends, business partners and customers, for instance, to join the scheme.
3. In terms of competition, the restriction in the General Terms and Conditions to lines with DTAG as the preselected carrier also gave cause for concern. By contrast with other schemes run by DTAG, the special flatrate would have been limited to *City* calls, and so customers might not necessarily have chosen to route their other calls via DTAG had they not been obliged to do so. DTAG would therefore clearly have been exploiting its continuing dominance in the local access market in order to improve its competitive chances as a long distance operator, at the same time impairing those of long distance carriers not in a position to offer comparable schemes.

### **Market Dominance in Specific Submarkets**

Still pending are a total of four submissions from DTAG concerning non-dominance in specific submarkets for voice telephony services: international

calls to the US, international business calls to Denmark, international calls to Turkey, and business calls and lines in the Berlin area. Comprehensive surveys have been made in order to determine the competitiveness of these submarkets. Because the data on traffic volumes and revenues as supplied by the companies surveyed is covered by commercial secrecy, specific figures for turnover and market shares cannot be disclosed with the findings.

### **Ruling Chamber 3**

(Special Control of Anti-Competitive Practices in the Telecoms Market, and *Ex Post* Telecoms Rates Regulation)

#### **Special Control of Anti-Competitive Practices Invoicing and Payments**

In February and March 2000, the Chamber issued two complementary Rulings requiring DTAG to continue to provide to its competitors until 31 December 2000 invoicing and payment services at the same conditions and prices. This served two key regulatory aims: first, to safeguard the justified interests of the consumers and, second, to ensure effective competition as a prerequisite for the provision by alternative operators of services using call by call carrier selection.

DTAG was ordered to submit to its competitors by 30 June 2000 a proposal for a new agreement regulating the relevant terms and conditions to be applicable as from 2001. This agreement was to be applicable to voice telephony, value added, directory enquiry, and pay-as-you-go Internet services, and provide for

- a standard bill detailing each individual product and the total amount payable,
- a request for payment of the total amount invoiced to only one bank account of DTAG, or initial direct debit by DTAG of the total amount invoiced,
- forwarding of payments due to other carriers, and
- an itemised bill for voice communication services, where requested by the customer.

In future, however, complaints and debt collection are to be dealt with by the competitors themselves, with the necessary data to be supplied by DTAG. The legality of the Chamber's determinations have been confirmed by courts of first and second instance ruling on a request for interim relief. Still pending, however, is a decision by Cologne administrative court on the merits of the case brought by DTAG. The appropriateness of the individual conditions in the proposed agreement is still under dispute between DTAG and its competitors. Crucial differences remain in particular concerning the charges for the services that DTAG must continue to provide. The Chamber is currently leading an informal conciliation process between DTAG and representatives of its competitors, with a view to finding a pragmatic solution. Whether or not this will lead to a mutually workable solution depends not least on the willingness of all those involved to make an active and constructive contribution.

### **Local Loop Access**

The Chamber ordered DTAG in mid-2000 to align specific clauses in its standard agreement for local loop access. The main causes for complaint were the lack of guaranteed provisioning times and the excessive supply times for local loops and collocation space. DTAG was also ordered to allow joint use of the lines by its local loop partners and third parties under specific conditions. DTAG requested the opportunity to negotiate the amendments and other issues with its competitors, with a view to making a wider update. The Chamber agreed after initial hesitation. However, despite intensive discussions attended in part by the RegTP, DTAG failed to reach a consensus with the vast majority of its competitors. In the interests of competition, and to avoid a standstill in amending the agreement, the Chamber ultimately insisted that DTAG modify the agreement as specified in its initial Ruling and subject to no further conditions. DTAG presented its competitors with the agreement, as amended in line with the determination, at the end of December.

Last year the Chamber also pursued two key cases not involving anti-competitive practices:

### **Line Sharing**

The Chamber is to determine when and to what extent DTAG is required to offer its competitors shared access to its local loops. Shared access, or line sharing, enables operators and the incumbent to share the same local loop line so that consumers can acquire low bandwidth voice services from one operator and high bandwidth services, in particular data services, from another. In view of a forthcoming EU Regulation concerning shared access, the Chamber will also need to have regard to Community legislation in making its determination.

### **Ex Post Rates Regulation**

The Chamber's Ruling of 15 November 2000 required DTAG firstly to offer ISPs unmetered Internet access at a flatrate and, secondly, to discontinue unlawful discounts and unlawful discrimination in its existing metered wholesale rates. DTAG was originally given until 15 December 2000 to change its per-minute rates. This deadline has, however, been postponed pending a decision by Cologne administrative court on the expedited proceedings brought by DTAG against the Chamber's Ruling. By contrast, DTAG submitted to its competitors before the deadline an offer for the required flatrate product. Examination of the proposed conditions and rates – which were immediately met with criticism by a number of companies – is still ongoing, and it is still too early to give an indication of the outcome.

### **Ruling Chamber 4**

(Special Network Access, including Interconnection)

Last year Chamber 4 dealt with 19 price proposals for special network access as provided for by Sections 39 (1<sup>st</sup> alternative) and 35 of the TKG, and nine requests for interconnection orders under Sections 39 (2<sup>nd</sup> alternative) and 37 of the TKG. The Chamber also ruled on one case concerning anti-competitive

practice, and revoked 24 interconnection orders after consultation with the parties concerned, who had since negotiated interconnection agreements.

The price proposals concerned the rates for optional and additional interconnect services, air conditioning in collocation rooms for interconnection and local loop access, transmitting suffixes for certain service numbers, connecting local loop lines at special times, additional services in connection with local loop access (in particular the rental charges for some 8,000 collocation sites), collocation space for interconnection, inter-building links, routing to all relevant switches, and service provider access. In some cases, the Chamber approved the proposed prices, whilst in others it fixed prices lower than those proposed, or gave its provisional approval. One key determination is that of 31 March 2000 approving the prices payable for a range of optional and additional services as from 1 April 2000, and those payable as from the introduction of carrier selection phase II, scheduled for 1 July 2000.

Most of the approved rates were published in the RegTP's Official Gazette as prices for standard services.

The interconnection orders issued under Section 37 of the TKG primarily concerned disagreements on bundling and on the prices for optional and additional interconnect services after introduction of carrier selection phase II. Mannesmann Arcor AG's request of 30 June 2000 for an order to interconnect with DTAG concerned the Element Based Charging (EBC) scheme. In its key determination of 8 September 2000, the Chamber ordered application as from 1 June 2001 of the new scheme, in which charges are based on the number of network elements used for each call. Although the scheme is based on a two-layered network, account was also taken of the third layer in DTAG's current network. The charges were determined on the basis of an analytical cost model for the core network, commissioned by the RegTP from the Scientific Institute for Communication Services (WIK).

### **Ruling Chamber 5**

(Postal Rates Regulation and Special Control of Anti-Competitive Practices in the Postal Market)

Chamber 5 responded to a number of complaints by initiating a review as provided for by Section 25(1) of the PostG. As a result, it formally objected on the grounds of anti-competitive pricing to the proportional large volume discounts offered by DPAG on heavyweight *Infopost* items in 1999 and 2000. Such loyalty discount schemes act as a strong magnet, attracting and tying large volume customers to DPAG while preventing them from sending mail through other providers, and in turn restricting competitors' chances in the market. In view of the Chamber's objections DPAG agreed in the course of the investigations to terminate its discount agreements. However, the possibility of DPAG concluding other, similar agreements in the future prompted the Chamber to formally object to the discounts as unlawful practice and to order DPAG to cease to apply the discounts and to charge the rates as specified in its general terms and conditions.

A special form of rates regulation is the procedure provided for by Section 31(2) of the PostG. Under certain circumstances the Chamber is, on request, to determine the basic conditions of a contract between a dominant provider and a competitor, relating to incidental services (Section 28) or access to PO box facilities and change of address information (Section 29), where the parties fail to conclude a contract within three months of the competitor's initial request for services or access. In contrast to the rates approval and review procedures as provided for by Sections 19ff and Sections 24 and 25 of the PostG, the Chamber is in this case obliged to fix the price structure as well as the prices themselves, as the parties cannot usually agree on the charges to be paid.

In September and October 2000 the Chamber granted three applications from competitors and five from end customers for access to incidental services provided by DPAG, and set the conditions for access to DPAG's mail centres. The Chamber's Rulings enable competitors and end customers to hand over letter items at the receipt and dispatch areas of DPAG's mail centres for forwarding and delivery. Tasks such as collecting, presorting and transporting to the mail centres may be undertaken by the competitors and end customers themselves, leading to cost and price reductions in the letter post market.

Last year 18 applications were submitted for access to PO box facilities, with the Chamber ruling on 12. In connection with contracts for PO box access, the Chamber, in agreement with the Federal Cartel Office, considers reasonable a maximum rate of DM 0.17 (€0.09) per letter deposited by DPAG staff in a PO box.

22 applications were submitted for access to change of address information, with the Chamber ruling on 11. The Chamber, again in agreement with the Cartel Office, sees as reasonable the following maximum rates:

- DM 0.23 (€0.12) plus VAT per address updated via remote data transmission,
- DM 5.54 (€2.83) plus VAT for electronically processing and transmitting via remote data transmission a set of permanent change of address data, and
- DM 6.94 (€3.54) plus VAT for electronically processing and transmitting via remote data transmission a set of temporary change of address data.

DPAG initially refused to implement some of the Chamber's Rulings, in particular those on transmitting change of address data, citing legal reservations in respect of data protection. However, following a statement from the Federal Commissioner for Data Protection that he had no legal objections to this form of access, DPAG agreed to ensure swift compliance with the Rulings. Provision of the change of address data will ultimately result in a reduction in misdeliveries by competitors. It is also expected to lead to a decrease in the number of letters wrongly delivered by the competitors and then landing in DPAG's network after being posted in DPAG's postboxes. How DPAG handles these letters is open to dispute: while DPAG maintains it should deliver the letters to the addressees, its competitors claim the letters should be returned to them so that they

themselves can complete delivery. The matter has now been referred to Ruling Chamber 5 for examination.

Approving the rates for serving documents in accordance with the relevant codes of procedure and legislation constitutes another special form of rates regulation. In this case, the criteria designed for regulating dominant companies only are applicable to all providers, both dominant and non-dominant. This has not given rise to any problems in practice. The average price regularly proposed for approval by the mostly regional licence holders is approximately DM 8.00 (excluding VAT), which is about 30 per cent less than DPAG's rate of DM 11.00. The Chamber approved 49 price proposals for document service during 2000.

### Ruling Chamber Proceedings 2000

Ruling Chamber	Rates regulation		Control of anti-competitive practices		Licensing		Frequency award	Inter-connection orders		Other proceedings (conciliation, complaints, authorisations)		Total number of proceedings	Number of summons	Disputed proceedings
	T	P	T	P	T	P		T	P*	T	P			
1	-	-	-	-	1	-	2	-	-	-	-	3	-	-
2	38	-	1	-	-	-	-	-	-	6	-	45	205	27
3	6	-	3	-	-	-	-	-	-	23	-	32	98	6
4	19	-	1	-	-	-	-	9	-	24	-	53	311	26
5	-	104	-	5	-	-	-	-	51	-	5	165	13	34
Total	63	104	5	5	1	-	2	9	51	53	5	298	627	93

\* Access to PO box facilities, change of address data, and incidental services.

## The Regulatory Authority

### Basis and Scope of Activities

The RegTP was set up on 1 January 1998 as a structurally separate and independent higher federal authority within the scope of business of the BMWi. Its headquarters are located in Bonn.

The RegTP's core tasks, underpinned by the TKG and the PostG, are to

- keep a check on the dominant market position of the former monopoly operators, DTAG and DPAG,
- create a level playing field for new entrants in the postal and telecoms markets, and
- promote the development of the postal and telecoms market.

The RegTP is also committed to acting as an advocate for consumers and to performing its range of activities outside market regulation, including

- awarding licences for postal and telecoms services,
- providing input for standardisation solutions,

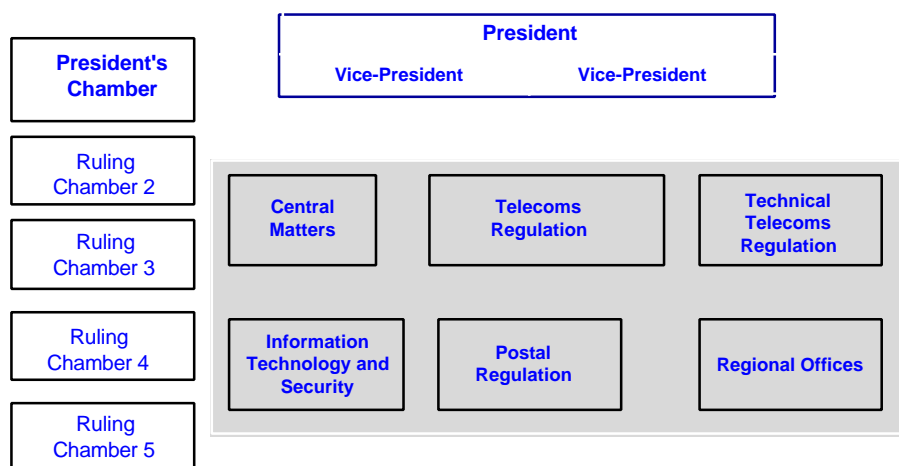


- managing spectrum and numbering resources,
- investigating and resolving radio interference,
- watching developments in the markets, and
- advising consumers, in particular on new regulations and their implications in the postal and telecoms markets.

### Organisational Structure

The RegTP's streamlined organisational structure is designed to mirror its tasks and enhance efficiency:

### Organisational Structure



The RegTP makes determinations through its Ruling Chambers. Key areas are imposing universal service obligations and approving rates in both the telecoms and the postal sector, ordering open network provision and interconnection of telecoms networks, and specifying postal services.

The RegTP's main departments are responsible for central administrative and technical matters, such as economic and legal aspects of regulating and licensing postal and telecoms services, and technical aspects of frequency management, standardisation and numbering.

A key objective of the RegTP's structure is to bring the technical and economic aspects of spectrum management under one roof. To better integrate the RegTP's executive tasks, a separate department oversees and coordinates work in the 46 Regional Offices, which act as local contact points, giving the RegTP a nationwide presence that benefits consumers and industry alike.

The Regional Offices provide local customer services, offering advice about, for instance, the provisions of the TKG, licensing requirements, frequency assignment, and EMC regulations. They issue radio operator licences and transmitter site certificates, hold examinations for flight radiotelephony operator and radio amateur licences, and assign frequencies for mobile, aeronautical

and CB radio equipment. The Offices are equipped with modern fixed and mobile facilities for round the clock spectrum monitoring, enabling the immediate identification, investigation and resolution of interference and other irregularities. The regional staff are also responsible for verifying compliance by licensees with the conditions of their licences, and are currently involved in establishing a scheme for postal licence holders.

### **Personnel Resources**

Proactive staff management is a priority at the RegTP. Matching the right staff with the right positions is a vital resource for a modern authority. The RegTP's highly interdisciplinary field of activity requires experts from a wide range of backgrounds such as law, economics, engineering, mathematics, information technology, and administration. The RegTP has around 2,600 staff; the grades of the posts held by both the civil servants and the 300 or so non-civil servants reflect the staff grades of the German civil service (basic, medium, upper, and senior).

Last year the RegTP awarded another six places for young office communication trainees.

Analysis of staff according to grades:

#### Senior grade (about 200 staff, including some 70 graduate engineers)

The non-technical posts are filled by economics and business economics graduates with various core areas of expertise, legal experts, and other graduates in disciplines specific to their specialised field of work. Among the 70 or so technical graduates are construction and mechanical engineers and communications engineers.

#### Upper grade (about 950 staff, including some 800 engineering and technical specialists)

Most of the non-technical personnel are administrative and business economics graduates from higher education colleges. The 800 or so technical staff are mainly communications engineers.

#### Medium grade (about 1,400 staff, including some 600 technical staff)

Most of the non-technical personnel have completed civil service traineeships in administration. The technical staff have had vocational training as telecoms workers or communications electronic technicians.

#### Basic grade (about 70 staff, including 20 technical staff)

These staff, most of whom have also completed apprenticeships, work in a variety of areas such as internal administration and maintenance.

### **Financial Resources**

The RegTP's income and expenditure is budgeted for in Section 09, Chapter 0910 of the federal budget. This Chapter is essentially incorporated in the flexible budget management system. The tables below show the RegTP's income and expenditure budget for 2000 and 2001, and performance for 2000:

## Income:

Type of income	2000 target DM'000	2000 performance DM'000	2001 target DM'000
Administrative income	302,650	545,075	287,230
Fees and contributions payable under the TKG	171,000	547,268*	117,000
Other fees and contributions	129,000	-3,673**	168,000
Other administrative income	2,650	1,480	2,230
Other income	101	73	90
<b>Total income</b>	<b>302,751</b>	<b>545,148</b>	<b>287,320</b>

The difference between the actual income for 2000 and the expected income for 2001 is accounted for by fees and contributions paid retrospectively under, in particular, the Telecommunications Number Fee Ordinance (TnGebV) and the Ordinance concerning Telecommunications Licence Fees (TKLGebV).

\* This figure includes number allocation and licence fees that have been legally contested on various grounds.

\*\* The EMC contributions could not be levied as expected because the EMC Contributions Ordinance (EMVBeitrV) was declared void by the Federal Administrative Court. Earlier contributions were partly reimbursed.

## Expenditure:

Type of expenditure	2000 target DM'000	2000 performance DM'000	2000 performance against target	2001 target DM'000
Staff costs	178,492	176,460	98.7%	169,111
General administrative expenditure and appropriations	70,992	61,380	86.5%	67,883
Investments	51,461	42,388	82.3%	45,709
Minus efficiency dividend and blocked funds	-9,794	-----	-----	-9,158
<b>Total expenditure</b>	<b>291,151</b>	<b>280,228</b>	<b>96.3%</b>	<b>273,545</b>

## **List of Abbreviations used in the RegTP Annual Report 2000**

<b>Abbreviation</b>	<b>Meaning</b>
3G	Third Generation
3GPP	Third Generation Partnership Project
3GPP2	Third Generation Partnership Project 2
ADSL	Asymmetric Digital Subscriber Line
AFuV	Amateur Radio Ordinance
AOC	Advice Of Charge
ATRT	Technical Telecommunications Regulation Committee
BMPT	Federal Ministry of Posts and Telecommunications
BMWi	Federal Ministry of Economics and Technology
BSI	Federal IT Security Agency
CAB	Conformity Assessment Body
CATV	CABle TeleVision
CB	Citizens Band
CEN	European Committee for Standardization
CEPT	European Conference of Postal and Telecommunications Administrations
CUGIC	Closed User Group Interlock Code
DAB	Digital Audio Broadcasting
DAR	German Accreditation Council
DFS	Deutsche Flugsicherung GmbH
DIN	German Standards Institute
DKE	German Electrotechnical Committee
DNIC	Data Network Identification Code
DPAG	Deutsche Post AG
DSL	Digital Subscriber Line
DTAG	Deutsche Telekom AG
DVB-T	Terrestrial Digital Video Broadcasting
EBC	Element Based Charging
ECTRA	European Committee for Telecommunications Regulatory Affairs
EEA	European Economic Area

EESSI	European Electronic Signature Standardization Initiative
EMC	ElectroMagnetic Compatibility
EMVBeitrV	EMC Contributions Ordinance
EMVG	EMC Act
EN	European Standard
ERC	European Radiocommunications Committee
ETSI	European Telecommunications Standards Institute
EU	European Union
FreqBZPV	Frequency Band Allocation Ordinance
FSS	Fixed Satellite Service
FTEG	R&TTE Act
FWA	Fixed Wireless Access
GG	Basic Law
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
GWB	Restraints of Competition Act
HDFS	High Density Fixed Service
HDSL	High data rate Digital Subscriber Line
HF	High Frequency
HSCSD	High Speed Circuit Switched Data
ICAO	International Civil Aviation Organization
ICC	International Carrier Code
ICNIRP	International Commission on Non-Ionising Radiation Protection
IEC	International Electrotechnical Commission
IMEI	International Mobile station Equipment Identity
IMO	International Maritime Organization
IMSI	International Mobile Subscriber Identity
IMT-2000	International Mobile Telecommunications-2000
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISIS	Industrial Signature Interoperability Specification
ISO	International Standards Organisation
ISP	Internet Service Provider

ISPC	International Signalling Point Code
ISSS	Information Society Standardization System
IT	Information Technology
ITSI	Individual TETRA Subscriber Identity
ITU	International Telecommunication Union
ITU-R	ITU Radiocommunication Sector
ITU-T	ITU Standardization Sector
IuKDG	Information and Communication Services Act
IVPN	International Virtual Private Network
LRIC	Long Run Incremental Cost
MCC	Mobile Country Code
MF	Medium Frequency
MNC	Mobile Network Code
MRA	Mutual Recognition Agreement
MWS	Multimedia Wireless System
NATO	North Atlantic Treaty Organisation
NCC	Network Colour Code
NSPC	National Signalling Point Code
PBR	Private Business Radio
PdIV	Postal Services Ordinance
PLT	PowerLine Telecommunications
PMP	Point to MultiPoint
PMR	Private Mobile Radio
PostG	Postal Act
PUDLV	Postal Universal Service Ordinance
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
SDSL	Symmetric Digital Subscriber Line
SigG	Digital Signature Act
SigV	Digital Signature Ordinance
SIT	Satellite Interactive Terminal
SMS	Short Message Service
SNG	Satellite News Gathering

SOLAS	Safety Of Life At Sea Convention
SRD	Short Range Device
SUT	Satellite User Terminal
T-DAB	Terrestrial Digital Audio Broadcasting
TDSV	Telecommunications Data Protection Ordinance
TEntgV	Telecommunications Rates Regulation Ordinance
TETRA	TErrestrial TRunked RAdio
TIPHON	Telecommunications and Internet Protocol Harmonization Over Networks
TKG	Telecommunications Act
TKLGebV	Ordinance concerning Telecommunications Licence Fees
TKV	Telecommunications Customer Protection Ordinance
TKZuIV	Telecommunications Type Approval Ordinance
TnGebV	Telecommunications Number Fee Ordinance
UMTS	Universal Mobile Telecommunications System
VAT	Value Added Tax
VDE	Association for Electrical, Electronic & Information Technologies
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal
VwVfG	Administrative Procedures Act
WAP	Wireless Application Protocol
WIK	Scientific Institute for Communication Services
WLL	Wireless Local Loop
WRC	World Radiocommunication Conference
WTSA	World Telecommunication Standardization Assembly