

**COMPETITION POLICY IN TELECOMMUNICATIONS:  
THE CASE OF DENMARK**

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**INTERNATIONAL TELECOMMUNICATION UNION**



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## **1 Introduction**

The advent of liberalization and the introduction of competition have transformed telecommunication markets the world over. For decades, the telecommunication industry was dominated exclusively by protected public utilities. Since then, a great many countries have privatised their historical operator and developed policy frameworks to establish, foster and regulate competition in the sector. The perceived benefits of open and free competition in telecommunications are manifold. They include a drop in prices, technological innovation, greater consumer choice, and increased market penetration. Many countries have set up independent sector-specific regulatory bodies to achieve these objectives. But in sufficiently competitive markets, the need for cutting back on telecommunication regulation is being advocated, in favour of increased application of general competition policy.

In Europe, the full liberalization of the telecommunication sector occurred in most member states in 1998. Nordic countries particularly have been early adopters of information and communication technologies. In one such country, Denmark, the government established a broad political agreement on liberalization in 1995, which resulted in the introduction of full competition in July 1996, ahead of the European Union deadline. This report examines the current level of competition in the Danish market, the main problem areas for regulation, and some of the challenges to be met on the road to enhanced competition.

### **1.1 What is competition policy?**

In principle, where there exists free and open competition in a market, individual firms are unable to develop the “market power” to dictate terms to each other, and in the telecommunication market, to set unreasonable interconnection rates and access rights. In other words, they cannot operate unilaterally to the detriment of consumers or overall industry development. Rather, they must respond to the strategies of other players in order to succeed. Like any utopia, however, perfect competition does not exist. In fact, many telecommunication markets today are dominated by a small number of large or well-established players. Market liberalization may have facilitated competition, but has certainly not guaranteed it. Thus, there continues to be a need for government intervention. Through the application of adequate competition policy, governments can foster and encourage competition in the greater public interest. Their main objective must be to tackle market failures and curtail abuses of market power, while improving the overall efficiency and performance of the sector.

### **1.2 Context and structure of the report**

The information and analysis presented in this report will form part of the background material for a New Initiatives Workshop<sup>1</sup> to be convened in Geneva in November 2002 by the International Telecommunication Union (ITU). Country case studies on India, Chile and the United States will also be presented. The ITU workshop is meant to serve as a forum for competition and telecommunications policy-makers, national telecommunication regulators, industry players and user groups to exchange information and experiences on the issue of competition policy and law in telecommunications regulation<sup>2</sup>. The meeting will also seek to identify key issues concerned with competition law as it affects telecommunications. These issues might range from the institutional (such as the division of assignments between competition agencies or national telecommunications regulators) to the substantive (such as how relevant markets and significant market power are determined).

The present study is divided into six chapters. Chapter two of this report includes a country background and some of the historical developments leading to the introduction of competition in the national market. Chapter three takes a look at the current level of telecommunication competition and the main players in the Danish market. Chapter four outlines the legal and regulatory framework for telecommunications. Chapter five considers the application of competition policy to telecommunication regulation, with reference to specific disputes and cases. Chapter six concludes with the main findings of the study and posits on the challenges that lie ahead.

## 2 Country background

### 2.1 Geography and demographics

On the European continent, between the North Sea and the Baltic Sea, lies the Kingdom of Denmark, bordered in the south by its only landward neighbour, Germany. The Danish mainland occupies the “Jutland” peninsula, a lowland area that is on average 30 m above sea level, with the highest point a mere 173 metres above sea level. Of the 483 islands that make up the rest of the country, only 80 or so are inhabited. “Sjælland” or Zealand is the largest of these. The capital of the country, Copenhagen, is situated on it. Greenland and the Faroe Islands also belong to the Kingdom of Denmark, but they are independently regulated in the telecommunications area<sup>3</sup>. The Danish islands are on the sea route from the Baltic to the main oceans of the world and also on trade routes from mainland Nordic countries to central Europe.



Denmark is home to 5.3 million people and has a landmass of 43'075 square kilometres, giving it a population density of 120 per square kilometre. Some 290,000 immigrants live on its soil. The vast majority (85%) of the population lives in urban centres. The Danish language is spoken throughout the country. However there is a small German minority near the border. Culturally, the country is fairly homogeneous. The national currency is the Danish Kroner, which is equal to about 13 US cents.

### 2.2 Human development

The standard of living in Denmark is relatively high. The country ranks fifteenth among the 162 countries that make up the United Nations Development Programme<sup>4</sup> Human Development Index (HDI) and is placed in the ‘high’ human development group. In this respect, it ranks ahead of France, Switzerland and Hong

Kong SAR but behind Canada, the United States, Australia and Norway. Table 1.1 provides some relevant social and economic indicators for the country.

### 2.3 Political economy

With a queen as its nominal head, Denmark is nevertheless a parliamentary democracy. It was at the end of the 10<sup>th</sup> century that it was united into a single kingdom. It has been an independent nation every since. Today, it is divided into 14 administrative counties (“amter”) and 275 local authorities (“kommuner”).

**Table 2.1: Basic social and economic indicators for Denmark**

	1997	1998	1999	2000	2001
Population (000s)	5'275	5'299	5'314	5'330	5'367
Gross Domestic Product (GDP) (US\$ billion)	191.7	195.0	199.5	205.5	207.4
GDP Per Capita (US\$ thousands)	36.3	36.7	37.5	38.5	38.6
Average Annual Exchange Rate Per US\$	6.60	6.70	6.98	8.08	8.32

Note: The population in Denmark as of July 2002 was 5'374'255

Source: International Telecommunication Union, UNDP, Statistics Denmark



Denmark is a member of the European Union, but this did not thwart the presence of a certain degree of “Euro scepticism”. In 1992, the Danes voted against the Maastricht Treaty, which proposed monetary union and a common European defence force and the country was granted opt-outs from these provisions, among others, before the treaty was finally signed in 1993. Later on, in a referendum held in September 2000, the Danes voted against the adoption the common European currency, the Euro.

Denmark is a relatively small, open economy. Imports and exports of goods and services represent between 30 and 40 percent of the country’s Gross National Product (GNP). Around 70% of foreign trade is with EU countries. The remainder covers a large number of partners, of which the United States and Norway are the most important.

Almost three-quarters of Denmark’s citizens are employed in the service sector: 31% in the public sector and 41% in private business (including the traditional shipping trade). Industry and construction employ about 24% of the population. The traditional sectors of agriculture and fisheries account for a mere 4% of the workforce.

In the political sphere, the Social Democrats and liberal parties, respectively, have led a number of coalition governments during the 20<sup>th</sup> century. Since November 2001, a liberal coalition is in power, promising a ceiling on taxes and tighter immigration controls.

## **2.4 Introduction to the Danish telecommunication sector**

### **2.4.1 Brief overview of the liberalization of the 1980s and 1990s**

The liberalization of telecommunications in Denmark is part of the larger process of liberalization of telecommunications at an EU level (see section 4). Liberalization of the Danish telecommunication market began as early as the 1980s with liberalization completed for customer premises equipment (CPE) by 1990. Data communication services were liberalized in 1993 and liberalization of third part traffic handling of telephony services and certain types of infrastructure took place in 1994-1995. In November 1995, the Danish Parliament reached a decision aiming to complete the liberalisation process for services and infrastructure 18 months ahead of the 1998 European target. A number of legislative instruments were enacted, following a memorandum from the Ministry of Research entitled “Best and cheapest by way of real competition”<sup>5</sup>. These sector-specific regulations were meant to encourage competition and ensure consumer protection. The liberalization policy of the government marked a departure from the priorities of the previous decade. During the 1980s and the beginning of the 1990s, Denmark was fairly reluctant to infringe upon the power and privileges of its monopoly operator. In 1990, the government created Tele Danmark through a merger of the state-run international operator and the four regional monopoly operators. The main reasons cited for the merger were the need to create a more powerful national operator able to compete on the international market and a powerful company as a partner for Danish industry. Since then, the emphasis has shifted from international competition to the development of the telecommunication market as a basis for social and economic growth. Whereas in the early 1990s the main policy priority was to strengthen the national champion, the latter half of the decade saw a political agenda centred on lowering the barriers to entry for new operators.

There have been two main phases to the full liberalization process that began in 1995. During the first phase of liberalization, price-cap regulation on end-user tariffs was introduced alongside interconnection regulation. The main focus of the National Telecom Agency at the time was to reduce interconnection rates so as to encourage alternative providers to enter the market. New legislation was passed in spring 1996, abolishing the exclusive rights of Tele Danmark. The *Mobile Communications Act* was passed, providing the basis for the licensing of additional mobile services, such as GSM 900. The *Interconnection Act* was passed, stipulating, *inter alia*, that operators with a significant share of the market (that is to say more than 25%) were to grant interconnection to other operators at cost-based prices and on terms that were objective, transparent and non-discriminatory. The new legislation also called for the creation of a board of appeal, later on split into one board dealing with consumer matters and the other with disputes occurring between the various operators and service providers. This legislation was revised and expanded in 1997 and 1998.

The next phase followed the political framework agreement signed in September 1999. During this phase, the government added to the “best and cheapest” policy the goal of promoting public access to the network society (see also Section 5.1.1). Fostering competition was seen as the principal means to achieve this goal,

through initiatives aiming to stimulate the creation of competing access routes for consumers ('several pipes to the home'). In 2000, much of the existing legislation for the telecommunication sector was consolidated into the *Act on Competitive Conditions and Consumer Interests in the Telecommunications Market*.

In sum, the two-phase process resulted in the full liberalisation of the Danish telecommunication sector, preliminary sector-specific regulations on interconnection, the extension of the mandate of an independent regulator and complaints board, enhanced competition in the mobile market, along with the abolition of all exclusive rights of the former monopoly provider.

### 2.4.2 Creation of a national regulatory authority for telecommunications

In 1991, Denmark's National Telecom Agency (NTA) or *Telestyrelsen* was established. A government agency under the Ministry of Information Technology and Research (MITR), its mandate has been considerably extended since that time. The *June 1997 Act on the National Telecom Agency* sets out the NTA's responsibilities. These include the following:

- Supervising and making decisions in relation to the application of telecommunication sector legislation;
- Establishing administrative regulations in those areas permitted by enabling Acts or Executive Orders;
- Advising the Ministry of Information Technology and Research (MITR) on telecommunication issues, ensuring an ongoing review of existing legislation;
- Advising the MRIT amendments to telecommunication sector legislation;
- Representing Danish telecommunication interest in international organisations and negotiations;
- Collecting and publishing telecommunication statistics in order to ensure a competitive environment.

In 2002, the *1997 Act* was made part of a general act on competition policy and consumer issues. Furthermore, in relation with the *2002 Finance Act*, a new National IT and Telecom Agency replaced the former National Telecom Agency and State Information Service. This new Agency is under the Ministry for Science, Technology and Innovation, which was created in November 2001 as an extension of the former MITR. The new Ministry is responsible for research and education (universities), industrial research, and national technology and innovation policy. The principal mandate of the new regulatory agency is to "develop and implement initiatives within key areas of the governments IT and policy strategy – a strategy that aims to ensure an optimal framework for IT and telecommunications and conditions that will enable citizens, businesses, and the public sector to realise the network society". This is further discussed in Section 4.2.3.

### 2.4.3 Establishment of Tele Danmark

As mentioned, Tele Danmark was established in 1990 by the Government, in the form of a holding company for four regional telephone companies and the international telephone service provider, Telecom A/S. In 1996, the companies were merged into one organization.

In 1998, the government sold the remaining 41.6 per cent states owned shares in the company to the American operator Ameritech. The other shares were offered to the market already in 1994 with a restriction on individual ownership to 7.5 per cent of the privately owned shares. In October 1999, US-based SBC Communications acquired Ameritech, and with it, a 41.6 per cent share of Tele Danmark.

Until mid-1996, Tele Danmark retained its exclusive right to operate and provide fixed line network infrastructure for voice telephony as well as for leased lines. Other operators, therefore, did not have the ability to provide PSTN services directly to the end-customer through separate infrastructure. In 1996, the monopoly operator saw its exclusive rights abolished, and the 'national champion' policy abandoned.

In 2000, Tele Danmark was renamed TDC. Operations were restructured and the group now consists of a holding company, TDC Ltd, with subsidiaries working in specific business areas, e.g. TDC Tele Danmark (fixed-line telephony and data services), TDC Mobile International; TDC Internet; TDC Services (billing, procurement, logistics etc...); TDC Cable TV; and TDC Directories. The company has made a number of

foreign acquisitions, among them, the Swiss companies diAx and Sunrise communications that were later merged to form TDC Switzerland (in 2001). TDC is also involved in the mobile markets of the following countries: Austria, Czech Republic, Germany, Lithuania, Poland, Ukraine and the Netherlands. More than 50 per cent of the turnover of TDC presently comes from operations in foreign countries.

### 3 Current Levels of Penetration, Prices and Competition in Telecommunications

#### 3.1 Market size

The European Information Technology Observatory estimates the overall Danish market for telecommunications in 2001 at €4.9 billion<sup>6</sup>. This corresponds to an annual expenditure of €921 per capita, which is above the Western European average of €802. It is up 16 per cent since 1999 (€809). Together with the Netherlands, Sweden, United Kingdom, Austria and Norway, Denmark has one of the higher telecommunication turnovers per inhabitant in Europe (see figure 3.1).

With the introduction of competition, investments have increased considerably. Investments went up from 3'078 million DKK (550 million US\$) in 1995 to 10.646 million DKK (1'280 million US\$) in 2001<sup>7</sup>. In 2001, the annual investment level was three times (in DKK) that in the years preceding liberalization. Investment has been stimulated by the expansion of wireless networks, as well as the deployment of ADSL and cable modems. It is expected to increase further over the next few years, following the licensing of 3G mobile services and fixed wireless access (FWA) services.

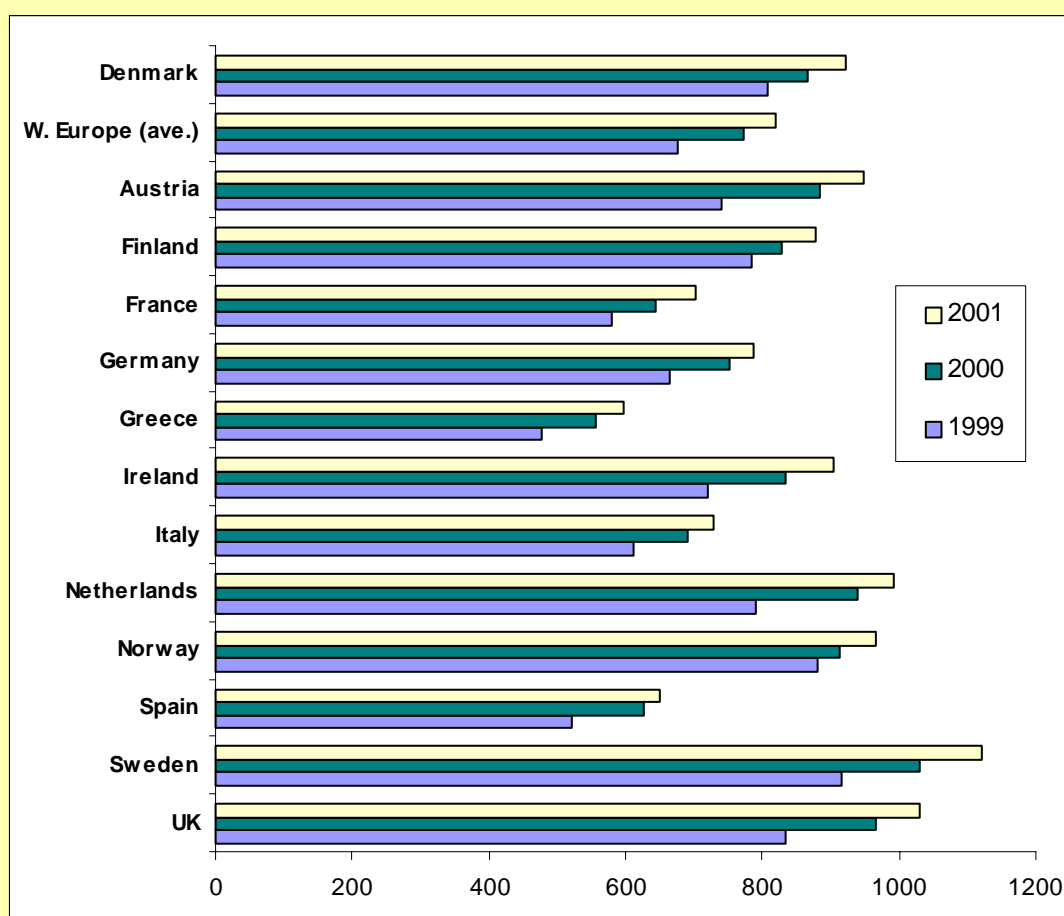
Table 3.1 sets out some basic telecommunication indicators for the Danish market.

**Table 3.1 Basic IT and Telecommunication Indicators for Denmark**

	1998	1999	2000	2001	June 2002
<b>Number of Fixed Lines (000s)</b>	3'496	3'638	3'835	3'901	3'909
<b>Fixed Lines per 100 inhabitants</b>	65.8	68.3	71.7	72.7	72.7
<b>Number of mobile subscriptions (000s)</b>	1'931'	2'628	3'363	3'960	4'154
<b>Mobile subscriptions per 100 inhabitants</b>	36.3	49.3	62.9	73.7	77.3
<b>Internet subscriptions (000s)</b>	n/a	1'135	1'684	2'023	2'282
<b>Internet subscriptions per 100 inhabitants</b>	n/a	21.3	31.5	37.7	42.5
<b>XDSL and cable modem subscriptions (000s)</b>	n/a	n/a	66.7	237.7	354.3
<b>XDSL and cable modem subscriptions per 100 inhabitants</b>	n/a	n/a	1.2	4.4	6.6
<b>CaTV subscribers (000s)</b>	946.46	964.9	1'040.6	1'078.5	n.a
<b>CaTV subscribers per 100 inhabitants</b>	17.8	18.1	19.5	20.1	n.a

Source: National IT and Telecom Agency, ITU World Telecommunication Indicators Database

**Figure 3.1 Per capita telecommunication expenditure in selected European countries and Western European average, euros, 1999-2001**



Source: European Information Technology Observatory 2002.

### 3.2 Main players

The incumbent operator, TDC, continues to be the largest provider of telecommunication services on the market, particularly for fixed-line subscriptions of which it has a market share of 86 per cent (mid-2002). In 2001, the company had a domestic turnover of approximately DKK 24.8 billion (2.98 billion US\$), which corresponds to almost 70 per cent of the total Danish telecommunications market. The company provides fixed (PSTN and ISDN), mobile, Internet, cable TV, and ADSL services as well as leased line and interconnection services.

With new players entering the market, TDC has gradually been losing market share in areas such as fixed-line domestic and international traffic, narrowband Internet subscriptions, and mobile phone subscriptions (See Table 3.2)

TDC's first major competitor in the mobile area was Sonofon, which began its operations in March 1992. At the time, it was owned by Dansk MobilTelefon I/S, a consortium consisting of GN Great Nordic (Denmark) and BellSouth (United States), and two smaller partners. During the summer of 2000, Telenor acquired GN Great Nordic's share in the company. Telenor now has a 53.5 per cent stake in the company while Bell South has 46.5 per cent. In 2001, SONOFON had a turnover of DKK 3'540 million (425 million US\$). In 2001, the company added Fixed Wireless Access (FWA) to its service portfolio. At the end of 2001,

**Box 3.1 Mobilix goes Orange**

In 2001, the operator Mobilix, owned by France Télécom (FT), changed its name to Orange as a consequence of FT's take over of the international mobile operator Orange. Mobilix/Orange has been active on the Danish market since 1998 following its successful applications for a GSM 1800 license. Orange has the major part of its operations in Denmark in the mobile field and has also acquired a GSM 900 and a 3G license in 2001.

The main shareholder in Orange Denmark is FT with 54%; 14% are held by a Danish state institution, Banestyrelsen – the authority responsible for rail way tracks; 32% are held by five financial institutions, GE Capital Structure Finance Group of the US, Paribas Affaires Industrielles, PART'COM (Groupe Caisse de Dépôts), SDP Capital Communications, and MEDIATEL CAPITAL.

FT has seen Denmark as a test market and has invested heavily in building an infrastructure and attracting customers. Deficits are, consequently, high each year – more than 1 billion DKK in 2001 and the company does not expect to recoup its investment in the short term.

With the transition from Mobilix to Orange, the operator increasingly perceives itself as part of an international operation and the focus in telecommunications policy matters centres on the establishment of uniform regulatory conditions across the EU area. Naturally, this is in line with the key goal is the delivery of pan-European services.

Source: ITU

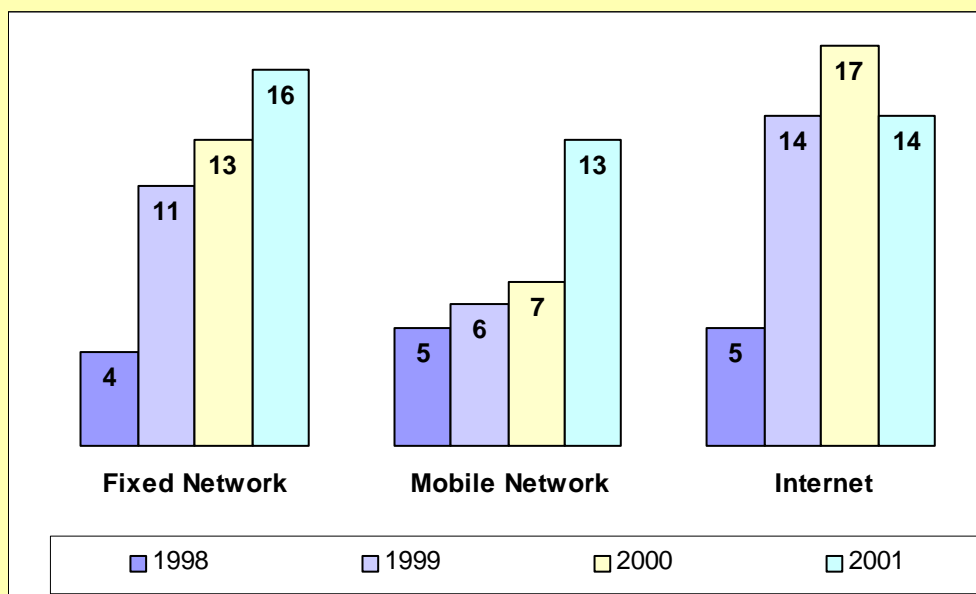
Sonofon had over a million mobile subscribers, which compares well with TDC's customer base of one and half million.

Another leading provider of telecommunication services is Telia, which began operating in Denmark in 1995. The company offers the following services: fixed network, mobile telephony, Internet access, cable TV, and cable modem Internet access. At the end of 2001, it had over 291'000 mobile subscribers, up only slightly from 263,000 a year earlier. However, in July 2002, the subscriber base increased drastically to 413,000. In June 2001, Telia bought Powercom<sup>8</sup>, an infrastructure provider, and in August 2001, it acquired Telepassport with its 30,000 fixed network customers.

Orange began serving the Danish market in 1998, when it launched GSM services. Orange operates mainly in the mobile field (see Box 3.1), where they have app. 600,000 GSM customers. But Orange also offers services in the fixed network areas, e.g. telephony and Internet connections.

In addition to these providers with infrastructure in both the fixed and mobile area, there are a number of other companies on the Danish market focusing, to a greater extent, on service provision. Tele2 and Debitel are the largest of these alternative service providers. Tele2 offers fixed network telephony, dial-up Internet access and has started up on mobile telephony and ADSL. Debitel offers mainly mobile telephony services. Tiscali<sup>9</sup> and Tele2 are the main Internet providers competing with TDC – and in the area of residential ADSL services, TDC, Cybercity and Tiscali are the main providers.

**Figure 3.2 Number of nationwide providers serving the residential segment in the Danish market**



Note: Figures shown refer the month of August for each year.

Source: National Telecom Agency

In total, as of August 2001, there were 16 nationwide providers of fixed-line telephony in the country, 13 mobile providers and 14 providers of Internet access (Figure 3.2). Today, there are about sixty telecom providers in Denmark, including the following companies: TDC, Orange, Telia, Sonofon, Tele2, Tiscali, debitel, Telmore, Cibercity and Equant.

Figure 3.2 shows the number of fixed network, mobile and Internet companies on the Danish market, which has steadily been on the rise since 1998, due to market liberalisation and the introduction of competition.

Many firms have been expanding their services and moving into new markets, giving consumers increased freedom of choice. Only in the Internet market has the number of nationwide providers decreased from 2000 to 2001. This is due to the fact that larger companies have bought up smaller providers. It is interesting to note that, other than the incumbent and early new entrant Sonofon and a few others, many of the providers relying on their own infrastructure continue to operate at a loss, e.g. Telia and Orange.

Through a number of establishments and acquisitions over the last few years, the Danish telecommunication market has a significant foreign presence. Investors include American companies SBC and BellSouth, and Nordic providers Telia and Telenor. France Telecom and Asian giant Hutchison Whampoa also have significant interests in the market. Hutchinson was awarded a license to provide 3G mobile services in Denmark. This has meant that developments in the sector have been largely influenced by international considerations and strategies.

### 3.3 Telecommunication services penetration and market shares

#### 3.3.1 Market shares of the incumbent

Competition in different areas is illustrated through TDC market shares in Table 3.1 (see also figures 3.4, 3.6, 3.7 and 3.8 below). Competition is strongest in SMS, Internet subscriptions, international telephone traffic, domestic mobile traffic, and mobile subscriptions. On the other hand, there is less competition in domestic telephone traffic and in fixed line subscriptions. In these areas, the incumbent is clearly dominant. The development of TDC's market share in ADSL subscriptions demonstrates the notion that in an area so closely related to network access provision, the incumbent operator has a considerable advantage despite an initially low market share.

#### 3.3.2 Fixed lines

Denmark boasts a strongly developed fixed line infrastructure and high service penetration. At the end of 2001, it had the third highest fixed teledensity in the world. Only Luxembourg and Sweden<sup>10</sup> have higher densities, at 78.3 and 73.9 respectively. Denmark has more fixed lines per 100 inhabitants than Norway, the United States, Canada and Germany (see figure 3.3). The number of fixed lines has grown from 3.2 million in 1995 to 3.9 million lines by June 2002. This growth in a saturated market can be primarily attributed to the increase in the number of ISDN (integrated services digital network)<sup>11</sup> subscriber lines. In the early years of ISDN, growth rates reached 100 per cent. Since then, overall growth rates have been declining, most likely due to the availability of ADSL and cable modems for high-speed Internet access. From 1999 to 2000, the number of ISDN-2 connections grew by about 35 per cent, and during the first half of 2001, they grew only by about 7 per cent.

The main provider of fixed lines remains the incumbent operator, TDC. However, a number of interconnection agreements have been signed with alternative service providers and carrier selection has been introduced (1996). In 1997, there were 200,000 customers using carrier selection. In June 2002, there were 3.08 million users of selection services, of which 1.2 million pre-selection users.

Competition has been further enhanced further through governmental policies for unbundling the local loop (See Section 3.3.3). There has been a decline in TDC's market share of fixed subscriber lines, albeit gradual, from almost 97 per cent in early 2000 to 86 per cent in mid-2002.

Although TDC has largely dominated the carriage of domestic traffic, its market share in this area has also declined, from 67 per cent in June 2000 compared with 62 per cent a year later. However, in June 2002, TDC's market share rose again slightly to 65 per cent (Figure 3.4). The largest competitive provider is Tele2, with a market share of 12 per cent in June 2002, down slightly from a year earlier. TDC's volume of international traffic has also decreased since the introduction of competition and carrier pre-selection. In 1997, TDC carried 82 per cent of international traffic but in mid-2002, this figure had dropped to just over 50 per cent (see Figure 3.4). Once again, the largest competing provider is Tele2, which carries about 11 per

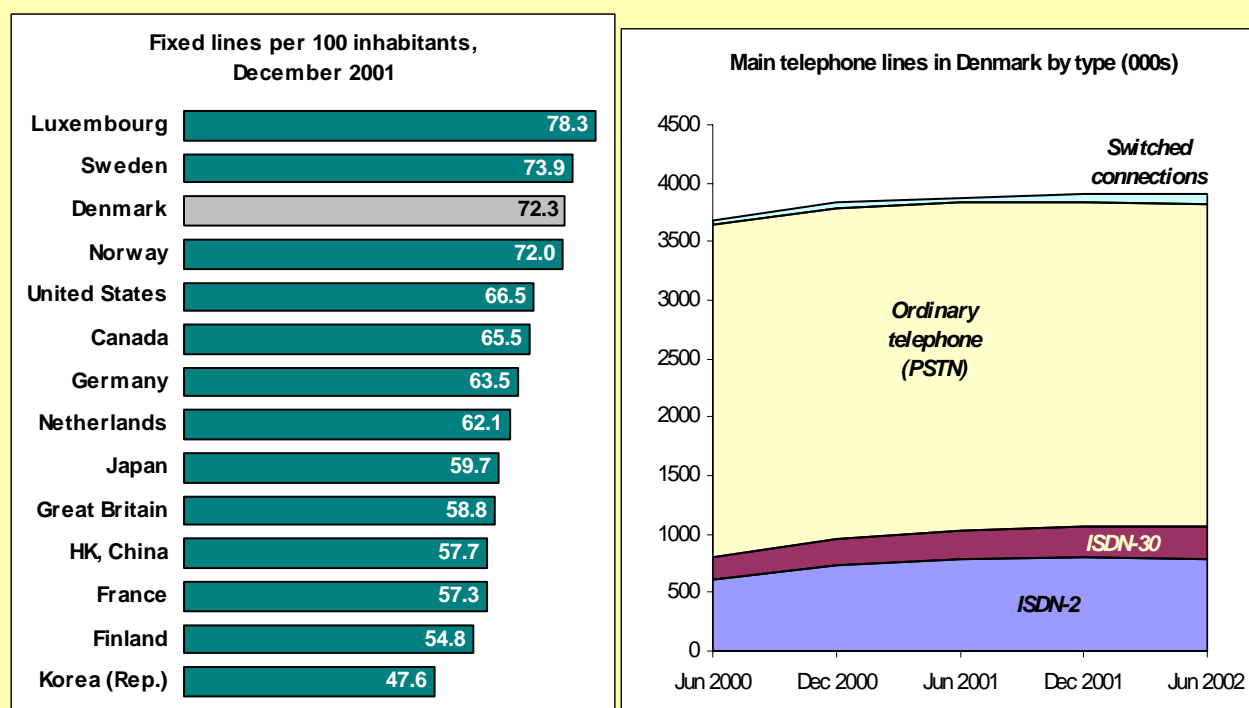
**Table 3.2: TDC Tele Danmark's market share (%) 2000-2002**

	1. H. 2000	2. H. 2000	1. H. 2001	2. H. 2001	1. H. 2002
<b>Fixed line subscriptions</b>	98	94	90	88	86
<b>Domestic traffic (fixed lines)</b>	67	63	62	64	65
<b>Mobile phone subscriptions</b>	45	43	42	41	40
<b>Domestic traffic (mobile)</b>	45	44	42	42	42
<b>International traffic (mobile)</b>	39	38	40	38	42
<b>SMS sent</b>	30	27	28	29	27
<b>Internet subscriptions</b>	36	38	33	34	34
<b>ADSL subscriptions</b>	n/a	37	55	73	79

Source: National and IT Telecom Agency

**Figure 3.3 Fixed infrastructure and penetration**

Fixed lines per 100 inhabitants in selected countries (December 2001) and main telephone lines by type in Denmark (2000-2002)



Source: ITU World Telecommunication Indicators Database (left chart) and National IT and Telecom Agency (right chart)

cent of international traffic.

Competition does not exist only between public network operators and service providers. There is also competition from private networks, which together with growth of ADSL, cable modems and Ethernet-LAN is reflected in a decrease of over 10 per cent in overall public telephone traffic during the past year from the first half of 2001 to the first half of 2002 (from 12'141 million minutes to 10'834 million minutes)<sup>12</sup>.

### 3.3.3 Mobile

The NMT (Nordic Mobile Telephone) network was the first mobile network to be deployed in Denmark, over which services began operating in 1982. Table 5.1, which figures later in this paper, sets out the public mobile licences awarded by the government since the early days of the mobile telephone. Only the incumbent operator was licensed to provide NMT services. With the introduction of GSM networks in 1992, the number of NMT subscribers gradually declined to under 35,000 in 2001 and TDC discontinued the service in 2002.

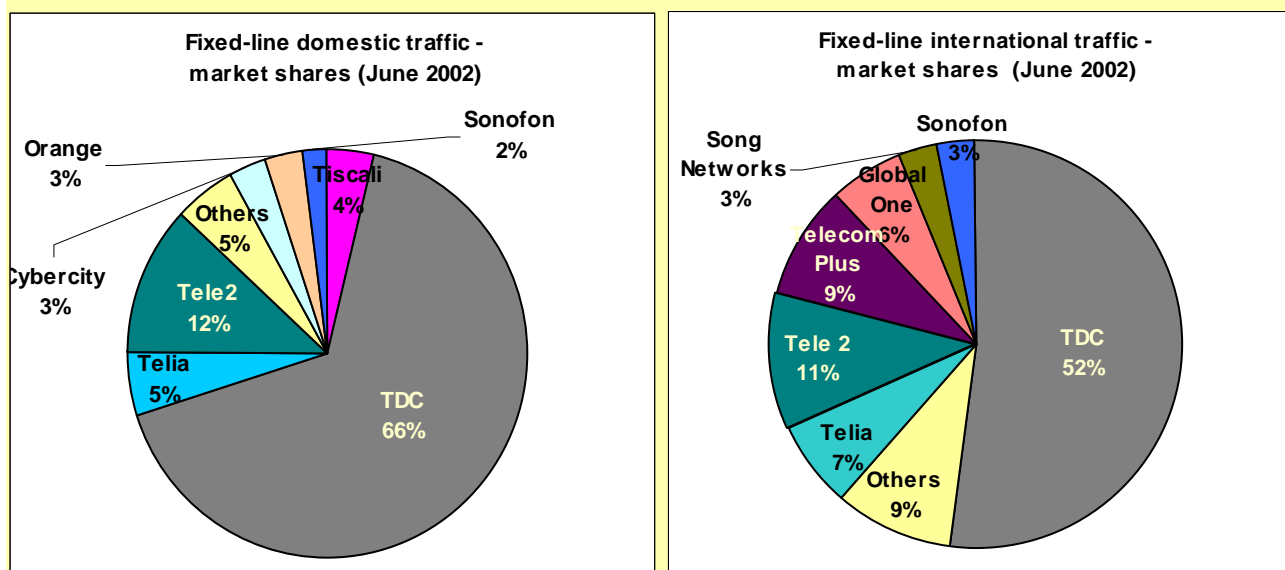
At present, there are four mobile operators in Denmark that own their own infrastructure: TDC, Sonofon, Telia and Orange. The government issued additional licences in the GSM 900 and GSM 1800 bands in December 2000-January 2001, enabling all four operators to offer dual-band services. In September 2001, third-generation (3G) mobile licences were sold in an auction to all GSM operators, with the exception of SONOFON. A new entrant, Hi3G, also bought a 3G license.

Like in many countries around the world, the number of mobile subscribers in Denmark has been growing rapidly and the market is nearing saturation. The cumulative annual growth rate (CAGR) from 1992-2001 was 38.5 per cent (see Figure 3.5). The total number of mobile subscribers in Denmark at the end of 2001 was over 3.9 million, including pre-paid subscribers. This translates into 73.7 per cent mobile teledensity. At the end of June 2002, there were almost 4.2 million mobile subscribers in the country (i.e. 77.3 per cent mobile teledensity). The number of mobile lines overtook the number of fixed lines in 2001 (Figure 3.6). in



**Figure 3.4 Market shares for traffic originating on fixed networks**

Market shares for fixed-line domestic traffic and fixed-line international traffic (June 2002)



Source: National IT and Telecom Agency

mid-2002, the proportion of prepaid subscribers was about 35 per cent, decreasing from 37 per cent in late 2001. Overall, Denmark has one of the higher rates of mobile penetration in the world, comparing favourably with other high-income economies, like Japan and Germany. However, within the Nordic region, the other countries have an even higher number of mobile users per 100 inhabitants (Figure 3.5).

With the rise in the number of subscribers, mobile traffic has also been steadily increasing: the amount of traffic originating on mobile networks reached 1.7 billion minutes in June 2002, up from 1.2 billion minutes two years earlier. In terms of data use, the Danes sent 906 million short messages (SMS) over

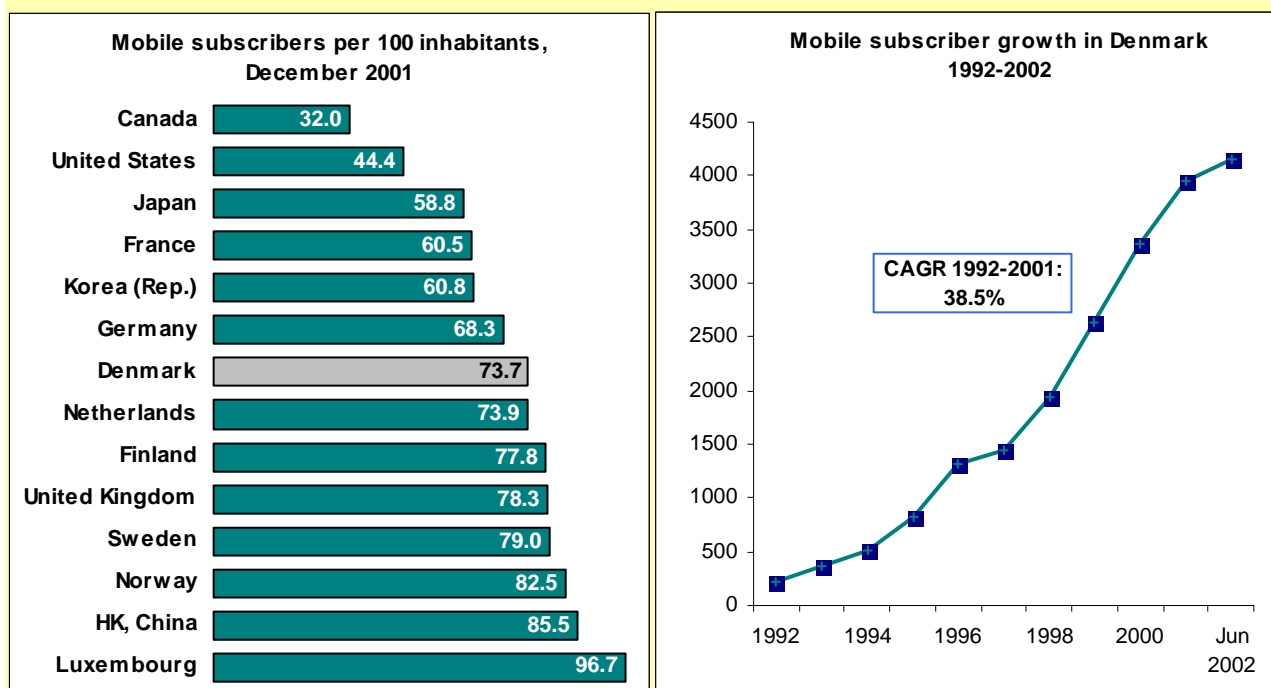
mobile networks in the first half of 2002. This is up 46 per cent from 619 million messages during the first half of 2001 (Figure 3.7). Mobile messaging is an area in which there has been fierce competition between the players, and the only service segment where the incumbent is not leading in terms of market share: in June 2002, TDC only had 27 per cent of the SMS market whereas Sonofon had 30 per cent (Figure 3.7).

GPRS (General Packet Radio Service) or 2.5G mobile networks were deployed in 2001. These networks can offer speeds of up to 57.6 kbit/s. However, like in many other European countries, take-up has been limited: in June 2002, there were only 11'034 GPRS subscribers. The next stage of development for mobile telephony may be EDGE (Enhanced Data for GSM evolution), which may be able to provide transmission speeds of up to 384 kbit/s. 3<sup>rd</sup> generation services (based on the W-CDMA standard) are due to be launched in 2003.

In order to increase competition in the mobile market, mobile number portability was introduced in July 2001. Mobile number portability allows a subscriber to change to another mobile provider and keep their original telephone number. During the first half-year 2002, the number of users taking advantage of mobile number portability reached over 130,000, up from 82'000 in the second half-year 2001. The cost of mobile ownership has been going down since 1992, particularly through handset subsidies and prepaid cards but also through general decreasing traffic charges. As part of the liberalization process in the mid-1990s, the Danish regulator reduced the maximum price for calls from DKK 2.80 per minute to 2.35 per minute. And more recently, from 1998 to 2001, prices have fallen by 21 per cent (by current prices). When corrected for inflation, the drop amounts to 27 per cent<sup>13</sup>. According to data from the Organization for Economic Co-operation and Development (OECD) and Teligen, Denmark ranks as the 3<sup>rd</sup> cheapest country in the OECD area for mobile telephony<sup>14</sup>.

**Figure 3.5 Mobile penetration in Denmark**

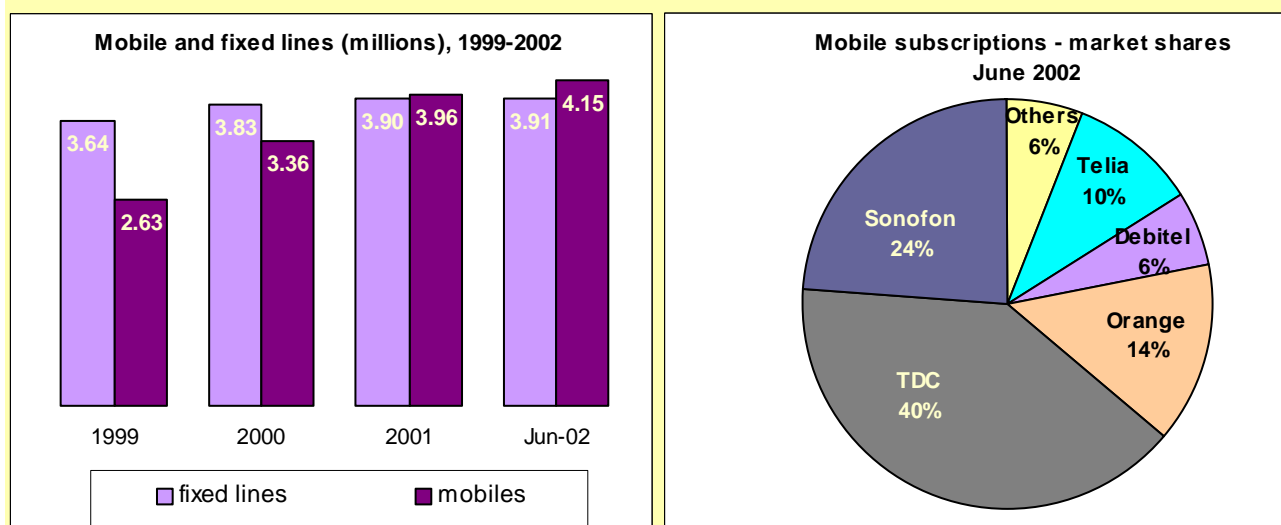
Subscribers per 100 inhabitants in selected countries (December 2001) and mobile subscriber growth in Denmark (1992-2002)



Note: By June 2002, Denmark had 77.3 mobile subscribers per 100 inhabitants. CAGR stands for cumulative annual growth rate. Source: ITU World Telecommunication Indicators Database, National IT and Telecom Agency.

**Figure 3.6 Mobile overtakes fixed in Denmark**

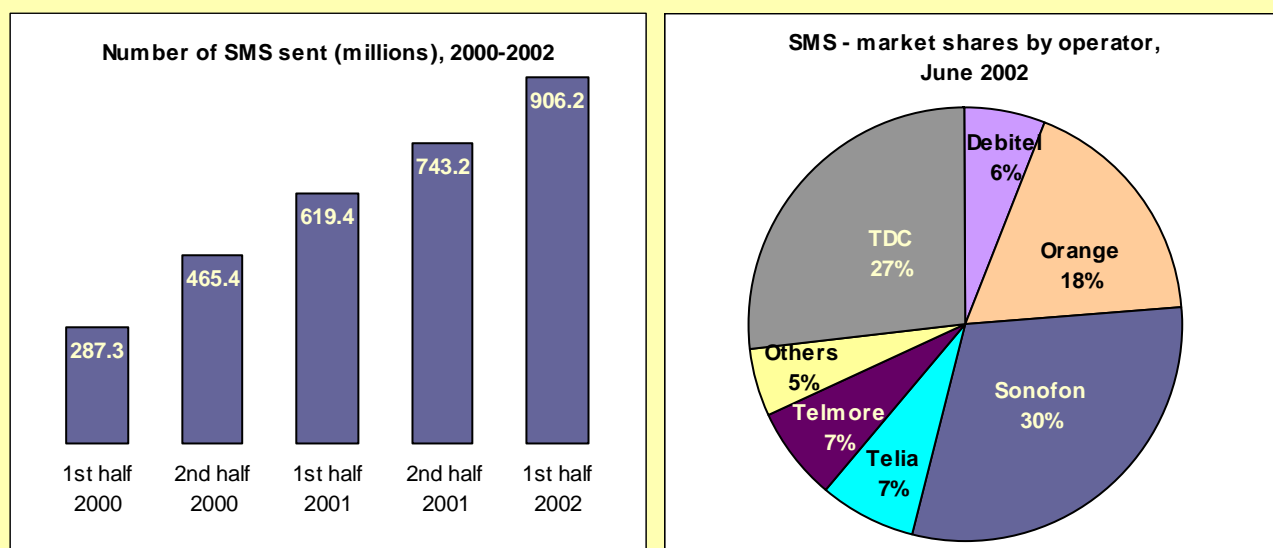
The number of mobile vs. fixed lines in Denmark (1999-2002) and mobile market shares by operator (June 2002)



Source: ITU World Telecommunication Indicators Database, National IT and Telecom Agency

**Figure 3.7 SMS mania**

Total SMS sent from Danish mobile phones (2000-2002) and SMS market share (June 2002)



Source: National IT and Telecom Agency

### 3.3.4 Internet

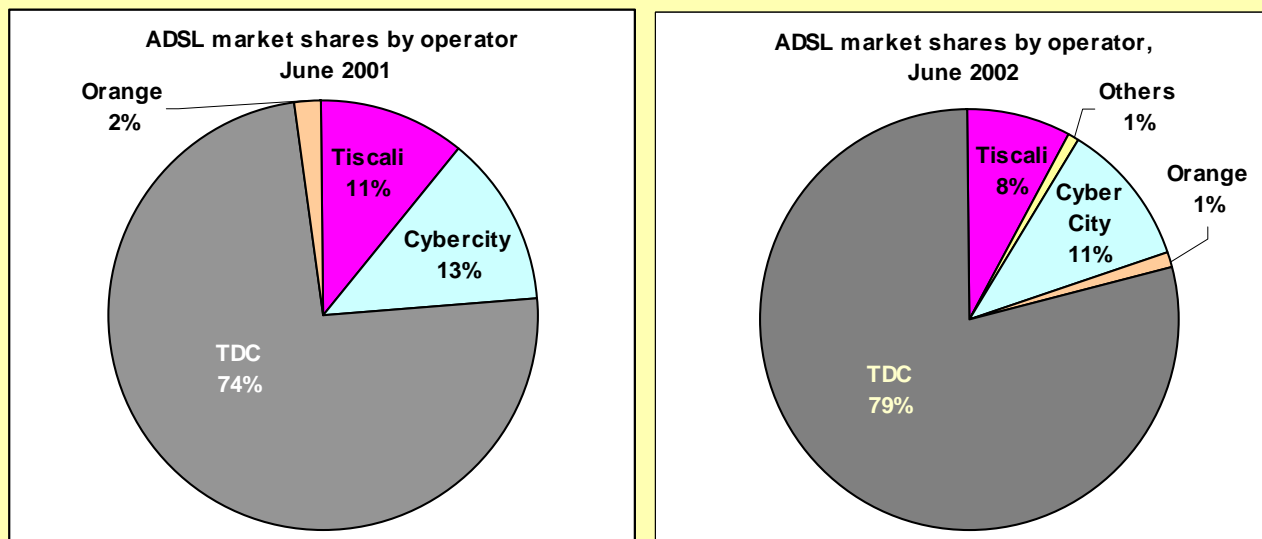
At the end of June 2002, there were 2.3 million residential and business Internet subscriptions in the country, up from 1.9 million in June of the preceding year. Within the Nordic region, Denmark is ahead of Finland, but behind Sweden and Norway. Compared with other high-income countries, it ranks ahead of Canada, Germany and the United Kingdom, but has fewer fixed-line Internet users than Korea, Japan and the United States (Figure 3.8). There were 44.7 Internet users per 100 inhabitants at the end of 2001.

Over the last few years, the availability and penetration of high-speed Internet access services has improved greatly. Danes now have a number of options for higher-speed Internet access: ISDN-2, ISDN-30, ADSL (asymmetric digital subscriber lines), cable modems and more recently, fixed wireless access (FWA). Seven fixed wireless licenses were granted at the end of 2000 (see chapter 5) but there were only some 800 FWA subscribers in the country in mid-2002.

The number of ADSL subscribers has more than tripled over the last year, while the number of cable modem subscribers has doubled. In June 2002, there were around 230'000 ADSL subscribers and 120'000 cable modem subscribers (see Figure 3.8). According to the National IT and Telecom Agency, the availability of ADSL has risen to 95 per cent of households by end June 2002. By end June 2002, the availability of cable modem had risen to 30 per cent of all households. More than 60 per cent of households passed by cable networks now have access to cable modems via upgraded cable networks.

**Figure 3.8 Evolution of ADSL market shares in 2001 and 2002**

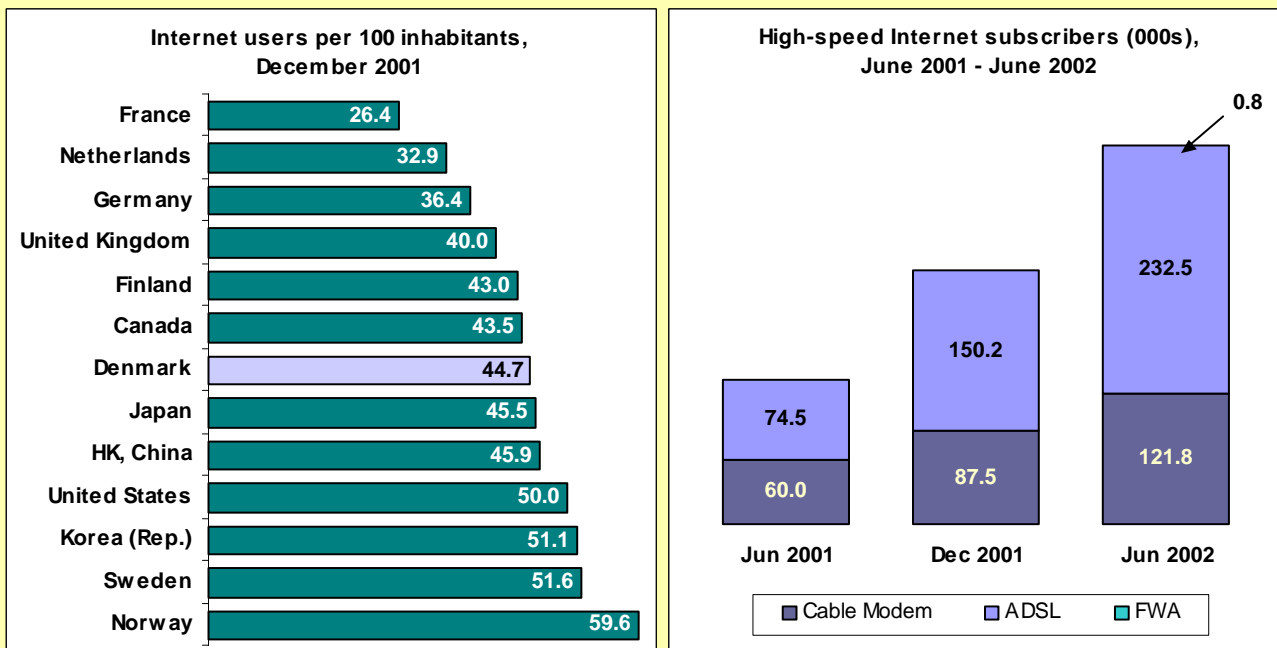
ADSL market shares by operator, June 2001 and June 2002



Source: National IT and Telecom Agency.

**Figure 3.9 Internet penetration in Denmark**

Internet users per 100 inhabitants, December 2001 and high-speed Internet subscribers (000s), June 2001-2002.



Source: ITU World Telecommunication Indicators Database (left chart), National IT and Telecom Agency (right chart)

**Table 3.3 Average monthly expenditure – residential users (composite basket), in Euro adjusted for PPP and including VAT (August 2001)**

	<b>Fixed</b>	<b>Usage</b>	<b>Total</b>
<b>Sweden</b>	14	18	32
<b>Denmark</b>	15	19	34
<b>Luxembourg</b>	20	14	34
<b>Netherlands</b>	18	19	37
<b>Germany</b>	13	26	39
<b>Ireland</b>	19	21	40
<b>Finland</b>	14	27	41
<b>UK</b>	16	26	42
<b>France</b>	14	30	44
<b>USA</b>	14	30	44
<b>EU15</b>	16	30	46
<b>Belgium</b>	19	27	46
<b>Austria</b>	20	28	48
<b>Spain</b>	17	34	51
<b>Japan</b>	19	33	52
<b>Italy</b>	16	37	53
<b>Greece</b>	14	46	60
<b>Portugal</b>	22	47	69

Note: VAT stands for “value-added tax” and PPP refers to “purchasing power parities”.

Source: European Commission

### 3.4 International price comparison

According to OECD telecommunication price comparisons, Denmark is well placed and ranks among one of the least expensive countries. The ‘composite OECD basket’, which includes fixed national/international calls and calls to mobiles, ranks Denmark as the second cheapest in the OECD area (after Sweden) for residential users (Table 3.3) and the third cheapest (after Sweden and Luxembourg) for business users. This ranking is calculated using purchasing power parities (PPP)<sup>15</sup>.

Leased lines are also comparatively cheap in Denmark as shown in Tables 3.4 and 3.5. They are matched only by Germany for 64kbit/s (2 km) and Sweden for 64kbit/s (50 km) and 2Mbit/s (50 and 200 km).

(The leased line figures are not calculated using purchasing power parities and refer only to prices of incumbent operators)<sup>16</sup>.

**Table 3.4: Prices for leased lines (64 kbit/s), Euro per year (August 2001)**

	<b>2 km</b>	<b>50 km</b>	<b>200 km</b>
<b>Germany</b>	1,104	4,985	5,767
<b>Denmark</b>	1,186	2,529	3,066
<b>USA-California</b>	1,489	3,940	11,645
<b>Ireland</b>	1,544	3,770	4,456
<b>EU15</b>	2,086	4,558	5,915
<b>Sweden</b>	2,439	2,477	3,254
<b>France</b>	2,766	5,342	6,632
<b>Netherlands</b>	2,920	6,344	6,344
<b>UK</b>	3,064	6,309	7,959
<b>Japan</b>	9,770	16,749	17,764

Note: The figures above are exclusive of VAT (value-added tax)

Source: European Commission

**Table 3.5: Prices for leased lines ( 2 Mbit/s), Euros per year (August 2001)**

	<b>2 km</b>	<b>50 km</b>	<b>200 km</b>
<b>Germany</b>	4,080	23,749	30,054
<b>Denmark</b>	1,956	11,884	16,315
<b>USA-California</b>	6,080	20,847	61,676
<b>Ireland</b>	4,571	21,517	35,344
<b>EU15</b>	6,841	22,652	37,055
<b>Sweden</b>	4,326	9,175	12,737
<b>France</b>	7,500	23,325	39,515
<b>Netherlands</b>	13,363	33,489	33,489
<b>UK</b>	4,786	24,116	52,722
<b>Japan</b>	47,222	108,950	135,004

Note: The figures above are exclusive of VAT (value-added tax)

Source: European Commission

**Table 3.7: Lowest monthly cost for ADSL access and cable modem at 1 Mbit/s, Euros, adjusted for PPP (December 2001)**

	ADSL	Cable
<b>Germany</b>	24.09	33.63
<b>Belgium</b>	29.14	28.21
<b>Denmark</b>	29.70	16.79
<b>Netherlands</b>	37.61	61.55
<b>France</b>	38.65	38.84
<b>Sweden</b>	40.45	17.04
<b>Finland</b>	43.63	13.86
<b>UK</b>	67.18	40.30
<b>Spain</b>	90.93	11.31

Note: The figures above are exclusive of VAT (value-added tax)  
 Source: European Commission (Teligen)

Of specific interest during the past couple of years have been the prices for high-speed access to the Internet. In this area, prices in Denmark are also low compared with most other countries. For both ADSL and cable modem access, Denmark ranks third (Table 3.7).

The situation is not dissimilar when evaluating interconnection rates, as Danish rates are among the lowest in Europe. The level of competition in EU countries is examined yearly by the European Commission in their "Implementation Report". In the latest available report (7<sup>th</sup> report, issued November 2001)<sup>17</sup>, interconnection charges in Denmark for call termination on fixed networks were deemed to be the fourth cheapest at the local level, the third cheapest for single transit and the fourth cheapest for double transit (August 2001)<sup>18</sup>.

### 3.5 Comparisons of competition levels

The EU's 7<sup>th</sup> implementation report compares competition levels in markets for local, long-distance and international calls. In all three cases, the level of competition in Denmark is relatively high compared with most other EU countries, when competition is measured as a function of market share of non-incumbents. With respect to local calls (outgoing minutes), the level of competition in Denmark was the highest in mid-2001, when the market share of non-incumbents amounted to 37 per cent. At the same time, the figure for Germany was 35 per cent, Austria 33 per cent, and the UK 28 per cent. In other EU countries, the non-incumbent market shares ranged from 90 to 100 per cent<sup>19</sup>. In the market for outgoing long-distance and international calls, four or five of the EU countries considered were sent to have a competition level higher or equal to that of Denmark (see Table 3.8).

With respect to ADSL access, which is of special interest for a high-speed 'networked' society, competition fares quite well. In most EU countries, incumbent operators totally dominate the markets. In Denmark, the market share of non-incumbents was 21 per cent in mid-2002. However, as shown in table 3.2, the market share of non-incumbents has been decreasing during the past two years. At the beginning of the launch of ADSL in Denmark, operators competing with TDC acquired a sizeable market share but have since lost ground to the incumbent.

**Table 3.8 Comparison of non-incumbent operator's market shares in the EU for local, long-distance and international calls, outgoing minutes (June 2001)**

	<b>Local</b>	<b>Long-distance</b>	<b>International</b>
<b>Denmark</b>	37%	37%	50%
<b>Germany</b>	35%	35%	54%
<b>Austria</b>	33%	42%	56%
<b>UK</b>	28%	49%	69%
<b>Spain</b>	10%	15%	14%
<b>Ireland</b>	10%	48%	33%
<b>Luxembourg</b>	7%	n.a.	26%
<b>Finland</b>	7%	68%	46%
<b>France</b>	3%	21%	26%
<b>Netherlands</b>	1%	4%	30%
<b>Greece</b>	0%	0%	0%

Source: European Commission



## 4 Legal and Regulatory Framework

### 4.1 The framework of the European Union

During the past two decades, the European Union (EU) has developed telecommunication policies with a view to enhancing competition in member states and countries directly affected by EU policies<sup>20</sup>. Generally, policies are set out at the European level in legislative directives, transposed into national legislation by governments, and implemented by national regulatory authorities<sup>21</sup>. The reorientation of the Danish telecommunication policy in 1994-96, for instance, although seen as a bold step (section 4.2.1), was basically a result of developments in EU policy. There is not always a complete concordance between EU decisions and the legal frameworks of individual member states, however. Often, there are differences in the precise implementation of EU policies and delays or advances in harmonising and implementing EU regulatory frameworks (see box 4.1). It is fair to say, though, that the direction of telecommunication policies of member states is typically decided at the European level.

The overall aim of telecommunication policy development in the EU during the 1980s and 1990s was to dismantle national monopolies and to create a common European market for telecommunications. Telecommunication policies have also been seen as a battering ram for the more general development of a common market, due to the great importance of telecommunications in the exchange of goods, services, labour and investments. The EU telecommunication policy since the 1980s has thus had a double and coherent purpose: liberalization and harmonization. Since 1998, the deadline for achieving the liberalisation of markets in the EU, more attention has been focused on accommodating technological convergence in the regulation and on applying general competition rules to the telecommunication field.

The first EU interventions in telecommunication markets took place at the beginning of the 1980s<sup>22</sup>. However, these interventions belong to the somewhat 'pre-historic' period of EU telecommunication policies. It was not until 1987 that EU initiatives really took off in this area and gained momentum. In 1987, the Commission issued a Green Paper entitled 'Towards a dynamic European economy – Green Paper on the development of the common market for telecommunications services and equipment'<sup>23</sup>. This Green Paper constitutes the definitive beginning of EU telecommunication policies and proposes a number of initiatives, e.g. to liberalize the markets for terminal equipment and value added services (while leaving the delivery of basic services such as telephony, and infrastructure, in the hands of the incumbent operators).

Since then, the liberalization of telecommunication markets has progressed in the EU, including a growing number of areas. In the late 1980s, there were many players in the sector having difficulties imagining competition in telephony, not to mention infrastructure. Despite that fact that it was the long-term goal of the Commission to liberalize the entire telecommunications area, there was significant resistance to the notion (e.g. from telecommunications administrations). This resistance was so strong that liberalization had to be implemented incrementally, step by step. The first areas to be liberalized were those with a minor economic importance for the telecommunication administrations or where it was obviously difficult to defend a continued monopoly. Then, more and more areas were included until the process culminated in the liberalization of telephony and infrastructure. This happened in 1998, where all telecommunications services and infrastructures had to be liberalized (with a small number of derogations for countries that were not able to meet the general deadline).

In the wake of the 1998 deadline, the Commission issued a communication entitled 'Towards a new framework for Electronic Communications infrastructure and associated services – The 1999 Communications Review'<sup>24</sup>. The aim of this communication was to set out the direction for the coming

#### Box 4.1 Case law in the EU

Case law in the field of telecommunications exists at the EU level with judgements passed by the European Court of Justice (ECJ). Judgements have been passed in many areas, including basic concepts (provision of services, terminal equipment, and abuse of dominant position), regulatory packages (liberalisation and harmonization of national rules), and related issues (privatisation of public undertakings, copyright, satellite broadcast, R&D, information in the field of technical standards and regulations, public procurement in the telecommunications sector, and promotion of linguistic diversity). One of the fields where a number of judgements have been passed is lack of transposition (national implementation of directives) in relation to harmonization of national rules.

Source: European Commission

**Box 4.2 The new regulatory package/framework and related legal measures**

- Directive on a Common Regulatory Framework (2002/21/EC)
- Directive on Access and Interconnection (2002/19/EC)
- Directive on Authorization (2002/20/EC)
- Directive on Universal Service and Users' Rights (2002/22/EC)
- Directive on Data Protection and Privacy (draft) (Official Journal L 201, 31.07.2002)
- Directive on Competition in the Markets for Electronic Communications Services (Official Journal C 96, 27.03.2001)
- Decision on a Regulatory Framework for Radio Spectrum Policy (676/2002/EC)
- Commission Guidelines on Market Analysis and Assessment of Significant Market Power (Official Journal C 165, 11.07.2002)

Source: ITU

communications policy initiatives on the basis of what has been achieved in terms of liberalization in member states. Until 1998, the most important objective had been to liberalize markets to facilitate competition. In the post 1998 period, the aim has been to further competition, taking the more complex communications environment into consideration, particularly tendencies towards convergence between telecommunications, IT and broadcasting.

At the EU level, the general policy objectives are a) to promote and sustain an open and competitive market for communications services, b) to benefit the European citizen (access and protection), and c) to consolidate the internal market in a converging environment<sup>25</sup>. The principles for regulatory action must a) be clearly based on the above mentioned policy objectives, b) be the minimum necessary to meet the objectives, c) further enhance legal certainty in a dynamic market, d) aim to be technologically neutral, and e) be enforced as closely and practically to the activities being regulated (the so-called subsidiarity principle)<sup>26</sup>.

Based on these objectives and principles, the new regulatory framework is structured along the following lines:

- A simplified community sector-specific regulation consisting of a considerably reduced number of directives.
- Accompanying non-binding measures (recommendations, guidelines, etc.), which can respond flexibly to changing circumstances.
- Greater reliance on general competition rules<sup>27</sup>.

The outcome of the political processes based on the 1999 Communications Review has been the so-called "New Regulatory Package/Framework", which has a much-reduced number of legal measures and an implementation deadline of July 2003<sup>28</sup>. The scope of the new regulatory package covers communication networks and associated facilities and communications services. Content services are outside its scope. Where, formerly, there were more than twenty directives concerning the liberalization and regulation of telecommunications, the new framework encompasses only five directives by the European Parliament and Council, one Commission directive, and one decision on a regulatory framework for radio spectrum of the European Parliament and Council<sup>29</sup>. A Commission guideline on market analysis and assessment of significant market power is closely related to the package of directives (see box 4.2).

A guiding idea in the new regulatory package/framework is not only to reduce the number of directives but also to gradually reduce sector-specific regulation and to rely more on general competition law when the level of competition allows. In order better to determine the level of competition, telecommunication markets (retail and wholesale) are to be divided into more specifically defined sub-markets (see box 4.4) and analyses of market dominance are to be performed *ex-ante*. The purpose is to establish a basis for either implementing regulatory measures directed asymmetrically at the dominating operator(s) or to relax regulation by relying increasingly on general competition rules. The new Commission guidelines on market analysis and assessment of significant market power mentioned above constitute an important tool in this endeavour.

#### 4.1.1 New European Commission guidelines on significant market power (SMP)

In light of the converging IT, telecommunications and broadcasting sectors, a crucial objective of the new European communications framework is to reduce technology-based and sector-specific regulation in favour of technologically neutral regulation and general competition law. The new guidelines on market analysis and the assessment of SMP<sup>30</sup> basically fulfil two important functions. First, they implement and seek to foster the shift from sector-specific regulation towards competition law by introducing economic market analysis and by adjusting the original SMP concept to fall in line with the dominance concept as set out in Article 82 of the European Treaty. In terms of the threshold for dominance and market share, the guidelines introduce collective dominance as a further competition law tool. Second, the guidelines seek to ensure coherent application and implementation of the directives. Whereas in the past, considerable differences have existed in the practical implementation of the 1998 framework, the new guidelines and recommendations concerning SMP and market definitions attempt to create a European telecommunication sector in which national regulatory authorities (NRAs) impose similar obligations in similar circumstances. The achievement of a common market in the European telecommunication sector depends largely on a uniform – or at least harmonized – application of competition rules.

##### 4.1.1.1 New market definitions

The defining of market segments is of the utmost importance, since it is only on this basis that effective competition, the elimination of SMP and (joint) dominance can be realized. While the manner in which the relevant market is defined is determined *ex-ante* by the Framework Directive and subsequent recommendations, the substance (market criteria) is derived from principles developed by competition law. In this regard, Article 15 (paragraph 1) of the Framework Directive obliges the Commission to publish periodically Recommendations on relevant product/service market definitions, which raise competition issues. As a starting point, the Commission has to take into consideration the markets defined in the Annex of the Framework Directive.<sup>31</sup> Thus, in contrast to competition law, where markets are defined *ex post* and on an individual basis, the new framework envisages *ex ante* market determination (see Box 4.3).

The new guidelines also amend the criteria for defining the relevant markets, invoking competition law methodology and adopting the method set out in the Notice on market definitions.<sup>32</sup> Rather than focusing on different technologies, access relations and end-to-end communication aspects, the guidelines focus on demand-supply substitutability, inter-changeability, and competitive constraints on undertakings in order to determine the relevant market. This triggers an economic analysis of current market conditions under general competition law.

#### Box 4.3 Merits of *ex ante* vs. *ex post* regulation

Competition law is traditionally *ex post* in the sense that matters are brought before the appropriate authorities when abuses have been committed or are about to be committed. Telecommunication regulation, on the other hand, is mostly been *ex ante* in nature with proactive market intervention based on specific legislative provisions. However, with the increasing influence of general competition regulation in the telecommunication field, the application of *ex ante* and *ex post* regulation of telecommunications will be combined and modified in new ways.

The prime argument in favour of *ex post* regulation is that it is more flexible and less interventionist, leaving problems to be sorted out in the market place until the point where abuses of general rules are committed. The major disadvantage of *ex post* regulation is that it is slow – too slow in a fast developing communications environment. Cases have to be processed by the appropriate authorities, and the experience is that it may take years to reach a final decision (e.g. New Zealand).

The argument in favour of *ex ante* regulation is that this kind of regulation may be necessary in cases where a non-competitive environment flourishes, in order to promote competition. This has been the general understanding of the situation in telecommunication markets. The current consensus is that general competition regulation will come to play an increasingly important role in telecommunications. Competition analysis of more narrowly defined market segments will be undertaken with reference to the new EU guidelines. However, despite this shift, regulatory measures on basis of such analysis will continue to be *ex ante* in nature.

Source: ITU

4.1.1.2 *New definitions for SMP (significant market power) and joint dominance*

In general, the new SMP and joint dominance concepts are tools to determine which firms are subject to certain obligations for addressing market inefficiencies. More specifically, the purpose of this procedure is to prevent influential undertakings from using their market power to distort competition in the relevant market. Additionally, national regulatory authorities (NRAs) have to ensure that companies do not leverage their significant market power in one market into another horizontally or vertically adjacent market, thereby resulting in a position of dominance on both markets.<sup>33</sup>

In the early stage of telecommunication liberalization, the SMP concept introduced a low, static threshold, which was relatively easy to calculate. This is because in the transition from a monopoly to a competitive telecommunication environment, it was necessary to foster the entry of new companies by asymmetric and sector-specific regulation aimed at facilitating access to essential infrastructure. The aim of governments was the smooth introduction of a competition-based environment. In other words, the SMP concept was the European answer to the question of which undertakings should be subject to *ex ante* obligations in order to effectively open up the telecommunication sector and foster competition.

While the term “significant market power” has been retained, its content has changed considerably compared to the 1998 framework. Most importantly, the guidelines do away with the static 25 per cent threshold in the assessment of SMP. Rather, the new framework brings SMP in line with competition law, as the guidelines take over the wording and meaning of dominance under Art 82 of the European Commission Treaty. This new approach will raise the threshold SMP market share to around 40 per cent. An undertaking is now deemed to have SMP when “either individually or jointly with others”, it enjoys a “position of economic strength affording an undertaking the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers”.<sup>34</sup> This phrasing is taken from European Court of Justice (ECJ) judgments. However, despite this common terminology, important differences still exist.

SMP obligations are imposed to fulfil specific objectives as set out in the directives. Remedies under competition law, on the other hand, aim to sanction agreements or abusive behaviour which restrict or distort competition. As for their practical application, dominance under Art 82 is in sharp contrast to SMP. While the former is applied *ex post* after an actual abuse based on evidence (e.g. past behaviour demonstrating abusive practices), SMP designation occurs *ex ante* where there is a lack of evidence (e.g. records of past

**Box 4.4 Markets to be analysed by NRAs in accordance with the Framework Directive**

Retail level

1. Access to the public telephone network at a fixed location
2. Publicly available telephone services at a fixed location
3. The minimum set of leased lines

Wholesale level

4. Call origination on the public telephone network provided at a fixed location
5. Call termination on individual public telephone networks provide at a fixed location
6. Wholesale local access, for the purpose of providing broadband Internet access
7. Local dedicated capacity (wholesale local or terminating segments of leased lines)
8. Call termination on individual mobile networks
9. The wholesale national market for international roaming on the public mobile networks
10. Broadcasting transmission services and distribution networks, to deliver broadcast content to end users
11. Transit services in the fixed public telephone network
12. Access and call origination on public mobile telephone networks

Source: European Commission

behaviour) and the decisions are based on data existing at the time of the decision.

As a second “measurement tool”, collective or joint dominance is introduced in order to impose obligations on undertakings that hold a dominant position in conjunction with other undertakings. This effectively lowers the threshold in terms of market share. However, EU competition jurisprudence sets forth in detail the requirements under which collective dominance is likely to occur. Recently, the Court of First Instance overturned, for the first time, a Commission decision prohibiting concentration. With respect to collective dominance, the Court highlighted three main criteria. First, the market has to be sufficiently transparent. It is only if the undertakings have the ability to monitor each other’s behaviour, and thus to detect “cheaters”, that collective dominance exists.<sup>35</sup> Secondly, the tacit collusion must be sustainable over time, and this is the case only if all collectively dominant undertakings follow the same strategy. Finally, the Commission bears the burden of proof regarding the “the foreseeable reaction of current and future competitors, as well as of consumers, would not jeopardize the results expected from the common policy”.<sup>36</sup> The individual market share of competitors is not relevant. Rather, what matters is if those small competitors – taken as a whole – can respond to anti-competitive price settings and thereby counteract the creation of a collective dominant position.<sup>37</sup> Indeed, the concept of collective dominance can serve as an instrument to address market inefficiencies in the communications market. When the structure of the market and other factors mentioned above are present, the environment is likely to be conducive to tacit collusion.

### 4.1.2 The relationship between European Union (EU) and Danish telecommunication regulation

Like all other EU and EEA (European Economic Area) countries, Denmark is obliged to follow the course of EU telecommunication policy. However, as EU telecommunication policies are mainly issued in the form of directives to be implemented at the national level, there are differences both in the mode of implementation and, consequently, the specific national rules and schedules for implementation.

Denmark implemented a fully liberalized telecommunication market a full year and a half before the 1998 EU deadline, i.e. in mid-1996. Furthermore, Danish telecommunication regulation has also differed in substance from general EU legislation, for instance, with respect to licensing: neither licensing nor registration of operators has been required in Denmark since 1996 (with the exception of the wireless area). It is only with the new licensing directive that EU legislation begins to resemble the Danish situation. This also applies to unbundling the local loop, for which Danish legislation was put in place in 1998 where as the EU issued its ULL (Unbundled Local Loop) regulation in 2000. Furthermore, the Danish ULL regulation encompasses a broader array of access technologies than the EU Directive on Access and Interconnection, which only includes the fixed public telephone network. Danish regulation also requires unbundled access to raw fibre. A third example is universal service, where the Danish provisions since the 1996 legislation encompass not only PSTN (Public Switched Telephone Service) but also ISDN (Integrated Services Digital Network). The universal service provisions in the EU directive do not require the inclusion of more advanced services than PSTN and thus the Danish legislation marks a noticeable departure.

The implementation of the new regulatory package will require changes in Danish legislation. A proposal for amendments will be put forward by the government in early 2003<sup>38</sup>. However, as Danish legislation has generally been a step ahead of EU policies, the required changes will not be substantial. It must be noted, though, that there are differences in opinion as to the degree of the changes needed. The incumbent operator TDC, for instance, is of the view that ULL rules in Denmark have to be more narrowly defined than they are presently, in order to be in accordance with EU rules<sup>39</sup>. However, this is not the interpretation put forward by the national regulatory authority<sup>40</sup>.

The changes foreseen by the Danish National IT and Telecom Agency deal, in very general terms, with a transition from an ex-ante provision-oriented regulation towards a more specific decision-oriented regulation. Furthermore, competition analysis of market segments will provide the basis for the level of regulation, and there will be a built-in mechanism for a relaxation of sector-specific regulations<sup>41</sup>. It should be noted, however, that competition analysis of this kind has already been performed by the regulatory authority. The NITA published an analysis of end-user prices in the universal service area in May 2002, following a 1999 political decision to survey the need for continued price regulation under the banner of universal service obligations<sup>42</sup>. The conclusion of the report is that, in the area of international traffic, the market is characterized by effective competition and price regulation can be discontinued. On the other hand, in the

market for national traffic, there are indicators for and against effective competition. The conclusion on national traffic also shows that if the trend of price decreases continues, there will be effective competition. Moreover, the analysis states that in the markets for ordinary telephone services and ISDN connections, the necessary conditions are not met<sup>43</sup>. In relation to the interconnection market, the NITA published a similar report in April 2002, recommending that it should be considered to lift the obligations on operators with significant market power in the wholesale market for international connections and the step-by-step reduction of obligations in the wholesale market for backbone networks<sup>44</sup>.

In particular, the NITA considers that the EU *Directive on a Common Regulatory Framework*, in the field of interconnection and competition, will require the following:

- a) The “duty to carry out regular analyses to determine the effectiveness of competition in a number of predefined markets. The results of these analyses must be followed by the necessary consequential amendments to the regulation in the markets analyzed;
- b) New consultation and transparency procedures, where ‘All decisions of key importance to the market should be submitted for prior consultation with the Commission as well as the National Regulatory Authorities of other EU member states’;
- c) More scope for exchanging confidential information between the national telecommunications authorities and the national competition authorities’;
- d) Requirements may be specified for sharing of established infrastructure, where it is indicated by planning and environmental authorities<sup>45</sup>.

Furthermore, the EU *Directive on Access and Interconnection* will require the following changes:

- e) the implementation of a set of obligations – also known as the toolbox – to be imposed on players in the markets analyzed, and
- f) the inclusion of access to systems for control of digital TV programs under the concept of interconnection<sup>46</sup>.

In the field of universal service and the rights of users, the required changes are minor and, all in all, it must be concluded that the new EU regulatory package will not necessitate substantial changes to existing Danish regulation, as a great majority of the provisions have already been included. The most important influence of the new direction of EU policies is on a more general level with respect to the increasing role of general competition legislation and the greater emphasis on EU consultation and coordination process.

The greater emphasis on coordination will require that national policy and regulatory authorities consult with the European Commission and the other member countries before implementing changes of any substantial nature. A Radio Spectrum Policy Group and a European Regulators Group (ERG) have been set up in July 2002 by the Commission in order to ensure a consistent application of EU telecommunications policies across EU countries. For mutual consulting and coordination purposes, there already exists an Independent Regulators Group (IRG) set up by the national telecommunications authorities. The relationship between the ERG and IRG is not yet clear. However, there is a general consensus that a greater coordination of regulation within the European Union is needed in order to create more homogeneous market conditions. Governmental bodies and telecommunication operators in Denmark seem to welcome a more internationalized regulatory approach<sup>47</sup>. However, the general opinion is that national differences will continue to exist and must not be neglected through an over-zealous application of cross-European regulation. In this context, there is little support in Denmark for a European regulatory body, though initiatives like the Radio Spectrum Policy Group and ERG are seen as positive developments.

## 4.2 The Danish regulatory framework

As mentioned in Chapter 3, the Danish telecommunication market is relatively advanced in terms of the level of competition, the penetration of different telecommunication facilities and services, and prices (wholesale and retail). Apart from the general relative wealth of the country and the fact that, for instance, Telia has seen the Danish market as a natural expansion area and France Télécom/Orange has used Denmark as a test market, the general explanation for this relatively positive state of affairs is the early liberalization of



telecommunications in Denmark (ahead of the EU 1998 deadline) as well as the persistently proactive competition measures taken politically and in the regulatory implementation of policies<sup>48</sup>.

In 1995, the Danish Ministry of Information Technology and Research published a 'green paper' entitled 'Bedst og billigst gennem reel konkurrence'<sup>49</sup> ('Best and cheapest by way of real competition'), which announced the main principle guiding subsequent Danish telecommunication policies. Users and operators are generally satisfied with the level of competition, developments in service penetration and price reductions. Sector-specific regulation has thus far been perceived as effective<sup>50</sup>. There are a number of problem areas, however, mainly in terms of competitive access. TDC, the incumbent operators, strongly dominates access in the fixed-line market, and with the exception of the mobile area, competition is more developed in services than in facilities. These problems have been readily acknowledged at the political level and a policy of developing 'several pipes to the home' has consequently been pursued during the past years. This has resulted in an emphasis on providing new opportunities for operators to get direct access to customers, e.g. by way of wireless technologies.

Despite these problems, the general view among interested parties and observers<sup>51</sup> is that the telecommunication market in Denmark has reached a stage where new forms of market regulation are possible and even necessary – meaning a stepwise shift towards general competition regulation through decisions addressing SMP providers according to the new regulatory. A rolling back of regulation in areas where competition is sufficient is being favoured, and the application of sector-specific regulation is seen as necessary only in those areas where significant barriers to entry still exist. This approach is in line with the new European regulatory package. However, even though there is an overall consensus on the necessity of turning to a regulatory model based increasingly on general competition policy, the practical interpretation of what it means to roll back sector-specific regulation differs from player to player, depending on their market position, e.g. whether they are trying to increase their market share or already have a stronghold in the market. The incumbent operator, for instance, is quite willing to see an end to sector-specific and asymmetrical regulation across the board, whereas most competitors would prefer to maintain sector-specific regulation for some time to come in problem areas. Some of the operators, put more emphasis on the development of uniform policies across country borders as a result of their Nordic and international focus, respectively, whereas for end-users there is a concern that a move away from sector-specific regulation may mean that the needs of users will take second place. But the general policy direction taken by the EU and supported by government has been positively received in the Danish telecommunications environment.

### 4.2.1 From national champion to a focus on competition

Section 2.4 of this report provides a brief overview of telecommunication policies in the 1980s and. Perhaps the two most important policy decisions were the creation of Tele Danmark (later TDC) and the bold move towards total liberalization in 1996. To some extent, these two policy decisions point in opposite directions – but they were also taken at different moments in the process of opening up the Danish telecommunication market to competition<sup>52</sup>.

Formerly, the Danish telecommunication market had been divided into regional areas served by regional telecommunication operators with different ownership structures (the two largest operators were limited companies with partly private ownership) plus a state operator dealing with interregional and international communications. It was a monopoly market in the sense that the regional operators held exclusive rights in their regional markets. The only type of competition at the time was yard-stick competition, where regional operators could compare their performance.

In 1990, Tele Danmark was created as a holding company equipped to take over and integrate the then four regional operators and the international operator - a process that was completed at the beginning of 1996. If the aim in 1990 had been to introduce as much competition as possible, the most appropriate step might have been to open the market and let the regional operators compete with each other. However, in contrast, the objective was to strengthen the position of the Danish operator in an increasingly liberalized national and international market and to avoid what was seen as destructive rivalry among the regional operators.

Between 1994 and 1996, this 'protectionist' policy was totally abolished. In 1994, the first Danish information society policy statement ('Info-Society 2000'<sup>53</sup>) was published, inspired by similar statements from the European Commission and countries such as the United States. This policy statement identified information technology and telecommunications as factors for socio-economic development and pointed to

market liberalization as a necessary step. Following the release of the 'Best and cheapest' report<sup>54</sup>, Danish telecommunication legislation was entirely changed, culminating in the total liberalization of all telecommunication markets in mid-1996. This constituted a major change in policy priorities from an industrial policy orientation to a policy based on infrastructure and market development, focusing on telecommunications as a basis for other economic and social activities.

In the years that followed, Danish telecommunication legislation was continuously amended, taking into consideration problems encountered in the Danish market and those taken at the EU level. Current legislation still awaits the implementation of the new EU regulatory package. A new set of Danish telecommunication acts will be presented to Parliament in early 2003 (See section 4.1.1).

#### 4.2.2 General competition law and telecommunications regulation

Danish competition law<sup>55</sup> applies to any kind of business undertaking, including telecommunications. In terms of general competition law, the Danish Competition Authority is the competent authority for general competition matters. Competition law does not apply in cases where limits to competition are a consequence of public regulation. However, the competition authority can approach relevant ministries and point to possible detrimental consequences, while proposing solutions<sup>56</sup>. Since January 1998, Danish competition law has been based on the principle of 'prohibition' rather than the earlier 'control' principle. The prohibition principle applies in relation to agreements limiting competition and to abuses of dominant position. Furthermore, in October 2000, control of mergers and acquisitions became a part of competition law, and Danish competition authorities acquired the possibility of invoking competition provisions contained in the EU treaty<sup>57</sup>.

With respect sector-specific telecommunication regulation, the regulator, NITA, is the principal regulatory body, coordinating its initiatives with the Danish Competition Authority where required. Under the sector-specific legislation, the areas in which the Competition Authority has binding influence are in relation to a) maximum prices in the universal service area, and b) standard offers of operators with significant market power in the interconnection area<sup>58</sup>. In both these cases, the NITA must consult the Competition Authority. Moreover, the latter, in cooperation with the telecommunication regulator, examines the accounting separation of operators with significant market power, issuing binding statements, and intervenes in cases where the general competition rules or abuse of dominant position are relevant. This applies, for instance, in cases of predatory pricing, for which the NITA has no authority.

There is a cooperative relationship between the Competition Authority and the sector-specific NITA, furthering the political objective of ensuring an efficient supervision of competition in the telecommunication field. In 1997, a working group examined possible overlaps in authority between the NITA and the Competition Authority. Its findings constitute the basis for current cooperation. Apart from the areas in which the Competition Authority issues binding statements (universal service prices, standard interconnection offers, and accounting separation), liaison meetings are held four times a year between the two authorities, exchanging information and discussing matters of mutual interest. Furthermore, there is ongoing cooperation based on contact persons and principles and procedures for the processing of cases have been laid out.

Given the greater focus on general competition rules, the Competition Authority has shown an increasing interest in the telecommunication sector. It has, for instance, recently published a competition analysis of the Danish telecommunication market<sup>59</sup>, and in the latest annual competition statement, the country's cable and satellite market has been analyzed<sup>60</sup>. The Authority is of the view that it has longstanding experience and competence in the analysis of competition as it is being proposed for the telecommunication sector in the new EU guidelines<sup>61</sup>, and that its involvement is increasingly relevant. In its evaluation of market developments, the Competition Authority expresses the opinion that sector-specific regulation was needed order to kick-start competition in a former monopoly market but that when the market matures, general competition law must take precedence<sup>63</sup>. It is indeed expected that the Competition Authority and the NITA will develop an even closer cooperative relationship in the years to come.

##### 4.2.2.1 Overview of legislation relating to competition in telecommunications

In Denmark, sector-specific regulatory measures are enshrined in the legislation but are also based on a certain degree of self-regulation. In mid-2000, Danish telecommunication legislation underwent a restructuring and was amalgamated, to a large extent, into one *Act on competitive conditions and consumer*



*interests in the telecommunications market*<sup>64</sup>, the focus of this report<sup>65</sup>. There is also legislation covering the use of radio frequencies, rights of way, use of masts.

The *Act on Competitive Conditions and Consumer Interests* [hereinafter referred to as the *Act*] includes provisions on end-user relations, universal service, numbering issues, access and interconnection (see Box 4.5 and 4.6). There are also provisions governing the relationship between the Ministry, the NITA and other bodies in the telecommunication field [e.g. Telebrugernævnet (Telecommunications Consumer Board), Teleklagenævnet (Telecommunications Complaints Board), and Service 900-Nævnet (Service 900 Board)].

The *Act* provides that interconnection agreements in Denmark are to be made on commercial terms<sup>67</sup>. However, the conditions under which these agreements are made are subject to regulatory intervention when one of the parties holds a strong market position. It is stated in the act that “providers of public telecommunications networks or services shall have a right and obligation to negotiate agreements among themselves on the exchange of traffic between providers of telecommunications networks or services”<sup>68</sup>. Certain aspects of these rules must be noted. First, they only apply to *public networks or services* and not to closed user-groups. Second, these providers have both the *right and obligation*, but only to *negotiate*. Finally, the negotiation pertains only to interconnection in terms of the *exchange of traffic*.

Rules for providers with significant market power in a given sub market are much more stringent. The *Act* states that they are to “meet all reasonable requests for establishing or modifying interconnection agreements”<sup>69</sup> regarding all interconnection products mentioned in box 4.6. Here, there is not only an obligation to negotiate but to actually enter into agreements. In addition, providers with significant market power are subject to special rules regarding access on objective, transparent, and non-discriminatory terms, and interconnection charges must be cost-based<sup>70</sup>. There is thus an asymmetry in the rules relating to providers with significant market power compared to other providers.

Special rules also apply to mobile operators. They must “meet all reasonable requests for establishing or modifying interconnection agreements on national roaming”<sup>71</sup>. This obligation to enter into agreements on objective, transparent, and non-discriminatory conditions only refers to roaming and does not include the obligation to provide cost-based charges<sup>72</sup>.

Finally, the NITA might decide that providers controlling the only existing access to the end-user, who use this access to prevent competitive providers from getting access to such end-users, are to meet all reasonable requests for establishing or modifying interconnection agreements in all interconnection areas. This power, however, has not been put into practice. The current situation, therefore, sees differentiated obligations for interconnection, ranging from the strictest obligations on operators with significant market power, to other types of obligations for operators abusing their bottleneck facilities or mobile operators.

Apart from some exceptions, an operator is deemed to have significant market power under present Danish telecommunication legislation if it has a market share larger than 25% in a specified sub market. Currently, these sub-markets are a) the total fixed and mobile market, b) the market for fixed network services, c) the market for mobile communications services, and d) the relevant market for leased infrastructure capacity<sup>73</sup>. However, this is subject to change with the implementation of the new EU regulatory package.

#### 4.2.2.2 *New legislative provisions*

Based on the new EU package, the Ministry of Science, Technology and Innovation issued a draft proposal for a new set of Danish telecommunication laws at the end of October 2002. This draft proposal has been sent out to interested parties for comment. At the beginning of 2003, a new set of legislative proposals will be presented to parliament, including amendments to the following Acts:

- *Act on competitive conditions and consumer interests in the telecommunications market*
- *Act on rights of way and expropriation etc. for telecommunications purposes*
- *Act on establishment of shared use of masts for radio communication purposes etc.*

The primary aim of the new legislative provisions is to transpose the new EU package of directives into Danish legislation. The implementation has, first and foremost, affected the *Act on Competitive Conditions and Consumer Interests*. The major changes outlined to this *Act* are set out below:

- In the interconnection area, NITA shall, based on market analyses, take specific decisions on the selection of providers with significant market power on a given market and on the character of the obligations, which can be imposed upon them. The draft proposal includes a so-called toolbox with the obligations, which NITA can impose on SMP providers.
- Price regulation shall be one of different possible tools to obtain effective competition if market analyses show that there is not effective competition in different areas. This also applies to the mobile market.
- In the consumer market analyses and the consequential regulation, decisions shall also be made in certain areas<sup>74</sup>.

**Box 4.5 The Act of Competitive Conditions and Consumer Interests: The intent of the legislator**

In terms of competition, the overall purpose of the *Act of Competitive Conditions and Consumer Interests* is to provide end-users with the possibility to a) choose freely the provider(s) of telecommunications networks or services under whom they want to be customers, b) communicate with all other end-users, whether or not these are customers under the same provider or another provider, c) have access to all providers of various information and content services via telecommunications networks, d) compose freely their usage of telecommunications networks and services as well as information and content services, whether or not these are delivered by several different providers of networks or services, and e) to retain their subscriber numbers when changing between providers of telecommunications networks and services .

And more specifically, regarding access and interconnection, the purpose of the *Act* are as follows:

- To ensure all providers of telecommunications networks or services real and non-discriminatory opportunities to negotiate interconnection agreements with providers with significant market power in one or more relevant submarkets on various forms of interconnection allowing the exchange of traffic, access to lease infrastructure capacity, service provider access, as well as access to share facilities such as buildings, exchange equipment etc. in connection with interconnection agreements.
- To ensure all providers of telecommunications networks or services real and non-discriminatory opportunities to negotiate agreements with the aim of allowing number portability ...
- Through price regulation of interconnection products that are in the nature of decisive bottleneck resources, to ensure providers without significant market power a real competitive margin in all areas where this is possible.
- Through price regulation ... to ensure that prices for this will not be burdened with outdated technology, bad investments, inefficient operation etc. at the provider of telecommunications networks or services who is obliged to provide interconnection.
- Through price regulation ... to support innovative investments in a wide sense throughout the market.
- Through price regulation ... to support an environment where new infrastructure investments are made on the basis of forward-looking technology choices that will promote a coordinated and optimal infrastructure development.
- Through price regulation ... to promote capacity-oriented investments to the extent that it has been demonstrated that an unfilled need for infrastructure will arise, and that the pressure of competition will not be sufficient to ensure the necessary expansion.
- To ensure a balanced competition between service and infrastructure providers that will not inhibit the necessary infrastructure investments.

Source: *Act on Competitive Conditions and Consumer Interest*, Act 418, May 2000

### 4.2.3 Institutional aspects

#### 4.2.3.1 The Danish competition authority and the application of general competition law in Denmark

The Danish Competition Authority is an independent body under the Danish Ministry of Economic and Business Affairs. The Authority is responsible for issues relating to competition, energy regulation, public procurement and state aid. The authority acts as the secretariat of the Competition Council and the Danish Energy Regulatory Authority<sup>75</sup>. The Danish Competition Authority is made up of a number of departments dealing with infrastructure, consumer goods, the services sector, the industrial sector, public procurement, and the energy sector. Telecommunications is a small part of the infrastructure department and only very little manpower is allocated specifically to this field.

Even though national legislation on competition applies also to telecommunications, the Competition Authority has seldom intervened in the telecommunication sector. Regulation of telecommunications has mainly been the purview of the national regulatory authority for telecommunications, the NITA. However, in accordance with the general rules on agreements limiting competition and the abuse of dominant position, the Competition Authority has the mandate to act – it has, in fact, acted in a number of recent cases. In 2000, it intervened on the grounds of abuse of dominant position: in that case, Tele Danmark, with reference to net disturbance problems, announced the deployment of filters in order to limit speed on lines for data transmission and Internet access leased by competing operators. The Competition Authority held that such a measure was unjustified and suggested that Tele Danmark withdrew the limits on speed, which it subsequently did<sup>76</sup>.

A more recent case relating to the abuse of dominant position is also worth noting. In May 2002, the Competition Authority resolved that TDC Tele Danmark had abused its dominant position by retaining an inequitably large share of tariffs for calls to 70-numbers of the operator Consorte. In August 2002, the Competition Authority announced that TDC Tele Danmark had presented a new and acceptable model<sup>77</sup>.

#### **Box 4.6 Interconnection products**

In Danish legislation, the provisions on interconnection cover the following interconnection products:

**1. Exchange of traffic between providers of telecommunications networks or services:**

- Collection of traffic for the purpose of call-by-call selection or carrier pre-selection etc.
- Termination of traffic
- Transit

**2. Lease of infrastructure capacity:**

- Lease of transmission capacity, including leased lines, between several specific interconnection points in radio- or cable-based telecommunications networks
- Lease of non-equipped infrastructure sections and other network elements in radio- or cable-based telecommunications networks
- Intermediate forms between the two above-mentioned types of transmission capacity
- National roaming

**3. Service provider access, meaning wholesale purchase of telecommunications networks or services provided to a number of end-users who have not been specified in advance**

**4. Sharing of facilities such as buildings, exchange equipment etc., :**

- Access to place on another provider's premises one's own exchanges and other equipment intended to transmit and control signals between specific termination points in connection with the exchange of traffic between providers of telecommunications networks or services, lease of infrastructure capacity, or service provider access
- Access to carry out one's own operation and maintenance etc. of exchanges and equipment etc. as mentioned above.

Source: *Act on Competitive Conditions and Consumer Interest*, Act 418, May 2000

### 4.2.3.2 *The national regulatory authority: National IT and Telecom Agency (NITA)*

As mentioned in Section 4.2, the National IT and Telecom Agency (NITA) is the independent sector-specific agency responsible for information technology and telecommunications regulation in Denmark and the administration of the relevant legislation. The NITA is part of the Ministry for Science, Technology and Innovation and has a staff of about 240. The NITA's principal task is to develop and implement initiatives within key areas under government's telecommunication and IT policy<sup>78</sup>. It forms part of the Ministry's organization, taking an active part in advising Minister on matters concerned with telecommunications, communications and information technology. The NITA also assists with the drafting of policy proposals, bills and executive orders in cooperation with the Ministry's departments. Furthermore, it provides assistance in responding to enquiries from the Folketing (parliament) as well as individual citizens.<sup>79</sup> Thus, the NITA works closely with the Ministry but retains its independence for regulatory matters.

The national regulatory authority in Denmark was established in 1991 under the name of National Telecom Agency as a reaction to the changes taking place in the telecommunication environment, i.e. the liberalization process and the creation of Tele Danmark. In fact, a telecommunication regulatory institution was first established in Denmark in 1919 to regulate the privately-owned regional telephone companies. This body continued to exist until the mid-1980s. In the interim, a purely technical organization (Teleinspektionen) was established. However, National Telecom Agency created in 1991 had authority not only in technical matters but also in the broader array of economic and policy matters.

The National Telecom Agency became an essential player with the accelerated liberalization process in 1994-96. In 1997, legislation governing its assignments and highlighting its independent status was enacted<sup>80</sup>. This act, however, was repealed with the latest amendments in June 2002. The provisions regarding the new NITA are now part of larger body of telecommunication acts, but without any change in the status and independence of the agency.

In spring 2002, the NITA was joined together with the Central Information Bureau of the public administration, Statens Information. This was done in connection with a general initiative by the new liberal government aiming at reducing the number of councils, agencies, etc. funded by the state. However, the opportunity was taken to prepare the ground for expanding the scope of work of the NITA, to cover information technology. It has explicitly been stated by the Minister of Science, Technology and Innovation that the new National IT and Telecom Agency is to ensure a better synergy between information technology, communications, and telecommunications<sup>81</sup>.

### 4.2.3.3 *The Ministry of Science, Technology and Innovation*

The Ministry of Science, Technology and Innovation – formerly the Ministry of Information Technology and Research – was assigned the responsibility for telecommunications policies in connection with the accelerated liberalization of telecommunications in the mid-1990s. Its first major initiatives in the area included the issuing of the 'Info-Society 2000'<sup>82</sup> (1994) and 'Best and cheapest'<sup>83</sup> (1995) reports and the subsequent total liberalization of telecommunications in Denmark. It has contributed significantly to the stable progress of information technology and telecommunication policies. Since this shift in focus in the mid-1990s, policy decisions in parliament have had the broad support of a large majority of parties in from the right to left.

Currently, the government's information technology and telecommunication policies aim to ensure:

- an available, effective, secure and inexpensive digital infrastructure for citizens, businesses and the public sector;
- competition, consumer protection and efficient management of scarce resources in the telecommunication area;
- an innovative and coordinated implementation of government IT initiatives and other IT projects where the ministry participates in a partnership;
- optimal framework conditions for a digital reform of the public sector;

- an optimal and secure use of IT and other technologies among citizens and businesses<sup>84</sup>.

#### 4.2.3.4 *The relationship between the Ministry and NITA*

The principle of separating policy, regulation and operation is clearly implemented in Denmark. The separation is all the more clear, as the incumbent operator, TDC, is totally privatized. There is no state ownership interest in favouring the former monopolist. The principle of separating the three different roles is not a new one. As mentioned in section 4.2.3.2, an independent regulatory body existed from 1919 till the mid-1980s, and the three large regional operators were independent and partly private companies. There was also a General Directorate of P&T, acting as ministerial department and responsible for the operation of interregional and international telephony and local telephony in a few smaller areas, but policy, regulation and operations were, to a large extent, kept separate.

The current legislation clearly states that “ the Minister of Science, Technology and Innovation shall not be in a position to give official orders to the IT and Telecom Agency on the agency’s handling of authority functions in concrete cases; in handling and decision of individual cases; on the IT and Telecom Agency’s issue of administrative regulations in areas where the agency is authorized to do so; or on other supervisory activities of the IT and Telecom Agency for the purpose of ensuring compliance with the act and administrative regulations issued in pursuance thereof”<sup>85</sup>. This paragraph, which is included in all relevant telecommunication legislation, points to the administrative and regulatory independence of the agency.

As described in section 4.2.3.2, the NITA is also involved in drafting laws and promoting the policies of the government - these functions have been further expanded since the inclusion of the information technology sector under its responsibility. There is, however, no contradiction between the execution of these assignments and the independence of the regulator. The independence of administrative and regulatory decisions is covered by the telecommunication legislation. Furthermore, independence is not solely based on formal legal provisions but also on the efficiency and accountability of the regulator and its interventions<sup>86</sup>.

#### 4.2.3.5 *The Telecommunications Complaints Board*

There are two boards of appeal in the Danish telecommunication legal system: the Telecommunications Consumer Board and the Telecommunications Complaints Board<sup>87</sup>. The Telecommunications Complaints Board deals with cases concerning competition and relationship between operators. It processes and makes the final administrative decisions in cases involving complaints regarding the NITA’s decisions and those relating to competition and interconnection, maximum prices in the universal service area, licenses in the wireless areas and the *Act on Radio and Terminal Equipment and Electromagnetic Relations*. The Minister of Science, Technology and Innovation has no regulatory authority regarding the Complaints Board’s decisions and handling of cases. The decisions of the Board cannot be appealed to other administrative authorities, but solely be brought before the courts<sup>88</sup>. However, no case in the history of the complaints board has yet been brought to court.

The Telecommunications Complaints Board processes only a limited number of cases. However, the Telecommunications Consumer Board processes a large number of cases each year<sup>90</sup>. During the past five years, the number of cases annually has in average been 30-35, and only an average of 3-4 were related to the provisions regarding competition and interconnection<sup>91</sup>. In most cases, the decisions taken by the National IT and Telecom Agency are supported by the Complaints Board – but not in all cases<sup>92</sup>.

#### 4.2.3.6 *Self-regulation and industry co-regulation*

In some areas, industry agreements (self-regulation) are used to ensure the best possible regulatory framework. The basis for such industry agreements are laid down in the telecommunications legislation and are negotiated between the operators under the leadership of the telecommunication industry cooperative body, the Telecommunications Industry Association. Such agreements exist in the areas of access to the ‘raw copper’, co-location, service provider agreements, and carrier pre-selection constituting the basis for interconnection agreements between operators.

The NITA also seeks to involve the operators in the regulatory process by means of cooperative forums. Such forums exist in the areas of frequency regulation and interconnection. The purpose of these forums is to ensure industry participation in the development of regulation by keeping operators informed and by providing a channel for industry influence on new initiatives.

There is a National Board of Telecommunications consisting of representatives of residential and business users, industry organizations in the information technology and telecommunication sector, a broad range of telecommunication companies operating on the Danish market, the NITA and the Competition Authority. The board gives advice to the Minister of Science, Technology and Innovation in important matters relating to telecommunication and all proposals for important regulatory measures are discussed within the Board.

## **5 Application of Competition Policy to Telecommunications Regulation in Denmark**

### **5.1 Introduction to telecommunications competition policy in Denmark**

#### **5.1.1 The first phase: ‘Best and Cheapest’**

A real, but small, break with Tele Danmark’s monopoly came in 1991, when the State licensed a new operator, Sonofon, in what was then a new service, GSM900. Until the mid-1990s, however, the general attitude in Denmark was to change as little as possible and only after European pressure. Change came only in 1994 when a number of political initiatives were taken in order to bring Denmark to the forefront of IT use and telecommunications<sup>93</sup>. Since then, it has been a declared ambition for Denmark to have one of the most advanced telecom regulations and most competitive telecom markets.

Thus, liberalization of the telecommunications sector in Denmark was seriously started in 1995 under the political slogan “best and cheapest” with the aim of providing Danish telecommunication customers, before the year 2000, the world's best and cheapest telecommunications services. The means to achieve this have been sector-specific regulation designed to ensure both free and real competition and adequate consumer protection. In the first phase of the liberalization - 1995-99 - the focus was to a wide extent on ensuring free and real competition in the telecommunications market and ensuring lower prices for consumers. The tools have primarily been regulation on maximum prices and on interconnection. The National Telecom Agency (NTA) has focused on achieving the lowest possible interconnection prices. The aim here, once again, was to ensure fair opportunities for new entrants into the market and therefore promote competition.

In spite of asymmetric interconnection regulation, Tele Danmark remained the largest company in the market. By 1997 it still represented nearly 90% of the turnover of the ten most important telecommunications providers according to NTA statistics and this figure remained above 80% in 1998. In all major areas of service, Tele Danmark had the largest market share. To change this, and realize the ambition of introducing real competition, legislation was introduced in 1998 to secure the new providers in the telecommunications market access to Tele Danmark's subscriber lines, the raw copper, and thus direct access to individual end-users.

#### **5.1.2 The second phase: From services-based to facilities-based competition**

In a political framework agreement of 1999 which formed the basis for phase two of the telecom liberalization, the general telecommunications policy objective of “best and cheapest” was supplemented with the aim to promote general access to the network society. The primary means to achieve this goal is again stated to be competition, but now the tools were supplemented with new initiatives targeting a facility-based competition.



**Box 5.1: Several pipes to the home – no wires**

From December 2000 through October 2001, additional frequency spectrum was opened and licenses for the operation of FWA (Fixed Wireless Access), 2G, and 3G services were awarded in order to strengthen competition by providing new ‘pipes to the home’ in the mobile and broadband market. While licenses for FWA and 2G services were awarded through beauty-contests, 3G frequency spectrum was assigned by way of a money auction. The usage of the 2.4 GHz frequency band (e.g. for WLAN – Wireless Local Area Network) requires no license.

***FWA (Fixed Wireless Access) Licenses***

In February 2000, the National Telecom Agency invited tenders for a total of seven nationwide FWA licenses in two frequency bands (three licenses in the 3.5 GHz, and four in the 26 GHz band). Interested parties were able to submit one bid in each frequency category. The agency received a total of 17 tenders from 12 bidders with six bids for the 3.5 GHz and 11 for the 26 GHz spectrum.

The tender was a beauty-contest consisting of an initial round for prospective licensees to indicate their interest and a final round of competitive bidding. Evaluating the tenders and subsequently selecting the license holders were based on a number of selection criteria, including the range of interconnection products, as well as their prices and terms, the coverage of the projected network within the license area and the overall extent to which the tender would foster a competition-driven market for subscriber connections capable of handling new and advanced services and facilities requiring large bandwidth and high transmission speeds. Moreover, competence, experience and financial situation of the bidders were considered. Unlike in the mobile tenders, the evaluation solely involved interconnection products and related prices, but not end-user products and prices.

In December 2000, the NTA issued seven licenses to five different companies to establish and operate public networks for FWA. Although the incumbent operator TDC was among the bidders, it was not awarded a license. Presently, the assignment of FWA-licenses has not resulted in much access competition. At the end of the first half-year 2002, there were less than 800 FWA-subscribers.

***2G Mobile Licenses***

In March 2000, the NTA invited tenders for four nationwide additional mobile licenses in the 900 MHz and 1800 MHz bands. Bidders were able to submit one tender in each frequency category and obtain a maximum of two licenses.

The tender was a beauty-contest. The evaluation and selection process were based on criteria like the range of end-user products and their prices, and the overall extent to which the submitted tender promotes competition in the mobile market. Unlike previous 2G tenders, this tender incorporated an assessment of prices and products regarding national roaming and interconnection. Prices and products were incorporated as binding obligations in the licenses, enabling service providers’ access to buying interconnection products at prices set in advance.

In December 2000, the NTA allocated two licenses in the 1800 MHz range to the only applicants for this frequency band, TDC and Sonofon. In January 2001, after evaluation of four applications, the NTA then issued two licenses in the 900 MHz spectrum to Orange and Telia, respectively.

***3G Mobile Licenses***

In June 2001, the NTA invited tenders for a total of four UMTS licenses in three frequency bands (1900-1980 MHz, 2020-2025 MHz and 2110-2170 MHz). Unlike the FWA and 2G beauty-contests, the 3G licenses were awarded in a sealed-bid auction. The auction model was chosen inspired by the huge bidding prices in the UK and Germany and because of the uncertainty about future services. It was argued that it was not possible to award licenses on basis of services, prices, and usage options, all of which were yet more or less unknown.

Regarding the requirements of participation in the auction, inter alia the bidders were obliged to run their own networks, to meet certain technical standards and coverage goals, and to introduce number portability. Operators having significant market powers can be subject to further obligations. The bids of tenderers which fulfilled the prescribed requirements were accepted for the final stage of the auction, where the license allocation was determined by the four highest bids. Eventually, all bidders had to pay the same price, which was the lowest of the four offers. The licenses were awarded for a 20 year period.

In October 2001, the licenses were granted to four of the five bidders (HI3G, TDC Mobile International, Telia Mobile, and Orange), where HI3G Denmark competes as a new entrant without an established 2G network in the Danish mobile telecom market. For each mobile license a sum of approximately DKK 950 million. had to be paid.

***WLAN (Wireless Local Area Networks)***

Contrary to the above-mentioned wireless communication services, the establishment and operation of a WLAN system using the 2.4 GHz band does not require a frequency license. There are no fees to be paid, nor any coverage obligations to be fulfilled. However, technical standards have to be complied with.

*Source: Based on information from National IT and Telecom Agency*

**Table 5.1 Public Mobile Cellular Licences in Denmark**

Company	Ownership Structure	Licence	Year Awarded
<b>TDC (previously Tele Danmark)</b>	SBC (41.6%); publicly traded (58.4%)	NMT 450 NMT 900 GSM 900 GSM 1800  GSM 1800 UMTS	1982 (closed) 1986 (closed) 1992 1998  2000 2001
<b>Sonofon</b>	Telenor (53.5%); BellSouth (46.5%)	GSM 900 GSM 1800  GSM 1800	1992 1998  2000
<b>Telia Denmark</b>	Telia (100%)	GSM 1800 GSM 900 UMTS	1998 2001 2001
<b>Orange A/S (previously Mobilix)</b>	France Telecom (54%); Banestyrelsen (14%); GE Capital Finance (9%); PAI (9%) Partcom (6%); Capital Communications (5%); Mediatel Capitael (3%)	GSM 1800 GSM 900 UMTS	1998 2001 2001
<b>Hi3G Denmark APS</b>	Hutchison Whampoa (60%); Investor AB (40%)	UMTS	2001

Source: National Telecom Agency, Espicom Business Intelligence.

Following on from the legal initiatives introduced in 1998, the NITA has sought to enable and stimulate the establishment of several alternative and competing access routes for consumers in line with the slogan “Several Pipes to the Home”. These alternative access routes refer to facilities such as cable TV, mobile networks, fibre networks and fixed wireless access (FWA). At the same time, the NITA has maintained its focus on ensuring access by competing providers to existing telecommunications networks. The primary tool used to achieve this has been the unbundling the local loop (“raw copper”), which was meant to enable competition in the market for provision of ADSL services. Access to raw copper wires, i.e. to Tele Danmark's subscriber lines (and to the individual end-user), is an important element in ensuring competition.

In October 2002, the NITA published a mapping of the current development on availability and penetration of fast access connections to the Internet by mid-2002<sup>95</sup>. The mapping shows that ADSL is now available to 95 per cent of all households. It is available in all municipalities in Denmark, including rural areas and smaller islands. Cable modems access is available in a large number of municipalities – mainly in the more populated areas. More than 60 per cent of households served by cable networks have access to cable modems via upgraded cable networks. FWA is also available in many parts of Denmark. In large areas of the country there are competing providers of various types of high-speed access.

However, the mapping also demonstrates that the actual use of high-speed Internet access connections has not progressed as far as the availability (see table 3.1).

To promote the use of fast access connections, Government's broadband strategy has been to stimulate demand further, partly by promoting the development of useful and high-quality content services on the Internet. The government has also noted that there is a need for the continued promotion of competition in this field.

## 5.2 Promoting Fair Interconnection

### 5.2.1 Interconnection framework

The NITA sees its tasks in relation to interconnection and promoting competition as including the supervision of standard offers for interconnection (reference interconnection offers, RIO), supervision of interconnection agreements submitted to the Agency, processing of complaints, accounting supervision and "own initiative" cases.

National legislation is based on general EU principles and contains two key concepts and four types of interconnect agreements (see box 4.6). The key concepts are SMP (Significant Market Power) and standard offers. The agreements relate to switched interconnection (exchange of traffic between two providers/operators), leased lines (and other arrangements for lease of infrastructure capacity), service provision (all forms of service provision incl. special network access), and co-location (sharing of facilities such as building and equipment).

#### 5.2.1.1 Interconnection: key concepts

In essence, the Danish definition of SMP operators falls in line with the EU definition<sup>96</sup>, and is relevant mainly in relation to interconnection and standard offers. According to Danish regulations, international interconnection agreements are included in the rules for submission and publication. This means that international interconnection agreements made by SMP providers must be made public. The only exception is if it can be proven that the publication of these agreements are not required in the home country of the foreign party to the agreement (Section 11 of the *Executive Order on Interconnection*). SMP designations on the Danish market are as follows: Tele Danmark for fixed telephony and leased lines, and Tele Danmark and SONOFON for mobile telephony.

The Danish rules on standard offers are based on the *Ac on Competitive Conditions and Consumer Interests* from May 2000 and an Executive order from June 2000<sup>97</sup>. SMP providers in a given submarket must give access to fixed network interconnection products indicated in the *Telecommunications Act* at cost-based rates and must prepare and publish standard offers for a number of interconnection products<sup>98</sup>. Together with the standard offers, providers must also submit documentation that their standard agreements are in conformity with interconnection regulation. The documentation must include an analysis of the conditions underlying the calculation of interconnection prices.

The NITA ensures that the substance of standard offers complies with the requirements of telecommunication legislation with respect to interconnection, prices, terms etc.

#### 5.2.1.2 Interconnection Agreements

#### Box 5.2 Best Practice

In October 1998 the NTA denied a request from Telia to lower the Danish interconnect rates to the then prevailing level in the UK. The legislation gave the NTA the right to demand the rates lowered, if equivalent prices were documented lower in other countries. Telia provided such documentation for a single country, the UK, which had the lowest rates in the EU.

The denial was based on a ruling in the Telecommunications Complaints Board stating that 'best practice' for end-user prices has to be decided by comparing with rates in *several* countries. The NTA regretted the uncertainty created by this and asked for legal clarification.

In 1999 Telia asked for a 41% reduction of the Danish interconnection rates based on a comparison of the rates in Denmark, the UK, Sweden and Germany. This was rejected by the NTA arguing that Telia had used an *international standard basket for interconnection* and thereby not fulfilling the demand for documentation of rates for 'parallel interconnection services'.

In May 2000 a new Act was introduced, which made it possible to conduct best practice comparison with a single country (BP1) when correcting for both product-related and country-related differences. At the same time, the best practice rule was maintained, according to which a comparison is made between three countries (BP3), correcting solely for product-related differences.

Based on information from National IT and Telecom Agency

The first interconnection agreement on the fixed network that Tele Danmark made in 1996 with Tele2 was concerned only with switched interconnection and leased lines. Today, an interconnection agreement may deal with a variety of aspects, e.g., interconnection agreements for access to raw copper and co-location. In terms of a method for evaluating these agreements, the NITA has used “best practice” as a basis for the decisions. The NITA believed that the basis for comparison should be “best practice” in only one given country. However, the use of best practice was appealed by Tele Danmark and disputed by the Telecommunications Complaints Board as described in Box 5.2. This led to a change in legislation making it possible to conduct best practice comparisons with a single country when correcting for both product-related and country-related differences<sup>99</sup>. One of the results of these regulatory activities has been that, compared with other countries in the EU, the Danish charges for switched interconnection are among the very lowest.

With the introduction of *Act No. 470* in 1998, service provider agreements were explicitly envisaged in the legislation, including special network access as well as agreements concerning wholesale purchase of minute-blocks of traffic. This again may also cover associated telephone subscriptions, from an existing SMP operator’s network (fixed and mobile).

### 5.2.2 Interconnection rates

Prices for switched interconnection constitute an important element in the ability of competing providers to offer telecommunication services to consumers. This holds true both in relation to ordinary telephony (switched interconnection and leased lines) and dial-up access to the Internet using carrier select codes. The prices for switched interconnection have been a particular focus area for the Danish regulator in recent years.

#### 5.2.2.1 Switched interconnection

From September 1998 onwards, the NITA has achieved continued price reductions via decisions based on “best practice”. For instance, overall prices have fallen by 23-69 per cent from mid-1999 to March 2002, depending on the type of traffic (see Table 5.2). An NITA “best practice” decision reduced the price of local interconnection by 20 per cent in March 2002.

In December 2000, the regulator decided to order a reduction in Tele Danmark’s (TDC) prices for the establishment and operation of regional interconnection points and 2 Mbit/s interconnection capacity by 40 and 25 per cent respectively. This decision was based on a comparison with similar prices in Norway and was thus the first decision using the option of comparison with one country only (See Box 5.2).

#### 5.2.2.2 Leased lines

Leased lines are significant elements in building alternative infrastructure – especially for backbone networks. Prices for leased lines are, therefore, of great importance to the ability of alternative providers to establish a foothold in the market. As an SMP provider, the incumbent’s prices for leased lines must be calculated under the rules of interconnection legislation. Following instructions from the NITA during 1999 and 2000, TDC has made a number of substantial and successive price reductions. As a result, end-user prices (which are not regulated under the interconnection law) were very low by international standards in 2002 (see table 3.5 and 3.6).

#### **Box 5.3 Best practice – the 3 countries case**

In February 2002, the National IT and Telecom Agency made a decision to reduce TDC’s price for switched interconnection on the basis of a best-practice examination involving three countries (BP3). TDC appealed the decision, claiming that the prices in one of the three countries, Ireland, were not suitable for inclusion in the decision partly because the relevant price in Ireland had been appealed to the High Court and could be regarded as preliminary prices.

In August 2002, the Telecommunications Complaints Board ruled that the NITA’s decision was in conformity with the framework set by telecommunications legislation for the authority’s assessment in fixing a specific interconnection price based on the best-practice method.

Source: Based on information from National IT and Telecom Agency

**Table 5.2: Developments in interconnection pricing from 1999 to 2002, in DKK 1/100**

	<b>Until 15 August 1999</b>	<b>1 October 1999 – early May 2000</b>	<b>Early May 2000 – 1 January 2001</b>	<b>1 January 2001 – March 2002</b>	<b>March 2002 -</b>	<b>Developments during period</b>
<b>Termination</b>						
Local interconnection	6.06	5.18	4.66	4.13	3.29	- 46%
Within interconnection areas	11.32	7.32	5.86	5.86	5.86	- 48%
Between interconnection areas	13.74	11.02	8.27	8.27	8.27	- 40%
<b>Access</b>						
Local interconnection	6.06	5.18	4.66	4.66	4.66	- 23%
Within interconnection areas	11.32	7.32	5.86	5.86	5.86	- 48%
Between interconnection areas	13.74	11.02	8.27	8.27	8.27	- 40%
<b>Transit</b>						
With interconnection areas	7.67	7.67	2.38	2.38	2.38	- 69%
Between interconnection areas	10.89	10.89	4.36	4.36	4.36	60%

Note: Note: The per-minute prices shown weighted to take account of traffic composition day/night, and a share of the call setup charge is included.

Source: National IT and Telecom Agency.

**Box 5.4 Duet: a trigger of legislative changes concerning service provision**

With the introduction of Duet on September 22, 1997, Tele Danmark launched the first mobile/fixed-network combination product in the Danish market for telecommunications services.

Duet is a concept whereby a single telephone subscription includes both fixed-network and mobile telephony elements. The product is offered in addition to Tele Danmark's fixed-network subscription and is based on purchase of network capacity and subscriptions from Tele Danmark's own mobile division, on a service provision basis.

Prior to its launch, the NTA was asked by Tele Danmark to assess whether or not the draft Duet concept conflicted with the legislation at the time. The NTA found together with the Danish Competition Authorities that there was no immediate indication that Tele Danmark's provision of the Duet service would violate the telecommunications legislation.

Immediately after Tele Danmark's introduction of Duet, uncertainty arose among Tele Danmark's competitors in the mobile market regarding their possibilities of providing combination services similar to Duet, either in collaboration with Tele Danmark or on their own and on the allocation of costs between the fixed and mobile services within Tele Danmark. The first was declined by Tele Danmark of technical/ signalling reasons; the other because the legislation did not require public insight in these matters. Both arguments were accepted by the NTA.

On the basis of the options, the National Telecom Agency advised the Ministry that Tele Danmark's competitors would be ensured increased opportunities to provide combination products, if interconnect regulation were amended clearly establishing access to service provision agreements in the fixed network sector. At the same time it was necessary to ensure that service provision agreements also be included explicitly under the interconnect legislation.

*Based on information from National IT and Telecom Agency*

*5.2.2.3 Setting rates: From best practice to LRAIC*

Legislation passed in mid-2000<sup>100</sup> mandated that the NITA develop an LRAIC model (Long-Run Average Incremental Cost) for switched interconnection, lease of raw copper and collocation, by the end of 2002. This followed EU recommendations in this area with the aim of reducing biased decisions and introducing more 'objective' model-based results. In July 2000, the NITA retained the services of a consortium of consulting firms to assist with the LRAIC project. The model was developed as a combined top-down and bottom-up approach, and the NITA determined the criteria and minimum requirements for both approaches. The top-down analysis was made by Tele Danmark, and the bottom-up analysis by a group of 'other providers' in a process in which the NITA was under an obligation to provide guidance in the preparation of the analysis. However, the law very clearly states that Tele Danmark and the other providers themselves have had to make the two cost analyses.

The NITA has subsequently mapped out the differences between the top-down and bottom-up analysis. These differences will be discussed within the industry. The NITA will lay down the final principles to be included in a hybrid model. In this manner, the final LRAIC model (including the actual charges) would be based on contributions from the various parties.



**Box 5.5 Mobile termination rates**

In 2000, the National Telecom Agency dealt with a case on termination tariffs in mobile networks for calls coming from other national or international networks respectively. Tariffs were higher for the termination of calls from national networks than from international networks, which has also been the case in other countries. The reason was that it has been difficult to determine the kind of number called (mobile or fixed) from the originating country and henceforth the tariff collected from the calling subscriber.

Differences in termination tariffs, however, are not in accordance with the non-discrimination principle for SMP-operators like TDC and Sonofon in the Danish market. The National Telecom Agency, therefore, made an analysis of the different termination tariffs in mobile networks and discussed the matter with TDC and Sonofon. The conclusion of the matter was that the two SMP mobile operators agreed that the differences in the termination tariffs would have to be phased out. Technologically, it has also become increasingly possible to analyze the kinds of numbers called, and there is, moreover, increasingly more direct exchange of traffic between operators internationally, by-passing traditional fixed network operators.

*Based on information from National Telecom Agency*

**5.2.3 The case of the MVNO (Mobile Virtual Network Operator)**

A Mobile Virtual Network Operator (MVNO) can be defined as a mobile network operator that does not have its own radio access network but does have its own Mobile Network Code (MNC) and in some cases, its own SIM (Subscriber Identity Module) cards. The legislation passed in mid-2000 obliged SMP providers to conclude MVNO agreements. In August 2000, the first real MVNO agreement was concluded in Denmark – and in Europe - between SONOFON and Tele2. Under this agreement, Tele2 was allowed access to using Sonofon’s network for the provision of mobile services and roaming agreements. Roaming is one of the issues that highlight the difference between service-only agreements and MVNO-agreements. This new option was introduced as a result of a – denied – request from Norwegian mobile operator Sense Communications (See Box 5.5).

**5.2.4 Access to essential facilities: Unbundling the local loop (ULL)**

The *Interconnection Act of July 1998* granted new providers access to Tele Danmark's subscriber lines or its raw copper. Following the entry into force of the *Interconnection Act*, the industry developed a framework agreement on access to the raw copper, and Tele Danmark prepared a standard offer.

A year later, this had only resulted in one concrete interconnection agreement for the raw copper (between

**Box 5.7 The ADSL Case**

In late 2001, the NRA decided to examine the market for the provision of ADSL (asymmetric digital subscriber line). The reasons were that players in the Danish market had pointed at certain inexpediciencies in the market, and that the market share of TDC had increased from 37 percent by the end of 2000 to 74 per cent by end 2001.

Two aspects were taken up for examination: 1. Some of the operators, competing with TDC, suspected TDC of charging their end-users unrealistically low prices for ADSL, leading to distortions of competitive conditions. The NRA brought this case before the NCA as predatory pricing is not within the NRA’s field of action. 2. TDC’s competitors voiced their suspicion that non-discrimination was not observed and that TDC was favouring the internal business areas with regard to delivery dates, access to internal data bases, etc. In this case, the NRA made an agreement with the accountancy company KPMG to review the business procedures in connection with the delivery of ADSL-related interconnection products.

On the basis of the KPMG report, published in July 2002, it was concluded that there is no reason to believe that TDC’s business procedures for ordering, delivery and fault repair have involved any discrimination between TDC Internet and other providers. However, material was brought up calling for further investigations into the providers’ access to data bases and the relocation of connections. The NRA has requested TDC to give an account on these points. Furthermore, the NCA examination of possible predatory pricing is still pending.

*Source: Based on information from National IT and Telecom Agency*

Tele Danmark and CyberCity). After this very slow start, however, a number of agreements have been made. In 2000, a total of 12 agreements for the leasing of raw copper had been made between Tele Danmark and competing providers.

Having made these agreements, Tele Danmark and a number of competitive providers began providing high-speed Internet connections (up to 2 Mbit/s) - primarily Asymmetric Digital Subscriber Line (ADSL).

There has, however, been continued dissatisfaction with Tele Danmark's tardiness in filling specific orders regarding the access to raw copper. The dissatisfaction has focused on several points, but has primarily centred on Tele Danmark's late processing of orders for raw copper and shared use. "Shared use" means that several providers "share" existing subscriber connection. This means that the incumbent handles the subscriber's ordinary telephony, and the alternative operator the subscriber's ADSL traffic. This requires installation of equipment for separating the two types of traffic. As for the delivery times for the raw copper agreed on by Tele Danmark and its customers, such deadlines are not regulated by the *Interconnection Act*. Basically, these are common contract stipulations and as such, negotiable and agreed upon by the parties on commercial terms. Any failure to comply with such contractual stipulations cannot be sanctioned under the *Interconnection Act*, but must be tried via a civil lawsuit. Hence, in processing the complaints in question, the NITA has concluded that the speed with which the orders for the raw copper are filled entails no violation of the telecom laws. Only if Tele Danmark fills its own orders faster than those of other providers will there be a violation of the non-discrimination rules of the legislation. The NITA has not found justification to rule that this has been the case (Box 5.7).

With regard to shared use, the *Act on Competitive Conditions and Consumer Interests* from May 2000 requires that agreements on shared use of the raw copper be negotiated. The NITA achieved some progress through mediation on the more detailed specifications of share use interconnection agreements.

### 5.2.4.1 *Unbundling the local loop in Denmark*

The NITA, amongst others, considered the unbundling of the local loop to be of great interest with respect to the possibility of various providers offering combination products no matter whether these are based on the fixed network or on mobile services, and not least in connection with the provision of new services such as ADSL. During 1997 and 1998 a topic of frequent discussion was the practical scope of the legislation at the time as it was stipulated that providers were allowed, on certain conditions, to lease facilities in the telecommunications networks of dominant providers. The NITA – well ahead of the general EU-regulation-made a decision in February 1998, in connection with a specific case, ruling that access to lease of infrastructure capacity included access to leasing the "raw copper", i.e. unbundled access to the last connecting link in the direct access to the customers. The decision of the NITA was brought before the Telecommunications Complaints Board from where a ruling stated that the interconnect law itself at the time did not explicitly allow the "raw copper" to be included under the interconnect regime.

Following the NITA's recommendation, the legislative basis was subsequently extended by *Act No. 470 of 1 July 1998* to explicitly include the unbundling of infrastructure including the local loop, i.e. providers wishing to lease stretches of existing physical infrastructure. The Act specifies that lease of infrastructure capacity also includes access to lease stretches of physical infrastructure capacity including, for example, 'raw' copper (the unbundled local loop), dark fibre and coaxial cables. Thus, the entire capacity of the local loop as such is included under the interconnect legislation and should, therefore, be regarded as an ordinary interconnect product.

The price of the local loop (exclusive of VAT of 25%) was, irrespective of its length, set at DKK 740 per

#### **Box 5.6 Request from an MVNO: Sense Communications**

Norwegian mobile operator Sense in 1998 approached Sonofon to get an interconnect agreement which included use of Sense's own MNC on their own SIM-cards. This was denied by Sonofon.

Following a complaint, the NTA ruled that Sonofon was obliged to grant access to their network, but not to give roaming (made possible by the MNC-code) to operators without a mobile license/ a mobile network in Denmark. However, the NTA found that acceptance of Sense's request could lead to 'new and innovative mobile services' (Press release from the NTA 15 February 1999). This led to the MVNO-option in the Act of May 2000.

*Based on information from National IT and Telecom Agency*



year (i.e. approximately EUR 100) which presently amounts to approximately 2/3 of the price of the average annual subscription fee for a telephone line.

#### *5.2.4.2 Unbundling the local loop in the European Union*

As part of the 1999 telecommunication review, the European Commission began evaluating the need for amendments of EU regulations in order to enable new operators' direct access to the end-users via the raw copper. In April 2000, these deliberations produced a Recommendation and Communication from the Commission, requesting member countries to allow such access no later than year's end 2000<sup>101</sup>.

In addition, in December 2002, the Commission issued an 'Un-bundling Code', which further regulates access to the raw copper as part of the new EU telecommunication framework. Since then, EU member states have, in principle, established mechanisms for providing competitive access to raw copper wiring. Outside the EU, countries such as Norway and Switzerland have also enabled such access. Danish prices for lease of the raw copper are currently among the lowest in the EU (see Table 5.3).

The new EU regulatory package obliges SMP operators in member states to publish a reference offer for unbundled access to their local loops and related facilities. Moreover, these operators must meet all reasonable requests for unbundled access under transparent, fair and non-discriminatory conditions. The obligation on SMP operators to prepare reference offers and to allow 'shared use' constitutes the major changes. As a result, SMP operators (e.g. TDC in Denmark) now have the obligation to permit shared use whether or not the company is offering this product itself. Another change in relation to previous national regulation is the limited right of the SMP operators to refuse a request for access to the products dealt with by the regulation. Requests may only be refused "on the basis of objective criteria, relating to technical feasibility or the need to maintain network integrity".

In Denmark, TDC has prepared a reference offer for the 'shared use' product and has revised its existing reference offer for raw copper. The latest reference offer for collocation is dated 2 April 2002. TDC has, furthermore, prepared a reference offer regarding the 'bit stream access' product, where the network providers install equipment making it possible to give a new provider access to a part of the total capacity on the subscriber line.

**Table 5.3 Unbundled Local Loop, Implementation Date and Monthly Rental Prices (US\$), second half of 2001**

	Implementation date	Unbundled access cost	Shared access cost	Line rental cost
<b>Denmark</b>	July 1998	7.16	3.58	10.46
<b>Finland</b>	1996	101.7-12.96	6.48-9.51	10.16
<b>France</b>	January 2001	9.94	3.02	10.85
<b>Germany</b>	January 1998	10.78	4.12	9.45
<b>Netherlands</b>	January 2000	14.23	9.37	13.39
<b>Sweden</b>	March 2000	10.02	4.75	9.51
<b>UK</b>	August 2000	13.97	6.05	12.62

Source: OECD: Developments in Local Loop Unbundling, DSTI/ICCP/TISP(2002)5

### 5.2.5 Carrier pre-selection

Since the middle of 1996, it has been possible for end-users, via a 4-digit code for each call (carrier selection on a call-by-call basis), to decide that their outgoing calls shall be routed via a company other than the one with which they have a direct customer relationship.

The *Numbering Act*<sup>102</sup> (later revoked and replaced by the general *Act on Competitive Conditions and Consumer Interests*) stipulates that it should be made possible for the end-user to choose a pre-selected routing for outgoing calls via a company other than the one that holds the subscription- this is also known as “carrier pre-selection”. It must be noted that carrier pre-selection is mandatory for operators of public telecommunication networks or telecommunication services belonging to providers with significant market power. Nonetheless, Tele Danmark was given the permission to implement carrier pre-selection in successive stages for a limited number of end-users (22%). The delay was due to technical complications associated with analogue exchanges. Carrier pre-selection has been on offer since 1 January 1999. By the first half-of 2002, more than 1.2 million customers or 30% of the subscriber-base were utilizing this facility<sup>103</sup>.

In general, the operators' right to facilitate carrier selection (by-call or pre-selection) is ensured through the negotiation of interconnect agreements. The *Act on Competitive Conditions and Consumer Interests* stipulates that end-users, through an overruling option, are enabled to combine the use of carrier pre-selection with carrier selection on a call-by-call basis.

**Table 5.4 The least expensive offers: price developments for fixed network telephony, mobile telephony and Internet (1998-2001)**

	Fixed network – 900 minutes	Mobile telephone – 270 minutes	Mobile telephone – 450 minutes	Internet – 600 minutes
<b>Aug 1998</b>	DKK 644	DKK 477	DKK 651	DKK 170
<b>Aug 1999</b>	DKK 648	DKK 477	DKK 574	DKK 95
<b>Aug 2000</b>	DKK 559	DKK 447	DKK 540	DKK 83
<b>Aug 2001</b>	DKK 560	DKK 380	DKK 514	DKK 80
<b>Change 1998-2001 (current prices)</b>	- 13%	- 20%	- 21%	- 53%
<b>Change 1998-2001 (fixed prices)</b>	- 20%	- 26%	- 27%	- 56%

Source: National IT and Telecom Agency

### 5.2.6 Recent market analysis on interconnection by the national regulatory authority

In 2002, the NITA conducted an analysis of competition on the wholesale market for telecommunication services in Denmark<sup>104</sup>. The aim was to see to what extent there is real competition on ‘relevant market segments’, i.e., to what extent specific regulation is needed. The following markets were examined: 1) international connections, 2) main backbone networks, and 3) connections between the access market and main backbone networks. The access market was not subject to analysis, as this still constitutes a bottleneck area so long as the incumbent, TDC, is dominant.

The NITA’s concluded that the abolition of all special obligations on SMP providers in the wholesale market for international connections should be considered. As regards main backbone networks, a step-by-step elimination of special obligations should be considered. For connections between access networks and main backbone networks, the regulator deemed that that the environment is not competitive enough to warrant a phasing out of special obligations.

### 5.3 End-user pricing

In general, prices for telecommunication services in Denmark have declined since the beginning of the liberalization process. This development is ascribed partly to competition and partly to technological developments. Furthermore, a rebalancing of prices has been conducted. As a result, prices for long distance telephone traffic have fallen, while subscription prices have increased. From August 1998 to August 2001, prices of different baskets of services have decreased considerably. Table 5.4 sets out the remarkable price decreases for Internet traffic as well as sizeable decreases in mobile and fixed tariffs.

Compared with other OECD countries, telecommunication prices in Denmark are relatively low<sup>105</sup>. The Competition Authority, in an analysis of competition in the Danish telecommunication market, states that there are grounds to conclude (falling and relatively low prices) that competition has increased during the past years<sup>106</sup>. The Competition Authority, however, also states that this positive development is partly a consequence of technological developments and warns that the lowering of prices indicates that many new companies are trying to gain a foothold on the market but may have to consolidate their economies in the coming years. The Authority also noted that price decreases will not automatically continue<sup>107</sup>.

Universal service in Denmark refers not only PSTN, but also ISDN and leased lines up to 2 Mbit/s. There is only one universal service provider in Denmark, the incumbent operator TDC, even though legislation allows for the appointment of different universal service providers. Universal service prices are subject to price cap regulation. Baskets of services are regulated by means of maximum prices or ‘price caps’ (RPI-X)<sup>108</sup> for PSTN and ISDN and prices must be lowered in real terms. In order to ensure that Danish universal service

prices are among the cheapest internationally, they are compared with best practice prices in other countries and adjusted accordingly.

The calculation of universal service obligations merits further clarification. Both an X-factor and a Y-factor are determined for each year, with X being the required real fall in prices on the average private consumer's total telephone bill and Y being the required real fall on the average low-usage consumer's total telephone bill. However, the relationship between maximum universal service prices and interconnection prices is also important. If universal service end-user prices fall too much in comparison with interconnection prices paid by new entrants to the incumbent and universal service provider, there is a danger of squeezing the margins of other providers, which would deteriorate the competitive situation. It was, therefore, part of the new legislation in 2000<sup>109</sup> to introduce a factor Z measuring the realized fall in prices for the interconnection products related to universal service obligation products. If X or Y turns out to be larger than Z, then X or Y is to be reduced<sup>110</sup>. Even if the sector-specific telecommunication legislation does not include rules on predatory pricing, instances of competition distortion because of lowering of prices are nonetheless taken into account.

### **5.3.1 Recent market analysis on end-user tariffs by the national regulatory authority**

In May 2002, the National IT and Telecom Agency published document entitled 'Analysis of end-user prices in the universal service area'<sup>111</sup>. This analysis is the result of a political agreement dated 1999 on an evaluation to be conducted in 2002 on the merits and modalities of universal service regulation<sup>112</sup>. The possibility of rolling back regulation in the universal service area is mentioned in the 2000 *Telecommunications Act*<sup>113</sup>. In the attached comments to this Act, it is stated that when there is sufficient competition leading to a continuous decrease in end-user tariffs, thus making price regulation partly or entirely superfluous, sector-specific universal service price regulation may be rolled back.

The analysis includes a discussion of when the level of competition can be deemed sufficiently effective to roll back price regulation. The indicators for effective competition used in the analysis are listed in Table 5.5. In the market for international traffic, the final conclusion was that there is effective competition and that the conditions for a continued decrease in end-user prices seems to be present based solely on this competition. In the PSTN and ISDN subscription and directory services market, it was found that sufficient competition did not exist<sup>114</sup>. The report was not conclusive as to whether or not there is effective competition on the local traffic market.

**Table 5.5: Indicators for effective competition**

	Type	Indicators
<b>Supply side</b>	Market structure	- Market actors, market shares, concentration and geographic spread - Barriers to market entry - Other characteristics of market structure
	Behaviour of suppliers	- Revenue - Prices and price development - Product differentiation - Competition behaviour
<b>Demand side</b>	Barriers to end-user choice	- Access to information - Lock-in periods - Barriers to shift of supplier
	Market conditions of end-users	- Price level and elasticity - Shift of supplier in practice

Source: IT- og Telestyrelsen

With this analysis and one similar for interconnection<sup>116</sup>, the path towards competition analyses, foreseen in the new EU legislation (see section 4.1), has been forged. In the field of universal service maximum prices, the incumbent operator, the universal service provider, is more than willing to roll-back price regulation. The incumbent operator has no interest in having its prices scrutinized and regulated (downwards). Similarly, competing operators have no interest in maintaining a maximum price regulation, which only puts pressure on their prices. However, end-users have a vital interest in ensuring that prices are kept low and continuously on the decline, and there is a concern among representatives of end-users in Denmark (both residential and business users) that it may be too early to lift price regulation on basic telecommunication services<sup>117</sup>.

## 5.4 Infrastructure sharing

Infrastructure sharing is a key competition and interconnection issue that also relates to rights of way and environmental protection (e.g. the erection of masts). The Danish *Act on the Establishment and Joint Utilization of Masts for Radio Communication Purposes*<sup>118</sup>, for instance, states its purpose as being the limitation of the number of masts and the implications on the surrounding areas<sup>119</sup>. However, infrastructure sharing is a broader issue, which in the interconnection and competition area deals with the question of infrastructure or facilities-based competition versus service competition. In the radio communications area, different kinds of infrastructure sharing exist. The simplest form is sharing of masts and associated buildings. Another form could be the geographic division of markets, using roaming to cover the whole area. A third and more complex form could be the sharing of networks, e.g. by establishing separate network companies servicing different service providers<sup>120</sup>.

The most heated debates, lately, under the heading of infrastructure sharing have dealt with the establishment of 3G infrastructures and the costs incurred by mobile operators in this area. Many mobile operators internationally are in severe financial problems partly due to the high costs of acquiring licenses in a number of countries, and these operators would certainly welcome the possibility of sharing the costs of building out the networks. However, in the mobile area, more than in the fixed network area, a high political priority is placed on infrastructure competition. Good reasons exist for this difference – infrastructure competition is more difficult to achieve in the fixed network, given the incumbent operator’s traditional monopoly in network access. Nevertheless, financial problems have led many mobile operators to question the degree of emphasis on infrastructure competition.

In Denmark, 4 licenses for 3G frequencies were sold in an auction for DKK 950 million per license (app. US\$ 115). Compared with license prices in the UK and Germany, the cost per inhabitant is relatively low. Still, operators have put pressure on public authorities to allow for a greater degree of infrastructure sharing. One of the requirements on the licensees is that 30 per cent of the Danish population must be covered by 2004 at the latest and 80 per cent by 2008 (corresponding to app. 35% geographical coverage). At first, the requirement was 90 per cent in 2008, but on the basis of a hearing prior to the auction (which began in September 2001), this requirement was lowered to 80 per cent, as the costs of covering the remaining 10-20 per cent were deemed disproportionately high. Some of the operators also proposed the option of building a joint system for the remaining 10-20 per cent. However, this was rejected politically on the grounds that it would alter the real number of licensees and would infringe on the principle of infrastructure competition. If operators are not able to cover 100 per cent, they will have to rely on roaming and MVNO agreements<sup>121</sup>.

### **5.5 Number portability**

Another mechanism that is seen as an important step for increasing competition is number portability. Number portability allows customers not only transfer and retain their telephone numbers between geographic locations but also between different operators. It effectively lowers switching costs for customers. A first phase of number portability began in October 1999 in Denmark, when it became possible to retain numbers for fixed telephony, including ISDN, but only within the same local area. The aim was then to introduce full geographic number portability, mobile number portability and portability between fixed and mobile platforms by January 2001. But technical problems turned out to be significant – a point on which all operators in the telecommunications industry agreed.

In line with these concerns, the Minister of IT and Research revised the original schedule as follows: number portability for fixed telephony between geographic areas was to be introduced by January 2001, number portability for mobile telephony by July 2001, and full number portability by April 2002. However, this plan also turned out to be too ambitious. Full geographic fixed number portability and mobile number portability was introduced by the required date, but operators have yet to find solutions for portability between mobile and fixed networks. The deadline for fixed-mobile number portability has been extended to April 2004.

Statistically, the amount of users taking advantage of number portability has increased considerably since its introduction, as illustrated in table 5.6. The mobile field has seen a sharp increase, whereas fixed telephony number portability has declined following a significant head start in 2000.

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**Table 5.6: Number portability: requests received (2000-2002)**

	<b>First half-year 2002</b>	<b>2001</b>	<b>2000</b>
<b>Fixed network</b>	67,834	132,576	163,450
<b>Mobile network</b>	131,649	82,539*	-
<b>Total</b>	199,483	213,115	163,450

\* Mobile portability was introduced 1 July 2001

Source: National IT and Telecom Agency

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## 6 Conclusions

### 6.1 Main findings

The overall picture of telecommunications in Denmark is one of high penetration levels and relatively low prices. Although not satisfactory, the level of competition in the market places Denmark among the leading countries in Europe. In terms of the take-up of traditional fixed line communications, mobile communications, Internet and broadband networks, the country fares well on both international and European comparisons. Prices have also been declining over the past decade. Investments in the telecommunication area increased with liberalization and have continued to maintain a solid level.

These positive developments are due in part to liberalization and increased competition, on the one hand, and technological innovation and overall wealth on the other. But the positive developments can also be ascribed to the proactive intervention of the national regulatory authority, the NITA. In the fixed line market, there are many operators and licenses have not been required since 1996. However, competition in the access market is primarily service-based, as the incumbent operator TDC continues to retain a significantly dominant position in network access. In mobile communications, there is enhanced competition with currently four operators (with networks of their own), a number of service providers, and an MVNO. In the fast growing ADSL market, competition in Denmark is at a higher level than in other European countries, but the incumbent operator is steadily increasing its ADSL market share. In an area not often considered in competition analysis, competition has also started to have an impact. The number of outgoing telephone calls on public networks has decreased more than 10% during the past year (2001-2002), partly reflecting the growing number of calls made on private networks. The overall conclusion must be that the liberalization and the creation of competition in the Danish telecommunication market has been a relative success compared with most other countries, but some problems persist. Furthermore, regulation seems to have played a central role.

The full liberalization of telecommunications in Denmark was implemented ahead of the general EU 1998 deadline. The positive results of this process are largely due to the proactive role of the telecommunication regulatory agency in carrying out the policy of 'best and cheapest' and 'several pipes to the home'. Before the change of policy in the mid-1990s, Denmark was not among the group of leading countries in the EU with respect to liberalization of telecommunications. But since this shift in policy, the implementation of the new package has been carried through with consistency and often more stringently than in other EU countries.

Competition among the operators is regulated primarily through bills and executive orders but is also promoted by means of, *inter alia*, published surveys of prices and quality of services of the operators in order to improve transparency in the market for the users. Decisions by the regulator or the appeal system are generally accepted by the players in the market, supported by the fact that no cases have yet been brought to court. There is generally a cooperative spirit between the operators and the regulatory authority, for instance in the form of industry agreements (self-regulation) and co-operative forums endorsed by the regulatory authority, e.g., in the field of interconnection and spectrum management.

There remain, however, some serious problems. The major one is the difficulty in developing competition in the network access field. Service competition has developed, but infrastructure or facilities-based competition may be more difficult to obtain, and the ADSL case has shown that in service areas closely related to the physical access network, the incumbent operator continue to have a stronghold, which is difficult to compete with.

Another problem, like in other EU countries, is the persistently high mobile termination rates, which are not regulated under Danish legislation. For a number of years, these rates have not come down in spite of the relatively high number of mobile operators in the Danish market and falling prices for mobile to fixed calls. Operators in the mobile area complain that there are too many mobile operators in the Danish market, making it difficult to run a profitable business. The future regulation of mobile termination rates will be more in line with the new EU regulatory framework.

## 6.2 Towards a common European telecommunications market

Generally, telecommunication policies implemented in Denmark are determined at the European level. Since the European Commission started intervening more actively in telecommunications from the second half of the 1980s, the policy goal has been to liberalize the national telecommunication markets and to develop a competitive telecommunication environment and to harmonize the conditions across the EU area, thereby creating a common European market for telecommunication networks and services.

The liberalization process has succeeded, but accomplishments in other areas are more limited. Competing operators have entered the national markets from abroad and new operators have been created on the national market. However, national incumbent operators still dominate their national markets. Conditions across the national markets have, in principle, been harmonized by means of EU regulatory provisions, but the mode and speed of implementation differ from country to country. But a truly common European market has not been achieved. In the equipment area, a common market has been created, and this was an important aim of telecommunication policies from the outset of EU intervention in the area. In the networking area, backbone networks have also, to some degree, become internationalized. However in all other areas, markets are still largely national.

The new EU regulatory package seeks to change this situation, e.g. by issuing general guidelines concerning market analysis determining the level of competition in different market segments and subsequent regulatory measures to be implemented. The European Regulators Group (ERG) was created with this aim in mind. The policy objective is thus to accelerate the development towards a truly common European telecommunication market. It is also an ambition of large operators to establish themselves as sub-regional or European players offering pan-European services. Eventually, national markets will play a less dominant role in the EU area. However, as the experience of the last 15 years of telecommunication liberalization in the EU tells us, this is likely to be a protracted process.

## 6.3 Future challenges facing Danish policy-makers and regulators

The main challenges for Danish policy-makers and regulatory authorities are no different than the challenges facing the European Commission and other European countries, i.e. how to increase competition, rely more on general competition law, accommodate trends in convergence, support tendencies towards truly sub-regional and European markets, and in general, support the development of information and network societies.

More specifically, the main challenges with respect to enhancing competition are to improve the conditions for network access competition, including alternative access technologies and unbundling provisions, and to implement the new LRAIC system for interconnection charges. In the mobile area, termination charges are far too high, and at a more general level, mobile operators believe that there are too many operators in the market. A consolidation process in the mobile area is likely and foreseen by players in the market.

There is no doubt that general competition law will play an increasing role in telecommunications. In the Danish telecommunication environment, there is widespread agreement that telecommunication markets have developed to a stage where a greater reliance on general competition law is possible and even desirable. However, the speed and character of this process is up for discussion. While the incumbent operator wishes as quickly as possible to disband sector-specific regulation, there is a concern both among competing operators and among end users that sector-specific regulation will be necessary for some time to come.

Furthermore, an important assignment for the national regulator will be to further develop expertise in conducting the kind of the competition analysis required by the new EU guidelines. Moreover, organizational relations between the NITA and the Competition Authority have to continuously develop with the increasing integration of telecommunication regulation and general competition law.

Convergence has only briefly been touched upon in this report. But convergence between IT, telecommunications and broadcasting has been a pivotal concern in the development of the new EU regulator package. The opinion among Danish policy makers is, however, that convergence and technology neutrality is clearly reflected in existing Danish legislation. Issues outstanding are related to the development and



relationship between communication legislation and legislation regarding privacy, security, digital rights, and consumer protection.

All operators, and in particular operators with interests or ambitions in regional or sub-regional markets, are in support of more harmonized regulatory conditions across national borders. However, the national segmentation of the European telecommunication market has been a source of concern, and there is no support for a sector-specific European regulator at this time. Current coordination initiatives (e.g. common guidelines and ERG) are considered as sufficient in the current environment.

Finally, the overall aim of telecommunication regulatory policy is to promote the development of information or network societies. The Danish NITA has clear responsibilities in this field. The role of the regulator is not only to be a reactive 'watchdog' but, in line with activities at the Ministerial level, its role extends to promoting the usage of new information and communication technologies. In some countries, this may raise concerns regarding the independence of the regulator. However, the Danish government is not worried. In regulatory matters, the authority is independent and in policy matters, the NITA provides advice to the Ministry. In the view of NITA, the main focus should be effective independence based on criteria of regulatory efficiency and accountability. Continued developments in this direction are an important and ongoing challenge for the development of the Danish telecommunication market and the enhancement of competition within it.

## Endnotes

<sup>1</sup> The objective of the New Initiatives Programme is "to advise the Secretary-General, in an informal manner, on new topics of a regulatory, policy or other nature of high-current interest which cut across the work of the ITU Sectors, with a view to possible inclusion of these topics in the regular work programme of the Union" (ITU Council Decision 496). The topics of the workshops are selected from areas of high current interest by the Secretary-General in consultation with the Member States and Sector Members.

<sup>2</sup> See the website for the Competition Policy Workshop at <http://www.itu.int/osg/spu/ni/competition/>.

<sup>3</sup> Greenland and the Faroe Islands are not covered in the report.

<sup>4</sup> The [UNDP's](http://www.undp.org/hdr2001/) HDI is a composite of key indicators of well-being such as life expectancy, literacy, school enrolment and per capita GDP. For the 2001 Human Development Indicators, see <http://www.undp.org/hdr2001/>

<sup>5</sup> "Bedst og billigst gennem reel konkurrence" (July 1995 Ministry of Research memorandum).

<sup>6</sup> Statistical Outlook from the European Information Technology Observatory 2002, 10<sup>th</sup> Edition.

<sup>7</sup> Exchange rates of 1995 (5.60) and 2001 (8.32). The difference in exchange rates underestimates the change in US\$.

<sup>8</sup> Powercom offered data communication services to end-users within the business segment and also offered services as a local carrier – for instance for one of the major mobile companies.

<sup>9</sup> Tiscali was formerly World Online.

<sup>10</sup> ITU World Telecommunication Indicators Database. This categorization excludes island states, such as Bermuda.

<sup>11</sup> ISDN is an international communications standard for sending voice, video, and data over digital telephone lines or normal telephone wires. There are two types of ISDN, basic rate and primary rate. Basic Rate ISDN (BRI) consists of two 64-Kbps B-channels and one D-channel for transmitting control information. This is also known as ISDN-2. Primary Rate ISDN -- consists of 23 B-channels and one D-channel (U.S.) or 30 B-channels and one D-channel (Europe). The latter is also known as ISDN-30.

<sup>12</sup> These figures may also reflect increasing usage of substituting services such as mobile and Internet. However, it is the evaluation of the incumbent operator, TDC, that the decrease in public fixed line traffic, to a great extent, is due to private networks. (Information from interview with representative of TDC 26 August 2002 in relation to the preparation of the present report).

<sup>13</sup> Ministry of Science, Technology and Innovation, "Denmark's IT Status", June 2002. The drop in prices refers to the lowest-priced segment of 450 mobile minutes.

<sup>14</sup> OECD and Teligen, T-basket, August 2001. See <http://www.oecd.org/>. The ranking has been adjusted for purchasing power parities (PPP). When not adjusted, Denmark ranks as the 6<sup>th</sup> cheapest in the OECD region.

<sup>15</sup> In the OECD basket, the user is assumed to have a contract for the provision of voice telephony services with the incumbent operator and to use only this operator for all types of calls. The fixed charges include the annual line rental plus the charge for the installation of a new line (depreciated over 5 years). Fixed charges for residential users include VAT, while for business users VAT is excluded. The usage charge for residential users refers to a basket of 1,200 national calls to fixed lines, 120 calls to mobile networks, plus 72 international calls. The usage charge for business users refers to a basket of 3,600 national calls to fixed lines, 360 calls to mobile networks and 216 international calls. (Information from Commission of the European Communities: 'Annexes to the Seventh report on the implementation of the telecommunications regulatory package', COM(2001)706, pp. 22-23, where additional information on the construction of the baskets can be found).

<sup>16</sup> Further information of calculation of leased lines prices, see Commission of the European Communities: Annexes to the 7<sup>th</sup> implementation report, COM(2001)706, pp. 37-38

<sup>17</sup> Commission of the European Communities: Annexes to the seventh report on the implementation of the telecommunications regulatory package, COM(2001)706.

<sup>18</sup> Commission of the European Communities: Ibid. pp. 80-81.

<sup>19</sup> It should be noted that figures were only reported for 11 EU countries.

<sup>20</sup> The affected non-member countries are primarily EFTA (European Free Trade Agreement) countries of which Norway, Iceland and Liechtenstein take part in the EEA (European Economic Area) together with the EU countries.

- <sup>21</sup> A similar mode of operation applies with respect to general competition authorities in the EU. In matters of predominantly national character, the so-called EU-sub subsidiarity principle applies so that national competition authorities are in charge.
- <sup>22</sup> The first intervention dates back to 1982, where the Commission issued a decision regarding the abuse of dominant market power of British Telecommunications in the British market (see decision 82/861, 1982, OJ L360/36). In 1984, the Council made a recommendation regarding the implementation of harmonization in the telecommunications area (see recommendation 84/549/EEC). Furthermore, other initiatives were taken in this period.
- <sup>23</sup> COM (87) 1290.
- <sup>24</sup> COM (1999) 539.
- <sup>25</sup> Ibid. p. iv-v.
- <sup>26</sup> Ibid. p. v.
- <sup>27</sup> Ibid. p. v-vi.
- <sup>28</sup> The implementation deadline does not include the data protection directive, which is still subject to negotiation between the European Parliament and the Council.
- <sup>29</sup> There are two kinds of directives: Those issued by the European Parliament and the Council of Ministers in accordance with article 95 of the European Treaty, and those issued by the Commission on the basis of article 86.
- <sup>30</sup> See Guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for E-Communications networks and services, OJ C 165/6 11.07.2002.
- <sup>31</sup> See Working document on the relevant markets within the E-communications sector, Brussels 17.06.2002 [http://europa.eu.int/information\\_society/topics/telecoms/news/documents/recommendation\\_directive\\_2002\\_21\\_EC/206\\_17\\_rec\\_public\\_consultation.pdf](http://europa.eu.int/information_society/topics/telecoms/news/documents/recommendation_directive_2002_21_EC/206_17_rec_public_consultation.pdf); see also Market Definitions for Regulatory Obligations in Communications Markets, (Brussels, May 2002) Squire, Sanders & Dempsey Study for the EU Commission, [http://europa.eu.int/information\\_society/topics/telecoms/regulatory/studies/documents/market\\_definitions\\_exec\\_sum.pdf](http://europa.eu.int/information_society/topics/telecoms/regulatory/studies/documents/market_definitions_exec_sum.pdf)
- <sup>32</sup> See Notice, paragraphs 7-24.
- <sup>33</sup> Especially in vertically integrated markets such as in the telecom sector, where the network owner also provides down-stream services, leveraging can be utilized to expand market power from the infrastructure to the service markets.
- <sup>34</sup> C-27/76 United Brands vs. Commission, ECR [1978] paragraph 65; see also Art 14 paragraphs 2 in the Framework Directive.
- <sup>35</sup> Case T-342/99 Airtours vs. Commission [2002] ECR, paragraph 62.
- <sup>36</sup> Case T-342/99 Airtours vs. Commission [2002] ECR, paragraph 62.
- <sup>37</sup> To that effect, Case T-342/99 Airtours vs. Commission [2002] ECR, paragraph 213.
- <sup>38</sup> A draft proposal has been sent out for public hearing in October 2002.
- <sup>39</sup> Information from interview with representative of TDC, 26 August 2002, see list of interviewees.
- <sup>40</sup> Telestyrelsen: 'Vejledning om ULL-forordningen og dens retsvirkninger', July 2002.
- <sup>41</sup> Presentation by deputy director general Finn Petersen, National IT and Telecom Agency, 23.08.2002, <http://www.itst.dk/image.asp?page=image&objno=107671947>
- <sup>42</sup> IT- og Telestyrelsen: 'Analyse af slutbrugerpriser på forsyningspligtområdet', 31 May 2002.
- <sup>43</sup> Ibid. p. 4.
- <sup>44</sup> IT- og Telestyrelsen: 'Analyse af konkurrenceforhold på engrosmarkeder i telesektoren', 9 April 2002.
- <sup>45</sup> National Telecom Agency: 'Status 2001 – Annexes', chapter I, pp. 2-3, [http://www2.tst.dk/uk/publications/bilag2001\\_eng/kap01I.htm](http://www2.tst.dk/uk/publications/bilag2001_eng/kap01I.htm).
- <sup>46</sup> Ibid. p. 3.
- <sup>47</sup> This clearly came out of the interview round with operators, users, consultants and policy and regulatory authorities performed 26-28 August 2002 in relation to the preparation of this report.

<sup>48</sup> Conclusions of interview round.

<sup>49</sup> Forskningsministeriet: 'Bedst og billigst gennem reel konkurrence', 1995.

<sup>50</sup> This is the clear impression from interviews performed in relation to this report. However, there are, of course, differences. Representatives of Telia, for instance, expressed the concern that too much emphasis has been put on developing the 'cheapest' aspect and that not sufficient attention has been on the 'best' aspect, i.e. the development of networks and services of the highest quality.

<sup>51</sup> Conclusions of interview round.

<sup>52</sup> An analysis of Danish telecommunications policy developments in the 1990s is provided in Anders Henten and Thomas Wulff: 'Danish Telecommunications: Keeping the Policy Options Open', Telecommunications Policy, vol. 20, no. 9, 1996, pp. 669-684. The analysis in this sub-section is based on this paper.

<sup>53</sup> Committee on the Information Society: 'Info-society 2000', Ministry of Research and Information Technology, 1994.

<sup>54</sup> Op.cit.

<sup>55</sup> Act no. 426, 6 June 2002.

<sup>56</sup> 'Bekendtgørelse af konkurrenceloven', LBK no. 539 of 28-06-2002, <http://222.ks.dk/konkuromr/regler/LBK-nr-539-2002.htm>, § 2.

<sup>57</sup> Konkurrencestyrelsen: 'Konkurrenceloven i korte træk 2002', <http://www.ks.dk/konkuromr/regler/KL-kort-2002/KL-kort-2002.htm>, page 1.

<sup>58</sup> 'Lov om konkurrence- og forbrugerforhold på telemarkedet', act no. 418, May 2000.

<sup>59</sup> Konkurrencestyrelsen: 'Velfungerende markeder – til fremme af vækst og velfærd', section 5, <http://www.ks.dk/publikationer/2002/velfung-mar/velfung-mar-06.htm>

<sup>60</sup> Konkurrencestyrelsen: 'Konkurrenceredegørelse 2002', chapter 5, <http://www.ks.dk/publikationer/2002/kr2002/kap05.htm>

<sup>61</sup> Interview with representatives of the Danish Competition Authority, 27 August 2002, see list of interviewees.

<sup>62</sup> Interview with representatives of the Danish Competition Authority, 27 August 2002, see list of interviewees.

<sup>63</sup> Ibid.

<sup>64</sup> Act no. 418, 31 May 2000.

<sup>65</sup> This act was amended in June 2002 (act no. 420, 6 June 2002). However, these amendments are minor and of no consequence in relation to this report.

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<sup>67</sup> Ibid. § 51.

<sup>68</sup> Ibid. § 41.

<sup>69</sup> Ibid. § 42.

<sup>70</sup> Ibid. §§ 52 and 54.

<sup>71</sup> Ibid. § 43.

<sup>72</sup> Ibid. §52.

<sup>73</sup> Executive order no. 852, 28 September 2000.

<sup>74</sup> Source: Ministry of Science, Technology and Innovation

<sup>75</sup> See Danish Competition Authority: 'Annual Report 2001', page 3.

<sup>76</sup> Konkurrencestyrelsen: 'Rådsmødet den 26. april 2000 – Tele Danmark ændrede forretningsbetingelser for leje af faste kredsløb', <http://www.ks.dk/konkuromr/afg/2000/04-26/pkt11-5.tph.htm>

<sup>77</sup> Konkurrencestyrelsen: 'Pressemeldelse – TDC ændrer afregningsprincipper for konkurrenter for 70-numre', 28 August 2002, <http://www.ks.dk/publikationer/presse/2002/Consorte.htm>

<sup>78</sup> National IT and Telecom Agency: 'About National IT and Telecom Agency', <http://www.itst.dk/winpdoc.asp?page=tema&objno=95024027>, page 1.

<sup>79</sup> This description of assignments is taken from the homepage of the National IT and Telecom Agency.

<sup>80</sup> Act. No. 395, June 1997.

<sup>81</sup> Answer by the Minister of Science, Technology and Innovation to question S 470 in the parliament, 25 January 2002, [http://www.folketinget.dk/Samling/20012/spor\\_sv/S470.htm](http://www.folketinget.dk/Samling/20012/spor_sv/S470.htm)

<sup>82</sup> Op.cit.

<sup>83</sup> Op.cit.

<sup>84</sup> National IT and Telecom Agency: 'About National IT and Telecom Agency', <http://www.itst.dk/winpdoc.asp?page=tema&objno=95024027>, page 1.

<sup>85</sup> Act 420, 2002, §2.

<sup>86</sup> This point is emphasized by the director general of the IT and Telecom Agency, see <http://www.regulateonline.org/forum2002/machiavelli.htm>

<sup>87</sup> In cases where binding statements from the competition authority have to be collected by the IT and telecommunications authority, appeals must be directed to the Competition Complaints Board. Furthermore, there is a Service 900 Board. However, this is not a board of appeal but a complaints board in consumer-cases relating to 900 numbers

<sup>88</sup> Information from the telecommunications agency's annual status report 'Status 2001 – Annexes', chapter VI.

<sup>89</sup> The number of cases processed by the Telecommunications Consumer Board has, however, decreased sharply, as most cases presently are taken to the general Consumer Complaints Board. It has lately been proposed to merge the two consumer boards into one consumer complaints board, financed by telecommunications industry.

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<sup>91</sup> Teleklagenævnet: 'Statistik', <http://www.teleklage.dk/statistik/teleklagenævnet/tekst.htm>

<sup>92</sup> In the period covered by the status report 2001 of the telecommunications agency, two out of seven cases ended with another decision than the one taken by the telecommunications agency. See 'Status 2001 – Annexes', chapter VI.

<sup>93</sup> See, e.g., Ministry of Research, Info Society year 2000, Copenhagen 1994; Bedst og billigst gennem reel konkurrence, Copenhagen 1995.

<sup>94</sup> See, e.g., Ministry of Research, Info Society year 2000, Copenhagen 1994; Bedst og billigst gennem reel konkurrence, Copenhagen 1995.

<sup>95</sup> IT- og Telestyrelsen: IT- og Telestyrelsens kortlægning af hurtige adgangsveje I Danmark – Status medio 2002, October 2002.

<sup>96</sup> Basically, an operator with more than a 25% share of the relevant market.

<sup>97</sup> Act No. 418 of 31 May 2000 on Competitive Conditions and Consumer Interests in the Telecommunications Market (the Telecommunications Act) and Executive Order No. 571 of 22 June 2000 on Standard Offers in the Interconnection Field (Executive Order on Standard Offers).

<sup>98</sup> Providers of mobile communications with significant market power in the market for mobile communications are exempted from preparing standard offers for interconnection. Nor is there any obligation on providers of public mobile communications networks to prepare standard offers for national roaming.

<sup>99</sup> Act No. 418, 31 May 2000.

<sup>100</sup> Act No. 418, 31 May 2000.

<sup>101</sup> Commission Recommendation COM(2000)159 and Commission Communication COM(2000)237.

<sup>102</sup> Act No. 392 of 10 June 1997 on Assignment and Use of Numbering.

<sup>103</sup> This refers to subscribers of A-numbers. NTA, The Tele Yearbook 2001

<sup>104</sup> Telestyrelsen: 'Analyse af konkurrenceforhold på engrosmarkeder i telesektoren', October 2001.

- <sup>105</sup> OECD: 'Communications Outlook 2001'.
- <sup>106</sup> Konkurrencestyrelsen: 'Velfungerende markeder – til fremme af vækst og velfærd', section 5, page 8, <http://www.ks.dk/publikationer/2002/velfung-mar/velfung-mar-06.htm>
- <sup>107</sup> Ibid. page 8.
- <sup>108</sup> Retail Price Index minus a factor X, describing the percentage that universal services must be lowered in real terms.
- <sup>109</sup> Act 418, May 2000, § 19.
- <sup>110</sup> National Telecom Agency: 'Status 2001 – Annexes', chapter II, page 3.
- <sup>111</sup> IT- og Telestyrelsen: 'Analyse af slutbrugerpriser på forsyningspligtområdet', May 2002.
- <sup>112</sup> Political agreement of 8 September 1999.
- <sup>113</sup> Act 418, May 2000, § 19.
- <sup>114</sup> IT- og Telestyrelsen: Op.cit. pp. 4-5.
- <sup>115</sup> IT- og Telestyrelsen: Op.cit. pp. 4-5.
- <sup>116</sup> Telestyrelsen: 'Analyse af konkurrenceforhold på engrosmarkeder i telesektoren', October 2001.
- <sup>117</sup> Results of interview round performed in connection with the preparation of the present report.
- <sup>118</sup> 'Act on the Establishment and Joint Utilization of Masts for Radio Communications Purposes etc.', Act no. 212, March 1999.
- <sup>119</sup> Ibid. § 1.
- <sup>120</sup> See Oftel: '3G mobile infrastructure sharing in the UK – Note for Information', May 2001, <http://www.oftel.gov.uk/publications/mobile/infrashare0501.htm>
- <sup>121</sup> Based on IT- og Telestyrelsen: 'Høringsnotat 3g bkg vedrørende forslag', <http://www.itst.dk/winpdoc.asp?page=tema&objno=95029433>