Finnish Telecom Policy

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Abbreviations

2G	Stands for second generation mobile technology (part of name)
3G	Stands for third generation mobile technology (also part of name)
DNA	Name of mobile service provider
EU	European Union
FICORA	Finnish Communication Regulatory Authority
GDP	Gross Domestic Product
GSM	Global System for Mobile communication
H.E.	Her Excellency
HPY	Helsingin Puhelinyhdistys (abbreviation, part of name)
HTC	Helsinki Telephone Corporation
HTF	Helsingfors Telefonförening (abbreviation, part of name)
ICT	Information and Communication Technology
IN	Intelligent Network
IP	Internet Protocol
ISP	Internet Service Provider
IVO	Imatran Voima Osakeyhtiö, state owned power company
NMT	Nordic Mobile Telephony
OECD	Organisation of Economic Co-operation and Development
PABX	Private Automatic Branch Exchange
PT	Posts and Telecommunications (abbreviation, part of name)
RSL COM	Company name
SMP	Significant Market Power
USD	Currency unit, United States' dollar
WLAN	Wireless Local Area Network
xDSL	Generic name for family of DSL (Digital Subscriber Line) technologies

1 Introduction

This report is a description of the Finnish telecommunications sector and the Finnish telecommunications policy. The target group is international sector experts who wish to get a good basic understanding of the Finnish telecommunications sector, with all its peculiarities, and the underlying policy. The Finnish telecommunications sector described in this publication presents the situation in autumn 2002.

The report is brief. Initiated readers need to consult other sources, analysing data, sector reports, legislation, annual reports, etc.

The report aims at describing the policy as the Ministry has either expressed or implemented it. The report also includes some descriptions of the Ministry's rationale for the policy. Any policy includes distinct selection between options and alternatives. Such selection necessarily means that all parties cannot be equally satisfied; thus some degree of dissatisfaction may be considered normal.

The Finnish policy has been essentially neutral towards operators of different age and size, not biased against the many old operators, or against entrants, except for some obligations imposed on operators with Significant Market Power. The alternative main policy line would have been asymmetric policy and regulation, used in some countries with one strong incumbent.

The author (Mr. Arno Wirzenius, Teleplanning A. Wirzenius Ltd.) has benefited from numerous discussions with various stakeholders and other commenting persons. However, the views expressed in the report are those of the author and do not necessarily reflect those of the Ministry of Transport and Communications.

Helsinki, 15 January 2003

Harri Pursiainen
Director-General
Communications Department


TELEFON
PUHELIN

2 Finnish telecoms in a nutshell

2.1 Country background

Finland is a North European country, with rather scarce natural resources except for forests. It is located at the same latitude as Alaska. Its only valuable resource is the population, a mere 5.2 million inhabitants in a country slightly larger by area than the UK and Ireland together, or slightly smaller than Germany.

Finland's written history covers about 1000 years. At this time Sweden took over the then tribal area. After a number of wars between Sweden and Russia, Russia took over Finland in 1809. Finland became a Grand Duchy under the Czar of Russia.

In 1917 Finland declared independence from Russia, and has since then been an independent republic. In 1995 Finland joined the EU.

Its parliament is unicameral with 200 seats. Members are elected for four years terms using a proportional system, resulting in a multi-party parliament with no single majority party. The outcome is coalition cabinets, reducing the occurrence of abrupt policy changes after parliamentary elections. The Head of State is the President, elected by direct presidential ballot for six years. The current president is H.E. Ms. Tarja Halonen, elected in 2000.

After a civil war in 1918 and two wars against the Soviet Union during 1939 to 1944, the country has managed to establish itself as an industrialised country.

Over the years Finland has adopted a Scandinavian type structure of society, with a high taxation level and more social services than in extreme market economies.

Table 1.

Key facts about Finland, year 2001 unless indicated

Area	338,145 km^2
Population	5,195,000
Population density	15 inh / km2
Population growth	0.15 % / a
Urban population	60 %
Official languages	Finnish and Swedish (5.7 %)
Literacy	100 %
Life expectancy	77 yrs
GDP / capita (1999)	USD 24,900
Main natural resource	Forests (76 % of land area)

Source: Statistics Finland, Telecommunications statistics

Finland is one of the five Nordic countries (Denmark, Finland, Iceland, Norway, Sweden).

2.2 Sector history

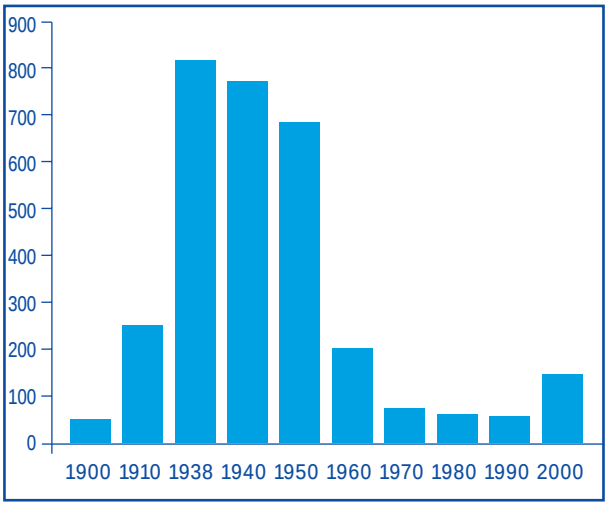
The first telephone connection in Finland was commissioned in 1877, one year after its invention. Local telephone companies (telcos) were founded from 1882 onwards, using a multitude of corporate forms. Many of the telcos were co-operatives. In the initial years there was no state involvement in the sector.

New small telcos were created on a continuous basis. In 1938 the number was 815, with a total of about 150,000 connections. The average size was thus a mere 180. The vast majority of the telcos were simply a small manual switchboard in a corner of a farm kitchen.

The very small telcos were not viable, particularly when automatic switching was introduced. The solution was mergers and take-overs, not bankruptcy. Mergers occurred almost from the outset. The merger rate increased from the 1950's, ultimately reducing the number to below 50. Since the sector was liberalised, during the 1990's, the number has again increased, due to a number of entrants, various specialised joint ventures and subsidiaries, each with its own licence. See Figure 1.

Figure 1.

Number of licensed telecom operators in Finland



Source: Ministry of Transport and Communications.[1]

[1] *In the early 1990's different licences were granted for different purposes, e.g. voice and data communications. The number of operators will increase significantly after the Communications Market law is enacted. The reason is that the same law will also covers broadcasting type network operators. Operators will be communications operators, not telecommunications operators.*

Even if no legal or formal monopoly existed, competing licences were usually not granted. Thus each telco had a de facto monopoly in its local service area.

The predecessor of Sonera, a traditional state department, was created after independence, taking over the former telegraphy business run by the Russian administration. It started telephony service in some areas and also took over some local telcos.

Long distance telephony was originally run as separate private companies. In 1934 the Government (Sonera) took over the largest long distance operator. Sonera also ran international telephony as a monopoly. The general approach of Sonera was overpriced long distance and international charges and subsidised local charges. The situation was to some extent understandable as Sonera had more rural areas (3/4 of the land area, 1/4 of the lines) than the local telcos (1/4 of the land area, 3/4 of the lines).

The first automatic switches were commissioned in Helsinki in 1922. Automatisation of the network gained momentum in late 1940's and 1950's, and was completed in 1980. Long distance telephony was initiated in 1958. Digitalisation started in 1977 and was completed in 1996.

Key data about the telecommunications sector is shown in Table 2.

2.3 Camps in the multi-operator system

2.3.1 Name development of main camps

This description is based on the situation before the merger between Telia and Sonera. See Chapter 2.3.5.

For the ease of foreign readers the report uses the present names of operators and camps and their predecessors rather than the names valid from time to time. The initiated reader will get more detailed information e.g. from available literature, see Chapter 5.

The main name changes of the main camps are presented in Table 3.

Table 2.
The Finnish telecommunications sector in 2001 in a nutshell

YARDSTICK	FINLAND	COMPARISON
Total operator revenue	euro 4691 million	
- as portion of GDP	3.5%	Western Europe 3.7
Fixed telephones	2,806,000	
Mobile telephones	4,175,000	
Fixed penetration	54.1 / 100 inh.	High income countries 59.7
Mobile penetration	80.4 / 100 inh.	High income countries 50.2
Fixed penetration	121 / 100 househ.	
Mobile penetration	178 / 100 househ.	
Internet penetration	51 / 100 househ.	EU 38

Sources: Telecommunications Statistics 2002, ITU World Telecommunication Indicators 2002

Table 3.
Name history of Sonera, parent company

SONERA	Name used in this report
The Telegraph Office of Finland	State organisation, 1917 - 1927
Posts and Telegraphs of Finland, later Posts and Telecommunications of Finland,	State organisation, merger with Posts of Finland, 1928 - 1989
Posts and Telecommunications of Finland	Unincorporated state-owned enterprise, 1990 - 1993
PT Finland	Limited liability company, with two main subsidiaries, Finland Post Ltd. and Telecom Finland, 1994 - June 1998
Telecom Finland Group plc	Demerger, telecommunications and postal functions separated, July 1998 - January 1999
Sonera Group plc	Name change, January 1999 - September 1999
Sonera Corporation	Merger with subsidiary, name change after merger, October 1999 -

Source: Sonera prospectus for public offering of shares, October 1999. Sonera's predecessors were included in the state budget until 1989.v

Table 4.
Name history of Elisa

ELISA	Name used in this report
Helsinki Telephone Association	Financial association (co-operative type), 1882 - June 1998
Telephone Co-operative HPY	Change of corporate form to co-operative, June 1998 - May 1999
HPY Holding - HTF Holding Oyj Abp	May 1999 - June 2000
Elisa Communications Corporation	July 2000 -

Source: HPY Holding - HTF Holding Oyj Abp Preliminary Offering Circular, May 1999, and http://elisa.com. Note that operator activities were run in a subsidiary, Helsinki Telephone Corporation (HTC) during 1994 - June 2000. HTC was merged with HPY Holding in June 2000.

The name **Finnet** is used as an umbrella name for the members of the Finnet Association, an association of the private telephone operators in Finland, and their subsidiaries and joint ventures.

The Finnet Association was founded in 1921 as the Association of Telephone Companies. The Association changed its name to Finnet Association in 1996.

Over the years all private operators joined the Association, until Elisa and its associates separated in 2001, with some other separating companies later. The remainder of the companies continue as Finnet. For ease of the foreign reader, the new, smaller, camp will be called **"New Finnet"** in this report, even if the name is not official or even used in Finland.

2.3.2 Main development

Before liberalisation Finland has had two distinct camps: Sonera and the private operators. Until the early 1990's all operators were part of these two camps. The liberalisation process changed the main picture in two ways:

- a number of small entrants commenced operation (from early 1990's); and
- the existing private operator camp (Finnet) split into two camps when Elisa and its associates separated from the other private operators (2001). Some operators also joined the Sonera camp.

Table 5.
Market share based on gross revenue and connections in 2001[2]

	GROSS REVENUE (euro million)		CONNECTIONS (million)			
Camp	euro	Share %	Fixed	Mobile	Total	Share %
Sonera	2278	48	0.89	2.28	3.17	49
Elisa	1463	31	1.00	1.19	2.19	34
New Finnet	654	14	0.89	0.03	0.92	14
Entrants	323	7	0.02	0.18	0.20	3
Total	4719	100	2.81	3.67	6.48	100

Source: Telecommunications Statistics 2002

2.3.3 Market share

The market share shown in Table 5 is based on the camp status as of October 2002.

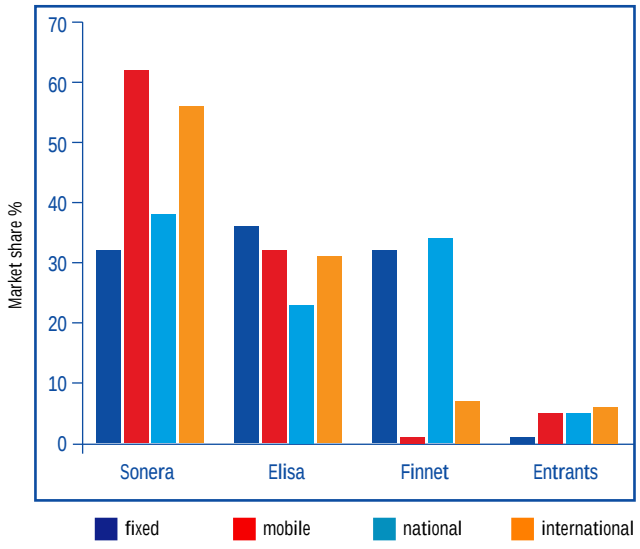
The table shows that Sonera alone has almost 50 % of the total market. Elisa has one third, New Finnet one seventh, and all entrants together a mere 7 %.

Figure 2 shows market share by sector. Market share for fixed and mobile is based on connections, market share for national and international long distance traffic is based on traffic distribution between fully competitive camps (anybody can use the service without contract in advance). Revenue based market shares are not published.

Sonera's growth has been mainly organic, only a minor part is due to take-overs of some existing operators. Sonera has focussed on mobile communications and is the undisputed market leader for mobile communications in Finland. Sonera has used its expertise in mobile for its international expansion. Sonera also focuses on corporate services.

Elisa's growth has been a combination of organic growth and take-overs. The Finnet camp has grown, but also diminished in take-overs and other camp changes. New entrants have mainly started from scratch. For more details see below.

Figure 2.
Market share by sector



Source: Telecommunications statistics 2002 (fixed, mobile, 2001), FICORA (national & international, September 2002)

[2] *The revenue figures in Table 5 include also other revenue than operator revenue, such as sales of terminal equipment, computers, cable television, dictionaries, etc. The Finnet GSM 900 service commenced operation in 2001.*

2.3.4 Split of the private operator camp

As indicated in Chapter 2.2, the Finnish sector history is to a large extent a restructuring history, with new enterprises, mergers, take-overs, etc., as in any normally working sector based on a market economy. Old restructuring will not be presented, but recent events will be described in this Chapter. The most important new feature is the emergence of a third major operator camp.

When liberalisation started, all existing private operators were part of the Finnet camp. Most Finnet companies were co-operatives, with Elisa alone being about as big as the other telcos together. See Chapter 2.4.

In order to offer various national and international services, the Finnet companies created joint ventures. The most important of these joint ventures were for mobile and international services and for country-wide backbone networks and corporate services. In some cases important customers were minority stakeholders in the joint ventures.

Three co-operatives, including the largest (Elisa), were converted into normal for-profit companies and were listed on the stock exchange. The share and the right to a line were unbundled. The companies also started to distribute dividend.

Over a period of time Elisa acquired a significant stake in the two other listed companies, gaining control of the business. Other ownership was mainly previous user-owners and no strategic owner existed. The control was subsequently used to increase ownership to majority level. Elisa also acquired control of a few other medium-size local telcos. Sonera has also taken over control of some Finnet companies in a similar way. Elisa itself has created mechanisms to prevent take-overs.

In parallel with this development, negotiations were held regarding restructuring of the joint ventures and also otherwise strengthening co-operation and joint business. Negotiations were not successful. Elisa and its associates separated from the Finnet camp and formed their own camp. Subsequently Elisa bought out the other Finnet companies from the most important joint ventures, in particular mobile (Radiolinja). Elisa sold its stake in the national long distance operator joint venture to the remaining Finnet companies (New Finnet).

New Finnet used the proceeds of the sales to create three new mobile operators:

- Suomen 2G (network operator for GSM, second generation);
- Suomen 3G[3] (network operator for 3G); and
- DNA (service provider for GSM and in the future also 3G).

The three companies are presently directly owned by the New Finnet companies, but have slight differences in ownership. Perhaps the most important difference is that Swedish Netcom (Tele2) has a 20 % stake in Suomen 3G. Otherwise the control is with the same owners, even if the three companies are legally independent. The three companies are some of the few cases in the world in which networks and services are separated in independent companies with different ownership.

The New Finnet companies also have some other joint ventures.

In September 2002 the New Finnet camp published a major consolidation plan. All significant joint ventures will be transferred from direct ownership to one holding company, Finnet Ltd.

None of the take-overs or other camp changes can be classified as hostile, even if sometimes implemented against the wish of the management and some owners. The take-overs are essentially normal acquisition of market share, customer base and presence in certain parts of the country. The take-overs are part of the consolidation process on-going in Finland for almost 100 years. It is interesting to note that entrants so far did not participate in take-overs.

Industry observers follow in particular the viability of the New Finnet camp, to see whether it succeeds in establishing itself as a third stabilised and credible major player in Finland.

The Finnish Ministry of Transport and Communications has not taken any stance with respect to take-overs and consolidation. Except for Sonera, an active role in ownership changes is outside the scope of the Ministry.

From a sector policy perspective the most important and positive feature is that a third significant national operator camp has emerged. Finland will continue to be one of the most competitive markets. Few other countries have three country-wide full-service operators. Thus the Ministry is satisfied with the new competitive set-up.

[3] *3G stands for third generation mobile telecommunications.*

2.3.5 New entrants

The description of Telia' operations in Finland describes the situation before the Telia-Sonera merger. See Chapter 2.3.6.

The new entrants are very different. Most are niche enterprises, focussing on rather narrow business segments. The operators with the widest business cover are Telia (and its predecessor Telivo) and Song Networks. Telivo was a spin-off of the national state-owned power company IVO, using the power grid as a backbone network platform. It started offering limited fixed, national long distance and international services in 1993, and mobile services in 1998.

Telia has subsequently sold its fixed business in 2001 to Song Networks, including long distance and international telephony, and a minority stake (40 %) of Corenet Oy, a spin-off of the state railways.

Most other entrants offer corporate services, low cost international access, services to closed user groups, or similar. A few mobile service providers have entered the market, with modest success.

Subsidiaries of international operators or consortia offer mainly services to business operators. From a European perspective Finland is a small and different market, more competitive than most other national markets. Thus there is little profit achievable. The presence of many international operators is probably due to the need to cover all Western European countries and thus offer multinational customers coverage of all European countries. Another possible reason for presence is to monitor a truly competitive market.

Out of the entrants, only Telia and Song Networks have some significant amount of network. Most other entrants operate either as service providers, leasing network capacity from existing network operators, or own limited network resources e.g. in the main business centre in the capital or operate radio links to major customers.

The new entrants are not organised as a group or camp.

A summary of main entrants is presented in Table 6.

Table 6.

Main entrants in Finland, data for 2001

COMPANY	MAIN BUSINESS	REVENUE EURO MILLION	STAFF
Song networks	Fixed (local, nat'l, int'l), Internet	49.8 (Finland)	353 (Finland)
Telia	Mobile (partially service provider), WLAN, mobile terminal eqpt	112 (Finland)	670 (mobile only, Finland)
Jippii Group Oyj	Internet, nat'l, int'l, mobile (service provider)	87.2 (total)	446 (total)
RSL COM FINLAND OY	Corporate services including fixed (local, nat'l, int'l), mobile (service provider), Internet, data communications	32 (Finland)	100 (Finland)
Cubio Communications	int'l, nat'l, directory services, toll-free and premium rate services, corporate services	8 (Finland)	20 (Finland)

Source: Telecommunications Statistics 2002

After publishing of the above list, New Finnet bought RSL COM.

2.3.6 International investors in Finland

Since liberalisation Finland has no restrictions on foreign ownership. From a European perspective Finland is a small market, different, and rather competitive.

International investors have entered the Finnish telecommunications market in four main ways, in historical order:

- as entrants (see Chapter 2.3.5);
- Swedish Netcom (Tele2) has a 20 % stake in Suomen 3G (New Finnet's 3G network operator);
- Vodafone made an agreement on co-operation with Radiolinja (Elisa's mobile subsidiary); and
- Telia and Sonera have agreed to merge (see Chapter 2.4).

When the Finnish 3G licences were issued, the New Finnet companies wanted to get a credible international partner for developing the business and to strengthen the consortium when applying for the licence. The position of Netcom in the consolidated New Finnet structure is still to be seen.

In early 2002 Elisa announced an agreement on co-operation between Radiolinja and Vodafone. Elisa's interim report states[4]: *Vodafone, the largest mobile operator in the world, and Radiolinja signed on February 14, 2002 a business and partner agreement. For Radiolinja, service of multi-national customers, dual branding for certain customer groups, GPRS roaming and similar international*

[4] *Source: www.elisa.com.*

products and services form the cornerstone of the partner agreement. In the same connection, an umbrella agreement was signed between Elisa Communications Corporation and Vodafone on cooperation enhancement.

The announcement does not disclose any co-operation on ownership level, and the final outcome of the enhanced co-operation is still to be seen.

2.4 Corporate structures

Sonera was initially fully state owned. Sonera has been partially privatised in several steps. Until the merger with Telia, shares have been sold to investors in public offerings. The Finnish Government retained a majority stake of 52.8 %[5].

Over the years the Finnish Government has been looking for a strategic owner for a possible merger. Various discussions have taken place. The final outcome is a merger between Telia and Sonera. See Chapter 2.4.

The first telcos were all private, but with a mix of various corporate forms. Most telcos were co-operatives, typically with one share giving the right to one line. All co-operatives were open to new customers. Anybody wanting a phone could join by buying a share. New shares were available on a continuous basis.

In most other countries the government decided either not to grant licences to private operators, or at an early stage took over the existing few and small telephone operators and created a state owned monopoly.

The shares were rather expensive, in the order of euro (or USD) 500 - 1000 (1990's level). The co-operative form was appropriate for growing companies in a cash-strapped economy, generating sufficient funds needed for investments. Another important source of funds was taxation. Investments could be depreciated quickly, allowing reinvestment without profit tax.

The co-operative structure also means that co-operatives did not aim at maximising profit and distributing dividends, they instead applied lower tariffs. The structure was self-regulatory.

The multi-operator structure combined with co-operative ownership also worked in a similar way to competition, keeping management alert. If the owners were not satisfied, they could change management and / or decide on a merger with another telco. An efficient telco was in a good position to take over less efficient neighbours. Sonera was usually very active in competing for take-overs, and indeed took over more than 430 telcos[6].

In addition to the mainstream co-operatives, a few telcos were municipal departments. They generated profit to the municipality owner. A few small telcos were also normal for-profit enterprises. Also the municipal and for-profit telcos had some degree of competitive pressure in the form of benchmark competition, limiting the degree of monopoly rents that could be extracted.

During the last 70 years two distinct camps have developed: the private telcos (mainly co-operatives), and the state-owned Sonera. At times the tension between the camps has been strong, with a strong political flavour in the past. The tension has been an effective hindrance to cartel type arrangements between the camps. Socialisation of all private telcos was proposed in the 1930's and 1950's. The proposals were not successful.

From 1985 onwards the private telcos organised most country-wide services as joint ventures, a kind of club ownership or federative structure. These joint ventures offered services to large corporate customers, mobile services, long distance and international communications, Internet, etc. See also Chapter 2.3.4.

[5] *In addition the state pension fund owns a 0.4 % stake.*

[6] *Source: The study of alternative solutions for the provision of telecommunications services in developing countries, Case study based on the regulatory and organisational structures in Finland (Case Finland), 1992, FINNIDA, Ministry of Transport and Communications, The World Bank.*

2.5 Telia-Sonera merger

This report describes general telecommunications policy, and does not focus on state ownership policy. The status of this chapter is of early October 2002.

Over the years the Finnish Government has been discussing various co-operation possibilities with major telecommunications operators, including a full merger option. The financial crisis of Sonera (see Chapter 2.6) speeded up merger talks.

The final outcome is an agreement on a merger with Swedish Telia. The terms and conditions for the merger are not finalised (status early October 2002), and the final decisions (company shareholder meetings) are not yet made. The merger is also pending approval from national competition authorities and the EU. One of the conditions for approval is that Telia sells its mobile business in Finland. This sale is on-going but not yet completed.

One of the important actions on the Sonera side before the merger was to fully write-down the value of the German 3G licence (euro 3600 million). The action has caused considerable discussion on the decision process that approve participation in the auctions, and a search for responsible persons. Because the Government still has a majority stake in Sonera, the discussion extended to Government approval processes and persons and political responsibility. The discussion is still on-going in the Parliament.

2.6 Finnish operators abroad

Sonera started an aggressive expansion abroad in the 1990's, mainly in mobile operations. Major investments have been various joint ventures in the Baltics, Turkey, Lebanon, Hungary and Russia. Some of these joint ventures have made investments elsewhere. Most of these were profitable until recent years. Sonera also acquired a stake in two US mobile operators, subsequently sold to Deutsche Telecom.

During the "dot.com boom" Sonera also initiated major efforts aiming at global markets in mobile transaction security and mobile Internet applications. These efforts were not profitable.

Perhaps the most significant move was to participate in third generation licence auctions and other licensing competitions in several European countries. Sonera and its partners did win one of the German licences. Sonera also won stakes in licences in some other countries, at substantially lower prices.

The outcome of the auctions is well known: the winning operators generally ran into financial difficulties when the world-wide telecom sector recession slowed down sector growth and postponed introduction of 3G technology and services. Sonera is no exception.

Sonera and its partners entered Germany, trying to capture a share of the present GSM market, deemed to be needed for a successful start of 3G business. The attempt failed and the German GSM joint venture (Quam) has been closed down. It is difficult to enter a mobile market from scratch, competing with several established operators. Telia experienced the same difficulty in Finland.

Elisa runs the second largest mobile operator in Estonia, which turned profitable in 2001. Since 1998 Elisa has also invested significant amounts in stakes in city carriers in Germany, to the extent that Elisa's German subsidiary is the largest city carrier group in Germany. The German business is so far deep in the red, but Elisa expects it to turn profitable in 2003.

Jippii also entered a number of countries as Internet and mobile service provider, partially with own backbone network. The business turned out to be non-profitable and Jippii is withdrawing from international markets except for mobile entertainment.

The New Finnet companies, so far, have never tried participating in the operator business abroad.

2.7 Vendor competition

The Finnish telecommunications sector has always been open for competition between manufacturers. The open competition, based on common standards (see Chapter 3.9) was not common elsewhere in Europe. Most countries had protected markets, with national manufacturers. The outcome elsewhere was that manufacturers did not need to compete.

Over time most European telecommunications manufacturers have been active in Finland. Some have been established more or less permanently, some withdrew quickly from the competitive market. Some manufacturers stated publicly that Finland was a test field: *if it works in Finland with tens of operators, then it is safe for world-wide deliveries.*

The present Finnish champion Nokia had to enter a fully competitive market with established competitors[7]. Nokia started with cables, continued with transmission equipment, further with switching, mobile network equipment and mobile handsets. Nokia entered the market when digital technology made its breakthrough, which offered a green-field window of opportunity world-wide. Nokia did not have the burden of backwards compatibility with own old analogue equipment. The Nokia success is recognised world-wide.

In particular the Finnish mobile success has created a huge amount of start-ups and also several success stories in the sector. This "communications cluster" is still developing, even if the telecommunications recession hampers growth. 30+ cluster companies are listed on the Helsinki stock exchange[8].

2.8 Policy and regulatory bodies

The Finnish Ministry of Transport and Communications is the policy making body, but, by law, it also has regulatory tasks. The Finnish Communications Regulatory Authority FICORA is the regulator. See Figure 3 and Chapter 4.11.

The decision power of FICORA is vested with the Chief Executive Officer, appointed by the Minister. Until 2001 FICORA had a board with representatives from the industry and users. The board decided on budgets, operational and financial plans, general development of FICORA, significant sector development plans, technical regulations and general licence conditions.

FICORA may appoint advisory committees, and had appointed five advisory committees by the end of 2001. FICORA interacts closely with competition and consumer authorities and with the industry, as well as with relevant international organisations. It maintains a comprehensive Internet site, in Finnish and Swedish (official languages) and English, as well as publishes periodicals and runs seminars.

A breakdown of the revenues is shown in Table 7.

At the end of 2001, FICORA employed 220 permanent staff, and in addition about 20 temporary staff. FICORA's revenues in 2001 were euro 26 million, and the profit euro 1.5 million.

Table 7.
Breakdown of FICORA's revenues in 2001

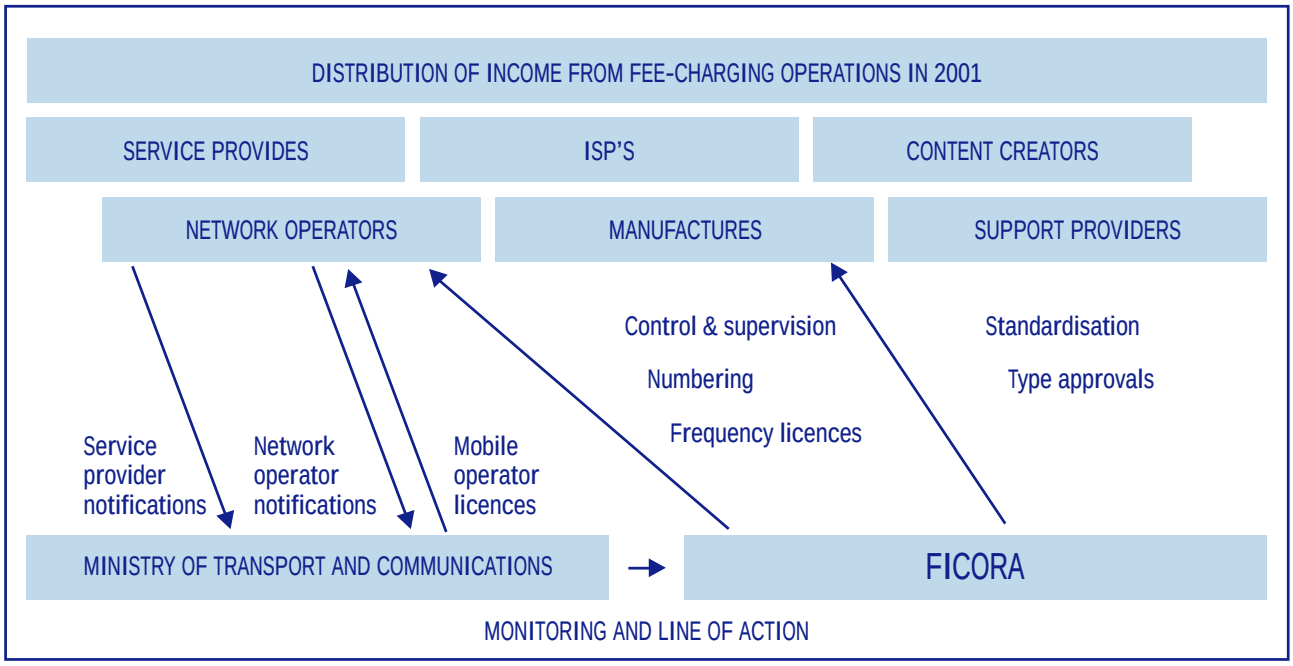
DISTRIBUTION OF INCOME FROM FEE-CHARGING OPERATIONS IN 2001	EURO
Radio transmitter licence fees	4,741,168
Spectrum fees	5,148,101
Telecommunications network numbering fees	3,340,283
Internet domain name fees	828,764
Other fees	1,033,841
Postal operation supervision fees	843,841
Refund from the State Television and Radio Fund	10,122,916
Total	26,058,915

Source: www.ficora.fi

[7] *Ericsson and Siemens had local switching manufacturing plants in Finland, as well as equipment design. In recent years mobile equipment design has been the focus, taking advantage of Finland's forerunner status in mobile usage. A number of other international information and communications technology (ICT) manufacturers have established design units in Finland, for the same reason.*

[8] *www.hexgroup.com. See also Chapter 5.*

Figure 3.
Structure of Finnish telecommunications administration.



Source:Telecommunications statistics 2002

2.9 Legislation

The Finnish primary telecommunications legislation has evolved in the following main steps:

Table 8.
Development of primary communications legislation

YEAR	LAW	DESCRIPTION
1886	Telephone Declaration	The Finnish senate was empowered to issue licences for installation of telephone lines, no monopoly mentioned
1919	Telegraph law	Government monopoly to provide telegraph service
1987	Telecommunications law	Competing licences possible, licence granted based on political discretion. Initially Sonera had by law right to provide service, other operators needed a licence
1997	Telecommunications market law	Public mobile telecommunications needs a licence, tendering mandatory, all other telecommunications is either subject to notification or fully liberalised, obligations to offer services and lease lines to other operators, accounting separation of networks and services, meets EU directives, interface to competition legislation
2002	Communications market law I	All communications networks (also broadcasting except content) in the same law (convergence)
2003	Communications market law II (under preparation)	Meets the proposed new EU framework

After 1987 the legislation has been amended several times, almost annually. The above table does not include amendments. Some amendments have been significant, e.g. Sonera 's special rights were repealed and its status was changed to a normal licensed operator in 1990.

The Communications Market law I includes the essential elements of convergence, including the policy of technology neutrality. There is no distinction between networks built for traditional telecommunications, cable television and terrestrial television, except for frequency licensing. All these networks can be used for any service. Broadcasting contents does have special legislation regarding contents, but it is separate from networks. Perhaps the most important new feature is that Internet services can now be delivered using cable television and (later) digital terrestrial television.

SMP status can be imposed on operators that have Significant Market Power in relevant markets, including telecommunications and broadcasting.

2.10 Finland and the EU

The Finnish Telecommunications Act of 1987 was drafted at the same time as the Commission's Telecommunications Green Paper of 1987. While Finland was a member of EFTA and not a member of the EEC, some contacts were established during the drafting of the two papers.

The Finnish starting point was different from virtually all other countries in the present EU (see Chapter 3). Finland had a long history of a multi-operator market, with large private ownership, while most other countries had state owned monopoly operators. The EU as well as Finland aimed at increased competition to the benefit of users. Many of the concepts and principles were identical or similar. Both implemented immediate liberalisation of terminal equipment. Separation of operation and regulation was adopted in both. Interconnection was a century-old tradition in Finland, and a necessary new feature in other countries. Both aimed at, and participated in, creation of common European standards.

However, in terms of liberalising (opening for competition), the speed and the routes were different. The Finnish choice was to liberalise simply by removing competition barriers established by licences. The main tool was facilities competition, with parallel (overlay) networks. No exclusivity was specifically included, but competitive licences were to be granted in stages. Full liberalisation was implemented in 1994 in Finland, in 1998 in the EU.

The EU approach was essentially based on (temporary) exclusive rights for the incumbents to provide infrastructure. That infrastructure should then be available to service providers through the Open Network Provision concept, with slower liberalisation of networks. The idea was based on one shared main network. Full liberalisation was implemented in 1998, with later deadlines for some other countries. Finland stressed facilities competition.

The Finnish approach was strictly technology neutral, with no official preference for any technology. Users may choose between available services, all of them to be provided at commercial terms and conditions. The EU approach was more biased, through the Universal Service approach, favouring fixed telephony, and some exclusive rights for incumbent operators.

Finland also chose a more light-handed regulation than the EU. The Finnish approach was based on the belief that true competition would create better solutions for the users than a regulator driven approach.

When Finland joined the EU in 1995, it was required to amend its legislation to correspond to the EU principles. No major changes were needed, as Finland already had implemented many liberal features that were only in the planning stage in the EU.

After joining the EU, the Commission intervened a few times in the Finnish telecommunications sector. Two main cases were:

- unbundling of ownership and customer contract (see Chapter 3.4), and
- enforcement of the EU principles for interconnection (see Chapters 3.7 and 4.4).

In both cases user charges increased.
Other intervention cases have been:

- operator pre-selection for local calls and calls to mobile networks; and
- verification of cost accounts of SMP operators.

Both have been duly implemented. Both concepts have been designed for one-incumbent countries.

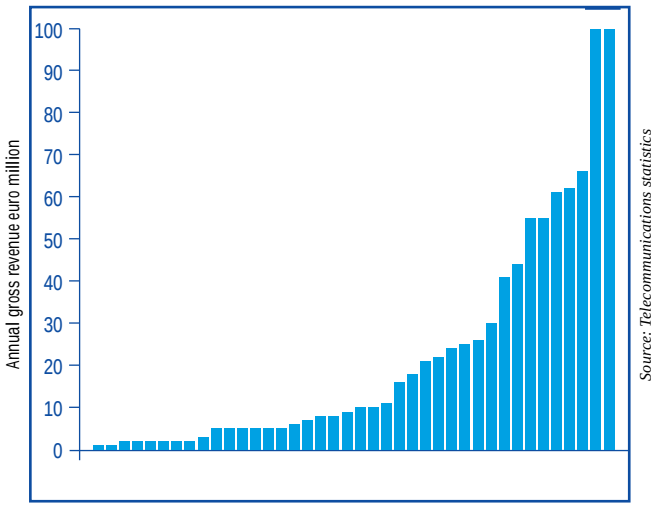
The Finnish authorities were reluctant to implement operator pre-selection for local calls and calls to mobile operators, arguing that routing calls through alternative operators would only increase cost. Entrants have lobbied strongly for such pre-selection, and the EU intervened. Operator pre-selection has been mandated (technically available) from September 2001. All local operators with Significant Market Power had made pre-selection available in their networks.

In October 2002 FICORA did not know about any operator, entrant or older, using such pre-selection for routing local calls and calls to mobile networks via alternative operators.

Verification of cost accounts is also implemented. Taking into account the number of local fixed SMP operators in Finland, the regulatory burden for the small operators as well as the regulator is significant. The regulator has a similar burden for each operator independent of size. A distribution of revenue of the local SMP operators is shown in Figure 4.

Figure 4.

Annual gross revenue (2001)
of local fixed operators with SMP



Source: Telecommunications statistics

SMP obligations have been imposed on Finnish local fixed operators to ensure that each inhabitant has the right to get a connection from at least one operator which does not have the right to deny the request. The purpose is to ensure service to the entire population. Independent of SMP obligations, the smallest operators will anyway be forced out of business (merged) if they are not reasonably competitive.

Because EU's SMP rules do not distinguish between operators of different size, all SMP rules apply equally to an euro 0.6 million, 3 staff, operator and an euro 1000+ million, 10,000+ staff, operator.

3 Finland has always had a multi-operator market

This chapter describes the main structural features in Finland, and the impact of these features. Most of the impact is due to two basic features:

- multi-operator structure, no incumbent; and
- co-operatives in the past.

3.1 Multi-operator structure

In most other countries the state owned incumbent had a unique status before liberalisation:

- no competition;
- no risk of take-over (competition-like pressure);
- strong political protection (state ownership);
- political tariff setting, with little relation to underlying cost;
- in some cases used as a government cash cow;
- mixed political and business interests; and
- little cost control.

Finland never had one single incumbent. Until 1994 Finland had regional fixed local monopolies, each of them having the sole licence for that particular area. The areas had evolved over time as a result of creation of new telcos and mergers. Sonera had by law the obligation to offer services in areas where private telcos did not have a licence.

The regional monopolies did not have the same protection as monopolies in other countries. A competition-like pressure existed in two ways:

- benchmark competition with other operators in terms of price and quality; and
- continuous take-over threat.

Sonera built the first automated national mobile networks in Finland. The first significant ones were NMT 450 (1982) and NMT 900 (1986). Competition was introduced in 1990 when two licences were granted for GSM, one for each of the two camps, to Sonera and Finnet.

Because Finland never had a true incumbent, international reports and analyses that are based on comparison of incumbents and entrants give an inaccurate picture of the Finnish situation. Nevertheless most country comparisons use that kind of analysis because it is appropriate for almost all other countries, but, unfortunately, it forces Finland into an inappropriate model.

Directives and legislation based on a one incumbent structure are not necessarily suitable for Finland. E.g. the SMP (Significant Market Power) concept is designed for countries with one large incumbent. The design of the SMP concept forces Finland to also apply the rules to the smallest telcos, which have some 1500 subscribers and 3 - 10 staff. Such approaches are commonly seen as obstacles for the telecommunications sector moving towards a normal competitive market. They also mean that Finland is not allowed to be a forerunner, possibly providing valuable experience for other countries.

3.2 Co-operatives

The co-operative structure means bundling of ownership and user status: users have to buy a share in the co-operative for each line. Users are therefore also owners. Most private telcos were co-operatives in the 1990's, but many large telcos have since been converted to normal limited liability companies.

The co-operative structure causes a number of differences compared to normal commercial entities. Because users are owners and for example appoint the Board of Directors, user charges are set to cover costs only (price ceiling). Usually no dividend is distributed. Dividends would mean that users pay higher charges and receive the higher charges back in return as dividends (after tax deduction) which is not sensible. This corporate culture of not maximising revenue has a very strong impact, which is difficult to explain. It also contributed to pride in providing services also to non-profitable areas within each former licence area (now traditional area). Some operators charged higher fees for remote areas, but usually not the full cost to permanent residences.

Most co-operatives are less keen on expanding outside their own traditional areas than normal companies. However, the telcos did expand into new services within their traditional areas. Major new local services were cable television and various forms of data transmission.

Country-wide services such as mobile telephony, long distance telephony and some data communications services were implemented using joint ventures (e.g. Radiolinja, DNA). The local telcos invested in networks, and leased network capacity to these joint ventures, usually at a good price.

A hostile take-over of a true co-operative is impossible. On the other hand, if the user-owners are not satisfied with the management, they may decide on a merger with a neighbour which has better management. It is a competitive-like pressure on management. This kind of pressure has existed from the very beginning.

The telcos co-operated using associations and joint companies for technical assistance, training, joint procurement, consulting, etc.

The former Finnish taxation system favoured investments. The device was fast depreciation of investments. The present depreciation rules are more neutral and correspond to normal usage time.

3.3 Easy to introduce effective competition

Due to the multi-operator structure and the two camps, Finland had no difficulties in introducing effective competition. The only action needed was to remove the obstacles for operators to compete, i.e. extend the licences to cover the competitors' former licence areas and former monopoly services.

Some facilities-based competition was already introduced in the mid 1980's, for data communications that was not covered by the outdated telephone legislation from 1886. Sonera claimed exclusivity for telefax and data services. The telcos offered telefax services and interconnected their backbone networks for data services, and could thus easily cover most of the corporate data communications market. This caused a bitter fight and legal actions. The outcome of the legal actions was that telefax and data communications were not covered by the outdated legislation.

The first major competitive licensing was to grant GSM licences to the two camps in 1990. The outcome was good: Finland soon became the world leader in mobile penetration. Sonera had a previous NMT service, but the Finnet camp was an entrant in mobile. Sonera has been able to retain its position as market leader in mobile services.

The multi-operator structure with two camps resulted in facilities competition. Sonera implemented its own mobile network covering the Finnet camp areas. The telcos agreed on how to cover the areas in which Sonera was the traditional local fixed operator. Both camps used the underlying backbone networks for all their different services, in particular also for data services and corporate services.

After some cautious liberalisation up to 1993, full competition in fixed telephony was introduced in 1994. The changes in market share in national and international long distance services were impressive. Within a few months the Finnet camp achieved a 50+ percent market share in domestic long distance services. See Figure 5.

The Finnet success in international traffic was smaller (20 % in 1995). All new entrants were much less successful. The most successful entrant was Telia (its predecessor Telivo).

The Government also tried to introduce competition on the local level, e.g. by mandating lease of access loops and loop sharing. The outcome is not impressive. The main results are achieved in corporate services, mainly using competitive facilities (optical fibre and microwave links) built for the purpose to major customer sites. Facilities competition appears not to be realistic for residential customers and small enterprises. Lease of loops appears to remain a marginal method.

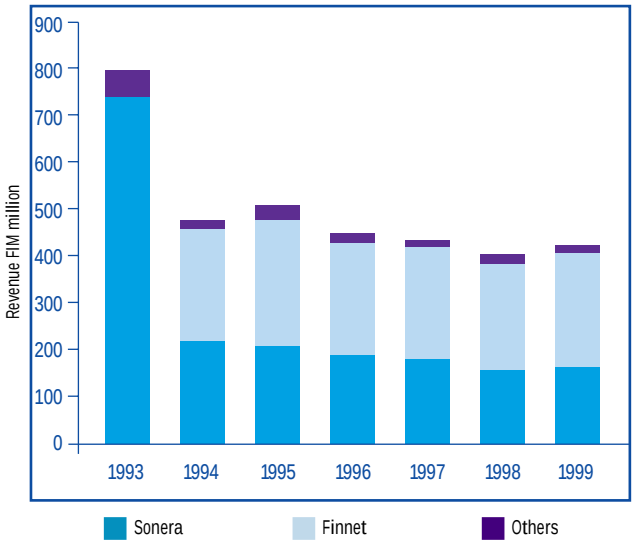
The four main underlying reasons for the different outcome in national and international market changes were

- numbering;
- tariffs;
- the relevant subscriber base; and
- marketing.

Interconnection was not an issue as it was a century-old tradition.

Figure 5.

National long-distance call revenue



Source: Telecommunications Statistics. Data for 2000 are not published

Numbering

When introducing competition in national and international telephony the user should in principle select operator or leave the selection to the operator. Many different arrangements can be done. The starting point in Finland was:

- some old switches had restricted functionality and limitations in number length, thus simultaneous use of operator selection code and international access code was not possible during 1994 - 1996 until old switches were replaced; and
- liberalisation in 1994 was co-ordinated with a major numbering reform in 1996, including introduction of "0" as long distance access code (escape code) and "00" as international access code[9].

The regulatory decision was that operator access codes were defined differently for national and international traffic.

The numbering change increased the size of the local call areas and related numbering areas from an average of 4400 sq km to 30,000 sq km. In Finland numbering and call charging are paired. The change was from 78 local call areas (each with its own area code) to 12 (again each with its own numbering code). This change reduced the national long distance market by roughly 50 %, see Figure 5. The ultimate step, postalised tariffs (the entire country as one local call area), is yet to be seen.

National long distance operator selection was done either using pre-selection (setting in the switch) or call-by-call selection[10] (including override of pre-selection). Calls with no operator selection were distributed between operators in relation to properly selected calls. The procedure did not automatically favour the previous operator.

For international calls the international access code before liberalisation was 990 (the code corresponds to the pan-European access code 00). Sonera retained the old code 990 as combined international operator selection and international access code, other operators were assigned new codes (e.g. Finnet 999 and Telia 994). This arrangement meant that users who continued to use the old code automatically used Sonera. All international calls had to use one or the other international code. Only after

[9] *"9" was commissioned as the long distance access code in Finland in 1958 when automatic long distance telephony was introduced. "990" was introduced later as international access code. At that time Sonera was the sole long distance operator.*

[10] *Operator codes for main operators were Sonera 101, Finnet 109, Telia 1041.*

introduction of the pan-European code 00 calls international calls without operator selection were possible, and operator pre-selection relevant.

From a user point if view a change of operator access code (from 990 to 99X) would have required re-programming of international calls in handsets, dialling machines, fax machines, PABX abbreviated dialling settings, etc. Many users who did not care that much about operator selection simply continued to dial 990 and thus, perhaps unintentionally, chose Sonera.

For mobile users the GSM standard allows using "+" instead of international access or operator selection code. Using "+" means that operator choice is left to the mobile operator unless a pre-selection is done in the mobile switch. For roaming convenience many users programme their handset using "+", which means that "alternative" international operators are in an awkward position.

The impact of numbering on market share appears to be significant. An exact assessment of the magnitude is not possible.

Tariffs

At the time for liberalisation of international telephony, mobile operators did not charge for access (the national part of the outgoing international call), the international charge included mobile access. This was possible because of the vertically integrated operator structure and most calls used the same camp's international operator. Because fixed access was charged (most calls used an international operator from another camp), international calls from a mobile phone were cheaper than from a fixed phone. Mobile access charges were mandated later on, normalising the situation so that international calls were cheaper from fixed telephones.[11]

Subscriber base

For national long distance traffic the underlying relevant subscriber base was fixed telephony. Mobile services already included national long distance, as mobile services in Finland (as well as most of Western Europe) were postalised: one call charge for the entire country. The Finnet companies had about three times the number of subscribers of Sonera.

For international calls the underlying relevant subscriber base included fixed and mobile telephone users. The first mobile users were business users; thus mobile users used international traffic above average. Sonera was much stronger in mobile.

Marketing

National long distance telephony was liberalised in January 1994. International telephony was liberalised later, in March 1994. The Finnet companies conducted a strong marketing campaign, including direct contacts with all major customers. Sonera chose to have a more traditional campaign, based more on advertising.

Summary and lessons

As a whole the changes in market share for international and national subsectors were exceptionally large compared to other countries. It is not possible to analyse the impact of the various reasons. Regulatory tools (read: numbering) can be intentionally used to either offer neutral or biased business possibilities. However, a precondition is that the regulator understands the power of the various tools.

Finnet as well as Telia had their own existing backbone networks, which were valuable assets in the implementation of the national long distance service.

Other entrants in long distance services were much less successful, due to the reasons described above.

An important conclusion is also that it does not appear to be realistic to create competition in the residential fixed telephony market using regulatory tools. Overlay networks are not viable, and sharing networks with the main operator in the respective area is not a properly working alternative. The problems are price related but also to a large extent non-price issues. See also Chapter 4.12.

[11] *It is important to understand the different Finnish retail call charging system and the different interconnection regime. See Chapters 3.6 and 3.7. The Finnish international call charge does not include the outgoing national fixed local call segment or outgoing mobile call segment, both are charged separately to the calling subscriber.*

3.4 Impact of co-operative company form on user charges

The co-operative company form gave a strong say to residential customers. The result was uniform charges (no bulk discount) for all customers. A uniform charge acts as a subsidy mechanism from corporate customers to residential customers.

The requirement to subscribe to a share for each line means that the initial connection fee is high, typically of the order of euro (or USD) 500 - 1000. On the other hand, shares can be sold and thus the user can get his money back if he finds another user. A removal charge has to be paid to remove the connection to another location, but the removal charge is significantly lower than the share price. During present slow or no growth, shares are not that easy to sell. In 2001 the number of fixed connections was already slowly decreasing.

In return for the high price for a share the user gets a lower annual rental than a non-owner rental (discounts vary, at present of the order of euro 50 - 100 / year). Over the years the return on invested capital has varied with market interest rates, but it has usually been higher than a long term bank account.

This system worked very well during the monopoly period with fast growth, until the 1980's. The system ensured funds for expansion of the network even during periods when access to capital such as bank loans was scarce (still significant in the 1970's). In present years funds are available, and the original reason is no longer valid.

Telcos also have alternative subscription baskets, with a more normal connection fee (of the order of euro 200) and higher rental, but no ownership power. The connection fee may or may not be transferable to another person. Call charges are the same as for user-owners.

EU competition policies did not accept the bundling of ownership and the customer position, with owner discounts. The EU intervened, which resulted in that the share and the line were, or will be, unbundled. The co-operatives will be converted into normal limited liability companies. User-owners can sell the shares if they wish while still retaining their telephone connection. Unbundling also means that the owner discount on annual rental is removed, i.e. user charges will increase. Several major telcos have already implemented this arrangement, and other telcos will follow. The co-operative company form is likely to disappear.

One outcome of the unbundling of shares and connections is that a take-over is much easier, as can be seen from the experience of the first listed companies. A number of the companies have taken various actions against the threat of take-over.

3.5 Cost based tariffs

All private companies were financially independent from the outset. None of the local telcos received any subsidy from long distance or international revenue. See also Chapters 3.6 and 3.7. Thus charges were automatically cost based. Because the private telcos were mainly co-operatives (one line for one share), the user-owners never accepted overcharging. Charges were not below cost, as such charges would quickly have resulted in bankruptcy.

The only major exception to cost based tariffs was Sonera until the early 1990's. Sonera could cross-subsidise from long distance and international revenue to its own local services. The subsidies vanished in the early 1990's when competition was introduced. Sonera had to cut the cost of local services, increase rentals and reduce long distance and international tariffs to competitive levels.

Finland has performed rather well in comparison of user costs. One comparison is shown in Table 9. The table shows that Finland is usually in the top three.

Table 9.
Finland's position in residential fixed and mobile telephony basket comparison covering EU and OECD countries

YEAR	POSITION IN COMPARISON	
	Fixed (EU)	Mobile (OECD)
1996	4	2
1997	2	3
1998	1	4
1999	2	1
2000	2	3
2001	2	2
2002	4	1

Source: Telecommunications Statistics. 1 means cheapest

3.6 Different call retail pricing substituting interconnection charges

Finnish telephone call retail pricing is different from virtually all other countries. It is rather complicated and not always easy to understand for foreigners. It is, however, necessary to understand the structure in order to have a good understanding of Finnish telecommunications. The usual trend in international comparisons is that Finnish mobile retail prices e.g. for fixed to mobile calls are said to be termination charges (interconnection charges) without even mentioning the difference, which is wrong. This is done because other countries have termination charges, not retail charges.

The description below includes some historic development.

The main principle in all other countries is end-to-end pricing. One operator decides the price for the entire call, end-to-end. This operator then buys the other call segments from relevant operators, and pays interconnection charges to these other operators.

Finnish retail call charges (with more than one operator involved) are mainly based on segment pricing. The original reason for segment pricing was the duopoly structure in the sector, with independent local operators and Sonera as the sole long distance operator, with part of the local market. Neither party accepted the other to have power to influence the retail call price of the other party. Thus a structure was created in which both parties had the power to set and charge their own retail prices.

The exceptions from this general segment pricing rule are

- local calls with more than one operator involved;
- mobile to mobile; and
- mobile to fixed.

In these cases end-to-end prices are applied and termination charges paid to terminating operators.

Charging was technically implemented using charging pulses. Monitoring such pulses was technically possible even in old analogue switching technology. Customer charging was based on total number of pulses, without distinguishing between various call types or call segments. Normally the operator in charge of the first segments invoices the entire call. See also Chapter 3.8.

The following figures present Finnish call charges when more than one operator is involved. Please note the distinction between local call charge (covering both local segments in a national long distance call) and local network charge (covering only local segment 1). The difference was an outcome of the EU intervention in interconnection (see Chapter 3.7). Segment means network segment.

The Figures 6 - 10 beside present only the most common retail prices. Other traffic cases (e.g. premium rate services) are also included in the system in a corresponding way.

No call charges are applied for incoming calls, except for call forwarding and international roaming, which are not included in the above cases.

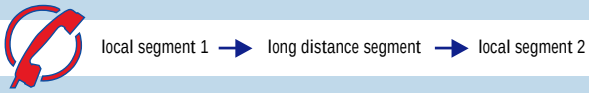
Perhaps the most important feature in the Finnish segment pricing is that when an operator changes tariffs, such changes are automatically, and fully, reflected in retail prices, because the prices are user charges.

Interconnection charges are not automatically reflected in retail prices. **Example:**

> The fixed operator sets a price for fixed to mobile calls, the same for any mobile operator. When one mobile operator lowers its termination charge (interconnection charge), the fixed operator does not lower the retail price but bags the difference itself. There is no incentive whatsoever for the mobile operator to compete with lower interconnection charges unless these lower charges are fully reflected in retail charges. Real price competition is in the retail market. This can be understood so that end-to-end pricing partially prevents real price competition, as terminating operators have no power over retail prices.

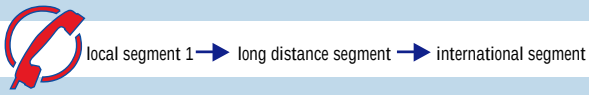
The planned mobile number portability will perhaps blur the main concept that the caller can determine the call charge based on the called number. Users would not anymore know the price of the call.

Figure 6.
National long distance call



Retail call charge until April 1999: local call charge + long distance call charge. Local call charge covered both local segments. Long distance call charge covered only long distance segment.
Retail charge from May 1999: local network charge + long distance call charge.
Local network charge covers local segment 1.
Long distance call charge covers long distance segment + local segment 2.

Figure 7.
Outgoing international call



Retail call charge: local call charge + international call charge (until April 1999) or local network charge + international call charge (from May 1999 onwards).
Local call charge or local network charge covers local segment 1.
International call charge covers long distance segment + international segment.
Outgoing calls from mobile networks: outgoing mobile network call + international call charge.

Figure 8.
Fixed to mobile call

Retail call charge: local call charge + incoming mobile call charge (until April 1999) or local network charge + incoming mobile call charge (from May 1999 onwards).
Local call charge or local network charge covers local segment 1.
Incoming mobile call charge covers mobile segment and is charged to the calling fixed user.

Figure 9.
Mobile to fixed call

Retail call charge: outgoing mobile call charge (end-to end pricing).

Figure 10.
Mobile to mobile call

Retail call charge: outgoing mobile call charge (end-to end pricing).

3.7 Long history of interconnection[12]

Finland has a century-long history of interconnection. In a multi-operator environment interconnection is a necessity. The manual telephony period is not included in this description.

The retail tariff structure (created in the mid 1950's) is described in Chapter 3.6.

Originally no termination charges were in use. Sender keeps all was used for outgoing calls, the originating local operator retained the entire local call charge. Incoming local call segments were handled free of charge, for national as well as for international calls. The traffic was reasonably balanced, originated and terminated call minutes were about equal. Arrangement for reliable monitoring of traffic (number of calls and call minutes) would have been expensive in analogue switching, part of which was as old as from the 1920's and 1930's.

When mobile services became more important, the situation changed. Mobile traffic was not well balanced, initially mobile was used significantly more for outgoing calls than for incoming calls. Also other call types emerged such as premium rate calls and toll-free calls. Termination charges had to be introduced and sender keeps all had to be abandoned. Digital switching technology was already widely employed, easing such a change.

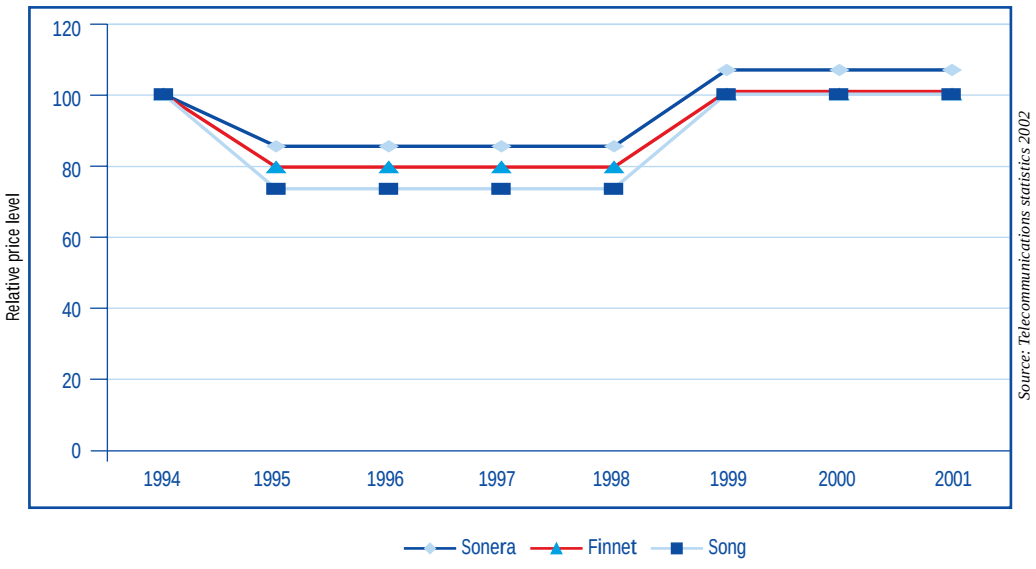
The solution was agreed between the operators without regulatory intervention, and was introduced in 1994. The local call charge was split into two parts, divided between the originating and terminating local segments. The termination charge was standardised, the same in the entire country, and did not differ between operators. The long distance operators acted as clearing-houses. The originating local operator paid termination charges to the long distance operator for the total of the originating minutes. Due to the clearing-house concept, there was no need to separate between destination local areas. The long distance operator then paid the termination charges to the destination local operator without separation by originating local areas or originating local operator.

The originating local operator charged a normal local call charge, paid the termination charge and kept the balance. The local call charge was an automatic ceiling. The local call charge was set within the more or less self-regulatory co-operative environment. See Chapter 3.5.

The system was simple and worked without regulatory intervention. It was self-regulatory, as the termination charges were paid from the local call charges. Termination charges had to be set at about half the average local call charges. Too high termination charges would have resulted in too low revenue for originating local operators. The system still maintained the principle of keeping local call retail prices (covering outgoing segment + terminating segment) fully separate from long distance segment prices.

However, the system was based upon (cost based) retail charges and did not correspond to the EU principles of operator specific cost based interconnection charges.

Figure 11.
Relative price level development of national long distance call charges. Year 1994 is 100.
EU intervention was effective in May 1999.

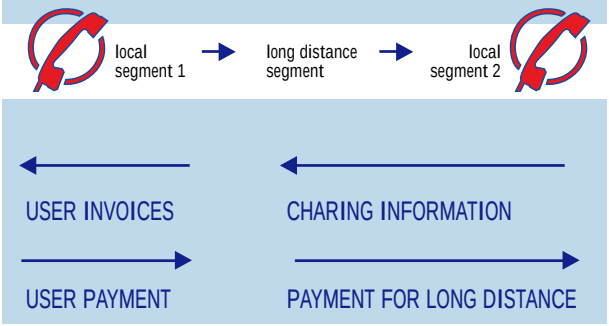


[12] *For another description of Finnish interconnection please see Fixed Mobile Interconnection: The Finnish Case, http://www.itu.int/interconnect/workshop.*

The EU intervened, and required each local operator to set its own termination charges based on its own cost. Furthermore, the termination charges should be included in the long distance charges and not in the originating local segment charges.

The changes required by the EU were carried out. The changes removed the self-regulatory feature (access + termination charges equal local call charge, a ceiling function). It blurred the boundaries between operators and their charges. Interconnection charges as well as retail tariffs were immediately increased, in some cases doubled. Regulatory intervention was needed. The situation, even after the regulatory intervention, was an increase of retail tariffs and an expectation that further intervention may be necessary, possibly with repeated court cases so common in other countries. See Figure 11.

Figure 12.
Main features of call invoicing convention



3.8 Call invoicing convention

In an end-to-end charging regime no call invoicing convention is used. In the Finnish segment charging regime an invoicing convention is necessary. Setting call segment charges independently does not mean that the operator setting the charges also invoices the user.

The invoicing convention introduced when automatic long distance calling was introduced (1957) was that the originating local operator invoices the call charges on behalf of all parties involved. The originating local operator was responsible for any bad debts. In order to compensate for invoicing cost, bad debts etc., the originating operator retained an agreed portion (a few percent) of invoiced amounts and forwarded the balance to the other operators (long distance, international, mobile, etc.). This arrangement means that customers receive one single invoice for all telephone charges. See Figure 12.

This main rule still works in most cases. However, at present long distance operators have the right to charge their segment themselves if they agree to do so with the customer. Direct invoicing is expensive, in particular for low users, thus most operators using direct invoicing are in the corporate services market. Also end-to-end charges are at present possible.

Other call types are charged in the same way.

3.9 Common technical standards

In connection with increased introduction of automatic switching national technical standards were introduced in 1954, and published as a book. The book (commonly called the Green book due to the cover colour) was widely used by all technical management in all telcos. The technical standards were based on ITU standards, applied to the Finnish environment. The technical standards were repeatedly revised in line with technical development. Present digital technology needs less, but different, technical standards to the analogue technology.

The common technical standards offered a good foundation to introduce competition between vendors for almost all network equipment, including switching. The change of switching equipment vendor was not that common, as it required complete re-training of all installation and maintenance staff. Changes did occur, usually in connection to introduction of digital switching starting from the late 1970's.

Before liberalisation of terminal equipment in the mid 1980's, telephone sets were manufactured in three factories in Finland. After liberalisation the number of vendors increased, the variety of models improved and prices generally dropped. Similar development could be seen in the PABX market.

3.10 Innovative competition

Competition in telecommunications (in the modern sense) started in the 1970's, when Sonera started to build some microwave links to major customer to bypass the local networks of Finnet companies for data networks. It accelerated in 1985, when the Finnet companies created an own network for corporate data services. No competition would have been possible without each party having full control of all network components.

Facilities competition was used from the outset, different from a number of other countries where the incumbent long had exclusive rights with regard to networks, and other operators had to lease capacity from the incumbent. Use of fixed data services (leased lines and dedicated data networks) have been shrinking since about 1990. Leased lines are still in use for corporate networks, e.g. as described below. All operators have the option to build own facilities, which increases the interest to provide leased lines even to competing operators.

A number of innovative solutions have been created for entrants competing with the previous monopolist in each area. The other main camps are entrants when expanding into the competitor's area. Thus Sonera is an entrant in Finnet's previous areas, and Finnet an entrant in Sonera's previous areas. New entrants are, of course, entrants everywhere.

The main solutions for arranging access facilities are:

- optical fibre or microwave connection to sites of large customer;
- lease 2 Mbit/s line (or xDSL line, perhaps even dark fibre) from competitors to sites of large customer;
- connect a SIM card router to the PABX or key telephone system to connect the PABX or key telephone system to one or more GSM networks.

The main access services (using the above facilities) are:

- direct connection (usually 2 Mbit/s) from PABXs to mobile switches for bypassing the local operator's fixed telephony services and integrating the customer's mobile handsets and PABX (network) extensions;
- direct connection (usually 2 Mbit/s) from a PABXs to IN (Intelligent Network nodes) for bypassing the local operator's fixed telephony services and connecting the customer's PABX to a virtual PABX network, including call centre control;
- bypass the local telephone network (using SIM card router) and utilise the lower call tariff within a GSM network rather than using call charges into or out of a GSM network[13]; and
- other similar by-pass functions.

These solutions are all common, even almost standard, and examples of innovative solutions to by-pass the local fixed access network. Competing with the fixed network does not necessarily mean that an overlay fixed network is the only solution, substituting solutions are sufficient. These solutions have emerged as a result of market economy, when regulatory ex-ante decisions do not restrict acceptable or allowed solutions. With a strong regulatory control, the above alternatives would perhaps not have materialised to the extent they are in use today.

Alternatives for residential customers continue to be a problem, in particular for Internet access. For voice use mobile is taking over. See Chapter 3.11.

3.11 Mobile takes over voice

In the early 1990's Sonera realised that mobile was the only possibility for it to compete with the Finnet fixed telephony. With several tariff baskets mobile started to become the cheapest telephone for low users.

About one third of the Finnish households have abandoned fixed telephone lines and moved to mobile only. This has happened over the last 10 - 12 years. Mobile telephones are often the cheapest alternative for so called non-stabilised households: students, one-person households, low income households, unemployed, frequent residence movers, etc[14]. The two main underlying reasons are that mobile rental (typically euro 40 - 45 / year) is much lower than fixed rental (typically euro 120 - 160 / year), and the charge

[13] *Many operators world-wide apply the lowest charges for calls within their own network. The cost for the mobile operator is highest for an own network call. The SIM card router is thus designed based on a tariff anomaly, but it does provide a competitive solution.*

[14] *Source: Vesa Kuusela: Puhelinpeittävyyden muutos Suomessa, Katsauksia 2000/3, Statistics Finland.*

for moving a fixed connection to another location is quite high (in the order of euro 100). A student may need to do at least two such moves per year, which is a considerable additional cost compared to a mobile connection. Also in other countries mobile (usually pre-paid) has been the choice of the poor, or his only possibility.

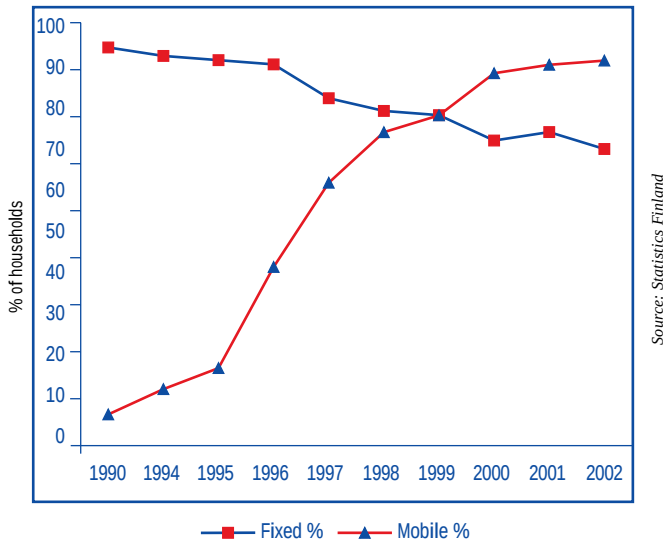
In 1990, 94 % of the households had a fixed telephone, and 7 % a mobile. At that time households with a mobile also had a fixed telephone. See Figure 13. Development over the last few years is shown in Figure 14.

The figures show that a vast majority (90+ %) of Finnish households have at least one mobile phone. The portion of households relying on only fixed telephone has dropped well below 10 %. Two thirds of the households have both. A mere 2 % of households have no phone, even if social service would finance a phone (fixed or mobile) for many of the poorest if they need one.

A similar development can be seen in corporate use, in particular in small enterprises.

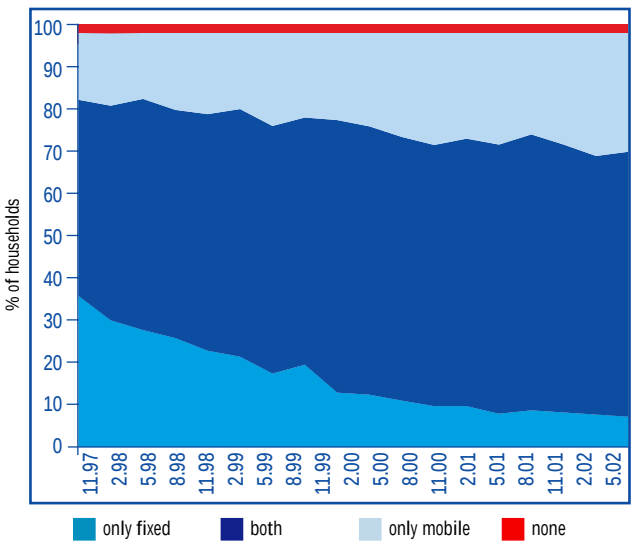
Fixed telephony usage appears to change to data rather than predominantly voice. Fixed telephony networks are expected to remain the perhaps most important broadband access media for the foreseeable future, using xDSL technology. Cable television networks cover only part of households. Potential technology competitors appear to be terrestrial digital television, wireless access, and power distribution networks.

Figure 13.
Portion of households with at least one fixed or mobile telephone



Source: Statistics Finland

Figure 14.
Portion of households with only fixed, only mobile or with both types of telephones



Source: Statistics Finland

4 Finnish policy is different

4.1 Regulatory approaches

Regulation can be implemented in many different ways. One important feature is regulatory approach in the sense of how strong regulation is used. A scale could be the following:

Table 10.
Regulatory approaches. Framework regulation means standardisation, tariff structures, interconnection principles, etc.

APPROACH	DESCRIPTION
No regulation	Reliance on competition legislation and courts, no sector-specific regulation or regulatory body, no framework regulation or other neutral system for assignment of scarce resources
Light-handed	Regulation is used as a last resort, only when needed. Frameworkregu lation exists as well as assignment of scarce resources. Regulation usually provides a minimum set solution. Market forces (players) may agree otherwise, exceeding the minimum. The regulator has the right to intervene if necessary regulation
Heavy-handed regulation	Mandatory solutions. Market forces are not allowed to do otherwise, even if the solutions would be better for customers

The above three-tier scale is rather coarse. A more detailed scale could also be used.

The only country using the No regulation approach has been New Zealand. The experience of the country is not better than in countries with regulators. Even New Zealand is planning to introduce some degree of telecommunications regulation.

Virtually all other countries have opted for some kind of sector specific regulation. Such regulation is often intended to be an interim type solution, to be decreased over time when sufficient competition develops. However, no significant decrease in regulation has been seen so far.

No regulation is the ultimate objective for most countries that have implemented liberalisation. Telecommunications should be similar to any other business and governed mainly or only by normal business practice and business legislation, including competition legislation and consumer protection legislation.

Light-handed regulation means that a regulator exists, some regulation is in place as a last resort type function. The regulator intervenes only when significant need arises. The main rule is competition, even if not always ideal. The regulator is aware that regulatory intervention may help, but in some cases may even worsen the situation. Light-handed regulation is a “doctor” type policy. Light-handed regulation may set a floor or a ceiling, but not both.

Light-handed regulation gives market forces the possibility to work. For example interconnection agreements can be made freely, also differing from generally accepted practice if the parties so agree. The regulator intervenes only upon request. The business is mainly market-driven, not regulator-driven, and reflects a belief in market economy.

Light-handed regulation is easier if a reasonable degree of competition has been established. On the other hand, light-handed regulation is not necessary weak, it may be quite strong if operators misbehave.

The Finnish approach has so far essentially been more light-handed regulation than in most other EU countries.

Heavy-handed regulation means that a powerful regulator exists and directs the market using its power. Regulation may specify the only allowed solution, and players do not have the right to deviate from that. Deviations are not allowed even if it would offer customers better terms and conditions. The sector is to a large extent regulator-driven rather than business-driven. Heavy-handed regulation is used when policy makers do not believe in market economy. Heavy-handed regulation often sets a floor and a ceiling.

The EU directives include a number of features that could be described as heavy-handed regulation.

Heavy-handed regulation can be used in a market economy for certain details to ensure the desired result. Heavy-handed regulation may also be needed when a former monopoly adopts a business culture significantly based on unfair competition, disrespect for consumer rights, and similar.

A good example of a regulatory change from heavy-handed to light-handed is terminal equipment type approval. The stepwise change has been the following (not all countries had all steps):

- operator-specific type approval, each operator had its own (often very detailed) requirements and its own laboratories, result: operator-specific types and generally small markets;
- country-specific type approval, each country had its own requirements and its own laboratories, result:

country-specific types and country-wide markets;
- common European type approval, European requirements (focussed on safety only), result: Europe-wide market; and
- common European requirements, manufacturers' declaration, result: Europe-wide market, but with less bureaucracy.

The development has resulted in significantly improved equipment supply and variety of equipment, with a simultaneous reduction of prices. Unbundling of connection and first telephone set, where applied, has contributed to a positive development. No significant degradation of quality or risk to networks has occurred.

Finland has used semi-heavy-handed regulation in some cases. One example is mandatory unbundling of mobile handsets and mobile services, different to many other countries. Another is mandating lease of "last mile" resources in the fixed network. Both have been considered necessary to avoid abuse. In particular, mandated lease of unused capacity (xDSL band15) on existing fixed subscriber lines was considered necessary to speed up the provision of xDSL. Fixed operators appeared to be unwilling to introduce xDSL alternatives, to promote dial-up Internet access. The cases may also be understood as framework regulation rather than heavy-handed regulation.

One of the disadvantages of in particular ex-post type regulatory intervention is that regulatory decisions can be challenged in courts. While such a possibility is necessary in an orderly society, the outcome can be a series of almost endless court cases and a lawyer-oriented business. Business management has to use significant time for court cases, rather than for developing their business. Such signs are also visible in Finland. The court cases are usually related to inter-operator relations, not to customer relations.

4.2 Impact of regulatory tools

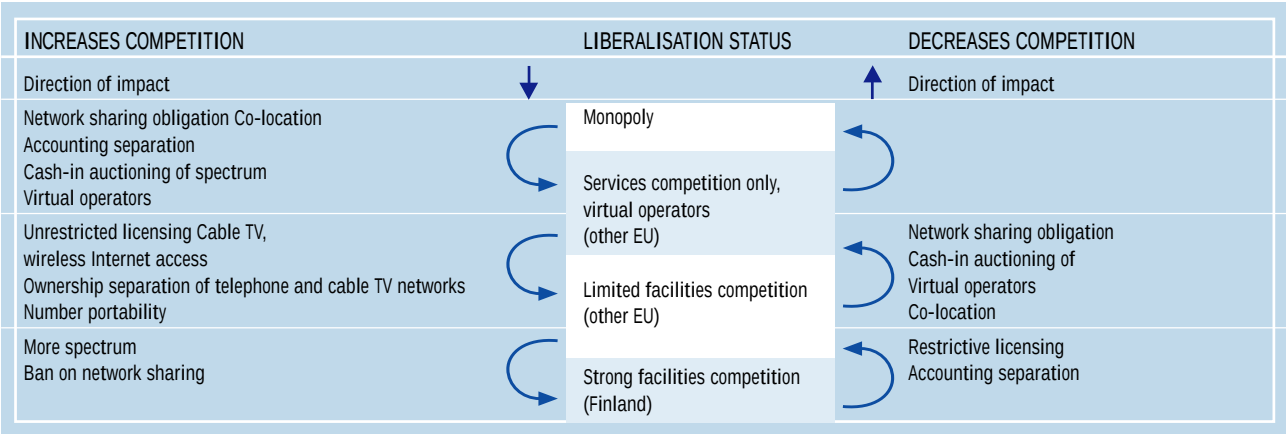
Various policy and regulatory tools can be used for sector control. The impact of such tools depends on the overall situation in the relevant country. One possible view is presented in Figure 15.

Figure 15 illustrates the impact depending on the status of liberalisation. E.g. network sharing and co-location as well as promotion of virtual operators may be good tools when moving from a monopoly to services competition, i.e. in the first phases of liberalisation before facilities competition has developed. The same tools may have a negative impact on competition if applied to a situation with existing facilities competition, in particular if facilities competition is strong.

Figure 15 is intended to be a basis for discussion, as well as the impact of various tools. The most important is to realise that the impact can be different if the liberalisation status is different.

With three country-wide operator camps offering full service, with about equal bargaining power, Finland may be understood to have strong facilities competition. Most other EU countries are either on a services competition or limited facilities competition level.

Figure 15.
Impact of regulatory tools depending on status of liberalisation



[15] *xDSL is a generic term for a family of Digital Subscriber Line technologies, used for high speed data transmission on copper pairs, in particular subscriber lines. The xDSL spectrum allows a normal analogue telephony connection and a high speed data connection (usually Internet access) to be provided on one copper pair.*

4.3 Strong reliance on market forces

The Finnish telecommunications policy relies strongly on market forces rather than on regulatory intervention. Even if competition is not ideal, with numerous players in each relevant market, the policy has been to rely on competition and use regulatory intervention mainly as a last resort. The power to use intervention is in many cases sufficient, thus making its use unnecessary.

Whenever possible, Finnish policy makers and the regulator have intentionally avoided defining how competition should take place and which alternatives are "politically acceptable". A technology neutral policy has been applied.

One example is local fixed telephony for residential customers. A regulatory definition would be that the only acknowledged alternative is fixed telephone access from another fixed operator, including fixed wireless access. Such a decision would exclude e.g. mobile telephony as an alternative, and most by-pass type solutions. While many countries have made such decisions (usually as part of Universal Service policies), Finland has avoided doing so. Users have a choice between cost-based and otherwise equally treated solutions. The policy maker does not make the choice.

Country-wide PABX networks have become common, with national numbering and local call charge to these networks from anywhere in the country. This service is usually implemented using IN (Intelligent Network) services. It is also an example of facilities based competition.

The above examples are intended to show that regulatory decisions defining "politically acceptable" alternatives may well exclude useful and competitive alternatives. Market forces (manufacturers, operators, users) often develop new solutions outside the scope of such regulatory decisions. Regulation should not prevent such development by mandating regulator-selected solutions or otherwise neglecting different competing solutions.

4.4 Selective intervention

Selective regulatory intervention has been used at times to ensure certain features. In the past such intervention was often done so that the Ministry discussed informally with the operators and stated that if the required actions were not carried out it could even be possible that new legislation would be enacted. Such discussions were often sufficient. At the time the Ministry could implement such legislation as ministerial decisions. At present (after the new Constitution) most such legislation has to be done on a primary legislation level.

Many new initiatives have been implemented so that the idea is discussed initially, and then a consultant is contracted to elaborate the topic and create one or several alternatives. The Ministry has also enhanced competition e.g. by regularly publishing price comparisons, user cost development and other relevant studies.

Some examples:

Interconnection of packet switching networks

Interconnection of packet switching networks was not implemented voluntarily. The Ministry discussed the matter with operators and stated that interconnection can be mandated if necessary. Interconnection was subsequently implemented without official obligations.

Interconnection of IP networks

Interconnection of IP networks was not implemented voluntarily. The Ministry discussed the matter with IP network operators. No suitable interconnection standard was developed. The solution was to licence an interconnection operator and develop an interim standard, which subsequently has developed into an international de facto standard.

Leasing xDSL spectrum on fixed subscriber lines

Telecom operators appeared to be slow in introducing xDSL technology. They apparently preferred dial-up, a more profitable service, and essential as voice telephony is moving to mobile networks. Broadband is a key component in the emerging Information Society. At the same time EU and several other European countries discussed alternatives to speed up xDSL provision.

Lease of copper lines was mandated earlier. The fixed operator had the possibility to supply xDSL on existing subscriber lines, even if no loops were available to other operators. The Finnish solution was to mandate lease of xDSL spectrum on existing subscriber lines to other operators as well. Mandating spectrum also means minimising the resource to be leased, even if such a lease has some difficulties. The principle of leasing spectrum has subsequently been included in EU directives. Supply of xDSL is now satisfactory.

The Ministry has also used its policy-making position to initiate various projects for development of the Information Society. Some of the projects have been related to interconnection of various networks, development of common platforms and user interfaces etc. This type of development work continues.

4.5 Limited price regulation

Price regulation has three different components:
- definition of tariff structure;
- definition of tariff setting principles; and
- regulation of individual tariffs.

The first two components are examples of light-handed regulation, while the third is closer to heavy-handed regulation, even if e.g. price cap regulation is applied.

Tariff structure has several dimensions. Finnish local call areas are defined as a regulatory decision. In 1996 the number of local call areas was decreased from some 75 to 12. Local call charges are applied to calls within the local call areas, and long distance charges to calls between the areas (connection between numbering and tariff structure). The decision can be understood as somewhat heavy-handed regulation with limited scope, but it does not prevent operators from going further, towards postalised tariffs.

Tariffs have to be separated into connection charges, rental charges and usage charges. This regulatory rule is not perhaps worth much, as the relation between the charges is the most important.

The main principles for **tariff setting**, including interconnection charges, are defined in Finland. They follow EU principles of cost orientation. Bulk discounts are allowed. Introduction of bulk discounts is a significant change from the previous system with one tariff applied to all users, low users and heavy users alike.

Finland does not regulate **individual tariffs**, with some notable exceptions. Usually competition in the multi-operator structure works satisfactorily. The regulator has the power to intervene.

Price regulation was used in connection with the EU intervention regarding interconnection prices. The previous self-regulatory mechanism vanished and interconnection prices (access and termination charges) were increased, in some cases doubled. Intervention was needed.

In line with the Finnish policy of minimising regulatory intervention, the decision was to set a temporary ceiling for local interconnection access and termination charges to 60 % of local call charges. After the expiry of the period no formal limit for interconnection charges has been in force. The operators have applied the expired temporary rule. The regulator showed its powers, and that was sufficient to limit abuse.

In the last years intervention has been used regarding several interconnection charges, resulting in a decrease of charges. Intervention has also been used on individual tariffs for network capacity leased to service providers.

This type of regulation of inter-operator charges appears to be the most disputed regulatory area, resulting in repeated court cases with appeals to upper court levels as high as it is possible to go. The typical time from the first complaint to the final court decision is several years. These court cases leave aside the equally important non-price aspects.

4.6 Technology neutral

Finnish telecom policy makers have explicitly stressed that they aim at technology neutral policy and regulation. The market should decide on technology, not the policy maker or regulator.

In the Finnish context, technology neutral regulation means many different approaches:

- neutral regulatory fees (see Chapter 4.7);
- radio spectrum charges cover only administrative cost of spectrum management (see Chapter 4.7);
- lack of strong Universal Service policy (see Chapter 4.8); and
- no limitation on using any technology (except scarce resources).

The technology neutral approach is emphasised in the new legislation enacted in 2002. The legislation is common to telecommunications and broadcasting networks, and does not distinguish between different networks. Services may be provided using any network.

A key difference between countries is the policy when it is apparent that mobile may compete strongly with fixed telecommunications. Some alternatives are presented in Figure 16.

The figure is intended to be a basis for discussion. The main purpose is to show that a number of different approaches can be adopted to deal with emerging competition. The countries mentioned are examples only, other countries could be added, as well as other approaches.

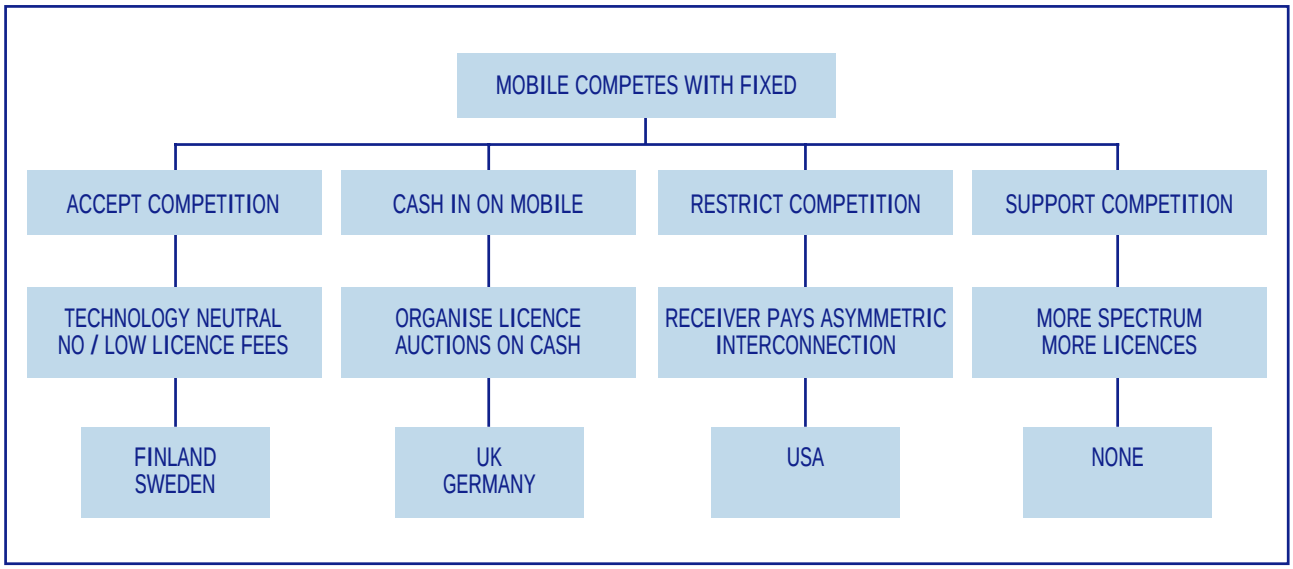
An approach supporting competition is not easily available on a country basis, as increased spectrum allocation requires international agreement.

4.7 Neutral regulatory fees

Finland does not levy licence fees on telecommunications operators; operating licences are free of charge. Mobile operators get their operating licence free of charge, other operators (including fixed) only notify the Ministry. All operators do pay administrative charges for spectrum needed, and for numbering capacity. These two charge types are the main source of revenue for FICORA. The numbering charges will be partially replaced by supervision fees, to extend charges to operators not using numbering.

The reason for not imposing any licence fee is that telecommunications is considered normal business, not subject to any special taxation.

Figure 16.
Alternative approaches to fixed-mobile competition



Finland was the first country to issue licences for third generation (3G) mobile services. Also these operator licences were issued free of charge, based on "beauty contest" selection criteria defined in law. The long term purpose is that mobile data services should successfully compete with fixed Internet access. Fixed Internet is a low cost service due to low underlying cost, and a competitor should not need to pay excess charges or tax type fees if it is to be competitive. Mobile services are one component of the Information Society, and should be promoted, not punished. Government should avoid increasing the risk level for any business.

The main reasons for the Finnish preference for administrative assignment of spectrum and beauty contest as the selection method for operators are shown in Table 11[16].

Table 11.
Reasons for Finnish selection
of third generation mobile services

REASON	RATIONALE
Technology neutral policy	Mobile telecommunications should compete on a level playing field with fixed services, future digital broadcasting (convergence!), and other services, no tax type fees should be levied only on some competing services
Large coverage	The desired outcome is large geographical and population coverage to ensure that service is available to those who wish service
Selection criteria should correspond to desired outcome	The desired outcome is provision of services. The corresponding selection criteria should be supply of service, large coverage, and resources for implementing the desired outcome. Highest licence fee does not correspond to the desired outcome and ensure service provision
Spectrum assignment can be reversed	If spectrum is not sold, administrative assignment of spectrum allows for administrative reorganisation of spectrum, which has been done. Sold spectrum cannot easily be rearranged. A working secondary market for spectrum has not emerged anywhere
Government should not increase risk level for operators	High licence or spectrum fees mean an increased risk level for operators due to high initial cost for an uncertain business. Generally the task of any government is to support smooth can be reverseddevelopment rather than sudden changes

Finland does not have a strong tradition of operators going to court against almost each and every regulatory decision. In such a culture a beauty contest type selection with assessment of bidders would not work, as assessment includes subjective elements. Auctions significantly lower the risk for complaints[17].

During the period when several European countries auctioned their 3G licences at astonishing prices, the Finnish Government was strongly criticised for not cashing in on the revenue that could be gained by selling the licences. The outcome of the auctions at astonishingly high prices can be seen today, with the worsening of the world-wide telecommunications crisis and the delay in the introduction of 3G networks and services, with the result that Europe now risks losing much of its leading position in mobile communications.

4.8 Licensing policy

During the entire period since the first legislation was enacted in 1886, anybody has had the possibility to apply for a licence, at anytime. This is how the multi-operator system was created. Groups of persons decided to create a telco in the relevant city or village or other geographical area. They applied for a licence, and usually got one. Even competing licences could be applied for.

Exclusive or special rights have been included in primary legislation in two cases, when telegraph exclusivity was granted to Sonera in 1919, and granting the State exclusivity for radio broadcasting in 1926. The exclusivity for radio (and partially television) broadcasting created a perception that it is a public service. That perception is difficult to combine with running telecommunications as a business, when convergence merges the two.

Exclusivity was arranged by not granting competing licences. Each local telco had a de facto exclusivity in its own area. Sonera had a similar exclusivity in long distance, international and (analogue) cellular mobile communications.

[16] *The full text of the reasoned decision granting the 3G licences dated 16 March 1999 can be found on the Ministry's web pages: http://www.mintc.fi*

[17] *The public discussion on methods for selection of licensees has mentioned only auction (on highest licence fee) and beauty contest (with assessment of bidders) as alternatives. Also other methods have been used: closed bids (Dutch auctions) on highest licence fee, closed bids on largest coverage, multi-criteria bidding with several clearly specified criteria. Selection based on subjective assessment is more prone to court cases than selection based on clearly specified, measurable criteria.*

In all cases the exclusivity granted to state entities created a perception that certain services are - and should be - reserved for Government. When such perceptions last for generations, such perceptions are then significant hindrances for change. In local telephony no such perception existed, due to the multi-operator system.

During the period until 1987 a few competing local licences were granted. E.g. in 1931 a second local telco licence was granted for the small city Loviisa. The new entrant quickly forced the previous operator to withdraw.

Present facilities competition started in 1985. The telcos built a country-wide digital network for data communications, mainly using existing backbone facilities. Due to the outdated legislation (from 1886!), data communications was not covered by telecommunications legislation, only by normal business legislation.

The 1987 law covered all telecommunications. Sales and connection of type approved terminal equipment was liberalised. All telecommunications needed a licence unless specifically exempted. Initially competing licences were granted cautiously, with marginal competition impact. Some of the licences even included ceilings on revenue. At the time all telecommunications licences in Europe were granted using political discretion, and Finland was no exception.

Initially all licences were individual licences, with individual terms and conditions in each licence. The terms and conditions included in the licences were, however, restricted to those that were different between similar licences such as licence area, duration, etc[18]. Terms and conditions common to similar licences were included in common regulations. That concept simplified licensing and ensured a level playing field. The tradition of common technical standards was a natural foundation for such common regulations.

The main licensing steps liberalising the Finnish telecommunications market are shown in Table 12.

Sonera prepared for the inevitable onset of competition by a complete reorganisation and reduction, by almost half, of its staff in 1991 - 1993. There were no dismissals. The surplus staff were transferred to an engineering subsidiary, retired or resigned voluntarily.

Table 12.
Main licensing steps in liberalising the Finnish telecommunications market

YEAR	ACTION
1985	• Datatie (Finnet data network) started operation without needing a licence
1988	• Datatie and Yritysverkot (a Sonera corporate services subsidiary) were both granted country-wide licences
1990	• Sonera was granted a licence (special rights in the legislation were repealed) • two competing GSM 900 licences were awarded • competing licences for corporate services were awarded
1991	• regional trunking licences were awarded
1992	• switched data communications was fully liberalised (exempted from licensing)
1993	• limited competition in long distance and international telecommunications was introduced
1994	• national and international long distance was fully liberalised • the first service providers were licensed
1995	• competing GSM 1800 licences were awarded
1996	• operators were obliged to lease network capacity to other operators
1997	• licensing was abolished and replaced with notification, except for mobile licences
1998	• transborder telecommunications into Finland was exempted from notification • minor mobile communications were exempted from operator licensing (e.g. trunking, paging), but frequency permits were still needed
1999	• four nation-wide third generation mobile licences were granted using beauty contest • service providers were given rights to more flexible tariff setting and invoicing
2000	• a third GSM 900 licence was granted • xDSL spectrum leasing obligation was imposed
2001 - 02	• first convergence based licences granted, digital broadcasting networks may be used for telecommunications (three television and two radio broadcasting networks) • cable television networks will be opened as access media to any Internet service providers

Source: Telecommunications statistics 1989 - 2002

The largest step was taken in 1994 when long distance and international telecommunications was fully liberalised, without political discretion in awarding licences. The policy discussion before the decision focussed on how large service disturbances would occur, in particular whether the viability of Sonera would be severely disturbed.

[18] *Finnish telecommunications licences were typically a few pages. One page licences were not uncommon. If needed, annexes were used (e.g. a map clarifying the licence area).*

After the liberalisation the local telcos' joint venture for long distance services captured more than 50 % of the national long-distance market in a short time, and a significant portion of the international market. The financial impact on Sonera was not serious. The importance of these changes was reduced due to three simultaneous changes:

- price elasticity increased demand for competitive services;
- overall fast growth, in particular in mobile (Sonera's emerging main business); and
- Sonera had prepared for competition through a radical staff reduction in 1991.

Thus there was no significant hindrance for full liberalisation of the entire market. That was done in a 1996 law amendment abolishing political discretion in awarding licences. This was further eased in the 1997 Telecommunications Market law. Except for public mobile networks, telecommunications operators only need to formally notify the Ministry. Some minor mobile services are exempted even from notification. After liberalisation in 1987 the number of operators has grown quickly, see Table 13.

Despite the liberalised market, the structure has not changed significantly in terms of operators. Previous major players are still major players, even if the relations have changed. The main change has been the growth in mobile and data communications sectors and the stagnation in fixed telephony.

As an outcome of the licensing policy, facilities competition and parallel networks have developed for almost all other sub-sectors except fixed telephony for residential users and small and medium size enterprises. The Ministry has stated that it does not appear to be possible to increase local fixed telephony competition using legislative and regulatory means.

Table 13.
Number of telecommunications operators in Finland

YEAR	NUMBER OF OPERATORS
1990	57
1991	58
1992	59
1993	55
1994	60
1995	66
1999	120
2002	154

Source: Telecommunications Statistics

4.9 Some societal issues

Finland has no specific Universal Service obligations imposed on certain operators. Generally, Universal Service aims at promoting the Information Society. Universal Service policies usually deal with three specific issues:

- social component (everybody should have access, at reasonable prices);
- regional balance (extend access to the entire country); and
- cultural and educational promotion.

The Finnish approach to the **social** component of telecommunications is that it is similar to any other social needs, such as food, clothes, accommodation, health, etc. All of these are more expensive than telecommunications. Persons with normal income pay normal, commercial prices. Low income persons may need financial support. Such support is paid from tax funds. Relevant commodities and services are in most cases procured from the private sector at market prices. There is no good reason why the public sector should transfer financing of social obligations to private enterprises, or even to state owned enterprises when they work in a competitive environment.

The normal social administration is more competent to assess the subsidy needs than any normal commercial enterprise. The social administration can buy the needed services for each case, using competitive procurement, in the same way as any other social services.

A commercial entity has to apply "social" charges even to the majority of users who could pay normal commercial charges. There is no real possibility for a commercial company to hand-pick the needy, the daily work for a social administration. Such social charges are a burden for the company, and it has to cross-subsidise the social charges from other services. Cross-subsidies are generally frowned upon when assessing economic efficiency. A summary of differences between tax based social services and cross-subsidised Universal Service is shown in Table 14.

Table 14.
Summary of differences between tax financed and operator financed social services

TAX BASED SOCIAL SERVICE	CROSS-SUBSIDISED UNIVERSAL SERVICE
Part of overall social service	Special arrangements for one sector
Subsidised services case-by-case basis, abuse can be controlled	Subsidised services to all users independent of need, abuse cannot be controlled
Any appropriate service can be selected, tailoring normal routine	Only pre-selected services can be subsidised no tailoring
100 % subsidies possible, with ceiling	Only minor subsidies possible, does not help the really needy
Neutral to telecom operators	Burden for some telecom operators
Does not distort tariff structure (cost based)	Distorts tariff structure (cross-subsidies)
Open taxation	Hidden taxation

A prerequisite for tax based social service is a reasonable living standard and a working tax financed social service system. In a poor country it may be questionable to arrange for subsidised telecommunications if food, health and housing are not.

The **regional** service provision is historically good, even if Finland is the most sparsely populated country in the EU. Virtually every permanent home is within reach of the fixed telephony network as well as two or three mobile networks. The main reasons were:

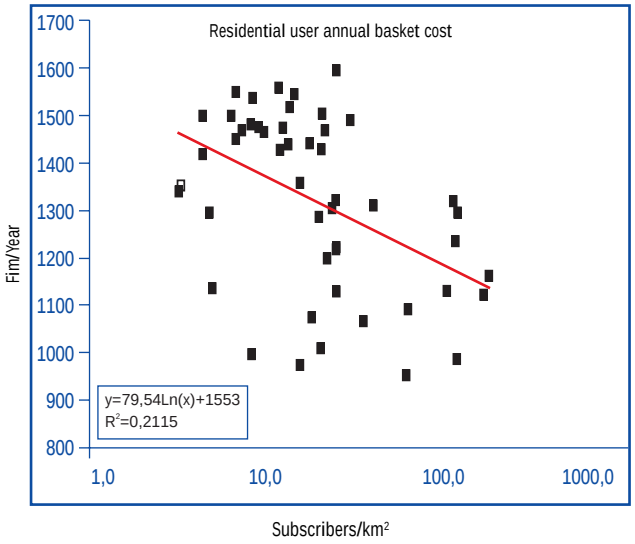
- the multi-operator system and benchmark competition;
- the co-operative system; and
- operators, in particular Sonera during its long distance monopoly period, extended fixed service even to the most remote parts of the country[19] where commercial provision is not that economic.

Some private telcos have areas corresponding to Sonera's average areas, and do serve these areas.

Studies in Finland as well as elsewhere, within one operator, show that the cost of providing fixed telephony service is rather strongly depending on subscriber density. Rural areas are more expensive. That is not a new finding.

The picture seems to be different if comparing fully independent operators. Such a comparison has a new element: it includes differences in management skills, planning, construction and maintenance, etc. Those parameters do not differ within one operator, except over time. It is interesting to note that in such a comparison average subscriber density does not necessarily have a significant impact on cost. See Figure 17.

Figure 17.
Relation between user cost and user areal density



Source: Finnet, year 1993 (before liberalisation) [20]

In the figure each dot represents the value of a standardised local telephony basket for a telco. Because the telcos were - and are - financially fully independent, they received no subsidies, and the bulk of their business was local telephony, the charges were comparable and fully cost based.

The average density is not a good measure for the area, as the population usually is in clusters in villages and towns, along roads.

One of the peculiarities of Finland is the custom of having a vacation home, mainly in the archipelago or in the lake district. About one vacation home per 10 persons exists. Such vacation homes are not clustered to the same extent as permanent residences. Most vacation homes are within the coverage area of a mobile network, even in the most remote areas[21]. Fixed telephony access is often also available, even if there is a heavy surcharge if the dwelling is situated far from existing networks.

[19] *Sonera provides fixed telecommunications services to about 3/4 of the land area and about 1/4 of the population, while Finnet and Elisa serve 1/4 of the area and 3/4 of the population. An extreme example of remote areas: the six most sparsely populated municipalities in Finland have each an average population density of less than 1 person per sq km. Their total area is 54,000 sq km (almost twice the area of Belgium, or almost a quarter of the UK) and their total population is 29,000 persons. These municipalities are also fully served. In addition Finland has almost 200,000 islands, which are also served if populated. Despite these geographic and demographic features, rural services are not a major issue in Finland.*

[20] *Note that the value of R^2 for the trend line is about 0.2, which means that subscriber density has a low correlation to the value of the user basket cost. Many observers agree that the most important reason for the variations is management capability.*

[21] *Much of the comprehensive - but as such non-profitable - mobile rural area coverage is due to these vacation homes. Many mobile users intentionally used vacation home coverage as the most important selection criteria for operator selection. This was true for business users as well as private users, as business users often had to be available also during evenings, weekends and vacations.*

If a Universal Service obligation had been imposed on fixed services, vacation homes should reasonably have been excluded. Vacation home users were satisfied with mobile access. Mobile access also included data communications access (mobile data, at least for e-mail).

Access to broadband Internet is widely available, but not yet ubiquitous. In 2000 95 % of the municipalities were within reach of fibre optic backbone networks. These municipalities have 99 % of the population. 95 % of the population reside within a few km distance from a fibre optic cable. xDSL technology was available in 98 % of the municipalities in 2002. However, in only 74 % of the municipalities xDSL was available to more than 50 % of the households. Cable television broadband access was available in only 29 % of the municipalities. xDSL was introduced as recently as 1999. Other technologies (notably fixed wireless) are also in use, including several trials of wireless broadband Internet access.

By far the largest investment needed is the access network. Local and national backbone network investments are a small fraction of the investment in the access network. The present Government policy is that such access is needed, but the Government will not assign subsidises and will not favour any particular technology. Operators will take care of the needed investments on a commercial basis. The Government's objective is that all citizens should have the possibility to have broadband access in 2005.

For all these reasons, Finland does not see a significant need for a distinct Universal Service Policy based on cross-subsidies (and corresponding market distortion) rather than normal tax financing of services to the needy.

Cultural and educational promotion is also a Government task. Virtually all schools have Internet, provided at normal commercial terms and conditions from normal educational funds. Most libraries also have Internet access free of charge to citizens, also procured at commercial terms and conditions and paid from tax funds. Other countries have commonly imposed obligations on Internet access providers to supply schools and libraries etc. at either heavily subsidised charges or completely free of charge.

In addition to the above, Government actively promotes **e-government** by implementing various services on the Internet. Government information is available on the Internet, various forms can be filled in and submitted on-line or downloaded. The sites of the Ministry of Transport and Communications and FICORA are no exceptions.

Tax information, tax payment and employer tax reporting is easily done using the Internet[22]. Government use is developed from data communications arrangements in use since the early 1980's, initially for large enterprises. A majority of enterprises use Internet or other data communications for tax routines.

Bank transactions are already almost solely based on Internet or self-service payment counters. Many of the young have never seen a cheque but they use Internet and counters almost daily for payments. Mobile banking (using handsets) is still developing.

4.10 Separation of operation and regulation

Separation of operation and regulation is one of the cornerstones in sector restructuring. It is included in EU legislation and e.g. in the WTO Reference Paper on basic telecommunications.

Finland has policymaking and ownership control of Sonera in the Ministry of Transport and Communications.

Within the Ministry the two functions were separated in 1990, on an organisational level as well as on a personnel level. The only persons with responsibility for both are the Minister and the Secretary General. For this reason Finland does not get full scores for separation.

However, little criticism has been heard due to the dual role of the Minister and the Secretary. The Finnish multi-sector structure and the long liberal telecommunications tradition does not allow for significant double standards.

The regulator FICORA is fully separated from all operators.

[22] *In 2001 the average number of Internet users on the tax administration site per month were 100,000, including 7000 individual contacts (most request for information), handled by some 70 full time persons.*

4.11 Division between policy and regulation

Policy making has been fully with the Ministry of Transport and Communications. The Ministry's importance has increased dramatically with the liberalisation of the sector.

Until 1987 regulation was vested with Sonera. Sonera thus acted as competitor as well as regulator, a typical conflict of interest. Perhaps the most important cases occurred when Sonera refused to grant frequencies for some services competing with its own services.

In 1987 regulation was transferred to the Ministry. In 1988 a separate regulator was created, the present Finnish Communications Regulatory Authority (FICORA, formerly named Telecommunications Administration Centre, TAC).

Regulatory tasks have been divided between the Ministry and FICORA. When FICORA was created in 1988, it was a purely technical telecommunications regulator, responsible for technical inspection, enforcement of technical regulations and spectrum management. Other regulatory matters were vested with the Ministry, including licensing, approval of technical standards, financial regulation, and overall monitoring of operators. The Ministry has the right to decide on individual regulatory issues even if the decision power lies with FICORA. On the other hand, the Ministry has the right to delegate power to FICORA.

The Ministry has gradually transferred most regulatory activities to FICORA. The major regulatory functions still vested with the Ministry are licensing and issuing part of regulations. Presently licensing is a minor function, as only mobile operators need a licence, other operators only need to give notification. Many minor activities are exempted even from notification. At present Internet service provision is not subject to licensing or notification.

FICORA has developed into a multi-sector regulator. In addition to telecommunications, it is responsible for postal services, and e-commerce security issues.

FICORA is also responsible for collection of television receiver fees[23].

One of the key features in the 2002 Communications Market Act is that regulations with an impact on rights and obligations of persons either have to be issued by a body that is controlled by the Legislature (Parliament), or the right to issue regulations has to be specifically included in primary legislation. This is a reversal of previous delegation development, due to the new Finnish constitution.

4.12 Service providers

World-wide policies differ with respect to separation of networks and services. Some countries pursue a policy with separation.

Finland included the service provider concept in legislation in 1994. Network operators are obliged to lease free capacity to service providers. All service providers shall be treated equally. In addition, network operators with Significant Market Power (SMP) have to apply reasonable and cost-oriented charges. Operators have to separate network operations, service operations and other business in accounting.

The service provider concept is otherwise not mandated or specifically supported. The policy is to rely on market forces. Operators may freely opt for being network operators, service providers or both combined. The outcome is that separate service providers (without networks) have emerged, but their market share is small. Service providers are usually also network operators.

Some major attempts to separate networks and services have occurred in Finland. See Table 15.

[23] *In Finland television receiver fees are payable. The fees are tax-like, one of the few taxes that are earmarked for a particular purpose. The purpose of the fees is to finance the state-owned public broadcasting company Yleisradio.*

In addition to the above major cases a number of independent entrant service providers operate in the Finnish market, e.g. Jippii. None of them has so far become a major player.

The total revenue of all independent service providers (including Telia as service provider) is not published. Based on data in Telecommunications Statistics 2002 the authors estimate is that it may be of the order of 3 % of total revenue, or perhaps even less.

The main conclusion of the above table and knowledge of case details is that separation of networks and services in different companies with different owners does not appear to be a stable long-term arrangement.

Despite regulatory intervention and numerous court cases, use of other operators' network capacity has been rather minimal. In interviews operators point out that no major business can be based on a competitor's network.

As a whole the Finnish experience of separation is that separation of networks and services appears to be an unrealistic approach. Separation is not properly compatible with a market economy even with continuous regulatory intervention. This is the case in particular for fixed telephony.

The problems are not only price, also non-price issues such as delivery time, repair time, timely information on availability and technical details, abuse of customer information, and numerous other issues keep the service provider's service level below the level of the network operator's own service provision. Most or all such abuse methods are banned in law, but it is not possible to fully enforce such legislation.

Facilities based competition has been much more successful, even with a limited number of players.

Most of the court cases related to telecommunications regulations are with regard to the interface between network operators and service providers. A normal market economy arrangement rarely results in such quantities of court cases. Business should be business, not legal argumentation. Policy and regulation should avoid arrangements resulting in frequent court cases.

Court cases have focussed on pricing, not on non-price issues. Non-price issues are very hard to demonstrate in a court, but are nevertheless efficient.

Operators appear to invest in networks only if they can see a competitive advantage. If investments are available to operators at the same terms and conditions little competitive advantage can be seen.

Table 15.
Main cases of separation of networks and services

CASE	DESCRIPTION
Radiolinja	When starting business in 1991, Radiolinja was essentially a service provider. Finnet companies acted as network operators each investing in the required network in its area. The joint ownership base split, and the arrangement turned out to be unstable. At present Radiolinja (or the owner Elisa) has bought most of the leased network to ensure sufficient control, and thus turned into a network operator cum service provider
Telia	Telia made several efforts to act as partial service provider in Sonera's and Radiolinja's GSM networks, an overflow type arrangement for areas outside main cities, in one case based on international roaming arrangements. Commercial negotiations failed, and FICORA and courts stated that the arrangements have to be agreed on a commercial basis. Finally Telia agreed to be service provider in Radiolinja's network. Later Telia changed network operator, to New Finnet, with disturbances in customer relations due to very quick implementation (a few days). The former network operator Radiolinja was also accused of abusing customer data for its own marketing in connection to the operator change. In addition to this country-wide service provider based service Telia also runs another service based on an own network covering major cities
New Finnet in Turku	A number of New Finnet companies in Turku and surrounding areas agreed that one of the companies would handle certain common network elements and act as a separate network operator. After Sonera took over control of that network operator, the arrangement broke down, again showing that full control of the network is essential
New Finnet mobile	After the split of the Finnet group and sale of Radiolinja to Elisa the New Finnet companies decided to create a third country-wide mobile service. The concept is based on separate network operators and service providers. Service provision started in 2001, with an "own" service provider, and Telia joining later. The long term outcome is still to be seen

5 Additional information sources

Additional information is available on the following web sites:

Table 16.
Information sources on Finnish telecommunications

www.mintc.fi	Ministry of Transport and Communications, links to all operators, other links, reports, other information
www.ficora.fi/englanti/index.html	Finnish Communications Authority, legislation and regulations in English
www.sonera.com	Sonera, operator
www.elisa.com	Elisa, operator
www.finnet.fi/eng/	Finnet Association, association of private telcos (New Finnet), links, some national statistics
www.telia.fi	Telia, operator (only Finnish)
www.songnetworks.fi	Song Networks, operator
www.kilpailuvirasto.fi	Finnish Competition Authority

DOCUMENTS IN ENGLISH ON FINLAND:

TELECOMMUNICATIONS STATISTICS (Ministry of Transport and Communications, hard copy only, annual statistics book with comprehensive data about Finland). 2002 edition, 85 pages, available from
http://www.finnetfocus.fi/eng/

CASE MOBILE FINLAND
http://www.mintc.fi/

FINLAND´S WIRELESS VALLEY. FROM INDUSTRIAL POLICIES TOWARD CLUSTER STRATEGIES
http://www.mintc.fi/

FIXED MOBILE INTERCONNECTION:
THE FINNISH CASE
http://www.itu.int/interconnect/workshop

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